APPENDIX B

BIOASSAY BATCHING AND SAMPLE SELECTION MEMO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
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SUPERFUND &
EMERGENCY
MANAGEMENT DIVISION

March 19, 2020

Kris McCaig
Teck American Incorporated
501 North Riverpoint Boulevard, Suite 300
Spokane, Washington 99202

VIA ELECTRONIC MAIL ONLY

Subject: EPAs approval of TAI Revised Draft Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendation Memo, (3/18/2020)

Dear Kris,

EPA approved TAIs Revised Draft Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendation Memo dated March 18, 2020. While we acknowledge TAI's concern about organic carbon (OC)-normalization of excess SEM at low organic carbon concentrations, EPA maintains that the OC-normalization should be used as a line of evidence for all UCR samples.

Please let me know if you have any questions or concerns.

Sincerely,

Kathryn S. Cerise

Kathryn Cerise
EPA Remedial Project Manager

cc: Dan Audet, U.S. Department of Interior
Cindy Marchand, Confederated Tribes of the Colville Reservation
Tamara Knudson, Spokane Tribe of Indians
John Roland, Washington Department of Ecology

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MEMORANDUM

To: Kris McCaig

From: Karen Tobiason, Robert Santore, Nancy Judd, Claire Detering

Subject: Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendation

Date: March 19, 2020

Sediment samples were collected in fall 2019 for the Upper Columbia River (UCR) 2019 Phase 3 sediment study (ERM et al. 2019) (hereinafter, the "study"). As part of the study, sediment samples were collected for bioassays at locations in sampleable sand and mud strata within each area of interest (AOI) and from reference locations. Bioassays will be performed on a subset of the collected samples.

Teck American Incorporated (TAI) has reviewed preliminary data[1] and recommends conducting bioassays on 57 sediment samples representing the range of metals concentrations and factors affecting bioavailability and spatially distributed across sampled stratum. The 57 samples are from the following areas:

- AOIs—40 samples total
  - Deadman's Eddy—14 samples
  - China Bend—13 samples
  - Evans—13 samples
- Reference areas—17 total

This memorandum presents the rationale for the selection of the 57 samples recommended for bioassay testing, as well as the rationale for the recommended bioassay batching approach.

[1] Since developing the recommendations for bioassay sample selection and batching provided in this memo, TAI has received validated data, which were provided to EPA on January 27, 2020. Recommendations provided herein are not affected by changes resulting from data validation.

SAMPLE SELECTION

AOI Bioassay Sample Selection

The methods used to select bioassay samples were consistent with the study quality assurance project plan (QAPP) (ERM et al. 2019), which states (Section A7.7.5): *Preliminary analytical data will be used to identify up to 14 samples for bioassay testing at each AOI. The bioassay samples will represent the range of metals concentrations and factors affecting bioavailability and be spatially distributed across each stratum in the AOI.*

Attachment A to this memorandum provides the preliminary sediment chemistry data (including information on grain size and estimated percent slag) used in this evaluation to select bioassay samples; the data and calculations are not intended to be used for any purpose other than selecting bioassay samples. Since developing the recommendations for bioassay sample selection and batching provided in this memo, TAI has received validated data, which were provided to EPA on January 27, 2020. Recommendations provided herein are not affected by changes resulting from data validation.

The volume of sediment collected at each of the target sample locations varied. The goal was to collect sufficient volume of sediment in the sampleable sand and mud strata to conduct the initial 42-day *Hyalella azteca* bioassays and potential toxicity identification evaluations (TIEs). Table B3-1 the study QAPP lists the target and minimum volumes needed for these two purposes.[2]

It was not possible to collect the target volume at all locations in the sampleable sand stratum. The minimum volume of 2.5 L (0.7 gal.) for the initial bioassay was collected from 71 AOI locations (potential bioassay locations) (Attachment A, Table A4); the target volume of 5 L (1.4 gal.) for the initial bioassay was collected from 61 of those locations, and additional volume for potential TIEs was collected at 58 locations. Of the 71 AOI sediment samples with at least the minimum volume of sediment available, 40 are recommended for bioassays (14 from Deadman's Eddy and 13 each from China Bend and Evans). These 40 samples include 13 from locations pre-determined by the US Environmental Protection Agency (EPA) for analysis of bioassay split samples as part of its quality assurance/quality control (QA/QC) program (4 to 5 locations per AOI).[3] Also included are six samples from repeat sample locations (two locations per AOI).[4]

Preliminary sediment chemistry data were used to support the selection of the remaining 21 bioassay samples (i.e., those that were not from the 19 pre-determined locations). Samples were selected to represent a range of chemical and physical

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[2] The target and minimum volumes of sediment were 5 L (1.4 gal.) and 2.5 L (0.7 gal.), respectively, for the initial bioassays and 19 L (5 gal.) (both target and minimum) for potential TIEs.

[3] Attachment A Table A4 provides the sample volumes available for the EPA split samples.

[4] Four of the repeat sample locations are from the Phase 2 sediment study (Windward et al. 2017) and two are from the US Geological Survey (USGS) sediment study (Ingersoll et al. 2016).

characteristics. The characteristics used in the selection process included the following (provided in Attachment A):

- Chemical characteristics (based on preliminary analytical data)
  - Excess simultaneously extracted metals (SEM)[5]
  - Mean probable effects concentration quotients (mPECqs) for four metals (cadmium, copper, lead, and zinc)
- Physical characteristics
  - Percent total organic carbon (TOC)
  - Grain size (percent fines, percent sand, percent gravel)
  - Estimated percent slag (based on segmented linear regressions specified in the study QAPP)[6]:

Segment 1: $\sqrt{\%\,Slag} = 0.223 \times \sqrt{\log_{10} Zn}$ when $\sqrt{\log_{10} Zn} < 1.72$

Segment 2: $\sqrt{\%\,Slag} = 16.2 \times \sqrt{\log_{10} Zn} - 27.4$ when $1.72 < \sqrt{\log_{10} Zn} < 1.95$

Segment 3: $\sqrt{\%\,Slag} = 29.7 \times \sqrt{\log_{10} Zn} - 53.7$ when $1.95 < \sqrt{\log_{10} Zn}$

The selection process also considered whether enough sediment was available for the initial bioassays and subsequent TIEs (if needed) and adequate spatial representation of each strata within each AOI.[7]

Table 1 shows the samples recommended for bioassays with their associated preliminary chemical and physical characteristics. Available sediment volumes were considered sufficient for the initial bioassays and subsequent TIEs for these samples, unless otherwise noted in Table 1. Table 2 provides a comparison of summary statistics between the 71 samples with the minimum volume of 2.5 L (0.7 gal.) available for bioassays and the recommended samples organized by AOI. The same information is shown in Figures 1 through 7 demonstrating that the selected bioassay samples (circled samples in the figures) adequately represent the ranges of chemical and physical characteristics within the AOIs.

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[5] Organic carbon (OC)-normalized excess SEM is also provided in Attachment A at EPA's request. EPA (2005) guidance does not address the influence of normalizing excess SEM in samples with low concentrations of OC, which are typical in samples from the UCR. TAI has requested further discussion with EPA about utilizing appropriate methods to OC normalize excess SEM that do not inflate the value due to very low TOC concentrations.

[6] Note that the Phase 3 sediment study QAPP (ERM et al. 2019) specifies that percent slag determination will be conducted on 10 percent of sampleable sand samples (i.e., six samples).

[7] Only two of the samples (EV044 and EV063) contain greater than 80 percent silt and clay and are considered mud.

Maps 1 through 3 show the spatial distribution of the selected samples in the three AOIs, respectively.

Reference Sample Selection

Reference samples were collected at 18 locations in Canada, upstream of the site. According to the study QAPP, bioassays were intended to be conducted using all reference area samples. EPA requested analysis for organic chemicals (polycyclic aromatic hydrocarbons [PAHs], polychlorinated biphenyls [PCBs], and pesticides) in the reference samples. A preliminary review of organic chemicals in the reference samples has been conducted (Attachment B). Based on the preliminary data, none of the organic chemical concentrations exceeded the probable effects quotients (PECs). In addition, the sum of PAH equilibrium partitioning benchmark toxic units for the 18 reference samples are all below the sediment benchmark (i.e., ≤1.0) and therefore PAHs would not be considered toxic to benthic organisms (EPA 2003). The recommendations provided herein suggest excluding one of the reference area samples: REF018, which has substantially higher percent TOC (7.1%) than AOI samples and other reference samples (range from 0.06 to 2.94% for AOI samples and 0.46 to 2.92% for reference samples, excluding REF018)

Table 1 provides the preliminary chemical and physical characteristics for the recommended reference samples and Table 2 provides summary statistics for those sample characteristics. Figures 5 through 7 show the ranges for percent TOC, fines, and sand in the reference samples relative to the ranges in the AOIs.

BIOASSAY SAMPLE BATCHING

According to the study QAPP (ERM et al. 2019), if it is necessary to conduct bioassays in multiple batches, samples selected for each batch should be stratified so that full ranges (to the extent practicable) of chemistry and grain sizes are included in each batch. In addition, at least two samples should be selected to be run in all of the batches as an additional inter-batch comparability control.[8] An additional consideration suggested by EPA (USGS et al. 2019) would be to distribute samples from EPA split bioassay sampling locations among the different batches.

Based on the total number of 57 samples recommended for bioassay analysis (40 AOI samples and 17 reference samples), a minimum of 3 batches will be needed to conduct the testing. Two samples will be included in all three batches, leaving 55 samples to distribute among the three batches. The breakdown of samples per batch will be as follows:

- The laboratory control (Spring River control) and quartz sand

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[8] Standard laboratory control sediment and clean quartz sand also will be included in each batch, providing additional information about potential inter-batch variability.

- Two samples (proposed herein) to be run in each batch, one AOI sample and one reference sample
- Either 18 or 19 of the remaining AOI and reference samples

Based on the breakdown above, one batch will be composed of 23 samples (19 AOI and reference area samples, the 2 samples included in each batch, and the laboratory control sample and quartz sand), and the other two batches will both be composed of 22 samples (18 AOI and reference area samples, the 2 samples included in each batch, and the laboratory control and quartz sand).

The two samples recommended for inclusion in all of the batches are REF013 and DM008. Both samples have sufficient volume for this purpose, if sediment from the 5-gal. bucket (on hold for possible future TIEs) is used to augment the volume from the 2-gal. bucket collected specifically for the initial bioassays. Using these two samples during the initial bioassays will preclude their use for potential TIEs but will provide valuable information on inter-batch variability, and other samples will be available for use in potential TIEs. REF013 primarily consists of sand but differs from quartz sand in that it has 5.9% fines and 0.5% TOC; this sample has low concentrations of metals and organics (Attachment A). DM008 is one of the samples with higher excess SEM (116 µmol/g) and will allow for an evaluation of batch variability among samples with higher metals concentrations. DM008 is also an EPA split bioassay sample location.

A stratified random sampling design was used to select the 55 samples to be distributed among the three batches. Samples from each area (the three AOIs and the combined reference areas) were randomly assigned to one of the three batches. The batch assignments were then evaluated to verify that each batch included similar ranges of chemicals and grain sizes, and that EPA bioassay split samples were evenly distributed.

Table 3 show the recommended sample by batch. Tables 4 and 5 provide the numbers of samples in each batch by AOI and summary statistics for comparison among batches, respectively.

REFERENCES

EPA. 2003. Procedures for the derivation of equilibrium partitioning sediment benchmarks (ESBs) for the protection of benthic organisms: PAH mixtures. EPA-600-R-02-013. Office of Research and Development, US Environmental Protection Agency, Washington, DC.

EPA. 2005. Procedures for the derivation of equilibrium partitioning sediment benchmarks (ESBs) for the protection of benthic organisms: metal mixtures (cadmium, copper, lead, nickel, silver and zinc. EPA/600/R-02-011. Office of Research and Development, US Environmental Protection Agency, Washington, DC.

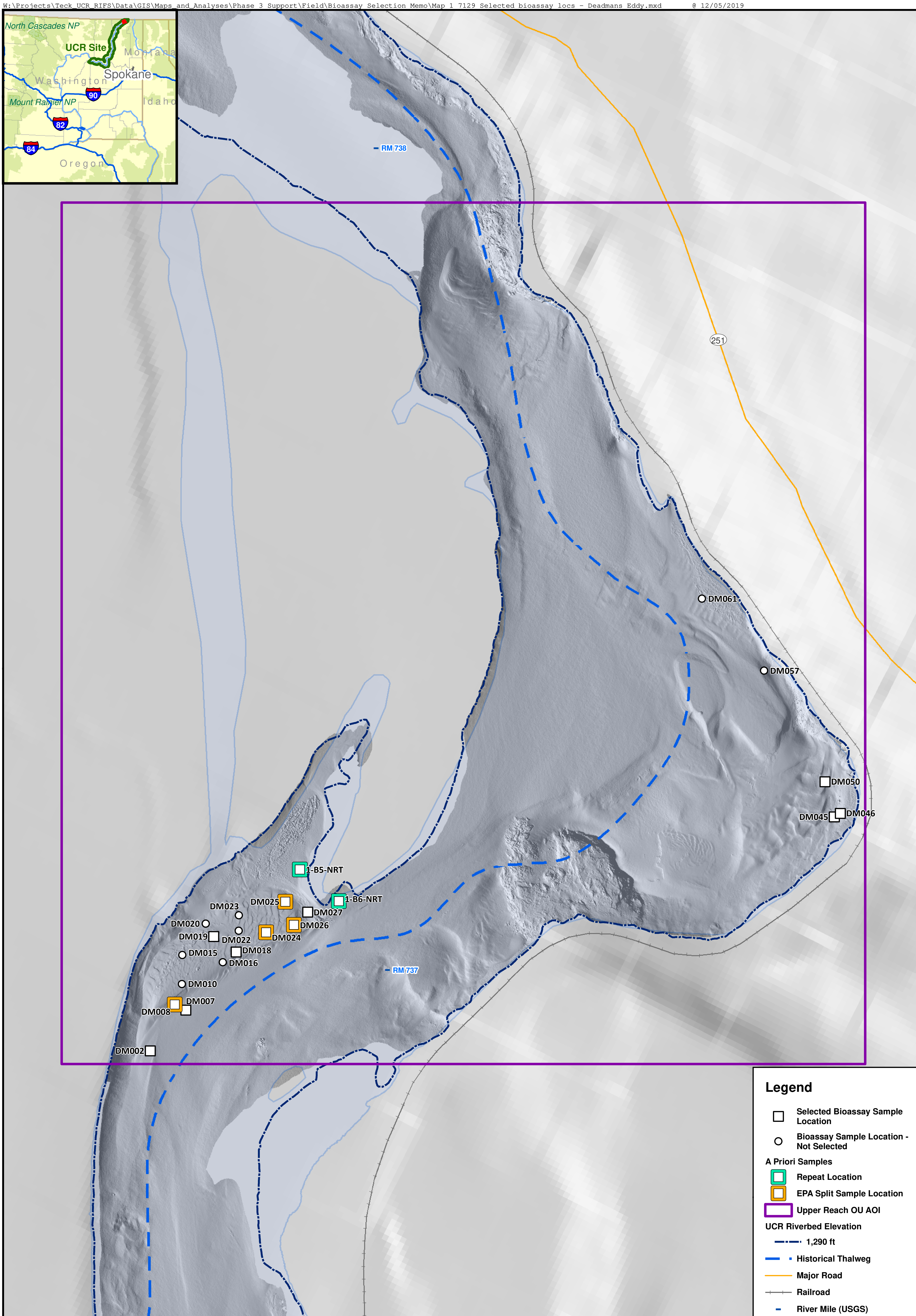
ERM, Windward, HDR, Exponent, Parametrix. 2019. Upper Columbia River. Final. Quality assurance project plan for the 2019 Phase 3 sediment study. ERM, Windward Environmental LLC, HDR, Exponent, and Parametrix, Inc.

Ingersoll CG, Besser JM, Brumbaugh WG, Kunz JL, Cox SE, Balistrieri LS, Mebane CA, MacDonald DD, Sinclair JA, Schein A. 2016. Toxicity evaluation of metal-contaminated sediments from the Upper Columbia River, Washington, to the amphipod, *Hyalella azteca*, the midge, *Chironomus dilutus*, and the mussel, *Lampsilis siliquoidea*. US Geological Survey.

USGS, Jacobs, EcoTox, Pacific EcoRisk, Windward. 2019. Personal communication (bioassay discussion among J. Steevens [USGS], S. Roark and J. Gondek [Jacobs], K. Brix [EcoTox], S. Clark and B. Jorgensen [Pacific EcoRisk], and K. Tobiason [Windward]). Toronto, ON. November 6, 2019.

Windward, Exponent, Parametrix, HDR. 2017. Upper Columbia River. Final. Phase 2 sediment study data summary and data gap report. Windward Environmental LLC, Exponent, Parametrix, Inc., and HDR, Inc., Seattle, WA.

W:\Projects\Teck_UCR_RIFS\Data\GIS\Maps_and_Analyses\Phase 3 Support\Field\Bioassay Selection Memo\Map 1 7129 Selected bioassay locs - Deadmans Eddy.mxd @ 12/05/2019



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Map 1. **Selected Bioassay Sample Locations at Deadman's Eddy AOI**
Upper Columbia River, WA

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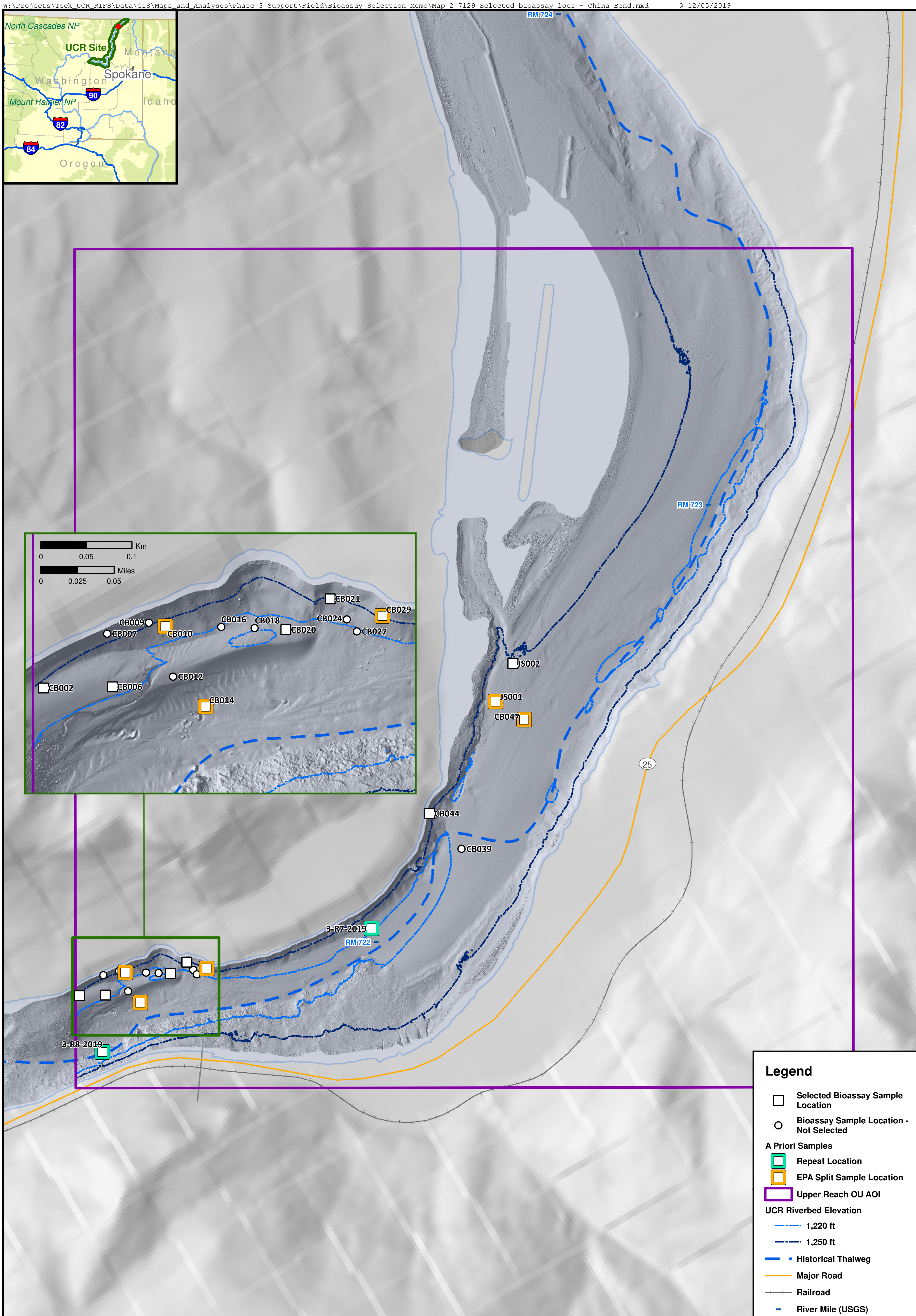

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Km
0 0.2 0.4
Miles
0 0.1 0.2

N

FINAL

Map 2. **Selected Bioassay Sample Locations at China Bend AOI**

Upper Columbia River, WA

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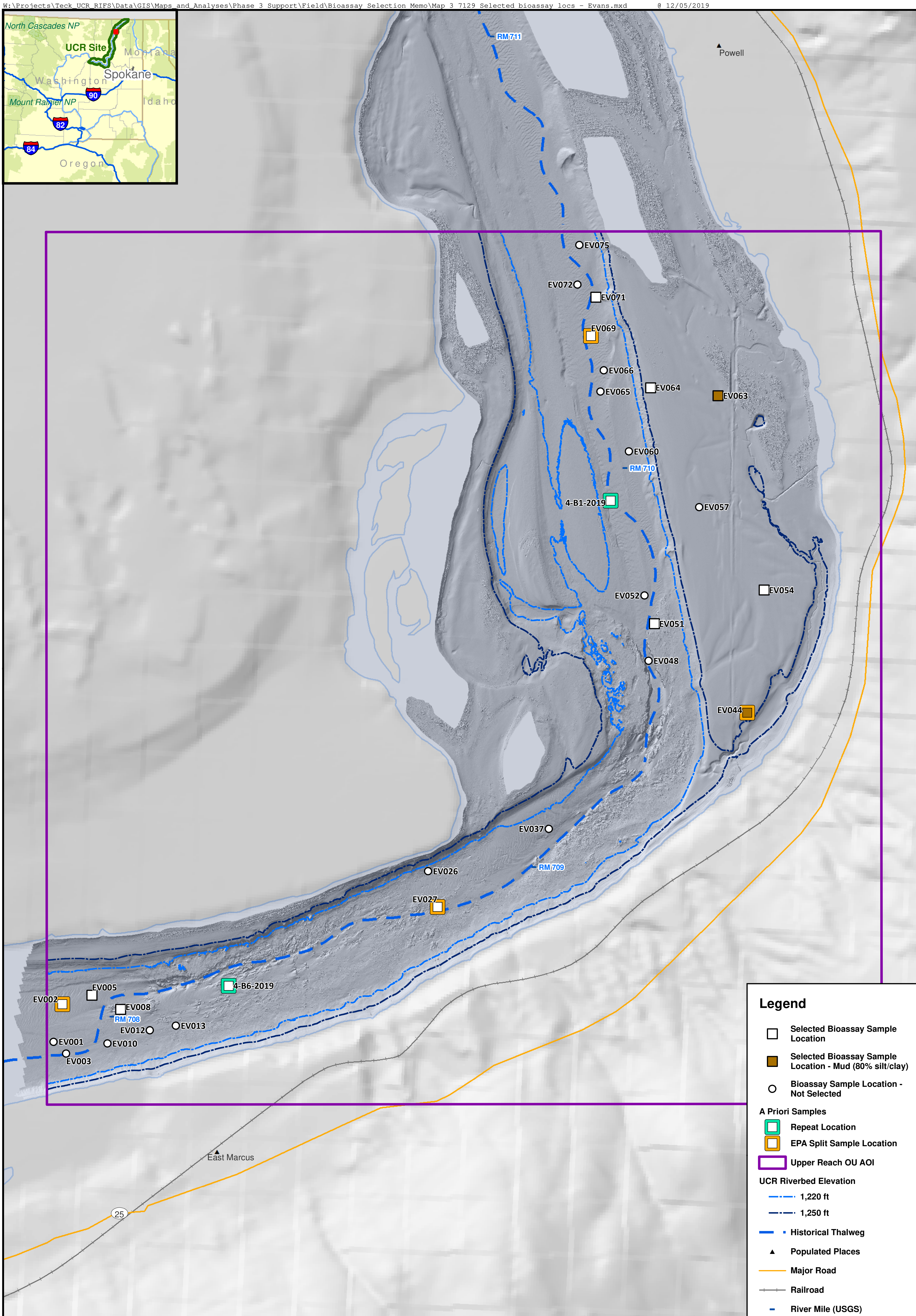

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Miles: 0 0.1 0.2

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Map 3. **Selected Bioassay Sample Locations at Evans AOI**

Upper Columbia River, WA

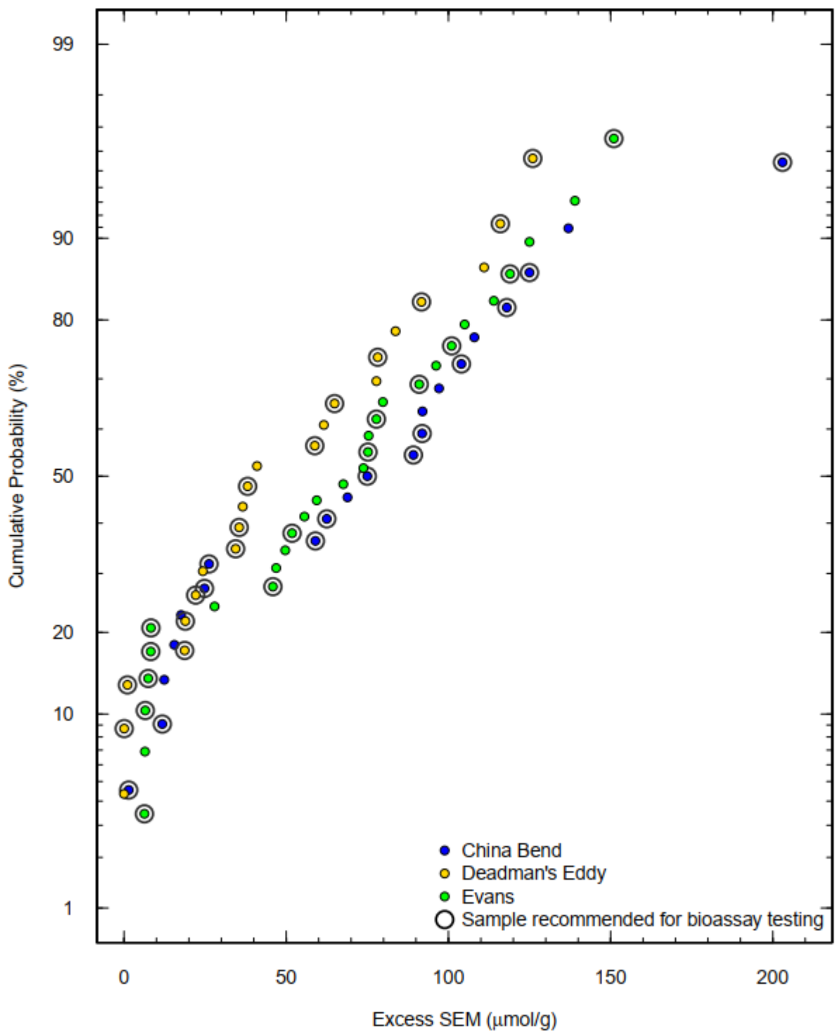

Figure 1. Distribution of excess SEM in AOIs

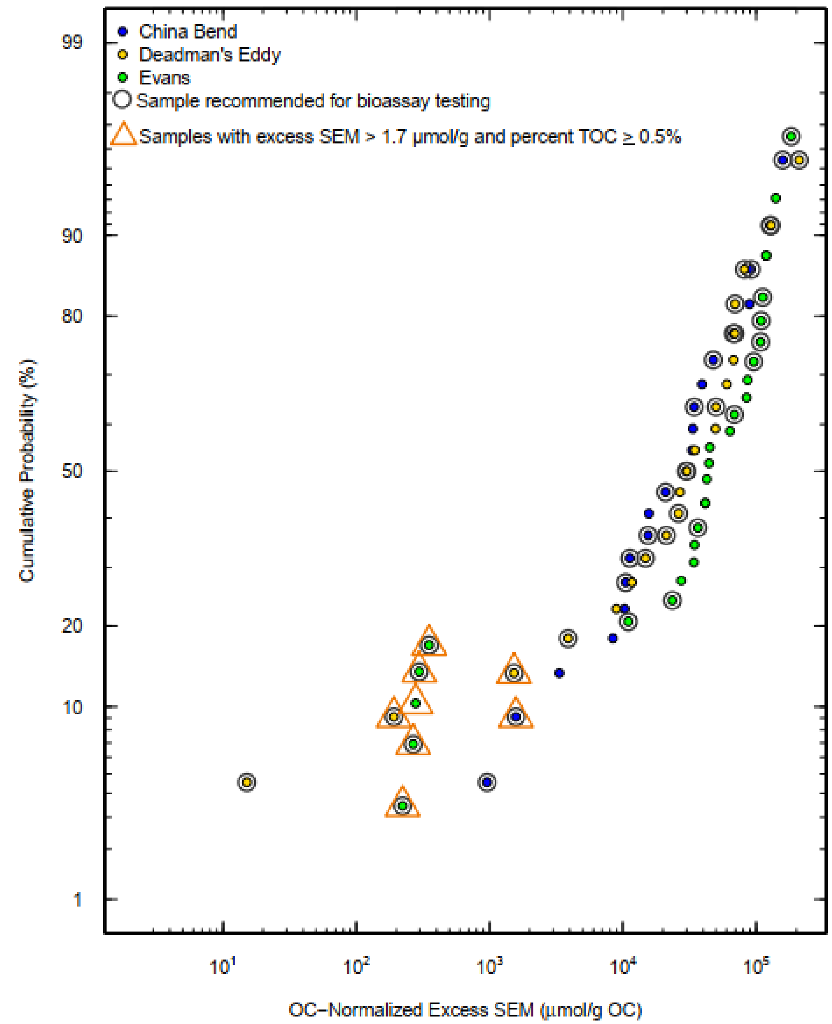

Figure 2. Distribution of OC-normalized excess SEM in AOIs

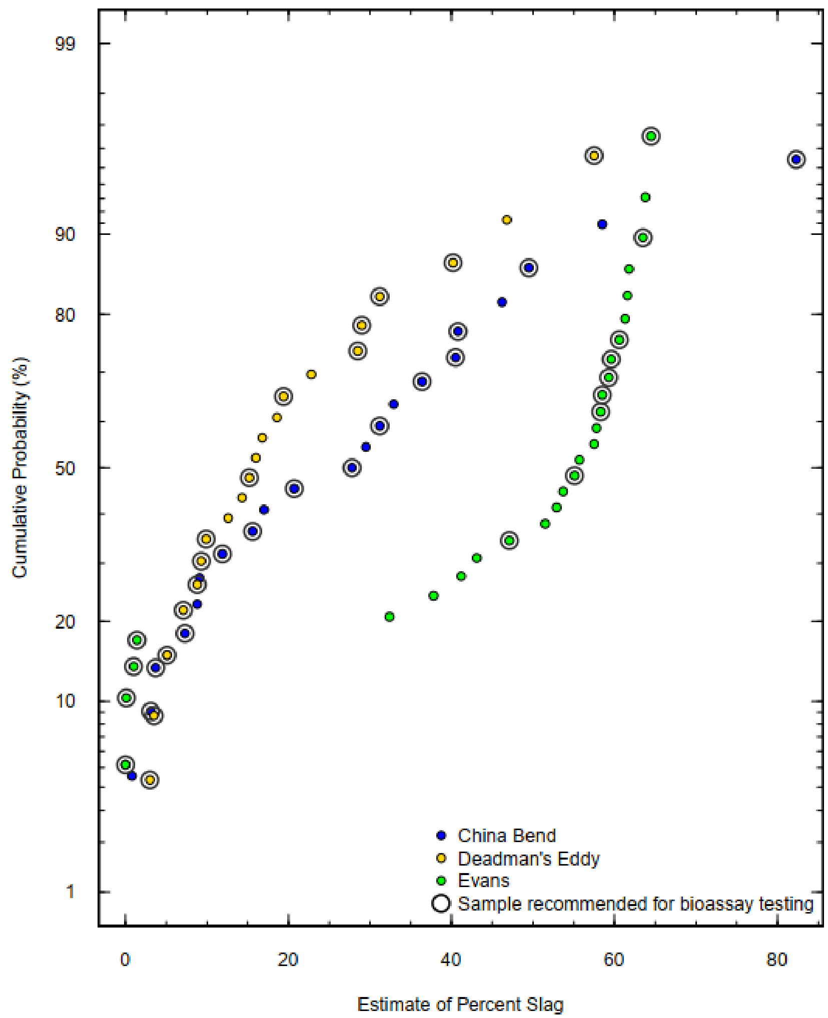

Figure 3. Distribution of estimated percent slag in AOIs

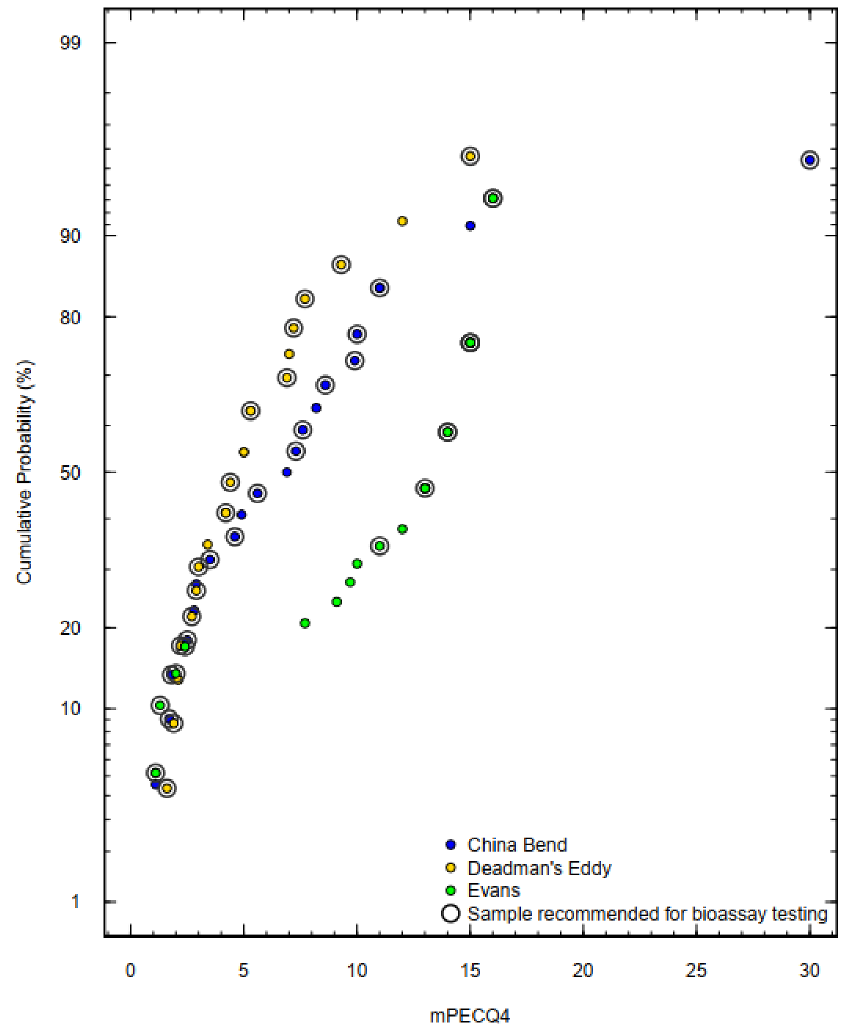

Figure 4. Distribution of mean PEC quotient for 4 metals (cadmium, copper, lead, and zinc) in AOIs

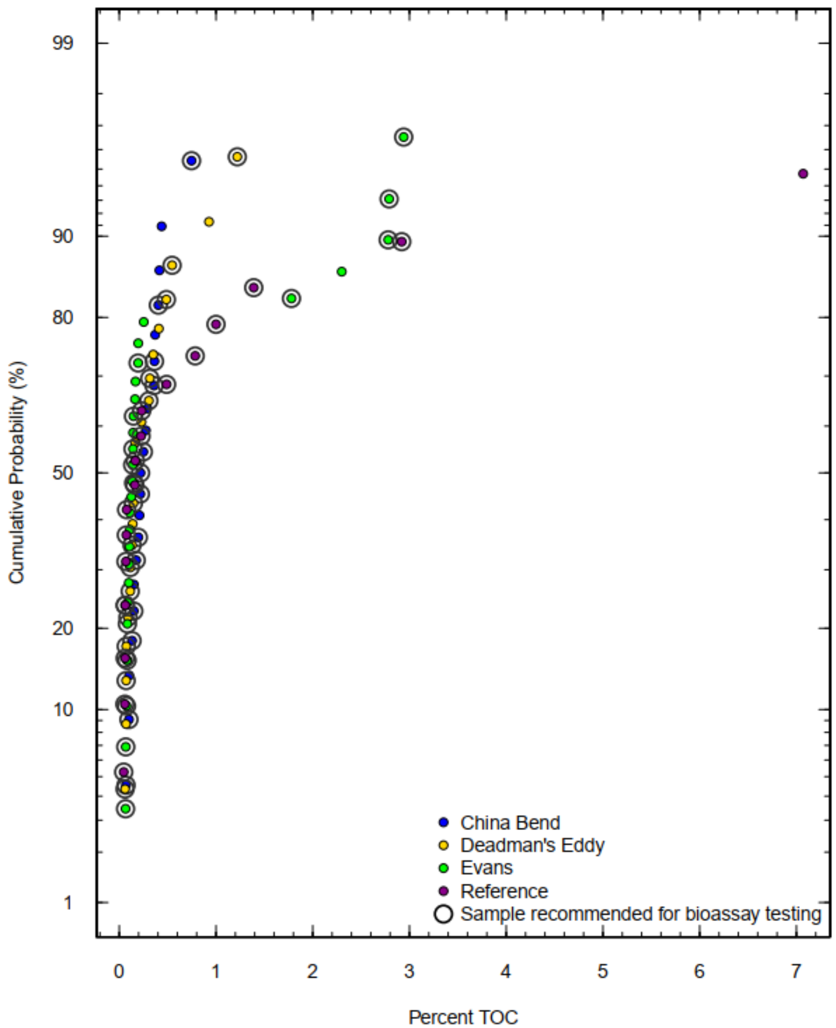

Figure 5. Distribution of percent TOC in AOIs and reference areas

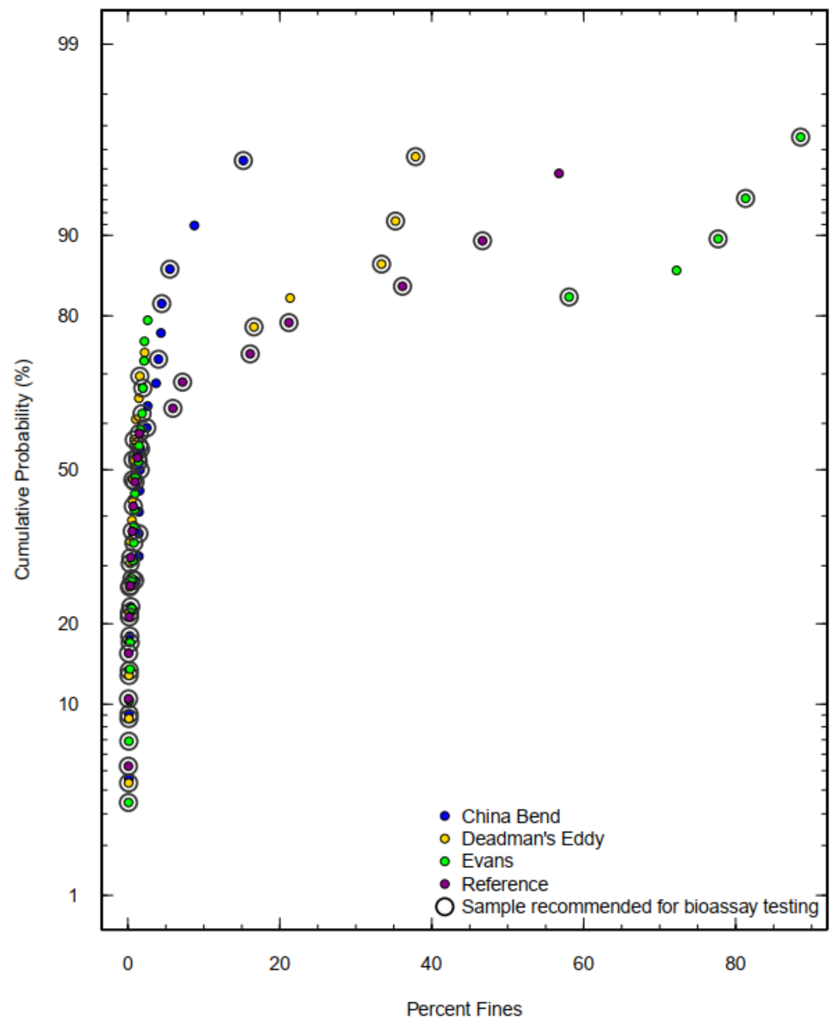

Figure 6. Distribution of percent fines in AOIs and reference areas

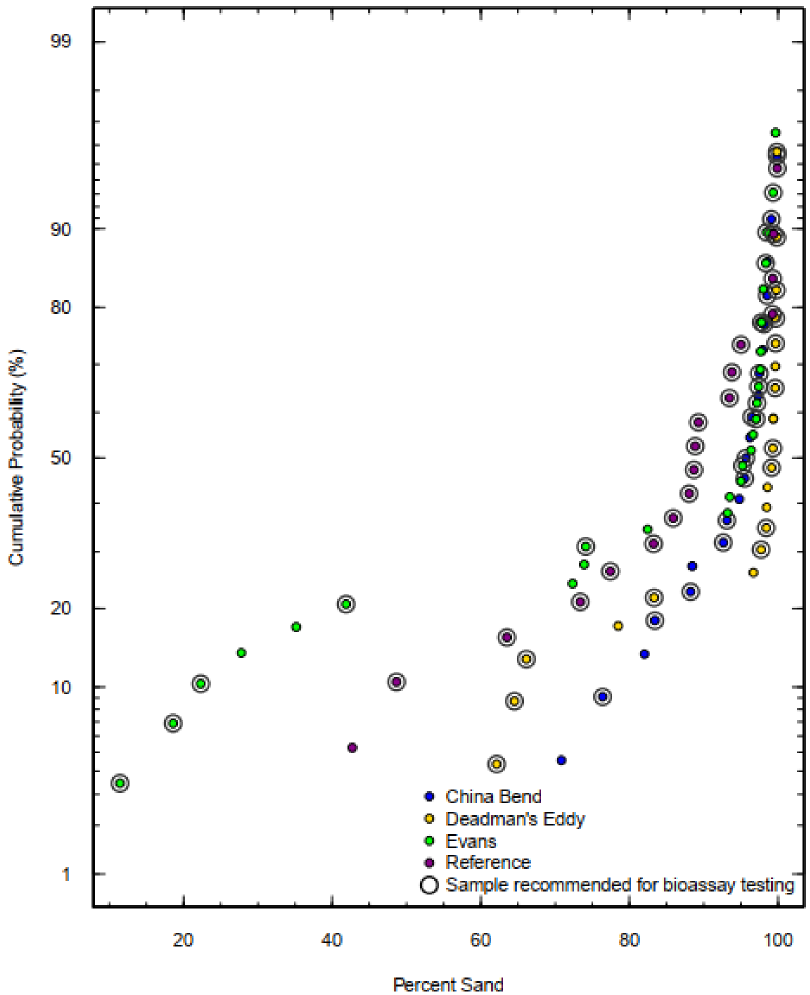

Figure 7. Distribution of percent sand in AOIs and reference areas

Table 1. Chemical and physical characteristics for the recommended bioassay samples by area, ordered from highest to lowest excess SEM

Location ID	Characteristics								Rationale for Recommendation
	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	Grain Size			Estimated % Slag	
					% Fines	% Sand	% Gravel		
Deadman's Eddy									
DM002	126	1,530	9.3	0.06	0.14	100	0.18	40	excess SEM above EPA (2005) upper equilibrium partitioning benchmark of 120 µmol/g, coarse sand
DM008	116	129,000	15	0.09	0.84	99	0.020	58	EPA split sample location
DM027	91.7	69,500	6.9	0.13	0.21	100	0.00	29	midrange of excess SEM, fine to medium sand
DM025	78.2	69,200	7.2	0.11	0.10	100	0.070	28	EPA split sample location
1-B6-NRT	64.9	21,200	7.7	0.31	0.69	98	1.6	31	repeat sample location
DM007	58.8	81,700	5.3	0.072	0.15	100	0.00	19	midrange of excess SEM
DM018	38.1	26,100	2.9	0.15	0.30	100	0.00	9.3	lower range of excess SEM, fine to medium sand
DM026	35.5	50,000	4.4	0.071	0.23	100	0.14	15	EPA split sample location
DM024	34.4	30,200	2.7	0.11	0.66	99	0.020	8.8	EPA split sample location
DM019	22.1	14,800	1.6	0.15	1.6	98	0.020	3.5	lower range of excess SEM, fine to medium sand
DM050	18.9	3,880	4.2	0.49	33	66	0.48	9.9	in eddy, lower range of excess SEM, mostly sand but with higher % fines than most samples
1-B5-NRT[c]	18.7	1,530	2.2	1.2	17	83	0.090	5.1	repeat location, low volume for potential TIE, if needed

Location ID	Characteristics								Rationale for Recommendation
	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	Grain Size			Estimated % Slag	
					% Fines	% Sand	% Gravel		
DM046[c]	1.05	192	1.9	0.55	35	65	0.24	3.0	in eddy, less volume available for potential TIE if needed; excess SEM below EPA (2005) lower equilibrium partitioning benchmark of 1.7 µmol/g, mostly sand but higher percent fines than most samples
DM045	0.0478	15.1	3.0	0.32	38	62	0.00	7.1	in eddy, excess SEM below EPA (2005) lower equilibrium partitioning benchmark of 1.7 µmol/g, mostly sand but higher %fines than most samples
China Bend									
3-R8[c]	203	158,000	30	0.13	0.25	88	12	82	repeat sample location, highest excess SEM (above EPA (2005) upper equilibrium partitioning benchmark of 120 µmol/g) and estimated percent slag, low volume but included because repeat sample location
JS001[c]	125	34,300	8.6	0.36	1.7	98	0.24	36	EPA split sample location
JS002[c]	118	67,400	11	0.18	1.6	96	2.0	49	high excess SEM, sand
CB006	104	47,700	5.6	0.22	0.89	99	0.010	21	high excess SEM, sand
CB014	91.9	91,900	9.9	0.10	0.15	100	0.010	41	EPA split sample location
3-R7[d]	89.2	127,000	10	0.070	0.18	93	6.7	40	repeat sample location, use even though contains 6.7% gravel
CB020	75.0	20,900	7.3	0.36	1.5	99	0.010	28	midrange of excess SEM, sand
CB010[d]	62.5	15,500	4.6	0.40	5.5	93	1.8	16	EPA split sample location
CB002	59.0	29,900	3.5	0.20	2.5	97	0.030	12	lower to midrange of excess SEM
CB044	26.2	10,500	1.7	0.25	4.0	96	0.30	3.7	Low range of excess SEM
CB029[c]	24.8	11,300	2.5	0.22	4.5	96	0.010	7.3	EPA split sample location
CB021	11.8	1,580	1.8	0.75	15	83	1.4	3.1	Low range of excess SEM, highest %TOC in AOI

Location ID	Characteristics								Rationale for Recommendation
	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	Grain Size			Estimated % Slag	
					% Fines	% Sand	% Gravel		
CB047	1.44	960	7.6	0.15	0.38	76	23	31	EPA split sample location, use even though 23% gravel, excess SEM below EPA (2005) lower equilibrium partitioning benchmark of 1.7 µmol/g
Evans									
EV071	151	109,000	16	0.14	0.55	98	1.7	64	excess SEM above EPA (2005) upper equilibrium partitioning benchmark of 120 µmol/g, sand
4-B6	119	183,000	14	0.065	0.30	99	0.30	60	repeat sample location
EV027	101	68,700	11	0.15	0.080	74	26	47	EPA split sample location
4-B1	91.0	108,000	15	0.084	1.4	98	0.20	59	repeat sample location
EV008	77.8	96,000	15	0.081	1.5	98	0.17	61	midrange of excess SEM, sand
EV069	75.2	112,000	16	0.067	1.9	97	1.1	65	EPA split sample location
EV005	51.8	36,500	14	0.14	2.0	97	0.86	58	midrange of excess SEM, sand
EV051	45.9	23,500	15	0.20	0.79	95	4.0	59	midrange of excess SEM, sand
EV054	8.29	297	2.0	2.8	78	22	0.010	1.0	low excess SEM, high %fines and %TOC
EV002	8.24	11,000	13	0.075	0.13	97	2.5	55	EPA split sample location
EV044	7.45	268	1.3	2.8	81	19	0.090	0.14	EPA split sample location, mud, high %TOC
EV063	6.55	223	2.4	2.9	89	11	0.010	1.4	low excess SEM, mud, high %TOC
EV064	6.29	353	1.1	1.8	58	42	0.040	0.0	low excess SEM, mixture %fines and sand, higher %TOC
Reference									
REF004	0.337	203	0.10	0.17	1.5	77	21	0.089	EPA split sample location
REF016	0.323	32.3	0.084	1.0	21	73	5.4	0.083	-
REF007	0.242	150	0.041	0.16	1.3	95	3.7	0.076	EPA split sample location

Location ID	Characteristics								Rationale for Recommendation
	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	Grain Size			Estimated % Slag	
					% Fines	% Sand	% Gravel		
REF017	0.229	16.5	0.091	1.4	47	49	4.7	0.083	-
REF012[d]	0.226	97.8	0.060	0.23	7.2	88	4.8	0.082	-
REF011	0.209	337	0.041	0.062	0.58	99	0.0	0.079	-
REF003	0.196	268	0.034	0.073	0.71	99	0.0	0.071	-
REF008	0.179	259	0.036	0.069	0.39	94	5.8	0.073	-
REF010	0.174	229	0.034	0.076	0.070	86	14	0.069	-
REF002	0.156	256	0.030	0.061	0.10	100	0.0	0.068	-
REF001	0.154	335	0.044	0.046	0.090	89	11	0.072	-
REF005	0.135	218	0.032	0.062	0.20	89	11	0.068	-
REF009A	0.127	219	0.032	0.058	0.33	99	0.41	0.070	-
REF014	0.123	15.7	0.069	0.79	16	83	0.64	0.078	-
REF013	0.0102	2.09	0.045	0.49	5.9	93	0.61	0.072	-
REF006	AVS>SEM	-264	0.047	0.23	0.93	89	10	0.077	-
REF015	AVS>SEM	-11.5	0.26	2.9	36	64	0.34	0.097	EPA split sample location

Note:

[a] At EPA's request, OC-normalized excess SEM are presented for all samples, including those with low concentrations of TOC. Dividing excess SEM by very low concentrations of TOC results in inflated values for OC-normalized excess SEM. EPA (2005) guidance does not address the influence of normalizing excess SEM in samples with low concentrations of OC, which are typical in samples from the UCR. TAI has requested further discussion with EPA about utilizing appropriate methods to OC normalize excess SEM measured in UCR sediment samples.

[b] The mPECq4 is the mean probable effects concentration quotient for four metals (cadmium, copper, lead, and zinc).

[c] The target volume for the initial bioassay was collected, but the minimum volume for the potential TIE, if needed, was not obtained for this sample.

[d] The target volume of 5 L (1.4 gal.) for the initial bioassay was not collected but the minimum volume of 2.5 L (0.7 gal) is available.

AOI – area of interest
AVS – acid volatile sulfide
ID – identification
mPECq – mean probable effects concentration quotient
SEM – simultaneously extracted metals
TAI – Teck American Incorporated

EPA – US Environmental Protection Agency
EqP – equilibrium partitioning
NA – not applicable
OC – organic carbon
TIE – toxicity identification evaluation
TOC – total organic carbon
UCR – Upper Columbia River

Table 2. Summary statistics for bioassay samples by AOI

Statistic	Potential Bioassay Samples						Recommended Samples					
	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	Estimated % Slag	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	Estimated % Slag
Deadman's Eddy												
n	22	22	22	22	22	22	14	14	14	14	14	14
Minimum	0.0480	15.1	1.6	0.060	0.10	3.0	0.0480	15.1	1.6	0.060	0.10	3.0
Maximum	126	210,000	15	1.2	38	58	126	210,000	15	1.2	38	58
Median	41.0	30,000	4.7	0.15	0.67	16	36.8	30,200	4.3	0.14	0.68	13
Mean	54.3	46,000	5.4	0.29	7.1	19	50.3	50,5	5.3	0.27	9.1	19
China Bend												
n	21	21	21	21	21	21	13	13	13	13	13	13
Minimum	1.44	960	1.1	0.070	0.13	0.76	1.44	960	1.7	0.070	0.15	3.1
Maximum	203	154,000	30	0.75	15	82	203	154,000	30	0.75	15	82
Median	75.0	33,000	6.9	0.22	1.6	28	75.0	33,000	7.3	0.22	1.6	28
Mean	73.3	40,300	7.5	0.27	3.0	27	76.3	47,100	8.0	0.26	2.9	29
Evans												
n	28	28	28	28	28	28	13	13	13	13	13	13
Minimum	6.29	223	1.1	0.065	0.080	0.0	6.29	223	1.1	0.065	0.080	0.0
Maximum	151	183,000	16	2.9	89	65	151	183,000	16	2.9	89	65
Median	70.7	42,600	13	0.14	1.2	55	51.8	41,500	14	0.14	1.5	58
Mean	66.8	59,800	11	0.55	14	45	57.7	57,600	10	0.87	24	41

Statistic	Potential Bioassay Samples						Recommended Samples					
	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	Estimated % Slag	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	Estimated % Slag
Reference												
n	18	18	18	18	18	18	17	17	17	17	17	17
Minimum	0.0102	2.09	0.030	0.046	0.070	0.068	0.0102	2.09	0.030	0.046	0.070	0.068
Maximum	0.337	337	0.26	7.1	57	0.097	0.337	337	0.26	2.9	47	0.097
Median	0.188	211	0.045	0.16	1.1	0.077	0.179	211	0.044	0.16	0.93	0.076
Mean	0.197	165	0.069	0.83	11	0.078	0.188	176	0.064	0.46	8.2	0.077

[a] The mPECq4 is the mean probable effects concentration quotient for four metals (cadmium, copper, lead, and zinc).

[b] At EPA's request, OC-normalized excess SEM are presented for all samples, including those with low concentrations of TOC. Dividing excess SEM by very low concentrations of TOC results in inflated values for OC-normalized excess SEM. EPA (2005) guidance does not address the influence of normalizing excess SEM in samples with low concentrations of OC, which are typical in samples from the UCR. TAI has requested further discussion with EPA about utilizing appropriate methods to OC normalize excess SEM measured in UCR sediment samples.

AOI – area of interest

mPECq – mean probable effects concentration quotient

OC – organic carbon

NA – not applicable

SEM – simultaneously extracted metals

TAI – Teck American Incorporated

TOC – total organic carbon

UCR – Upper Columbia River

Table 3. Sediment samples recommended for each batch of bioassay testing

Location ID	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	% Sand	Estimated % Slag
Batch 1							
Site Samples							
1-B5-NRT	18.7	1,530	2.2	1.2	17	83	5.1
DM007	58.8	81,700	5.3	0.072	0.15	100	19
DM008[c,d]	116	129,000	15	0.090	0.84	99	58
DM019	22.1	14,800	1.6	0.15	1.6	98	3.5
DM025[c]	78.2	69,200	7.2	0.11	0.10	100	29
DM046	1.05	192	1.9	0.55	35	65	3.0
3-R7	89.2	127,000	10	0.070	0.18	93	41
CB002	59	29,900	3.5	0.20	2.5	97	12
CB020	75	20,900	7.3	0.36	1.5	99	28
CB021	11.8	1,580	1.8	0.75	15	83	3.1
EV002[c]	8.24	11,000	13	0.075	0.13	97	55
EV051	45.9	23,500	15	0.20	0.79	95	59
EV054	8.29	297	2.0	2.8	78	22	1.0
EV071	151	109,000	16	0.14	0.55	98	64
Reference Samples							
REF003	0.196	268	0.034	0.073	0.71	99	NA
REF004[c]	0.337	203	0.10	0.17	1.5	77	NA
REF006	0.0	AVS>SEM	0.047	0.23	0.93	89	NA
REF007[c]	0.242	150	0.041	0.16	1.3	95	NA
REF008	0.179	259	0.036	0.069	0.39	94	NA
REF013[d]	0.0102	2.09	0.045	0.49	5.9	93	NA
REF017	0.229	16.5	0.091	1.4	47	49	NA
Batch 2							
Site Samples							
1-B6-NRT	64.9	21,200	7.7	0.31	0.69	98	31.2
DM002	126	210,000	9.3	0.06	0.14	100	40
DM008[c,d]	116	129,000	15	0.090	0.84	99	58
DM045	0.0478	15.1	3.0	0.32	38	62	7.1
DM050	18.9	3,880	4.2	0.49	33	66	9.9

Location ID	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	% Sand	Estimated % Slag
3-R8	203	154,000	30	0.13	0.25	88	82.3
CB029[c]	24.8	11,300	2.5	0.22	4.5	96	7.3
CB047[c]	1.44	960	7.6	0.15	0.38	76	31.2
JS002	118	67,400	11	0.18	1.6	96	49.5
4-B6	119	183,000	14	0.065	0.30	99	60
EV005	51.8	36,500	14	0.14	2.0	97	58
EV008	77.8	96,000	15	0.081	1.5	98	61
EV064	6.29	353	1.1	1.8	58	42	0.0
EV069[c]	75.2	112,000	16	0.067	1.9	97	65
Reference Samples							
REF001	0.154	335	0.044	0.046	0.090	89	NA
REF002	0.156	256	0.030	0.061	0.10	100	NA
REF010	0.174	229	0.034	0.076	0.070	86	NA
REF013[d]	0.0102	2.09	0.045	0.49	5.9	93	NA
REF014	0.123	15.7	0.069	0.79	16	83	NA
REF015[c]	0.0	AVS>SEM	0.26	2.9	36	64	NA
Batch 3							
Site Samples							
DM008[c,d]	116	129,000	15	0.090	0.84	99	58
DM018	38.1	26,100	2.9	0.15	0.30	100	9.3
DM024[c]	34.4	30,200	2.7	0.11	0.66	99	8.8
DM026[c]	35.5	50,000	4.4	0.071	0.23	100	15
DM027	91.7	69,500	6.9	0.13	0.21	100	29
CB006	104	47,700	5.6	0.22	0.89	99	21
CB010[b]	62.5	15,500	4.6	0.40	5.5	93	16
CB014[c]	91.9	91,900	9.9	0.10	0.15	100	41
CB044	26.2	10,500	1.7	0.25	4.0	96	3.7
JS001[c]	125	34,300	8.6	0.36	1.7	98	36
4-B1	91.0	108,000	15	0.084	1.4	98	59
EV027[c]	101	68,700	11	0.15	0.080	74	47
EV044[c]	7.45	268	1.3	2.8	81	19	0.10
EV063	6.55	223	2.4	2.9	89	42	1.4
Reference Samples							

Location ID	Excess SEM (µmol/g)	OC-normalized Excess SEM (µmol/g OC)[a]	mPECq4[b]	TOC (%)	% Fines	% Sand	Estimated % Slag
REF005	0.135	218	0.032	0.062	0.20	89	NA
REF009A	0.127	219	0.032	0.058	0.33	99	NA
REF011	0.209	337	0.041	0.062	0.58	99	NA
REF012	0.226	97.8	0.06	0.23	7.2	88	NA
REF013[c]	0.0102	2.09	0.045	0.49	5.9	93	NA
REF016	0.323	32.3	0.084	1.0	21	73	NA

[a] The mPECq4 is the mean probable effects concentration quotient for four metals (cadmium, copper, lead, and zinc).

[b] At EPA's request, OC-normalized excess SEM are presented for all samples, including those with low concentrations of TOC. Dividing excess SEM by very low concentrations of TOC results in inflated values for OC-normalized excess SEM. EPA (2005) guidance does not address the influence of normalizing excess SEM in samples with low concentrations of OC, which are typical in samples from the UCR. TAI has requested further discussion with EPA about utilizing appropriate methods to OC normalize excess SEM measured in UCR sediment samples.

[c] Sample is an EPA split sample.

[d] DM008 and REF013 will be tested with each batch of samples to assess inter-batch variability.

AVS – acid volatile sulfide
EPA – US Environmental Protection Agency
ID – identification
mPECq – mean probable effects concentration quotient
OC – organic carbon
NA – not applicable
SEM – simultaneously extracted metals
TAI – Teck American Incorporated
TOC – total organic carbon
UCR – Upper Columbia River

Table 4. Distribution of Samples by Batch

Batch	Number of Samples by Area				Number of Pre-determined Samples	
	Deadman's Eddy	China Bend	Evans	Reference	EPA Split Sample Locations	Repeat Sample Locations
Batch 1	6	4	4	7	5	2
Batch 2	5	4	5	6	5	3
Batch 3	5	5	4	6	8	1

EPA – US Environmental Protection Agency

Table 5. Summary statistics for recommended bioassay samples by batch

Statistic	Excess SEM (µmol/g)	mPECq4[a]	TOC (%)	% Fines	Estimated % Slag
Batch 1	**(n = 21)**				
Minimum	0.0	0.034	0.069	0.10	0.10
Maximum	151	16	2.8	78	64
Median	11.8	2.0	0.17	1.3	3.5
Mean	35.5	4.9	0.44	10	18
Batch 2	**(n = 20)**				
Minimum	0.0	0.03	0.046	0.070	0.0
Maximum	203	30	2.9	58	82
Median	21.9	5.9	0.15	1.5	21
Mean	50.2	7.5	0.42	10	28
Batch 3	**(n = 20)**				
Minimum	0.0102	0.032	0.058	0.08	0.10
Maximum	125	15	2.9	89	59
Median	35.0	2.8	0.15	0.87	9.0
Mean	46.6	4.6	0.49	11	17

[a] The mPECq4 is the mean probable effects concentration quotient for four metals (cadmium, copper, lead, and zinc).

mPECq – mean probable effects concentration quotient

SEM – simultaneously extracted metals

TOC – total organic carbon

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Attachment A. Preliminary unvalidated Phase 3 sediment results - Metals

		Convent			**Convent**			**Convent**			**Metal/oids (SEM)**			**Metal/oids (SEM)**			**Metal/oids (SEM)**			**Metal/oids (SEM)**			**Metal/oids (SEM)**			**Metal/oids (SEM)**			**Metal/oids (SEM)**		
		Solids			**Sulfide**			**TOC**			**Antimony**			**Arsenic**			**Cadmium**			**Chromium**			**Copper**			**Lead**			**Nickel**		
		percent			umol/g			percent			umol/g			umol/g			umol/g			umol/g			umol/g			umol/g			umol/g		
material_analyzed	sample_no	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect
Sediment	1-B5-NRT-SE-1-101519	62.1		Yes	1.76		Yes	1.22		Yes	0.022	J	Yes	0.05	U	No	0.0119		Yes	0.166		Yes	1.96		Yes	0.512		Yes	0.068		Yes
Sediment	1-B6-NRT-SE-1-101619	89.8		Yes	4.33		Yes	0.306		Yes	0.0493		Yes	0.013		Yes	0.0369		Yes	0.412		Yes	3.63		Yes	0.418		Yes	0.111		Yes
Sediment	3-R7-2019-SE-1-101519	82.6		Yes	3.3		Yes	0.07		Yes	0.115		Yes	0.04	U	No	0.0225		Yes	0.621		Yes	5.82		Yes	0.582		Yes	0.126		Yes
Sediment	3-R8-2019-SE-1-101619	84.5		Yes	23.9		Yes	0.132		Yes	0.0192		Yes	0.009	J	Yes	0.0667		Yes	0.207		Yes	0.993		Yes				0.155		Yes
Sediment	4-B1-2019-SE-1-092619	91.6		Yes	1.58		Yes	0.084		Yes	0.067		Yes	0.0164		Yes	0.007	J	Yes	0.472		Yes	5.12		Yes	0.521		Yes	0.07	J	Yes
Sediment	4-B6-2019-SE-1-092619	93.4		Yes	5.59		Yes	0.065		Yes	0.0981		Yes	0.021		Yes	0.012	J	Yes	0.642		Yes	7.85		Yes	0.772		Yes	0.1	J	Yes
Sediment	CB002-SE-1-101619	69.5		Yes	5.87		Yes	0.197		Yes	0.0597		Yes	0.026		Yes	0.0311		Yes	0.399		Yes	4.65		Yes	0.574		Yes	0.0996		Yes
Sediment	CB005-SE-1-101819	64		Yes	0.61		Yes	0.147		Yes	0.0319		Yes	0.011	J	Yes	0.00719		Yes	0.0942		Yes	1.23		Yes	0.235		Yes	0.0425		Yes
Sediment	CB006-SE-1-100919	72.8		Yes	1.15		Yes	0.218		Yes	0.22		Yes	0.1	U	No	0.0121		Yes	0.826		Yes	10.9		Yes	0.56		Yes	0.092		Yes
Sediment	CB007-SE-1-100919	70.9		Yes	2.26		Yes	0.438		Yes	0.09	J	Yes	0.1	U	No	0.0096		Yes	0.494		Yes	4.8		Yes	0.555		Yes	0.057	J	Yes
Sediment	CB009-SE-1-101219	73.9		Yes	7.93		Yes	0.415		Yes	0.0465		Yes	0.058		Yes	0.044		Yes	0.22		Yes	3.91		Yes	3.82		Yes	0.1	J	Yes
Sediment	CB010-SE-1-101219	73		Yes	13		Yes	0.404		Yes	0.0147		Yes	0.005	U	No	0.027		Yes	0.13	J	Yes	1.13		Yes	1.33		Yes	0.07	J	Yes
Sediment	CB012-SE-1-100919	71.9		Yes	1.02		Yes	0.151		Yes	0.03	U	No	0.09	U	No	0.0102		Yes	0.131		Yes	1.36		Yes	0.322		Yes	0.043	J	Yes
Sediment	CB014-SE-1-101519	79		Yes	1.79		Yes	0.1		Yes	0.117		Yes	0.05	U	No	0.0258		Yes	0.647		Yes	6.67		Yes	0.551		Yes	0.105		Yes
Sediment	CB014-SE-2-101519	79.8		Yes	2.3		Yes	0.12		Yes	0.121		Yes	0.05	U	No	0.0244		Yes	0.664		Yes	7.04		Yes	0.583		Yes	0.109		Yes
Sediment	CB016-SE-1-101119	74.2		Yes	8.37		Yes	0.275		Yes	0.0388		Yes	0.012	J	Yes	0.046		Yes	0.43		Yes	3.76		Yes	1.77		Yes	0.09	J	Yes
Sediment	CB018-SE-1-100919	73.3		Yes	0.621		Yes	0.29		Yes	0.17		Yes	0.1	U	No	0.0126		Yes	0.744		Yes	6.85		Yes	0.611		Yes	0.084		Yes
Sediment	CB018-SE-2-100919	71.1		Yes	1.58		Yes	0.306		Yes	0.16		Yes	0.09	U	No	0.0131		Yes	0.731		Yes	7.09		Yes	0.582		Yes	0.078		Yes
Sediment	CB020-SE-1-101419	72.1		Yes	3.52		Yes	0.359		Yes	0.104		Yes	0.05	U	No	0.0223		Yes	0.626		Yes	6.74		Yes	0.678		Yes	0.112		Yes
Sediment	CB021-SE-1-101419	63.4		Yes	0.617		Yes	0.747		Yes	0.0079	J	Yes	0.012	J	Yes	0.0129		Yes	0.0967		Yes	0.896		Yes	0.375		Yes	0.058		Yes
Sediment	CB024-SE-1-101419	69.2		Yes	1.93		Yes	0.371		Yes	0.0095		Yes	0.016		Yes	0.0091		Yes	0.126		Yes	1.1		Yes	0.324		Yes	0.0571		Yes
Sediment	CB027-SE-1-101419	69		Yes	2.42		Yes	0.209		Yes	0.0148		Yes	0.012		Yes	0.01		Yes	0.151		Yes	1.43		Yes	0.302		Yes	0.0494		Yes
Sediment	CB029-SE-1-101519	69.5		Yes	2.36		Yes	0.22		Yes	0.052	J	Yes	0.06	U	No	0.0112		Yes	0.206		Yes	2.02		Yes	0.531		Yes	0.056		Yes
Sediment	CB035-SE-1-100319	81.4		Yes	1.37		Yes	0.097		Yes	0.07	J	Yes	0.1	U	No	0.0061	J	Yes	0.314		Yes	2.38		Yes	0.364		Yes	0.051	J	Yes
Sediment	CB035-SE-2-100319	81.7		Yes	2.17		Yes	0.115		Yes	0.08	J	Yes	0.1	U	No	0.0084	J	Yes	0.469		Yes	3.45		Yes	0.539		Yes	0.057	J	Yes
Sediment	CB036-SE-1-100419	79.6		Yes	1.52		Yes	0.155		Yes	0.08	J	Yes	0.09	U	No	0.0055	J	Yes	0.464		Yes	3.21		Yes	0.387		Yes	0.059	J	Yes
Sediment	CB039-SE-1-101119	81.7		Yes	1.97		Yes	0.103		Yes	0.0851		Yes	0.004	U	No	0.03		Yes	0.61		Yes	4.9		Yes	0.447		Yes	0.12	J	Yes
Sediment	CB040-SE-1-101819	58.4		Yes	2.57		Yes	0.18		Yes	0.017		Yes	0.006	U	No	0.0298		Yes	0.224		Yes	1.55		Yes	0.554		Yes	0.0762		Yes
Sediment	CB044-SE-1-101519	69.2		Yes	1		Yes	0.249		Yes	0.055	J	Yes	0.06	U	No	0.0147		Yes	0.168		Yes	2.04		Yes	0.57		Yes	0.051		Yes
Sediment	CB046-SE-1-100819	78.8		Yes	1.95		Yes	0.112		Yes	0.07	J	Yes	0.07	U	No	0.0051	J	Yes	0.343		Yes	2.65		Yes	0.3		Yes	0.042	J	Yes
Sediment	CB047-SE-1-101119	79.8		Yes	1.55		Yes	0.15		Yes	0.0054	J	Yes	0.005	U	No	0.009	U	No	0.05	U	No	0.2		Yes	0.06	U	No	0.04	U	No
Sediment	CB056-SE-1-101719	68.4		Yes	4.45		Yes	0.309		Yes	0.0039	J	Yes	0.007	J	Yes	0.00746		Yes	0.0557		Yes	0.365		Yes	0.216		Yes	0.052		Yes
Sediment	DM002-SE-1-100919	79.6		Yes	5.2		Yes	0.06		Yes	0.0974		Yes	0.009	J	Yes	0.034		Yes	0.92		Yes	7.89		Yes	0.74		Yes	0.17		Yes
Sediment	DM007-SE-1-101519	84.2		Yes	1.45		Yes	0.072		Yes	0.08		Yes	0.04	U	No	0.0159		Yes	0.437		Yes	3.99		Yes	0.406		Yes	0.078		Yes
Sediment	DM008-SE-1-101119	75.8		Yes	2.29		Yes	0.09		Yes	0.225		Yes	0.026		Yes	0.04		Yes	1.19		Yes	12.6		Yes	0.53		Yes	0.16	J	Yes
Sediment	DM010-SE-1-101119	76.7		Yes	1.9		Yes	0.139		Yes	0.095		Yes	0.011	J	Yes	0.031		Yes	0.61		Yes	7.1		Yes	0.68		Yes	0.12	J	Yes
Sediment	DM015-SE-1-101019	76.4		Yes	0.97		Yes	0.157		Yes	0.175		Yes	0.034		Yes	0.024		Yes	0.55		Yes	8.28		Yes	0.56		Yes	0.1	J	Yes
Sediment	DM016-SE-1-101019	69.8		Yes	12.2		Yes	0.164		Yes	0.0341		Yes	0.005	U	No	0.04		Yes	0.73		Yes	5.17		Yes	0.91		Yes	0.14	J	Yes
Sediment	DM016-SE-2-101019	77.4		Yes	1.29		Yes	0.09		Yes	0.0592		Yes	0.018		Yes	0.018	J	Yes	0.32		Yes	3.64		Yes	0.43		Yes	0.06	J	Yes
Sediment	DM018-SE-1-100919	73		Yes	0.51		Yes	0.146		Yes	0.0452		Yes	0.012	J	Yes	0.012	J	Yes	0.26		Yes	3.18		Yes	0.38		Yes	0.06	J	Yes

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Attachment A. Preliminary unvalidated Phase 3 sediment results - Metals

		Convent			Convent			Convent			Metal/oids (SEM)			Metal/oids (SEM)			Metal/oids (SEM)			Metal/oids (SEM)			Metal/oids (SEM)			Metal/oids (SEM)			Metal/oids (SEM)		
		Solids			Sulfide			TOC			Antimony			Arsenic			Cadmium			Chromium			Copper			Lead			Nickel		
		percent			umol/g			percent			umol/g			umol/g			umol/g			umol/g			umol/g			umol/g			umol/g		
material_analyzed	sample_no	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect
Sediment	DM019-SE-1-101419	69.4		Yes	0.638		Yes	0.149		Yes	0.0339		Yes	0.015		Yes	0.01	J	Yes	0.18	J	Yes	2.29		Yes	0.3		Yes	0.04	J	Yes
Sediment	DM020-SE-1-101419	69.3		Yes	0.666		Yes	0.409		Yes	0.075	J	Yes	0.06	U	No	0.0115		Yes	0.265		Yes	3.35		Yes	0.369		Yes	0.052		Yes
Sediment	DM022-SE-1-092119	72.1		Yes	0.727		Yes	0.351		Yes	0.057	J	Yes	0.05	U	No	0.0125		Yes	0.281		Yes	4.15		Yes	0.378		Yes	0.062		Yes
Sediment	DM023-SE-1-092119	87.8		Yes	0.491		Yes	0.07		Yes	0.033	J	Yes	0.021	U	No	0.0076		Yes	0.171		Yes	2.32		Yes	0.215		Yes	0.038		Yes
Sediment	DM024-SE-1-101519	76		Yes	9.95		Yes	0.114		Yes	0.106		Yes	0.05	U	No	0.0141		Yes	0.375		Yes	4.32		Yes	0.479		Yes	0.084		Yes
Sediment	DM024-SE-2-101519	70.6		Yes	3.89		Yes	0.129		Yes	0.098		Yes	0.05	U	No	0.0161		Yes	0.439		Yes	4.77		Yes	0.502		Yes	0.088		Yes
Sediment	DM025-SE-1-101219	76.9		Yes	3.37		Yes	0.113		Yes	0.0687		Yes	0.005	U	No	0.027		Yes	0.64		Yes	6.24		Yes	0.5		Yes	0.11	J	Yes
Sediment	DM026-SE-1-092119	86.2		Yes	0.68		Yes	0.071		Yes	0.048	J	Yes	0.033	U	No	0.0106		Yes	0.265		Yes	2.95		Yes	0.304		Yes	0.05		Yes
Sediment	DM026-SE-2-092119	84.6		Yes	0.207		Yes	0.087		Yes	0.053	J	Yes	0.04	U	No	0.0115		Yes	0.294		Yes	3.35		Yes	0.305		Yes	0.059		Yes
Sediment	DM027-SE-1-101419	73.1		Yes	6.47		Yes	0.132		Yes	0.095		Yes	0.05	U	No	0.0276		Yes	0.624		Yes	3.93		Yes	0.679		Yes	0.108		Yes
Sediment	DM036-SE-1-101819	62.5		Yes	1.45		Yes	0.73		Yes	0.014		Yes	0.009	J	Yes	0.0088		Yes	0.128		Yes	1.04		Yes	0.222		Yes	0.0454		Yes
Sediment	DM038-SE-1-101919	75.7		Yes	0.307		Yes	0.123		Yes	0.0263		Yes	0.005	U	No	0.0148		Yes	0.211		Yes	2.37		Yes	0.229		Yes	0.0519		Yes
Sediment	DM039-SE-1-101719	78.5		Yes	1.91		Yes	0.091		Yes	0.0521		Yes	0.009	J	Yes	0.0417		Yes	0.5		Yes	5.01		Yes	0.456		Yes	0.103		Yes
Sediment	DM044-SE-1-101619	71.2		Yes	1.71		Yes	0.64		Yes	0.064		Yes	0.045		Yes	0.0362		Yes	0.343		Yes	7.17		Yes	0.494		Yes	0.0933		Yes
Sediment	DM045-SE-1-091919	73.9		Yes	13		Yes	0.316		Yes	0.004	U	No	0.009	U	No	0.0281		Yes	0.0957		Yes	0.168		Yes	1.32		Yes	0.0317		Yes
Sediment	DM046-SE-1-092019	71.9		Yes	6.54		Yes	0.546		Yes	0.0019	U	No	0.006	J	Yes	0.011		Yes	0.0508		Yes	0.235		Yes	0.464		Yes	0.0289		Yes
Sediment	DM047-SE-1-101819	78.3		Yes	0.96		Yes	0.208		Yes	0.0175		Yes	0.042		Yes	0.0179		Yes	0.0667		Yes	1.77		Yes	2.24		Yes	0.0441		Yes
Sediment	DM050-SE-1-092019	69.2		Yes	7.19		Yes	0.487		Yes	0.011	U	No	0.029	U	No	0.0428		Yes	0.097		Yes	0.974		Yes	2.58		Yes	0.056		Yes
Sediment	DM057-SE-1-091819	73.3		Yes	0.39		Yes	0.23		Yes	0.0352		Yes	0.026		Yes	0.00941		Yes	0.384		Yes	5.57		Yes	0.244		Yes	0.0501		Yes
Sediment	DM061-SE-1-101219	70.1		Yes	16.6		Yes	0.928		Yes	0.0029	J	Yes	0.006	J	Yes	0.009	J	Yes	0.09	J	Yes	0.5		Yes	0.37		Yes	0.05	J	Yes
Sediment	EV001-SE-1-092619	92.8		Yes	0.335		Yes	0.11		Yes	0.0226		Yes	0.0041	J	Yes	0.0055	J	Yes	0.2		Yes	1.35		Yes	0.282		Yes	0.03	J	Yes
Sediment	EV001-SE-2-092619	93.5		Yes	2.77		Yes	0.096		Yes	0.0624		Yes	0.0153		Yes	0.01	J	Yes	0.412		Yes	4.54		Yes	0.605		Yes	0.065	J	Yes
Sediment	EV002-SE-1-092419	92.9		Yes	5.54		Yes	0.075		Yes	0.15		Yes	0.08	U	No	0.0377		Yes	0.954		Yes	9.57		Yes	0.997		Yes	0.188		Yes
Sediment	EV003-SE-1-092019	78.6		Yes	0.463		Yes	0.112		Yes	0.053	J	Yes	0.04	U	No	0.0123		Yes	0.318		Yes	2.82		Yes	0.36		Yes	0.065		Yes
Sediment	EV005-SE-1-091119	90		Yes	0.788		Yes	0.142		Yes	0.0418		Yes	0.007	J	Yes	0.02		Yes	0.275		Yes	2.67		Yes	0.25		Yes	0.0397		Yes
Sediment	EV008-SE-1-092319	90.3		Yes	2.04		Yes	0.081		Yes	0.07	J	Yes	0.08	U	No	0.021		Yes	0.485		Yes	4.44		Yes	0.486		Yes	0.096		Yes
Sediment	EV010-SE-1-091219	81.5		Yes	0.772		Yes	0.163		Yes	0.0351		Yes	0.017		Yes	0.0106		Yes	0.302		Yes	3.03		Yes	0.262		Yes	0.04		Yes
Sediment	EV011-SE-1-092819	58.6		Yes				0.173		Yes																					
Sediment	EV012-SE-1-091319	81.6		Yes	1.15		Yes	0.143		Yes	0.0407		Yes	0.02		Yes	0.00968		Yes	0.313		Yes	3.21		Yes	0.312		Yes	0.0424		Yes
Sediment	EV013-SE-1-091319	79.3		Yes	0.327		Yes	0.102		Yes	0.014		Yes	0.0107		Yes	0.00479		Yes	0.13		Yes	1.32		Yes	0.143		Yes	0.0243		Yes
Sediment	EV020-SE-1-100219	66.6		Yes				0.165		Yes																					
Sediment	EV022-SE-1-092819	27		Yes																											
Sediment	EV026-SE-1-092019	76.8		Yes	0.964		Yes	0.196		Yes	0.071		Yes	0.024	U	No	0.0208		Yes	0.449		Yes	4.75		Yes	0.48		Yes	0.089		Yes
Sediment	EV027-SE-1-092119	80		Yes	2.6		Yes	0.147		Yes	0.09	J	Yes	0.09	U	No	0.0256		Yes	0.582		Yes	4.75		Yes	0.832		Yes	0.127		Yes
Sediment	EV036-SE-1-091419	58.9		Yes	5.46		Yes	0.661		Yes	0.002	U	No	0.006	J	Yes	0.00679		Yes	0.057		Yes	0.211		Yes	0.178		Yes	0.0589		Yes
Sediment	EV037-SE-1-092319	94.3		Yes	3.74		Yes	0.087		Yes	0.05	J	Yes	0.08	U	No	0.0203		Yes	0.445		Yes	3.63		Yes	0.516		Yes	0.1		Yes
Sediment	EV037-SE-2-092319	94.4		Yes	6.6		Yes	0.089		Yes	0.08	J	Yes	0.08	U	No	0.0286		Yes	0.662		Yes	5.52		Yes	0.895		Yes	0.141		Yes
Sediment	EV044-SE-1-092419	40.5		Yes	0.372		Yes	2.78		Yes	0.01	J	Yes	0.025		Yes	0.0323		Yes	0.0909		Yes	1.11		Yes	0.651		Yes	0.137		Yes
Sediment	EV048-SE-1-092419	91		Yes	6.14		Yes	0.099		Yes	0.14		Yes	0.07	U	No	0.037		Yes	0.988		Yes	11.3		Yes	0.968		Yes	0.188		Yes
Sediment	EV049-SE-1-092719	66.6		Yes	2.01		Yes	0.754		Yes	0.0581		Yes	0.013	J	Yes	0.009	J	Yes	0.38		Yes	3.86		Yes	0.38		Yes	0.07	J	Yes

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Attachment A. Preliminary unvalidated Phase 3 sediment results - Metals

material_analyzed	sample_no	Convent Solids percent			Convent Sulfide umol/g			Convent TOC percent			Metal/oids (SEM) Antimony umol/g			Metal/oids (SEM) Arsenic umol/g			Metal/oids (SEM) Cadmium umol/g			Metal/oids (SEM) Chromium umol/g			Metal/oids (SEM) Copper umol/g			Metal/oids (SEM) Lead umol/g			Metal/oids (SEM) Nickel umol/g		
		value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect
Sediment	EV051-SE-1-092419	88.1		Yes	0.599		Yes	0.195		Yes	0.049	J	Yes	0.031	U	No	0.0128		Yes	0.317		Yes	3.02		Yes	0.223		Yes	0.06		Yes
Sediment	EV052-SE-1-092619	89		Yes	1.74		Yes	0.253		Yes	0.0893		Yes	0.025		Yes	0.01	J	Yes	0.55		Yes	6.37		Yes	0.68		Yes	0.08	J	Yes
Sediment	EV054-SE-1-091119	40.5		Yes	0.02	U	No	2.79		Yes	0.006	J	Yes	0.029		Yes	0.0294		Yes	0.0558		Yes	1.07		Yes	0.807		Yes	0.0798		Yes
Sediment	EV057-SE-1-091119	45.5		Yes	0.389		Yes	2.3		Yes	0.003	J	Yes	0.019	J	Yes	0.0207		Yes	0.0846		Yes	0.764		Yes	0.528		Yes	0.103		Yes
Sediment	EV060-SE-1-092119	75.2		Yes	2.59		Yes	0.132		Yes	0.16		Yes	0.1	U	No	0.0282		Yes	0.82		Yes	8.62		Yes	0.649		Yes	0.151		Yes
Sediment	EV063-SE-1-091019	38.5		Yes	0.017	U	No	2.94		Yes	0.008	J	Yes	0.026		Yes	0.0299		Yes	0.0403		Yes	0.92		Yes	0.686		Yes	0.0579		Yes
Sediment	EV064-SE-1-091019	50.7		Yes	0.74		Yes	1.78		Yes	0.003	U	No	0.016	J	Yes	0.0172		Yes	0.0897		Yes	0.702		Yes	0.442		Yes	0.0968		Yes
Sediment	EV065-SE-1-092519	90.7		Yes	2.3		Yes	0.081		Yes	0.12	J	Yes	0.09	U	No	0.0245		Yes	0.661		Yes	6.74		Yes	0.568		Yes	0.126		Yes
Sediment	EV065-SE-2-092519	91.7		Yes	1		Yes	0.075		Yes	0.09	J	Yes	0.08	U	No	0.0188		Yes	0.521		Yes	5.01		Yes	0.425		Yes	0.101		Yes
Sediment	EV066-SE-1-092519	87.8		Yes	1.95		Yes	0.125		Yes	0.081		Yes	0.05	U	No	0.0206		Yes	0.534		Yes	5.11		Yes	0.481		Yes	0.102		Yes
Sediment	EV069-SE-1-092519	90.8		Yes	1.29		Yes	0.067		Yes	0.07	J	Yes	0.07	U	No	0.0184		Yes	0.513		Yes	5.16		Yes	0.458		Yes	0.099		Yes
Sediment	EV071-SE-1-092519	88.6		Yes	5.14		Yes	0.139		Yes	0.19		Yes	0.09	U	No	0.0376		Yes	1.08		Yes	11		Yes	1.03		Yes	0.192		Yes
Sediment	EV072-SE-1-092619	80.2		Yes	3.43		Yes	0.105		Yes	0.102		Yes	0.03		Yes	0.014	J	Yes	0.673		Yes	8.66		Yes	0.72		Yes	0.1	J	Yes
Sediment	EV072-SE-2-092619	81.4		Yes	5.03		Yes	0.124		Yes	0.139		Yes	0.042		Yes	0.013	J	Yes	0.837		Yes	10.6		Yes	0.98		Yes	0.11	J	Yes
Sediment	EV075-SE-1-091119	87.6		Yes	1.7		Yes	0.168		Yes	0.0584		Yes	0.0239		Yes	0.0235		Yes	0.451		Yes	4.9		Yes	0.267		Yes	0.0594		Yes
Sediment	JS001-SE-1-101019	75.7		Yes	10.9		Yes	0.364		Yes	0.0293		Yes	0.005	U	No	0.039		Yes	0.55		Yes	2.78		Yes	1.44		Yes	0.14	J	Yes
Sediment	JS002-SE-1-101019	78.2		Yes	12.7		Yes	0.175		Yes	0.0238		Yes	0.005	U	No	0.041		Yes	0.45		Yes	1.73		Yes	1.12		Yes	0.12	J	Yes
Sediment	REF001-SE-1-092819	87.1		Yes	0.009	U	No	0.046	J	Yes	0.0018	U	No	0.008	J	Yes	0.00069		Yes	0.0072		Yes	0.0243		Yes	0.0126		Yes	0.0111		Yes
Sediment	REF002-SE-1-092819	92.7		Yes	0.008	U	No	0.061		Yes	0.0016	U	No	0.0064	J	Yes	0.00065		Yes	0.0066		Yes	0.0182		Yes	0.0127		Yes	0.0123		Yes
Sediment	REF003-SE-1-092719	72.9		Yes	0.011	U	No	0.073		Yes	0.0021	U	No	0.005	U	No	0.00082		Yes	0.0093		Yes	0.0192		Yes	0.0203		Yes	0.0123		Yes
Sediment	REF004-SE-1-092719	84.7		Yes	0.009	U	No	0.166		Yes	0.0017	U	No	0.006	J	Yes	0.00106		Yes	0.0098		Yes	0.0194		Yes	0.0726		Yes	0.0104		Yes
Sediment	REF005-SE-1-100319	85		Yes	0.008	U	No	0.062		Yes	0.0014	U	No	0.004	J	Yes	0.00047		Yes	0.0067		Yes	0.0173		Yes	0.0114		Yes	0.01		Yes
Sediment	REF006-SE-1-100219	80.3		Yes	0.84		Yes	0.225		Yes	0.0018	U	No	0.005	U	No	0.00075		Yes	0.0157		Yes	0.0187		Yes	0.0149		Yes	0.0202		Yes
Sediment	REF007-SE-1-093019	81.8		Yes	0.01	U	No	0.161		Yes	0.0021	J	Yes	0.006	J	Yes	0.0011		Yes	0.0149		Yes	0.022		Yes	0.015		Yes	0.0187		Yes
Sediment	REF008-SE-1-093019	91.3		Yes	0.008	U	No	0.069		Yes	0.0018	J	Yes	0.004	U	No	0.00066		Yes	0.0081		Yes	0.0211		Yes	0.0162		Yes	0.0113		Yes
Sediment	REF009A-SE-1-100219	74.5		Yes	0.009	U	No	0.058		Yes	0.0018	U	No	0.004	U	No	0.00067		Yes	0.0087		Yes	0.0223		Yes	0.0115		Yes	0.0102		Yes
Sediment	REF010-SE-1-100319	80.9		Yes	0.009	U	No	0.076		Yes	0.0016	U	No	0.0075	J	Yes	0.00074		Yes	0.0075		Yes	0.0174		Yes	0.0167		Yes	0.0153		Yes
Sediment	REF011-SE-1-100119	72.7		Yes	0.01	U	No	0.062		Yes	0.002	U	No	0.007	J	Yes	0.00083		Yes	0.0162		Yes	0.0195		Yes	0.0164		Yes	0.0154		Yes
Sediment	REF011-SE-2-100119	77.1		Yes	0.009	U	No	0.067		Yes	0.0017	U	No	0.005	J	Yes	0.00065		Yes	0.0127		Yes	0.0145		Yes	0.0131		Yes	0.0123		Yes
Sediment	REF012-SE-1-100419	71.8		Yes	0.011	J	Yes	0.231		Yes	0.0015	U	No	0.0037	U	No	0.00125		Yes	0.0138		Yes	0.0184		Yes	0.0263		Yes	0.0149		Yes
Sediment	REF013-SE-1-092419	72.9		Yes	0.124		Yes	0.489		Yes	0.0027	J	Yes	0.0038	U	No	0.00055		Yes	0.0122		Yes	0.014		Yes	0.0159		Yes	0.02		Yes
Sediment	REF014-SE-1-092619	66.7		Yes	0.128		Yes	0.785		Yes	0.0023	U	No	0.006	U	No	0.0015		Yes	0.028		Yes	0.0375		Yes	0.0325		Yes	0.0462		Yes
Sediment	REF014-SE-2-092619	65.6		Yes	0.526		Yes	0.774		Yes	0.0022	U	No	0.005	U	No	0.00107		Yes	0.0184		Yes	0.0226		Yes	0.0244		Yes	0.0348		Yes
Sediment	REF015-SE-1-092619	48.6		Yes	0.92		Yes	2.92		Yes	0.003	U	No	0.008	U	No	0.00329		Yes	0.0451		Yes	0.0496		Yes	0.104		Yes	0.0918		Yes
Sediment	REF016-SE-1-092519	58.5		Yes	0.014	U	No	1		Yes	0.006	J	Yes	0.01	J	Yes	0.00137		Yes	0.0256		Yes	0.0728		Yes	0.0203		Yes	0.0561		Yes
Sediment	REF017-SE-1-092519	50.9		Yes	0.137		Yes	1.39		Yes	0.003	J	Yes	0.007	U	No	0.00138		Yes	0.0373		Yes	0.0994		Yes	0.0295		Yes	0.0758		Yes
Sediment	REF018-SE-1-092519	41.2		Yes	0.059	J	Yes	7.07		Yes	0.004	U	No	0.014	J	Yes	0.0017		Yes	0.0311		Yes	0.169		Yes	0.0231		Yes	0.0643		Yes

Final Phase 3 Sediment Study Bioa

Attachment A. Preliminary unvalid

		Metal/oids (SEM)			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/o	
		Zinc			Aluminum			Antimony			Arsenic			Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Coppe	
		umol/g			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg	
material_analyzed	sample_no	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual
Sediment	1-B5-NRT-SE-1-101519	17.9		Yes	6620		Yes	8.76		Yes	9.4		Yes	453		Yes	0.353		Yes	4.25		Yes	32900		Yes	25.2		Yes	9.93		Yes	244	
Sediment	1-B6-NRT-SE-1-101619	65		Yes	12700		Yes	25.2		Yes	11.7		Yes	1020		Yes	0.572		Yes	1.42		Yes	45500		Yes	71.8		Yes	38.7		Yes	1200	
Sediment	3-R7-2019-SE-1-101519	85.9		Yes	15700		Yes	45.7		Yes	20.6		Yes	1410		Yes	0.806		Yes	0.492		Yes	54500		Yes	97.5		Yes	44.8		Yes	1750	
Sediment	3-R8-2019-SE-1-101619	226		Yes	27200		Yes	16.4		Yes	80.5		Yes	608		Yes	0.804		Yes	5.01		Yes	64800		Yes	43.5		Yes	58.7		Yes	1540	
Sediment	4-B1-2019-SE-1-092619	86.9		Yes	23100		Yes	34.2		Yes	20.4		Yes	1690		Yes	0.872		Yes	0.802		Yes	70200		Yes	123		Yes	46.6		Yes	2130	
Sediment	4-B6-2019-SE-1-092619	116		Yes	21500		Yes	26.8		Yes	18.6		Yes	1480		Yes	0.809		Yes	0.785		Yes	65100		Yes	111		Yes	42.9		Yes	1830	
Sediment	CB002-SE-1-101619	59.5		Yes	6880		Yes	13		Yes	7.1		Yes	457		Yes	0.316		Yes	2.28		Yes	30300		Yes	31.9		Yes	13.9		Yes	453	
Sediment	CB005-SE-1-101819	21.2		Yes	4780		Yes	1.84		Yes	3.23		Yes	47.8		Yes	0.274		Yes	0.339		Yes	4930		Yes	15.2		Yes	5.31		Yes	49.5	
Sediment	CB006-SE-1-100919	94		Yes	9430		Yes	24.8		Yes	12		Yes	727		Yes	0.458		Yes	1.23		Yes	32700		Yes	50.3		Yes	25.5		Yes	811	
Sediment	CB007-SE-1-100919	65.7		Yes	7130		Yes	4.21		Yes	4.95		Yes	248		Yes	0.288		Yes	1.68		Yes	18100		Yes	17.3		Yes	7.76		Yes	112	
Sediment	CB009-SE-1-101219	137		Yes	11900		Yes	17.7		Yes	21		Yes	657		Yes	0.483		Yes	3.1		Yes	31800		Yes	43.6		Yes	21.4		Yes	1090	
Sediment	CB010-SE-1-101219	72.9		Yes	6890		Yes	7.28		Yes	8.4		Yes	281		Yes	0.286		Yes	4.36		Yes	33500		Yes	20.7		Yes	9.62		Yes	354	
Sediment	CB012-SE-1-100919	14.8		Yes	8270		Yes	23.4		Yes	9.4		Yes	660		Yes	0.387		Yes	1.25		Yes	29400		Yes	45.6		Yes	21.3		Yes	713	
Sediment	CB014-SE-1-101519	86.3		Yes	14600		Yes	26.6		Yes	15.9		Yes	1240		Yes	0.711		Yes	1.04		Yes	43700		Yes	90.1		Yes	43.2		Yes	1490	
Sediment	CB014-SE-2-101519	86.5		Yes	13200		Yes	27.8		Yes	13.5		Yes	1120		Yes	0.637		Yes	0.982		Yes	40100		Yes	80.8		Yes	38.5		Yes	1320	
Sediment	CB016-SE-1-101119	111		Yes	10600		Yes	9.54		Yes	9.8		Yes	565		Yes	0.423		Yes	3.32		Yes	33800		Yes	38.9		Yes	11.7		Yes	549	
Sediment	CB018-SE-1-100919	90.2		Yes	11100		Yes	48.2		Yes	16.4		Yes	1100		Yes	0.567		Yes	1.88		Yes	45800		Yes	72.3		Yes	35.8		Yes	1240	
Sediment	CB018-SE-2-100919	86.2		Yes	11600		Yes	44.6		Yes	16.5		Yes	1140		Yes	0.597		Yes	1.66		Yes	48100		Yes	73.6		Yes	36.1		Yes	1290	
Sediment	CB020-SE-1-101419	71		Yes	10700		Yes	30.5		Yes	13.2		Yes	907		Yes	0.518		Yes	3.93		Yes	39000		Yes	66.2		Yes	32.9		Yes	1170	
Sediment	CB021-SE-1-101419	11.1		Yes	6640		Yes	5.68		Yes	7.4		Yes	414		Yes	0.359		Yes	3.57		Yes	25600		Yes	21.8		Yes	8.11		Yes	175	
Sediment	CB024-SE-1-101419	12.8		Yes	6340		Yes	31.5		Yes	8.3		Yes	425		Yes	0.286		Yes	3.35		Yes	32700		Yes	26.1		Yes	10.2		Yes	342	
Sediment	CB027-SE-1-101419	18.2		Yes	6140		Yes	9.18		Yes	5.9		Yes	412		Yes	0.276		Yes	2.86		Yes	29200		Yes	24.3		Yes	10.1		Yes	321	
Sediment	CB029-SE-1-101519	24.5		Yes	5130		Yes	8.96		Yes	6		Yes	401		Yes	0.247		Yes	3.06		Yes	30700		Yes	21		Yes	8.78		Yes	266	
Sediment	CB035-SE-1-100319	49.2		Yes	10400		Yes	26.4		Yes	9.9		Yes	652		Yes	0.494		Yes	0.482		Yes	31400		Yes	47.6		Yes	22.7		Yes	812	
Sediment	CB035-SE-2-100319	70.7		Yes	12800		Yes	28.1		Yes	10.9		Yes	856		Yes	0.523		Yes	0.794		Yes	36700		Yes	60.1		Yes	25.9		Yes	982	
Sediment	CB036-SE-1-100419	65.4		Yes	15700		Yes	37.2		Yes	17.1		Yes	1230		Yes	0.705		Yes	0.508		Yes	49600		Yes	87.3		Yes	40.3		Yes	1450	
Sediment	CB039-SE-1-101119	88.5		Yes	26600		Yes	49.5		Yes	30.7		Yes	1800		Yes	0.912		Yes	0.883		Yes	59800		Yes	125		Yes	57.8		Yes	2240	
Sediment	CB040-SE-1-101819	61		Yes	18200		Yes	21.2		Yes	16.8		Yes	924		Yes	0.701		Yes	2.05		Yes	41000		Yes	61.8		Yes	28.5		Yes	1170	
Sediment	CB044-SE-1-101519	24.5		Yes	5860		Yes	7.06		Yes	5.8		Yes	267		Yes	0.256		Yes	1.93		Yes	16300		Yes	19.5		Yes	7.61		Yes	169	
Sediment	CB046-SE-1-100819	53.9		Yes	20800		Yes	44.8		Yes	19.5		Yes	1790		Yes	0.963		Yes	0.752		Yes	75400		Yes	124		Yes	55		Yes	2160	
Sediment	CB047-SE-1-101119	2.68		Yes	12300		Yes	23.5		Yes	9.3		Yes	958		Yes	0.523		Yes	0.774		Yes	36500		Yes	66.4		Yes	31.1		Yes	1180	
Sediment	CB056-SE-1-101719	4.41		Yes	6160		Yes	3.97		Yes	5.69		Yes	240		Yes	0.321		Yes	1.92		Yes	12700		Yes	20.4		Yes	6.26		Yes	98.4	
Sediment	DM002-SE-1-100919	122		Yes	13300		Yes	30.4		Yes	12.8		Yes	1170		Yes	0.629		Yes	0.707		Yes	44100		Yes	80.8		Yes	41.2		Yes	1240	
Sediment	DM007-SE-1-101519	55.8		Yes	9860		Yes	20.2		Yes	10.1		Yes	725		Yes	0.455		Yes	0.724		Yes	26400		Yes	54.1		Yes	26.3		Yes	805	
Sediment	DM008-SE-1-101119	105		Yes	17100		Yes	71.6		Yes	24.4		Yes	2440		Yes	1.04		Yes	1.45		Yes	65700		Yes	163		Yes	126		Yes	2860	
Sediment	DM010-SE-1-101119	77.7		Yes	8740		Yes	28.9		Yes	11.1		Yes	617		Yes	0.408		Yes	1.39		Yes	27300		Yes	46.2		Yes	21.8		Yes	807	
Sediment	DM015-SE-1-101019	69.8		Yes	9640		Yes	51.8		Yes	17.7		Yes	913		Yes	0.523		Yes	2.03		Yes	35900		Yes	57.9		Yes	23.6		Yes	1370	
Sediment	DM016-SE-1-101019	117		Yes	7420		Yes	9.14		Yes	5.3		Yes	357		Yes	0.309		Yes	1.78		Yes	25000		Yes	29.8		Yes	9.45		Yes	403	
Sediment	DM016-SE-2-101019	36.8		Yes	5620		Yes	11.6		Yes	5.5		Yes	306		Yes	0.262		Yes	1.95		Yes	21900		Yes	23.5		Yes	10.4		Yes	343	
Sediment	DM018-SE-1-100919	35		Yes	6000		Yes	19.3		Yes	7.94		Yes	374		Yes	0.314		Yes	1.09		Yes	19000		Yes	28.2		Yes	12.9		Yes	427	

Final Phase 3 Sediment Study Bioa
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		Metal/oids (SEM)			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/o	
		Zinc			Aluminum			Antimony			Arsenic			Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Coppe	
		umol/g			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg	
material_analyzed	sample_no	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual
Sediment	DM019-SE-1-101419	20.1		Yes	4920		Yes	10.2		Yes	6.17		Yes	242		Yes	0.225		Yes	1.48		Yes	15800		Yes	19.3		Yes	7.62		Yes	228	
Sediment	DM020-SE-1-101419	33.5		Yes	8090		Yes	33.6		Yes	13.4		Yes	677		Yes	0.386		Yes	1.46		Yes	27400		Yes	44.4		Yes	19		Yes	849	
Sediment	DM022-SE-1-092119	37.1		Yes	9710		Yes	20.2		Yes	11.1		Yes	653		Yes	0.397		Yes	1.07		Yes	27300		Yes	56.5		Yes	22.7		Yes	806	
Sediment	DM023-SE-1-092119	22.2		Yes	8280		Yes	23.9		Yes	16.5		Yes	528		Yes	0.339		Yes	0.638		Yes	20200		Yes	42.9		Yes	19.7		Yes	686	
Sediment	DM024-SE-1-101519	39.5		Yes	5950		Yes	13.9		Yes	6.51		Yes	377		Yes	0.303		Yes	0.946		Yes	16800		Yes	30.1		Yes	14.1		Yes	413	
Sediment	DM024-SE-2-101519	46.6		Yes	6000		Yes	32.7		Yes	13.7		Yes	363		Yes	0.371		Yes	0.871		Yes	16400		Yes	28.6		Yes	14		Yes	456	
Sediment	DM025-SE-1-101219	74.7		Yes	11300		Yes	26		Yes	11.9		Yes	972		Yes	0.556		Yes	0.804		Yes	32700		Yes	68		Yes	35.3		Yes	1090	
Sediment	DM026-SE-1-092119	32.9		Yes	8780		Yes	23.8		Yes	13.1		Yes	580		Yes	0.365		Yes	0.775		Yes	21800		Yes	44		Yes	21.6		Yes	676	
Sediment	DM026-SE-2-092119	36.9		Yes	8850		Yes	25.3		Yes	10.5		Yes	606		Yes	0.36		Yes	0.649		Yes	22600		Yes	46.6		Yes	23.8		Yes	734	
Sediment	DM027-SE-1-101419	93.4		Yes	11300		Yes	16.8		Yes	9.6		Yes	670		Yes	0.466		Yes	1.08		Yes	31600		Yes	49.6		Yes	22.1		Yes	868	
Sediment	DM036-SE-1-101819	22.1		Yes	11200		Yes	15.2		Yes	12.1		Yes	351		Yes	0.374		Yes	1.27		Yes	19200		Yes	30.6		Yes	15.6		Yes	450	
Sediment	DM038-SE-1-101919	34.2		Yes	12300		Yes	26.2		Yes	13		Yes	1040		Yes	0.57		Yes	0.944		Yes	33800		Yes	74.9		Yes	39.3		Yes	1170	
Sediment	DM039-SE-1-101719	77.7		Yes	11400		Yes	34.5		Yes	14.2		Yes	961		Yes	0.551		Yes	0.727		Yes	31700		Yes	72.2		Yes	35.7		Yes	1130	
Sediment	DM044-SE-1-101619	61.4		Yes	12700		Yes	32.7		Yes	20.1		Yes	1280		Yes	0.596		Yes	3.04		Yes	49800		Yes	64.2		Yes	29.8		Yes	1250	
Sediment	DM045-SE-1-091919	11.5		Yes	5680		Yes	7.11		Yes	11.1		Yes	624		Yes	0.298		Yes	7.12		Yes	55400		Yes	18		Yes	4.75		Yes	139	
Sediment	DM046-SE-1-092019	6.85		Yes	4430		Yes	2.12		Yes	8.9		Yes	477		Yes	0.211		Yes	5.48		Yes	61500		Yes	13		Yes	4.09		Yes	71.6	
Sediment	DM047-SE-1-101819	64.4		Yes	10800		Yes	10.4		Yes	23.3		Yes	222		Yes	0.31		Yes	1.97		Yes	19900		Yes	19.9		Yes	15.4		Yes	514	
Sediment	DM050-SE-1-092019	22.4		Yes	5230		Yes	5.33		Yes	15.1		Yes	557		Yes	0.26		Yes	12.7		Yes	68600		Yes	15.6		Yes	4.47		Yes	142	
Sediment	DM057-SE-1-091819	56.1		Yes	14900		Yes	38.7		Yes	20.4		Yes	1430		Yes	0.742		Yes	0.836		Yes	56000		Yes	120		Yes	71.6		Yes	2010	
Sediment	DM061-SE-1-101219	8.75		Yes	6180		Yes	5.57		Yes	8.8		Yes	397		Yes	0.275		Yes	4.32		Yes	37100		Yes	18.7		Yes	6.55		Yes	159	
Sediment	EV001-SE-1-092619	45.6		Yes	22900		Yes	24.5		Yes	21.4		Yes	1340		Yes	0.836		Yes	1.15		Yes	65000		Yes	102		Yes	40.7		Yes	1770	
Sediment	EV001-SE-2-092619	84.8		Yes	21700		Yes	26.6		Yes	23.4		Yes	1340		Yes	0.778		Yes	0.87		Yes	61000		Yes	99.3		Yes	39.1		Yes	1780	
Sediment	EV002-SE-1-092419	2.99		Yes	21300		Yes	25.9		Yes	19.1		Yes	1390		Yes	0.772		Yes	0.99		Yes	60800		Yes	102		Yes	45.4		Yes	1870	
Sediment	EV003-SE-1-092019	46.9		Yes	15000		Yes	22.3		Yes	17.8		Yes	969		Yes	0.573		Yes	0.884		Yes	43500		Yes	79.5		Yes	35.4		Yes	1270	
Sediment	EV005-SE-1-091119	49.6		Yes	20600		Yes	29		Yes	20.1		Yes	1420		Yes	0.836		Yes	1.36		Yes	60300		Yes	99		Yes	42.1		Yes	1900	
Sediment	EV008-SE-1-092319	74.8		Yes	22100		Yes	26.8		Yes	19.9		Yes	1370		Yes	0.788		Yes	0.919		Yes	61100		Yes	102		Yes	44		Yes	1970	
Sediment	EV010-SE-1-091219	53		Yes	16200		Yes	26.7		Yes	18.6		Yes	1050		Yes	0.656		Yes	0.967		Yes	47500		Yes	85.7		Yes	41.4		Yes	1340	
Sediment	EV011-SE-1-092819				4530		Yes	0.39		Yes	8.8		Yes	59.4		Yes	0.168		Yes	0.748		Yes	19300		Yes	5.88		Yes	2.48		Yes	12.1	
Sediment	EV012-SE-1-091319	57		Yes	12200		Yes	19.8		Yes	12.2		Yes	775		Yes	0.528		Yes	0.755		Yes	53100		Yes	61.2		Yes	26.1		Yes	1020	
Sediment	EV013-SE-1-091319	26.7		Yes	17500		Yes	26.8		Yes	21.8		Yes	1110		Yes	0.721		Yes	0.983		Yes	50900		Yes	93		Yes	44.7		Yes	1540	
Sediment	EV020-SE-1-100219				8050		Yes	14		Yes	7.96		Yes	482		Yes	0.347		Yes	0.9		Yes	24300		Yes	31.3		Yes	16.1		Yes	529	
Sediment	EV022-SE-1-092819				7250		Yes	0.38		Yes	4.5		Yes	98.8		Yes	0.256		Yes	0.827		Yes	7730		Yes	14.7		Yes	4.64		Yes	20.4	
Sediment	EV026-SE-1-092019	63.2		Yes	13800		Yes	19.6		Yes	14.8		Yes	975		Yes	0.549		Yes	1.42		Yes	40300		Yes	75.7		Yes	34.6		Yes	1290	
Sediment	EV027-SE-1-092119	98.1		Yes	18000		Yes	24.1		Yes	17.3		Yes	1120		Yes	0.636		Yes	1.05		Yes	48200		Yes	85.8		Yes	41.3		Yes	1530	
Sediment	EV036-SE-1-091419	1.91		Yes	6910		Yes	0.529		Yes	5.82		Yes	164		Yes	0.288		Yes	1.23		Yes	7880		Yes	16.2		Yes	5.21		Yes	31	
Sediment	EV037-SE-1-092319	73.3		Yes	22500		Yes	21.5		Yes	16.7		Yes	1260		Yes	0.746		Yes	0.672		Yes	56600		Yes	93		Yes	38.2		Yes	1790	
Sediment	EV037-SE-2-092319	106		Yes	21000		Yes	20.6		Yes	17		Yes	1140		Yes	0.665		Yes	0.656		Yes	52800		Yes	85.7		Yes	36.6		Yes	1540	
Sediment	EV044-SE-1-092419	5.89		Yes	14700		Yes	1.48		Yes	8.51		Yes	458		Yes	0.668		Yes	4.95		Yes	12800		Yes	33.2		Yes	10.5		Yes	102	
Sediment	EV048-SE-1-092419	133		Yes	19400		Yes	30.7		Yes	20		Yes	1400		Yes	0.736		Yes	0.862		Yes	57600		Yes	110		Yes	48.2		Yes	1950	
Sediment	EV049-SE-1-092719	62.5		Yes	4610		Yes	0.102		Yes	1.11		Yes	48.7		Yes	0.191		Yes	0.22		Yes	2250		Yes	14.3		Yes	3.37		Yes	5.87	

Final Phase 3 Sediment Study Bioa
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		Metal/oids (SEM)			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/o	
		Zinc			Aluminum			Antimony			Arsenic			Barium			Beryllium			Cadmium			Calcium			Chromium			Cobalt			Coppe	
		umol/g			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg	
material_analyzed	sample_no	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual
Sediment	EV051-SE-1-092419	43.2		Yes	21500		Yes	33.9		Yes	24.7		Yes	1590		Yes	0.794		Yes	1.11		Yes	63900		Yes	116		Yes	51.9		Yes	2180	
Sediment	EV052-SE-1-092619	100		Yes	21100		Yes	32.6		Yes	21.4		Yes	1340		Yes	0.776		Yes	0.974		Yes	60700		Yes	92.9		Yes	39		Yes	1700	
Sediment	EV054-SE-1-091119	6.3		Yes	13100		Yes	2.33		Yes	10.9		Yes	493		Yes	0.697		Yes	7.76		Yes	11600		Yes	34.2		Yes	10.1		Yes	139	
Sediment	EV057-SE-1-091119	5.42		Yes	10700		Yes	1.4		Yes	7.48		Yes	620		Yes	0.57		Yes	4.09		Yes	21100		Yes	27		Yes	8.69		Yes	76.5	
Sediment	EV060-SE-1-092119	107		Yes	21100		Yes	30.5		Yes	18.7		Yes	1550		Yes	0.821		Yes	0.779		Yes	61200		Yes	115		Yes	51.6		Yes	2170	
Sediment	EV063-SE-1-091019	4.86		Yes	14400		Yes	2.82		Yes	13		Yes	530		Yes	0.785		Yes	10.2		Yes	12700		Yes	39		Yes	11.2		Yes	172	
Sediment	EV064-SE-1-091019	5.77		Yes	9070		Yes	1.8		Yes	6		Yes	544		Yes	0.482		Yes	3.6		Yes	21800		Yes	23.8		Yes	7.66		Yes	67.3	
Sediment	EV065-SE-1-092519	91		Yes	22900		Yes	32.8		Yes	21.7		Yes	1620		Yes	0.837		Yes	0.839		Yes	66500		Yes	118		Yes	50.5		Yes	2260	
Sediment	EV065-SE-2-092519	73.1		Yes	22900		Yes	32.3		Yes	23.6		Yes	1600		Yes	0.838		Yes	1.02		Yes	69700		Yes	117		Yes	51.5		Yes	2330	
Sediment	EV066-SE-1-092519	76		Yes	23500		Yes	30.6		Yes	20		Yes	1660		Yes	0.876		Yes	0.75		Yes	69800		Yes	124		Yes	56.2		Yes	2300	
Sediment	EV069-SE-1-092519	70.8		Yes	23200		Yes	33		Yes	21.2		Yes	1690		Yes	0.87		Yes	0.984		Yes	73500		Yes	121		Yes	52		Yes	2410	
Sediment	EV071-SE-1-092519	144		Yes	23100		Yes	34.3		Yes	23.3		Yes	1730		Yes	0.882		Yes	0.874		Yes	72300		Yes	126		Yes	56.6		Yes	2460	
Sediment	EV072-SE-1-092619	119		Yes	22600		Yes	46.8		Yes	25.6		Yes	1770		Yes	0.899		Yes	0.865		Yes	71500		Yes	133		Yes	52.1		Yes	2310	
Sediment	EV072-SE-2-092619	148		Yes	21900		Yes	38.4		Yes	20.9		Yes	1710		Yes	0.866		Yes	1.05		Yes	67900		Yes	113		Yes	48.9		Yes	2020	
Sediment	EV075-SE-1-091119	71.9		Yes	19700		Yes	38.7		Yes	21.5		Yes	1540		Yes	0.922		Yes	0.734		Yes	64700		Yes	129		Yes	56		Yes	2340	
Sediment	JS001-SE-1-101019	132		Yes	14100		Yes	10.7		Yes	11.9		Yes	646		Yes	0.546		Yes	2.78		Yes	38400		Yes	37.9		Yes	18.2		Yes	803	
Sediment	JS002-SE-1-101019	128		Yes	17600		Yes	8.29		Yes	12.8		Yes	665		Yes	0.635		Yes	2.49		Yes	40900		Yes	43.3		Yes	16.5		Yes	872	
Sediment	REF001-SE-1-092819	0.105		Yes	3890		Yes	0.04	U	No	1.3		Yes	27.9		Yes	0.176		Yes	0.14		Yes	1940		Yes	4.95		Yes	2.39		Yes	4.89	
Sediment	REF002-SE-1-092819	0.112		Yes	2730		Yes	0.033	U	No	0.83	J	Yes	21.2		Yes	0.135		Yes	0.089		Yes	1580		Yes	5.88		Yes	1.74		Yes	3.36	
Sediment	REF003-SE-1-092719	0.143		Yes	2510		Yes	0.05	U	No	0.7	J	Yes	17.6		Yes	0.127		Yes	0.093		Yes	1570		Yes	9.09		Yes	1.73		Yes	3.39	
Sediment	REF004-SE-1-092719	0.234		Yes	4210		Yes	0.204		Yes	1.94		Yes	45.1		Yes	0.179		Yes	0.196		Yes	3360		Yes	13		Yes	3.27		Yes	4.98	
Sediment	REF005-SE-1-100319	0.0954		Yes	2440		Yes	0.039	U	No	0.85	J	Yes	22.6		Yes	0.128		Yes	0.091		Yes	1550		Yes	7.87		Yes	2.13		Yes	4.95	
Sediment	REF006-SE-1-100219	0.192		Yes	2990		Yes	0.034	U	No	0.96		Yes	32.8		Yes	0.164		Yes	0.203		Yes	2000		Yes	9.48		Yes	2.18		Yes	3.77	
Sediment	REF007-SE-1-093019	0.185		Yes	3410		Yes	0.031	U	No	1.49		Yes	25.3		Yes	0.142		Yes	0.104		Yes	1590		Yes	7.21		Yes	2.27		Yes	4.41	
Sediment	REF008-SE-1-093019	0.13		Yes	2770		Yes	0.034	U	No	0.95		Yes	26.3		Yes	0.12		Yes	0.093		Yes	1680		Yes	7.21		Yes	1.84		Yes	3.97	
Sediment	REF009A-SE-1-100219	0.0827		Yes	3040		Yes	0.027	U	No	0.66	J	Yes	32.2		Yes	0.154		Yes	0.095		Yes	1790		Yes	7.47		Yes	2.01		Yes	3.75	
Sediment	REF010-SE-1-100319	0.124		Yes	2450		Yes	0.035	U	No	1.19		Yes	37.9		Yes	0.124		Yes	0.106		Yes	1740		Yes	7.12		Yes	1.95		Yes	3.76	
Sediment	REF011-SE-1-100119	0.157		Yes	3040		Yes	0.04	U	No	0.9	J	Yes	44.3		Yes	0.161		Yes	0.11		Yes	1860		Yes	8.86		Yes	2.24		Yes	3.34	
Sediment	REF011-SE-2-100119	0.137		Yes	2860		Yes	0.04	U	No	0.9	J	Yes	37.7		Yes	0.155		Yes	0.107		Yes	1800		Yes	8.97		Yes	2.11		Yes	3.37	
Sediment	REF012-SE-1-100419	0.176		Yes	3260		Yes	0.04	U	No	1	J	Yes	29.1		Yes	0.177		Yes	0.209		Yes	2360		Yes	8.57		Yes	2.12		Yes	3.72	
Sediment	REF013-SE-1-092419	0.0837		Yes	3510		Yes	0.054	J	Yes	0.89		Yes	41		Yes	0.146		Yes	0.133		Yes	2060		Yes	11.6		Yes	2.85		Yes	3.89	
Sediment	REF014-SE-1-092619	0.133		Yes	6050		Yes	0.131		Yes	1.26		Yes	62.7		Yes	0.203		Yes	0.256		Yes	2410		Yes	14.4		Yes	3.46		Yes	6.03	
Sediment	REF014-SE-2-092619	0.109		Yes	4610		Yes	0.14	J	Yes	1.2	J	Yes	46.3		Yes	0.2		Yes	0.22		Yes	2330		Yes	14.2		Yes	3.43		Yes	6.3	
Sediment	REF015-SE-1-092619	0.335		Yes	11600		Yes	0.5		Yes	4.7		Yes	142		Yes	0.517		Yes	1.1		Yes	4310		Yes	40.4		Yes	10.3		Yes	21.5	
Sediment	REF016-SE-1-092519	0.172		Yes	9100		Yes	0.04	U	No	9.5		Yes	98.6		Yes	0.525		Yes	0.229		Yes	4480		Yes	20.4		Yes	13.1		Yes	16.3	
Sediment	REF017-SE-1-092519	0.16		Yes	9310		Yes	0.05	J	Yes	4.6		Yes	110		Yes	0.487		Yes	0.219		Yes	4440		Yes	19.4		Yes	10		Yes	19.2	
Sediment	REF018-SE-1-092519	0.136		Yes	9360		Yes	0.28		Yes	3.2		Yes	109		Yes	0.678		Yes	0.631		Yes	6650		Yes	19.2		Yes	7.76		Yes	19.9	

Final Phase 3 Sediment Study Bioa
Attachment A. Preliminary unvalid

		ids	Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			M
		r	Iron			Lead			Magnesium			Manganese			Mercury			Nickel			Potassium			Selenium			Silver			Sodium			T
		g	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			
material_analyzed	sample_no	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value
Sediment	1-B5-NRT-SE-1-101519	Yes	30600		Yes	197		Yes	16800		Yes	487		Yes	0.152		Yes	15		Yes	1240		Yes	0.6	J	Yes	1.8		Yes	185		Yes	0.298
Sediment	1-B6-NRT-SE-1-101619	Yes	114000		Yes	193		Yes	9060		Yes	2270		Yes	0.037		Yes	11.4		Yes	2430		Yes	1.3	J	Yes	2.16		Yes	1270		Yes	0.059
Sediment	3-R7-2019-SE-1-101519	Yes	163000		Yes	284		Yes	6740		Yes	2980		Yes	0.004	J	Yes	15.6		Yes	3730		Yes	1.6	J	Yes	3.92		Yes	2060		Yes	0.043
Sediment	3-R8-2019-SE-1-101619	Yes	171000		Yes	5520		Yes	11300		Yes	3410		Yes	0.009	J	Yes	17.2		Yes	8020		Yes	2.8		Yes	6.13		Yes	4780		Yes	0.096
Sediment	4-B1-2019-SE-1-092619	Yes	229000		Yes	383		Yes	6420		Yes	4140		Yes	0.009	J	Yes	15.5		Yes	4100		Yes	2		Yes	3.74		Yes	2120		Yes	0.045
Sediment	4-B6-2019-SE-1-092619	Yes	222000		Yes	503		Yes	6190		Yes	4030		Yes	0.01	J	Yes	12.6		Yes	4070		Yes	2.1		Yes	2.71		Yes	1940		Yes	0.046
Sediment	CB002-SE-1-101619	Yes	48500		Yes	159		Yes	10600		Yes	970		Yes	0.051		Yes	10.1		Yes	1290		Yes	0.6	J	Yes	1.41		Yes	423		Yes	0.09
Sediment	CB005-SE-1-101819	Yes	10800		Yes	143		Yes	3420		Yes	240		Yes	0.002	U	No	21.4		Yes	677		Yes	0.2	U	No	0.278		Yes	293		Yes	0.06
Sediment	CB006-SE-1-100919	Yes	82800		Yes	202		Yes	5850		Yes	1590		Yes	0.027		Yes	9.8		Yes	1780		Yes	0.9	J	Yes	2.26		Yes	849		Yes	0.086
Sediment	CB007-SE-1-100919	Yes	26000		Yes	92.9		Yes	10100		Yes	458		Yes	0.115		Yes	11.4		Yes	1460		Yes	0.3	J	Yes	0.868		Yes	260		Yes	0.174
Sediment	CB009-SE-1-101219	Yes	100000		Yes	772		Yes	8460		Yes	2300		Yes	0.096		Yes	11.9		Yes	2040		Yes	1.5	J	Yes	2.53		Yes	798		Yes	0.143
Sediment	CB010-SE-1-101219	Yes	46800		Yes	390		Yes	11700		Yes	930		Yes	0.305		Yes	8.14		Yes	1230		Yes	0.8	J	Yes	0.781		Yes	414		Yes	0.113
Sediment	CB012-SE-1-100919	Yes	77600		Yes	175		Yes	5650		Yes	1380		Yes	0.025		Yes	9.08		Yes	1510		Yes	0.8	J	Yes	1.97		Yes	736		Yes	0.066
Sediment	CB014-SE-1-101519	Yes	138000		Yes	325		Yes	5540		Yes	2790		Yes	0.02	J	Yes	13.1		Yes	2670		Yes	1.5	J	Yes	3.29		Yes	1400		Yes	0.072
Sediment	CB014-SE-2-101519	Yes	125000		Yes	251		Yes	5360		Yes	2530		Yes	0.02		Yes	12.3		Yes	2460		Yes	1.4	J	Yes	2.64		Yes	1220		Yes	0.064
Sediment	CB016-SE-1-101119	Yes	83000		Yes	430		Yes	7900		Yes	1760		Yes	0.095		Yes	9		Yes	1590		Yes	1.2	J	Yes	1.02		Yes	521		Yes	0.128
Sediment	CB018-SE-1-100919	Yes	119000		Yes	248		Yes	6600		Yes	2200		Yes	0.046		Yes	11.7		Yes	2190		Yes	1.2	J	Yes	3.3		Yes	1210		Yes	0.106
Sediment	CB018-SE-2-100919	Yes	123000		Yes	223		Yes	7070		Yes	2210		Yes	0.052		Yes	12.3		Yes	2280		Yes	1.1	J	Yes	3.67		Yes	1230		Yes	0.102
Sediment	CB020-SE-1-101419	Yes	98200		Yes	247		Yes	7720		Yes	2110		Yes	0.05		Yes	11.3		Yes	2030		Yes	1.1	J	Yes	3.15		Yes	1080		Yes	0.109
Sediment	CB021-SE-1-101419	Yes	26700		Yes	174		Yes	14300		Yes	472		Yes	0.256		Yes	13.6		Yes	1220		Yes	0.6	J	Yes	0.923		Yes	185		Yes	0.322
Sediment	CB024-SE-1-101419	Yes	36000		Yes	183		Yes	13200		Yes	749		Yes	0.084		Yes	10		Yes	1120		Yes	0.5	J	Yes	1.22		Yes	297		Yes	0.14
Sediment	CB027-SE-1-101419	Yes	36600		Yes	154		Yes	11500		Yes	751		Yes	0.085		Yes	9.35		Yes	1090		Yes	0.5	J	Yes	0.972		Yes	308		Yes	0.122
Sediment	CB029-SE-1-101519	Yes	29500		Yes	158		Yes	13400		Yes	668		Yes	0.085		Yes	9.46		Yes	996		Yes	0.4	J	Yes	0.729		Yes	243		Yes	0.116
Sediment	CB035-SE-1-100319	Yes	91200		Yes	153		Yes	4810		Yes	1550		Yes	0.004	J	Yes	9.69		Yes	2450		Yes	0.7	J	Yes	1.7		Yes	1190		Yes	0.151
Sediment	CB035-SE-2-100319	Yes	111000		Yes	261		Yes	5890		Yes	1910		Yes	0.004	J	Yes	11.3		Yes	2500		Yes	0.9	J	Yes	1.84		Yes	1420		Yes	0.085
Sediment	CB036-SE-1-100419	Yes	158000		Yes	218		Yes	5660		Yes	2730		Yes	0.002	J	Yes	14		Yes	3320		Yes	1.3	J	Yes	2.75		Yes	1930		Yes	0.058
Sediment	CB039-SE-1-101119	Yes	190000		Yes	461		Yes	6580		Yes	3870		Yes	0.006	J	Yes	18.3		Yes	3910		Yes	2.2		Yes	4.28		Yes	2110		Yes	0.068
Sediment	CB040-SE-1-101819	Yes	153000		Yes	648		Yes	7550		Yes	3000		Yes	0.012	J	Yes	11.7		Yes	3290		Yes	2.1		Yes	2.54		Yes	1390		Yes	0.107
Sediment	CB044-SE-1-101519	Yes	27900		Yes	147		Yes	8290		Yes	484		Yes	0.07		Yes	9.74		Yes	874		Yes	0.3	J	Yes	0.582		Yes	199		Yes	0.12
Sediment	CB046-SE-1-100819	Yes	244000		Yes	356		Yes	6810		Yes	4710		Yes	0.011	J	Yes	16.6		Yes	4410		Yes	2.2		Yes	3.67		Yes	2480		Yes	0.038
Sediment	CB047-SE-1-101119	Yes	110000		Yes	189		Yes	4630		Yes	2190		Yes	0.004	J	Yes	9.66		Yes	2730		Yes	1.2	J	Yes	1.93		Yes	1670		Yes	0.041
Sediment	CB056-SE-1-101719	Yes	19200		Yes	86.3		Yes	8630		Yes	317		Yes	0.038		Yes	13.6		Yes	1040		Yes	0.4	J	Yes	0.372		Yes	149		Yes	0.238
Sediment	DM002-SE-1-100919	Yes	145000		Yes	264		Yes	4880		Yes	2530		Yes	0.012	J	Yes	11.5		Yes	2610		Yes	1.6	J	Yes	3.06		Yes	1360		Yes	0.055
Sediment	DM007-SE-1-101519	Yes	80800		Yes	152		Yes	4340		Yes	1620		Yes	0.016	J	Yes	10.2		Yes	1790		Yes	1	J	Yes	1.62		Yes	783		Yes	0.072
Sediment	DM008-SE-1-101119	Yes	190000		Yes	255		Yes	5910		Yes	4660		Yes	0.064		Yes	17.4		Yes	3380		Yes	1.9	J	Yes	12.2		Yes	2930		Yes	0.187
Sediment	DM010-SE-1-101119	Yes	66300		Yes	175		Yes	6450		Yes	1440		Yes	0.093		Yes	9.77		Yes	1600		Yes	0.8	J	Yes	3.55		Yes	756		Yes	0.086
Sediment	DM015-SE-1-101019	Yes	82700		Yes	248		Yes	6890		Yes	1930		Yes	0.143		Yes	13.6		Yes	1890		Yes	1	J	Yes	6.95		Yes	1040		Yes	0.247
Sediment	DM016-SE-1-101019	Yes	51300		Yes	116		Yes	8090		Yes	980		Yes	0.07		Yes	8.65		Yes	1320		Yes	0.8	J	Yes	0.912		Yes	345		Yes	0.124
Sediment	DM016-SE-2-101019	Yes	35600		Yes	112		Yes	8350		Yes	727		Yes	0.043		Yes	7.73		Yes	1010		Yes	0.4	J	Yes	0.867		Yes	358		Yes	0.093
Sediment	DM018-SE-1-100919	Yes	42800		Yes	125		Yes	5100		Yes	825		Yes	0.027		Yes	8.65		Yes	1070		Yes	0.5	J	Yes	2.26		Yes	422		Yes	0.086

Final Phase 3 Sediment Study Bioa
Attachment A. Preliminary unvalid

		ids	Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			M
		r	Iron			Lead			Magnesium			Manganese			Mercury			Nickel			Potassium			Selenium			Silver			Sodium			T
		g	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			
material_analyzed	sample_no	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value
Sediment	DM019-SE-1-101419	Yes	24500		Yes	91		Yes	7230		Yes	488		Yes	0.045		Yes	8.76		Yes	927		Yes	0.3	J	Yes	1.29		Yes	230		Yes	0.103
Sediment	DM020-SE-1-101419	Yes	64700		Yes	195		Yes	6010		Yes	1390		Yes	0.072		Yes	10.9		Yes	1440		Yes	0.7	J	Yes	2.58		Yes	645		Yes	0.149
Sediment	DM022-SE-1-092119	Yes	78700		Yes	178		Yes	5580		Yes	1520		Yes	1.58		Yes	11.3		Yes	1730		Yes	0.85		Yes	2.13		Yes	738		Yes	0.097
Sediment	DM023-SE-1-092119	Yes	59100		Yes	153		Yes	4200		Yes	1200		Yes	0.017	J	Yes	10.1		Yes	1390		Yes	0.7	J	Yes	2.81		Yes	607		Yes	0.076
Sediment	DM024-SE-1-101519	Yes	40300		Yes	94.8		Yes	5030		Yes	826		Yes	0.27		Yes	8.48		Yes	1100		Yes	0.5	J	Yes	1.6		Yes	385		Yes	0.071
Sediment	DM024-SE-2-101519	Yes	40700		Yes	109		Yes	4910		Yes	830		Yes	0.062		Yes	8.49		Yes	1130		Yes	0.5	J	Yes	3.81		Yes	383		Yes	0.06
Sediment	DM025-SE-1-101219	Yes	101000		Yes	219		Yes	4820		Yes	2130		Yes	0.014	J	Yes	11.1		Yes	2130		Yes	1.2	J	Yes	2.38		Yes	1060		Yes	0.073
Sediment	DM026-SE-1-092119	Yes	68000		Yes	167		Yes	4230		Yes	1320		Yes	0.019	J	Yes	8.91		Yes	1570		Yes	0.77	J	Yes	5.12		Yes	682		Yes	0.12
Sediment	DM026-SE-2-092119	Yes	64000		Yes	128		Yes	4250		Yes	1370		Yes	0.02	J	Yes	9.67		Yes	1530		Yes	0.7	J	Yes	1.91		Yes	700		Yes	0.07
Sediment	DM027-SE-1-101419	Yes	98300		Yes	228		Yes	4970		Yes	2000		Yes	0.03		Yes	8.5		Yes	2080		Yes	1.4	J	Yes	1.57		Yes	844		Yes	0.041
Sediment	DM036-SE-1-101819	Yes	43000		Yes	270		Yes	7050		Yes	990		Yes	0.006	J	Yes	13.2		Yes	2050		Yes	0.7	J	Yes	1.66		Yes	1010		Yes	0.118
Sediment	DM038-SE-1-101919	Yes	115000		Yes	301		Yes	4630		Yes	2300		Yes	0.017	J	Yes	10.5		Yes	2230		Yes	1.5	J	Yes	2.44		Yes	1140		Yes	0.066
Sediment	DM039-SE-1-101719	Yes	111000		Yes	229		Yes	4030		Yes	2150		Yes	0.0132		Yes	10.5		Yes	2070		Yes	1.4	J	Yes	2.44		Yes	1100		Yes	0.077
Sediment	DM044-SE-1-101619	Yes	124000		Yes	287		Yes	9340		Yes	2340		Yes	0.156		Yes	14.7		Yes	2090		Yes	1.1	J	Yes	1.46		Yes	676		Yes	0.2
Sediment	DM045-SE-1-091919	Yes	29300		Yes	440		Yes	22200		Yes	478		Yes	1.94		Yes	10.8		Yes	896		Yes	0.8	J	Yes	0.828		Yes	206		Yes	0.335
Sediment	DM046-SE-1-092019	Yes	23300		Yes	312		Yes	27200		Yes	369		Yes	0.368		Yes	13.7		Yes	782		Yes	0.75	J	Yes	0.473		Yes	148		Yes	0.312
Sediment	DM047-SE-1-101819	Yes	57700		Yes	1170		Yes	5570		Yes	986		Yes	0.03		Yes	10.8		Yes	2250		Yes	1	J	Yes	1.21		Yes	1440		Yes	0.078
Sediment	DM050-SE-1-092019	Yes	31300		Yes	698		Yes	29700		Yes	569		Yes	1.57		Yes	12.5		Yes	811		Yes	0.98		Yes	0.856		Yes	173		Yes	0.408
Sediment	DM057-SE-1-091819	Yes	160000		Yes	335		Yes	6550		Yes	3590		Yes	0.018	J	Yes	13.3		Yes	3050		Yes	1.6		Yes	4.96		Yes	1980		Yes	0.096
Sediment	DM061-SE-1-101219	Yes	29200		Yes	200		Yes	18800		Yes	499		Yes	0.173		Yes	12.5		Yes	1130		Yes	0.5	J	Yes	0.609		Yes	179		Yes	0.231
Sediment	EV001-SE-1-092619	Yes	234000		Yes	555		Yes	7070		Yes	4040		Yes	0.011	J	Yes	13		Yes	4190		Yes	2.2		Yes	2.76		Yes	1910		Yes	0.101
Sediment	EV001-SE-2-092619	Yes	215000		Yes	613		Yes	6320		Yes	3810		Yes	0.008	J	Yes	12.9		Yes	4200		Yes	2.1		Yes	2.61		Yes	1990		Yes	0.088
Sediment	EV002-SE-1-092419	Yes	194000		Yes	382		Yes	6880		Yes	3720		Yes	0.005	J	Yes	12.3		Yes	4160		Yes	1.87		Yes	2.74		Yes	2180		Yes	0.062
Sediment	EV003-SE-1-092019	Yes	137000		Yes	354		Yes	5510		Yes	2650		Yes	0.01	J	Yes	10.8		Yes	2840		Yes	1.46		Yes	2.21		Yes	1440		Yes	0.065
Sediment	EV005-SE-1-091119	Yes	209000		Yes	487		Yes	7690		Yes	3840		Yes	0.008	J	Yes	12.6		Yes	4250		Yes	2.08		Yes	2.4		Yes	2020		Yes	0.083
Sediment	EV008-SE-1-092319	Yes	208000		Yes	541		Yes	6670		Yes	4000		Yes	0.007	J	Yes	12.7		Yes	4120		Yes	2.17		Yes	2.57		Yes	1860		Yes	0.048
Sediment	EV010-SE-1-091219	Yes	151000		Yes	371		Yes	7300		Yes	2890		Yes	0.012	J	Yes	12.7		Yes	3450		Yes	1.8		Yes	3.1		Yes	1800		Yes	0.063
Sediment	EV011-SE-1-092819	Yes	16300		Yes	26		Yes	12000		Yes	179		Yes	0.014	J	Yes	9.01		Yes	474		Yes	0.2	U	No	0.058		Yes	50		Yes	0.079
Sediment	EV012-SE-1-091319	Yes	115000		Yes	251		Yes	11800		Yes	2200		Yes	0.016	J	Yes	10.3		Yes	2750		Yes	1.29		Yes	2.06		Yes	1280		Yes	0.052
Sediment	EV013-SE-1-091319	Yes	190000		Yes	593		Yes	7010		Yes	3300		Yes	0.009	J	Yes	13.4		Yes	3700		Yes	1.9		Yes	2.48		Yes	1770		Yes	0.06
Sediment	EV020-SE-1-100219	Yes	71300		Yes	214		Yes	4360		Yes	1180		Yes	0.014	J	Yes	10.1		Yes	1750		Yes	0.7	J	Yes	0.95		Yes	808		Yes	0.061
Sediment	EV022-SE-1-092819	Yes	15400		Yes	32.6		Yes	6000		Yes	270		Yes				14.9		Yes	967		Yes	0.3	J	Yes	0.173		Yes	195		Yes	0.112
Sediment	EV026-SE-1-092019	Yes	134000		Yes	301		Yes	6790		Yes	2470		Yes	0.026		Yes	11.9		Yes	2550		Yes	1.31		Yes	1.99		Yes	1170		Yes	0.126
Sediment	EV027-SE-1-092119	Yes	159000		Yes	429		Yes	6410		Yes	3010		Yes	0.006	J	Yes	12.5		Yes	3390		Yes	1.67		Yes	2.45		Yes	1640		Yes	0.065
Sediment	EV036-SE-1-091419	Yes	19000		Yes	62.4		Yes	6880		Yes	242		Yes	0.044		Yes	14.4		Yes	1000		Yes	0.3	J	Yes	0.251		Yes	177		Yes	0.133
Sediment	EV037-SE-1-092319	Yes	193000		Yes	369		Yes	7010		Yes	3650		Yes	0.002	J	Yes	12.8		Yes	4250		Yes	2.05		Yes	2.3		Yes	2010		Yes	0.049
Sediment	EV037-SE-2-092319	Yes	184000		Yes	393		Yes	6810		Yes	3150		Yes	0.005	J	Yes	12.2		Yes	4140		Yes	1.83		Yes	2.32		Yes	2070		Yes	0.057
Sediment	EV044-SE-1-092419	Yes	28500		Yes	205		Yes	11600		Yes	434		Yes	0.514		Yes	27.6		Yes	2260		Yes	1	J	Yes	1.44		Yes	240		Yes	0.485
Sediment	EV048-SE-1-092419	Yes	180000		Yes	403		Yes	6940		Yes	3550		Yes	0.006	J	Yes	14.5		Yes	3580		Yes	1.66		Yes	2.85		Yes	1790		Yes	0.08
Sediment	EV049-SE-1-092719	Yes	8490		Yes	12.1		Yes	2620		Yes	104		Yes	0.009	J	Yes	13.5		Yes	958		Yes	0.2	U	No	0.031	J	Yes	100		Yes	0.081

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Attachment A. Preliminary unvalid

		ids	Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			Metal/oids			M
		r	Iron			Lead			Magnesium			Manganese			Mercury			Nickel			Potassium			Selenium			Silver			Sodium			T
		(	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			
material_analyzed	sample_no	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value
Sediment	EV051-SE-1-092419	Yes	200000		Yes	480		Yes	6590		Yes	4010		Yes	0.008	J	Yes	14.6		Yes	4050		Yes	2.07		Yes	3.93		Yes	2040		Yes	0.067
Sediment	EV052-SE-1-092619	Yes	194000		Yes	435		Yes	6930		Yes	3540		Yes	0.015	J	Yes	14.9		Yes	3930		Yes	1.7	J	Yes	2.31		Yes	1920		Yes	0.097
Sediment	EV054-SE-1-091119	Yes	28000		Yes	393		Yes	11100		Yes	418		Yes	1.53		Yes	26.8		Yes	1960		Yes	1.3	J	Yes	1.9		Yes	238		Yes	0.593
Sediment	EV057-SE-1-091119	Yes	24500		Yes	183		Yes	16400		Yes	386		Yes	0.264		Yes	22.9		Yes	1940		Yes	0.8	J	Yes	1.12		Yes	191		Yes	0.376
Sediment	EV060-SE-1-092119	Yes	202000		Yes	356		Yes	6570		Yes	3990		Yes	0.011	J	Yes	14.2		Yes	3800		Yes	1.88		Yes	3.43		Yes	1980		Yes	0.057
Sediment	EV063-SE-1-091019	Yes	30600		Yes	462		Yes	11700		Yes	458		Yes	1.28		Yes	29.2		Yes	2290		Yes	1.6	J	Yes	2.76		Yes	256		Yes	0.803
Sediment	EV064-SE-1-091019	Yes	22600		Yes	149		Yes	16400		Yes	361		Yes	0.235		Yes	19.9		Yes	1750		Yes	0.7	J	Yes	0.87		Yes	195		Yes	0.387
Sediment	EV065-SE-1-092519	Yes	220000		Yes	464		Yes	6940		Yes	4170		Yes	0.007	J	Yes	14.2		Yes	4340		Yes	2.08		Yes	4.47		Yes	2190		Yes	0.05
Sediment	EV065-SE-2-092519	Yes	242000		Yes	549		Yes	7120		Yes	4310		Yes	0.005	J	Yes	14.3		Yes	4260		Yes	2.04		Yes	3.71		Yes	2100		Yes	0.078
Sediment	EV066-SE-1-092519	Yes	242000		Yes	373		Yes	7030		Yes	4400		Yes	0.01	J	Yes	14.8		Yes	4360		Yes	2.17		Yes	3.4		Yes	2140		Yes	0.062
Sediment	EV069-SE-1-092519	Yes	250000		Yes	448		Yes	6790		Yes	4420		Yes	0.016	J	Yes	13.9		Yes	4360		Yes	2.05		Yes	3.8		Yes	2170		Yes	0.05
Sediment	EV071-SE-1-092519	Yes	245000		Yes	465		Yes	6800		Yes	4460		Yes	0.007	J	Yes	14.3		Yes	4310		Yes	2.08		Yes	3.63		Yes	2210		Yes	0.048
Sediment	EV072-SE-1-092619	Yes	237000		Yes	457		Yes	6290		Yes	4490		Yes	0.012	J	Yes	15.9		Yes	4200		Yes	2.1		Yes	4.16		Yes	2190		Yes	0.057
Sediment	EV072-SE-2-092619	Yes	219000		Yes	464		Yes	6670		Yes	4180		Yes	0.013	J	Yes	15.2		Yes	4130		Yes	2	J	Yes	3.14		Yes	2130		Yes	0.073
Sediment	EV075-SE-1-091119	Yes	215000		Yes	328		Yes	7280		Yes	4120		Yes	0.011	J	Yes	16.2		Yes	4360		Yes	2.1		Yes	3.45		Yes	2260		Yes	0.061
Sediment	JS001-SE-1-101019	Yes	107000		Yes	534		Yes	9730		Yes	2170		Yes	0.13		Yes	9.61		Yes	2580		Yes	1.4	J	Yes	1.46		Yes	1060		Yes	0.181
Sediment	JS002-SE-1-101019	Yes	141000		Yes	671		Yes	7630		Yes	2960		Yes	0.027		Yes	8.29		Yes	3160		Yes	1.8	J	Yes	1.45		Yes	1150		Yes	0.165
Sediment	REF001-SE-1-092819	Yes	8080		Yes	6.8		Yes	2360		Yes	175		Yes	0.002	J	Yes	6.03		Yes	541		Yes	0.2	U	No	0.025	J	Yes	129		Yes	0.049
Sediment	REF002-SE-1-092819	Yes	5670		Yes	3.5		Yes	1800		Yes	112		Yes	0.002	U	No	5.36		Yes	438		Yes	0.1	U	No	0.023	J	Yes	61		Yes	0.032
Sediment	REF003-SE-1-092719	Yes	7700		Yes	4.57		Yes	1610		Yes	76.2		Yes	0.002	U	No	5.08		Yes	430		Yes	0.2	U	No	0.018	J	Yes	59		Yes	0.035
Sediment	REF004-SE-1-092719	Yes	10200		Yes	24.2		Yes	2840		Yes	145		Yes	0.003	J	Yes	7.76		Yes	818		Yes	0.1	U	No	0.031		Yes	62		Yes	0.065
Sediment	REF005-SE-1-100319	Yes	7720		Yes	3.61		Yes	1800		Yes	79.6		Yes	0.002	U	No	6.01		Yes	444		Yes	0.2	U	No	0.025	J	Yes	49		Yes	0.043
Sediment	REF006-SE-1-100219	Yes	7680		Yes	5.64		Yes	2210		Yes	96.2		Yes	0.002	U	No	7.86		Yes	599		Yes	0.2	U	No	0.025	J	Yes	56		Yes	0.048
Sediment	REF007-SE-1-093019	Yes	7710		Yes	5.18		Yes	2330		Yes	125		Yes	0.002	J	Yes	6.13		Yes	612		Yes	0.1	U	No	0.023	J	Yes	63		Yes	0.043
Sediment	REF008-SE-1-093019	Yes	6060		Yes	4.18		Yes	1780		Yes	78.4		Yes	0.002	J	Yes	5.55		Yes	519		Yes	0.2	U	No	0.023	J	Yes	65		Yes	0.036
Sediment	REF009A-SE-1-100219	Yes	6700		Yes	3.55		Yes	2080		Yes	90.9		Yes	0.002	U	No	5.85		Yes	539		Yes	0.1	U	No	0.023	J	Yes	68		Yes	0.038
Sediment	REF010-SE-1-100319	Yes	6720		Yes	4.41		Yes	1810		Yes	112		Yes	0.002	U	No	7.11		Yes	548		Yes	0.2	U	No	0.02	J	Yes	55		Yes	0.041
Sediment	REF011-SE-1-100119	Yes	7420		Yes	5.12		Yes	2100		Yes	97.6		Yes	0.002	U	No	6.86		Yes	636		Yes	0.2	U	No	0.032	J	Yes	66		Yes	0.044
Sediment	REF011-SE-2-100119	Yes	7090		Yes	4.76		Yes	2000		Yes	92		Yes	0.003	J	Yes	7.24		Yes	530		Yes	0.2	U	No	0.021	J	Yes	63		Yes	0.057
Sediment	REF012-SE-1-100419	Yes	7810		Yes	9.72		Yes	2050		Yes	83.1		Yes	0.002	U	No	6.18		Yes	641		Yes	0.2	J	Yes	0.029	J	Yes	66		Yes	0.055
Sediment	REF013-SE-1-092419	Yes	6530		Yes	8.4		Yes	2230		Yes	74.6		Yes	0.002	U	No	11.7		Yes	719		Yes	0.09	J	Yes	0.019	J	Yes	103		Yes	0.064
Sediment	REF014-SE-1-092619	Yes	8600		Yes	12.9		Yes	2580		Yes	104		Yes	0.01	J	Yes	13.7		Yes	957		Yes	0.2	U	No	0.039		Yes	97		Yes	0.084
Sediment	REF014-SE-2-092619	Yes	8400		Yes	12		Yes	2570		Yes	101		Yes	0.009	J	Yes	13.1		Yes	950		Yes	0.5	U	No	0.03	J	Yes	110		Yes	0.09
Sediment	REF015-SE-1-092619	Yes	18500		Yes	59.1		Yes	6770		Yes	231		Yes	0.03	J	Yes	41.1		Yes	2930		Yes	0.4	J	Yes	0.112		Yes	215		Yes	0.219
Sediment	REF016-SE-1-092519	Yes	20200		Yes	10		Yes	4300		Yes	226		Yes	0.013	J	Yes	24.5		Yes	1830		Yes	0.4	J	Yes	0.066		Yes	215		Yes	0.183
Sediment	REF017-SE-1-092519	Yes	18500		Yes	11.6		Yes	4830		Yes	205		Yes	0.014	J	Yes	20.3		Yes	2080		Yes	0.4	J	Yes	0.081		Yes	312		Yes	0.16
Sediment	REF018-SE-1-092519	Yes	18600		Yes	26.7		Yes	5100		Yes	216		Yes	0.03	J	Yes	20		Yes	1880		Yes	0.5	J	Yes	0.1		Yes	249		Yes	0.197

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		etal/oids		Metal/oids			Metal/oids			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize		
		hallium		Vanadium			Zinc			Clay			CoarseSand			FineGravel			FineSand			MedGravel			MedSand			Silt			VCoarseSand		
		mg/kg		mg/kg			mg/kg			percent			percent			percent			percent			percent			percent			percent			percent		
material_analyzed	sample_no	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect
Sediment	1-B5-NRT-SE-1-101519		Yes	26.4		Yes	2240		Yes	1.62		Yes	1.26		Yes	0.09		Yes	62.09		Yes	0		Yes	4.35		Yes	14.91		Yes	0.07		Yes
Sediment	1-B6-NRT-SE-1-101619	J	Yes	31.8		Yes	9660		Yes	0.18		Yes	41.61		Yes	1.28		Yes	18.57		Yes	0.28		Yes	17.22		Yes	0.5		Yes	17.91		Yes
Sediment	3-R7-2019-SE-1-101519	J	Yes	40.4		Yes	12300		Yes	0.04		Yes	55.05		Yes	6.48		Yes	0.14		Yes	0		Yes	1.93		Yes	0.14		Yes	33.03		Yes
Sediment	3-R8-2019-SE-1-101619		Yes	77.4		Yes	29300		Yes	0.08		Yes	14.57		Yes	11.07		Yes	1.11		Yes	0.3		Yes	0.58		Yes	0.17		Yes	70.71		Yes
Sediment	4-B1-2019-SE-1-092619		Yes	42		Yes	18800		Yes	0.21		Yes	73.2		Yes	0.19		Yes	1.59		Yes	0		Yes	13.91		Yes	1.1		Yes	5.94		Yes
Sediment	4-B6-2019-SE-1-092619		Yes	41.6		Yes	18900		Yes	0.06		Yes	78.97		Yes	0.33		Yes	0.39		Yes	0		Yes	12.32		Yes	0.23		Yes	3.41		Yes
Sediment	CB002-SE-1-101619	J	Yes	21.3		Yes	4220		Yes	0.34		Yes	4.18		Yes	0.03		Yes	44.9		Yes	0		Yes	44.16		Yes	2.11		Yes	0.11		Yes
Sediment	CB005-SE-1-101819		Yes	15.2		Yes	638		Yes	0		Yes	5.76		Yes	81.9		Yes	0.33		Yes	29.93		Yes	0.1		Yes	0.19		Yes	12.35		Yes
Sediment	CB006-SE-1-100919		Yes	22.9		Yes	7030		Yes	0.1		Yes	14.34		Yes	0.01		Yes	20.76		Yes	0		Yes	63.55		Yes	0.79		Yes	0.18		Yes
Sediment	CB007-SE-1-100919		Yes	26.2		Yes	1110		Yes	0.89		Yes	9.43		Yes	21.52		Yes	32.18		Yes	0		Yes	12.7		Yes	8.35		Yes	14.86		Yes
Sediment	CB009-SE-1-101219		Yes	31		Yes	14100		Yes	0.55		Yes	9.04		Yes	6.29		Yes	33.47		Yes	0.84		Yes	39.51		Yes	3.79		Yes	3.78		Yes
Sediment	CB010-SE-1-101219		Yes	23.7		Yes	5570		Yes	0.5		Yes	4.54		Yes	1.83		Yes	42.81		Yes	0		Yes	42.33		Yes	4.99		Yes	1.21		Yes
Sediment	CB012-SE-1-100919		Yes	21.6		Yes	6120		Yes	0.35		Yes	11.36		Yes	0		Yes	28.01		Yes	0		Yes	60.92		Yes	1.12		Yes	0.08		Yes
Sediment	CB014-SE-1-101519		Yes	32.9		Yes	12400		Yes	0.13		Yes	18.24		Yes	0.01		Yes	5.86		Yes	0		Yes	74.38		Yes	0.02		Yes	0.03		Yes
Sediment	CB014-SE-2-101519	J	Yes	30.5		Yes	10900		Yes	0.1		Yes	22.16		Yes	0		Yes	5.96		Yes	0		Yes	69.47		Yes	0.15		Yes	0.07		Yes
Sediment	CB016-SE-1-101119		Yes	32.3		Yes	9210		Yes	0.21		Yes	3.17		Yes	3.64		Yes	38.91		Yes	0		Yes	49.88		Yes	1.31		Yes	0.54		Yes
Sediment	CB018-SE-1-100919		Yes	26.8		Yes	10100		Yes	0.21		Yes	12.34		Yes	0.53		Yes	22.85		Yes	0.04		Yes	58.07		Yes	1.21		Yes	0.25		Yes
Sediment	CB018-SE-2-100919		Yes	28.6		Yes	9950		Yes	0.21		Yes	12.89		Yes	0.24		Yes	30.38		Yes	0		Yes	58.92		Yes	1.01		Yes	0.36		Yes
Sediment	CB020-SE-1-101419		Yes	26.5		Yes	8750		Yes	0.17		Yes	9.19		Yes	0.01		Yes	28.28		Yes	0		Yes	60.44		Yes	1.29		Yes	0.28		Yes
Sediment	CB021-SE-1-101419		Yes	24.5		Yes	1730		Yes	1.91		Yes	1.56		Yes	1.42		Yes	61.07		Yes	0		Yes	9.28		Yes	13.8		Yes	1.94		Yes
Sediment	CB024-SE-1-101419		Yes	20.3		Yes	3360		Yes	0.45		Yes	2.33		Yes	0.07		Yes	47.73		Yes	0		Yes	40.9		Yes	3.23		Yes	0.14		Yes
Sediment	CB027-SE-1-101419		Yes	20.3		Yes	3260		Yes	0.45		Yes	3.27		Yes	0.03		Yes	47.98		Yes	0		Yes	44.48		Yes	2.18		Yes	0.11		Yes
Sediment	CB029-SE-1-101519		Yes	20.2		Yes	2840		Yes	0.51		Yes	0.95		Yes	0.01		Yes	60.86		Yes	0		Yes	27.55		Yes	3.94		Yes	0.03		Yes
Sediment	CB035-SE-1-100319		Yes	28		Yes	6080		Yes	0.03		Yes	36.25		Yes	22.9		Yes	1.39		Yes	0		Yes	1.72		Yes	0.42		Yes	37.52		Yes
Sediment	CB035-SE-2-100319		Yes	32.6		Yes	8410		Yes	0.05		Yes	41.94		Yes	17.21		Yes	2.87		Yes	0		Yes	2.28		Yes	0.42		Yes	34.13		Yes
Sediment	CB036-SE-1-100419		Yes	37.2		Yes	12000		Yes	0.22		Yes	66.98		Yes	5.19		Yes	3.18		Yes	0		Yes	2.28		Yes	0.08		Yes	19.99		Yes
Sediment	CB039-SE-1-101119		Yes	43.4		Yes	18500		Yes	0.02		Yes	55.99		Yes	17.56		Yes	1.92		Yes	0		Yes	8.53		Yes	0.11		Yes	14.22		Yes
Sediment	CB040-SE-1-101819		Yes	42.2		Yes	14700		Yes	0.13		Yes	50.2		Yes	4.94		Yes	6.47		Yes	0		Yes	18.75		Yes	1.52		Yes	13.92		Yes
Sediment	CB044-SE-1-101519		Yes	19.8		Yes	1890		Yes	0.6		Yes	2.92		Yes	0.29		Yes	61.16		Yes	0		Yes	26.14		Yes	3.35		Yes	0.85		Yes
Sediment	CB046-SE-1-100819	J	Yes	42.5		Yes	20700		Yes	0.18		Yes	75.94		Yes	0.35		Yes	5.2		Yes	0		Yes	5.57		Yes	1.05		Yes	10.05		Yes
Sediment	CB047-SE-1-101119	J	Yes	26.9		Yes	9650		Yes	0.03		Yes	45.98		Yes	23.49		Yes	2.85		Yes	0		Yes	14.31		Yes	0.35		Yes	13.88		Yes
Sediment	CB056-SE-1-101719		Yes	28.1		Yes	858		Yes	0.81		Yes	12.52		Yes	14.65		Yes	18.74		Yes	10.64		Yes	11.48		Yes	13.17		Yes	8.21		Yes
Sediment	DM002-SE-1-100919		Yes	31.3		Yes	12200		Yes	0.05		Yes	61.47		Yes	0.18		Yes	2.13		Yes	0		Yes	31.98		Yes	0.09		Yes	3.24		Yes
Sediment	DM007-SE-1-101519	J	Yes	24.1		Yes	6710		Yes	0.05		Yes	32.78		Yes	0		Yes	4.77		Yes	0		Yes	56.19		Yes	0.09		Yes	0.04		Yes
Sediment	DM008-SE-1-101119		Yes	41.2		Yes	18100		Yes	0.11		Yes	11.28		Yes	0.02		Yes	23.11		Yes	0		Yes	62.53		Yes	0.72		Yes	0.98		Yes
Sediment	DM010-SE-1-101119		Yes	22.8		Yes	6030		Yes	0		Yes	7.91		Yes	0		Yes	25.39		Yes	0		Yes	65.87		Yes	0.16		Yes	0.06		Yes
Sediment	DM015-SE-1-101019		Yes	25.8		Yes	7520		Yes	0.01		Yes	5.31		Yes	0.06		Yes	39.74		Yes	0		Yes	52.46		Yes	0.55		Yes	0.3		Yes
Sediment	DM016-SE-1-101019		Yes	18.8		Yes	4460		Yes	0.03		Yes	5.91		Yes	0.08		Yes	50.33		Yes	0		Yes	39.32		Yes	0.5		Yes	0.19		Yes
Sediment	DM016-SE-2-101019		Yes	15.9		Yes	3120		Yes	0.01		Yes	2.75		Yes	0.01		Yes	43.58		Yes	0		Yes	47.63		Yes	0.3		Yes	0.03		Yes
Sediment	DM018-SE-1-100919		Yes	17		Yes	3400		Yes	0.07		Yes	5.57		Yes	0		Yes	27.46		Yes	0		Yes	70.85		Yes	0.24		Yes	0.04		Yes

Final Phase 3 Sediment Study Bioa

Attachment A. Preliminary unvalid

		etal/oids		Metal/oids			Metal/oids			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize			GrainSize		
		hallium		Vanadium			Zinc			Clay			CoarseSand			FineGravel			FineSand			MedGravel			MedSand			Silt			VCoarseSand		
		mg/kg		mg/kg			mg/kg			percent			percent			percent			percent			percent			percent			percent			percent		
material_analyzed	sample_no	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect
Sediment	DM019-SE-1-101419		Yes	17.4		Yes	1830		Yes	0.2		Yes	1.14		Yes	0.02		Yes	63.46		Yes	0		Yes	31.83		Yes	1.37		Yes	0.18		Yes
Sediment	DM020-SE-1-101419		Yes	21.7		Yes	5700		Yes	0.14		Yes	6.22		Yes	0.07		Yes	22.05		Yes	0		Yes	69.51		Yes	1.33		Yes	0.24		Yes
Sediment	DM022-SE-1-092119		Yes	25.8		Yes	6540		Yes	0.23		Yes	16.53		Yes	0.26		Yes	33.22		Yes	0.12		Yes	52.69		Yes	0.89		Yes	0.38		Yes
Sediment	DM023-SE-1-092119		Yes	21.6		Yes	5060		Yes	0.23		Yes	12.63		Yes	0.04		Yes	10.44		Yes	0		Yes	65.88		Yes	0.05		Yes	0.04		Yes
Sediment	DM024-SE-1-101519	J	Yes	18.9		Yes	3270		Yes	0.27		Yes	7.37		Yes	0.02		Yes	16.57		Yes	0		Yes	72.48		Yes	0.37		Yes	0.19		Yes
Sediment	DM024-SE-2-101519	J	Yes	18.5		Yes	3200		Yes	0.31		Yes	5.5		Yes	0		Yes	25.33		Yes	0		Yes	64.85		Yes	0.39		Yes	0.02		Yes
Sediment	DM025-SE-1-101219		Yes	27.7		Yes	8940		Yes	0.05		Yes	49.87		Yes	0.07		Yes	5.58		Yes	0		Yes	44.67		Yes	0.05		Yes	0.48		Yes
Sediment	DM026-SE-1-092119		Yes	22.5		Yes	5410		Yes	0.11		Yes	25.47		Yes	0.12		Yes	11.48		Yes	0		Yes	50.72		Yes	0.1		Yes	0.33		Yes
Sediment	DM026-SE-2-092119		Yes	21.9		Yes	5620		Yes	0.12		Yes	34.19		Yes	0.04		Yes	8.47		Yes	0		Yes	40.86		Yes	0.09		Yes	0.26		Yes
Sediment	DM027-SE-1-101419	J	Yes	25		Yes	9070		Yes	0.01		Yes	26.42		Yes	0		Yes	6.35		Yes	0		Yes	65.91		Yes	0.2		Yes	0.12		Yes
Sediment	DM036-SE-1-101819		Yes	31.3		Yes	3880		Yes	0.15		Yes	3.91		Yes	26.19		Yes	10.52		Yes	59.21		Yes	6.97		Yes	1.39		Yes	4.62		Yes
Sediment	DM038-SE-1-101919		Yes	28.8		Yes	9890		Yes	0.05		Yes	56.11		Yes	4.43		Yes	4.27		Yes	5.1		Yes	24.74		Yes	0.54		Yes	4.79		Yes
Sediment	DM039-SE-1-101719		Yes	26.9		Yes	9090		Yes	0		Yes	68.57		Yes	0.36		Yes	1.46		Yes	0		Yes	23.75		Yes	0.39		Yes	3.72		Yes
Sediment	DM044-SE-1-101619		Yes	29.6		Yes	9720		Yes	0.77		Yes	22.46		Yes	0.33		Yes	24.87		Yes	0		Yes	27.5		Yes	9.27		Yes	5.81		Yes
Sediment	DM045-SE-1-091919		Yes	24		Yes	2780		Yes	1.73		Yes	0.41		Yes	0		Yes	36.57		Yes	0		Yes	3.72		Yes	31.97		Yes	0.22		Yes
Sediment	DM046-SE-1-092019		Yes	26.8		Yes	1710		Yes	1.63		Yes	2.73		Yes	0.23		Yes	35.66		Yes	0		Yes	4.35		Yes	31.81		Yes	0.06		Yes
Sediment	DM047-SE-1-101819		Yes	33.2		Yes	9220		Yes	0.16		Yes	37.3		Yes	18.35		Yes	4.79		Yes	0		Yes	14.59		Yes	1.54		Yes	19.64		Yes
Sediment	DM050-SE-1-092019		Yes	26.3		Yes	3590		Yes	1.02		Yes	0.52		Yes	0.52		Yes	48.32		Yes	0		Yes	5.89		Yes	35.27		Yes	0.45		Yes
Sediment	DM057-SE-1-091819		Yes	35.3		Yes	14300		Yes	0.09		Yes	55.91		Yes	1.02		Yes	5.76		Yes	0.06		Yes	27.83		Yes	2.1		Yes	5.45		Yes
Sediment	DM061-SE-1-101219		Yes	23.9		Yes	2250		Yes	1.37		Yes	2.77		Yes	0.13		Yes	41.58		Yes	0		Yes	12.86		Yes	18.33		Yes	0.65		Yes
Sediment	EV001-SE-1-092619		Yes	41.6		Yes	19800		Yes	0.09		Yes	68.67		Yes	1.53		Yes	0.04		Yes	0.25		Yes	13		Yes	0.4		Yes	11.25		Yes
Sediment	EV001-SE-2-092619		Yes	41.3		Yes	19200		Yes	0.22		Yes	68.15		Yes	1.56		Yes	0.47		Yes	0.3		Yes	12.74		Yes	0.72		Yes	10.89		Yes
Sediment	EV002-SE-1-092419		Yes	42.2		Yes	17200		Yes	0.04		Yes	65.12		Yes	1.33		Yes	0.86		Yes	0.93		Yes	18.85		Yes	0.08		Yes	4.44		Yes
Sediment	EV003-SE-1-092019		Yes	31.4		Yes	12500		Yes	0.13		Yes	15.91		Yes	23.61		Yes	1.58		Yes	47.57		Yes	14.46		Yes	0.08		Yes	6.68		Yes
Sediment	EV005-SE-1-091119		Yes	40.6		Yes	18400		Yes	0.16		Yes	70.71		Yes	0.84		Yes	1.57		Yes	0		Yes	17		Yes	1.77		Yes	5.37		Yes
Sediment	EV008-SE-1-092319		Yes	40.2		Yes	19300		Yes	0.2		Yes	68.34		Yes	0.15		Yes	1.1		Yes	0		Yes	16.03		Yes	1.12		Yes	2.44		Yes
Sediment	EV010-SE-1-091219		Yes	35.8		Yes	13100		Yes	0.03		Yes	30.75		Yes	25.4		Yes	3.74		Yes	0		Yes	28.46		Yes	0.96		Yes	11.58		Yes
Sediment	EV011-SE-1-092819		Yes	15.4		Yes	158		Yes																								
Sediment	EV012-SE-1-091319		Yes	27.5		Yes	9970		Yes	0.09		Yes	35.96		Yes	27.78		Yes	2.14		Yes	0.03		Yes	23.72		Yes	0.56		Yes	12.51		Yes
Sediment	EV013-SE-1-091319		Yes	39.5		Yes	15900		Yes	0.03		Yes	35.36		Yes	16.71		Yes	2.71		Yes	0.02		Yes	34.55		Yes	0.79		Yes	9.69		Yes
Sediment	EV020-SE-1-100219		Yes	20.2		Yes	5680		Yes																								
Sediment	EV022-SE-1-092819		Yes	25.6		Yes	165		Yes																								
Sediment	EV026-SE-1-092019		Yes	36		Yes	11500		Yes	0.41		Yes	10.68		Yes	0.24		Yes	18.02		Yes	0		Yes	62.18		Yes	1.45		Yes	0.5		Yes
Sediment	EV027-SE-1-092119		Yes	38.8		Yes	14400		Yes	0.02		Yes	33.27		Yes	12.45		Yes	0.2		Yes	13.79		Yes	8.47		Yes	0.06		Yes	33.47		Yes
Sediment	EV036-SE-1-091419		Yes	27.9		Yes	303		Yes	0.39		Yes	11.52		Yes	61.75		Yes	4.08		Yes	0		Yes	7.07		Yes	14.67		Yes	16.98		Yes
Sediment	EV037-SE-1-092319		Yes	43.9		Yes	17400		Yes	0.24		Yes	49.74		Yes	1.04		Yes	0.16		Yes	0		Yes	3.18		Yes	0.64		Yes	41.14		Yes
Sediment	EV037-SE-2-092319		Yes	45.9		Yes	14700		Yes	0.19		Yes	49.16		Yes	0.71		Yes	0.18		Yes	0		Yes	3.36		Yes	0.9		Yes	40.87		Yes
Sediment	EV044-SE-1-092419		Yes	41.3		Yes	810		Yes	14.74		Yes	2.14		Yes	0.09		Yes	5.09		Yes	0		Yes	1.43		Yes	68.1		Yes	2.42		Yes
Sediment	EV048-SE-1-092419		Yes	38.1		Yes	16400		Yes	0.19		Yes	61.44		Yes	2.74		Yes	1.82		Yes	2.33		Yes	16.12		Yes	0.6		Yes	4.73		Yes
Sediment	EV049-SE-1-092719		Yes	13.5		Yes	36.4		Yes	0.8		Yes	58.14		Yes	3.43		Yes	2.33		Yes	0.84		Yes	18.43		Yes	6.94		Yes	7.15		Yes

Final Phase 3 Sediment Study Bioa

Attachment A. Preliminary unvalid

		etal/oids		**Metal/oids**			**Metal/oids**			**GrainSize**			**GrainSize**			**GrainSize**			**GrainSize**			**GrainSize**			**GrainSize**			**GrainSize**			**GrainSize**		
		hallium		**Vanadium**			**Zinc**			**Clay**			**CoarseSand**			**FineGravel**			**FineSand**			**MedGravel**			**MedSand**			**Silt**			**VCoarseSand**		
		mg/kg		mg/kg			mg/kg			percent			percent			percent			percent			percent			percent			percent			percent		
material_analyzed	sample_no	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect	value	qual	detect
Sediment	EV051-SE-1-092419		Yes	40.6		Yes	18500		Yes	0.22		Yes	59.49		Yes	2.45		Yes	1.1		Yes	1.21		Yes	20.29		Yes	0.5		Yes	6.25		Yes
Sediment	EV052-SE-1-092619		Yes	41.1		Yes	16700		Yes	0.36		Yes	61.49		Yes	3.19		Yes	2.61		Yes	0		Yes	15.24		Yes	1.21		Yes	11.15		Yes
Sediment	EV054-SE-1-091119		Yes	38.3		Yes	1190		Yes	5.36		Yes	4.14		Yes	0.01		Yes	7.02		Yes	0		Yes	3.2		Yes	70.32		Yes	1.78		Yes
Sediment	EV057-SE-1-091119		Yes	36.6		Yes	805		Yes	4.23		Yes	1.52		Yes	0.01		Yes	8.82		Yes	0		Yes	1.33		Yes	65.8		Yes	0.67		Yes
Sediment	EV060-SE-1-092119		Yes	37.6		Yes	18100		Yes	0.04		Yes	70.96		Yes	0.01		Yes	2.85		Yes	0.03		Yes	30.07		Yes	0.25		Yes	0.63		Yes
Sediment	EV063-SE-1-091019		Yes	42.7		Yes	1290		Yes	11.59		Yes	1.84		Yes	0.01		Yes	3.63		Yes	0		Yes	1.67		Yes	76.52		Yes	0.95		Yes
Sediment	EV064-SE-1-091019		Yes	32.1		Yes	832		Yes	3.32		Yes	0.46		Yes	0.04		Yes	20.42		Yes	0		Yes	0.53		Yes	52.2		Yes	0.26		Yes
Sediment	EV065-SE-1-092519		Yes	42.2		Yes	19600		Yes	0.06		Yes	63.52		Yes	2.78		Yes	1.26		Yes	0		Yes	15.42		Yes	0.39		Yes	5.68		Yes
Sediment	EV065-SE-2-092519		Yes	40.1		Yes	20300		Yes	0.16		Yes	67.05		Yes	2.92		Yes	1.37		Yes	1.34		Yes	14.22		Yes	0.49		Yes	4.97		Yes
Sediment	EV066-SE-1-092519		Yes	42.9		Yes	19700		Yes	0.26		Yes	64.82		Yes	2.59		Yes	1.65		Yes	1.6		Yes	16.3		Yes	1.72		Yes	1.66		Yes
Sediment	EV069-SE-1-092519		Yes	40.8		Yes	20900		Yes	0.36		Yes	65.32		Yes	0.51		Yes	1.16		Yes	0.41		Yes	14.66		Yes	1.27		Yes	3.03		Yes
Sediment	EV071-SE-1-092519		Yes	40.7		Yes	20500		Yes	0.12		Yes	67.18		Yes	1.5		Yes	1.04		Yes	0		Yes	17.07		Yes	0.38		Yes	2.66		Yes
Sediment	EV072-SE-1-092619		Yes	41.6		Yes	20600		Yes	0.47		Yes	74.54		Yes	0.75		Yes	1.61		Yes	0		Yes	17.89		Yes	2.16		Yes	2.99		Yes
Sediment	EV072-SE-2-092619		Yes	41.6		Yes	19400		Yes	0.37		Yes	71.12		Yes	0.59		Yes	1.79		Yes	0.42		Yes	18.64		Yes	1.66		Yes	2.95		Yes
Sediment	EV075-SE-1-091119		Yes	42.7		Yes	18200		Yes	0.06		Yes	80.34		Yes	0.21		Yes	1.08		Yes	0		Yes	24.44		Yes	2.29		Yes	0.6		Yes
Sediment	JS001-SE-1-101019		Yes	30.4		Yes	11100		Yes	0.23		Yes	40.07		Yes	0.23		Yes	27.36		Yes	0		Yes	16.66		Yes	1.39		Yes	9.69		Yes
Sediment	JS002-SE-1-101019		Yes	38.7		Yes	15200		Yes	0.08		Yes	50.04		Yes	1.91		Yes	9.18		Yes	0		Yes	20.64		Yes	1.49		Yes	13.54		Yes
Sediment	REF001-SE-1-092819		Yes	14		Yes	27.8		Yes	0.01		Yes	32.59		Yes	10.58		Yes	0.31		Yes	0		Yes	1.97		Yes	0.08		Yes	48.68		Yes
Sediment	REF002-SE-1-092819	J	Yes	9.37		Yes	23.1		Yes	0.05		Yes	85.24		Yes	0		Yes	0.59		Yes	0		Yes	9.37		Yes	0.05		Yes	1.82		Yes
Sediment	REF003-SE-1-092719	J	Yes	15.8		Yes	26.5		Yes	0.22		Yes	53.27		Yes	0		Yes	10.97		Yes	0		Yes	41.64		Yes	0.55		Yes	0.28		Yes
Sediment	REF004-SE-1-092719		Yes	23		Yes	62.5		Yes	0.19		Yes	23.08		Yes	20.66		Yes	8.12		Yes	0		Yes	31.32		Yes	1.3		Yes	12.64		Yes
Sediment	REF005-SE-1-100319		Yes	13.4		Yes	22.9		Yes	0.1		Yes	45.83		Yes	10.44		Yes	4.96		Yes	0		Yes	22.84		Yes	0.1		Yes	14.86		Yes
Sediment	REF006-SE-1-100219		Yes	12.4		Yes	36.1		Yes	0.19		Yes	18.88		Yes	10.11		Yes	30.85		Yes	0		Yes	27.63		Yes	0.73		Yes	9.26		Yes
Sediment	REF007-SE-1-093019		Yes	12.6		Yes	33.9		Yes	0.14		Yes	42.94		Yes	3.64		Yes	9.3		Yes	0		Yes	13.44		Yes	1.11		Yes	25.81		Yes
Sediment	REF008-SE-1-093019		Yes	9.92		Yes	29.7		Yes	0.08		Yes	50.57		Yes	3.47		Yes	3.92		Yes	2.14		Yes	21.49		Yes	0.3		Yes	14.4		Yes
Sediment	REF009A-SE-1-100219		Yes	11.1		Yes	25.3		Yes	0.06		Yes	44.68		Yes	0.43		Yes	7.99		Yes	0		Yes	42.04		Yes	0.29		Yes	9.97		Yes
Sediment	REF010-SE-1-100319		Yes	11.7		Yes	24.5		Yes	0		Yes	40.65		Yes	14.06		Yes	0.7		Yes	0		Yes	7.23		Yes	0.07		Yes	37.36		Yes
Sediment	REF011-SE-1-100119		Yes	11.3		Yes	38.8		Yes	0.1		Yes	23.04		Yes	0		Yes	18.98		Yes	0		Yes	63.62		Yes	0.52		Yes	0.27		Yes
Sediment	REF011-SE-2-100119		Yes	11		Yes	33.9		Yes	0.14		Yes	28.5		Yes	0		Yes	12.36		Yes	0		Yes	58.23		Yes	0.33		Yes	0.42		Yes
Sediment	REF012-SE-1-100419		Yes	13.7		Yes	44.7		Yes	0.19		Yes	12.74		Yes	4.92		Yes	39.45		Yes	0		Yes	20.55		Yes	7.25		Yes	11.27		Yes
Sediment	REF013-SE-1-092419		Yes	11.8		Yes	28.6		Yes	1.09		Yes	1.99		Yes	0.45		Yes	67.5		Yes	0.17		Yes	12.19		Yes	4.95		Yes	1.31		Yes
Sediment	REF014-SE-1-092619		Yes	13.5		Yes	37.4		Yes	1.44		Yes	2.03		Yes	0.68		Yes	53.72		Yes	0		Yes	7.26		Yes	15.72		Yes	0.95		Yes
Sediment	REF014-SE-2-092619	J	Yes	13.5		Yes	36.5		Yes	1.24		Yes	1.78		Yes	0.63		Yes	50.39		Yes	2.74		Yes	5.9		Yes	14.6		Yes	0.75		Yes
Sediment	REF015-SE-1-092619		Yes	29.1		Yes	90.8		Yes	15.56		Yes	1.61		Yes	0.34		Yes	41.37		Yes	0		Yes	3.07		Yes	20.51		Yes	0.85		Yes
Sediment	REF016-SE-1-092519		Yes	30.6		Yes	47.2		Yes	7.75		Yes	14.61		Yes	3.98		Yes	20.23		Yes	1.2		Yes	8.32		Yes	12.54		Yes	14.43		Yes
Sediment	REF017-SE-1-092519		Yes	28.1		Yes	47		Yes	11.15		Yes	4.02		Yes	1.93		Yes	14.07		Yes	1.42		Yes	2.36		Yes	22.35		Yes	3.47		Yes
Sediment	REF018-SE-1-092519		Yes	28.4		Yes	58.8		Yes	12.16		Yes	1.78		Yes	0.53		Yes	21.96		Yes	0		Yes	2.15		Yes	43.96		Yes	1.61		Yes

Final Phase 3 Sediment Study Bioa
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material_analyzed	sample_no	GrainSize VeryFineSand percent value	qual	detect
Sediment	1-B5-NRT-SE-1-101519	15.21		Yes
Sediment	1-B6-NRT-SE-1-101619	0.65		Yes
Sediment	3-R7-2019-SE-1-101519	0.09		Yes
Sediment	3-R8-2019-SE-1-101619	0.23		Yes
Sediment	4-B1-2019-SE-1-092619	0.27		Yes
Sediment	4-B6-2019-SE-1-092619	0.08		Yes
Sediment	CB002-SE-1-101619	2.78		Yes
Sediment	CB005-SE-1-101819	0.07		Yes
Sediment	CB006-SE-1-100919	0.55		Yes
Sediment	CB007-SE-1-100919	5.56		Yes
Sediment	CB009-SE-1-101219	2.11		Yes
Sediment	CB010-SE-1-101219	1.01		Yes
Sediment	CB012-SE-1-100919	0.22		Yes
Sediment	CB014-SE-1-101519	0.14		Yes
Sediment	CB014-SE-2-101519	0.08		Yes
Sediment	CB016-SE-1-101119	1.12		Yes
Sediment	CB018-SE-1-100919	0.94		Yes
Sediment	CB018-SE-2-100919	0.98		Yes
Sediment	CB020-SE-1-101419	0.99		Yes
Sediment	CB021-SE-1-101419	12.38		Yes
Sediment	CB024-SE-1-101419	4.34		Yes
Sediment	CB027-SE-1-101419	2.42		Yes
Sediment	CB029-SE-1-101519	5.95		Yes
Sediment	CB035-SE-1-100319	0.07		Yes
Sediment	CB035-SE-2-100319	0.21		Yes
Sediment	CB036-SE-1-100419	0.2		Yes
Sediment	CB039-SE-1-101119	0.12		Yes
Sediment	CB040-SE-1-101819	1.47		Yes
Sediment	CB044-SE-1-101519	2.75		Yes
Sediment	CB046-SE-1-100819	0.59		Yes
Sediment	CB047-SE-1-101119	0.24		Yes
Sediment	CB056-SE-1-101719	5.46		Yes
Sediment	DM002-SE-1-100919	0.04		Yes
Sediment	DM007-SE-1-101519	0.09		Yes
Sediment	DM008-SE-1-101119	0.44		Yes
Sediment	DM010-SE-1-101119	0.3		Yes
Sediment	DM015-SE-1-101019	1.13		Yes
Sediment	DM016-SE-1-101019	2.24		Yes
Sediment	DM016-SE-2-101019	0.52		Yes
Sediment	DM018-SE-1-100919	0.35		Yes

Final Phase 3 Sediment Study Bioa

Attachment A. Preliminary unvalid

material_analyzed	sample_no	GrainSize VeryFineSand percent value	qual	detect
Sediment	DM019-SE-1-101419	1.79		Yes
Sediment	DM020-SE-1-101419	0.89		Yes
Sediment	DM022-SE-1-092119	1.5		Yes
Sediment	DM023-SE-1-092119	0.53		Yes
Sediment	DM024-SE-1-101519	0.66		Yes
Sediment	DM024-SE-2-101519	0.85		Yes
Sediment	DM025-SE-1-101219	0.1		Yes
Sediment	DM026-SE-1-092119	0.22		Yes
Sediment	DM026-SE-2-092119	0.15		Yes
Sediment	DM027-SE-1-101419	0.15		Yes
Sediment	DM036-SE-1-101819	1.23		Yes
Sediment	DM038-SE-1-101919	0.38		Yes
Sediment	DM039-SE-1-101719	0.17		Yes
Sediment	DM044-SE-1-101619	5.9		Yes
Sediment	DM045-SE-1-091919	14.37		Yes
Sediment	DM046-SE-1-092019	18.47		Yes
Sediment	DM047-SE-1-101819	0.68		Yes
Sediment	DM050-SE-1-092019	16.69		Yes
Sediment	DM057-SE-1-091819	0.65		Yes
Sediment	DM061-SE-1-101219	14.54		Yes
Sediment	EV001-SE-1-092619	0.08		Yes
Sediment	EV001-SE-2-092619	0.1		Yes
Sediment	EV002-SE-1-092419	0.05		Yes
Sediment	EV003-SE-1-092019	0.04		Yes
Sediment	EV005-SE-1-091119	0.37		Yes
Sediment	EV008-SE-1-092319	0.2		Yes
Sediment	EV010-SE-1-091219	0.25		Yes
Sediment	EV011-SE-1-092819			
Sediment	EV012-SE-1-091319	0.15		Yes
Sediment	EV013-SE-1-091319	0.15		Yes
Sediment	EV020-SE-1-100219			
Sediment	EV022-SE-1-092819			
Sediment	EV026-SE-1-092019	0.84		Yes
Sediment	EV027-SE-1-092119	0.02		Yes
Sediment	EV036-SE-1-091419	1.96		Yes
Sediment	EV037-SE-1-092319	0.1		Yes
Sediment	EV037-SE-2-092319	0.14		Yes
Sediment	EV044-SE-1-092419	7.87		Yes
Sediment	EV048-SE-1-092419	0.17		Yes
Sediment	EV049-SE-1-092719	1.35		Yes

Final Phase 3 Sediment Study Bioa
Attachment A. Preliminary unvalid

material_analyzed	sample_no	GrainSize VeryFineSand percent value	qual	detect
Sediment	EV051-SE-1-092419	0.15		Yes
Sediment	EV052-SE-1-092619	0.27		Yes
Sediment	EV054-SE-1-091119	5.58		Yes
Sediment	EV057-SE-1-091119	14.59		Yes
Sediment	EV060-SE-1-092119	0.16		Yes
Sediment	EV063-SE-1-091019	3.3		Yes
Sediment	EV064-SE-1-091019	18.36		Yes
Sediment	EV065-SE-1-092519	0.15		Yes
Sediment	EV065-SE-2-092519	0.2		Yes
Sediment	EV066-SE-1-092519	0.31		Yes
Sediment	EV069-SE-1-092519	0.28		Yes
Sediment	EV071-SE-1-092519	0.16		Yes
Sediment	EV072-SE-1-092619	0.48		Yes
Sediment	EV072-SE-2-092619	0.41		Yes
Sediment	EV075-SE-1-091119	0.45		Yes
Sediment	JS001-SE-1-101019	2.21		Yes
Sediment	JS002-SE-1-101019	0.72		Yes
Sediment	REF001-SE-1-092819	0.03		Yes
Sediment	REF002-SE-1-092819	0.03		Yes
Sediment	REF003-SE-1-092719	0.54		Yes
Sediment	REF004-SE-1-092719	0.81		Yes
Sediment	REF005-SE-1-100319	0.15		Yes
Sediment	REF006-SE-1-100219	1.35		Yes
Sediment	REF007-SE-1-093019	1.72		Yes
Sediment	REF008-SE-1-093019	0.33		Yes
Sediment	REF009A-SE-1-100219	0.31		Yes
Sediment	REF010-SE-1-100319	0.04		Yes
Sediment	REF011-SE-1-100119	0.62		Yes
Sediment	REF011-SE-2-100119	0.4		Yes
Sediment	REF012-SE-1-100419	6.87		Yes
Sediment	REF013-SE-1-092419	12.19		Yes
Sediment	REF014-SE-1-092619	24.8		Yes
Sediment	REF014-SE-2-092619	21.66		Yes
Sediment	REF015-SE-1-092619	16.47		Yes
Sediment	REF016-SE-1-092519	12.66		Yes
Sediment	REF017-SE-1-092519	11		Yes
Sediment	REF018-SE-1-092519	14.75		Yes

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Prelim unvalidated Phase 3 sediment results - PEC point by point screen, reference samples, organics

material_analyzed	sample_no	anal_type	analyte_name	detected	value	value or half-DL	qual	units	PEC value	PEC units	Exceeds (using full DL if ND)	Exceeds (using half DL if ND)	EF (using full DL if ND)	EF (using half DL if ND)
Sediment	REF001-SE-1-092819	PAH	Anthracene	No	0.33	0.165	U	ug/kg	845	ug/kg	No	No	0.00039	0.0002
Sediment	REF001-SE-1-092819	PAH	Benzo[a]anthracene	Yes	0.55	0.55	J	ug/kg	1050	ug/kg	No	No	0.00052	0.00052
Sediment	REF001-SE-1-092819	PAH	Benzo[a]pyrene	No	0.43	0.215	U	ug/kg	1450	ug/kg	No	No	0.0003	0.00015
Sediment	REF001-SE-1-092819	PAH	Chrysene	No	0.35	0.175	U	ug/kg	1290	ug/kg	No	No	0.00027	0.00014
Sediment	REF001-SE-1-092819	Pest-Herb	Dieldrin	No	0.23	0.115	U	ug/kg	61.8	ug/kg	No	No	0.0037	0.0019
Sediment	REF001-SE-1-092819	Pest-Herb	Endrin	No	0.33	0.165	U	ug/kg	207	ug/kg	No	No	0.0016	0.0008
Sediment	REF001-SE-1-092819	PAH	Fluoranthene	No	0.7	0.35	U	ug/kg	2230	ug/kg	No	No	0.00031	0.00016
Sediment	REF001-SE-1-092819	PAH	Fluorene	No	0.64	0.32	U	ug/kg	536	ug/kg	No	No	0.0012	0.0006
Sediment	REF001-SE-1-092819	Pest-Herb	gamma-BHC	No	0.32	0.16	U	ug/kg	4.99	ug/kg	No	No	0.064	0.032
Sediment	REF001-SE-1-092819	Pest-Herb	Heptachlor epoxide	No	0.68	0.34	U	ug/kg	16	ug/kg	No	No	0.043	0.021
Sediment	REF001-SE-1-092819	PAH	Naphthalene	No	0.53	0.265	U	ug/kg	561	ug/kg	No	No	0.00094	0.00047
Sediment	REF001-SE-1-092819	PAH	Phenanthrene	No	0.66	0.33	U	ug/kg	1170	ug/kg	No	No	0.00056	0.00028
Sediment	REF001-SE-1-092819	PAH	Pyrene	No	0.36	0.18	U	ug/kg	1520	ug/kg	No	No	0.00024	0.00012
Sediment	REF002-SE-1-092819	PAH	Anthracene	No	0.3	0.15	U	ug/kg	845	ug/kg	No	No	0.00036	0.00018
Sediment	REF002-SE-1-092819	PAH	Benzo[a]anthracene	Yes	0.4	0.4	J	ug/kg	1050	ug/kg	No	No	0.00038	0.00038
Sediment	REF002-SE-1-092819	PAH	Benzo[a]pyrene	No	0.39	0.195	U	ug/kg	1450	ug/kg	No	No	0.00027	0.00013
Sediment	REF002-SE-1-092819	PAH	Chrysene	No	0.32	0.16	U	ug/kg	1290	ug/kg	No	No	0.00025	0.00012
Sediment	REF002-SE-1-092819	Pest-Herb	Dieldrin	No	0.23	0.115	U	ug/kg	61.8	ug/kg	No	No	0.0037	0.0019
Sediment	REF002-SE-1-092819	Pest-Herb	Endrin	No	0.33	0.165	U	ug/kg	207	ug/kg	No	No	0.0016	0.0008
Sediment	REF002-SE-1-092819	PAH	Fluoranthene	No	0.64	0.32	U	ug/kg	2230	ug/kg	No	No	0.00029	0.00014
Sediment	REF002-SE-1-092819	PAH	Fluorene	No	0.58	0.29	U	ug/kg	536	ug/kg	No	No	0.0011	0.00054
Sediment	REF002-SE-1-092819	Pest-Herb	gamma-BHC	No	0.32	0.16	U	ug/kg	4.99	ug/kg	No	No	0.064	0.032
Sediment	REF002-SE-1-092819	Pest-Herb	Heptachlor epoxide	No	0.67	0.335	U	ug/kg	16	ug/kg	No	No	0.042	0.021
Sediment	REF002-SE-1-092819	PAH	Naphthalene	No	0.48	0.24	U	ug/kg	561	ug/kg	No	No	0.00086	0.00043
Sediment	REF002-SE-1-092819	PAH	Phenanthrene	No	0.6	0.3	U	ug/kg	1170	ug/kg	No	No	0.00051	0.00026
Sediment	REF002-SE-1-092819	PAH	Pyrene	No	0.33	0.165	U	ug/kg	1520	ug/kg	No	No	0.00022	0.00011
Sediment	REF003-SE-1-092719	PAH	Anthracene	Yes	0.52	0.52	J	ug/kg	845	ug/kg	No	No	0.00062	0.00062
Sediment	REF003-SE-1-092719	PAH	Benzo[a]anthracene	Yes	0.67	0.67	J	ug/kg	1050	ug/kg	No	No	0.00064	0.00064
Sediment	REF003-SE-1-092719	PAH	Benzo[a]pyrene	No	0.51	0.255	U	ug/kg	1450	ug/kg	No	No	0.00035	0.00018
Sediment	REF003-SE-1-092719	PAH	Chrysene	No	0.42	0.21	U	ug/kg	1290	ug/kg	No	No	0.00033	0.00016
Sediment	REF003-SE-1-092719	Pest-Herb	Dieldrin	No	0.24	0.12	U	ug/kg	61.8	ug/kg	No	No	0.0039	0.0019
Sediment	REF003-SE-1-092719	Pest-Herb	Endrin	No	0.35	0.175	U	ug/kg	207	ug/kg	No	No	0.0017	0.00085
Sediment	REF003-SE-1-092719	PAH	Fluoranthene	No	0.85	0.425	U	ug/kg	2230	ug/kg	No	No	0.00038	0.00019
Sediment	REF003-SE-1-092719	PAH	Fluorene	Yes	0.96	0.96	J	ug/kg	536	ug/kg	No	No	0.0018	0.0018
Sediment	REF003-SE-1-092719	Pest-Herb	gamma-BHC	No	0.34	0.17	U	ug/kg	4.99	ug/kg	No	No	0.068	0.034
Sediment	REF003-SE-1-092719	Pest-Herb	Heptachlor epoxide	No	0.71	0.355	U	ug/kg	16	ug/kg	No	No	0.044	0.022
Sediment	REF003-SE-1-092719	PAH	Naphthalene	Yes	1.3	1.3	J	ug/kg	561	ug/kg	No	No	0.0023	0.0023
Sediment	REF003-SE-1-092719	PAH	Phenanthrene	Yes	2.1	2.1	J	ug/kg	1170	ug/kg	No	No	0.0018	0.0018
Sediment	REF003-SE-1-092719	PAH	Pyrene	Yes	0.75	0.75	J	ug/kg	1520	ug/kg	No	No	0.00049	0.00049
Sediment	REF004-SE-1-092719	PAH	Anthracene	No	0.34	0.17	U	ug/kg	845	ug/kg	No	No	0.0004	0.0002
Sediment	REF004-SE-1-092719	PAH	Benzo[a]anthracene	Yes	0.43	0.43	J	ug/kg	1050	ug/kg	No	No	0.00041	0.00041
Sediment	REF004-SE-1-092719	PAH	Benzo[a]pyrene	No	0.45	0.225	U	ug/kg	1450	ug/kg	No	No	0.00031	0.00016
Sediment	REF004-SE-1-092719	PAH	Chrysene	No	0.37	0.185	U	ug/kg	1290	ug/kg	No	No	0.00029	0.00014
Sediment	REF004-SE-1-092719	Pest-Herb	Dieldrin	No	0.22	0.11	U	ug/kg	61.8	ug/kg	No	No	0.0036	0.0018
Sediment	REF004-SE-1-092719	Pest-Herb	Endrin	No	0.32	0.16	U	ug/kg	207	ug/kg	No	No	0.0015	0.00077
Sediment	REF004-SE-1-092719	PAH	Fluoranthene	No	0.74	0.37	U	ug/kg	2230	ug/kg	No	No	0.00033	0.00017
Sediment	REF004-SE-1-092719	PAH	Fluorene	No	0.67	0.335	U	ug/kg	536	ug/kg	No	No	0.0013	0.00063
Sediment	REF004-SE-1-092719	Pest-Herb	gamma-BHC	No	0.31	0.155	U	ug/kg	4.99	ug/kg	No	No	0.062	0.031
Sediment	REF004-SE-1-092719	Pest-Herb	Heptachlor epoxide	No	0.66	0.33	U	ug/kg	16	ug/kg	No	No	0.041	0.021
Sediment	REF004-SE-1-092719	PAH	Naphthalene	No	0.55	0.275	U	ug/kg	561	ug/kg	No	No	0.00098	0.00049
Sediment	REF004-SE-1-092719	PAH	Phenanthrene	No	0.69	0.345	U	ug/kg	1170	ug/kg	No	No	0.00059	0.00029
Sediment	REF004-SE-1-092719	PAH	Pyrene	No	0.38	0.19	U	ug/kg	1520	ug/kg	No	No	0.00025	0.00013
Sediment	REF005-SE-1-100319	PAH	Anthracene	No	0.34	0.17	U	ug/kg	845	ug/kg	No	No	0.0004	0.0002
Sediment	REF005-SE-1-100319	PAH	Benzo[a]anthracene	No	0.27	0.135	U	ug/kg	1050	ug/kg	No	No	0.00026	0.00013
Sediment	REF005-SE-1-100319	PAH	Benzo[a]pyrene	No	0.44	0.22	U	ug/kg	1450	ug/kg	No	No	0.0003	0.00015
Sediment	REF005-SE-1-100319	PAH	Chrysene	No	0.36	0.18	U	ug/kg	1290	ug/kg	No	No	0.00028	0.00014
Sediment	REF005-SE-1-100319	Pest-Herb	Dieldrin	No	0.22	0.11	U	ug/kg	61.8	ug/kg	No	No	0.0036	0.0018
Sediment	REF005-SE-1-100319	Pest-Herb	Endrin	No	0.32	0.16	U	ug/kg	207	ug/kg	No	No	0.0015	0.00077
Sediment	REF005-SE-1-100319	PAH	Fluoranthene	No	0.73	0.365	U	ug/kg	2230	ug/kg	No	No	0.00033	0.00016
Sediment	REF005-SE-1-100319	PAH	Fluorene	No	0.66	0.33	U	ug/kg	536	ug/kg	No	No	0.0012	0.00062
Sediment	REF005-SE-1-100319	Pest-Herb	gamma-BHC	No	0.31	0.155	U	ug/kg	4.99	ug/kg	No	No	0.062	0.031
Sediment	REF005-SE-1-100319	Pest-Herb	Heptachlor epoxide	No	0.66	0.33	U	ug/kg	16	ug/kg	No	No	0.041	0.021
Sediment	REF005-SE-1-100319	PAH	Naphthalene	Yes	1	1	J	ug/kg	561	ug/kg	No	No	0.0018	0.0018
Sediment	REF005-SE-1-100319	PAH	Phenanthrene	Yes	1.2	1.2	J	ug/kg	1170	ug/kg	No	No	0.001	0.001
Sediment	REF005-SE-1-100319	PAH	Pyrene	No	0.37	0.185	U	ug/kg	1520	ug/kg	No	No	0.00024	0.00012
Sediment	REF006-SE-1-100219	PAH	Anthracene	No	0.35	0.175	U	ug/kg	845	ug/kg	No	No	0.00041	0.00021
Sediment	REF006-SE-1-100219	PAH	Benzo[a]anthracene	Yes	1	1	J	ug/kg	1050	ug/kg	No	No	0.00095	0.00095
Sediment	REF006-SE-1-100219	PAH	Benzo[a]pyrene	Yes	0.74	0.74	J	ug/kg	1450	ug/kg	No	No	0.00051	0.00051

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Prelim unvalidated Phase 3 sediment results - PEC point by point screen, reference samples, organics

material_analyzed	sample_no	anal_type	analyte_name	detected	value	value or half-DL	qual	units	PEC value	PEC units	Exceeds (using full DL if ND)	Exceeds (using half DL if ND)	EF (using full DL if ND)	EF (using half DL if ND)
Sediment	REF006-SE-1-100219	PAH	Chrysene	Yes	0.62	0.62	J	ug/kg	1290	ug/kg	No	No	0.00048	0.00048
Sediment	REF006-SE-1-100219	Pest-Herb	Dieldrin	No	0.23	0.115	U	ug/kg	61.8	ug/kg	No	No	0.0037	0.0019
Sediment	REF006-SE-1-100219	Pest-Herb	Endrin	No	0.33	0.165	U	ug/kg	207	ug/kg	No	No	0.0016	0.0008
Sediment	REF006-SE-1-100219	PAH	Fluoranthene	Yes	1.4	1.4	J	ug/kg	2230	ug/kg	No	No	0.00063	0.00063
Sediment	REF006-SE-1-100219	PAH	Fluorene	No	0.68	0.34	U	ug/kg	536	ug/kg	No	No	0.0013	0.00063
Sediment	REF006-SE-1-100219	Pest-Herb	gamma-BHC	No	0.32	0.16	U	ug/kg	4.99	ug/kg	No	No	0.064	0.032
Sediment	REF006-SE-1-100219	Pest-Herb	Heptachlor epoxide	No	0.67	0.335	U	ug/kg	16	ug/kg	No	No	0.042	0.021
Sediment	REF006-SE-1-100219	PAH	Naphthalene	No	0.56	0.28	U	ug/kg	561	ug/kg	No	No	0.001	0.0005
Sediment	REF006-SE-1-100219	PAH	Phenanthrene	Yes	0.95	0.95	J	ug/kg	1170	ug/kg	No	No	0.00081	0.00081
Sediment	REF006-SE-1-100219	PAH	Pyrene	Yes	1.5	1.5	J	ug/kg	1520	ug/kg	No	No	0.00099	0.00099
Sediment	REF007-SE-1-093019	PAH	Anthracene	Yes	0.37	0.37	J	ug/kg	845	ug/kg	No	No	0.00044	0.00044
Sediment	REF007-SE-1-093019	PAH	Benzo[a]anthracene	Yes	0.76	0.76	J	ug/kg	1050	ug/kg	No	No	0.00072	0.00072
Sediment	REF007-SE-1-093019	PAH	Benzo[a]pyrene	No	0.46	0.23	U	ug/kg	1450	ug/kg	No	No	0.00032	0.00016
Sediment	REF007-SE-1-093019	PAH	Chrysene	Yes	0.47	0.47	J	ug/kg	1290	ug/kg	No	No	0.00036	0.00036
Sediment	REF007-SE-1-093019	Pest-Herb	Dieldrin	No	0.22	0.11	U	ug/kg	61.8	ug/kg	No	No	0.0036	0.0018
Sediment	REF007-SE-1-093019	Pest-Herb	Endrin	No	0.32	0.16	U	ug/kg	207	ug/kg	No	No	0.0015	0.00077
Sediment	REF007-SE-1-093019	PAH	Fluoranthene	No	0.76	0.38	U	ug/kg	2230	ug/kg	No	No	0.00034	0.00017
Sediment	REF007-SE-1-093019	PAH	Fluorene	No	0.68	0.34	U	ug/kg	536	ug/kg	No	No	0.0013	0.00063
Sediment	REF007-SE-1-093019	Pest-Herb	gamma-BHC	No	0.31	0.155	U	ug/kg	4.99	ug/kg	No	No	0.062	0.031
Sediment	REF007-SE-1-093019	Pest-Herb	Heptachlor epoxide	No	0.66	0.33	U	ug/kg	16	ug/kg	No	No	0.041	0.021
Sediment	REF007-SE-1-093019	PAH	Naphthalene	Yes	0.63	0.63	J	ug/kg	561	ug/kg	No	No	0.0011	0.0011
Sediment	REF007-SE-1-093019	PAH	Phenanthrene	Yes	1	1	J	ug/kg	1170	ug/kg	No	No	0.00085	0.00085
Sediment	REF007-SE-1-093019	PAH	Pyrene	Yes	0.75	0.75	J	ug/kg	1520	ug/kg	No	No	0.00049	0.00049
Sediment	REF008-SE-1-093019	PAH	Anthracene	No	0.29	0.145	U	ug/kg	845	ug/kg	No	No	0.00034	0.00017
Sediment	REF008-SE-1-093019	PAH	Benzo[a]anthracene	Yes	0.4	0.4	J	ug/kg	1050	ug/kg	No	No	0.00038	0.00038
Sediment	REF008-SE-1-093019	PAH	Benzo[a]pyrene	No	0.38	0.19	U	ug/kg	1450	ug/kg	No	No	0.00026	0.00013
Sediment	REF008-SE-1-093019	PAH	Chrysene	No	0.31	0.155	U	ug/kg	1290	ug/kg	No	No	0.00024	0.00012
Sediment	REF008-SE-1-093019	Pest-Herb	Dieldrin	No	0.22	0.11	U	ug/kg	61.8	ug/kg	No	No	0.0036	0.0018
Sediment	REF008-SE-1-093019	Pest-Herb	Endrin	No	0.32	0.16	U	ug/kg	207	ug/kg	No	No	0.0015	0.00077
Sediment	REF008-SE-1-093019	PAH	Fluoranthene	No	0.63	0.315	U	ug/kg	2230	ug/kg	No	No	0.00028	0.00014
Sediment	REF008-SE-1-093019	PAH	Fluorene	No	0.57	0.285	U	ug/kg	536	ug/kg	No	No	0.0011	0.00053
Sediment	REF008-SE-1-093019	Pest-Herb	gamma-BHC	No	0.31	0.155	U	ug/kg	4.99	ug/kg	No	No	0.062	0.031
Sediment	REF008-SE-1-093019	Pest-Herb	Heptachlor epoxide	No	0.66	0.33	U	ug/kg	16	ug/kg	No	No	0.041	0.021
Sediment	REF008-SE-1-093019	PAH	Naphthalene	No	0.47	0.235	U	ug/kg	561	ug/kg	No	No	0.00084	0.00042
Sediment	REF008-SE-1-093019	PAH	Phenanthrene	No	0.59	0.295	U	ug/kg	1170	ug/kg	No	No	0.0005	0.00025
Sediment	REF008-SE-1-093019	PAH	Pyrene	No	0.32	0.16	U	ug/kg	1520	ug/kg	No	No	0.00021	0.00011
Sediment	REF009A-SE-1-100219	PAH	Anthracene	Yes	3.4	3.4	J	ug/kg	845	ug/kg	No	No	0.004	0.004
Sediment	REF009A-SE-1-100219	PAH	Benzo[a]anthracene	Yes	0.54	0.54	J	ug/kg	1050	ug/kg	No	No	0.00051	0.00051
Sediment	REF009A-SE-1-100219	PAH	Benzo[a]pyrene	No	0.48	0.24	U	ug/kg	1450	ug/kg	No	No	0.00033	0.00017
Sediment	REF009A-SE-1-100219	PAH	Chrysene	No	0.39	0.195	U	ug/kg	1290	ug/kg	No	No	0.0003	0.00015
Sediment	REF009A-SE-1-100219	Pest-Herb	Dieldrin	No	0.27	0.135	U	ug/kg	61.8	ug/kg	No	No	0.0044	0.0022
Sediment	REF009A-SE-1-100219	Pest-Herb	Endrin	No	0.39	0.195	U	ug/kg	207	ug/kg	No	No	0.0019	0.00094
Sediment	REF009A-SE-1-100219	PAH	Fluoranthene	No	0.79	0.395	U	ug/kg	2230	ug/kg	No	No	0.00035	0.00018
Sediment	REF009A-SE-1-100219	PAH	Fluorene	No	0.72	0.36	U	ug/kg	536	ug/kg	No	No	0.0013	0.00067
Sediment	REF009A-SE-1-100219	Pest-Herb	gamma-BHC	No	0.38	0.19	U	ug/kg	4.99	ug/kg	No	No	0.076	0.038
Sediment	REF009A-SE-1-100219	Pest-Herb	Heptachlor epoxide	No	0.8	0.4	U	ug/kg	16	ug/kg	No	No	0.05	0.025
Sediment	REF009A-SE-1-100219	PAH	Naphthalene	No	0.59	0.295	U	ug/kg	561	ug/kg	No	No	0.0011	0.00053
Sediment	REF009A-SE-1-100219	PAH	Phenanthrene	Yes	0.77	0.77	J	ug/kg	1170	ug/kg	No	No	0.00066	0.00066
Sediment	REF009A-SE-1-100219	PAH	Pyrene	No	0.4	0.2	U	ug/kg	1520	ug/kg	No	No	0.00026	0.00013
Sediment	REF010-SE-1-100319	PAH	Anthracene	Yes	1.7	1.7	J	ug/kg	845	ug/kg	No	No	0.002	0.002
Sediment	REF010-SE-1-100319	PAH	Benzo[a]anthracene	Yes	1.6	1.6	J	ug/kg	1050	ug/kg	No	No	0.0015	0.0015
Sediment	REF010-SE-1-100319	PAH	Benzo[a]pyrene	No	0.47	0.235	U	ug/kg	1450	ug/kg	No	No	0.00032	0.00016
Sediment	REF010-SE-1-100319	PAH	Chrysene	Yes	2.3	2.3	J	ug/kg	1290	ug/kg	No	No	0.0018	0.0018
Sediment	REF010-SE-1-100319	Pest-Herb	Dieldrin	No	0.22	0.11	U	ug/kg	61.8	ug/kg	No	No	0.0036	0.0018
Sediment	REF010-SE-1-100319	Pest-Herb	Endrin	No	0.32	0.16	U	ug/kg	207	ug/kg	No	No	0.0015	0.00077
Sediment	REF010-SE-1-100319	PAH	Fluoranthene	Yes	4.3	4.3	J	ug/kg	2230	ug/kg	No	No	0.0019	0.0019
Sediment	REF010-SE-1-100319	PAH	Fluorene	No	0.7	0.35	U	ug/kg	536	ug/kg	No	No	0.0013	0.00065
Sediment	REF010-SE-1-100319	Pest-Herb	gamma-BHC	No	0.31	0.155	U	ug/kg	4.99	ug/kg	No	No	0.062	0.031
Sediment	REF010-SE-1-100319	Pest-Herb	Heptachlor epoxide	No	0.66	0.33	U	ug/kg	16	ug/kg	No	No	0.041	0.021
Sediment	REF010-SE-1-100319	PAH	Naphthalene	Yes	4.7	4.7	J	ug/kg	561	ug/kg	No	No	0.0084	0.0084
Sediment	REF010-SE-1-100319	PAH	Phenanthrene	Yes	6.3	6.3		ug/kg	1170	ug/kg	No	No	0.0054	0.0054
Sediment	REF010-SE-1-100319	PAH	Pyrene	Yes	4.1	4.1	J	ug/kg	1520	ug/kg	No	No	0.0027	0.0027
Sediment	REF011-SE-1-100119	PAH	Anthracene	No	0.37	0.185	U	ug/kg	845	ug/kg	No	No	0.00044	0.00022
Sediment	REF011-SE-1-100119	PAH	Benzo[a]anthracene	Yes	0.58	0.58	J	ug/kg	1050	ug/kg	No	No	0.00055	0.00055
Sediment	REF011-SE-1-100119	PAH	Benzo[a]pyrene	No	0.49	0.245	U	ug/kg	1450	ug/kg	No	No	0.00034	0.00017
Sediment	REF011-SE-1-100119	PAH	Chrysene	No	0.4	0.2	U	ug/kg	1290	ug/kg	No	No	0.00031	0.00016
Sediment	REF011-SE-1-100119	Pest-Herb	Dieldrin	No	0.25	0.125	U	ug/kg	61.8	ug/kg	No	No	0.004	0.002
Sediment	REF011-SE-1-100119	Pest-Herb	Endrin	No	0.36	0.18	U	ug/kg	207	ug/kg	No	No	0.0017	0.00087

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Prelim unvalidated Phase 3 sediment results - PEC point by point screen, reference samples, organics

material_analyzed	sample_no	anal_type	analyte_name	detected	value	value or half-DL	qual	units	PEC value	PEC units	Exceeds (using full DL if ND)	Exceeds (using half DL if ND)	EF (using full DL if ND)	EF (using half DL if ND)
Sediment	REF011-SE-1-100119	PAH	Fluoranthene	No	0.8	0.4	U	ug/kg	2230	ug/kg	No	No	0.00036	0.00018
Sediment	REF011-SE-1-100119	PAH	Fluorene	No	0.73	0.365	U	ug/kg	536	ug/kg	No	No	0.0014	0.00068
Sediment	REF011-SE-1-100119	Pest-Herb	gamma-BHC	No	0.35	0.175	U	ug/kg	4.99	ug/kg	No	No	0.07	0.035
Sediment	REF011-SE-1-100119	Pest-Herb	Heptachlor epoxide	No	0.74	0.37	U	ug/kg	16	ug/kg	No	No	0.046	0.023
Sediment	REF011-SE-1-100119	PAH	Naphthalene	No	0.6	0.3	U	ug/kg	561	ug/kg	No	No	0.0011	0.00053
Sediment	REF011-SE-1-100119	PAH	Phenanthrene	No	0.75	0.375	U	ug/kg	1170	ug/kg	No	No	0.00064	0.00032
Sediment	REF011-SE-1-100119	PAH	Pyrene	No	0.41	0.205	U	ug/kg	1520	ug/kg	No	No	0.00027	0.00013
Sediment	REF011-SE-2-100119	PAH	Anthracene	No	0.37	0.185	U	ug/kg	845	ug/kg	No	No	0.00044	0.00022
Sediment	REF011-SE-2-100119	PAH	Benzo[a]anthracene	Yes	0.54	0.54	J	ug/kg	1050	ug/kg	No	No	0.00051	0.00051
Sediment	REF011-SE-2-100119	PAH	Benzo[a]pyrene	No	0.49	0.245	U	ug/kg	1450	ug/kg	No	No	0.00034	0.00017
Sediment	REF011-SE-2-100119	PAH	Chrysene	No	0.4	0.2	U	ug/kg	1290	ug/kg	No	No	0.00031	0.00016
Sediment	REF011-SE-2-100119	Pest-Herb	Dieldrin	No	0.25	0.125	U	ug/kg	61.8	ug/kg	No	No	0.004	0.002
Sediment	REF011-SE-2-100119	Pest-Herb	Endrin	No	0.36	0.18	U	ug/kg	207	ug/kg	No	No	0.0017	0.00087
Sediment	REF011-SE-2-100119	PAH	Fluoranthene	No	0.8	0.4	U	ug/kg	2230	ug/kg	No	No	0.00036	0.00018
Sediment	REF011-SE-2-100119	PAH	Fluorene	No	0.73	0.365	U	ug/kg	536	ug/kg	No	No	0.0014	0.00068
Sediment	REF011-SE-2-100119	Pest-Herb	gamma-BHC	No	0.35	0.175	U	ug/kg	4.99	ug/kg	No	No	0.07	0.035
Sediment	REF011-SE-2-100119	Pest-Herb	Heptachlor epoxide	No	0.74	0.37	U	ug/kg	16	ug/kg	No	No	0.046	0.023
Sediment	REF011-SE-2-100119	PAH	Naphthalene	No	0.6	0.3	U	ug/kg	561	ug/kg	No	No	0.0011	0.00053
Sediment	REF011-SE-2-100119	PAH	Phenanthrene	No	0.75	0.375	U	ug/kg	1170	ug/kg	No	No	0.00064	0.00032
Sediment	REF011-SE-2-100119	PAH	Pyrene	No	0.41	0.205	U	ug/kg	1520	ug/kg	No	No	0.00027	0.00013
Sediment	REF012-SE-1-100419	PAH	Anthracene	Yes	1.6	1.6	J	ug/kg	845	ug/kg	No	No	0.0019	0.0019
Sediment	REF012-SE-1-100419	PAH	Benzo[a]anthracene	Yes	6.1	6.1	J	ug/kg	1050	ug/kg	No	No	0.0058	0.0058
Sediment	REF012-SE-1-100419	PAH	Benzo[a]pyrene	Yes	3.8	3.8	J	ug/kg	1450	ug/kg	No	No	0.0026	0.0026
Sediment	REF012-SE-1-100419	PAH	Chrysene	Yes	6.3	6.3	J	ug/kg	1290	ug/kg	No	No	0.0049	0.0049
Sediment	REF012-SE-1-100419	Pest-Herb	Dieldrin	No	0.55	0.275	Ui	ug/kg	61.8	ug/kg	No	No	0.0089	0.0044
Sediment	REF012-SE-1-100419	Pest-Herb	Endrin	No	0.32	0.16	U	ug/kg	207	ug/kg	No	No	0.0015	0.00077
Sediment	REF012-SE-1-100419	PAH	Fluoranthene	Yes	14	14		ug/kg	2230	ug/kg	No	No	0.0063	0.0063
Sediment	REF012-SE-1-100419	PAH	Fluorene	Yes	2.2	2.2	J	ug/kg	536	ug/kg	No	No	0.0041	0.0041
Sediment	REF012-SE-1-100419	Pest-Herb	gamma-BHC	Yes	0.73	0.73	J	ug/kg	4.99	ug/kg	No	No	0.15	0.15
Sediment	REF012-SE-1-100419	Pest-Herb	Heptachlor epoxide	No	0.66	0.33	U	ug/kg	16	ug/kg	No	No	0.041	0.021
Sediment	REF012-SE-1-100419	PAH	Naphthalene	Yes	2	2	J	ug/kg	561	ug/kg	No	No	0.0036	0.0036
Sediment	REF012-SE-1-100419	PAH	Phenanthrene	Yes	8.7	8.7		ug/kg	1170	ug/kg	No	No	0.0074	0.0074
Sediment	REF012-SE-1-100419	PAH	Pyrene	Yes	15	15		ug/kg	1520	ug/kg	No	No	0.0099	0.0099
Sediment	REF013-SE-1-092419	PAH	Anthracene	No	0.39	0.195	U	ug/kg	845	ug/kg	No	No	0.00046	0.00023
Sediment	REF013-SE-1-092419	PAH	Benzo[a]anthracene	Yes	1.3	1.3	J	ug/kg	1050	ug/kg	No	No	0.0012	0.0012
Sediment	REF013-SE-1-092419	PAH	Benzo[a]pyrene	No	0.51	0.255	U	ug/kg	1450	ug/kg	No	No	0.00035	0.00018
Sediment	REF013-SE-1-092419	PAH	Chrysene	Yes	1.1	1.1	J	ug/kg	1290	ug/kg	No	No	0.00085	0.00085
Sediment	REF013-SE-1-092419	Pest-Herb	Dieldrin	No	0.26	0.13	U	ug/kg	61.8	ug/kg	No	No	0.0042	0.0021
Sediment	REF013-SE-1-092419	Pest-Herb	Endrin	No	0.38	0.19	U	ug/kg	207	ug/kg	No	No	0.0018	0.00092
Sediment	REF013-SE-1-092419	PAH	Fluoranthene	Yes	1.4	1.4	J	ug/kg	2230	ug/kg	No	No	0.00063	0.00063
Sediment	REF013-SE-1-092419	PAH	Fluorene	No	0.76	0.38	U	ug/kg	536	ug/kg	No	No	0.0014	0.00071
Sediment	REF013-SE-1-092419	Pest-Herb	gamma-BHC	Yes	0.76	0.76	J	ug/kg	4.99	ug/kg	No	No	0.15	0.15
Sediment	REF013-SE-1-092419	Pest-Herb	Heptachlor epoxide	No	0.77	0.385	U	ug/kg	16	ug/kg	No	No	0.048	0.024
Sediment	REF013-SE-1-092419	PAH	Naphthalene	Yes	2.3	2.3	J	ug/kg	561	ug/kg	No	No	0.0041	0.0041
Sediment	REF013-SE-1-092419	PAH	Phenanthrene	Yes	1.7	1.7	J	ug/kg	1170	ug/kg	No	No	0.0015	0.0015
Sediment	REF013-SE-1-092419	PAH	Pyrene	Yes	1.6	1.6	J	ug/kg	1520	ug/kg	No	No	0.0011	0.0011
Sediment	REF014-SE-1-092619	PAH	Anthracene	Yes	0.93	0.93	J	ug/kg	845	ug/kg	No	No	0.0011	0.0011
Sediment	REF014-SE-1-092619	PAH	Benzo[a]anthracene	Yes	1.6	1.6	J	ug/kg	1050	ug/kg	No	No	0.0015	0.0015
Sediment	REF014-SE-1-092619	PAH	Benzo[a]pyrene	Yes	2.8	2.8	J	ug/kg	1450	ug/kg	No	No	0.0019	0.0019
Sediment	REF014-SE-1-092619	PAH	Chrysene	Yes	2.7	2.7	J	ug/kg	1290	ug/kg	No	No	0.0021	0.0021
Sediment	REF014-SE-1-092619	Pest-Herb	Dieldrin	No	0.33	0.165	U	ug/kg	61.8	ug/kg	No	No	0.0053	0.0027
Sediment	REF014-SE-1-092619	Pest-Herb	Endrin	No	0.48	0.24	U	ug/kg	207	ug/kg	No	No	0.0023	0.0012
Sediment	REF014-SE-1-092619	PAH	Fluoranthene	Yes	5	5	J	ug/kg	2230	ug/kg	No	No	0.0022	0.0022
Sediment	REF014-SE-1-092619	PAH	Fluorene	Yes	0.93	0.93	J	ug/kg	536	ug/kg	No	No	0.0017	0.0017
Sediment	REF014-SE-1-092619	Pest-Herb	gamma-BHC	No	0.46	0.23	U	ug/kg	4.99	ug/kg	No	No	0.092	0.046
Sediment	REF014-SE-1-092619	Pest-Herb	Heptachlor epoxide	No	0.98	0.49	U	ug/kg	16	ug/kg	No	No	0.061	0.031
Sediment	REF014-SE-1-092619	PAH	Naphthalene	Yes	20	20		ug/kg	561	ug/kg	No	No	0.036	0.036
Sediment	REF014-SE-1-092619	PAH	Phenanthrene	Yes	8.8	8.8		ug/kg	1170	ug/kg	No	No	0.0075	0.0075
Sediment	REF014-SE-1-092619	PAH	Pyrene	Yes	4.9	4.9	J	ug/kg	1520	ug/kg	No	No	0.0032	0.0032
Sediment	REF014-SE-2-092619	PAH	Anthracene	Yes	0.7	0.7	J	ug/kg	845	ug/kg	No	No	0.00083	0.00083
Sediment	REF014-SE-2-092619	PAH	Benzo[a]anthracene	Yes	0.97	0.97	J	ug/kg	1050	ug/kg	No	No	0.00092	0.00092
Sediment	REF014-SE-2-092619	PAH	Benzo[a]pyrene	Yes	1.1	1.1	J	ug/kg	1450	ug/kg	No	No	0.00076	0.00076
Sediment	REF014-SE-2-092619	PAH	Chrysene	Yes	1	1	J	ug/kg	1290	ug/kg	No	No	0.00078	0.00078
Sediment	REF014-SE-2-092619	Pest-Herb	Dieldrin	No	0.32	0.16	U	ug/kg	61.8	ug/kg	No	No	0.0052	0.0026
Sediment	REF014-SE-2-092619	Pest-Herb	Endrin	No	0.46	0.23	U	ug/kg	207	ug/kg	No	No	0.0022	0.0011
Sediment	REF014-SE-2-092619	PAH	Fluoranthene	Yes	3.3	3.3	J	ug/kg	2230	ug/kg	No	No	0.0015	0.0015
Sediment	REF014-SE-2-092619	PAH	Fluorene	No	0.86	0.43	U	ug/kg	536	ug/kg	No	No	0.0016	0.0008
Sediment	REF014-SE-2-092619	Pest-Herb	gamma-BHC	No	0.45	0.225	U	ug/kg	4.99	ug/kg	No	No	0.09	0.045

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

Prelim unvalidated Phase 3 sediment results - PEC point by point screen, reference samples, organics

material_analyzed	sample_no	anal_type	analyte_name	detected	value	value or half-DL	qual	units	PEC value	PEC units	Exceeds (using full DL if ND)	Exceeds (using half DL if ND)	EF (using full DL if ND)	EF (using half DL if ND)
Sediment	REF014-SE-2-092619	Pest-Herb	Heptachlor epoxide	No	0.95	0.475	U	ug/kg	16	ug/kg	No	No	0.059	0.03
Sediment	REF014-SE-2-092619	PAH	Naphthalene	Yes	17	17		ug/kg	561	ug/kg	No	No	0.03	0.03
Sediment	REF014-SE-2-092619	PAH	Phenanthrene	Yes	7.4	7.4	J	ug/kg	1170	ug/kg	No	No	0.0063	0.0063
Sediment	REF014-SE-2-092619	PAH	Pyrene	Yes	2.9	2.9	J	ug/kg	1520	ug/kg	No	No	0.0019	0.0019
Sediment	REF015-SE-1-092619	PAH	Anthracene	Yes	5.4	5.4	J	ug/kg	845	ug/kg	No	No	0.0064	0.0064
Sediment	REF015-SE-1-092619	PAH	Benzo[a]anthracene	Yes	5.6	5.6	JX	ug/kg	1050	ug/kg	No	No	0.0053	0.0053
Sediment	REF015-SE-1-092619	PAH	Benzo[a]pyrene	Yes	7.4	7.4	J	ug/kg	1450	ug/kg	No	No	0.0051	0.0051
Sediment	REF015-SE-1-092619	PAH	Chrysene	Yes	7.9	7.9	J	ug/kg	1290	ug/kg	No	No	0.0061	0.0061
Sediment	REF015-SE-1-092619	Pest-Herb	Dieldrin	No	0.42	0.21	U	ug/kg	61.8	ug/kg	No	No	0.0068	0.0034
Sediment	REF015-SE-1-092619	Pest-Herb	Endrin	No	0.61	0.305	U	ug/kg	207	ug/kg	No	No	0.0029	0.0015
Sediment	REF015-SE-1-092619	PAH	Fluoranthene	Yes	28	28		ug/kg	2230	ug/kg	No	No	0.013	0.013
Sediment	REF015-SE-1-092619	PAH	Fluorene	Yes	7.9	7.9	J	ug/kg	536	ug/kg	No	No	0.015	0.015
Sediment	REF015-SE-1-092619	Pest-Herb	gamma-BHC	No	0.59	0.295	U	ug/kg	4.99	ug/kg	No	No	0.12	0.059
Sediment	REF015-SE-1-092619	Pest-Herb	Heptachlor epoxide	No	1.3	0.65	U	ug/kg	16	ug/kg	No	No	0.081	0.041
Sediment	REF015-SE-1-092619	PAH	Naphthalene	Yes	95	95		ug/kg	561	ug/kg	No	No	0.17	0.17
Sediment	REF015-SE-1-092619	PAH	Phenanthrene	Yes	44	44		ug/kg	1170	ug/kg	No	No	0.038	0.038
Sediment	REF015-SE-1-092619	PAH	Pyrene	Yes	24	24		ug/kg	1520	ug/kg	No	No	0.016	0.016
Sediment	REF016-SE-1-092519	PAH	Anthracene	No	0.5	0.25	U	ug/kg	845	ug/kg	No	No	0.00059	0.0003
Sediment	REF016-SE-1-092519	PAH	Benzo[a]anthracene	Yes	1.4	1.4	J	ug/kg	1050	ug/kg	No	No	0.0013	0.0013
Sediment	REF016-SE-1-092519	PAH	Benzo[a]pyrene	No	0.65	0.325	U	ug/kg	1450	ug/kg	No	No	0.00045	0.00022
Sediment	REF016-SE-1-092519	PAH	Chrysene	No	0.53	0.265	U	ug/kg	1290	ug/kg	No	No	0.00041	0.00021
Sediment	REF016-SE-1-092519	Pest-Herb	Dieldrin	No	0.31	0.155	U	ug/kg	61.8	ug/kg	No	No	0.005	0.0025
Sediment	REF016-SE-1-092519	Pest-Herb	Endrin	No	0.45	0.225	U	ug/kg	207	ug/kg	No	No	0.0022	0.0011
Sediment	REF016-SE-1-092519	PAH	Fluoranthene	No	1.1	0.55	U	ug/kg	2230	ug/kg	No	No	0.00049	0.00025
Sediment	REF016-SE-1-092519	PAH	Fluorene	No	0.97	0.485	U	ug/kg	536	ug/kg	No	No	0.0018	0.0009
Sediment	REF016-SE-1-092519	Pest-Herb	gamma-BHC	No	0.43	0.215	U	ug/kg	4.99	ug/kg	No	No	0.086	0.043
Sediment	REF016-SE-1-092519	Pest-Herb	Heptachlor epoxide	No	0.91	0.455	U	ug/kg	16	ug/kg	No	No	0.057	0.028
Sediment	REF016-SE-1-092519	PAH	Naphthalene	Yes	1.4	1.4	J	ug/kg	561	ug/kg	No	No	0.0025	0.0025
Sediment	REF016-SE-1-092519	PAH	Phenanthrene	Yes	1	1	J	ug/kg	1170	ug/kg	No	No	0.00085	0.00085
Sediment	REF016-SE-1-092519	PAH	Pyrene	Yes	0.56	0.56	J	ug/kg	1520	ug/kg	No	No	0.00037	0.00037
Sediment	REF017-SE-1-092519	PAH	Anthracene	No	0.57	0.285	U	ug/kg	845	ug/kg	No	No	0.00067	0.00034
Sediment	REF017-SE-1-092519	PAH	Benzo[a]anthracene	Yes	1.4	1.4	J	ug/kg	1050	ug/kg	No	No	0.0013	0.0013
Sediment	REF017-SE-1-092519	PAH	Benzo[a]pyrene	No	0.75	0.375	U	ug/kg	1450	ug/kg	No	No	0.00052	0.00026
Sediment	REF017-SE-1-092519	PAH	Chrysene	Yes	0.88	0.88	J	ug/kg	1290	ug/kg	No	No	0.00068	0.00068
Sediment	REF017-SE-1-092519	Pest-Herb	Dieldrin	No	0.39	0.195	U	ug/kg	61.8	ug/kg	No	No	0.0063	0.0032
Sediment	REF017-SE-1-092519	Pest-Herb	Endrin	No	0.57	0.285	U	ug/kg	207	ug/kg	No	No	0.0028	0.0014
Sediment	REF017-SE-1-092519	PAH	Fluoranthene	Yes	2.1	2.1	J	ug/kg	2230	ug/kg	No	No	0.00094	0.00094
Sediment	REF017-SE-1-092519	PAH	Fluorene	No	1.2	0.6	U	ug/kg	536	ug/kg	No	No	0.0022	0.0011
Sediment	REF017-SE-1-092519	Pest-Herb	gamma-BHC	Yes	0.74	0.74	J	ug/kg	4.99	ug/kg	No	No	0.15	0.15
Sediment	REF017-SE-1-092519	Pest-Herb	Heptachlor epoxide	No	1.2	0.6	U	ug/kg	16	ug/kg	No	No	0.075	0.038
Sediment	REF017-SE-1-092519	PAH	Naphthalene	Yes	4.1	4.1	J	ug/kg	561	ug/kg	No	No	0.0073	0.0073
Sediment	REF017-SE-1-092519	PAH	Phenanthrene	Yes	3.4	3.4	J	ug/kg	1170	ug/kg	No	No	0.0029	0.0029
Sediment	REF017-SE-1-092519	PAH	Pyrene	Yes	1.3	1.3	J	ug/kg	1520	ug/kg	No	No	0.00086	0.00086
Sediment	REF018-SE-1-092519	PAH	Anthracene	Yes	7.2	7.2	J	ug/kg	845	ug/kg	No	No	0.0085	0.0085
Sediment	REF018-SE-1-092519	PAH	Benzo[a]anthracene	Yes	9.8	9.8	J	ug/kg	1050	ug/kg	No	No	0.0093	0.0093
Sediment	REF018-SE-1-092519	PAH	Benzo[a]pyrene	Yes	8.1	8.1	J	ug/kg	1450	ug/kg	No	No	0.0056	0.0056
Sediment	REF018-SE-1-092519	PAH	Chrysene	Yes	11	11	J	ug/kg	1290	ug/kg	No	No	0.0085	0.0085
Sediment	REF018-SE-1-092519	Pest-Herb	Dieldrin	No	0.48	0.24	U	ug/kg	61.8	ug/kg	No	No	0.0078	0.0039
Sediment	REF018-SE-1-092519	Pest-Herb	Endrin	No	0.7	0.35	U	ug/kg	207	ug/kg	No	No	0.0034	0.0017
Sediment	REF018-SE-1-092519	PAH	Fluoranthene	Yes	22	22		ug/kg	2230	ug/kg	No	No	0.0099	0.0099
Sediment	REF018-SE-1-092519	PAH	Fluorene	Yes	5	5	J	ug/kg	536	ug/kg	No	No	0.0093	0.0093
Sediment	REF018-SE-1-092519	Pest-Herb	gamma-BHC	No	1.1	0.55	Ui	ug/kg	4.99	ug/kg	No	No	0.22	0.11
Sediment	REF018-SE-1-092519	Pest-Herb	Heptachlor epoxide	No	1.5	0.75	U	ug/kg	16	ug/kg	No	No	0.094	0.047
Sediment	REF018-SE-1-092519	PAH	Naphthalene	Yes	46	46		ug/kg	561	ug/kg	No	No	0.082	0.082
Sediment	REF018-SE-1-092519	PAH	Phenanthrene	Yes	30	30		ug/kg	1170	ug/kg	No	No	0.026	0.026
Sediment	REF018-SE-1-092519	PAH	Pyrene	Yes	22	22		ug/kg	1520	ug/kg	No	No	0.014	0.014

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations
Sum PAH Equlibrium Partioning Benchmark Toxic Unit Calculation

Note: Values that were below detection were adjusted to 0 for the purpose of evaluating the presence of organics for bioassay sample selection. Detected v
Note: Chemicals that were not detected in any sediment samples were removed from this dataset and were not considered in this preliminary analysis.
Note: Sum PAH equlilbrium ESBTU was determined by summing the 13 measured PAHs and adjusted to 34 PAHs using 95% confidence factor of 11.5 (follov

			PAH											
			2-Methylnaphthalene	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo_a_anthracene**	**Benzo_a_pyrene**	**Benzo_b_fluoranthene**	**Benzo_g,h,i_perylene**	**Benzo_k_fluoranthene**	**Chrysene**	**Dibenzo_a,h_anthracene**	**Fluoranthene**
			ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
material_analyzed	sample_no	Sum ESBTU FCV_{34}	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val
SEDIMENT	REF001-SE-1-092819	0.23	0	0	0	0	0.55	0	0	0	0	0	0	0
SEDIMENT	REF002-SE-1-092819	0.16	0	0	0	0	0.4	0	0	0	0	0	0	0
SEDIMENT	REF003-SE-1-092719	0.27	1.4	0.77	0	0.52	0.67	0	0	0	0	0	0	0
SEDIMENT	REF004-SE-1-092719	0.066	0	0	0	0	0.43	0	0	0	0	0	0	0
SEDIMENT	REF005-SE-1-100319	0.21	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF006-SE-1-100219	0.075	0	0	0	0	1	0.74	1.1	0.57	0	0.62	0	1.4
SEDIMENT	REF007-SE-1-093019	0.082	0	0	0	0.37	0.76	0	0	0	0	0.47	0	0
SEDIMENT	REF008-SE-1-093019	0.14	0	0	0	0	0.4	0	0	0	0	0	0	0
SEDIMENT	REF009A-SE-1-100219	0.31	0	0	0	3.4	0.54	0	0	0	0	0	0	0
SEDIMENT	REF010-SE-1-100319	0.75	1.9	0.5	0	1.7	1.6	0	2.9	1.2	0.96	2.3	0	4.3
SEDIMENT	REF011-SE-1-100119	0.2	0	0	0	0	0.58	0	0	1.3	0	0	0.32	0
SEDIMENT	REF011-SE-2-100119	0.18	0	0	0	0	0.54	0	0	0	0	0	0	0
SEDIMENT	REF012-SE-1-100419	0.48	0	0	0	1.6	6.1	3.8	6.4	3.1	2.1	6.3	0	14
SEDIMENT	REF013-SE-1-092419	0.052	0.83	0	0	0	1.3	0	1.4	0.82	0	1.1	0	1.4
SEDIMENT	REF014-SE-1-092619	0.15	1.9	0	2.3	0.93	1.6	2.8	4	4.3	1.3	2.7	0.55	5
SEDIMENT	REF014-SE-2-092619	0.11	1.6	0	1.2	0.7	0.97	1.1	1.4	1.3	0	1	0	3.3
SEDIMENT	REF015-SE-1-092619	0.2	8.5	3.3	17	5.4	5.6	7.4	9.8	8.8	2.7	7.9	0.78	28
SEDIMENT	REF016-SE-1-092519	0.019	0	0	0	0	1.4	0	0	0	0	0	0	0
SEDIMENT	REF017-SE-1-092519	0.026	0	0	0	0	1.4	0	0	0	0	0.88	0	2.1
SEDIMENT	REF018-SE-1-092519	0.051	6.1	3.4	4.1	7.2	9.8	8.1	10	5.2	3.9	11	0.81	22

Final Phase 3 Sediment Study Bioas/alues are unadjusted.
Sum PAH Equlibrium Partioning Ber
ving procedures in EPA 2003).

							PCB					Pest-Herb						SVOC
		Fluorene	**Indeno_1,2,3-cd_pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**2Cl11pBiphenyl**	**PCB_cong_153**	**PCB_cong_5**	**PCB_cong_52**	**PCB_cong_70**	**4,4'-DDD**	**alpha-Hexachlorocyclohexane**	**beta-BHC**	**Endosulfan II**	**gamma-BHC**	**Methoxychlor**	**Hexachlorobutadiene**
		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
material_analyzed	sample_no	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val	Detected Val
SEDIMENT	REF001-SE-1-092819	0	0	0	0	0	0	0	0.11	0	0	0	0	0	0	0	0	0
SEDIMENT	REF002-SE-1-092819	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF003-SE-1-092719	0.96	0	1.3	2.1	0.75	0	0	0	0	0	0	0	0	0	0	1.8	0.79
SEDIMENT	REF004-SE-1-092719	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.32
SEDIMENT	REF005-SE-1-100319	0	0	1	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF006-SE-1-100219	0	0	0	0.95	1.5	0	0.98	0	0	0.62	0	0	0	0	0	0	0.25
SEDIMENT	REF007-SE-1-093019	0	0	0.63	1	0.75	0	0	0	0	0	0	0	0	0	0	0	0.47
SEDIMENT	REF008-SE-1-093019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.2
SEDIMENT	REF009A-SE-1-100219	0	0	0	0.77	0	0	0	0	0	0	0	0	0	1.3	0	0	0.42
SEDIMENT	REF010-SE-1-100319	0	0	4.7	6.3	4.1	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF011-SE-1-100119	0	0.78	0	0	0	0	0	0	0	0	0	0	0	1.1	0	0	0
SEDIMENT	REF011-SE-2-100119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF012-SE-1-100419	2.2	2.3	2	8.7	15	0	0	0	0	0	0	0	0	0	0.73	0	0
SEDIMENT	REF013-SE-1-092419	0	0.61	2.3	1.7	1.6	0	0	0	0	0	0	0	0	0	0.76	0	0
SEDIMENT	REF014-SE-1-092619	0.93	3.7	20	8.8	4.9	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF014-SE-2-092619	0	0.88	17	7.4	2.9	0	0	0	0	0	0	0	0	0	0	0	0
SEDIMENT	REF015-SE-1-092619	7.9	6.5	95	44	24	0	0	0	0	0	1.4	0.58	0	0	0	0	0
SEDIMENT	REF016-SE-1-092519	0	0	1.4	1	0.56	0	0	0	0	0	0	0	1.9	0	0	0	0
SEDIMENT	REF017-SE-1-092519	0	0	4.1	3.4	1.3	0	0	0	0.52	0	0	0	0	0	0.74	0	0
SEDIMENT	REF018-SE-1-092519	5	4.9	46	30	22	8.3	0	0.21	0.83	0	0	0	0	0	0	0	0

Final Phase 3 Sediment Study Bioassay Sample Selection and Batching Recommendations

PEC criteria

Criteria_Name	Chem_Group	Chemical	Criteria_Value	Criteria_Units
PEC_FW	Pest-Herb	Dieldrin	61.8	ug/kg
PEC_FW	Pest-Herb	Endrin	207	ug/kg
PEC_FW	Pest-Herb	gamma-BHC	4.99	ug/kg
PEC_FW	Pest-Herb	Heptachlor epoxide	16	ug/kg
PEC_FW	Pest-Herb	Total chlordane, 1/2 DL	17.6	ug/kg
PEC_FW	Pest-Herb	Total DDD, 1/2 DL	28	ug/kg
PEC_FW	Pest-Herb	Total DDE, 1/2 DL	31.3	ug/kg
PEC_FW	Pest-Herb	Total DDT, 1/2 DL	62.9	ug/kg
PEC_FW	Pest-Herb	Total DDx, 1/2 DL	572	ug/kg
PEC_FW	PAH	Anthracene	845	ug/kg
PEC_FW	PAH	Benzo[a]anthracene	1050	ug/kg
PEC_FW	PAH	Benzo[a]pyrene	1450	ug/kg
PEC_FW	PAH	Chrysene	1290	ug/kg
PEC_FW	PAH	Fluoranthene	2230	ug/kg
PEC_FW	PAH	Fluorene	536	ug/kg
PEC_FW	PAH	Naphthalene	561	ug/kg
PEC_FW	PAH	Phenanthrene	1170	ug/kg
PEC_FW	PAH	Pyrene	1520	ug/kg
PEC_FW	PAH	Total PAHs, 1/2 DL	22800	ug/kg
PEC_FW	PCB	Total PCB Aroclors, 1/2 DL	676	ug/kg

APPENDIX C

BACKSCATTERED SCANNING ELECTRON MICROSCOPY SAMPLE SELECTION

McCaig Kris SPOK

From:	Orr Rob SPOK
Sent:	Friday, February 21, 2020 9:49 PM
To:	McCaig Kris SPOK
Subject:	Fwd: EPA Comments on Draft BSEM Selection Memo

BSEM selection memo is approved by the EPA.

Rob Orr

Begin forwarded message:

From: "Cerise, Kathy" <Cerise.Kathryn@epa.gov>
Date: February 21, 2020 at 5:16:54 PM PST
To: Orr Rob SPOK <Rob.Orr@teck.com>
Cc: "Gauthier, Marilyn/PDX" <marilyn.gauthier@jacobs.com>, "Cox, Stephen" <secox@usgs.gov>
Subject: EPA Comments on Draft BSEM Selection Memo

[External email]

Rob,

EPA has no further comments on the BSEM Selection Memo. It can be finalized.

Thank you

Kathryn Cerise
UCR RPM

From: Orr Rob SPOK <Rob.Orr@teck.com>
Sent: Wednesday, February 5, 2020 1:17 PM
To: Cerise, Kathy <Cerise.Kathryn@epa.gov>
Cc: Gauthier, Marilyn/PDX <Marilyn.Gauthier@jacobs.com>; Audet, Daniel <daniel_audet@nps.gov>; Roark, Shaun/DEN <Shaun.Roark@jacobs.com>; Mills Denise SPOK <Denise.Mills@teck.com>; Kessel Cristy SPOK <Cristy.Kessel@teck.com>; McCaig Kris SPOK <Kris.McCaig@teck.com>
Subject: [EXTERNAL] RE: EPA Comments on Draft BSEM Selection Memo

Hi Kathy,

Attached is TAI's response to EPA comments and a revised BSEM Selection Technical Memo (RLSO and Clean). Please let me know if there are any questions on the attached files or if we need to coordinate a call to discuss. Thank you.

Rob Orr, CHMM
Program Manager, Environmental Projects
Teck American Incorporated
Office: 509.623.4551
Cell: 509.368.4332
eMail: Rob.Orr@teck.com
www.teck.com

From: Cerise, Kathy <Cerise.Kathryn@epa.gov>
Sent: Thursday, January 16, 2020 3:41 PM
To: McCaig Kris SPOK <Kris.McCaig@teck.com>
Cc: Gauthier, Marilyn/PDX <marilyn.gauthier@jacobs.com>; Audet, Daniel <daniel_audet@nps.gov>; Roark, Shaun/DEN <Shaun.Roark@jacobs.com>
Subject: EPA Comments on Draft BSEM Selection Memo

[External email]

Kris,

Attached are EPAs comments on the Draft BSEM Memo.

Thanks

Kathy

Kathryn Cerise
Region 10 Remedial Project Manager
1200 6th Ave,
Seattle, WA 98101
Mail Code: 12 D12 1
Phone: 206-553-2589

From: Gauthier, Marilyn/PDX <Marilyn.Gauthier@jacobs.com>
Sent: Thursday, January 16, 2020 3:05 PM
To: Cerise, Kathy <Cerise.Kathryn@epa.gov>
Cc: Roark, Shaun/DEN <Shaun.Roark@jacobs.com>; Dillon, Frank/DET <Frank.Dillon@jacobs.com>; Gondek, John/BOS <John.Gondek@jacobs.com>
Subject: EPA Comments on Draft BSEM Selection Memo

As indicated in our call with TAI yesterday, the comments on the BSEM sample selection memo are minimal, but changes to the sample list and Attachment A are needed. The comments come from myself and Steve Cox. We also received comments from Ecology about the number of samples and use of the regression model, but did not include them because the requested changes with elements of the Phase 3 QAPP that were negotiated as part of the dispute. I'll forward the comments and our rationale for not including them in a separate email.

TECK AMERICAN INCORPORATED
FINAL TECHNICAL MEMORANDUM
PROPOSED SAMPLES FOR BACKSCATTERED ELECTRON MICROSCOPY ANALYSIS
UPPER COLUMBIA RIVER PHASE 3 SEDIMENT STUDY

1 Introduction

This technical memorandum (tech memo) presents the rationale for selection of Phase 3 sediment study sediment samples for analysis of slag using the backscattered scanning electron microscopy (BSEM). Select Phase 3 sediment study sediment samples will be analyzed for slag using BSEM to confirm the estimated percent slag content based a relationship between total zinc concentration and percent slag, as described in the Final Quality Assurance Project Plan for the 2019 Phase 3 Sediment Study (QAPP; ERM 2019). Specifically, Section B4.2 of the QAPP states:

> Validated total zinc data will be used to estimate percent slag in Phase 3 sediment samples using a total zinc regression model developed from the Phase 2 sediment study (Windward 2017) and USGS 2016 data. Regression model estimates will be confirmed with results from the samples analyzed for percent slag using BSEM. Regression model estimates will be confirmed by analysis of 10 percent of the samples from the sampleable sand stratum for percent slag by BSEM.

A total of 56 sampleable sand samples were collected during the Phase 3 sediment study; therefore, BSEM analysis will be performed on six sampleable sand samples. The samples proposed for BSEM in this tech memo were selected based on analytical results for bulk sediment chemistry, and are presented here for review and approval by the U.S. Environmental Protection Agency (EPA). The BSEM analysis of these samples will be initiated upon EPA approval of this tech memo.

2 Approach and Rationale for Sediment Sample Selection for BSEM Analysis

Sediment samples from Phase 3 sediment study Areas of Interest[1] (AOIs) for BSEM analysis were selected based on the results of analysis of bulk sediment samples for total zinc to ensure that the confirmation samples span the range of zinc concentrations in the Phase 3 sampleable sand samples, and therefore span the range of estimated percent slag content. Other factors that were considered when selecting samples for BSEM include the AOI (to ensure at least one sample is selected from each AOI) and results from grain size analysis (to ensure variation in sand and mud content).

The proposed samples for BSEM analysis were selected consistent with the approach described in QAPP Section B4.2 - Estimation of Percent Slag. The following steps outline the approach and rationale for selecting samples for BSEM analysis proposed in this tech memo:

1. Sediment zinc concentrations[2] were compiled for sampleable sand samples, and percent slag was calculated for each sample following the equation shown in Phase 3 sediment Study QAPP Figure B4-1 Segmented Regression Model for Zinc in UCR Sediment (Table 1).

[1] The three AOIs for the Phase 3 sediment study are Deadman's Eddy, China Bend, and Evans.
[2] Analytical results for Phase 3 sediment study have been validated. The zinc concentrations and grain size results presented in this tech memo are preliminary results.

2. Sediment grain results were tabulated for percent gravel, sand, and mud (Table 1).
3. Field notes were reviewed for observations of silica glass in the collected sediment (Table 1).
4. Samples were ranked based on zinc concentration and plotted (Figure 1). Samples collected from Deadman's Eddy had relatively low zinc, samples from Evans had relatively high zinc, and samples from China Bend ranged from low to high zinc.
5. Preference for BSEM confirmation samples was given to low to medium relative zinc concentrations to prioritize verification of percent slag predictions at lower zinc concentrations (and percent slag).

Table 1 presents zinc concentrations and estimated percent slag for sampleable sand samples and indicates the samples selected for BSEM analysis. Proposed samples for BSEM analysis are also indicated in the zinc concentration rank plot (Figure 1). The rationale for the selection of samples for BSEM analysis is given in Table 2, and Figures 2, 3 and 4 identify the locations for proposed samples for BSEM analysis at Deadman's Eddy, China Bend, and Evans AOIs, respectively.

3 BSEM Analytical Procedures

Slag determination by BSEM will be performed by RJ Lee Group, Inc. (RJLG), the same laboratory that performed BSEM analysis for sediment samples during the Phase 2 sediment study. The Phase 3 sediment study BSEM analysis method is the same method used during the Phase 2 study, as described in Appendix F of the Phase 2 Sediment Study Data Summary Report (Windward 2017). The RJLG *Scope of Work for Estimating Percent Slag in Upper Columbia River Sediment Samples Using Backscattered Scanning Electron Microscopy* is included as Attachment A to this tech memo and provides a description of the Phase 3 sediment study BSEM method, including sample preparation, sample analysis, data interpretation, and QC procedures.

4 Phase 3 Sediment Study QAPP Errata

During the course of data review for sediment sample collection, two errors were identified in QAPP Section B4.2 - Estimation of Percent Slag. These errors are as follow:

1. The segmented linear regression equations provided in Section B4.2 are missing a square root sign on the left side of the equation (on percent slag). The equations shown in Figure B4-1 are correct, therefore Figure B4-1 is referenced in this tech memo.
2. Near the bottom of Page B-7, the QAPP states that 12 samples will be proposed for BSEM analysis. The requirement for BSEM analysis as prescribed by EPA in the final, EPA-provided Data Quality Objectives is 10 percent of sampleable sand samples (see QAPP Section A7.7.8), which is correctly indicated in the introduction to Section B4.2: "Regression model estimates will be confirmed by analysis of 10 percent of the samples from the sampleable sand stratum for percent slag by BSEM." Based upon collection of 57 sampleable sand samples, a total of 6 samples are proposed for BSEM analysis.

5 References

ERM. 2019. Final Quality Assurance Project Plan for the 2019 Phase 3 Sediment Study. Prepared for Teck American Incorporated. Prepared by ERM in association and consultation with HDR, Windward Environmental LLC and Parametrix, Inc. August.

Windward. 2017. Final Phase 2 sediment study data summary and data gap report. Prepared for Teck American Incorporated in Association and Consultation with Exponent, Parametrix, Inc., and HDR, Inc. May.

List of Tables

Table 1 Sampleable Sand Samples from Phase 3 Sediment Study Areas of Interest

Table 2 Rationale for Selected Samples for BSEM Analysis

List of Figures

Figure 1 Zinc Concentrations in Sampleable Sand Samples

Figure 2 Sampleable Sand Stratum Samples Collected at Deadman's Eddy AOI

Figure 3 Sampleable Sand Stratum Samples Collected at China Bend AOI

Figure 4 Sampleable Sand Stratum Samples Collected at Evans AOI

Attachments

Attachment A. Final Phase 3 Sediment Study, Scope of Work for Estimating Percent Slag in Upper Columbia River Sediment Samples Using Backscattered Electron Microscopy. February 2020

TABLES

Table 1. Sampleable Sand Samples from Phase 3 Sediment Study Areas of Interest

AOI	Location ID	Zinc (mg/kg)		Estimated Slag [a] (%)	Gravel (%)	Sand (%)	Mud (%)	Elevation (feet amsl)	Field Sediment Type/Texture	Field Observation: Presence/Absence Silica Glass	Proposed for BSEM Analysis
Deadman's Eddy AOI n = 21	DM002	12200	J	40.17	0.2	99.7	0.1	1260.47	Poorly graded medium grain sand with gravel, sand grain subrounded to round	Yes, 50%	
	DM007	6710		19	0.0	99.9	0.2	1258.88	Fine- medium sand	Yes, 60%	
	DM008	18100		58	0.0	99.1	0.8	1263.79	Poorly graded sand medium grain rounded to well-rounded	Yes, 80%	
	DM010	6030		17	0.0	99.8	0.2	1282.24	Poorly graded medium grain sand, well rounded	Yes, 20%	
	DM015	7520		23	0.1	99.4	0.6	1282.45	Medium grain sand, poorly graded sand, rounded	Yes, 50%	
	DM016	4460	J	13	0.1	99.4	0.5	1274.44	Poorly graded sand, medium grained- well rounded	Yes, 25%	
	DM018	3400	J	9	0.0	99.7	0.3	1277.73	Poorly graded sand, medium grain, well rounded	Yes, 20%	
	DM019	1830		3	0.0	98.4	1.6	1282.05	Fine sand	Yes, Scattered 20%	
	DM020	5700		16	0.1	98.5	1.5	1271.83	Fine to medium sand, trace silt	Yes, Scattered 30%	
	DM022	6540		19	0.4	98.6	1.1	1281.37	Fine to medium sand with trace silt and debris	Present	
	DM023	5060		14	0.0	99.6	0.3	1278.75	Well sorted fine to medium sand	Scattered	
	DM024	3270		9	0.0	99.3	0.7	1280.88	Fine to medium sand	Yes, 30%	
	DM025	8940		28	0.1	99.8	0.1	1276.62	Poor graded sand - medium grained, subrounded-round	Yes, 60%	
	DM026	5410		15	0.1	99.6	0.2	1279.65	Fine to medium sand	Present, Scattered	
	DM027	9070		29	0.0	99.8	0.2	1270.62	Fine to medium sand	Yes, 40%	
	DM044	9720		31	0.3	89.3	10.4	1270.60	Silty fine medium sand. Thin silt layer on top. Very hard crust on of oxidized silica glass underneath with firm sand underneath	Abundant, 50%	
	DM045	2780		7	0.0	62.1	37.9	1269.14	Fine sand with few silt	None	
	DM046	1710		3	0.2	64.5	35.2	1270.27	Fine sand with few silt	None	X
	DM050	3590		10	0.5	66.1	33.4	1266.91	Fine sand with few silt. Trace clay inclusions	Not observed	
	DM057	14300		47	1.1	96.7	2.2	1257.06	Medium sand, trace fine gravel	Yes, Pockets and scattered	
	DM061	2250		5	0.1	78.5	21.4	1280.38	Silty very fine sand	Yes, 25%	
China Bend AOI n = 14	CB002	4220		12	0.0	97.5	2.5	1246.08	Fine to medium sand, trace silt	Present	X
	CB006	7030	J	21	0.0	99.1	0.9	1231.14	Fine to medium sand	Present	
	CB007	1110	J	1	20.4	70.9	8.8	1266.10	Gravelly fine to coarse sand, fine to coarse subrounded to rounded gravel with fine to coarse cobble subrounded to rounded, some silt	Yes, Trace	X
	CB009	14100		46	7.2	88.5	4.4	1231.42	Fine to medium sand, fine to medium gravel - subrounded to rounded, some rounded cobble, little silt	Some	
	CB010	5570		16	1.8	92.6	5.5	1218.71	0-1": Silt, trace fine sand; 1-6": fine to medium sand, trace silt, trace fine, rounded gravel, pockets of rounded, fine to medium sand	Small pockets	
	CB012	6120	J	17	0.0	98.6	1.4	1212.51	Fine to medium sand, trace silt	Yes, In top 2"	
	CB014	12400		41	0.0	99.8	0.2	1159.75	Fine to medium sand	Present throughout	X
	CB016	9210		30	3.7	94.8	1.5	1219.26	Fine to medium sand with subrounded to rounded; fine to coarse gravel, trace; rounded cobble, trace silt	Some	
	CB018	10100	J	33	0.6	97.9	1.5	1218.11	Fine to Medium Sand	Yes, Throughout	X
	CB020	8750		28	0.0	98.5	1.5	1218.17	Fine to medium sand, trace fine, subrounded gravel	Present	
	CB039	18500		59	17.8	82.0	0.1	1223.46	Gravelly medium coarse sand, gravel is subrounded to rounded, some rounded cobble	Yes	

Table 1. Sampleable Sand Samples from Phase 3 Sediment Study Areas of Interest

AOI	Location ID	Zinc (mg/kg)	Estimated Slag [a] (%)	Gravel (%)	Sand (%)	Mud (%)	Elevation (feet amsl)	Field Sediment Type/Texture	Field Observation: Presence/Absence Silica Glass	Proposed for BSEM Analysis
	CB047	9650	31	23.2	76.4	0.4	1234.35	Medium to coarse sand and fine to coarse gravel, subrounded to rounded	Yes	
	JS001	11100	36	0.2	98.1	1.7	1239.05	Fine to medium sand, top 1mm is silty, trace coarse sand below 1mm	Yes, Throughout	
	JS002	15200	49	2.0	96.4	1.6	1248.22	Medium to coarse sand	Yes, Scattered	
Evans AOI n = 21	EV001	19800	62	1.9	97.6	0.5	1202.77	Fine-coarse sand	Abundant	X
	EV002	17200	55	2.5	97.4	0.1	1204.27	Fine - medium sand w/ trace sub-rounded gravel (<1%)	Abundant	
	EV003	12500	41	64.7	35.2	0.2	1200.45	Gravelly medium sand with coarse sand rounded to sub-rounded	Yes	
	EV005	18400	58	0.9	97.2	2.0	1202.75	Silt 0-1 cm olive gray, > 1 cm sand fine to coarse	Present	
	EV008	19300	61	0.2	98.4	1.5	1198.88	Fine - medium sand <1cm layer silt on top	Abundant	
	EV010	13100	43	25.1	73.9	1.0	1202.04	Thin veneer of silt, dark olive brown on top	Yes - Present	
	EV012	9970	32	27.0	72.4	0.6	1200.75	0-1mm dark brown silt, very soft, >1mm fine to coarse gravelly sand, subrounded to subangular	Present	
	EV013	15900	52	16.7	82.5	0.8	1201.00	0-1 mm dark brown silt >1mm black w/brown speckles, gravelly sand, fine to coarse, subangular to subrounded gravels	Present	
	EV026	11500	38	0.3	97.8	2.0	1206.63	Fine to medium sand, trace silt, trace rounded gravel fine to coarse	Yes	
	EV027	14400	47	25.8	74.1	0.1	1202.48	Medium to coarse sand (subrounded to sub angular) with fine to coarse rounded gravel. Trace silt	Yes	
	EV037	17400	56	1.1	98.0	0.9	1205.24	Fine to medium sand w/ 1 cm silt overlying	Abundant	
	EV048	16400	53	5.6	93.5	0.9	1184.35	Fine-medium sand w/ trace sub-rounded coarse sand <1% sub-rounded fine gravel	Abundant	
	EV051	18500	59	4.0	95.2	0.8	1204.59	Fine to medium sand w. few coarse sand. sub-rounded to round	Abundant	
	EV052	16700	54	3.3	95.0	1.7	1206.99	Fine-coarse sand w/trace gravel (~3-5%)	Abundant	
	EV060	18100	58	0.0	99.7	0.3	1205.07	Med Sane, Trace Silt	Yes	
	EV065	19600	61	3.1	96.4	0.5	1206.23	Fine-med SAND w/few R coarse SAND, trace fine gravel <1%	Abundant	
	EV066	19700	62	4.6	93.2	2.2	1205.61	Fine-Med SAND	Abundant	
	EV069	20900	65	1.1	97.1	1.9	1203.90	Fine-med SAND w/ Trace R fine gravel (<1%)	Abundant	
	EV071	20500	64	1.7	97.8	0.6	1198.64	Fine-medium sand	Abundant	
	EV072	20600	64	0.7	96.7	2.6	1204.17	Fine-coarse sand w/trace (<1%) round gravel	Abundant	
	EV075	18200	58	0.2	97.7	2.1	1204.20	0 - 0.2 mm silt w. fine sand, fine-medium sand	Present - Abundant	

Notes:
AOI = Area of Interest
BSEM = backscattered scanning electron microscopy
J = Estimated value
Zinc and grain size results shown are preliminary data.
Total sampleable sand samples, n = 56
Total samples proposed for BSEM analysis, n = 6
[a] Percent slag was calculated for sampleable sand following the equation shown in Phase 3 Sediment Study QAPP Figure B4-1 Segmented Regression Model for Zinc in UCR Sediment.

Table 2. Rationale for Selected Samples for BSEM Analysis

AOI	Proposed Sample Location	Zinc, mg/kg	Percent Slag	Field Observation: Presence / Absence Silica Glass	Rationale for Selection for BSEM Analysis
Deadman's Eddy	DM046 [a]	1710	3.0	None observed	Selected to evaluate non-slag contributions of zinc in low end of regression model.
China Bend	CB007	1110 J	0.8	Yes, Trace	Selected to evaluate non-slag contribution of zinc in low end of regression model and to represent sampleable sand outside of pre-reservoir river channel (above 1250 ft).
China Bend	CB002	4220	11.9	Present	Selected to confirm low % slag for this area of China Bend AOI.
China Bend	CB018	10100 J	32.9	Yes, throughout	Selected to evaluate middle of percent zinc slag prediction model.
China Bend	CB014	12400	40.8	Present throughout	Selected to confirm middle of % slag prediction results using zinc concentration and field note observation.
Evans	EV001 [a]	19800	61.8	Abundant	Selected to confirm high % slag prediction.

Notes:
[a] Duplicate sample mounts will be prepared and analyzed for these samples
AOI = Area of Interest
BSEM = backscattered scanning electron microscopy
J = Estimated value
Zinc results shown are preliminary data

FIGURES

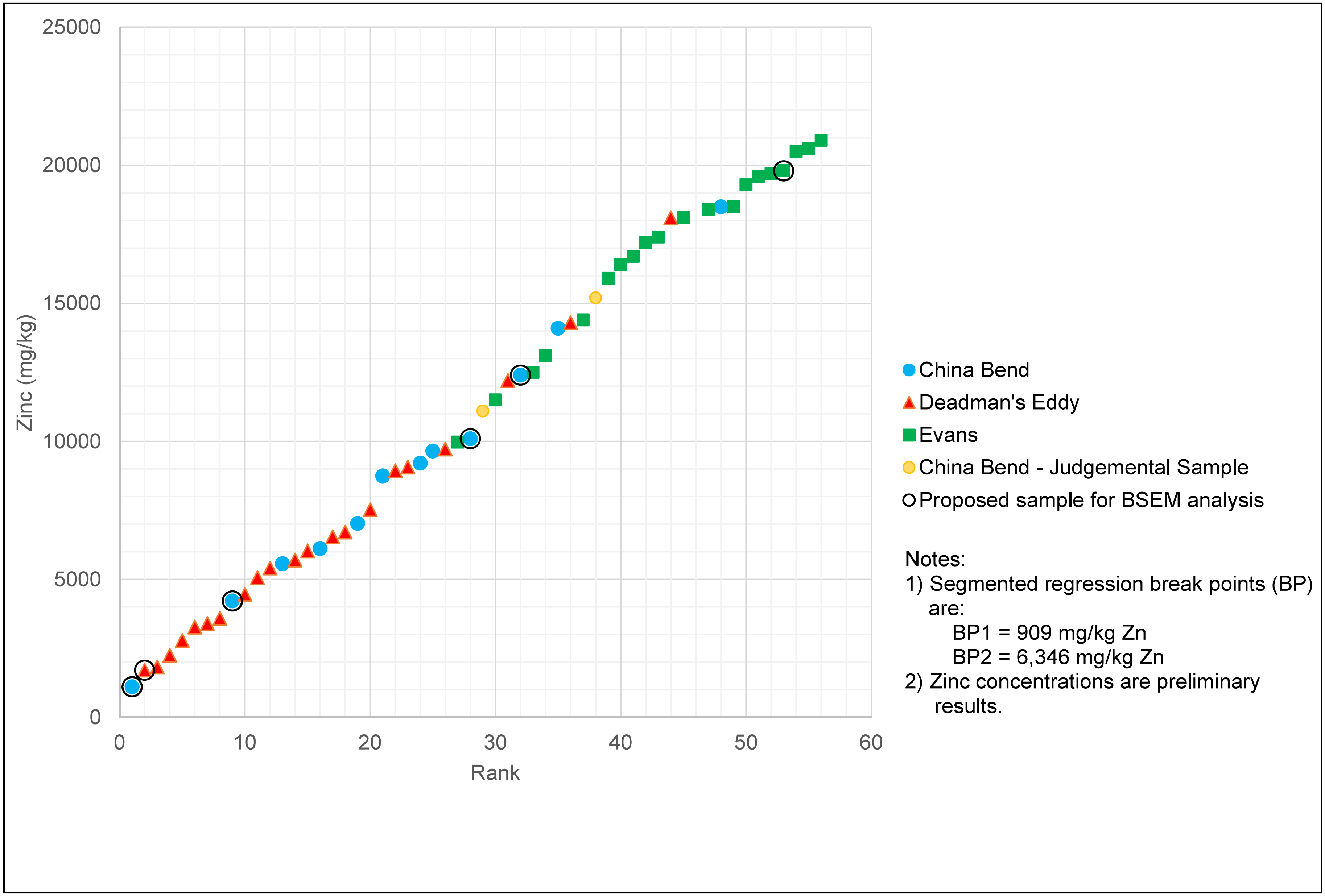
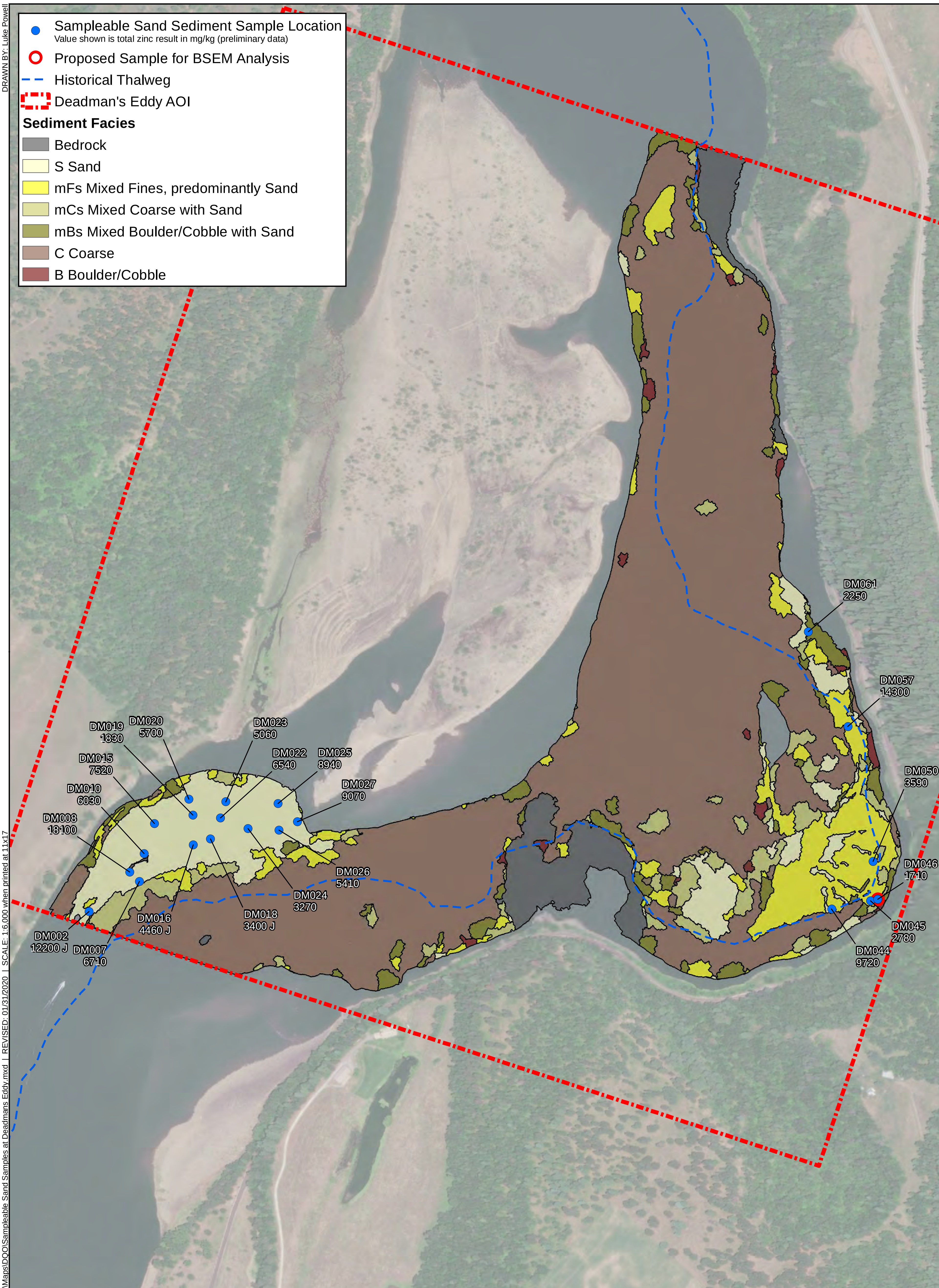
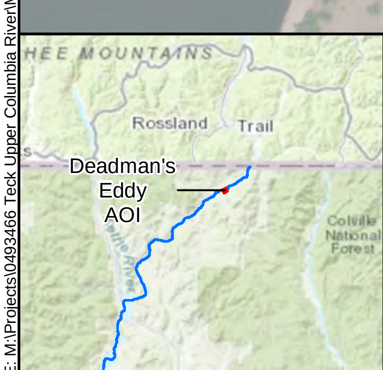


Figure 1. Zinc Concentrations in Sampleable Sand Samples

DRAWN BY: Luke Powell





N

0 500 1,000
Feet

Figure 2
Sampleable Sand Stratum Samples
Collected at Deadman's Eddy AOI
Upper Columbia River, Washington

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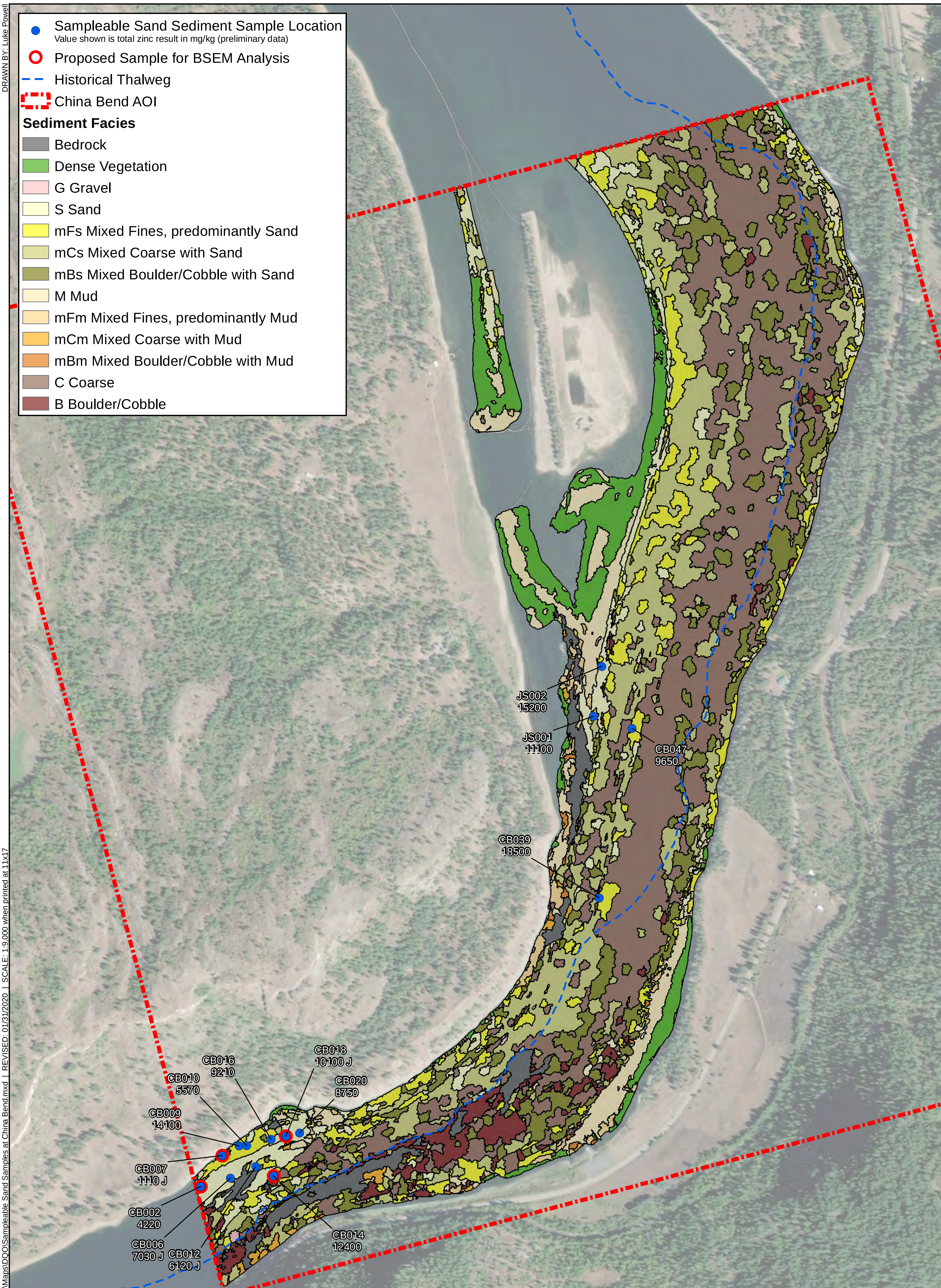
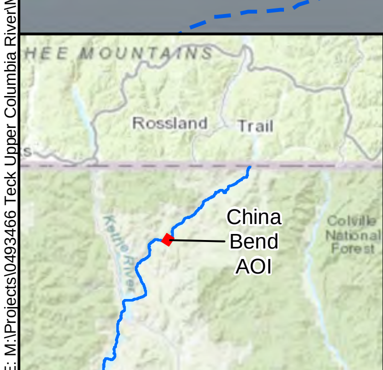
ERM

FILE: M:\Projects\0493466 Teck Upper Columbia River\Maps\DQO\Sampleable Sand Samples at Deadmans Eddy.mxd | REVISED: 01/31/2020 | SCALE: 1:6,000 when printed at 11x17

Source: Esri - World Imagery Web Mapping Service; NAD 1983 2011 StatePlane Washington North FIPS 4601 Ft US





N

0 500 1,000
Feet

Figure 3
Sampleable Sand Stratum Samples
Collected at China Bend AOI
Upper Columbia River, Washington

Environmental Resources Management
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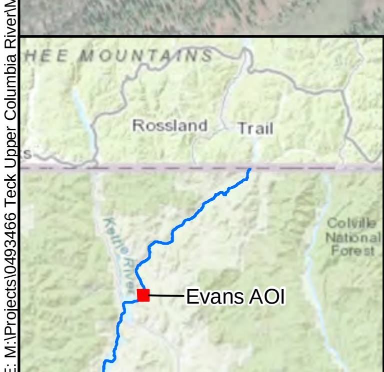
FILE: M:\Projects\0493466 Teck Upper Columbia River\Maps\DQO\Sampleable Sand Samples at China Bend.mxd | REVISED: 01/31/2020 | SCALE: 1:9,000 when printed at 11x17

Source: Esri - World Imagery Web Mapping Service; NAD 1983 2011 StatePlane Washington North FIPS 4601 Ft US



N

0 500 1,000
Feet

Figure 4
Sampleable Sand Stratum Samples
Collected at Evans AOI
Upper Columbia River, Washington

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ATTACHMENT A

RJ LEE GROUP, INC. SCOPE OF WORK FOR ESTIMATING PERCENT SLAG IN UPPER COLUMBIA RIVER SEDIMENT SAMPLES USING BACKSCATTERED SCANNING ELECTRON MICROSCOPY (FEBRUARY 2020)

Phase 3 Sediment Study

Scope of Work for Estimating Percent Slag in Upper Columbia River Sediment Samples Using Backscattered Scanning Electron Microscopy

Submitted to:

Teck American Incorporated

Submitted by:
RJ Lee Group, Inc.
350 Hochberg Road
Monroeville, PA 15146

February 2020

RJLG Project Number TLH910442

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

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Appendix I. *Final Report Characterization of Upper Columbia River Sediment (Phase II) by CCSEM" RJ Lee Group report for Project No. TLH411317 dated March 16, 2017* *14*

Introduction

This scope of work describes the measurement of identified slag in the Upper Columbia River (UCR) sediment using Computer Controlled Scanning Electron Microscopy (CCSEM). This method uses backscattered scanning electron microscopy (BSEM) imaging coupled with energy dispersive x-ray spectroscopy (EDS) elemental analysis performed in an automated analysis mode. Image analysis techniques are used for segmentation of field images. Confirmatory follow-up analysis of selected occurrences is performed using manual SEM techniques.

The procedure for measurement of slag described in this scope of work is comparable to the methods used by RJ Lee Group, Inc. to determine the amount of slag and the slag particle-size distributions in sediment samples during the UCR Phase 2 sediment study in 2014 - 2015. A description of slag composition, and an overview of CCSEM is provided in the “Final Report Characterization of Upper Columbia River Sediment (Phase II) by CCSEM” RJ Lee Group report for Project No. TLH411317 dated March 16, 2017, (Final Phase 2 BSEM Report), which was included as Appendix F to the EPA-approved Final Phase 2 Sediment Study Data Summary and Data Gap Report, May 2017 and is included as Appendix I to this Scope of Work.

Scope and Applicability

This project specific study plan is applicable to the analysis of epoxy impregnated and polished sediment samples that are amenable for CCSEM analysis using BSEM/EDS techniques for high atomic number (Hi-Z) features. Estimates of slag volume in the sample will be calculated based on elemental composition and percent area of particles within the field of rastered (scanned) polished mounts. Rules defining elemental composition of slag are described in the Final Phase 2 BSEM Report.

Summary of Method

Portions of UCR Phase 3 Sediment Study sediment samples selected for BSEM characterization will be mounted in epoxy and polished. The prepared samples will be analyzed using CCSEM techniques to obtain dimensional (e.g., area) and elemental information on a particle-by-particle basis. Particles will be grouped into classes based on elemental composition. Slag percent will be estimated based on relative area percentages of particle types that have the elemental composition(s) consistent with slag, relative to total particle area.

Acronyms

BSEM	Backscattered (scanning) electron microscopy
CAR	Corrective action Request
CCSEM	Computer-controlled scanning electron microscopy
EDS	Energy dispersive x-ray spectroscopy
Hi-Z	High atomic number
KeV	Kiloelectron volts
Low-Z	Low atomic number
RPD	Relative percent difference
SEM	Scanning electron microscope/microscopy
SOP	Standard Operating Procedure
UCR	Upper Columbia River

Health & Safety Requirements

There are no specific health and safety issues related to this study plan that are unique to this project that are outside the normal precautions related to the processing of laboratory samples for electron microscopy analysis. The following internal SOPs are applicable for handling samples within the laboratory:

1.) RJ Lee Group internal SOP GEN.001, General Package Receipt and Good Sample Management Practices.
2.) RJ Lee Group internal SOP SEM.006, Sample Management
3.) RJ Lee Group internal SOP CHSP, Comprehensive Health and Safety Program 4.) RJ Lee Group internal SOP RSP, Radiation Safety Plan

Conditions

In order to prevent microbial growth, samples will be refrigerated until sample preparation activities are performed. Portions of samples to be prepared for BSEM analysis will be dried prior preparing polished mounts.

Samples, including bulk samples, prepared polished mounts, and data will be archived until permission to dispose is granted by the US EPA. RJ Lee Group will store samples for up to one year after issuance of final report. After that time, samples and data will be returned to the client or client's representative for archive.

Interferences

Particles will be classified based on elemental composition information acquired during the CCSEM analysis. The major elements (Fe, Si and Ca) are variable in the slag, and they also are abundant elements in other minerals as well. To preliminarily identify slag particles from other Fe, Si, and Ca containing minerals, relative proportions of the major elements will be displayed in a Fe-Si-Ca ternary diagram. An example of a ternary diagram is presented in Figure 12 of the Final Phase 2 BSEM Report. Based on the Final Phase 2 BSEM Report, the compositional data and images obtained indicate that all slag has combinations of Fe, Si, Ca, and lesser elements at ratios and combinations following rules shown in Table 1:

Table 1 - Preliminary rules used to identify "Slag" and "Altered Slag".

Rule No.	Rule Definition	Slag	Altered Slag.
1	Si+Ca+Fe	>=70	>=70
2	Mg+Al+Si+S+K+Ca+Mn+Fe+Zn	>=94	>=94
3	Si/(Si+Ca+Fe)	0.20 to 0.60	0.15 to 0.65
4	Fe/(Si+Ca+Fe)	0.25 to 0.55	0.25 to 0.70
5	Ca/(Si+Ca+Fe)	0.15 to 0.40	0.02 to 0.15
6	Al	<=10	<=10
7	Mg	<=5	<=5

Manual review of the particles using BSEM/EDS techniques will be performed on a subset of particles by the Technical Lead. Particles that are consistent with slag may be verified based on internal structure and morphology characteristics (e.g., shape, presence of vugs, dendrites, and/or blebs) of the particles.

Personnel Qualifications

All personnel involved with the project will be required to have training as per RJ Lee Group internal SOP: GEN.013, Orientation and Training which includes quality system training, laboratory ethics and confidentiality requirements, and department specific training. Training records for personnel are available for review with the Quality Assurance department.

Any of the analysts performing electron microscopy analyses for the project are required to have received documented training in the operation of the SEM (ref. RJ Lee Group internal SOP: SEM.020, General MSEM Analysis).

A significant amount of knowledge and relevant experience is required in the application of electron microscopy techniques and for the interpretation of results. Technical oversight of this project will be performed by an electron microscopist(s) that has at least a minimum of 10 years of experience characterizing materials using SEM/EDS techniques.

Key personnel designated specifically for this study include:

Keith Rickabaugh, CIH, MBA	-	Project Manager
Stephen Kennedy, PhD	-	Technical Lead/Oversight
George Lincoln	-	Quality Assurance

Mr. Keith Rickabaugh is a Technical Director with RJ Lee Group. He has over 20 years of experience in the planning, implementation and oversight of analytical and field sample protocols for environmental projects. Mr. Rickabaugh has developed analytical procedures and testing programs using the applied sciences and instrumental analysis (including electron microscopy) techniques to characterize particulates. A copy of Mr. Rickabaugh's CV is available upon request.

Dr. Stephen Kennedy is a Senior Scientist with RJ Lee Group and was the principal investigator of the prior UCR Phase 2 Sediment Study. He has over 35 years of experience characterizing a wide range of geological and other materials. These materials include particulates, soils, sediments, sand grains and rock fragments using optical microscopy and electron beam techniques. A copy of Dr. Kennedy's CV is available upon request.

Mr. George Lincoln is the Quality Manager with RJ Lee Group. He is an experienced quality management professional with expertise in establishing and maintaining quality systems in compliance with ISO 17025 while managing a quality assurance team. Mr. Lincoln will have quality review responsibility for the project. A copy of Mr. Lincoln's CV is available upon request.

Equipment and Supplies

Laboratory containers
Laboratory refrigerator
Sieves
Sample mount epoxy (Buehler EpoThin or equivalent)
Sample mounting holder
Rock polishing wheel and abrasive media
Carbon coater system
SEM with EDS system and CCSEM with data reduction/summary capabilities
Carbon, aluminum and copper SEM tape
Image analysis and data reduction software

Instrument Calibration Verification

Monthly SEM calibration verification for size and EDS peak position(s) is conducted as per RJ Lee Group internal SOP: SEM.012, PSEM Performance Verifications and Maintenance. Briefly, the magnification calibration is performed using a Geller Type MRS-3XY Traceable standard to verify that linear measurements are within +/- 5% of specified values at multiple magnifications. The EDS peak position verification is performed by evaluating characteristic x-ray energies in kiloelectron volts (KeV). The analysis of copper tape is used to confirm that the CuKα peak is centered at 8.04 KeV (+/- 0.01 KeV) and the CuLα is at 0.93 KeV (+/- 0.01 KeV).

An EDS spectrum of copper SEM tape is checked for peak position(s) before the analysis of each sample.

Backscatter electron intensity (gray scale level) will be standardized, set and recorded for each sample using carbon and aluminum SEM conductive tape.

Sample Collection

Not Applicable – Samples will be delivered to RJ Lee Group with chain-of-custody documentation in appropriate containers suitable for lab analysis.

Sample Handling and Preservation

Samples will be received following RJ Lee Group internal SOP: GEN.001, General Package Receipt and Good Sample Management Practices.

Upon receipt, samples signed in at corporate receiving and transported to the appropriate department.

In the appropriate department, samples are inspected for integrity.

Samples are logged into a database with a project number and assigned unique laboratory sample numbers along with the provided sample parameter information for tracking purposes.

As-received samples are photographed.

Samples are kept refrigerated until sample mounts prepared.

Work orders are produced for each task.

Sample Preparation and Analysis

Samples are to be prepared, analyzed and results summarized following similar means and methods referenced in the Final Phase 2 BSEM Report. This report was included as Appendix H to the EPA-approved Final Phase 2 Sediment Study Data Summary and Data Gap Report, May 2017 (Windward 2017) and is included as Attachment I to this scope of work.

The following RJ Lee Group internal SOPs are referenced as guidelines for the analyses:

SEM.006,	Sample Management
SEM.020,	General MSEM Analysis
SEM.004,	CCSEM Analysis for the Aspex Personal SEM

The samples will be analyzed by CCSEM techniques which is typically limited to particles less than 2 mm in diameter. The samples will be sieved at 4 mm and 2 mm, resulting in three size splits (Coarse > 4 mm, Medium 4 to 2 mm, and Fine < 2 mm). The mass of each size fraction will be determined gravimetrically.

The fines will be mixed for 2-3 minutes using a Turbula® powder mixer/shaker and then split using cone and quartering techniques. A representative fraction will be epoxy impregnated in a 1.5” to 2.0” square sample mounting ring and polished to reveal particle interiors as a smooth surface for the analysis. These mounts will be photographed prior to carbon coating for the SEM analysis.

Troubleshooting

If any abnormalities are noticed during the sample preparation or analysis portions of the project, staff will be required to immediately contact the Technical Lead for guidance to address any questions. The Technical Lead will then document the occurrence and any actions performed to address the issue. Depending on the nature of the issue, the data may be qualified as deemed appropriate by the Technical Lead.

If the issue is deemed significant and cannot be resolved by the Technical Lead, a formal corrective action request (CAR) will be opened with RJ Lee Group's Quality Assurance Dept. as per RJ Lee Group internal SOP: QSP.011, Corrective Action Reports. Notice of the CAR will be provided to the client as soon as practicable.

Data Acquisition, Calculations & Data Reduction Requirements

The samples are analyzed by CCSEM. The analysis occurs at 20 KeV accelerating voltage in the backscattered electron imaging mode. The CCSEM procedure; 1) acquires a microscopic field image, 2) detects particles based on image brightness, 3) acquires particle periphery for size and shape measures, 4) collects an EDS spectrum to determine elemental composition of that particle, 5) processes each particle in the first field, and 6) continues analyzing additional fields until the entire analyzable area of the prepared mount has been scanned.

During the CCSEM analysis, the area of each particle is measured. Digital images are acquired in backscattered electron (BE) imaging mode (where brightness is proportional to the average atomic number). Because the particles of interest (slag) contain iron, they consist of a relatively high average atomic number and are relatively bright, so a particle detect brightness is set to detect the slag and other relatively bright particles. Bright slag is differentiated from bright non-slag based on composition (rules in Table 1) with additional information of shape and internal texture (e.g., blebs and dendrites).

The analysis of polished sample mounts yields the area of detected particles. The ratio of the area of any phase to the area of all the phases is a consistent estimate of the volume percent of that phase (Jon S. Galehouse, Chapter 16, Point Counting, p 385 – 407, in R.E. Carver, (ed), Procedures in Sedimentary Petrology, Wiley-Interscience, 1971).

The field images are segmented into 1) dark epoxy (e.g., brightness 0 to 70), 2) medium bright low atomic number (Low-Z) particles (e.g., brightness 71 to 170) and 3) bright Hi-Z particles dominated by the slag varieties (e.g., brightness 171 to 255). The objective is to determine the proportion of the particles that are slag. The total examined area of the sample is known. The total area of particles is determined by subtracting the sample area consisting of dark epoxy. The CCSEM analysis, using elemental composition as defined in Table 1, determines the area of the bright particles consisting of slag. The area percent of each identified slag variety is determined by comparing the slag area to the total particle area. Slag area percent by apparent diameter will also be tabulated.

Computer Hardware & Software

Aspex Personal SEM with PC based computer system
RJ Lee Group Proprietary Project Management and Sample Tracking Software
RJ Lee Group Zeppelin Software – Data CCSEM acquisition (ZepRun)
RJ Lee Group Zeppelin Software - Off-line CCSEM summarization tools (ZepSum)
RJ Lee Group Zeppelin Software – Off-line image and EDS review software (ZepView)
Microsoft Excel
MatLab Image Processing Toolbox™
RJ Lee Group Technical Tiff Explorer Software
EDS system with data reduction software with PC based computer system Secure computer network fileserver with data backup capabilities

Sample Selection

Not Applicable – The samples selected for analysis will be designated by Teck American, Inc. as agreed to by EPA.

Data and Records Management

Data and records management will be performed as per RJ Lee Group internal SOP: QSP.013, Record Creation Control Storage.

During the CCSEM analysis, each field image is saved. Images of each particle detected will be obtained and the associated EDS spectrum will be saved as a discrete data object. This provides a record of the analysis and can be used for offline evaluation. The EDS spectra will be saved in a format that allows for offline post processing if needed.

Quality Control and Quality Assurance

Prior to performing analyses of prepared samples, samples will be reviewed by a qualified operator or the Technical Lead to evaluate the suitability of the sample for analysis. This initial review will include the evaluation of particle loading, smoothness of polish and flatness of samples, a cursory scan for the presence of phases of interest and for the presence of any possible contamination.

Prior to the CCSEM analyses, the prepared samples will be marked with two fiducial points that will be used to reference particle locations of features analyzed during the analyses. These points reference the location of the SEM motorized stage using an X and Y coordinate system. The stage location information is recorded during the analysis. The particles can be relocated for further interrogation of particles by an operator immediately after the analysis or later, even if the sample has been removed and reloaded into the SEM.

Based on a preliminary study using CCSEM to measure circles of known dimension on a Geller MRS-3XY traceable standard, the accuracy of the total area measurement for particles of interest is estimated to be 5% relative to the expected value.

A subset of particles will be reviewed manually for each sample to qualitatively verify particles areas determined and the categorization of particles analyzed during the CCSEM analysis.

Corrective Action Procedure

If the Technical Lead suspects that there are any issues with the results, samples will be manually examined in greater detail to determine if additional sample preparations or reanalyses are necessary. All results are subject to expert review and peer review prior to being released for issuance to the client.

Data may be qualified at the Technical Lead's discretion along with a written explanation for the rationale for qualifying results.

If deemed appropriate, the Technical Lead may open a formal corrective action request (CAR) with RJ Lee Group's Quality Assurance Dept. as per RJ Lee Group internal SOP QSP.011, Corrective Action Reports.

Secondary Review

Particle classifications and evaluation of particle groupings will be performed using the same approach used in the Phase 2 Sediment Study.

Reproducibility

Quality control samples including one replicate (reanalysis of a prepared sample) and two duplicates (analysis of a second prepared sample) will be performed out of the six samples anticipated to be submitted for analysis. The samples designated for duplicate analyses will be specified by Teck American, Inc. Summary slag percent values will be determined to compare relative percent difference (RPD) between the analyses. No acceptance criteria have been established for RPD for this study.

In addition, one of the prepared polished mounts from the Phase 2 Sediment Study will be reanalyzed for comparison purposes.

Reporting of Results

The results will be presented in a letter report format and will include: an overview of the procedures used, tables with slag percent values and representative images and EDS spectra to illustrate particles of interest. An internal review of the report and a verification for completeness will be performed prior to issuance of a final report.

Anticipated Schedule

The estimated time of completion for the sample preparation and lab analysis is five to six weeks from sample receipt. The estimated time for data review and initial draft report preparation is two weeks from the completion of the analyses.

References

"Final Report: Characterization of selected Upper Columbia River Sediment (Phase II) by CCSEM" RJ Lee Group report for Project No. TLH411317 dated March 16, 2017 Windward. 2017. Final Phase 2 sediment study data summary and data gap report. Prepared for Teck American Incorporated in Association and Consultation with Exponent, Parametrix, Inc., and HDR, Inc. May 2017

Jon S. Galehouse, Chapter 16, Point Counting, p385 – 407, in R.E. Carver, (ed), Procedures in Sedimentary Petrology, Wiley-Interscience, 1971

Kennedy, S.K., Walker, W.W. and Forslund ,B. 2002, Speciation and Characterization of Heavy Metal Contaminated Soils using Computer-Controlled Scanning Electron Microscopy, Environmental Forensics, v. 3, p131-143.

Kennedy, S.K., Casuccio, G.S., Lee, R.J., Slifka, G.A. Ruby, M.V., Microbeam Analysis of heavy element phases in polished sections of particulate material – An improved insight into origin and Bioavailability, in Sampling Environmental Media, ASTM STP 1282, James Howard Morgan, Ed., American Society for Testing and Materials, 1996, p. 317-328.

APPENDIX I

"Final Report: Characterization of selected Upper Columbia River Sediment (Phase II) by CCSEM" RJ Lee Group report for Project No. TLH411317 dated March 16, 2017   Windward. 2017. Appendix F to the Final Phase 2 sediment study data summary and data gap report. Prepared for Teck American Incorporated in Association and Consultation with Exponent, Parametrix, Inc., and HDR, Inc. May 2017

March 16, 2017
Dave Enos, LHG, RG
Manager, Dormant Properties
Teck American Incorporated
501 N Riverpoint Blvd, Suite 300
Spokane, WA 99202

RE: Final Report:
Characterization of selected Upper Columbia River Sediment by CCSEM (computer-controlled scanning electron microscopy)
RJ Lee Group Project Number TLH411317

Dear Mr. Enos:

This letter summarizes results of computer-controlled scanning electron microscopy (CCSEM) in the backscattered electron (BE) imaging mode, incorporating energy dispersive spectroscopy (EDS), performed for the Upper Columbia River (UCR) remedial investigation study identified as "Phase 2 Sediment Study" for the 42 samples received from Teck American Incorporated (TAI) on December 11, 2014. The sediment samples are listed in Table A1 (Tables identified with a leading "A" are provided at the end of this report), with the RJ Lee Group (RJLG) sample ID and information provided to RJLG (TAI Sample number, and River mile). The purpose of the analyses was to determine the amount of slag and the slag particle-size distributions in the samples.

Introduction

Slag Composition

The morphology and composition of glassy slag particles found in sediments in the UCR have been described by Cox et al. (2005).[1] Cox et al. (2005) describe the matrix of slag particles as "a glassy calcium-iron-silicate with varying amounts of aluminum", which is illustrated as a glassy particle in their Figure 11A. These previous descriptions of composition and texture of slag in UCR sediments are used in this study to generally define the characteristics with which to identify the glassy slags found in sediments in the UCR. Crystalline byproducts of smelting, including crystalline slag varieties if any, are not identified in this study. The major elements in the glassy slag are Fe, Si and Ca, with a minor amount of Al. Also commonly present in smaller amounts in some of the particles were Zn, Na, Mg, Mn, Cu and K. Among the morphological features displayed by some glassy slag particles are "rounded and angular features often with needle-like projections, conchoidal fracture patterns, and small cavities or vugs" (Cox et al.

[1] Note that Cox's report assumed that all slag found in the UCR had been discharged by the Trail smelter in Trail, British Columbia; the report does not reference Le-Roi/Northport smelter in Northport, Washington, which also discharged slag to the UCR, copper smelting in the area, or potentially other slag sources.

2005). Some of these features are shown by example in Figure 1 and 2. (The scanning electron microscope (SEM) images acquired in the project consist of two backscattered electron images. The upper-left image is at a low magnification and contains a small square outlining magnified image to the right. The EDS spectrum acquired at the location of the small box is shown at the bottom. If the particle was previously analyzed by CCSEM, the CCSEM particle number and the CCSEM micro image are also displayed.) Some glassy slag particles display internal texture including spherical or near-spherical blebs (commonly sulfur-bearing phases), or dendritic structures (commonly iron oxides and oxyhydroxides) (Cox, et al., 2005, Figure 12B and 12C) as shown in Figures 3 and 4. Cox et al. (2005) also noted that some slag particles have a "flaked surface" of weathering rinds, and Cox reported compositions showing a reduction of the "often-mobile" calcium and iron. Figures 5 and 6 show a core and "weathering rind" respectively.

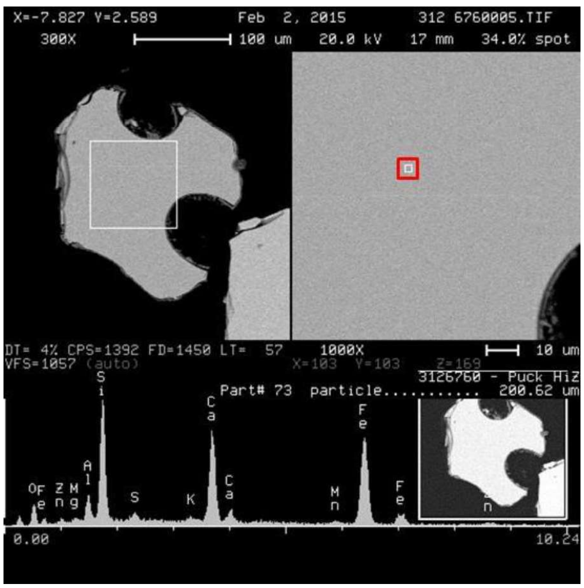

Figure 1 – Backscattered electron (BE) images and EDS spectrum of glassy slag showing characteristic morphology and composition (Sample SE-3-C1, 3126760).

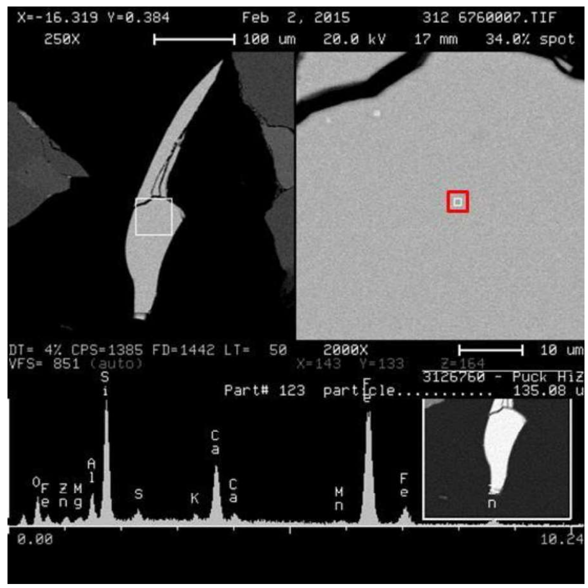

Figure 2 – BE images and EDS spectrum of glassy slag showing characteristic morphology and composition (Sample SE-3-C1, 3126760).

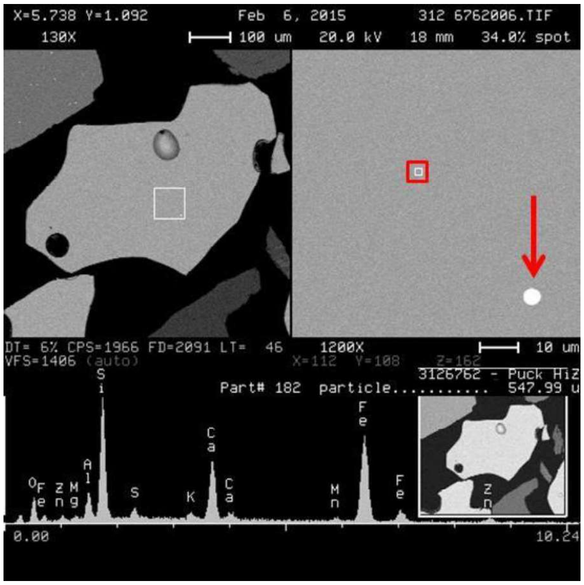

Figure 3 – BE images and EDS spectrum of slag matrix with a bleb texture (arrow). (Sample SE-3-B4, 3126762).

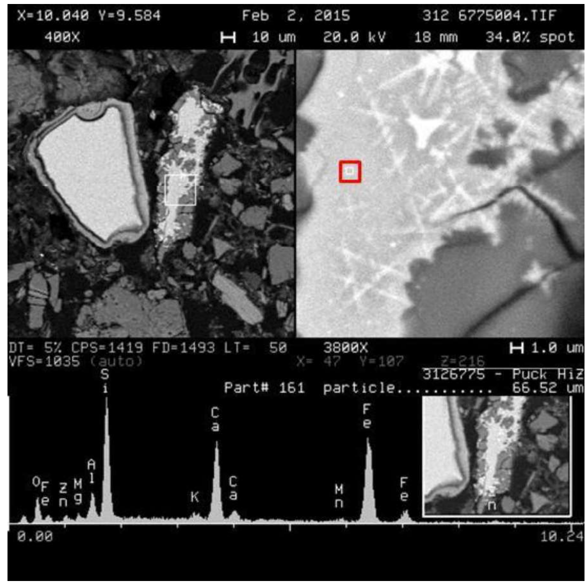

Figure 4 – BE images and EDS spectrum of slag matrix with a dendritic texture. (Sample SE-4-C4, 3126775).

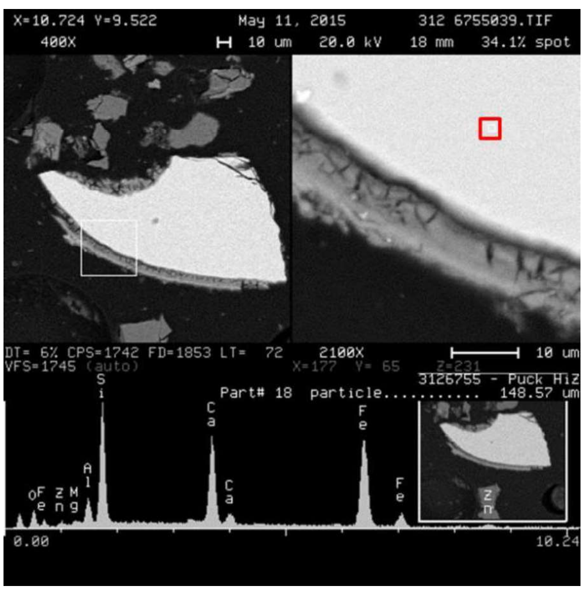

Figure 5 – BE images and EDS spectrum of pristine slag core of particle 18 in Sample SE–2-R3 (3126755).

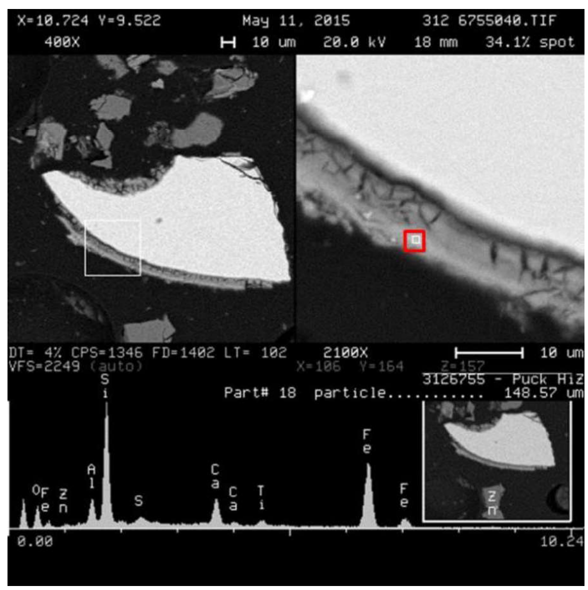

Figure 6 – BE images and EDS spectrum of altered slag rim of particle 18 in sample SE–2-R3 (3126755).

Overview of CCSEM

The SEM works by rastering a beam of electrons over a sample. The interaction between the electron beam and the sample causes some beam electrons to be scattered back off the sample (backscattered electrons, BE). These backscattered electrons can be detected, and an image is then created in 256 shades of gray. Computer-controlled SEM analysis operates on the principle that in the BE imaging mode, features have a brightness that is proportional to the average atomic number of that feature. In the polished epoxy mounts, the epoxy background is darker than the particulate (except for carbon or other light element materials), allowing particles to be identified using image analysis techniques by setting a particle threshold brightness value between the dark epoxy and the bright mineral.

In the analysis, the SEM computer directs scanning and acquires a BE image of the first field, which is saved electronically. Figure 7A shows the first low magnification (25x) field image. The image is interrogated and the first particle is detected. Figure 7B shows a detected particle. Once detected, its periphery is determined, and size and shape descriptors are calculated using image analysis (IA) procedures. In addition, x-rays are generated by the interaction of the electron beam and the particle, resulting in an x-ray energy spectrum. Each element has a characteristic EDS spectrum; the location and shape of peaks are used to identify that element. The particle size, shape and composition data are tabulated in an electronic file. In addition, a "zoomed in" image (microimage) of the particle and the 2048 channel EDS spectrum is saved for each particle as a TIFF file. The analysis continues until all particles in that field are analyzed, and additional fields are analyzed until a stopping criterion is met, which is either total area or total time and is based on the professional judgment of the analyst. The magnification is changed to a high magnification (200x), and additional fields (Figure 7C) are inspected and particles characterized (Figure 7D) until that stopping criterion is met. In this study, the low magnification analysis was stopped when all fields in the sample were inspected. The higher magnification inspection continued for a total of 2 hours, and the number of fields analyzed ranged from 187 to 617 (Table 1).

Table 1 – Number of fields analyzed, area analyzed and number of particles detected at the low magnification and high magnification analysis of each sample. The stopping criterion for the low magnification analysis was all fields and the stopping criterion for the high magnification analysis was 2 hours.

		Low Mag			High Mag		
RJLG ID	Client ID	Fields	Area (mm^2)	Particles	Fields	Area (mm2)	Particles
3126743	SE-LAL-5	16	202.322	16	341.00	67.275	885
3126744	SE-1-R5	16	202.322	249	402.04	79.435	512
3126744R	SE-1-R5	16	202.322	293	390.52	77.159	376
3126745	SE-1-R1	16	202.322	446	277.38	54.804	963
3126746	SE-1-R2	16	202.322	327	440.00	86.935	341
3126747	SE-1-B5	16	202.322	439	187.00	36.927	1084
3126748	SE-1-R8	16	202.322	369	257.47	50.872	1000
3126749	SE-1B-R3	16	202.322	265	328.78	64.96	562
3126750	SE-1B-C3	16	202.322	324	252.02	49.795	840
3126751	SE-1B-C1	16	202.322	376	190.68	37.675	783
3126752	SE-2-B1	16	202.322	48	565.00	111.633	200
3126753	SE-2-B2	16	202.322	245	410.02	81.013	516
3126754	SE-2-R1	16	202.322	608	301.73	59.615	699
3126755	SE-2-R3	16	202.322	169	246.50	48.704	1001
3126756	SE-2B-R1	16	202.322	189	284.48	56.208	567
3126757	SE-2B-C4	16	202.322	340	437.02	86.347	293
3126758	SE-2B-C3	16	202.322	184	356.46	70.429	748
3126759	SE-3-B1	16	202.322	392	361.55	71.436	537
3126760	SE-3-C1	16	202.322	197	238.62	47.146	1055
3126761	SE-3-B2	16	202.322	538	381.02	75.283	356
3126762	SE-3-B4	16	202.322	362	335.23	66.234	631
3126762R	SE-3-B4	16	202.322	414	330.02	65.206	480
3126763	SE-3-R7	16	202.322	392	411.02	81.21	348
3126763R	SE-3-R7	16	202.322	438	320.29	63.284	509
3126763R2	SE-3-R7	20	252.903	432	331.29	65.455	437
3126764	SE-3-R8	36	455.225	648	348.02	68.763	412
3126765	SE-3-R10	16	202.322	837	280.02	55.327	720
3126766	SE-3-R9	16	202.322	127	412.03	81.408	589
3126767	SE-3-C4	16	202.322	310	395.02	78.049	428
3126768	SE-3B-C3	16	202.322	423	402.28	79.483	336
3126769	SE-4-R1	16	202.322	323	289.02	57.105	778
3126770	SE-4-B1	16	202.322	347	364.43	72.004	475
3126771	SE-4-B6	16	202.322	534	338.61	66.903	520
3126771D	SE-4-B6	16	202.322	520	334.45	66.081	417
3126771R	SE-4-B6	16	202.322	425	280.51	55.424	635
3126772	SE-4-B2	16	202.322	413	405.02	80.025	330
3126773	SE-4-B4	16	202.322	347	292.89	57.869	704
3126774	SE-4-B5	16	202.322	216	335.83	66.353	611
3126775	SE-4-C4	16	202.322	3	274.84	54.304	828
3126776	SE-4B-C3	16	202.322	0	279.31	55.186	991
3126777	SE-REF-3	16	202.322	6	447.24	88.366	493
3126778	SE-5-B2	16	202.322	0	516.78	102.105	322
3126779	SE-5B-C1	16	202.322	0	572.02	113.021	181
3126780	SE-6-B4	16	202.322	0	540.24	106.74	295
3126781	SE-6B-C4	16	202.322	25	386.00	76.266	200
3126782	SE-7-B1	16	202.322	1	596.56	117.869	88
3126783	SE-8-B3	16	202.322	0	616.71	121.849	23
3126784	SE-8B-C2	16	202.322	23	380.05	75.091	637

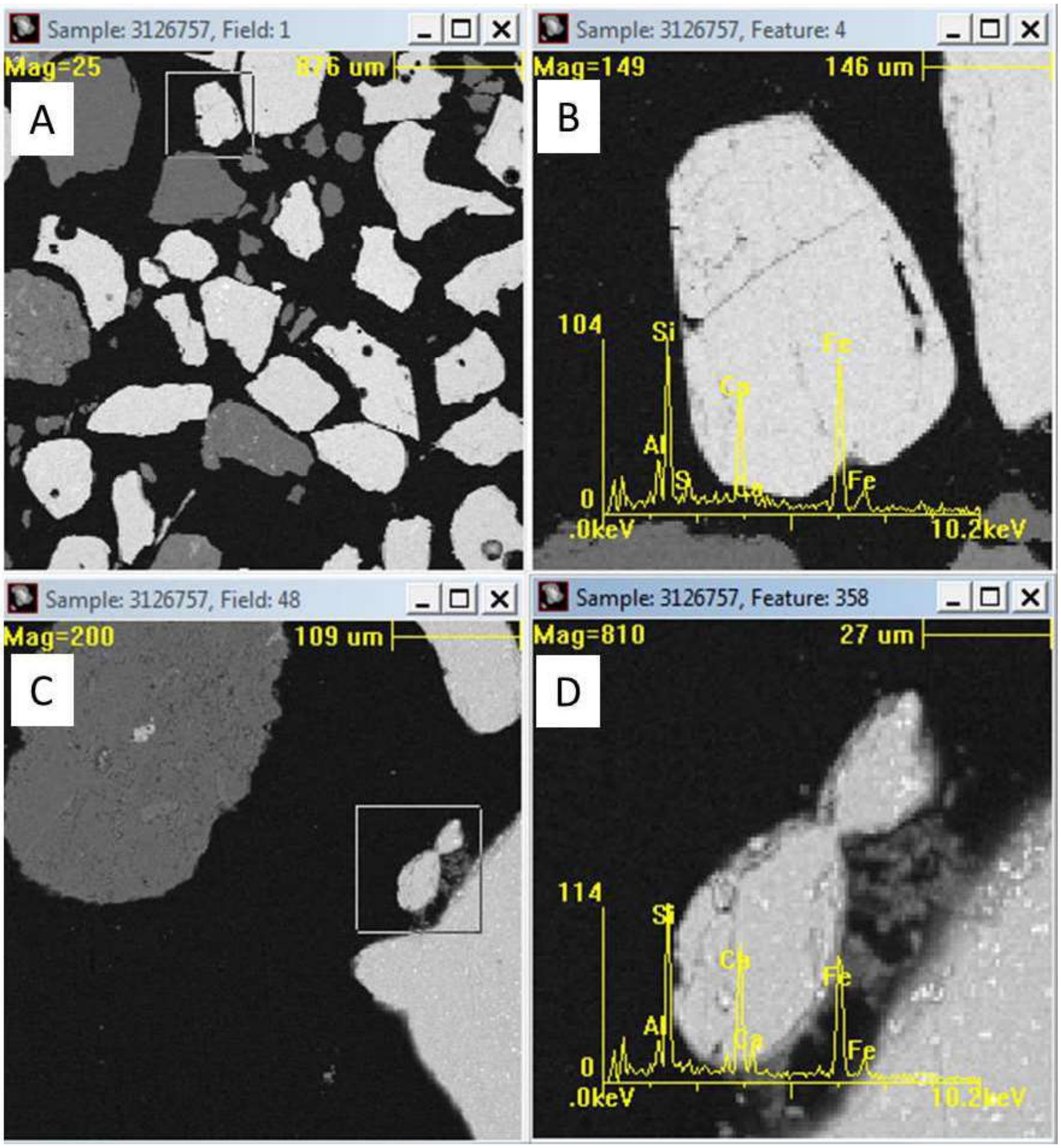

Figure 7 – Illustrates low magnification field (A) and a detected particle with EDS spectrum (B), and high magnification field (C) and a detected particle with EDS spectrum (D).

Where the material of interest is composed of relatively higher atomic number elements, a threshold brightness value can be selected to ignore the background (epoxy) and the relatively low atomic number particles (e.g., quartz, feldspar, etc.), thus increasing the number of the brighter particles of interest that can be analyzed in a given amount of time. This is referred to as a High-Z analysis where Z refers to atomic number.

When High-Z analysis is conducted, CCSEM analysis then requires that an appropriate image brightness and contrast be obtained, and that an appropriate image brightness threshold value be selected. This threshold value must be lower than the particles of interest. In a conservative setup, this value can be considerably lower than the intended particle type and still be effective in excluding the majority of the particles that are not of interest.

The data tabulated in the CCSEM analysis are used to classify particle types. In the case of unknown particle types, the general procedure is to construct preliminary rules for classification. After this classification, the data are reviewed and the rules modified if necessary until the analyst is satisfied that the classification is done correctly. For example, assume rules are being written to characterize particle class X. All compositional data for the particles satisfying the first iteration rules are displayed, as well as compositions that are outside the rules. The various elements defining that class are sorted from large to small. If the composition of an excluded particle is part of a compositional continuum with the particles in that class, and the morphological characteristics are consistent with that class, the rule is expanded to include particles of that type.

Procedures – Data Acquisition

Sample Preparation

The samples were received wet in glass jars in a cooler packed with ice. The jar containing sample SE-1-R5 (3126744) was broken, but the sample did not appear to be compromised. Each sample was assigned an RJ Lee Group identification number and logged into the RJ Lee Group database. The samples were stored under refrigeration (3-5°C) until preparation. Preparation was accomplished by removing a sample from the refrigerator and drying it overnight at 110° C. The dry sample was screened at 4 mm, and the retained +4 mm material was weighed; these weights are presented in Table A2. The volume of the passing fraction was reduced using a channel riffle splitter with 6 mm-wide channels in order to obtain a small volume subsample suitable for mounting. Each volume reduction was performed twice and quarters were combined. The reduced-volume sample was sieved using a number 10 mesh (2 mm) screen and the coarse (+2 mm) and fine (-2 mm) fractions were weighed. The weight percentages are shown in Table A2. Because it is difficult to collect a representative sample of the very coarse material that occurs in very small numbers, the coarsest fraction (+4 mm) is not included in the normalized percent of the -4 to +2 mm and -2 mm fractions in that table.

In this study, the -2 mm fraction particulate was prepared as a polished mount. A polished sample mount yields a more consistent EDS signal and a better estimate of volume than a strewn particle mount, and exposes particle interiors to inspection. The -2 mm fraction was mixed with epoxy, placed into a square mounting "ring" and allowed to cure overnight. The hardened mount was polished using a series of grits to as fine as 3 μm. This sample mount was photographed and given a thin coating of carbon under vacuum to provide a path to ground and to eliminate charging effects while under the electron beam. Carbon and aluminum tape was affixed to each sample mount for calibration purposes. Material from both coarse fractions was retained for optical and SEM examination and archived.

CCSEM Analysis Design for UCR Sediment

General

The High-Z CCSEM analysis was performed on the polished mounts of -2 mm particulate. The analysis was performed at two magnifications. The entire sample was scanned at a magnification of 25x, in which particles larger than 125 μm in diameter were characterized.

Randomly selected fields were also scanned an additional 2 hours at a magnification of 200x, in which particles larger than 15 μm were characterized. Various size and shape measures were automatically collected and written to an electronic file along with chemical composition, the EDS peak area percent for identified elements. It should be noted that all chemical percentages in this report are based on the relative peak area of the various elements. Although peak areas relate to actual chemical abundance in a general way, this measure does not provide weight percentages for the components. The peak area percentages of the EDS spectrum may be processed by adjusting for the effects of atomic number, absorption and fluorescence (ZAF) to obtain an estimate of weight percent. It should be noted, however, that this procedure does not improve the ability to distinguish among particles of different chemical compositions.[2]

The CCSEM analysis was performed on an Aspex PSEM 2000 with an accelerating voltage of 20 KeV, a beam current of 30-35 nA and a drive of 7-8 V in the BE imaging mode. A brightness threshold was used to categorize particles into relatively lower and relatively higher average atomic number. The relatively low atomic number particles included minerals such as quartz and feldspar, with average atomic numbers around 10.0 to 10.6. The threshold defining relatively high average atomic number particles was selected just above the brightness of feldspar. The relatively high atomic number particles included slag and other materials (e.g., biotite and hedenbergite with average atomic numbers from 11.4 to 12.2), which were then detected and sized (linear dimensions and area). Elemental compositions (EDS peak area percent) of relatively high atomic number particles were determined using EDS in the raster mode. Elements analyzed were Na, Mg, Al, Si, P, S, Cl, K, Ca, Ti, Cr, Mn, Fe, Zn, Zr, and Ba, which include the major and minor elements in the glassy slag and the elements in common mineral types in the river sediment. The size and compositional data (EDS peak area percent by element) were saved to a file for summarizing.

Magnification and Particle Size

The results obtained using the two magnifications were prorated based on the relative area analyzed and combined. Because the area analyzed at the higher magnification was less than that analyzed at the lower magnification, the high magnification data were normalized to the larger area of the low magnification. For example, for sample SE-2-R3 (1326755), 202 μm^2 was analyzed at the low magnification and 49 μm^2 was analyzed at the high magnification. Because 4.1 times the area was analyzed at the low magnification, the high magnification data were scaled up by that amount before being combined with the low magnification data.

Image Brightness and Contrast

Preliminary inspection of prepared sample mounts revealed brightness contrast settings that would allow the relatively low brightness (e.g., quartz or feldspar) particles and the relatively high brightness particles (e.g., iron-bearing phases) to be distinguished. Once the brightness and contrast settings were adjusted for optimum imaging, the image intensity (which ranges from 0 to 255) for carbon tape and aluminum tape were determined to be 30 and 150 respectively (See Figure 8A). Carbon and aluminum tape fixed to each sample were used to set

[2] Chemical compositions do not suffice as a proxy for this method of identifying slag content. Taken by themselves, none of the rules are sufficient to distinguish slag.

brightness and contrast for all subsequent analyses to assure image consistency among all analyses.

Particle Detect Threshold Brightness Value

A conservative brightness threshold value was selected at 150, just above feldspar, so the slag (and other compositions) will be detected. Figure 8B shows a brightness line scan passing over three particles. The first particle is above threshold and will be detected. Figure 8C shows the composition and texture of slag. The second particle is above threshold and will be detected. It is a rock fragment consisting of an iron-bearing aluminosilicate (Figure 8D), feldspar and chlorite. The third particle is below threshold and will not be detected. It is a two-phase particle consisting of feldspar (Figure 8E) and quartz.

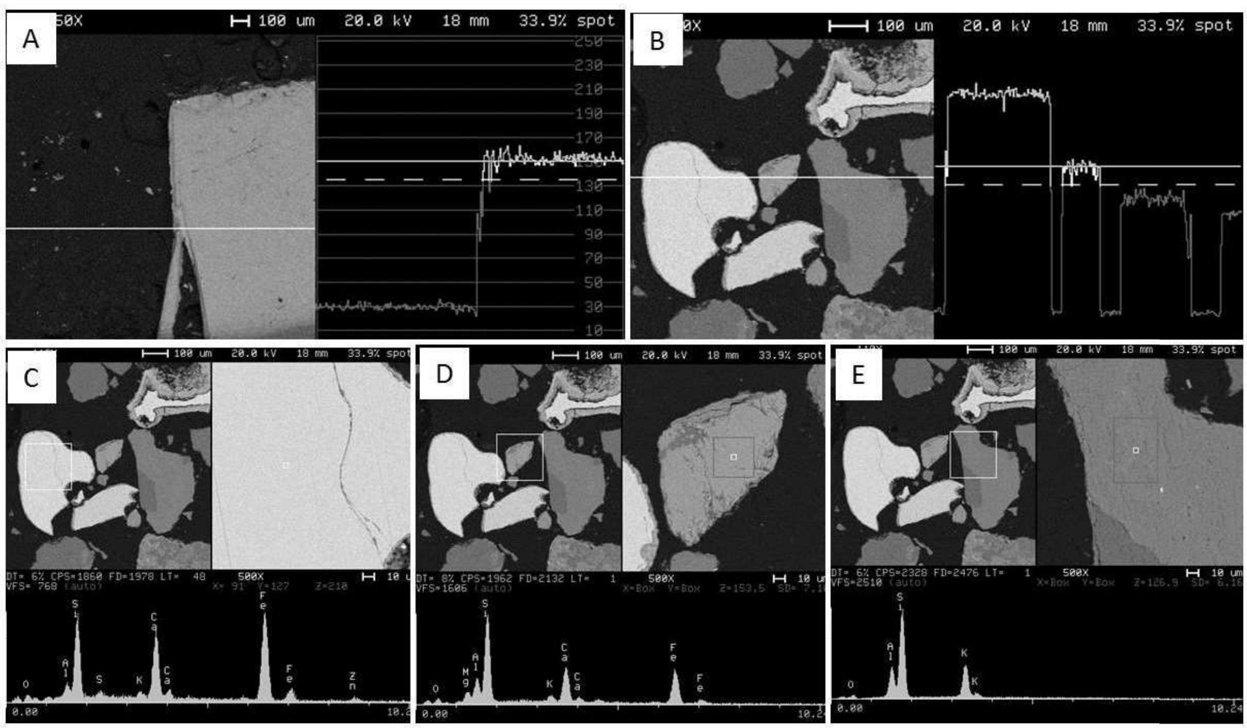

Figure 8. A shows a line scan of brightness across carbon (left) and aluminum (right). B shows a line scan of brightness across three particles. C, D and E are images and EDS spectra illustrating the morphology and composition of the three particles described in the text.

Post-CCSEM Analysis Review.

After the CCSEM analysis was completed, selected particles were analyzed in the manual mode to document representative particles. This quality assurance step was based on the professional judgment and at the discretion of the analyst. Typically, 10 or more slag particles were reviewed for each sample. To select particles for review, the tabulated particle compositional data were sorted to identify particles rich in Si, Ca and Fe. Every nth (approximately) particle was selected for review where "n" was selected based on the number of particles identified. For example, approximately every thirtieth particle in sample SE-1-R2 (3126746) was reviewed.

Procedures – Characterization of Glassy Slag

Once the particle-by-particle data were acquired, rules were written to define the particle types, and the overall abundances of those types. Size distributions for all particles in each class also were determined.

Definition of Glassy Slag and Altered Slag

After the CCSEM analysis was complete, the stored data were processed for particle type identification. The major elements (Fe, Si and Ca) are variable in slag, and they also are abundant elements in other minerals as well. To distinguish glassy slag particles from other Fe, Si, and Ca-containing minerals, relative proportions of the major elements were displayed in a Fe-Si-Ca ternary diagram. Review of the tabulated compositional data and the particle shape and internal texture displayed in SEM images for this study (although not all slag in the UCR) indicates that all glassy slag identified in this study has the combination of Fe, Si and Ca at 70 EDS peak area percent or more. Particles that fit this compositional threshold were plotted in a ternary diagram (Figure 9), where normalized Fe, Si and Ca are the apices. This ternary plotting was conducted on five samples which, based on the professional judgment of the investigator, represented slag presence in the sample set. This diagram shows the structure of the compositional data from one sample (SE-2-R3, 3126755) (used as an example for illustrative purposes). Cluster A includes particles that are over 60% Fe, and review of representative images indicate that these particles are not slag. Clusters B and C are mostly silicate minerals with a small amount of iron and higher in aluminum, such as amphibole, pyroxene or garnet. These particles show morphology and internal texture of minerals illustrated in Figure 10. However, there are particles in the region of these clusters that display the morphology and internal texture of slag such as those illustrated in Figures 1 to 4. The particles in Cluster D all display the morphology and internal texture of a slag with a composition distinct from minerals. The literature (e.g., Cox, 2005) suggests that altered slag should plot to the left of the main slag cluster (see arrow, Figure 9).

In order to assess the composition of altered slag, 20 particles of slag with one or more alteration rims were analyzed by manual SEM (MSEM) techniques. These normalized compositions are plotted in the ternary diagram in Figure 11. Note that the altered slag is reduced in calcium compared to Slag1, but not in iron. Of the 30 “altered” slag compositions, the five circled rims were low in average atomic number and would not be detected in a High-Z CCSEM analysis. No attempt was made to quantify the proportion of relatively low atomic number altered slag particles that may have been missed for all samples due to low brightness. However, five of the 30 examples in Figure 11 were not selected based on brightness (i.e., 17%), so this may be a first approximation. The locations of the remaining compositions in the Fe-Si-Ca ternary diagram were used to define the differentiation between slag and altered slag. It should be noted that in the CCSEM analysis, the EDS spectrum is acquired from the entire defined particle. If a thin alteration rim is present, the composition will not be sufficient to push the composition sufficiently to the left in the ternary diagram to be defined as Altered Slag. To be identified as Altered Slag, the particle is most likely a spalled alteration rim or a slag particle that most of its sectioned area has been altered.

To create rules that can classify the slag in all the samples, preliminary rules were written to define the dominant slag (referred to as "Slag1" in this report) at Cluster D in Figure 9, the Altered Slag to the left of Cluster D, and the slag interspersed with minerals in the region of Clusters B and C (referred to as "Slag2" in this report). Particles near the edges of the defined Fe-Si-Ca clusters were inspected to determine if the inside particles belonged to that cluster class and that the outside particles should be excluded and the rules were adjusted if appropriate. This procedure was repeated as additional samples were acquired until a stable solution was achieved. The rules are summarized in Table 2 and illustrated in the ternary diagram of Figure 12.

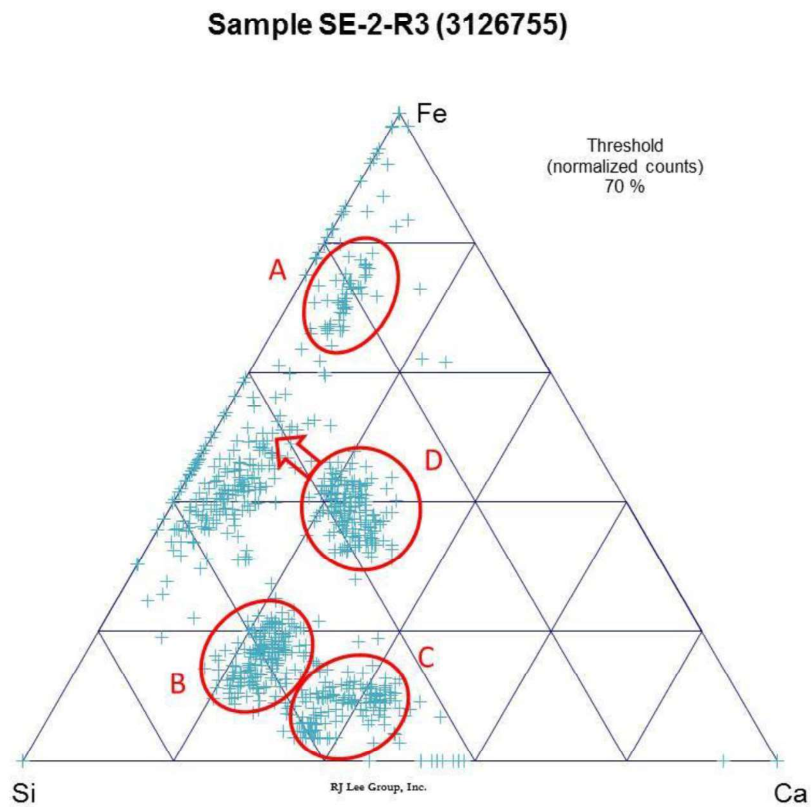

Figure 9 – Ternary diagram showing the relative proportions of Si, Ca, and Fe of all particle having a total of 70 EDS peak area percent or more for the CCSEM analysis of sample SE-2-R3. A is iron-rich particles, B and C are minerals with some Slag2 (similar to Slag1 but lower Fe concentration), and D is the major slag composition. The arrow points to the direction of alteration by calcium reduction.

The identification of Slag2 was more complicated in that its composition overlapped minerals. The image and spectrum of each particle assigned to that class was inspected and particles displaying the texture of minerals (see Figure 10) were rejected. Because the internal texture was required for positive identification of the Slag2, the small particles in the second magnification (less than 125 um diameter) were not considered. Based on the data acquired for Slag1, this would under-report Slag2 by about 2% by volume (See Table A3).

Finally, rare occurrences of a chromium slag (Slag3 in this report) were observed. A representative image and spectrum for the three slags are shown in Figure 13.

The rules defining each slag are shown in Table 2. Each rule consists of multiple components describing a complex composition. The components include: A] the total of major elements (component 2) B] elemental totals (components 3 and 4), C] Individual major elements (components 5 to 10) and D] minor elements (components 11 to 14). Slag2 also requires analysis at the low magnification (25x) only.

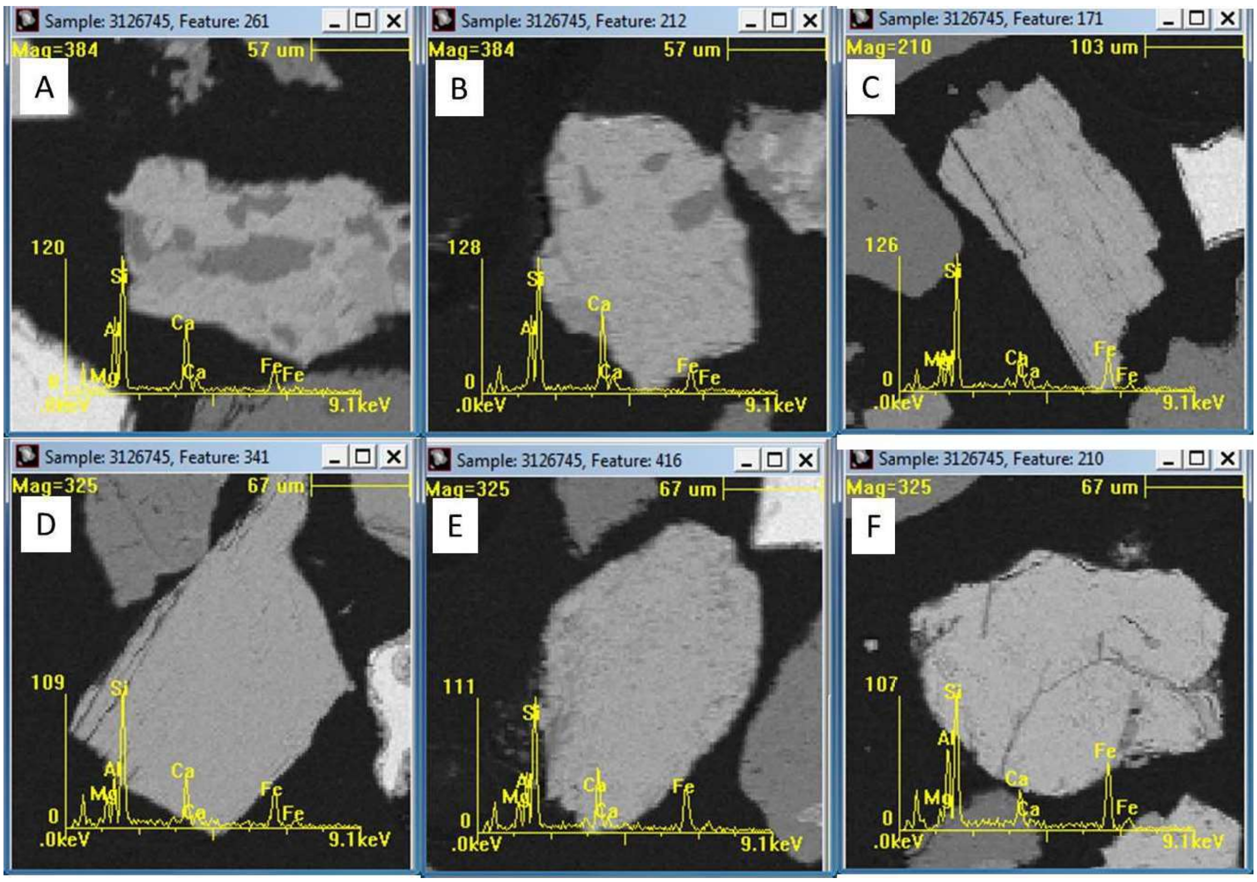

Figure 10. BE images and EDS spectra of non-slag SiCaFe-rich particles. A and B display multiple components of a rock fragment. C and D show parallel surfaces or internal cracks, E shows fine scale internal texture and F shows internal cracking.

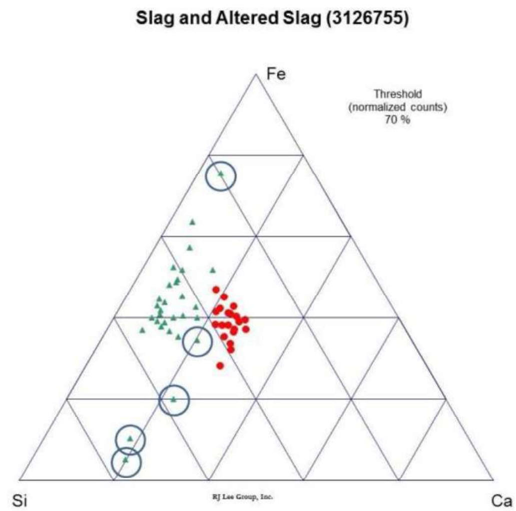

Figure 11 – Ternary diagram showing the EDS peak area percentages of Si, Ca and Fe of slag cores (red circles) and altered slag rim (green triangles) as determined by MSEM. The altered slag with circles have low image brightness and would not be detected in the CCSEM analysis.

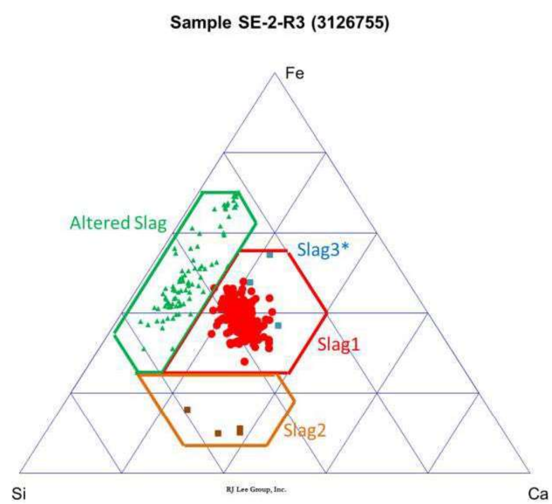

Figure 12 – Ternary diagram showing the EDS peak area percentages for three particle types in sample SE-2-R3 (3126755). The data for the rare Slag3 were derived from different samples.

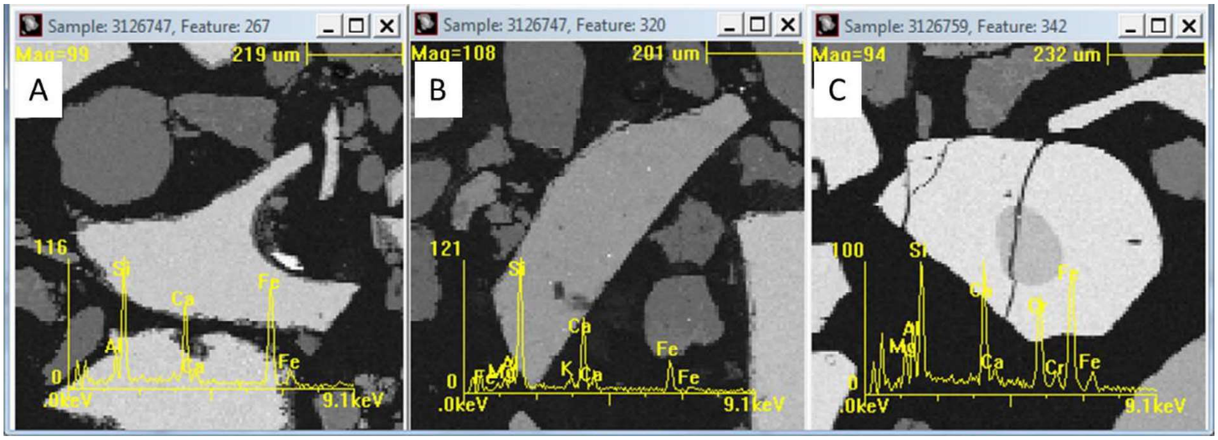

Figure 13 – Representative images of Slag1 (A), Slag2 (B), and Slag3 (C).

Table 2 - The rules used to identify various Slags. The values are EDS peak area percentages, or ratios of those percentages.

Rule Component	Rule Definition	Slag1	Altered Slag	Slag2	Slag3
1	Magnification	-	-	25x	-
2	Si+Ca+Fe	≥70	≥70	-	-
3	Mg+Al+Si+S+K+Ca+Mn+Fe+Zn	≥94	≥94	≥94	-
4	Mg+Al+Si+Ca+Cr+Fe	-	-	-	≥90
5	Si/(Si+Ca+Fe)	0.20 to 0.60	0.15 to 0.65	0.38 to 0.65	
6	Si	-	-	-	12 to 22
7	Fe/(Si+Ca+Fe)	0.25 to 0.55	0.25 to 0.70	0.07 to 0.41	
8	Fe	-	-	-	19 to 40
9	Ca/(Si+Ca+Fe)	0.15 to 0.40	0.02 to 0.15	0.10 to 0.45	-
10	Ca	-	-	-	8 to 23
11	Al	≤10	≤10	5 to 25	4 to 16
12	Mg	≤5	≤5	≤15	≤16
13	Mg+Al	-	-	≤29	-
14	Cr	-	-	-	16 to 33

Sample Slag Volume Estimate

The total area of glassy slag within the analyzed area of the prepared sample was determined using CCSEM software. Each field of analysis was electronically recorded and the portion of the sample that was epoxy was determined so the area of slag could be compared to the total area of particles. As derived mathematically[3], the area percent of the slag is a consistent estimate of the volume percent of the slag.

Particle Size Distribution

In the CCSEM analysis, the particle periphery is detected and the particle area determined. The diameter of a circle with the same area of the particles (Dcirc) was used to represent particle

[3] Chayes, F., 1956, Petrographic Modal Analysis, Chapter 1, Section 5 The Area-Volume or Delesse Relation, John Wiley & Sons, Inc.

size. Because the particle size is determined in the plane of the polished mount, which may not go through the particle center, this is referred to as an apparent diameter. Note that this method of measuring particle size was selected for simplicity; actual particle shapes are irregular.

Particle size is based on a contiguous particle periphery. A limitation to the CCSEM software is that touching particles are considered as a single particle, and are given the diameter based on the total area. Touching particles are rare when the slag content is small, but more common when the slag is abundant. Sample SE-3-B2 had a high concentration of slag. The data were manually reviewed for the 471 particles identified as slag. It was found that 29 (6.1%) of those were actually multiple particles. No attempt was made to address this issue in the size distribution data.

Epoxy Area determination by Image Analysis

The prepared sample mounts consist of particulate and epoxy. In order to determine the area percent of various particle types, the area of epoxy needs to be subtracted from the total area analyzed. The CCSEM analysis indicates the area of the prepared sample that comprises a particle type, but because it was a High-Z analysis the total area of all particles was not determined. However, because backscatter intensity standards (carbon and aluminum) were placed on each sample and the brightness and contrast set to consistent values in all analyses, the dark epoxy can be determined for all samples using image analysis techniques.

The intensity (brightness) distribution in the low magnification field images for three initial samples was determined using the ImageJ image analysis program (developed by the National Institutes of Health). Figure 14 illustrates a field image showing the dark epoxy, medium brightness particles including rock fragments and high brightness particles including slag. Inspection of the intensity histograms of these 48 fields confirmed tri-modal distributions of brightness levels that could consistently segment the images into low (epoxy), medium (relatively low atomic number particles) and high (relatively high atomic number particles) intensity features. Figure 15 shows the image brightness histogram and the image segmented into low intensity (0 to 70), medium intensity (71 to 170) and high intensity (171 to 255) regions. The CCSEM detection limit was set to 150, as it is more conservative and could reject non-slag particles based on composition.

Once these intensity ranges were identified using the interactive ImageJ, a script was written in MatLab® to perform the area segmentation automatically. This allowed the area of epoxy to be subtracted from the total area analyzed by CCSEM resulting in the total particle area. Comparing the area of Slag and Altered Slag to the total particle area reveals the percent of the slag varieties.

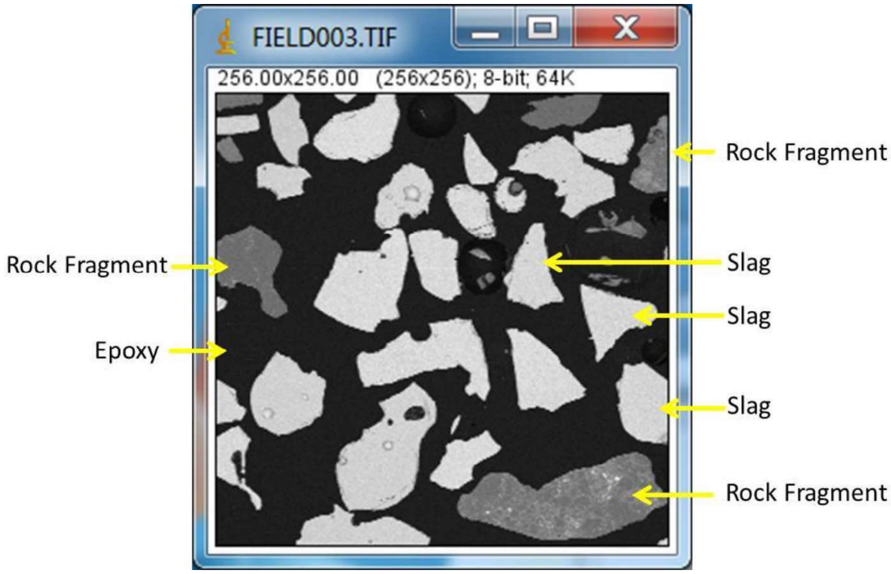

Figure 14 – Screen capture image of a low magnification field.

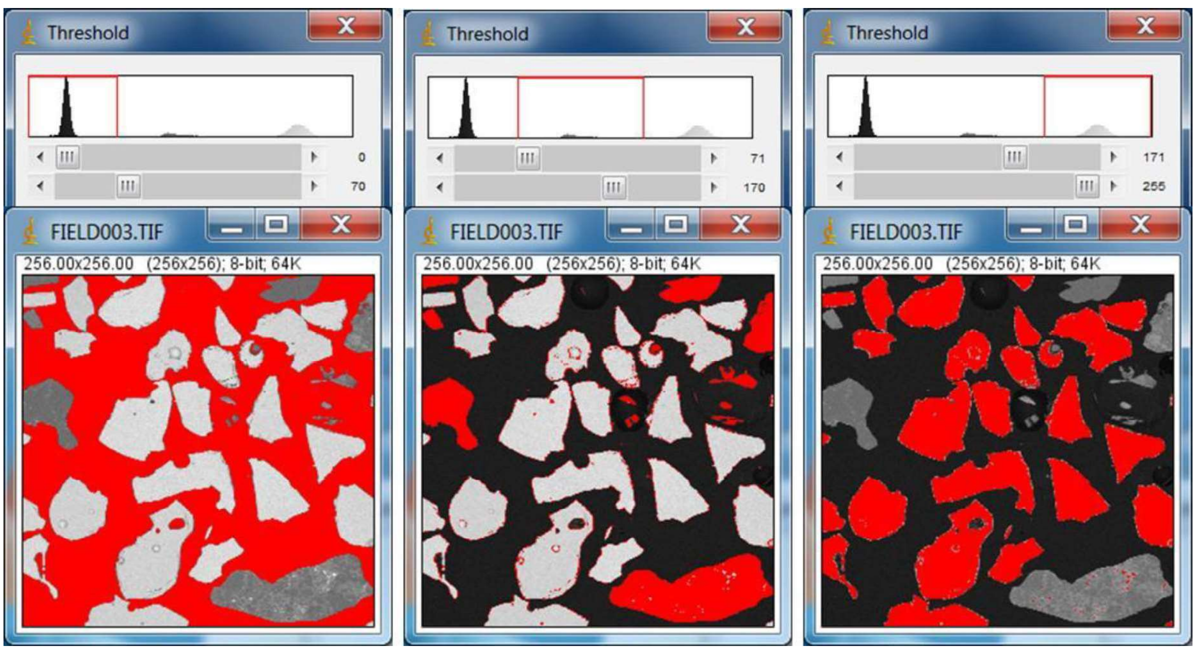

Figure 15 – Screen capture image of the same field segmented into low intensity epoxy (brightness 0 to 70), medium intensity particles that exclude slag (brightness 71 to 170), and high intensity particles dominated by slag (171 to 255).

Quality Assurance

Quality assurance steps were conducted to validate and confirm analytical results. This included comparison of CCSEM High-Z results to Image Analysis results, manual review of two samples, and duplicate and replicate analysis.

Comparison of CCSEM High-Z Analysis to Image Analysis

As described above, Image Analysis procedures applied to the low magnification fields was used to determine the relative proportion of particle and epoxy in a sample mount. Inspection of the intensity histograms (see Figure 15) indicated that there are two brightness intensity modes in the particle range. If slag is the only particle type present with a high average atomic number, the high brightness intensity peak would represent slag. The plot of the CCSEM percent slag versus the percent of particles determined by image brightness greater than 171 is shown in Figure 16. There is a very high correlation between the two measures.

The presence of other bright phases (including, for example, zircon, iron oxide, ilmenite and sphene) (Figure 17) indicates this assumption is not strictly true, but the bright phases other than slag tend to be small and do not comprise a large portion of the bright phases.

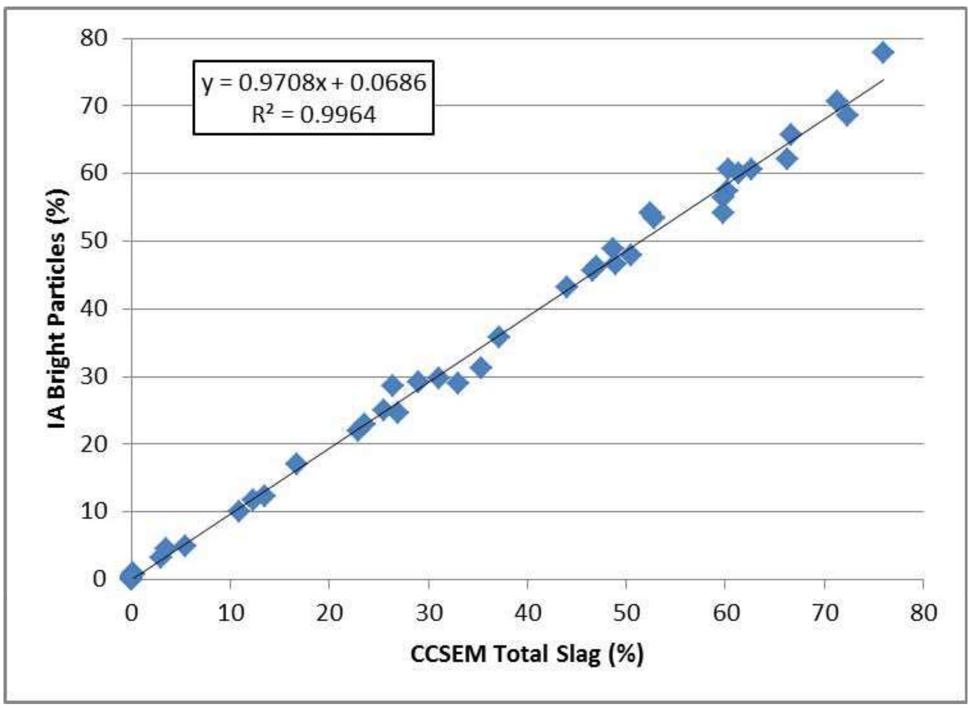

Figure 16 – Scatter plot of the area percent total glassy slag identified by CCSEM and the percent materials defined simply by high brightness. The equation and correlation coefficient for the best fit line is displayed.

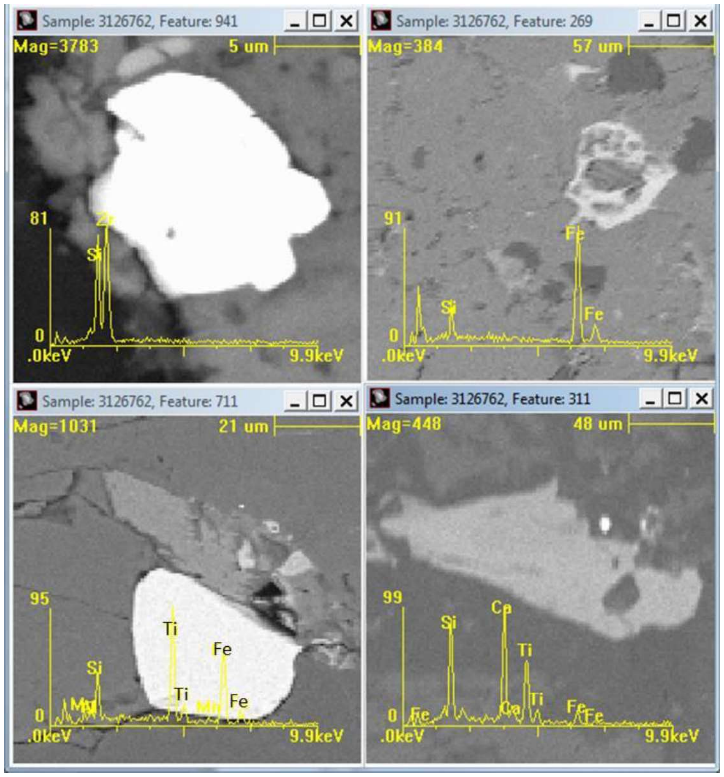

Figure 17 – SEM images showing zircon (top left), iron oxide (top right), ilmenite (bottom left) and sphene (bottom right).

Manual Review of Two Samples

The vast majority of the slag occurs in the low magnification particle size range. The slag can be reasonably identified by brightness, shape and texture observable in the acquired field images. A visual review of the field images of two samples (SE-3-B4, 3126762 and SE-3-R7, 3126763) was performed by inspecting the low magnification field images and determining which particles were identified as slag by CCSEM. Slag area can be underrepresented if slag particles are not detected or are undersized. Slag area can be overrepresented if slag particles are counted more than once. The difference between the manual review and CCSEM analysis is estimated to be 4.5% for SE-3-B4 (3126762) slag area and 2.7% for SE-3-R7 (3126763) slag area.

Duplicate Analyses and Replicate Sample Mounts

A duplicate analysis was performed on the original sample mount of sample SE-4-B6 (3126771). The results are shown in Table 3.

Table 3 – Results of duplicate analysis of SE-4-B6 (3126771).

	% Epoxy	Slag1% CCSEM	Slag% IA	Altered Slag% CCSEM
First Run	0.500	60.0	57.4	0.15
Second Run	0.498	59.6	56.5	0.19

A second mount was prepared and analyzed for three samples and two additional mounts were prepared and analyzed for another sample. The replicate sample mount results for Slag1, Slag2 and the Altered Slag are shown in Table 4. The Slag1 percentages in the 2-mount samples ranged from about 25 to 66%. Absolute differences in Slag1 were between 1 and 7% of the total and relative differences were between 1.8 and 19.9%. The fourth 3-mount sample had an absolute difference of 18% and a relative difference of 34.8%. The Slag2 and the Altered Slag had larger relative differences though small differences in absolute percent, ranging up to about 0.6%.

Table 4 – Slag EDS peak area percent for multiple mounts showing the maximum difference (if three analyses) the difference normalized to the average and the RSD estimated using the relative range. The same mount for sample SE-3-R7 was analyzed twice, so the Prep1 is the average of the two runs.

Client ID	RJLG ID	Type	Anal. 1 (% slag)	Anal. 2 (% slag)	Anal. 3 (% slag)	Max Diff (% slag)	Rel. Diff. %	RSD
SE-1-R5	3126744	Slag1	25.4	31.0	-	5.6	19.9	5.0
SE-3-B4	3126762	Slag1	59.8	66.5	-	6.7	10.6	5.9
SE-3-R7	3126763	Slag1	43.9	62.2	52.2	18.3	34.7	10.8
SE-4-B6	3126771	Slag1	59.8	60.9		1.1	1.8	1.0
SE-1-R5	3126744	Slag2	0.119	0.0927	-	0.026	24.8	0.02
SE-3-B4	3126762	Slag2	0.540	0.155	-	0.386	111.0	0.3
SE-3-R7	3126763	Slag2	0.117	0.510	0.712	0.595	133.2	0.4
SE-4-B6	3126771	Slag2	0.202	0.475		0.274	80.9	0.2
SE-1-R5	3126744	Alt Slag	0.0326	0.038		0.005	15.3	0.005
SE-3-B4	3126762	Alt Slag	0.108	0.0628		0.045	52.9	0.04
SE-3-R7	3126763	Alt Slag	0.061	0.0573	0.0818	0.025	36.7	0.01
SE-4-B6	3126771	Alt Slag	0.169	0.561		0.392	107.4	0.3

The sample variability is typical for counting individual discrete particles with variations in size and density. Sample heterogeneity, and the difficulty in capturing a representative subsample even using the riffle splitter and combining quarters, likely contributed to variations shown in Table 4. The presence or absence of few large particles in a population of hundreds can contribute to differences in the measured totals. The differences in measured Slag1 content in the three SE-3 R7 (3126763) prepared samples is influenced largely to no particles larger than 1000 μm, three particles between 1100 and 1233 μm, and three particles between 1000 and 1100 μm, in the three analyses respectively.

Assessment of the Coarse Fractions (+4 mm and -4 to +2 mm)

The +4 mm particles were photographed and the +4 mm particles and -4 to +2 mm particles were inspected using a binocular microscope to determine if slag particles were present.

Because slag was not the only dark component, questionable dark particles were mounted and analyzed in the SEM. Based on color and morphology, one sample (SE-1B-R3, 3126749) contained one Slag2 particle in the +4 mm fraction (approximately 4.25 mm) and another in the +2 mm fraction (Figures 18 and 19). Other than noting the presence of possible coarse slag, the observation of two particles does not significantly affect the slag abundance identified in this sample.

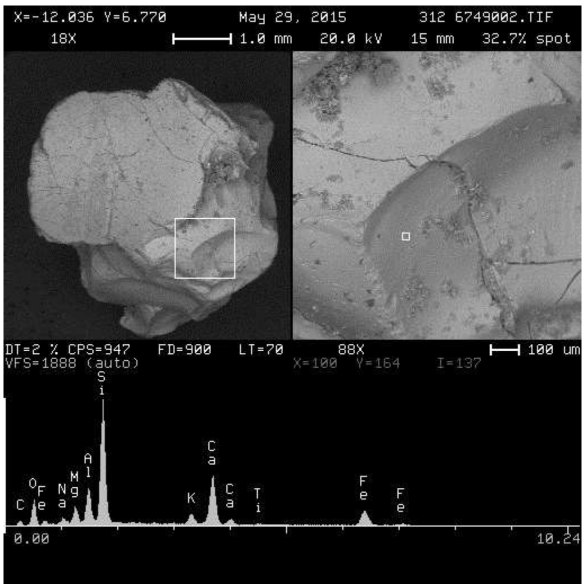

Figure 18 – BE images and EDS spectrum of particle in the +4 mm size range with slag-like morphology and consistent with Slag2 composition. (Sample SE-1B-R3 3126749)

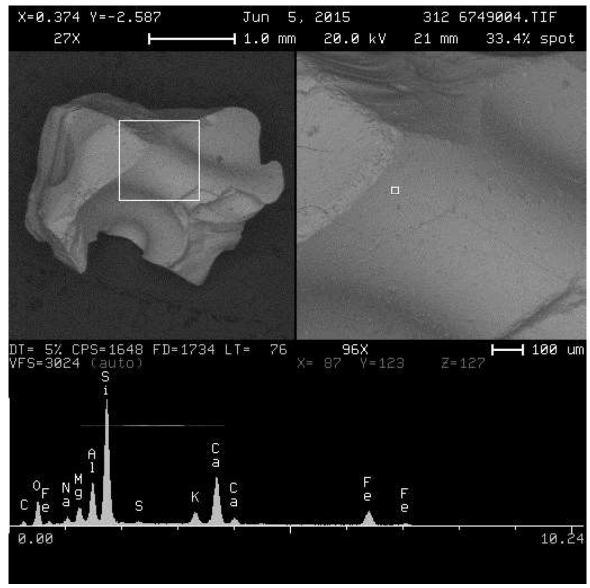

Figure 19 – BE images and EDS spectrum of particle in the -4 to +2 mm size range with slag-like morphology and consistent with Slag2 composition. (Sample SE-1B-R3 3126749)

Results

The calculated area percent (= volume percent) of three varieties of glassy slag and altered slag by CCSEM and percent bright particles by image analysis for each sample are presented in Table A1 following this report. The weight percent by particle size data are presented in Table A2. The +4 mm data are normalized to the whole sample. Because the coarsest particles are likely derived from local sources, the two finer fractions are normalized to 100%. The apparent size distributions of area percent in size bins are presented in Table A3. The size bins are defined as Dcirc (the diameter of a circle with the same area as the particle) in half phi gradations from 6 phi medium silt (15 μm) to -2 phi granule (4000 μm). Although three varieties of glassy slag were differentiated, the vast majority was a single type. Over 98% of the slag was coarser than 125 μm.

Reference

Cox, S.E., Bell, P.R., Lowther, J.S., and VanMetre, P.C., 2005, Vertical Distribution of Trace-element Concentrations and Occurrence of Metallurgical Slag Particles in Accumulated Bed Sediments of Lake Roosevelt, Washington, September 2002, US Geological Survey Scientific Investigations Report 2004-5090.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. RJ Lee Group will store samples from this project for a period of thirty (30) days after the end of this work scope, after which they will be stored but fees will apply. Samples can be returned at your request.

Should you have any questions regarding this information, please do not hesitate to contact us.

Sincerely,

Stephen K Kennedy

Stephen K. Kennedy, Ph.D.
Senior Scientist
Technical Consulting Services

Table A1 – Sample identification, River Mile, percent Slag1, Slag2, Slag3 and Total Slag based on CCSEM Analysis, percent bright particles based on Image Analysis, and percent Altered Slag based on CCSEM. RJLG IDs appendment: R – reprepared sample mount; D - duplicate analysis on the same mount.

RJLG ID	Client ID	River Mile	Slag	Slag2	Slag3	Total	IA	AltSlag
3126743	SE-LAL-5	N/A	0.0000	0.0000	0.0000	0.0000	0.260	0.0000
3126744	SE-1-R5	745	25.4	0.119	0.0000	25.5	25.0	0.0326
3126744R	SE-1-R5	745	31.0	0.0927	0.0000	31.1	29.8	0.0380
3126745	SE-1-R1	745	16.6	0.132	0.0000	16.8	17.1	0.205
3126746	SE-1-R2	743	32.9	0.166	0.0000	33.0	29.0	0.0862
3126747	SE-1-B5	738	26.3	0.734	0.0000	27.0	24.6	1.232
3126748	SE-1-R8	738	13.6	0.0000	0.0000	13.6	12.4	0.101
3126749	SE-1B-R3	735	48.0	0.895	0.0000	48.9	46.7	0.192
3126750	SE-1B-C3	735	10.5	0.381	0.0000	10.9	10.1	0.177
3126751	SE-1B-C1	735	29.0	0.0000	0.0000	29.0	29.1	0.509
3126752	SE-2-B1	733	0.234	0.0848	0.0000	0.319	0.742	0.0057
3126753	SE-2-B2	733	12.2	0.0524	0.0000	12.3	11.8	0.0735
3126754	SE-2-R1	733	22.8	0.0883	0.0000	22.9	21.9	0.430
3126755	SE-2-R3	732	2.93	0.0716	0.0000	3.0	3.22	0.197
3126756	SE-2B-R1	728	23.5	0.179	0.0000	23.6	22.9	0.0520
3126757	SE-2B-C4	729	70.8	0.544	0.0000	71.3	70.7	0.609
3126758	SE-2B-C3	727	5.44	0.0000	0.0000	5.4	4.85	0.574
3126759	SE-3-B1	726	48.2	0.0512	0.449	48.7	48.9	0.0243
3126760	SE-3-C1	724	20.1	6.38	0.0000	26.4	28.5	0.732
3126761	SE-3-B2	725	71.7	0.689	0.00328	72.4	68.6	0.0238
3126762	SE-3-B4	724	59.8	0.540	0.0000	60.4	60.6	0.108
3126762R	SE-3-B4	724	66.5	0.155	0.0000	66.7	65.7	0.0628
3126763	SE-3-R7	723	43.9	0.117	0.0000	44.0	43.2	0.0610
3126763R	SE-3-R7	723	62.2	0.510	0.0000	62.7	60.5	0.0573
3126763R2	SE-3-R7	723	52.2	0.712	0.0000	52.9	53.5	0.0818
3126764	SE-3-R8	722	75.3	0.724	0.0000	76.0	77.8	0.0312
3126765	SE-3-R10	721	46.0	0.587	0.0000	46.6	45.7	0.435
3126766	SE-3-R9	722	3.58	0.0113	0.0000	3.6	4.58	0.498
3126767	SE-3-C4	722	48.9	1.55	0.0000	50.5	47.9	0.387
3126768	SE-3B-C3	716	66.3	0.0000	0.0000	66.3	62.2	0.0370
3126769	SE-4-R1	711	45.5	1.50	0.0000	47.0	46.2	0.0646
3126770	SE-4-B1	711	51.6	0.888	0.0000	52.5	54.1	0.179
3126771	SE-4-B6	709	60.0	0.201	0.0000	60.2	57.4	0.145
3126771D	SE-4-B6	709	59.6	0.202	0.0000	59.8	56.5	0.193
3126771R	SE-4-B6	709	60.9	0.475	0.0000	61.4	60.0	0.561
3126772	SE-4-B2	709	59.5	0.285	0.0000	59.8	54.1	1.23
3126773	SE-4-B4	707	33.7	1.65	0.0923	35.4	31.3	0.551
3126774	SE-4-B5	705	34.8	2.32	0.0000	37.1	35.7	0.229
3126775	SE-4-C4	705	0.234	0.0000	0.0000	0.234	0.928	0.0180
3126776	SE-4B-C3	692	0.024	0.0000	0.0000	0.024	0.492	0.0510
3126777	SE-REF-3	689	0.001	0.0000	0.0000	0.0005	0.173	0.0032
3126778	SE-5-B2	678	0.003	0.0000	0.0000	0.003	0.109	0.0006
3126779	SE-5B-C1	673	0.013	0.0000	0.0000	0.013	0.192	0.0000
3126780	SE-6-B4	664	0.0000	0.0000	0.0000	0.0000	0.168	0.0000
3126781	SE-6B-C4	652	0.0000	0.0000	0.0000	0.0000	0.045	0.0005
3126782	SE-7-B1	645	0.0000	0.0000	0.0000	0.0000	0.045	0.0011
3126783	SE-8-B3	604	0.0000	0.0000	0.0000	0.0000	0.028	0.0000
3126784	SE-8B-C2	599	0.0000	0.0000	0.0000	0.0000	0.325	0.0042
Percent Slag by Type			30.0	0.48	0.01	30.5		
Slag Type Distribution			98.4	1.58	0.04	100.0		

Table A2 – Weight percent by particle size. The finer two fractions are normalized to 100%

Sample ID	Client ID	+4 mm	-4 mm +2 mm	-2 mm
3126743	SE-LAL-5	0.00	0.30	99.70
3126744	SE-1-R5	0.08	0.78	99.22
3126745	SE-1-R1	0.00	0.00	100.00
3126746	SE-1-R2	0.00	0.00	100.00
3126747	SE-1-B5	0.00	1.68	98.32
3126748	SE-1-R8	0.00	0.00	100.00
3126749	SE-1B-R3	0.76	22.26	77.74
3126750	SE-1B-C3	0.02	0.00	100.00
3126751	SE-1B-C1	0.00	0.00	100.00
3126752	SE-2-B1	0.25	0.00	100.00
3126753	SE-2-B2	0.00	0.00	100.00
3126754	SE-2R1	0.62	1.75	98.25
3126755	SE-2-R3	0.00	0.00	100.00
3126756	SE-2B-R1	0.00	4.17	95.83
3126757	SE-2B-C4	0.27	5.95	94.05
3126758	SE-2B-C3	2.27	0.00	100.00
3126759	SE-3-B1	0.00	1.73	98.27
3126760	SE-3-C1	0.00	6.33	93.67
3126761	SE-3-B2	1.45	1.76	98.24
3126762	SE-3-B4	0.00	1.88	98.12
3126763	SE-3-R7	0.00	0.36	99.64
3126764	SE-3-R8	0.00	2.02	97.98
3126765	SE-3-R10	1.32	0.00	100.00
3126766	SE-3-R9	0.00	0.00	100.00
3126767	SE-3-C4	0.00	0.00	100.00
3126768	SE-3B-C3	0.02	0.60	99.40
3126769	SE-4-R1	4.58	5.91	94.09
3126770	SE-4-B1	0.05	0.92	99.08
3126771	SE-4-B6	0.07	0.23	99.77
3126772	SE-4-B2	0.17	0.00	100.00
3126773	SE-4-B4	0.00	0.00	100.00
3126774	SE-4-B5	0.10	0.00	100.00
3126775	SE-4-C4	0.00	0.00	100.00
3126776	SE-4B-C3	0.54	2.33	97.67
3126777	SE-REF-3	0.14	0.00	100.00
3126778	SE-5-B2	0.00	0.00	100.00
3126779	SE-5B-C1	0.00	0.00	100.00
3126780	SE-6-B4	0.00	0.00	100.00
3126781	SE-6B-C4	0.00	0.00	100.00
3126782	SE-7-B1	0.00	0.00	100.00
3126783	SE-8-B3	0.00	0.00	100.00
3126784	SE-8B-C2	0.11	0.00	100.00

Table A3 – Slag1 area percent distribution (excluding Slag2 and Slag3) by particle apparent diameter (Dcirc) in µm. The last two columns and rows show the total distribution of fine (less than 125 um) and coarse (greater than 125 um) Slag1 relative to the total sample material.

RJLG ID	Client ID	< 22	22 to 31	31 to 44	44 to 62	62 to 88	88 to 125	125 to 177	177 to 250	250 to 350	350 to 500	500 to 710	710 to 1000	1000 to 1410	1410 to 2000	2000 to 2830	2830 to 4000	>4000	% Fine slag	% Coarse slag
3126743	SE-LAL-5	None																		
3126744	SE-1-R5	0.042	0.07	0.12	0.36	0.63	0.71	1.2	6.2	17.7	33.4	33.8	5.7	0.0	0.0	0.0	0.0	0.0	0.49	24.91
3126744R	SE-1-R5	0.053	0.041	0.13	0.21	0.57	0.81	1.4	5.3	14.7	42.7	25.4	8.6	0.0	0.0	0.0	0.0	0.0	0.57	30.43
3126745	SE-1-R1	0.065	0.10	0.32	0.67	1.3	1.7	8.0	16.8	33.9	33.4	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.70	15.90
3126746	SE-1-R2	0.072	0.032	0.11	0.38	0.64	1.0	1.9	9.2	22.6	49.6	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.72	32.18
3126747	SE-1-B5	0.085	0.10	0.26	0.58	1.1	1.2	3.9	10.9	25.1	30.6	26.2	0.0	0.0	0.0	0.0	0.0	0.0	0.87	25.43
3126748	SE-1-R8	0.047	0.12	0.19	0.82	1.3	2.4	7.2	25.5	35.4	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.67	12.93
3126749	SE-1B-R3	0.018	0.028	0.088	0.25	0.35	0.3	0.4	0.9	4.2	29.2	49.0	15.3	0.0	0.0	0.0	0.0	0.0	0.49	47.51
3126750	SE-1B-C3	0.17	0.15	0.53	0.85	2.4	3.7	14.8	29.5	29.5	16.4	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.82	9.68
3126751	SE-1B-C1	0.036	0.12	0.25	0.33	0.49	1.2	3.5	7.1	21.9	43.6	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.72	28.58
3126752	SE-2-B1	0.10	0.000	0.66	1.57	2.8	10.5	21.0	17.8	0.0	45.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.20
3126753	SE-2-B2	0.030	0.11	0.25	0.54	0.88	1.8	5.6	14.3	42.3	30.1	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.45	11.75
3126754	SE-2-R1	0.12	0.23	0.55	1.34	2.4	3.7	12.4	26.8	27.8	20.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	1.90	20.90
3126755	SE-2-R3	0.39	0.49	1.3	4.93	11.5	20.1	34.7	24.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.13	1.80
3126756	SE-2B-R1	0.059	0.099	0.10	0.50	0.60	0.58	0.89	5.1	12.5	29.3	30.7	15.8	3.7	0.0	0.0	0.0	0.0	0.46	23.04
3126757	SE-2B-C4	0.017	0.035	0.072	0.13	0.34	0.17	0.32	1.2	3.2	21.1	46.2	26.1	1.2	0.0	0.0	0.0	0.0	0.54	70.26
3126758	SE-2B-C3	0.65	0.99	2.8	5.18	7.9	18.3	26.7	33.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.95	3.49
3126759	SE-3-B1	0.034	0.048	0.13	0.42	0.77	0.52	1.6	5.0	13.3	33.4	32.0	12.7	0.0	0.0	0.0	0.0	0.0	0.92	47.28
3126760	SE-3-C1	0.004	0.031	0.23	0.15	0.46	0.23	1.50	1.82	5.18	13.7	33.7	30.7	12.3	0.0	0.0	0.0	0.0	0.55	48.65
3126761	SE-3-B2	0.029	0.045	0.044	0.24	0.50	0.26	0.74	2.8	12.9	37.4	33.5	10.4	1.2	0.0	0.0	0.0	0.0	0.80	70.90
3126762	SE-3-B4	0.033	0.052	0.13	0.21	0.49	0.48	1.0	2.4	8.2	19.5	40.3	23.3	3.8	0.0	0.0	0.0	0.0	0.84	58.96
3126762R	SE-3-B4	0.081	0.12	0.16	0.26	0.66	0.35	0.62	1.6	8.5	26.7	34.6	23.5	2.7	0.0	0.0	0.0	0.0	1.08	65.42
3126763	SE-3-R7	0.048	0.065	0.21	0.28	0.54	0.54	1.1	5.2	18.0	28.8	29.7	15.5	0.0	0.0	0.0	0.0	0.0	0.74	43.16
3126763R	SE-3-R7	0.031	0.057	0.15	0.28	0.47	0.39	0.74	2.8	9.2	31.0	33.3	16.8	4.8	0.0	0.0	0.0	0.0	0.86	61.34
3126763R2	SE-3-R7	0.027	0.035	0.15	0.30	0.47	0.51	0.70	2.6	10.9	23.9	38.9	17.7	3.8	0.0	0.0	0.0	0.0	0.78	51.42
3126764	SE-3-R8	0.075	0.057	0.10	0.15	0.24	0.11	0.36	0.7	1.9	13.1	38.7	35.3	8.1	1.0	0.0	0.0	0.0	0.55	74.75
3126765	SE-3-R10	0.061	0.083	0.22	0.40	1.0	1.5	3.5	10.1	27.6	36.2	17.4	2.0	0.0	0.0	0.0	0.0	0.0	1.52	44.58
3126766	SE-3-R9	0.26	0.24	1.2	1.4	4.9	5.4	19.3	16.6	47.3	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.48	3.10
3126767	SE-3-C4	0.018	0.027	0.07	0.19	0.31	0.42	1.1	1.6	6.6	35.2	42.3	12.2	0.0	0.0	0.0	0.0	0.0	0.50	48.40
3126768	SE-3B-C3	0.049	0.095	0.17	0.31	0.42	0.54	0.93	3.1	7.2	28.2	34.9	22.7	1.4	0.0	0.0	0.0	0.0	1.05	65.25
3126769	SE-4-R1	0.010	0.044	0.10	0.16	0.40	0.43	1.0	2.4	8.0	28.2	36.8	19.9	2.5	0.0	0.0	0.0	0.0	0.53	45.27
3126770	SE-4-B1	0.022	0.056	0.08	0.20	0.42	0.34	0.59	2.3	7.7	28.2	42.1	14.8	3.2	0.0	0.0	0.0	0.0	0.58	51.02
3126771	SE-4-B6	0.031	0.072	0.08	0.29	0.50	0.61	1.2	3.8	15.4	39.8	29.2	7.6	1.5	0.0	0.0	0.0	0.0	0.96	59.04
3126771D	SE-4-B6	0.037	0.043	0.12	0.22	0.57	0.65	1.1	4.0	16.0	41.3	30.1	4.5	1.5	0.0	0.0	0.0	0.0	0.98	58.62
3126771R	SE-4-B6	0.027	0.051	0.081	0.25	0.62	0.39	0.99	2.6	12.7	35.5	35.6	9.5	1.6	0.0	0.0	0.0	0.0	0.87	60.03
3126772	SE-4-B2	0.026	0.051	0.09	0.23	0.45	0.34	0.75	3.3	14.8	37.4	36.7	4.2	1.6	0.0	0.0	0.0	0.0	0.70	58.80
3126773	SE-4-B4	0.046	0.072	0.12	0.17	0.50	0.69	2.0	6.1	19.8	43.7	23.9	2.8	0.0	0.0	0.0	0.0	0.0	0.54	33.16
3126774	SE-4-B5	0.010	0.031	0.07	0.24	0.24	0.24	0.60	1.1	3.7	41.0	42.2	10.5	0.0	0.0	0.0	0.0	0.0	0.28	34.52

Table 3A continued

RJLG ID	Client ID	< 22	22 to 31	31 to 44	44 to 62	62 to 88	88 to 125	125 to 177	177 to 250	250 to 350	350 to 500	500 to 710	710 to 1000	1000 to 1410	1410 to 2000	2000 to 2830	2830 to 4000	>4000	% Fine slag	% Coarse slag
3126775	SE-4-C4	0.81	4.8	15.0	21.7	50.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.23	0.00
3126776	SE-4B-C3	21.2	28.9	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.00
3126777	SE-REF-3	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
3126778	SE-5-B2	40.6	59.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
3126779	SE-5B-C	0.000	14.3	19.2	0.0	66.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.00
3126780	SE-6-B4	None																		
3126781	SE-6B-C4	None																		
3126782	SE-7-B1	None																		
3126783	SE-8-B3	None																		
3126784	SE-8B-C2	None																		
Total																			28.88	1442.68
% Slag																			1.96	98.04

APPENDIX D

CHANGE REQUEST FORMS

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 of 1		Change No.: 1
CHANGE REQUEST:	**Collect sample volume for potential bioassay testing at judgmental sampleable sand sampling locations at China Bend**	
Applicable Reference:	QAPP Table B1-1 QAPP Appendix A (Field Sampling Plan) Table A1 QAPP Appendix E (Cultural Resources Coordination Plan) Table E3-1	
Description of Change:	Add sample type "TX" for "potential toxicity testing" to the primacy (JS001 and JS002) and alternate (JS003 and JS004) proposed judgmental sampling locations at the China Bend Area of Interest.	
Reason for Change:	Potential toxicity testing is being specified as a sample type for these locations in order to make them consistent with other proposed samples from the "sampleable sand" target stratum.	
Impact on Present and Completed Work:	None	
Requested By: (Scientist)	[signature]	Date: 8/29/2019
Acknowledged By: (Task Leader)	[signature]	Date: 8/29/2019
APPROVAL		
AECOM Project Manager:	Jerry a. Pr[signature]	Date: 8-29-19
TAI Project Manager:	Kris R. McCaig	Date: 8/29/2019
EPA Project Manager:	Kathryn J. Cerise	Date: 8/30/2019

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 **of** 1 | **Change No. :** 2

CHANGE REQUEST:

Applicable Reference:
QAPP Appendix A (Field Sampling Plan), Section 2.2.5
QAPP Appendix A (Field Sampling Plan), Table A2
QAPP Appendix A, Attachment A1 (Health and Safety Plan Addendum)
QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-8

Description of Change:
Add to Step 17 in the "Procedure for BMI samples" (on page A-2-12), "Once the sample container is sealed, gently roll the sample container to ensure distribution of the ethanol to the entire sample. As an alternative preservative, formalin may be used in place of ethanol. If formalin is used, add 10% buffered formalin until the volume of formalin is equal to the volume of the sediment. Safety glasses or goggles, as well as disposable nitrile or latex gloves, must be worn when preserving samples in formalin. As with ethanol, once the sample container is sealed, gently roll the sample container to ensure distribution of the ethanol to the entire sample."

In SOP-8, add to Step 9, "An alternative preservative, formalin, may be used in place of ethanol. Add 10% buffered formalin until the volume of formalin is equal to the volume of the sediment. Safety glasses or goggles and disposable nitrile or latex gloves, must be worn when preserving samples in formalin."

in SOP-8, add to Step 12, "Once the sample container is sealed, gently roll the sample container to ensure distribution of the ethanol or formalin, if used, to the entire sample."

Reason for Change:
After the sediment and preservative have been added to the BMI sample container, the container should be closed, sealed, and then gently rolled to ensure the preservative is fully mixed in with the sediment and in contact with the BMI. This will maximize preservation quality and specimin quality.

The flexibility to use the 10% buffered formalin as an alternative to ethanol may be necessary in the event that acquisition of the required volume of ethanol is delayed. The taxonomic laboratory has recommended the use of 10% buffered formalin as an alternative sample preservative for the BMI samples.

Impact on Present and Completed Work: None

Requested By: [signature] (Scientist) Date: 9/10/2019

Acknowledged By: Chad D. [signature] (Task Leader) Date: 9/10/2019

APPROVAL

AECOM Project Manager: Jerry a. [signature] Date: 9-11-19

TAI Project Manager: Kris R McCaig Date: 9/11/2019

EPA Project Manager: [signature] Date: 9/11/19

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 **of** 2 **Change No. :** 3

CHANGE REQUEST:

Applicable Reference: QAPP Appendix A (Field Sampling Plan), Section 2.2.5
QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-8

Description of Change: Add to step 13 in the "Procedure for BMI Samples" (on page A-2-12), and step 2 in SOP-8, "Subsample all Van Veen grab samples using a core sampler - a transparent lexan (polycarbonate) or PVC tube with a 4-inch inside diameter and a marked depth of 6 inches. Collect five subsamples systematically with at least one subsample in each quadrant of the sediment collected with sampler, or where the sediment appears to be the most intact and undisturbed. At each of the five subsample locations, the core sampler will be pushed into the sample to a 6-inch depth (or the total sample depth if less than 6 inches). If five subsamples cannot be collected from the sample, another grab will be collected. Sediment will be excavated around the tube, to the extent that technician can slide their gloved hand or a flat piece of material underneath the bottom of the core sampler, thereby holding in the sediment in the core sampler. The sediment inside the core sampler will be transferred to the BMI sample container. These five subsamples will result in an area of 0.44 square feet. Overlying water will be syphoned off the subsamples and passed through a 250 micron seive. Organisms collected on the sieve will be included in the sample."

Reason for Change: Preliminary BMI samples collected in the Phase 3 Sediment Study using a Van Veen power grab (XL) have averaged 3.2 square feet and 6 gallons of sediment per sample. The large volume of the samples collected to date is much more than expected and is requiring more sample containers, more preservative materials, and more storage space than is currently available in the field. Also, the large volume of sediment and preservative will require unanticipated hazardous materials transportation requirements. Finally, the taxonomic laboratory estimates that it will take one week to process each of the large samples. Collecting subsamples from the power Van Veen sampler will be representative of the total sample and will allow for the sampling and laboratory program to stay on schedule.

Impact on Present and Completed Work: See "Reason for Change", above. The first two samples already collected will have a larger sampled area. Density will be normalized to a square meter basis.

Requested By: [signature] Date: 9/16/2019
(Scientist)

Acknowledged By: Chad D. Wiseman Date: 9/17/2019
(Task Leader)

#3

APPROVAL

AECOM Project Manager:	Jeremy A. Porter	Date:	9-18-19
TAI Project Manager:	Kris R. McCaig	Date:	9-18-2019
EPA Project Manager:	[signature]	Date:	9/23/19

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 **of** 1 **Change No. : 3, Revision 1**

CHANGE REQUEST:

Applicable Reference:	QAPP Appendix A (Field Sampling Plan), Section 2.2.5 QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-8
Description of Change:	Add to step 13 in the "Procedure for BMI Samples" (on page A-2-12), and step 2 in SOP-8, "Collect half of the XL Van Veen power grab sediment sample to a 6-inch depth and place it into the BMI sample container. Half of the XL Power Van Veen sediment sample will be delineated by dividing the inside dimensions of the XL Power Van Veen in half. The BMI sample material will be collected from one contiguous area. Overlying water will be syphoned off the entire sample and passed through a 250 micron seive. Organisms collected on the sieve will be included in the sample. Care will be taken to entrain as little sediment as possible during removal of the water."
Reason for Change:	Preliminary BMI samples collected in the Phase 3 Sediment Study using a Van Veen power grab (XL) have averaged 3.2 square feet and 6 gallons of sediment per sample. The large volume of the samples collected to date using the Van Veen power grab sampler is much more than expected and is requiring more sample containers, more preservative materials, and more storage spece than is currently available in the field. Also, the large volume of sediment and preservative will require unanticipated hazardous materials transportation requirements. Finally, the taxonomic laboratory estimates that it will take one week to process each of the large samples. Collecting half of the Van Veen power grab (XL) sample will alleviate these field and laboratory issues, while still sampling approximately 1.6 square feet of benthic area.
Impact on Present and Completed Work:	See "Reason for Change", above. The first two samples already collected will have a larger sampled area. Density will be normalized to a square meter basis.

Requested By: [signature] (Scientist) Date: 9/20/2019

Acknowledged By: Chad D. Wiseman (Task Leader) Date: 9/20/2019

APPROVAL

AECOM Project Manager: [signature] Date. 9-20-19

TAI Project Manager: Kris R McCaig Date. 9/20/2019

EPA Project Manager: [signature] Date: 9/23/19

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 **of** 2 **Change No. :** 4

CHANGE REQUEST:

Applicable Reference:	QAPP Section B4.4.1, BMI Community Sample Sorting QAPP Appendix D (QA Information for EcoAnalysts), Laboratory Analysis SOP
Description of Change:	Add to QAPP Section A7.3.1, Needed Information, BMI survey data at each sampling location, "Residual AFDM, BMI biomass". Add to QAPP Table A7-3, QAPP Table B3.1, QAPP Appendix A, FSP Table A2 (Part B), "Residual AFDM, BMI biomass". Add to QAPP Section B4.4.1, BMI Community Sample Sorting and QAPP Appendix D, EcoAnalysts Laboratory Analysis: Benthic Macroinvertebrates Laboratory Sample Receipt and Handling Teck 2019 Standard Operating Procedure, SOP, page 4, "The material remaining on all the grids where BMIs were sorted will be analyzed for ash free dry mass (AFDM) to determine the organic content. Each sample is assessed by obtaining an initial dry weight by heating this material for 24 hours at 100°C. The dried samples are then heated to 550 °C for 2 hours, and a final weight is recorded. AFDM is the final weight of the sample following oxidation of the organic content. Organic content can then be assessed by subtracting AFDM from the sample's initial dry weight. The AFDM measurement will be proportionally extrapolated for the entire sample based on sorted grids divided by total grids in the tray." Add to QAPP Section B4.4.1, BMI Community Sample Sorting and QAPP Appendix D, EcoAnalysts Laboratory SOP, page 4, "Sorted and identified BMI will be will be measured for wet weight biomass. The BMI will be blotted dry and and weighed by major taxonomic group. The biomass measurement will be proportionally extrapolated for the entire sample based on sorted grids divided by total grids in the tray." Add to QAPP Table B5-3, "Residual AFDM Accuracy = ±0.01mg; Residual AFDM Precision = NA; Residual AFDM Completeness = all samples; Biomass Accuracy = 0.01 mg; BMI Biomass Precision = NA; BMI Biomass Completeness = all samples".
Reason for Change:	Residual AFDM in the BMI sample represents the particulate organic matter that many of the BMI are likely to use as a food source. Knowing the magnitude and availability of food resources may be useful for evaluating variation in BMI density and composition. BMI biomass will provide additional information pertaining to the magnitude of the BMI community present in the sample (similar to density).
Impact on Present and	None

Page 2 **of** 2	**Change No. :** 4

CHANGE REQUEST:

Requested By:	Chad D. Wiseman (Scientist)	Date:	9/17/2019
Acknowledged By:	Chad D. Wiseman (Task Leader)	Date:	9/17/2019

APPROVAL

AECOM Project Manager:	Jerry A. Prim	Date:	9-17-19
TAI Project Manager:	Kris R. McCaig	Date:	9-18-2019
EPA Project Manager:	Kathy Perise	Date:	9-23-19

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 of 1 | Change No. : 4, Revision 1

CHANGE REQUEST:

Applicable Reference: QAPP Section B4.4.1, BMI Community Sample Sorting
QAPP Appendix D (QA Information for EcoAnalysts), Laboratory Analysis SOP

Description of Change: Add to QAPP Section A7.3.1, Needed Information, BMI survey data at each sampling location, "Residual AFDM, BMI biomass".

Add to QAPP Table A7-3, QAPP Table B3.1, QAPP Appendix A, FSP Table A2 (Part B), "Residual AFDM, BMI biomass".

Add to QAPP Section B4.4.1, BMI Community Sample Sorting and QAPP Appendix D, EcoAnalysts Laboratory Analysis: Benthic Macroinvertebrates Laboratory Sample Receipt and Handling Teck 2019 Standard Operating Procedure, SOP, page 4, "The material remaining on all the grids where BMIs were sorted will be analyzed for ash free dry mass (AFDM) to determine the organic content. Each sample is assessed by obtaining an initial dry weight by heating this material for 24 hours at 100°C. The dried samples are then heated to 550 °C for 2 hours, and a final weight is recorded. AFDM is the final weight of the sample following oxidation of the organic content. Organic content can then be assessed by subtracting AFDM from the samples initial dry weight. The AFDM measurement will be proportionally extrapolated for the entire sample based on sorted grids divided by total grids in the tray."

Add to QAPP Section B4.4.1, BMI Community Sample Sorting and QAPP Appendix D, EcoAnalysts Laboratory SOP, page 4, "Sorted and identified BMI will be measured for wet weight biomass. The BMI will be blotted dry and weighed by the 250 and 500 micron sieve fractions. The biomass measurement will be proportionally extrapolated for the entire sample based on sorted grids divided by total grids in the tray."

Add to QAPP Table B5-3, "Residual AFDM Accuracy = ±0.01mg; Residual AFDM Precision = NA; Residual AFDM Completeness = all samples; Biomass Accuracy = 0.01 mg; BMI Biomass Precision = NA; BMI Biomass Completeness = all samples".

Reason for Change: Residual AFDM in the BMI sample represents the particulate organic matter that many of the BMI are likely to use as a food source. Knowing the magnitude and availability of food resources may be useful for evaluating variation in BMI density and composition.

BMI biomass will provide additional information pertaining to the magnitude of the BMI community present in the sample (similar to density).

Impact on Present and Completed Work: None

Requested By: Chad D. Wiseman (Scientist) Date: 3/12/2020

Acknowledged By: Chad D. Wiseman (Task Leader) Date: 3/12/2020

APPROVAL

Project Manager: [signature] Date: 3/12/2020

TAI Project Manager: Kris R McCaig Date: 3/12/2020

EPA Project Manager: [signature] Date: 3/17/2020

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 of 1 Change No.: 6

CHANGE REQUEST:

Applicable Reference:	QAPP Appendix A (Field Sampling Plan), Sections 2.2.1 and 2.2.5 QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-1 QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-3 QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-4 QAPP Appendix A (Field Sampling Plan), Attachment 2, SOP-5
Description of Change:	Add or revise the following text to locations in Appendix A of the Phase 3 sediment study QAPP specified below. FSP Section 2.2.2 and SOP-1, add the following: "If during sediment sampling a suitable location where the sediment bed matches the target stratum is not identified using video, at least one representative image of the sediment bed will be collected to document the actual sediment bed conditions." FSP Section 2.2.5 ,Sediment and BMI Sample Collection, General steps for sediment and BMI sample collection, Step 1, add the following: "Collect an image of the sediment bed." SOP-3, Procedures for Sediment Sample Collection, Step 12 and SOP-5, Procedures for Sediment Sample Collection, Step 13, add the following: "After any disturbed sediment has cleared, collect an image of the sediment bed by recording 1 to 2 seconds of video from the underwater camera." SOP-4, Procedures for Sediment Sample Collection, SOP-5, Step 11, revise as follows: "Allow the grab sampler to contact the bottom gently. After any disturbed sediment has cleared, collect an image of the sediment bed by recording 1 to 2 seconds of video from the underwater camera, then activate the pneumatic mechanism to push the scoop through the sediment and close the device."
Reason for Change:	Section A7.5.4 of the Phase 3 QAPP states the following: "Refusals, imagery, and grain size data from the Phase 3 sediment study, as well as similar results from historical events, will be used as appropriate to verify and refine the results of the preliminary sediment composition maps developed to support the Phase 3 sampling design." This change provides for the consistent collection of imagery at sediment sampling locations.
Impact on Present and Completed Work:	Underwater imagery has not ben collected at sediment sampling locations completed to-date. These locations will be re-visited opportunistically during the program, time allowing, for image collection.

Requested By: [signature] (Scientist) Date: 9/20/2019

Acknowledged By: [signature] (Task Leader) Date: 9/20/19

APPROVAL

AECOM Project Manager: Jerry A. P[signature] Date: 9-20-19

TAI Project Manager: Karl McCoy Date: 9-20-2019

EPA Project Manager: [signature] Date: 9/23/19

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CHANGE REQUEST:

Applicable Reference: Quality Assurance Project Plan (QAPP) for the 2019 Phase 3 Sediment Study

Description of Change: The following changes will be made to the bioassay procedures in the Phase 3 QAPP, QAPP Tables B4-2 and B4-4, Standard Operating Procedures (SOPs) in Appendix C (UCR_42-Dhyalella_SED_SOP, UCR_Peeper_SOP, UCR_PW_Centri_SOP), and Figure B4-2.
Specifically, the following changes are requested:

1. Section A7.6.3 will be amended to delete text referring to collection of laboratory bioassay porewater using peepers.
2. Section A7.7.8 will be amended to include the collection of sediment collected at Day -7 (which will be referred to as BULK in the sample ID) for analysis of TAL metals and TOC; update the timing for collection of bioassay-generated sediment chemistry and centrifuged porewater to Day 7 and Day 21; and removed text referring to collection of porewater using peepers.
3. Section B4.3 will be amended to remove text referring to the collection of porewater using peepers, add text to indicate sediment will be sampled from homogenized sediment on Day -7 for analysis of TAL metals, percent moisture, and TOC; update the number of replicates for chemistry analysis; update the timing for collection of bioassay-generated sediment chemistry and centrifuged porewater samples; and update the sample identification nomenclature for bioassay-generated porewater.
4. Table B3-1 Part E will be amended to include information needed for collection of sediment for analysis of total metals, percent moisture, and TOC in homogenized sediment prior to the start of the bioassay and remove information regarding collection of peeper porewater.
5. Table B4-2 will be amended to update the number of replicate chemistry chambers per treatment to indicate the following will be included:
   10 replicates for chemistry only as follows:
   - 2 replicates to collect sediment samples for analysis of AVS, SEM, and TOC; 1 for sample collection on Day 7 and 1 for Day 21
   - 2 sets of replicates (1.2 L of sediment distributed across 4 1L beakers per set) to equilibrate sediment for collecting porewater using centrifugation on Days 7 and 21; 700 mL overlying water per 1L beaker; porewater will be analyzed for dissolved metals (including major cations), dissolved organic carbon, pH, sulfide, chloride, sulfate, and alkalinity.
6. Table B4-2 will be amended to remove the collection of porewater using peepers, add a line indicating sediment samples will be equilibrated for 7 days with twice daily water changes prior to initiating the test, and clarify the number of replicate chemistry chambers.
7. Table B4-4 will be amended to update the number of analytical samples and the timing for their collection during the biossays.
8. The 42-day Hyalella SOP (in Appendix C) will be amended to update the procedures and timing for collection of porewater and sediment during the bioassay.
   Sediment samples for analysis of acid volatile sulfide (AVS), simultaneously extracted metals (SEM), and total organic carbon (TOC) will be obtained from sediment chemistry replicates using the same timing as for the porewater.
   Porewater will be obtained via centrifugation at 4,300 x g for 30 minutes for analysis of dissolved metals (including major cations, dissolved organic carbon, pH, sulfide, chloride, sulfate, and alkalinity. The SOP now states that 1.2 liter of sediment will be distributed across 4 1L beakers, 700 mL of overlying wataer will be added to each beaker, and porewater will be extracated on test days 7 and 21.
9. The general activity schedule in the 42-day Hyalella SOP (in Appendix C) has been updated to reflect the procedures and timing for the changes in Item 4.
10. The UCR Peeper Preparation, Deployment, and Retrieval and Sediment Chemistry Collection SOP (in Appendix C) has been replaced with the UCR Sediment Chemistry Collection SOP that describes methods used to collect sediment chemistry samples for analysis of AVS, SEM, and TOC.

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Description of Change:	11. The Porewater Extraction via Centrifugation SOP (in Appendix C) has been replaced with a project specific SOP to be more specific to project requirements. The SOP includes more details about centrifugation, filtration, priority of porewater analyses if sample volume is limited, and the order for subsampling the porewater after centrifugation. 12. Figure B4-2 has been amended to portray the procedures and timing recommended for collection of porewater and sediment chemistry samples.
Reason for Change:	The requested changes will be made to reflect current thinking on methods and timing for collecting porewater and sediment samples during the 42-day *Hyalella azteca* bioassays and comments received to date from EPA.
Impact on Present and Completed Work:	The change will provide porewater and sediment data consistent with organism exposure.

Requested By: Karen Tobiason (Scientist) Date: 5/4/2020

Acknowledged By: Karen Tobiason (Task Leader) Date: 5/4/2020

APPROVAL

Project Manager: [signature] Date: 5/4/2020

TAI Project Manager: Kris R. McCaig Date: 5/4/2020

EPA Project Manager: __________ Date: __________

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Description of Change:	11. The Porewater Extraction via Centrifugation SOP (in Appendix C) has been replaced with a project specific SOP to be more specific to project requirements. The SOP includes more details about centrifugation, filtration, priority of porewater analyses if sample volume is limited, and the order for subsampling the porewater after centrifugation. 12. Figure B4-2 has been amended to portray the procedures and timing recommended for collection of porewater and sediment chemistry samples.
Reason for Change:	The requested changes will be made to reflect current thinking on methods and timing for collecting porewater and sediment samples during the 42-day *Hyalella azteca* bioassays and comments received to date from EPA.
Impact on Present and Completed Work:	The change will provide porewater and sediment data consistent with organism exposure.

Requested By: Karen Tobiason (Scientist) Date: 5/4/2020

Acknowledged By: Karen Tobiason (Task Leader) Date: 5/4/2020

APPROVAL

Project Manager: Date: 5/4/2020

TAI Project Manager: Date: 5/4/2020

EPA Project Manager: Kathy Cerise Date: 5/13/20

REVISED PAGES FROM PHASE 3 SEDIMENT STUDY QAPP

A7.6.2 Sediment Chemistry

- Data quality indicators (DQIs) must meet precision, accuracy or bias, representativeness, completeness, comparability, and analytical sensitivity (PARCCS) requirements[9].
- Analyses must meet required quantitation limits per Table A7-1. Failure to meet quantitation limits will limit the usability of the data.

A7.6.3 Porewater Chemistry

Field-Collected (Trident probe) Porewater

- DQIs must meet PARCCS requirements.
- Analyses must meet required quantitation limits per Table A7-1. Failure to meet quantitation limits will limit the usability of the data.
- Confirm that excessive surface water was not drawn in during sampling (dissolved oxygen [DO], conductivity, oxidation-reduction potential [ORP], pH)

Laboratory Bioassay Porewater (Centrifuge)

- DQIs must meet PARCCS requirements.
- Method detection and reporting limits.
- Additional requirements may be needed based on the outcome of the porewater sampling study[10].

BLM

- Use of single metals BLMs may be useful as estimates of dissolved, bioavailable metals in field-collected porewater. EPA's February 21, 2020 letter provides: 'laboratory bioassay porewater data will not be used with either the mBLM or single metals BLMs for the purpose of making decisions about the cause of observed toxicity due to unacceptable uncertainty in the data.'

- The use and interpretation of the BLM and mBLM are subject to ongoing discussions between TAI and EPA. Use of the BLM and mBLM must be in accordance with agreed-upon methods.

[9] DQIs of precision, accuracy, bias, representativeness, completeness, comparability, and analytical sensitivity (PARCCS) will be used to assess the conformance of sediment, field porewater, and laboratory porewater analytical results with specific QC criteria. QC samples will include equipment rinsate blanks; field duplicates; standard reference materials (SRMs), if available and analyzed; and laboratory analytical QC samples. Field duplicate QC samples will be collected at a frequency of 10 percent for sediment and 5 percent for field-collected porewater. Data quality and conformance will be evaluated by third-party data validation of DQIs and laboratory QC procedures.

[10] The porewater extraction method study that is being conducted by TAI in collaboration with USGS and initiated July 30, 2019 is intended to resolve questions related to the measurement of metals concentrations and toxicity mitigating factors.

likely to have the mud, sand, and mixed sediment facies will be sampled. The locations will be a combination of previously sampled and new locations.

A7.7.8 Target Analytes, Tests, and Measurement

- Surface sediment samples:
  - TAL metals
  - Percent slag by BSEM (10 percent of sampleable sand sample locations)
  - Grain size
  - TOC
  - SEM
  - AVS
  - 42-day sediment bioassays using the freshwater amphipod *H. Azteca*
  - Organic chemicals (PCBs, PAHs, pesticides) [16]
  - TIE studies. [17]
- Field-collected porewater samples:
  - Dissolved metals, including major cations
  - Major anions (chloride, sulfate)
  - Alkalinity
  - Sulfide (if field data indicate need)
  - TOC and DOC
  - pH.
- BMI survey data:
  - BMI species
  - BMI abundance, by species
  - Physical location attributes
    - Water depth
    - Presence of macrophytes
    - Position in river (river channel, seasonally flooded historical channel, seasonally flooded backwater)
    - Near sediment bed water quality parameters (temperature, pH), collected during porewater sampling.
- Sediment and porewater collected synoptically with the bioassays:
  - Sediment (collected at Day -7 from homogenized sediment)
    - TAL metals

[16] Initially, only reference area samples will be analyzed. However, aliquots from potential bioassay sample locations (sampleable sand and mud strata samples) will be archived frozen and may be analyzed for organic chemicals at a later date if needed.

[17] Details on bioassay and chemistry data to be collected during the TIE will be provided in the TIE study plan prepared in collaboration with EPA as an addendum to the QAPP.

  - TOC
- Sediment (collected at Day 7 and Day 21):
  - SEM
  - AVS
  - TOC
- Centrifuged porewater (collected at Day 7 and Day 21):
  - Anions (chloride, sulfate)
  - Cations
  - Alkalinity
  - pH
  - DOC
  - Sulfide
  - Dissolved metals

A7.7.9 Sampling Methods

Sediment

Needed sample volumes for sediment chemistry, bioassays, and BMI community surveys in mud- and sand-dominated sediment facies are expected to be easily obtained using a mechanical sample method (i.e., power Van Veen or modified[18] Hamon grab sampler), because these facies are predominantly composed of finer-grained sediments with < 20 percent coarse (i.e., gravel and boulder/cobble) content. A sampling methods hierarchy for the sampleable sand stratum is provided in Figure A7-2. Adequate sample volumes may also be obtained from mixed fines, predominantly sand facies (mFs) using a mechanical sample method if the coarse sediment content is on the low end of this range. Mixed coarse with sand (mCs) facies, are expected to be sampleable using a freeze grab sample method (ERM 2019). Select locations may also be sampled using a manual collection method if river conditions are deemed safe.

Field-Collected Porewater

Porewater will be collected using the Trident probe, to be operated by Coastal Monitoring Associates (CMA) of San Diego, California. CMA has previously used the Trident probe for porewater sampling in the Columbia River within the Hanford Reach, adjacent to Hanford, Washington. A pilot study conducted in September 2018 demonstrated that porewater samples can be collected with the Trident probe under various depth, flow,

[18] A typical Hamon grab sampler is activated by release of tension in the cable (e.g., winch line) when the sampler contacts the sediment bed, and closed by tension on the cable during inhauling (Brown et al. 2002). The modified Hamon grab sampler being developed for use at the UCR is being constructed with a pneumatic arm to drive the sampler's bucket through the sediment.

Slag determination by BSEM will be performed by RJLG—the same laboratory that performed BSEM analysis for sediment samples during the Phase 2 Sediment Study. The methods used for BSEM analysis for the Phase 3 Sediment Study will be comparable to methods used during the Phase 2 study, as described in Appendix F of the *Phase 2 Sediment Study Data Summary Report* (Windward 2017). A description of the BSEM method, including sample preparation, sample analysis, data interpretation, and QC procedures will be included as an attachment to the BSEM sample selection memorandum.

B4.3 Bioassays

Sediment bioassays will be performed using the freshwater amphipod *H. azteca*. The bioassays will be conducted using the 42-day survival, growth, and reproduction test and will measure 28-day survival, weight, and biomass, 35-day survival and reproduction, and 42-day survival, weight, biomass, and reproduction endpoints. Bioassay protocols are described in Appendix C and will follow the standard protocols outlined below with modifications as noted. Additional details are described in EPA (USEPA 2000) and ASTM (2019). During the tests, water quality will be measured in the overlying water of representative replicate chambers for each sample according to EPA guidance. Lighting, room temperature, and other environmental operations of the exposure system will be monitored daily. As required in USEPA (2000) and ASTM (2019) (and listed in Table B4-2), hardness, alkalinity, conductivity, and ammonia will be measured in the overlying water of test chambers at the beginning and end of the sediment exposure (i.e., Day 0 and Day 28) and pH will be measured three times per week. Hardness, alkalinity, and ammonia will also be measured at Day 35 and Day 42, and conductivity will be measured on a weekly basis. Dissolved oxygen will be measured daily and maintained above 2.5 mg/L; water temperature will be measured daily in at least one test replicate per treatment to ensure that the daily average temperature is within ± 1°C of 23°C.

Bioassay endpoints will be evaluated using a minimum of 12 replicates for biological endpoints for each 42-day *H. azteca* bioassay. Additional replicate chambers will be run on each sediment sample to obtain analytical measurements in porewater and sediment samples from exposure chambers. Chemistry replicates will not be used to evaluate biological endpoints (i.e., survival, growth, or reproduction). Thus, the 42-day *H. azteca* bioassay will have a total of 12 replicates in 300 mL beakers for biological endpoints and 10 replicates for chemistry analysis (two 300-mL beakers for sediment collection [1 each at Day 7 and Day 21] and 8 1-liter beakers for porewater collection using centrifugation [four each at Day 7 and Day 21]). These chambers are not true test replicates and will not be assessed for biological endpoints. A schematic illustrating the above-mentioned anticipated number of bioassay and chemistry-only replicates are presented in Figure B4-2.

Sediment samples identified for bioassay testing will be shipped under COC from ALS to PER. The entire bucket of archived sediment will be shipped to PER. Prior to bioassay testing, sediment samples will be homogenized and then distributed directly into test beakers as follows: 100 mL of the sediment will be distributed into each 300-mL replicate and 300 mL of sediment will be distributed into each 1-liter beaker. The sediment in each beaker will be covered with laboratory water (see Table B4-2 and Appendix C for more details). Homogenization procedures are provided in Appendix C, SOP-17. Test chambers will be allowed to stabilize for 7 days with twice daily water changes prior to the introduction of test organisms. From the laboratory culture population, 10 test organisms will be randomly distributed to each replicate and allowed to burrow into the sediment.[19]

Standard responses (endpoints) of test organisms to be measured include the following:

- Survival—number of surviving organisms divided by the initial number of organisms
- Weight—dw of surviving organisms divided by the number of surviving organisms
- Biomass—dw of surviving organisms divided by the initial number of organisms
- Reproduction—number of young divided by the number of surviving females, and number of surviving adult males and females.

Standard bioassay test conditions for the above-referenced tests are described in Table B4-2 (USEPA 2000). Test acceptability requirements (i.e., test acceptability criteria and performance goals) are listed in Table B4-3.[20] If the test acceptability criteria of 80 percent mean survival in the laboratory control sediment on Day 28 is not met, the test will be repeated. Standard bioassay endpoints will be reported in accordance with applicable guidance (USEPA 2000; ASTM 2019). As described in SOP-17 (Appendix C), equipment rinsate blanks will be prepared for equipment used to homogenize sediment samples for bioassay testing. These rinsate blanks will be analyzed for total metals as QC samples to

[19] Amphipods (30 organisms per chamber) will also be added to the one liter beakers to simulate any bioturbation that typically occurs in a sediment bioassay.

[20] EPA (2000) guidance uses the term test acceptability requirements, which includes criteria that must be met for a test to be considered acceptable and other criteria that should be met as a goal for conducting a good test. For the purposes of providing clear language for the Phase 3 Sediment Study and as was used in the Phase 2 sediment study, the two types of requirements are distinguished as follows: test acceptability criteria that must be met are referred to as criteria and those that should be met are referred to as performance goals.

evaluate whether the homogenization equipment was effectively cleaned between samples

B4.3.1 Physico-Chemical Data in Overlying Water

A variety of physico-chemical properties will be measured in the test chamber water column (overlying water) to document water quality during bioassay tests as specified by USEPA (2000); see Table B4-2. Analysis of overlying water is described in the PER SOP included in Appendix C.

The following water quality properties will be documented for each sample in either a treatment replicate or a treatment composite sample (see the PER SOP for details):

- Hardness (mg/L as calcium carbonate)
- Alkalinity (mg/L as calcium carbonate)
- Conductivity (μS/cm)
- pH (standard units)
- Ammonia as NH_3-N (mg/L)
- Temperature (°C)
- Dissolved oxygen (mg/L).

B4.3.2 Laboratory Bioassay-Generated Porewater and Sediment Measurements

Table B4-4 provides the estimated number of laboratory bioassay-generated porewater samples that are expected to be analyzed during the study. Laboratory porewater data will be used in concert with the biological endpoint data to evaluate concentration-response relationships. Primary laboratory porewater measurements measured in bioassay porewater (volume permitting) will include the following:

- Anions (chloride, sulfate)
- Alkalinity
- pH
- DOC
- Sulfide
- Dissolved metals, including major cations.

Anions, alkalinity, pH, DOC, sulfide, and dissolved metals will be measured in centrifuged porewater collected from sediment samples equilibrated with overlying water for 7 days prior to the start of the test; porewater will be collected at Day 7 and Day 21).

Laboratory bioassay-generated sediment samples (Table B4-4) will be collected from bulk sediment (after sediment homogenization) prior to the start of the bioassay (i.e., Day -7) and analyzed for TAL metals. Sediment samples will also be collected from the sediment chemistry replicate chambers at Day 7 and Day 21. These sediment samples will be analyzed for SEM, AVS, and TOC.

Procedures for the collection of laboratory-generated bioassay porewater and sediment samples are included in the PER SOPs that are provided in Appendix C. The additional chambers setup for chemistry analysis of each sediment sample will contain test organisms to allow for bioturbation, but will only be used for sediment and porewater chemistry measurements. Sample containers containing the appropriate preservative and filters for collecting porewater samples for DOC analysis will be provided to PER by ALS. Analytical methods for laboratory bioassay-generated porewater and sediment samples are provided in Table A7-2; sample containers, preservation, and holding times are provided in Table B3-1.

Laboratory bioassay-generated porewater and sediment samples will be identified using the following nomenclature:

Laboratory Bioassay-Generated Sediment

Laboratory bioassay-generated sediment samples for analysis by the analytical chemistry laboratory will be labeled using the following nomenclature:

Sediment matrix code = SE

Location ID = see Table B1-1 for individual location identification (ID)

Organism code = HA42 for *H. azteca* 42-day test

Time code (days) = Day 21; for the test day the sample is generated; BULK will be used to identify the sediment samples collected from the homogenized sediment on Day -7 and submitted to ALS for analysis of TAL metals.

Bioassay batch code = Bi; where *i* is the sequential batch number

Below is an example of a laboratory bioassay-generated sediment sample ID for a *H. azteca* 42-day bioassay sediment sample on Day 21 from batch 1 from hypothetical field location CB081

SE-CB081-HA42-T21-B1

Laboratory Bioassay-Generated Porewater

Laboratory bioassay-generated porewater samples for analysis by the analytical chemistry laboratory will be labeled using the following nomenclature:

Porewater matrix code = PW

Location ID = see Table B1-1 for individual location IDs

Organism code = HA42 for *H. azteca* 42-day test

Time code (days) = Ti; where *i* is 0, 7, 21, or 28 for the test day the sample is generated

Bioassay batch code = Bi; where *i* is the sequential batch number

Below is an example of a bioassay laboratory-generated porewater sample ID for a *H. azteca* 42-day bioassay porewater sample on Day 7 from batch 3 from hypothetical field location EV092:

PW-EV092-HA42-T7-B3

B4.4 Benthic Macroinvertebrate Enumeration

Benthic macroinvertebrate enumeration will be performed as described in Appendix D and will follow the standard protocols outlined below. The processing of BMI community samples requires two main steps:

- Sample sorting of the BMI community to remove all organisms from the sediment sample
- Identification of the organisms to the lowest practical taxonomic level by a qualified taxonomist.

B4.4.1 BMI Community Sample Sorting

To conduct a BMI community sample sorting, the sorting technician checks out a sample and prints a sorting bench sheet that contains the EcoAnalysts' sample identification information and sorting protocols. The sorting technician records the primary matrix type and approximates the volume of detritus prior to sieving. The standard descriptors for the types of sample matrix are Inorganic, Coarse Organic, Fine Organic, Vegetation, and Filamentous Algae.

The sample is elutriated entirely (no subsampling) by emptying the matrix into a sieve (250 μm) to remove preservative and fine sediment. If the sample matrix is composed of a significant percentage of inorganic material, the organic material will be elutriated from the inorganic material prior to sorting. For elutriation, the whole sample is washed into a shallow pan of water. At this time, any large pieces of organic material can be rinsed and

REVISED TABLES FROM PHASE 3 SEDIMENT STUDY QAPP

Table B3-1. Sample Containers, Holding Times, Preservation, and Sample Quantity

Priority	Analysis	Container Type	Container Size	Filtered	Field Preservation	Holding Time	Minimum Laboratory Sample Size	Total Minimum Sample Size Needed [a, b]	Target Sample Size [c]
Part A. Bulk Sediment Analysis									
1	Total metals, percent moisture	WMG	8 oz	NA	4±2ºC			312 g	
	EPA 6020A metals					6 months	10 g		30 g
	EPA 6010C metals								
2	Total mercury					28 days	5 g		15 g
2	TOC						1 g		3 g
2	SEM-AVS				no headspace; 4±2ºC	14 days	25 g		75g
3	Grain size				4±2ºC	6 months	100 g		300 g
3	Backscatter electron microscopy		16 oz			NA	TBD		TBD
4	Organic chemicals		8 oz (2x)			14 days or 1 year if frozen	161 g		483 g
Total sediment volumes for chemical/physical analysis			56 oz (1.4 L)				312 g		936 g
Part B. Benthic Macroinvertebrate Analysis									
1	Taxonomic enumeration and identification	HDPE	1.0 L or 5 gal bucket	NA	90% ethanol	1 month, transfer to 70% ethanol after 1 month for longer holding time	500 sort count	0.1 m^2 sediment area (10 L or 2.7 gal)	0.1 m^2 sediment area (10 L or 2.7 gal)
Part C. Sediment Bioassays									
1	42-day *H. azteca* bioassay	plastic	2 gal	NA	4±2ºC	ASAP[g]	2.5 L (0.7 gal)	20 L	5 L (1.4 gal)
2	TIE		5 gal			NA	19 L (5 gal)		19 L (5 gal)
Total sediment volumes for sediment bioassays							21.5 L (5.7 gal)		24 L (6.3 gal)
Part D. In situ Sediment Porewater									
Dissolved Metals									
1	EPA 6020A metals	HDPE	125 mL	field filtered	HNO_3 to pH<2; 4±2ºC	6 months	20 mL	190 mL	60 mL
	EPA 6010C metals								
	Hardness[d]	NA	NA	NA	NA	NA	NA		NA
Organic Carbon									
2	DOC	amber glass	125 mL	field filtered	4±2ºC;	28 days	40 mL	190 mL	80 mL
	TOC	amber glass	125 mL	not filtered	sulfuric acid to pH < 2				
Conventional Parameters									
3	Alkalinity as $CaCO_3$	HDPE	125 mL	not filtered	4±2ºC	14 days	35 mL	190 mL	100 mL
	Chloride, sulfate					28 days	10 mL		
3	Sulfide (select locations only) [e]		250 mL (holds up to 270 mL [e])		No headspace, ZnAc, NaOH to pH>9; 4±2ºC	7 days	25 mL		270 mL[e]
Total porewater volumes for analysis							190 mL		320 mL or 570 mL [f]

Table B3-1. Sample Containers, Holding Times, Preservation, and Sample Quantity

Priority	Analysis	Container Type	Container Size	Filtered	Field Preservation	Holding Time	Minimum Laboratory Sample Size	Total Minimum Sample Size Needed [a, b]	Target Sample Size [c]
Part E: Bioassay Laboratory-generated Sediment and Porewater									
Sediment									
1	Total metals, percent moisture	WMG	4 oz	NA	4±2ºC	6 months	10 g	11 g	30 g
	EPA 6020A metals								
	EPA 6010C metals								
	TOC					28 days	1 g		3 g
2	SEM-AVS		4 oz	NA	< 80% full; nitrogen headspace; frozen[i]	14 days	25 g	26 g	75 g
	TOC					28 days	1 g		3 g
Centrifuge Porewater									
1	EPA 6020A metals	HDPE	125 mL	filtered	1 mL of 20% HNO_3, pH<2;	6 months	20 mL	150 mL	60 mL
	EPA 6010 metals				4±2ºC				
	Hardness	NA	NA	NA	NA	NA	NA		NA
2	DOC	amber glass	125 mL	filtered	4±2ºC; sulfuric acid to pH < 2	28 days	40 mL		80 mL
3	Alkalinity as $CaCO_3$	HDPE	125 mL	not filtered	4±2ºC	14 days	35 mL	150 mL	100 mL
	Chloride, sulfate					28 days	10 mL		
	Sulfide	HDPE	40 mL		no headspace, ZnAc, NaOH to pH>9; 4±2ºC	7 days	25 mL		40 mL

Notes:

[a] Total sample size does not include additional sample volumes needed for laboratory quality control or field duplicate samples. If sufficient sample volume is available, attempt to fill all sample containers provided. If insufficient sample volume is available, fill containers to laboratory minimums in order of priority and then fill the priority containers with any remaining sample.

[b] Project field duplicate samples should be collected for 10 percent of all analytical sediment samples and 5 percent of porewater samples and submitted blind to the analytical laboratory. Due to potential limitations on availability of porewater, field duplicates for porewater will be by bottle (or by analysis), not by sample location. If required, EPA split sediment samples will also be collected.

[c] If target volume exceeds for container size listed, additional containers will be filled.

[d] Hardness will be calculated from dissolved metals results for calcium (Ca) and magnesium (Mg) per: equivalent calcium carbonate ($CaCO_3$) = 2.5 (mg Ca2+/L) + 4.1(mg Mg2+/L).

[e] At locations where sulfide analysis is deemed necessary based on field measurements, a 250-mL high density polyethylene (HDPE) bottle will be filled with no headspace. The approximate volume of sample required to fill a 250-mL bottle with no headspace is 270 mL. See QAPP Section A.7.3 and SOP-7 in Attachment A2 to the Field Sampling Plan (QAPP Appendix A) for field measurement criteria for collecting samples for sulfide analysis.

[f] The total porewater volume required is either 320 mL or 590 mL, depending on necessity for sulfide analysis.

[g] After review of preliminary data and TAI and EPA agree on samples for bioassays.

[h] The volume of porewater prepared from peepers will be less than 20 mL See Pacific EcoRisk SOP (Appendix B) for details.

i In anticipation that the sediment sample volume may not always be sufficient to completely fill the 4 oz jar (as occurred during the Phase 2 Sediment Study [Windward 2017a]), samples will be covered with nitrogen headspace and frozen. Place the 4 oz sample jar in an 8 oz wide-mouth glass (WMG) jar and add nitrogen headspace before freezing the sample to provide secondary containment in case the 4 oz. sample jar cracks.

ASAP - as soon as possible
$CaCO_3$ - calcium carbonate
DOC - dissolved organic carbon
HNO_3 - nitric acid
NA - not applicable
NaOH - sodium hydroxide
SEM-AVS - simulatneously extracted metal minus acid volatile sulfide
TBD - to be determined

Table B3-1. Sample Containers, Holding Times, Preservation, and Sample Quantity

Priority	Analysis	Container Type	Container Size	Filtered	Field Preservation	Holding Time	Minimum Laboratory Sample Size	Total Minimum Sample Size Needed [a, b]	Target Sample Size [c]

TIE - Toxicity Identification Evaluation
TOC - total organic carbon
ZnAc - zinc acetate

Table B4-2. Test Conditions for Conducting a 42-day Sediment Toxicity Test with *Hyalella azteca*

Parameter	Conditions
Test type	Whole-sediment toxicity test with renewal of overlying water
Temperature	23 ± 1°C
Test duration	42 days
Light quality	Wide-spectrum fluorescent lights
Illuminance	Approximately 500 lux
Photoperiod	16L:8D
Test chamber	300-mL high-form lipless beaker
Sediment volume	100 mL
Overlying water	SAM-5S reconstituted water (Borgmann 1996) modified to contain 0.4 mg bromide/L
Overlying water volume	175 mL in the sediment exposure from Day 0 to Day 28
	270 mL for the water-only exposure from Day 28 to Day 42
Renewal of overlying water	2 intermittent volume additions/day (e.g., 1 volume addition every 12 hour)
Sediment equilibration	Equilibrate sediment samples in beakers for 7 days (Day -7 to Day 0) with twice daily water changes
Age of organisms [a]	7-to-8 days old at the start of the test with a goal of achieving starting weights in the range of 0.02 to 0.035 mg/organism. The weight of a representative sample of organisms at the start of sediment exposures will be documented.
Number of organisms/chamber	10 (add 30 organisms to the 1-liter chemistry only chambers)
Number of replicate bioassay chambers/treatment	12 replicates for biological endpoints; 4 replicates will be sacrificed for 28-day growth measurements and 8 replicates will be continued on with the water-only exposure for 35-day survival and reproduction and 42-day survival, growth, and reproduction.
Number of replicate chemistry chambers/treatment	10 replicates for chemistry only as follows:
	2 replicates to collect sediment samples for analysis of AVS, SEM, and TOC; 1 for sample collection on Day 7 and 1 for Day 21
	2 sets of replicates (1 L of sediment distributed across 4 1L beakers per set) to equilibrate sediment for collecting porewater using centrifugation on Days 7 and 21; 500 mL overlying water per 1L beaker; porewater will be analyzed for dissolved metals (including major cations), dissolved organic carbon, pH, sulfide, chloride, sulfate, and alkalinity.
Feeding [a]	YCT and fish flake food (e.g., Tetramin) according to the following schedule:
	YCT: 1.0 mL/beaker-day
	Flake fish food suspension:
	Week 1 – 0.25 mg/beaker-day Week 2 – 0.5 mg/beaker-day Week 3 – 1.0 mg/beaker-day Week 4 – 1.5 mg/beaker-day Week 5 – 2.0 mg/beaker-day Week 6 – 2.5 mg/beaker-day
Aeration	None, unless DO in overlying water drops below 2.5 mg/L.
Test chamber cleaning	If screens become clogged during a test, gently brush the *outside* of the screen.
Overlying water quality	Hardness, alkalinity, and ammonia at Day 0, 28, 35, and 42; temperature and DO daily; conductivity weekly; pH three times/week. Concentrations of DO should be measured more often if DO drops more than 1 mg/L since the previous measurement.
Endpoints	28-day survival, weight, and biomass; 35-day survival and reproduction; and 42-day survival, weight, biomass reproduction, and number of adult males and females on Day 42.
Test acceptability	Minimum mean control survival of 80% on Day 28.

Source: USEPA (2000)

Notes:

a The specified parameter is a project-specific condition that has been modified from EPA guidance USEPA (2000) based on discussions with EPA in advance of the Phase 2 sediment study (Windward 2017a) and during bioassay webinars conducted to prepare for the Phase 3 sediment study (McCaig 2019).

DO = dissolved oxygen

YCT = yeast, cereal leaves, and Tetramin

Table B4-4. Estimated Number of Bioassay-Generated Samples for Analytical Chemistry

Media	Analyses	Number of Sediment Samples Tested	Day 0	Number of Analytical Samples Generated at Different Times During Bioassays: Day 7	Day 21
Sediment	Total metals, percent moisture, TOC	57	57	0	0
	AVS, SEM, TOC	67	0	67	67
Centrifuged Porewater	Anions (chloride, sulfate), alkalinity, DOC, dissolved metals [a] (including major cations), sulfide	67	0	67	67
			Sediment total		191
			Porewater total		134

Notes:

The number of sediment samples tested in the bioassays includes the 57 samples recommended for testing by TAI in the Revised Draft Bioassay Sample Selection and Batching Recommendations Memo submitted to EPA on January 31, 2020. Samples will be tested in three batches with two samples and two laboratory controls (Spring River control and quartz sand control) repeated in each batch to yield a total of 67 sediment samples tested.

Total metals will be collected from 57 sediment samples (40 Site and 17 reference) after homogenizatioin and prior to the start of the bioassay.

[a] Dissolved metals include aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), vanadium (V), and zinc (Zn) by ICP/MS and calcium (Ca), iron (Fe), magnesium (Mg), potassium (K), and sodium (Na) by inductively coupled plasma/atomic emission spectrometry (ICP/AES).

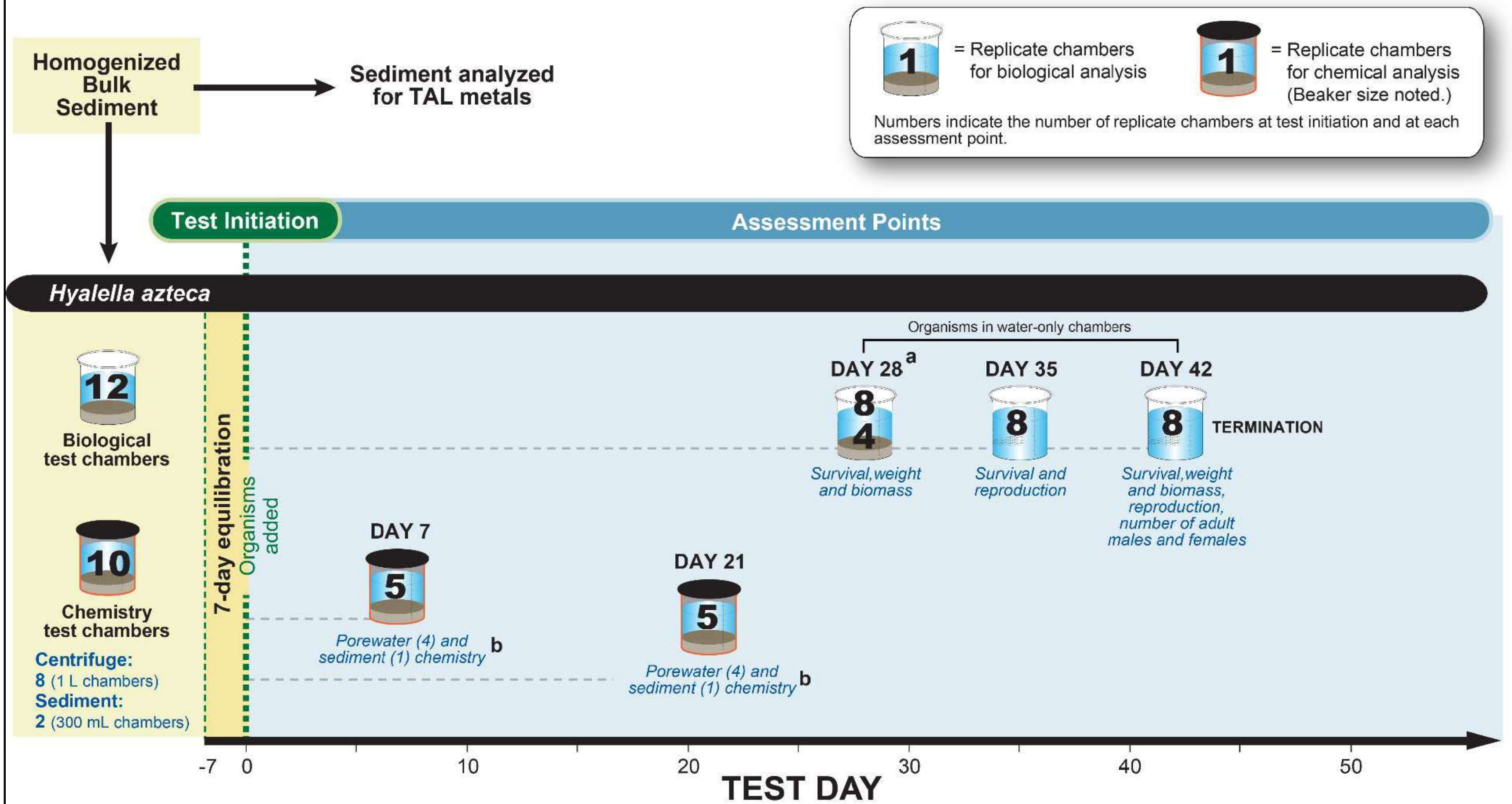
AVS - acid volatile sulfide

DOC - dissolved organic carbon

SEM - simultaneously extracted metals

TOC - total organic carbon

REVISED FIGURE FROM PHASE 3 SEDIMENT STUDY QAPP



[a] On Day 28, survival evaluated in all 12 replicates; 4 replicates sacrificed to obtain dry weight and biomass, surviving amphipods in 8 replicates transferred to water-only chambers and continued to Day 42

[b] Porewater from centrifugation analyzed for dissolved metals, DOC, pH, sulfide, alkalinity, sulfate, and chloride; sediment from chemistry test chambers analyzed for AVS, SEM, and TOC.

Figure B4-2. Bioassay Timeline for Sediment Samples

REVISED STANDARD OPERATING PROCEDURES

Hyalella azteca 42-Day Survival, Growth, and Reproduction Sediment Toxicity Test

Upper Columbia River Phase 3 Project Specific Standard Operations Procedure for *Hyalella azteca* 42-Day Survival, Growth, and Reproduction Sediment Toxicity Test

Effective date: April 9, 2020

Revised/Reviewed/Approved by:

Action	Name	Title	Signature	Date
Revised by:	Michael McElroy	Sr. Project Manager		
Reviewed by:	Krista Prosser	QA Manager		
Approved by:	Stephen L. Clark	Vice President		

Hyalella azteca
42-Day Survival, Growth, & Reproduction
Sediment Toxicity Test
UCR Project-Specific Standard Operating Procedures

This standard operating procedure (SOP) has been developed specifically for use in the Upper Columbia River (UCR) Phase 3 Sediment Study for Teck American Incorporated (TAI) and is based upon a modification of the EPA Method 100.4 described in Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition (EPA/600/R-99/064). It is also in general accordance with ASTM Standard E1706-19, Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates.

Modifications from the standard EPA and ASTM methods are based on updated draft guidance from EPA, discussions with EPA during webinars in Spring 2019 (McCaig 2019), and discussions with EPA in Fall 2019 regarding recommendations for Phase 3 sediment study bioassay chemistry data collection (Windward and USGS 2019; USGS et al. 2019).

1. INTRODUCTION

This test is based on a 28-day static-renewal exposure of 7-8 day old *Hyalella azteca* to sediments, followed by a 14-day exposure to water only during which reproduction is evaluated. The final test endpoints include survival, growth, and reproduction (survival and growth on Day 28; survival and reproduction on Day 35; survival, growth, and reproduction on Day 42; and number of adult males and females on Day 42).

H. azteca are often an important component of the benthos in freshwater ecosystems. They have been used in sediment toxicity testing and have been shown to be a sensitive indicator of contaminants associated with sediments. They have a wide tolerance of sediment grain size with acceptable survival in sediments ranging from >90% fines to 100% sand (Ingersoll and Nelson, 1990).

2. TEST PREPARATION

2.1 Equipment and Supplies Needed

1. The analytical lab will provide pre-cleaned and decontaminated sample containers for the field crew to use in the collection of sediment. A minimum volume of 4 L of sediment is necessary (>8 L is preferred) to provide sediment for the bioassay and for the accompanying sediment pore water characterization. Additional volume will be necessary for further characterization of sediment (e.g., grain size characteristics,

contaminant concentrations, porewater generation for Biotic Ligand Model (BLM) constituents).

2. Test organisms, 7-8 day old *H. azteca.*
3. Temperature-controlled room set to 23˚C.
4. Laboratory control water (Type I water and salts to produce SAM-5S reconstituted water per Borgmann (1996) modified to contain 0.4 mg Br/L). Performance based criteria: > 0.02 mg Br/L and > 15 mg Cl/L.
5. Control sediment consists of a field collected freshwater sediment from Spring River, Missouri. In addition, a quartz sand control will also be included in each test batch.
6. Food: YCT (prepared in-house, preferred) and TetraMin® fish flake food.
7. Lexan tubs, stainless steel bowls, plastic scoops, and spatulas (or spoons) to homogenize sediments prior to placement in replicate containers.
8. Sieves, 250 µm, 500 µm, and 1 mm, for removing excess debris and indigenous organisms from test sediments and collecting organisms on Day 28 and Day 42.
9. Test chambers (14 300-mL beakers and eight 1-L beakers per treatment):
    a. 12 for bioassay testing and two for sediment chemistry (AVS, SEM, and TOC) analysis, each consisting of 300 mL tall-form glass beakers, modified as follows:
        i. The flared lip of the beakers should be cut off, and the upper rim flame-polished. The prepared beakers must be appropriately cleaned before further use (See the Glassware & Plasticware Washing SOP).
        ii. Cut a 2.5 cm-wide band of 120 µm Nitex®, approximately 25 cm in length. Using aquarium-safe silicon sealant, attach the band of Nitex around the upper lip of the beaker, such that ~two-thirds of the width of the Nitex band is above the glass. Make sure to completely seal the Nitex such that there are no openings or seams into which the test organisms might become entrapped. Allow the silicon sealant to cure for a minimum of 24 hrs. The resulting test containers must be appropriately cleaned and rinsed, and then pre-soaked for 48 hrs in Type I water [i.e., reverse-osmosis, de-ionized (RO/DI)], before use in testing.
    b. Eight 1-liter beakers for sediment porewater obtained via centrifugation; these 1-L beakers will be modified for use with the Modified Zumwalt-type water delivery system or a Brunson style in-line flow splitter as described in Appendix A.5 of the EPA/600/R-99/064 manual. The 1-liter beakers will be modified as follows:
        i. Two 1-inch diameter holes will be drilled into opposite sides of the beakers at the 800-mL mark. The prepared beakers must be appropriately cleaned before further use (See the Glassware & Plasticware Washing SOP).

ii. Cut two 2-inch squares of 120 µm Nitex®. Using aquarium-safe silicon sealant, attach the squares of Nitex over each of the holes in the beaker. Make sure to completely seal the Nitex such that there are no openings or seams into which the test organisms might become entrapped. Allow the silicon sealant to cure for a minimum of 24 hrs. The resulting test containers must be appropriately cleaned and rinsed, and then pre-soaked for 48 hrs in Type I water [i.e., reverse-osmosis, de-ionized (RO/DI)], before use in testing.

10. Modified Zumwalt-type water delivery system, consisting of a lower plastic tub to hold replicate containers in position, and an upper plastic tub, plumbed with 60 mL syringes with flow restricting frits for delivery of water to replicate containers, or a Brunson style in-line flow splitter.
11. Plastic 25 mL disposable pipette with 120 µm Nitex® screen over one end, for collecting water sub-samples to measure water quality.
12. 50 mL plastic cup, to composite water sub-samples from each replicate to measure water quality.
13. Meters: D.O., pH, and conductivity/salinity, needed to document test water quality, calibrated and used as per the appropriate SOPs.
14. Type I water and wash bottles, for rinsing of probes, etc.
15. Sample bottles, titrators and reagents, calibrated and used as per the appropriate SOPs, required to measure hardness and alkalinity.
16. Colorimeter and reagents, calibrated and used as per the appropriate SOP, required to measure ammonia.
17. Thermometer: NIST certified, for documenting test water temperature.
18. Disposable plastic transfer pipettes, for the collection and transfer of test organisms.
19. Glass tray: for the sorting and collection of test organisms at test initiation and at test termination.
20. Plastic weigh boats for collection of test organisms at test termination.
21. Light boxes: for the sorting and collection of test organisms at test initiation, Day 28, Day 35, and at test termination.
22. Aeration system, in cases where the chambers need to be aerated when the D.O. drops below acceptable levels.
23. Methanol for euthanizing organisms prior to placing them in the drying oven.
24. Fine-tip forceps for organism handling when sacrificing organisms at test initiation (for initial weight measurements), Day 28, and Day 42 for dry weight determinations.

25. Aluminum Foil Weighing Pans, for drying and weighing of *H. azteca* for Test Initiation, Day 28, and Day 42 weights.
26. Drying oven, at 60˚C for drying *H. azteca* at Day 28 and test termination.
27. Desiccators, for holding dried organisms.
28. Balance, capable of weighing to 0.01 mg. Calibrate and use as per the appropriate SOP.
29. Reference weights, for calibration of balance.
30. Microscope and calibrated software for determining sex at Day 42 if necessary.
31. 5 mL clean quartz sand for each replicate beaker for the post-28 day water exposure.

2.2 Ordering and Holding of Test Organisms

2.2.1 Ordering and Holding of Test Organisms from Commercial Supplier

1. Test organisms should be ordered far enough in advance so as to ensure the arrival of 6-7 day old organisms 24 hrs prior to Day 0 (7-8 days old at Day 0). Approximately 15-25% more animals should be ordered than are actually needed for the test, so as to allow for some attrition of organisms that are stressed from the shipping, etc.
2. Order *H. azteca* from:
    a. Aquatic BioSystems, Inc. (800) 331-5916.
    b. Aquatic Research Organisms. (800) 927-1650.
    c. Aquatic Indicators. (904) 829-2780.
3. Upon receipt, the test organism culture should be transferred into 4 L HDPE tanks containing test water at 23˚C; the culture should be gently aerated, and should be fed YCT and TetraMin®. For additional instruction on the receipt and handling of the test organisms, see the **Test Organism Receipt and Handling SOP**.

2.2.2 Organism Health

Test organisms must appear healthy (not pale in color, not noticeably injured), behave normally (active when disturbed, not continually floating and getting stuck in the water surface tension), have been fed well, and have low mortality in the cultures during holding. There should be <10% mortality in the cultures prior to test initiation.

2.3 Collection and Holding of Sediment Samples

Grab or composite samples should be collected into appropriately-cleaned glass or plastic container(s), and immediately be placed on ice (or "blue ice" type product) to bring the temperature to ≤ 4°C. The sample should be handled and transported according to UCR Phase 3 sediment study Quality Assurance Project Plan (QAPP) specifications. Upon receipt of the sample(s) in the laboratory, each sample should be logged in, and then placed in the sample refrigerator at 4°C in the dark. For instruction on the log-in of incoming samples, see the **Sample Receipt and Handling SOP**. The test sample(s) used to start the test should be < 8 weeks old; however, the UCR Phase 3 sediment study Quality Assurance Project Plan (QAPP) may have project-specific established sediment hold times; the QAPP will supersede method recommendations. For each site tested, a minimum of 4 L of sample will be needed for this testing, but >8 L is preferred. This includes the volume needed for chemistry analyses as planned for the Phase 3 study.

NOTE: Samples can be tested up to eight weeks after collection or as established in the UCR Phase 3 QAPP; however, it is recommended to test them as soon as possible after collection. Depending on chemicals of interest and composition of the sediment, degradation and decomposition can occur the longer the sample is in storage.

3. TEST INITIATION

Before test initiation begins, be aware of any client-specific testing requirements and read the attached "**Summary of Test Conditions and Test Acceptability Criteria for Conducting the 42-Day *Hyalella azteca* Survival, Growth, and Reproduction Sediment Toxicity Test.**"

3.1 Pre-Test: Obtaining Test Organisms (Day –8, or before):

1. If in-house organisms are to be used for testing. A sufficient number of neonate *H. azteca* will be obtained and isolated from the culture. The neonate culture will be maintained for the next 7-8 days until test initiation per the **Test Organism Receipt and Handling SOP**.

2. If organisms for testing will be obtained from a test organism supplier, on Day -10 or before, an order for 4, 5, 6, or 7 day old amphipods (as needed to provide sufficient 7 or 8 day old organisms on Day 0) will be ordered for receipt 1 to 3 days in advance of test initiation. Once received, the amphipods will be maintained prior to testing per the **Test Organism Receipt and Handling SOP**.

3.2 Pre-test: Sediment Loading/Equilibration, Sample Collection Prior to Test Initiation (Day -7):

1. Remove the sediment from the sample storage refrigerator and allow thermal equilibration to room temperature. Re-homogenize the sediment along with any overlying water that has developed.

2. Label 14 test replicate containers. Label the test containers with their treatment and replicate ID code (Replicates "A" through "L" for bioassay test replicates, Replicates "M" and "N" for sediment chemistry replicates).

a. For each sediment sample, use a stainless steel spoon or spatula to transfer approximately 100 mL of homogenized sediment into each of the replicates, carefully "tamping" down the sediments. Carefully pour approximately 175 mL of SAM-5S water modified to contain 0.4 mg Br/L into each beaker, taking care to minimize disturbance of the sediment. Sediment chemistry replicates will be similarly established following the **UCR Phase 3 Sediment Chemistry SOP**. Place the test replicates into the water bath or test room, with the temperature controlled at 23˚C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

3. Label eight 1-L beakers with their treatment and replicate ID code for the centrifuged porewater replicates.

   a. For each sediment sample, use a stainless steel spoon or spatula to transfer approximately 286 mL of homogenized sediment into each of the eight replicates, carefully "tamping" down the sediments. Carefully pour approximately 500 mL of SAM-5S water modified to contain 0.4 mg Br/L into each beaker, taking care to minimize disturbance of the sediment. Place the test replicates into the water bath or test room, with the temperature controlled at 23˚C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

3.3 Sediment Equilibration Period (Day -7 to Day 0):

Water changes will be performed twice daily during the sediment equilibrium period. Use the pre-calibrated modified Zumwalt water delivery system or modified Brunson system to add approximately 175 mL of control water to each test chamber. Place the test chambers in the lower plastic tub to hold them in place. Place the tub with the test chambers directly under the syringes connected to the upper splitting chamber of the Zumwalt or Brunson water delivery system and add 1.8 L of overlying water to the splitting chamber. Once the upper reservoir has completely drained into the test chambers, adjust the volume of water in each test chamber so the surface of the water is approximately 1 cm below the mesh screen. If the Zumwalt system is used for performing water changes, drain the water that has overflowed into the lower plastic tub and return the test chambers to the test area. If the Brunson system is used for water changes, the overflow from the tubs will be plumbed to go to a drain in the test room and the test replicates will not need to be removed from the shelf. The 1-L chambers established for centrifuged porewater extraction will similarly have twice daily water changes performed with the water delivery system modified to deliver a proportional amount of water equivalent to the bioassay test replicates.

3.4 Immediately Prior to Test Initiation (Day 0):

1. Renew water as described in Section 3.3.
2. After the water is renewed, use a plastic 25 mL disposable pipette with 120 µm Nitex® screen over one end to collect approximately 20 mL of overlying water from each replicate.

Overlying water should be sampled 1-2 cm above the sediment surface. Composite into a beaker for a final volume of approximately 240 mL.

3. From the composite, collect sub-samples for analysis of alkalinity, hardness, and ammonia. Measure routine water quality parameters (temperature, pH, D.O., and conductivity) in the remaining composited water (**NOTE** – D.O. levels must be > 2.5 mg/L) and record onto the data sheet. Bring the volume of overlying water in each test chamber back to the appropriate level with overlying water.
4. If the D.O. levels fall below 2.5 mg/L, implement gentle aeration of each test replicate.
5. Isolation and Collection of Individual Test Organisms:
    a. Immediately prior to test initiation, transfer a small portion of test organisms and test water into a shallow glass dish or plastic freezer box placed on top of light box.
    b. Cut the tip off of the transfer pipette so as to not damage organisms when handling.
    c. Using plastic pipette, agitate the culture material. This disturbance will cause the juvenile *H. azteca* to swim up, facilitating their capture. However, if there is substrate present in the culture (e.g., leaves or Nitex screen), use a pair of tweezers to move the substrate to the glass dish/freezer box and gently shake the organisms off. Repeat this step until enough organisms are isolated to initiate the entire test.

3.5 Initiate the Test (Day 0):

1. Identify how many total replicates are in the test and gather an equal number of transfer dishes (e.g., plastic weigh boat). Aliquot a small amount of control water into each transfer dish and begin carefully transferring ten 7 or 8 day old *H. azteca* into each dish (these counts must be confirmed by a second scientist). Periodically verify that the organisms are not escaping from the pan and desiccating; resubmerge or replace any escaping organisms. **NOTE** – do not leave organisms in the transfer dishes for an extended amount of time as this will stress the organisms. If loading a large number of sites, it is possible to load one or two replicates at a time.
2. Allocate ten 7 or 8 day old *H. azteca* into each replicate beaker (30 *H. azteca* to each of the 1-L centrifuged porewater replicate chambers) by gently pouring the organisms from the transfer dishes into the test chambers; make sure that organisms are below the water surface in the test replicate chambers. Use a transfer pipette to rinse organisms from the dish into the test chamber, if necessary. Load all "A" replicate containers first, with the order of test treatments being randomized. Repeat process for the "B" replicates, with the order of test treatments being re-randomized. Continue until all test replicates are loaded. Place the weigh boat above the chamber to show that it has been loaded. Once every chamber is loaded carefully remove the weigh boat and double check that no organisms are stuck to the bottom.

3. Immediately re-examine the replicates, replacing any dead or injured animals. Due to surface tension, some organisms may be "trapped" on the water surface. Examine each replicate to ensure that all test organisms are below the water surface. Using a transfer pipette, organisms that are at the water surface should be moved into the water by gently squirting the organisms with test water.
4. Randomly place the replicate containers into the temperature-controlled water bath or room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.
5. After the water is changed in the afternoon each replicate should get fed by adding 1.0 mL of the YCT and 0.25 mg Tetramin® Tropical Flakes (sieved through 300-µm screen) to each of the 300 mL beakers. The 1-Liter beakers will be fed 3.0 mL of YCT and 0.75 mg Tetramin® Tropical Flakes.
6. At t=0, a minimum of 80 organisms should be dried as described below in Section 5.1.12 to assess growth (as per EPA guidelines).

4. TEST MAINTENANCE (DAYS 1-27)

1. AM Maintenance:
    a. Examine each replicate container. Any dead organisms observed on the water surface are to be removed via pipette, and the number of mortalities is recorded onto the test data sheet.
    b. Measure the temperature in the test water from one randomly-selected replicate for each treatment and record data onto test datasheet.
    c. Using a plastic 25 mL disposable pipette with 120 µm Nitex® screen over one end, collect "old" test water from 1-2 cm above the sediment from a replicate chamber being careful not to remove any *H. azteca* (multiple replicates may need to be sampled). Composite the replicate water samples for each treatment into a 50 mL plastic cup to provide a total volume of ~40 mL; the pipet must be inspected to ensure no organisms were removed during sampling.
    d. Measure the "old" D.O. and record data onto the test data sheet. If the D.O. levels fall below 2.5 mg/L, implement gentle aeration of each test replicate. Measure pH in addition to D.O. three times per week (e.g. Tuesday, Thursday, Saturday) and measure conductivity once per week.
    e. Every 7 days, collect sub-samples for analysis of alkalinity, hardness, and ammonia analysis as described in Section 3.4, Step 3.
    f. Renew the overlying water using the Zumwalt or Brunson water delivery system to deliver at least one replicate water volume to each replicate container as described above in Section 3.3.

g. Return the test to the test area.

h. Collect "new" test water and measure "new" D.O. and record data onto the test data sheet as described in Sections 4.1.c and 4.1d.

2. PM Maintenance:

   a. Examine each replicate container. Any dead organisms observed on the water surface are to be removed via pipette, and the number of mortalities recorded onto the test data sheet.

   b. Renew the overlying water using the Zumwalt or Brunson water delivery system to deliver at least one replicate water volume to each replicate container as described above in Section 3.3.

   c. Return the test replicates to the test area, and feed each replicate YCT+flake fish food. The YCT is fed at 1.0 mL/replicate/day for the entire test period in the 300-mL beakers and 3.0 mL/replicate/day in the 1-L beakers. The Tetramin® food amount is increased each week to account for organism growth.

      i. Week 1: 0.25 mg/300-mLbeaker/day and 0.75 mg/1-L beaker/day Tetramin® fish flake suspension

      ii. Week 2: 0.5 mg/300-mL beaker/day and 1.5 mg/1-L beaker/day Tetramin® fish flake suspension

      iii. Week 3: 1.0 mg/300-mL beaker/day and 3.0 mg/1-L beaker/day Tetramin® fish flake suspension

      iv. Week 4: 1.5 mg/300-mL beaker/day Tetramin® fish flake suspension

   d. Initial "PM" maintenance on data sheet.

3. Day 7:

   a. Collect sediment from one sediment chemistry replicate. Collect samples for analytical chemistry analysis following the **UCR Phase 3 Sediment Chemistry Collection SOP**.

   b. Sample porewater for chemical analysis from four of the 1-L beaker centrifuged porewater replicates following the **UCR Phase 3 Project Specific Sediment Porewater Extraction via Centrifugation SOP**:

      i. Place the approximately 1000 mL of sediment into two 750-mL centrifuge bottles (~500 mL/bottle), add nitrogen to the overlying headspace, and centrifuge at 4,300 g-force for 30 min.

      ii. Decant sediment porewater following **Sediment Porewater Extraction via Centrifugation SOP**, measure pH, and submit porewater samples for chemical analyses (as per Phase 3 QAPP).

4. Day 21:

   a. Collect samples for analytical chemistry analysis following the **UCR Phase 3 Sediment Chemistry Collection SOP**.

b. Sample porewater for chemical analysis from four of the 1-L beaker treatment replicates following the **UCR Phase 3 Sediment Porewater Extraction via Centrifugation SOP** and as described above in Section 4.3.

5. DAY 28 TEST TERMINATION & INITIATION OF WATER-ONLY EXPOSURES

5.1 Day 28: Interim Assessment of Survival and Growth

<u>NOTE:</u> Survival and growth at 28 days will be assessed in <u>**four** of the original 12 replicates</u>, as follows.

1. Examine each replicate container. Any dead organisms should be removed via pipette, and the number of mortalities recorded onto the test data sheet.
2. Measure the temperature in the test water in one randomly-selected replicate for each treatment and record data onto test data sheet.
3. Collect sub-samples and measure water quality parameters per Sections 3.4.2 and 3.4.3.
4. Label plastic weigh boats with the corresponding treatment and replicate identification for each test chamber and fill with a small volume of clean test water.
5. Terminating growth replicates:
    a. Using a squirt bottle containing clean test water, vigorously squirt water onto the surface of the sediment so as to disturb the surficial layer – this will facilitate the collection of the *H. azteca*. Swirl and pour the slurry of water and sediment into a glass sorting dish atop a light box.
    b. Using a plastic transfer pipettes with the tip cut, remove the *H. azteca* (adult or young) from the dish and place them into the corresponding weigh boat. Sort through the slurry until all of the *H. azteca* have been removed.
    c. In order to monitor for early reproduction and quantify if it does occur (observation of neonates), pour the slurry of water and sediment from the glass sorting dish through stacked 1-mm opening, 500-µm opening, and 250-µm opening sieves. The contents of the sieves will then be washed, transferred into the glass sorting dish atop a light box, and any observed surviving organisms (adult or young) will be recovered. The presence or absence of neonates in growth replicates should be noted.
    d. If the turbidity of the transferred material is too high to effectively locate the amphipods, the contents will be rinsed again in the 250-µm sieve and re-examined.
    e. Repeat steps 5.a. – 5.d. If no young are recovered after two cycles, it is assumed that there are no young present. If no young are present and all 10 adult amphipods have been recovered, then recovery is considered complete and the remaining sediment can be discarded. If no young are present but all 10 adult amphipods have <u>not</u> yet been recovered, then all the remaining sediment is sieved through a 500-µm opening (or smaller) sieve using a gentle stream of water. Material retained by the sieve is then rinsed into a glass sorting dish, and checked for additional amphipods. If young are

recovered, repeat steps 5.a. – 5.d. until all sediment in the test replicate has been processed.

6. Recovering organisms from reproduction replicates:
   a. If no young are found during processing of the growth replicates, then it can be assumed no reproduction has occurred in that treatment and the reproduction replicates can be processed without monitoring for young.
   b. If young are recovered in the growth replicates, then it should be assumed that the reproduction replicates may contain young and steps 5.c.-5.e. should be performed on the reproduction replicates until no further young are recovered in two consecutive cycles of decanting.
   c. Any recovered neonates in reproduction replicates should be counted and recorded on Day 28 of the "*Hyalella azteca* 42-Day Test: Survival and Reproduction Data" test data sheets.
   d. Once all the *H. azteca* have been removed, dump the slurry into a waste bucket and rinse the sorting dish with test water.

7. Record the number of live adult amphipods in each replicate.

8. Using a squirt bottle, rinse the adult organisms with clean test water to remove any sediment or other clinging material. Using the transfer pipette, transfer the individual *H. azteca* into weigh boats containing methanol. Once euthanized, use forceps to transfer the organisms to Type I water to rinse the organisms.

9. Place a piece of Nitex screen on a paper towel. Using a pipette, transfer the organisms from the Type I rinse to the Nitex screen. This removes excess water from the organisms.

10. Lastly, use forceps to transfer the organisms to a pre-labeled, -dried, and -weighed aluminum foil drying pan corresponding to the appropriate treatment replicate. Make sure to fold down the edges of the weigh pan so the organisms do not "pop out" once dry. When fold the pan do not create any holes in the foil as organisms can be lost.

11. Repeat Sections 5.1.5- 5.1.10 for each test replicate.

12. Growth - When all of the replicates have been transferred into their respective drying pans, place the pans into the drying oven, and dry at 60˚C for 24 hrs. After 24 hrs, the pans should be removed from the oven and allowed to cool in a desiccator. Once cool, the pans should be weighed as per the **Weighing of Test Organisms SOP**.

13. Data analysis – Day 28 test endpoints include:
    a. Day 28 % survival, and
    b. Day 28 growth (as dry weight and biomass).

    The survival and weight data for each replicate, which are recorded on the appropriate data sheets, are entered into the most current CETIS™ statistical software data file labeled for identification of the specific test. Statistical analyses are performed in accordance with EPA guidelines.

5.2 Day 28: Initiation of Water-Only Exposures for Survival, Reproduction, and Growth

1. For each of the remaining **eight** replicates, prepare a new ‘water only’ replicate (300 mL glass beakers); labeled each replicate appropriately, and filled with ~270 mL control water.
2. Add 5 mL of clean quartz sand per replicate.
3. Process each test replicate as described above (Section 5.1, Steps 1-6). For each replicate, record the number of young recovered (if any), record adult survival, and transfer adults to new “water only” exposure chambers.
   a. If no young are found during processing of the growth replicates, then it can be assumed no reproduction has occurred in that treatment and the reproduction replicates can be processed without monitoring for young. If young are recovered in the growth replicates, then it should be assumed that the reproduction replicates may contain young and should also be sieved so that young are recovered and counted.
4. Return the “water only” replicates to the temperature-controlled room under the same test conditions used in the initial 28-days of testing.

6. TEST MAINTENANCE FOR WATER-ONLY EXPOSURE (DAY 28-42)

1. Perform test maintenance as described in Section 4.0, with the below adjustments to feeding rates:
   a. YCT+flake fish food. The YCT is fed at 1.0 mL/replicate/day for the entire test period. The Tetramin® food amount is increased each week to account for organism growth.
      i. Week 5: 2.0 mg/beaker-day Tetramin® fish flake suspension
      ii. Week 6: 2.5 mg/beaker-day Tetramin® fish flake suspension
2. On Day 35, reproduction of the amphipods is measured. Obtain the test chambers and a sorting tray filled with Control Water.
   b. Collect sub-samples for analysis of alkalinity, hardness, and ammonia. Measure routine water quality parameters (temperature, pH, D.O., and conductivity) per Section 3.4.2 and 3.4.3.
   c. Carefully pour the contents of the test chamber into the sorting tray. Fill up the test chamber with control water. Add 5 mL of new rinsed sand to the test chamber at this time.
   d. Using a wide bore pipette, count and then return the adult *H. azteca* to the test chamber.

e. Count the offspring in the sorting tray and then discard them. Be sure not to count debris as offspring. It is helpful to do this over a light box.

f. Return the test replicates to the test room, and continue to maintain the test for the remaining six days per Section 4.0.

7. TEST TERMINATION FOR WATER ONLY EXPOSURE (DAY 42)

1. On Day 42, collect ~25 mL of test water from each test replicate using a 25 mL disposable pipet. Composite the replicate water samples for each test treatment to provide a total volume of ~240 mL; the pipet must be inspected to ensure no organisms were removed during sampling.
2. From the composite, collect sub-samples for analysis of alkalinity, hardness, and ammonia, which are recorded in their respective logbooks. Then measure routine water quality parameters (temperature, pH, D.O., and conductivity) in the remaining composited water. Record the final water quality data onto the appropriate data sheet.
3. Remove and count adults and young in each replicate, and record on test data sheet. This is best accomplished by pouring the contents of the test chambers into a sorting tray on a light box.
4. Fill a weigh pan with methanol and euthanize the adult organisms.
5. Determine and record the number of adult males and females for each replicate. Mature male amphipods are distinguished by the presence of an enlarged second gnathopod. If necessary, a microscope and calibrated software may be used in assisting the determination sex at this time.
6. From the number of young produced from Day 28 to 42 and the number of adult females at Day 42, calculate and record the number of young produced per female for each replicate.
7. Measure dry weight and biomass as described above in Section 5.1, Step 12.

8. DATA ANALYSIS

Test endpoints include:

- Day 28: % survival,
- Day 28: growth (biomass and dry weight)
- Day 35: % survival,
- Day 35: number of offspring,
- Day 42: % survival,
- Day 42: growth (biomass and dry weight),
- Day 42: number of males and females, and
- Day 42: reproduction (as number of young/female).

The survival, weight, and reproduction data for each replicate, which are recorded on the appropriate data sheets, are entered into the most current CETIS statistical software data file labeled for identification of the specific test. Statistical analyses are performed in accordance with EPA guidelines.

9. PROJECT SPECIFIC TEST ACCEPTABILITY REQUIREMENTS

As per the UCR Phase 3 QAPP, "It is recommended that the following test performance requirements[1] be met":

1. Mean % survival must be ≥ 80% in the Control treatment on Day 28; target performance based criteria of ≥ 80% in the Control treatment on Day 42.
2. Performance goal of Control mean dry weight ≥ 0.35 mg/individual on Day 28 and ≥ 0.50 mg/individual on Day 42.
3. Performance goal for reproduction of ≥ 6.0 young/female from Day 28 to Day 42.
4. Test organisms must come from a single culture cohort, must be within 24 hours of age, and should be between 7 and 8 days old at the start of the test. Initial dry weights of the test organisms must be determined.

5. Hardness, alkalinity, and ammonia in the overlying water typically should not vary by more than 50% during the test, and dissolved oxygen should be maintained above 2.5 mg/L in the overlying water.

10. QUALITY CONTROL

1. Control water, consisting of SAM-5S reconstituted water per Borgmann (1996) modified to contain 0.4 mg Br/L, culture water will be used as the overlying water in this test. Performance based criteria indicate that the water used in testing should have > 0.02 mg Br/L and > 15 mg Cl/L.
2. To ensure that the organisms being used in the test are responding to test conditions in a "typical" manner, a lab "Control" sediment of known quality is run side-by-side with the test sediment. The control sediment consists of a field collected freshwater sediment from Spring River, Missouri; other project specific controls sediments (such as rinsed quartz sand) may be included. Reference test set-up, maintenance, and termination are identical to those described

[1] EPA (2000) guidance uses the term test acceptability requirements, which includes criteria that must be met for a test to be considered acceptable and other criteria that should be met as a goal for conducting a good test. For the purposes of providing clear language for the Phase 3 Sediment Study and as was used in the Phase 2 sediment study, the two types of requirements are distinguished as follows: test acceptability criteria that must be met are referred to as criteria and those that should be met are referred to as performance goals.

above.

3. All equipment is calibrated and operated as described in each applicable equipment SOP.
4. All staff working independently on any test shall have previously demonstrated familiarity and competency with the test, analytical equipment used, and the corresponding SOPs.

11. REFERENCE TOXICANT TESTING

To ensure that the organisms being used in the test are responding to chemical stress in a "typical" manner, a reference toxicant test may be performed side-by-side with the sediment test. The reference toxicant results are then compared with an in-house database to make this determination. Information regarding the reference toxicity test is presented in the ***Hyalella* Reference Toxicant Test SOP**.

12. TEST INTERFERENCES

Characteristics of a sediment, aside from sediment-associated chemical constituents of concern, that can potentially affect test organism survival and growth should be assessed prior to preparing data submittals to the client. Interferences for this test generally fall into the categories of contaminant and non-contaminant factors.

1. Contaminant Interferences
   a. All efforts should be made to avoid contaminating any component of the test system or sediments used in testing so as to avoid both false positives and false negatives. Standard "clean techniques" should be used in the lab at all times.
   b. Measurable concentrations of ammonia are common in the pore water of many sediments and have been found to be a common cause of toxicity in pore water. Total ammonia concentrations should be measured to determine if they exceed the reported tolerance limit for this test species.
2. Non-contaminant Interferences
   a. Natural geomorphological and physico-chemical characteristics, such as sediment texture, may influence the response of test organisms. A control sediment that includes characteristics (e.g., grain size, organic carbon) that are within the tolerance range of the test organism should be included in the study design. This may best be accomplished by using a formulated sediment.
   b. Morphologically similar indigenous organisms in a sediment sample may be confused with the test species during test termination, and result in overestimates in survival. In addition, indigenous organisms may also compete for food or prey on the test species. Should indigenous organisms be observed during test termination, the scientist should immediately notify the Project Manager, as it may be necessary to identify the indigenous

organism, and determine the number or biomass in order to better interpret the growth data.

c. During water changes, it is important to observe the water stream from the syringes as they clog easily. If clogged, the corresponding test replicate will not receive a sufficient water renewal, which could result in low D.O. levels. To un-clog the syringe, insert the end of a paperclip into the tip of the syringe.

13. SAFETY

There is little risk to those performing the 42-d *Hyalella* toxicity test. Staff should wear appropriate PPE. Sediments can contain pathogenic organisms and appropriate precautions should be observed when handling this material. After the test is complete, the sediments should be disposed of in an appropriate fashion.

14. REFERENCES

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Windward, USGS. 2019. Upper Columbia River. Draft. Porewater extraction method study. Stage 1. Prepared for Teck American Incorporated. Windward Environmental LLC, Seattle, WA.

SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR CONDUCTING THE 42-DAY *HYALELLA AZTECA* SURVIVAL GROWTH, AND REPRODUCTION SEDIMENT TOXICITY TEST		
1.	Test type	Whole-sediment toxicity test; 28 days of sediment exposure followed by 14 days of reproduction monitoring in clean water.
2.	Test duration	42 days + 7 day pre-test equilibrium period
3.	Temperature	23 ± 1°C
4.	Light quality	Wide-spectrum fluorescent lights
5.	Light intensity	About 500 lux
6.	Photoperiod	16L:8D
7.	Test chamber size	300-mL high-form lipless beaker or 1-L beaker
8.	Test sediment volume	100 mL for 300 mL replicates 286 mL for 1-L replicates
9.	Overlying water	SAM-5S Reconstituted Water (Borgmann 1996) modified to contain 0.4 mg Br/L. Performance based criteria: > 0.02 mg Br/L and > 15 mg Cl/L.
10.	Overlying water volume	300 mL replicates: 175 mL for Days 0-28, 270 mL for Days 28-42. 1-L replicates: 500 mL
11.	Overlying water quality	Hardness, alkalinity, and ammonia are measured at Day 0, 28, 35, and 42. Temperature and D.O. daily. pH three times per week. Conductivity weekly.
12.	Overlying water renewal	2 intermittent volume additions per day (i.e., one volume addition twice per day).
13.	Age of test organisms	7- or 8-d old at the start of the test
14.	No. of organisms per test chamber	10 for 300 mL replicates; 30 for 1-L replicates
15.	No. of rep. chambers/concentration	22 chambers: 8 replicates for 42-day endpoints, 4 replicates for 28-day endpoints; 2 replicates for TOC, AVS/SEM and 8 replicates for porewater chemistry.

16.	Feeding regime 300 mL replicates	YCT+flake fish food. YCT: 1.0 mL/beaker-day. Flake fish food suspension: Week 1: 0.25 mg/beaker-day. Week 2: 0.5 mg/beaker-day. Week 3:1.0 mg/beaker-day. Week 4: 1.5 mg/beaker-day. Week 5: 2.0 mg/beaker-day. Week 6: 2.5 mg/beaker-day.
17.	Feeding regime 1-L replicates	YCT+flake fish food. YCT: 3.0 mL/beaker-day. Flake fish food suspension: Week 1: 0.75 mg/beaker-day. Week 2: 1.5 mg/beaker-day. Week 3: 3.0 mg/beaker-day.
18.	Test chamber cleaning	If screens become clogged during the test, gently brush the *outside* of the screen
19.	Test solution aeration	None, unless DO in overlying water drops below 2.5 mg/L.
20.	Endpoints	Survival (Day 28, 35, and 42), growth (as dry weight and biomass on Day 28 and 42), reproduction (number of young/female from Day 28-42), and number of adult males and females on Day 42.
21.	Sample and sample holding requirements	Grab or composite samples should be stored at 4°C in the dark.
22.	Sample volume required	4 Liter minimum, 8 L preferred
23.	Project specific test acceptability requirements-	1. Mean 28-d control survival must be ≥ 80%. 2. Mean 28-d control weight performance-based goal ≥ 0.35 mg/individual. 3. Mean 42-d control survival performance-based goal ≥ 80%. 4. Mean 42-d control weight performance-based goal ≥ 0.50 mg/individual. 5. Mean 42-d control reproduction performance-based goal ≥ 6.0 young/female (Day 42). Test organisms must come from a single culture cohort, must be within 24 h of age, and should be between 7 and 8 d old at the start of the test. Initial dry weights of the test organisms must be determined.

General Activity Schedule for Conducting a Long-term Sediment Toxicity Test with the amphipod *Hyalella azteca* (adapted ASTM 2019 and USEPA 2000).	
Day	Activity
About -10	Inform organism supplier of the need to isolate <24-h old amphipods from mass culture, and to observe isolated amphipods daily to evaluate health.
-7	Sample sediments for physical and chemical characteristics and sample pore water for water quality analyses. Analytical program will follow approved UCR Phase 3 QAPP. Place sediments into exposure beakers, two sediment chemistry beakers for AVS, SEM, and TOC analysis, and eight 1-L beakers for porewater collection via centrifugation. Add overlying water for a 7-d equilibration period at 23°C. Start delivery of overlying water to the exposure beakers.
-3 to -1	4, 5, 6,or 7 day old amphipods (as needed to provide sufficient 7 or 8 day old organisms on Day 0) are received from the test organism supplier and maintained prior to testing. Amphipods are fed and observed daily to evaluate health.
0	Measure total water quality of overlying water (pH, temperature, dissolved oxygen, hardness, alkalinity, conductivity, ammonia). Transfer ten test organisms into each test chamber (30 test organisms for 1-L beaker exposures). Release organisms under the surface of the water. Add appropriate food to each test chamber. Isolate 80 amphipods for T0 weight measurement.
1–27	Feed test organisms 1.0 mL/300 mL beaker/day of YCT and 0.25 mg/300 mL beaker/day of Tetramin®. Feeding will be adjusted accordingly for 1-L beaker exposures with 3.0 mL of YCT and 0.75 mg Tetramin® added to each beaker. Perform AM and PM water changes (2 volume additions per day). Measure temperature and dissolved oxygen (DO) daily, pH three times a week, and conductivity weekly. Observe behavior of test organisms.
7	Collect sediment from one sediment chemistry beaker, and centrifuge sediment from four porewater 1-L beakers that were loaded on Day -7. Analytical program will follow approved UCR Phase 3 QAPP.
7-13	Increase Tetramin® feeding to 0.5 mg/300-mL beaker/day. 1-L beakers will be increased to 1.5 mg/1-L beaker/day
14–20	Increase Tetramin® feeding to 1.0 mg/300-mL beaker/day. 1-L beakers will be increased to 3.0 mg/1-L beaker/day
21	Collect sediment from one sediment chemistry beaker, and centrifuge sediment from four porewater 1-L beakers that were loaded on Day -7. Analytical program will follow approved UCR Phase 3 QAPP.
21–27	Increase Tetramin® feeding to 1.5 mg/ mg/300-mL beaker/day.
28	Measure temperature, dissolved oxygen, pH, hardness, alkalinity, conductivity, and ammonia. End the sediment-exposure portion of the test by collecting the test organisms via rinsing and decanting with the assistance of a 500-µm mesh size sieve as needed. Count survivors in test replicates A-L. For test replicates A-D, weigh test organisms for biomass and mean dry weight test endpoints. Prepare eight amphipod replicate beakers for reproduction measurements: Place survivors from test replicates E-L in individual water-only beakers containing control water and 5 mL clean quartz sand,. Add food to each test beaker.
28–34	Increase Tetramin® feeding to 2.0 mg/beaker-day. Measure temperature and dissolved oxygen (DO) daily, pH three times a week, and conductivity weekly. Perform AM and PM water changes (2 volume additions per day).
35	Record the number of surviving adults and remove offspring. Return adults to their original individual beakers and add food.
35–41	Increase Tetramin® feeding to 2.5 mg/beaker-day. Measure temperature and dissolved oxygen (DO) daily, pH three times a week, and conductivity weekly. Perform AM and PM water changes (2 volume additions per day).

42	Measure total water quality (pH, temperature, dissolved oxygen, hardness, alkalinity, conductivity, ammonia). Record the number of surviving adults and offspring. Surviving adult amphipods on Day 42 are observed for determination of the number of males and females in each replicate. This information is used to calculate the number of young produced per female per replicate from Day 28 to Day 42. Weigh adult test organisms for biomass and mean dry weight test endpoints.

Supplemental SOP Language

Definitions:

ACS:	American Chemical Society
ASAP :	As soon as possible
ASTM :	American Society for Testing Materials
°C :	degrees Celsius
dH_2O :	distilled water
D.O.:	dissolved oxygen
ECx:	Effective concentration in X% of the population.
hrs :	hours
ICx:	Inhibitory concentration in X% of the population.
LCx:	Lethal concentration in X% of the population.
LOEC:	Lowest Observed Effect Concentration
mg :	milligram
mg/L :	milligram per liter
mL :	milliliter
NOEC:	No Observed Effect Concentration
NPDES :	National Pollutant Discharge Elimination System
S.O.P.:	Standard Operation Procedure
TIE:	Toxicity Identification Evaluation
U.S. EPA :	United States Environmental Protection Agency

Interferences:
In an effort to eliminate interferences, SOPs have been established for every procedure involved in conducting a successful bioassay test. Additionally, a rigorous daily QA/QC inspection is designed to identify potential sources of interference. Prior to the initiation of toxicity tests every effort is made to identify and eliminate potential sources of interference that could compromise test results. These can include but are not limited to the following: clean and functional facilities, equipment and test chambers; sample storage and handling; test organism and food quality; laboratory water quality.

Pollution Prevention
As a pollution prevention measure, wastes generates during toxicity testing must be properly handled and disposed of in an appropriate manner. Care should be taken not to generate excessive wastes when preparing solutions for testing. All materials identified as hazardous should be labeled and appropriately stored for hazardous waste disposal.

Data Assessment
Bioassay and water quality data are assessed each day during the course of testing for accuracy and compliance with established criteria. At test termination, the data for each replicate, which

are recorded on the appropriate data sheets, are entered into a CETIS™ data file labeled for identification of the specific test. Statistical analyses are performed in accordance with EPA guidelines for statistical analysis. Control data for all endpoints are evaluated for compliance with established test acceptability criteria. Water Quality data are assessed for compliance with specifications outlined in the appropriate USEPA testing manuals.

<u>Corrective Actions and Contingencies for Out-of-Control Data</u>
If control performance is not met, a project manager should be notified immediately and, upon approval, the test is to be repeated. The potential cause(s) of poor control performance will be documented by scientific staff and evaluated and assessed by a project manager. Corrective actions will be determined on a case-by-case basis. The results of all tests will be summarized in reports for the regulatory authorities with an explanation of the results.

Sediment Porewater Extraction via Centrifugation

Upper Columbia River Phase 3 Project Specific Standard Operating Procedure for Sediment Porewater Extraction via Centrifugation

Effective Date: April 9, 2020

Revised/Reviewed/Approved by:

Action	Name	Title	Signature	Date
Revised by:	Michael McElroy	Sr. Project Manager		
Reviewed by:	Krista Prosser	QA Manager		
Approved by:	Stephen L. Clark	Vice President		

Sediment Porewater Extraction via Centrifugation

Standard Operating Procedures

1.0 INTRODUCTION

This standard operating procedure provides instructions for the extraction of porewater samples via centrifugation for the Upper Columbia River (UCR) Phase 3 Sediment Study for Teck American Incorporated (TAI). Sediment porewater (or interstitial water), consists of the water occupying the spaces between sediment particles. A centrifuge can be used to separate the sediment (precipitate) and pore water (supernatant liquid) of a sediment mixture using centrifugal force. Sediment porewater will be obtained from each site and reference sediment sample from sediment equilibrated with overlying water as described in the project specific UCR Phase 3 Sediment Study 42-day Hyalella Survival, Growth, and Reproduction SOP and to support the porewater analytical chemistry program outlined in the Upper Columbia River (UCR) Phase 3 Quality Assurance Project Plan (QAPP).

2.0 PREPARATION

2.1 Equipment and Supplies Needed

1. Thermo Forma General Purpose Centrifuge.
2. 750 mL Centrifuge Bottles
3. Homogenized Sediment Sample.
4. Mettler Toledo MS4002S Balance
5. Paper Towels
6. Large Water Quality Cup or Beaker
7. Stainless Steel Spoons/Spatulas
8. Pre-cleaned and preserved (as necessary) sample bottles provided by the analytical laboratory.
9. Pre-cleaned polyethersulfone (PES) luer lock disc filters (0.45-µm) approved for use in the study by the analytical laboratory for dissolved metals analysis.
10. Pre-cleaned Whatman® Puradisc 25 polyvinylidene difluoride (PVDF) luer lock disc filters (0.45 µm) provided by the analytical laboratory for dissolved organic carbon analysis. Filters will be batch tested by the analytical laboratory for DOC contamination.
11. Syringes of appropriate size for needed volumes
12. American Society for Testing and Materials (ASTM) Type 1 deionized water (DI) provided by the analytical laboratory for rinsing filters and syringes.

3.0 PROCEDURE

3.1 Loading Sediment into Centrifuge Bottles

1. Carefully syphon the overlying water off the top of the sediment within the bioassay test replicate.
2. Ensure that the balance calibration has been performed prior to use. If the calibration has not been performed, calibrate the balance according to the **"Mettler Toledo MS4002S/03 Top Loading Balance SOP"**.
3. Turn on the balance and make sure it is level. Tare the balance.
4. Put a piece of labeling tape on each of the centrifuge bottles and label that tape corresponding to the sample that is in that bottle.
5. Place the centrifuge bottle with the cap onto the balance. Fill the centrifuge bottles equally with sediment using a spoon. Record the weight of the container on the label.
6. Once the weight of the first sediment sample has been determined, all other samples must be within 1 g of that weight or the centrifuge will not function properly.
7. Add nitrogen headspace to the centrifuge bottle before capping
8. Clean the bottles of any debris before putting in the centrifuge.

3.2 Centrifuging Samples

1. Before turning on the centrifuge, clear the centrifuge area of any debris and loose paper. Allow 6 inches of clearance near the rear ventilation grill.
2. Press the On/Off switch on the lower right-hand corner of the front panel.
3. Press the OPEN key to open the centrifuge lid. A yellow light will turn on as long as the lid is open and it will turn off once the lid is closed.
4. Place either 2 or 4 of the centrifuge bottles in the rotor assembly making sure the bottles that are within 1 g of each other are in opposing positions.
5. Adjust the run parameters using the touch switches on the front panel. Adjust the parameters to the following settings. Press the arrow keys to change each parameter:

Run Parameters	Settings
Temperature	4 ºC
g-force	4300 g
Time	30 minutes
Accelerate	Maximum
Brake	Maximum

6. Close the cover by lowering the centrifuge lid so that the cover rests on the chamber gasket. Place hands on both sides of the cover and press down firmly.
    a. Always assure the lid is locked and secure before starting. The machine will make a loud "clicking" sound when it locks or unlocks.
7. Press START.
8. Do not walk way immediately after pressing start as an imbalance could occur. When an imbalance occurs, a sensor shuts the unit down and triggers a warning message (BAL) on the screen.
9. Once the centrifuge has completed its run and come to a complete stop, open the centrifuge lid and recover the centrifuge bottles. A separated layer of supernatant (the pore water) and precipitate should be visible.
10. Carefully decant and composite the supernatant from each centrifuge bottle into a beaker. See Section 3.3 for details on filtration and procedures for prioritizing analyses if sufficient supernatant was not produced during the centrifugation process.
11. Pour the composited porewater into pre-cleaned sample bottles provided by the analytical chemistry lab, fill out the provided Chain of Custody (COC), and prepare for shipment to the analytical laboratory.

3.3 Porewater Collection and Filtration

1. The volume of pore water obtained from one liter of sediment will vary by sediment sample characteristics (i.e. grain size). Recovery of pore water from coarse sand may be more difficult than from finer-grained material. After centrifugation of the sediment samples, assess the volume of pore water available for analysis. Use the guide in Table 1 with target and minimum volumes of pore water (adapted from Table B3-1 of the UCR Phase 3 Sediment Study QAPP) in order of collection priority if insufficient volume can be obtained for all parameters. After determining which analytes can be obtained with the available pore water sample volume, use the guide in Table 2 for the order subsamples should be collected. For example, sufficient volume of pore water may not be available for all samples. But if enough volume is available for sulfide, subsample the sulfide aliquot before subsampling for metals and DOC.

Table 1. Priority of Subsampling

Priority	Analysis	Minimum Volume	Target Volume	Notes
1	EPA 6020A metals[a]	20 mL	60 mL	Filter using 0.45µm PES filter
	EPA 6010 metals[b]			
	DOC	40 mL	80 mL	Filter using 0.45µm PVDS filter provided by analytical lab
	pH	10 mL	10 mL	Use a microprobe to measure pH if less than 10 mL is available for pH[c]
2	Sulfide	25 mL	40 mL	
3	Chloride, sulfate	10 mL	100 mL	Pore water for chloride, sulfate, and alkalinity are combined into one sample jar
4	Alkalinity	35 mL		

[a] EPA 6020A metals are: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium cobalt, copper, lead, manganese, nickel selenium, silver, thallium, vanadium, and zinc.

[b] EPA 6010 metals are: calcium, iron, magnesium, potassium, and sodium.

[c] A microprobe for measuring pH in smaller than 10 mL volume may be available for use in the study.

Table 2. Sampling Order

Priority	Analysis
1	pH
2	Sulfide
3	EPA 6020A metals
	EPA 6010 metals
	DOC
4	Chloride, sulfate, alkalinity

2. Filtration steps:

   Soak syringes in ASTM Type 1 DI water provided by the analytical laboratory for a minimum of 30 minutes to remove potential contaminants in the syringes.

   When ready to filter the pore water sample, rinse filter first by drawing up 5 mL of ASTM

Type 1 DI water into the syringe, attaching the filter to the syringe and gently pushing the water through the filter. Then remove the filter and draw up the appropriate volume of pore water, reattach the filter, push a small volume (i.e., 3 to 5 mLs) of pore water through the filter to discharge residual DI water from the filter, then push the sample through the filter directly into the appropriate sample bottle. Avoid applying too much pressure. Change filters when resistance is met to avoid break through. For each new filter used in the process, follow rinsing process described above.

4.0 INTERFERENCES

As sulfide is one of the analytes of interest, limiting exposure to air is encouraged to minimize loss of sulfide.

5.0 SAFETY

1. Use caution when closing the centrifuge lid, making sure not to close it on your fingers.
2. Centrifuge operation poses little to no risk to the operator.

Sediment Chemistry Collection

Draft
Upper Columbia River Phase 3 Project Specific Standard Operations Procedures for Sediment Chemistry Collection

Effective date: April 9, 2020

Revised/Reviewed/Approved by:

Action	Name	Title	Signature	Date
Drafted by:	Alison Briden	Sr. Project Manager		
Reviewed by:	Krista Prosser	QA Manager		
Approved by:	Jeffrey Cotsifas	President		

Collection of AVS/SEM Sediment Samples

Standard Operating Procedures

The purpose of this standard operating procedure (SOP) is to describe procedures used for collection of sediment from sediment chemistry replicates during bioassay testing. Sediment samples will be collected from replicate chambers (sediment chemistry replicates) set up and treated similar to bioassay replicates, including the addition of organisms. Sediment samples will be analyzed for AVS, SEM, and TOC at monitoring intervals (i.e., $T_{Day\ 7}$, $T_{Day\ 21}$) outlined in the UCR Phase 3 QAPP.

1. EQUIPMENT AND SUPPLIES NEEDED

1. Type I water and wash bottles, for rinsing of labware, etc.
2. Pre-cleaned sample containers consisting of wide mouth jars and lids provided by analytical lab for AVS/SEM samples.

2. ESTABLISHMENT OF AVS/SEM

1. At the same time as bioassay beakers are prepared, establish two additional replicates (sediment chemistry replicates) for analysis of AVS, SEM, and TOC on $T_{Day\ 7}$ and $T_{Day\ 21}$.

5. COLLECTION OF SEDIMENT FOR AVS/SEM

On $T_{Day\ 7}$ and $T_{Day\ 21}$, sediment from one sediment chemistry replicate will be collected into a single sample container for AVS, SEM, and TOC analyses.

1. Pour off overlying water.
2. Using an acid-cleaned plastic spoon, collect the sediment from the sediment chemistry replicate and place in a pre-cleaned wide-mouth glass sample jar provided by the analytical laboratory. Place the sample jar at an angle while collecting the sediment.
3. Immediately pass nitrogen gas over the sediment in the jar while the sediment from the remaining treatment replicates is being collected.
4. Ensure the jar is no more than 80% full to reduce the likelihood that the jar will crack when frozen.
5. Once the sediment from the sediment chemistry replicates is collected and placed into the sample jar, carefully cap the jar under a flow of nitrogen so ensure sample is capped with nitrogen headspace.
6. <u>Do not</u> tap the jar. If the sediment is compacted the jar will be more likely to break when frozen.

7. Place sample jars in a cardboard box and place the box at an angle in the freezer.
8. If any of the samples crack during freezing, double-bag the cracked jar under nitrogen and then place inside another larger jar with nitrogen headspace prior to shipment to the analytical lab.

Change Request Form
Upper Columbia River Phase 3 Sediment Study

Page 1 **of** 2 **Change No. :** 6 Revision 01

CHANGE REQUEST:

Applicable Reference: Quality Assurance Project Plan (QAPP) for the 2019 Phase 3 Sediment Study

Description of Change: The following changes will be made to the bioassay procedures in the Phase 3 QAPP: Tables B4-2 and B4-4, Standard Operating Procedures (SOPs) in Appendix C (UCR_42-Dhyalella_SED_SOP, UCR_Peeper_SOP, UCR_PW_Centri_SOP), and Figure B4-2. Specifically, the following changes are requested:

1. Section A7.6.3 will be amended to delete text referring to collection of laboratory bioassay porewater using peepers.

2. Section A7.7.8 will be amended to include the collection of sediment collected at Day -7 (which will be referred to as BULK in the sample ID) for analysis of TAL metals and TOC; update the timing for collection of bioassay-generated sediment chemistry and centrifuged porewater to Day 7 and Day 21; and removed text referring to collection of porewater using peepers.

3. Section B4.3 will be amended to remove text referring to the collection of porewater using peepers, add text to indicate sediment will be sampled from homogenized sediment on Day -7 for analysis of TAL metals, percent moisture, and TOC; update the number of replicates for chemistry analysis; update the timing for collection of bioassay-generated sediment chemistry and centrifuged porewater samples; and update the sample identification nomenclature for bioassay-generated porewater.

4. Table B3-1 Part E will be amended to include information needed for collection of sediment for analysis of total metals, percent moisture, and TOC in homogenized sediment prior to the start of the bioassay and remove information regarding collection of peeper porewater.

5. Table B4-2 will be amended to update the number of replicate chemistry chambers per treatment to indicate the following will be included:

   10 replicates for chemistry only as follows:

      2 replicates to collect sediment samples for analysis of AVS, SEM, and TOC; 1 for sample collection on Day 7 and 1 for Day 21

      2 sets of replicates (1.2 L of sediment distributed across 4 1L beakers per set) to equilibrate sediment for collecting porewater using centrifugation on Days 7 and 21; 700 mL overlying water per 1L beaker; porewater will be analyzed for dissolved metals (including major cations), dissolved organic carbon, pH, sulfide, chloride, sulfate, and alkalinity.

6. Table B4-2 will be amended to remove the collection of porewater using peepers, add a line indicating sediment samples will be equilibrated for 7 days with twice daily water changes prior to initiating the test, and clarify the number of replicate chemistry chambers.

7. Table B4-4 will be amended to update the number of analytical samples and the timing for their collection during the biossays.

8. The 42-day Hyalella SOP (in Appendix C) will be amended to update the procedures and timing for collection of porewater and sediment during the bioassay.
Sediment samples for analysis of acid volatile sulfide (AVS), simultaneously extracted metals (SEM), and total organic carbon (TOC) will be obtained from sediment chemistry replicates using the same timing as for the porewater.
Porewater will be obtained via centrifugation at 4,300 x g for 30 minutes for analysis of dissolved metals (including major cations, dissolved organic carbon, pH, sulfide, chloride, sulfate, and alkalinity. The SOP now states that 1.2 liter of sediment will be distributed across 4 1L beakers, 700 mL of overlying wataer will be added to each beaker, and porewater will be extracated on test days 7 and 21.

9. The general activity schedule in the 42-day Hyalella SOP (in Appendix C) has been updated to reflect the procedures and timing for the changes in Item 4.

10. The UCR Peeper Preparation, Deployment, and Retrieval and Sediment Chemistry Collection SOP (in Appendix C) has been replaced with the UCR Sediment Chemistry Collection SOP that describes methods used to collect sediment chemistry samples for analysis of AVS, SEM, and TOC.

11. The Porewater Extraction via Centrifugation SOP (in Appendix C) has been replaced with a project specific SOP to be more specific to project requirements. The SOP includes more details about centrifugation, filtration, priority of porewater analyses if sample volume is limited, and the order for subsampling the porewater after centrifugation.

12. Figure B4-2 has been amended to portray the procedures and timing recommended for collection of porewater and sediment chemistry samples.

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Page 2 **of** 2 **Change No. :** **6 Revision 01**

Description of Change:

13. Table B3-1, Part E has been amended to add the absolute minimum sample size needed if the porewater volume obtained via centrifugation is less than the minimum sample size.

14. Section 3.3 and Table 1 in the Porewater Extraction via Centrifugation SOP (in Appendix C) has been amended to add a column with the absolute minimum volumes needed if the minimum sample volume is not obtained.

Reason for Change:

The requested changes will be made to reflect current thinking on methods and timing for collecting porewater and sediment samples during the 42-day *Hyalella azteca* bioassays and comments recevied to date from EPA.
In anticipation that the minimum porewater volume may not be available from coarse sediment samples, ALS provided the absolute minimum volumes they could use without affecting quality of the analytical results. The change will allow the analysis of more analytes for samples in which the minimum porewater volume is not obtained via centrifugation.

Impact on Present and Completed Work:

The change will provide porewater and sediment data consistent with organism exposure. No changes are needed to ALS SOPs to accommodate use of the absolute minimum volumes. Detection limits will not be comproised and for most parameters ALS will still have sufficient volume to rerun the sample if needed (e.g., metals).

Requested By: Karen Tobiason (Scientist) Date: 6/22/2020

Acknowledged By: Karen Tobiason (Task Leader) Date: 6/22/2020

APPROVAL

Project Manager: Date: 6/22/2020

TAI Project Manager: Kris R. McCaig Date: 6/22/2020

EPA Project Manager: Date:

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Description of Change:	
	13. Table B3-1, Part E has been amended to add the absolute minimum sample size needed if the porewater volume obtained via centrifugation is less than the minimum sample size. 14. Section 3.3 and Table 1 in the Porewater Extraction via Centrifugation SOP (in Appendix C) has been amended to add a column with the absolute minimum volumes needed if the minimum sample volume is not obtained.
Reason for Change:	The requested changes will be made to reflect current thinking on methods and timing for collecting porewater and sediment samples during the 42-day *Hyalella azteca* bioassays and comments recevied to date from EPA. In anticipation that the minimum porewater volume may not be available from coarse sediment samples, ALS provided the absolute minimum volumes they could use without affecting quality of the analytical results. The change will allow the analysis of more analytes for samples in which the minimum porewater volume is not obtained via centrifugation.
Impact on Present and Completed Work:	The change will provide porewater and sediment data consistent with organism exposure. No changes are needed to ALS SOPs to accommodate use of the absolute minimum volumes. Detection limits will not be comproised and for most parameters ALS will still have sufficient volume to rerun the sample if needed (e.g., metals).

Requested By: Karen Tobiason (Scientist) Date: 6/22/2020

Acknowledged By: Karen Tobiason (Task Leader) Date: 6/22/2020

APPROVAL

Project Manager: Date: 6/22/2020

TAI Project Manager: Kris R McCaig Date: 6/22/2020

EPA Project Manager: Kathryn Cerise Date: 6/22/20

REVISED PAGES FROM PHASE 3 SEDIMENT STUDY QAPP

A7.6.2 Sediment Chemistry

- Data quality indicators (DQIs) must meet precision, accuracy or bias, representativeness, completeness, comparability, and analytical sensitivity (PARCCS) requirements[9].
- Analyses must meet required quantitation limits per Table A7-1. Failure to meet quantitation limits will limit the usability of the data.

A7.6.3 Porewater Chemistry

Field-Collected (Trident probe) Porewater

- DQIs must meet PARCCS requirements.
- Analyses must meet required quantitation limits per Table A7-1. Failure to meet quantitation limits will limit the usability of the data.
- Confirm that excessive surface water was not drawn in during sampling (dissolved oxygen [DO], conductivity, oxidation-reduction potential [ORP], pH)

Laboratory Bioassay Porewater (Centrifuge)

- DQIs must meet PARCCS requirements.
- Method detection and reporting limits.
- Additional requirements may be needed based on the outcome of the porewater sampling study[10].

BLM

- Use of single metals BLMs may be useful as estimates of dissolved, bioavailable metals in field-collected porewater. EPA's February 21, 2020 letter provides: 'laboratory bioassay porewater data will not be used with either the mBLM or single metals BLMs for the purpose of making decisions about the cause of observed toxicity due to unacceptable uncertainty in the data.'
- The use and interpretation of the BLM and mBLM are subject to ongoing discussions between TAI and EPA. Use of the BLM and mBLM must be in accordance with agreed-upon methods.

[9] DQIs of precision, accuracy, bias, representativeness, completeness, comparability, and analytical sensitivity (PARCCS) will be used to assess the conformance of sediment, field porewater, and laboratory porewater analytical results with specific QC criteria. QC samples will include equipment rinsate blanks; field duplicates; standard reference materials (SRMs), if available and analyzed; and laboratory analytical QC samples. Field duplicate QC samples will be collected at a frequency of 10 percent for sediment and 5 percent for field-collected porewater. Data quality and conformance will be evaluated by third-party data validation of DQIs and laboratory QC procedures.

[10] The porewater extraction method study that is being conducted by TAI in collaboration with USGS and initiated July 30, 2019 is intended to resolve questions related to the measurement of metals concentrations and toxicity mitigating factors.

likely to have the mud, sand, and mixed sediment facies will be sampled. The locations will be a combination of previously sampled and new locations.

A7.7.8 Target Analytes, Tests, and Measurement

- Surface sediment samples:
  - TAL metals
  - Percent slag by BSEM (10 percent of sampleable sand sample locations)
  - Grain size
  - TOC
  - SEM
  - AVS
  - 42-day sediment bioassays using the freshwater amphipod *H. Azteca*
  - Organic chemicals (PCBs, PAHs, pesticides) [16]
  - TIE studies. [17]
- Field-collected porewater samples:
  - Dissolved metals, including major cations
  - Major anions (chloride, sulfate)
  - Alkalinity
  - Sulfide (if field data indicate need)
  - TOC and DOC
  - pH.
- BMI survey data:
  - BMI species
  - BMI abundance, by species
  - Physical location attributes
    - Water depth
    - Presence of macrophytes
    - Position in river (river channel, seasonally flooded historical channel, seasonally flooded backwater)
    - Near sediment bed water quality parameters (temperature, pH), collected during porewater sampling.
- Sediment and porewater collected synoptically with the bioassays:
  - Sediment (collected at Day -7 from homogenized sediment)
    - TAL metals

[16] Initially, only reference area samples will be analyzed. However, aliquots from potential bioassay sample locations (sampleable sand and mud strata samples) will be archived frozen and may be analyzed for organic chemicals at a later date if needed.

[17] Details on bioassay and chemistry data to be collected during the TIE will be provided in the TIE study plan prepared in collaboration with EPA as an addendum to the QAPP.

  - TOC
- Sediment (collected at Day 7 and Day 21):
  - SEM
  - AVS
  - TOC
- Centrifuged porewater (collected at Day 7 and Day 21):
  - Anions (chloride, sulfate)
  - Cations
  - Alkalinity
  - pH
  - DOC
  - Sulfide
  - Dissolved metals

A7.7.9 Sampling Methods

Sediment

Needed sample volumes for sediment chemistry, bioassays, and BMI community surveys in mud- and sand-dominated sediment facies are expected to be easily obtained using a mechanical sample method (i.e., power Van Veen or modified[18] Hamon grab sampler), because these facies are predominantly composed of finer-grained sediments with < 20 percent coarse (i.e., gravel and boulder/cobble) content. A sampling methods hierarchy for the sampleable sand stratum is provided in Figure A7-2. Adequate sample volumes may also be obtained from mixed fines, predominantly sand facies (mFs) using a mechanical sample method if the coarse sediment content is on the low end of this range. Mixed coarse with sand (mCs) facies, are expected to be sampleable using a freeze grab sample method (ERM 2019). Select locations may also be sampled using a manual collection method if river conditions are deemed safe.

Field-Collected Porewater

Porewater will be collected using the Trident probe, to be operated by Coastal Monitoring Associates (CMA) of San Diego, California. CMA has previously used the Trident probe for porewater sampling in the Columbia River within the Hanford Reach, adjacent to Hanford, Washington. A pilot study conducted in September 2018 demonstrated that porewater samples can be collected with the Trident probe under various depth, flow,

[18] A typical Hamon grab sampler is activated by release of tension in the cable (e.g., winch line) when the sampler contacts the sediment bed, and closed by tension on the cable during inhauling (Brown et al. 2002). The modified Hamon grab sampler being developed for use at the UCR is being constructed with a pneumatic arm to drive the sampler's bucket through the sediment.

Slag determination by BSEM will be performed by RJLG—the same laboratory that performed BSEM analysis for sediment samples during the Phase 2 Sediment Study. The methods used for BSEM analysis for the Phase 3 Sediment Study will be comparable to methods used during the Phase 2 study, as described in Appendix F of the *Phase 2 Sediment Study Data Summary Report* (Windward 2017). A description of the BSEM method, including sample preparation, sample analysis, data interpretation, and QC procedures will be included as an attachment to the BSEM sample selection memorandum.

B4.3 Bioassays

Sediment bioassays will be performed using the freshwater amphipod *H. azteca*. The bioassays will be conducted using the 42-day survival, growth, and reproduction test and will measure 28-day survival, weight, and biomass, 35-day survival and reproduction, and 42-day survival, weight, biomass, and reproduction endpoints. Bioassay protocols are described in Appendix C and will follow the standard protocols outlined below with modifications as noted. Additional details are described in EPA (USEPA 2000) and ASTM (2019). During the tests, water quality will be measured in the overlying water of representative replicate chambers for each sample according to EPA guidance. Lighting, room temperature, and other environmental operations of the exposure system will be monitored daily. As required in USEPA (2000) and ASTM (2019) (and listed in Table B4-2), hardness, alkalinity, conductivity, and ammonia will be measured in the overlying water of test chambers at the beginning and end of the sediment exposure (i.e., Day 0 and Day 28) and pH will be measured three times per week. Hardness, alkalinity, and ammonia will also be measured at Day 35 and Day 42, and conductivity will be measured on a weekly basis. Dissolved oxygen will be measured daily and maintained above 2.5 mg/L; water temperature will be measured daily in at least one test replicate per treatment to ensure that the daily average temperature is within ± 1°C of 23°C.

Bioassay endpoints will be evaluated using a minimum of 12 replicates for biological endpoints for each 42-day *H. azteca* bioassay. Additional replicate chambers will be run on each sediment sample to obtain analytical measurements in porewater and sediment samples from exposure chambers. Chemistry replicates will not be used to evaluate biological endpoints (i.e., survival, growth, or reproduction). Thus, the 42-day *H. azteca* bioassay will have a total of 12 replicates in 300 mL beakers for biological endpoints and 10 replicates for chemistry analysis (two 300-mL beakers for sediment collection [1 each at Day 7 and Day 21] and 8 1-liter beakers for porewater collection using centrifugation [four each at Day 7 and Day 21]). These chambers are not true test replicates and will not be assessed for biological endpoints. A schematic illustrating the above-mentioned anticipated number of bioassay and chemistry-only replicates are presented in Figure B4-2.

Sediment samples identified for bioassay testing will be shipped under COC from ALS to PER. The entire bucket of archived sediment will be shipped to PER. Prior to bioassay testing, sediment samples will be homogenized and then distributed directly into test beakers as follows: 100 mL of the sediment will be distributed into each 300-mL replicate and 300 mL of sediment will be distributed into each 1-liter beaker. The sediment in each beaker will be covered with laboratory water (see Table B4-2 and Appendix C for more details). Homogenization procedures are provided in Appendix C, SOP-17. Test chambers will be allowed to stabilize for 7 days with twice daily water changes prior to the introduction of test organisms. From the laboratory culture population, 10 test organisms will be randomly distributed to each replicate and allowed to burrow into the sediment.[19]

Standard responses (endpoints) of test organisms to be measured include the following:

- Survival—number of surviving organisms divided by the initial number of organisms
- Weight—dw of surviving organisms divided by the number of surviving organisms
- Biomass—dw of surviving organisms divided by the initial number of organisms
- Reproduction—number of young divided by the number of surviving females, and number of surviving adult males and females.

Standard bioassay test conditions for the above-referenced tests are described in Table B4-2 (USEPA 2000). Test acceptability requirements (i.e., test acceptability criteria and performance goals) are listed in Table B4-3.[20] If the test acceptability criteria of 80 percent mean survival in the laboratory control sediment on Day 28 is not met, the test will be repeated. Standard bioassay endpoints will be reported in accordance with applicable guidance (USEPA 2000; ASTM 2019). As described in SOP-17 (Appendix C), equipment rinsate blanks will be prepared for equipment used to homogenize sediment samples for bioassay testing. These rinsate blanks will be analyzed for total metals as QC samples to

[19] Amphipods (30 organisms per chamber) will also be added to the one liter beakers to simulate any bioturbation that typically occurs in a sediment bioassay.

[20] EPA (2000) guidance uses the term test acceptability requirements, which includes criteria that must be met for a test to be considered acceptable and other criteria that should be met as a goal for conducting a good test. For the purposes of providing clear language for the Phase 3 Sediment Study and as was used in the Phase 2 sediment study, the two types of requirements are distinguished as follows: test acceptability criteria that must be met are referred to as criteria and those that should be met are referred to as performance goals.

evaluate whether the homogenization equipment was effectively cleaned between samples

B4.3.1 Physico-Chemical Data in Overlying Water

A variety of physico-chemical properties will be measured in the test chamber water column (overlying water) to document water quality during bioassay tests as specified by USEPA (2000); see Table B4-2. Analysis of overlying water is described in the PER SOP included in Appendix C.

The following water quality properties will be documented for each sample in either a treatment replicate or a treatment composite sample (see the PER SOP for details):

- Hardness (mg/L as calcium carbonate)
- Alkalinity (mg/L as calcium carbonate)
- Conductivity (μS/cm)
- pH (standard units)
- Ammonia as NH_3-N (mg/L)
- Temperature (°C)
- Dissolved oxygen (mg/L).

B4.3.2 Laboratory Bioassay-Generated Porewater and Sediment Measurements

Table B4-4 provides the estimated number of laboratory bioassay-generated porewater samples that are expected to be analyzed during the study. Laboratory porewater data will be used in concert with the biological endpoint data to evaluate concentration-response relationships. Primary laboratory porewater measurements measured in bioassay porewater (volume permitting) will include the following:

- Anions (chloride, sulfate)
- Alkalinity
- pH
- DOC
- Sulfide
- Dissolved metals, including major cations.

Anions, alkalinity, pH, DOC, sulfide, and dissolved metals will be measured in centrifuged porewater collected from sediment samples equilibrated with overlying water for 7 days prior to the start of the test; porewater will be collected at Day 7 and Day 21).

Laboratory bioassay-generated sediment samples (Table B4-4) will be collected from bulk sediment (after sediment homogenization) prior to the start of the bioassay (i.e., Day -7) and analyzed for TAL metals. Sediment samples will also be collected from the sediment chemistry replicate chambers at Day 7 and Day 21. These sediment samples will be analyzed for SEM, AVS, and TOC.

Procedures for the collection of laboratory-generated bioassay porewater and sediment samples are included in the PER SOPs that are provided in Appendix C. The additional chambers setup for chemistry analysis of each sediment sample will contain test organisms to allow for bioturbation, but will only be used for sediment and porewater chemistry measurements. Sample containers containing the appropriate preservative and filters for collecting porewater samples for DOC analysis will be provided to PER by ALS. Analytical methods for laboratory bioassay-generated porewater and sediment samples are provided in Table A7-2; sample containers, preservation, and holding times are provided in Table B3-1.

Laboratory bioassay-generated porewater and sediment samples will be identified using the following nomenclature:

Laboratory Bioassay-Generated Sediment

Laboratory bioassay-generated sediment samples for analysis by the analytical chemistry laboratory will be labeled using the following nomenclature:

Sediment matrix code = SE

Location ID = see Table B1-1 for individual location identification (ID)

Organism code = HA42 for *H. azteca* 42-day test

Time code (days) = Day 21; for the test day the sample is generated; BULK will be used to identify the sediment samples collected from the homogenized sediment on Day -7 and submitted to ALS for analysis of TAL metals.

Bioassay batch code = Bi; where *i* is the sequential batch number

Below is an example of a laboratory bioassay-generated sediment sample ID for a *H. azteca* 42-day bioassay sediment sample on Day 21 from batch 1 from hypothetical field location CB081

SE-CB081-HA42-T21-B1

Laboratory Bioassay-Generated Porewater

Laboratory bioassay-generated porewater samples for analysis by the analytical chemistry laboratory will be labeled using the following nomenclature:

Porewater matrix code = PW

Location ID = see Table B1-1 for individual location IDs

Organism code = HA42 for *H. azteca* 42-day test

Time code (days) = Ti; where *i* is 0, 7, 21, or 28 for the test day the sample is generated

Bioassay batch code = Bi; where *i* is the sequential batch number

Below is an example of a bioassay laboratory-generated porewater sample ID for a *H. azteca* 42-day bioassay porewater sample on Day 7 from batch 3 from hypothetical field location EV092:

PW-EV092-HA42-T7-B3

B4.4 Benthic Macroinvertebrate Enumeration

Benthic macroinvertebrate enumeration will be performed as described in Appendix D and will follow the standard protocols outlined below. The processing of BMI community samples requires two main steps:

- Sample sorting of the BMI community to remove all organisms from the sediment sample
- Identification of the organisms to the lowest practical taxonomic level by a qualified taxonomist.

B4.4.1 BMI Community Sample Sorting

To conduct a BMI community sample sorting, the sorting technician checks out a sample and prints a sorting bench sheet that contains the EcoAnalysts' sample identification information and sorting protocols. The sorting technician records the primary matrix type and approximates the volume of detritus prior to sieving. The standard descriptors for the types of sample matrix are Inorganic, Coarse Organic, Fine Organic, Vegetation, and Filamentous Algae.

The sample is elutriated entirely (no subsampling) by emptying the matrix into a sieve (250 μm) to remove preservative and fine sediment. If the sample matrix is composed of a significant percentage of inorganic material, the organic material will be elutriated from the inorganic material prior to sorting. For elutriation, the whole sample is washed into a shallow pan of water. At this time, any large pieces of organic material can be rinsed and

REVISED TABLES FROM PHASE 3 SEDIMENT STUDY QAPP

Table B3-1. Sample Containers, Holding Times, Preservation, and Sample Quantity

Priority	Analysis	Container Type	Container Size	Filtered	Field Preservation	Holding Time	Minimum Laboratory Sample Size	Total Minimum Sample Size Needed [a, b]	Target Sample Size [c]
Part A. Bulk Sediment Analysis									
1	Total metals, percent moisture	WMG	8 oz	NA	4±2ºC			312 g	
	EPA 6020A metals					6 months	10 g		30 g
	EPA 6010C metals								
2	Total mercury					28 days	5 g		15 g
2	TOC						1 g		3 g
2	SEM-AVS				no headspace; 4±2ºC	14 days	25 g		75g
3	Grain size				4±2ºC	6 months	100 g		300 g
3	Backscatter electron microscopy		16 oz			NA	TBD		TBD
4	Organic chemicals		8 oz (2x)			14 days or 1 year if frozen	161 g		483 g
Total sediment volumes for chemical/physical analysis			56 oz (1.4 L)				312 g		936 g
Part B. Benthic Macroinvertebrate Analysis									
1	Taxonomic enumeration and identification	HDPE	1.0 L or 5 gal bucket	NA	90% ethanol	1 month, transfer to 70% ethanol after 1 month for longer holding time	500 sort count	0.1 m^2 sediment area (10 L or 2.7 gal)	0.1 m^2 sediment area (10 L or 2.7 gal)
Part C. Sediment Bioassays									
1	42-day *H. azteca* bioassay	plastic	2 gal	NA	4±2ºC	ASAP[g]	2.5 L (0.7 gal)	20 L	5 L (1.4 gal)
2	TIE		5 gal			NA	19 L (5 gal)		19 L (5 gal)
Total sediment volumes for sediment bioassays							21.5 L (5.7 gal)		24 L (6.3 gal)
Part D. In situ Sediment Porewater									
Dissolved Metals									
1	EPA 6020A metals	HDPE	125 mL	field filtered	HNO_3 to pH<2; 4±2ºC	6 months	20 mL	190 mL	60 mL
	EPA 6010C metals								
	Hardness[d]	NA	NA	NA	NA	NA	NA		NA
Organic Carbon									
2	DOC	amber glass	125 mL	field filtered	4±2ºC;	28 days	40 mL	190 mL	80 mL
	TOC	amber glass	125 mL	not filtered	sulfuric acid to pH < 2				
Conventional Parameters									
3	Alkalinity as $CaCO_3$	HDPE	125 mL	not filtered	4±2ºC	14 days	35 mL	190 mL	100 mL
	Chloride, sulfate					28 days	10 mL		
3	Sulfide (select locations only) [e]		250 mL (holds up to 270 mL [e])		No headspace, ZnAc, NaOH to pH>9; 4±2ºC	7 days	25 mL		270 mL[e]
Total porewater volumes for analysis							190 mL		320 mL or 570 mL [f]

Table B3-1. Sample Containers, Holding Times, Preservation, and Sample Quantity

Priority	Analysis	Container Type	Container Size	Filtered	Field Preservation	Holding Time	Minimum Laboratory Sample Size	Total Minimum Sample Size Needed [a, b]	Target Sample Size [c]
Part E: Bioassay Laboratory-generated Sediment and Porewater									
Sediment									
1	Total metals, percent moisture	WMG	4 oz	NA	4±2ºC	6 months	10 g	11 g	30 g
	EPA 6020A metals								
	EPA 6010C metals								
	TOC					28 days	1 g		3 g
2	SEM-AVS		4 oz	NA	< 80% full; nitrogen headspace; frozen[h]	14 days	25 g	26 g	75 g
	TOC					28 days	1 g		3 g
Centrifuge Porewater									
1	EPA 6020A metals	HDPE	125 mL	filtered	1 mL of 20% HNO_3, pH<2;	6 months	20 mL[i]	130 mL	60 mL
	EPA 6010 metals				4±2ºC				
	Hardness	NA	NA	NA	NA	NA	NA		NA
2	DOC	amber glass	125 mL	filtered	4±2ºC; sulfuric acid to pH < 2	28 days	40 mL[i]		80 mL
3	Alkalinity as $CaCO_3$	HDPE	125 mL	not filtered	4±2ºC	14 days	35 mL [i]		100 mL
	Chloride, sulfate					28 days	10 mL [i]		
	Sulfide	HDPE	40 mL		no headspace, ZnAc, NaOH to pH>9; 4±2ºC	7 days	25 mL [i]		40 mL

Notes:

[a] Total sample size does not include additional sample volumes needed for laboratory quality control or field duplicate samples. If sufficient sample volume is available, attempt to fill all sample containers provided. If insufficient sample volume is available, fill containers to laboratory minimums in order of priority and then fill the priority containers with any remaining sample.

[b] Project field duplicate samples should be collected for 10 percent of all analytical sediment samples and 5 percent of porewater samples and submitted blind to the analytical laboratory. Due to potential limitations on availability of porewater, field duplicates for porewater will be by bottle (or by analysis), not by sample location. If required, EPA split sediment samples will also be collected.

[c] If target volume exceeds for container size listed, additional containers will be filled.

[d] Hardness will be calculated from dissolved metals results for calcium (Ca) and magnesium (Mg) per: equivalent calcium carbonate ($CaCO_3$) = 2.5 (mg Ca2+/L) + 4.1(mg Mg2+/L).

[e] At locations where sulfide analysis is deemed necessary based on field measurements, a 250-mL high density polyethylene (HDPE) bottle will be filled with no headspace. The approximate volume of sample required to fill a 250-mL bottle with no headspace is 270 mL. See QAPP Section A.7.3 and SOP-7 in Attachment A2 to the Field Sampling Plan (QAPP Appendix A) for field measurement criteria for collecting samples for sulfide analysis.

[f] The total porewater volume required is either 320 mL or 590 mL, depending on necessity for sulfide analysis.

[g] After review of preliminary data and TAI and EPA agree on samples for bioassays.

h In anticipation that the sediment sample volume may not always be sufficient to completely fill the 4 oz jar (as occurred during the Phase 2 Sediment Study [Windward 2017a]), samples will be covered with nitrogen headspace and frozen. Place the 4 oz sample jar in an 8 oz wide-mouth glass (WMG) jar and add nitrogen headspace before freezing the sample to provide secondary containment in case the 4 oz. sample jar cracks.

[i] In anticipation that some of the coarse sediment samples undergoing bioassays may not provide the total minimum porewater sample size needed to analyze all parameters, a priority for subsampling available volume is listed in Table 1 of the Standard Operatiing Procedure, UCR_PW_Centri_SOP, in Appendix C. The following smaller minimum volumes may be used to obtain a greater number of analytes: metals 15 mL, DOC 25 mL, sulfide 10 mL, sulfate/chloride 5 mL, and alkalinity 25 mL

ASAP - as soon as possible
$CaCO_3$ - calcium carbonate
DOC - dissolved organic carbon
HNO_3 - nitric acid
NA - not applicable
NaOH - sodium hydroxide
SEM-AVS - simulatneously extracted metal minus acid volatile sulfide
TBD - to be determined
TIE - Toxicity Identification Evaluation
TOC - total organic carbon
ZnAc - zinc acetate

Table B4-2. Test Conditions for Conducting a 42-day Sediment Toxicity Test with *Hyalella azteca*

Parameter	Conditions
Test type	Whole-sediment toxicity test with renewal of overlying water
Temperature	23 ± 1°C
Test duration	42 days
Light quality	Wide-spectrum fluorescent lights
Illuminance	Approximately 500 lux
Photoperiod	16L:8D
Test chamber	300-mL high-form lipless beaker
Sediment volume	100 mL
Overlying water	SAM-5S reconstituted water (Borgmann 1996) modified to contain 0.4 mg bromide/L
Overlying water volume	175 mL in the sediment exposure from Day 0 to Day 28
	270 mL for the water-only exposure from Day 28 to Day 42
Renewal of overlying water	2 intermittent volume additions/day (e.g., 1 volume addition every 12 hour)
Sediment equilibration	Equilibrate sediment samples in beakers for 7 days (Day -7 to Day 0) with twice daily water changes
Age of organisms [a]	7-to-8 days old at the start of the test with a goal of achieving starting weights in the range of 0.02 to 0.035 mg/organism. The weight of a representative sample of organisms at the start of sediment exposures will be documented.
Number of organisms/chamber	10 (add 30 organisms to the 1-liter chemistry only chambers)
Number of replicate bioassay chambers/treatment	12 replicates for biological endpoints; 4 replicates will be sacrificed for 28-day growth measurements and 8 replicates will be continued on with the water-only exposure for 35-day survival and reproduction and 42-day survival, growth, and reproduction.
Number of replicate chemistry chambers/treatment	10 replicates for chemistry only as follows:
	2 replicates to collect sediment samples for analysis of AVS, SEM, and TOC; 1 for sample collection on Day 7 and 1 for Day 21
	2 sets of replicates (1 L of sediment distributed across 4 1L beakers per set) to equilibrate sediment for collecting porewater using centrifugation on Days 7 and 21; 500 mL overlying water per 1L beaker; porewater will be analyzed for dissolved metals (including major cations), dissolved organic carbon, pH, sulfide, chloride, sulfate, and alkalinity.
Feeding [a]	YCT and fish flake food (e.g., Tetramin) according to the following schedule:
	YCT: 1.0 mL/beaker-day
	Flake fish food suspension:
	Week 1 – 0.25 mg/beaker-day Week 2 – 0.5 mg/beaker-day Week 3 – 1.0 mg/beaker-day Week 4 – 1.5 mg/beaker-day Week 5 – 2.0 mg/beaker-day Week 6 – 2.5 mg/beaker-day
Aeration	None, unless DO in overlying water drops below 2.5 mg/L.
Test chamber cleaning	If screens become clogged during a test, gently brush the *outside* of the screen.
Overlying water quality	Hardness, alkalinity, and ammonia at Day 0, 28, 35, and 42; temperature and DO daily; conductivity weekly; pH three times/week. Concentrations of DO should be measured more often if DO drops more than 1 mg/L since the previous measurement.
Endpoints	28-day survival, weight, and biomass; 35-day survival and reproduction; and 42-day survival, weight, biomass reproduction, and number of adult males and females on Day 42.
Test acceptability	Minimum mean control survival of 80% on Day 28.

Source: USEPA (2000)

Notes:

a The specified parameter is a project-specific condition that has been modified from EPA guidance USEPA (2000) based on discussions with EPA in advance of the Phase 2 sediment study (Windward 2017a) and during bioassay webinars conducted to prepare for the Phase 3 sediment study (McCaig 2019).

DO = dissolved oxygen

YCT = yeast, cereal leaves, and Tetramin

Table B4-4. Estimated Number of Bioassay-Generated Samples for Analytical Chemistry

Media	Analyses	Number of Sediment Samples Tested	Day 0	Number of Analytical Samples Generated at Different Times During Bioassays	
				Day 7	Day 21
Sediment	Total metals, percent moisture, TOC	57	57	0	0
	AVS, SEM, TOC	67	0	67	67
Centrifuged Porewater	Anions (chloride, sulfate), alkalinity, DOC, dissolved metals [a] (including major cations), sulfide	67	0	67	67
				Sediment total	191
				Porewater total	134

Notes:

The number of sediment samples tested in the bioassays includes the 57 samples recommended for testing by TAI in the Revised Draft Bioassay Sample Selection and Batching Recommendations Memo submitted to EPA on January 31, 2020. Samples will be tested in three batches with two samples and two laboratory controls (Spring River control and quartz sand control) repeated in each batch to yield a total of 67 sediment samples tested.

Total metals will be collected from 57 sediment samples (40 Site and 17 reference) after homogenizatioin and prior to the start of the bioassay.

[a] Dissolved metals include aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), silver (Ag), thallium (Tl), vanadium (V), and zinc (Zn) by ICP/MS and calcium (Ca), iron (Fe), magnesium (Mg), potassium (K), and sodium (Na) by inductively coupled plasma/atomic emission spectrometry (ICP/AES).

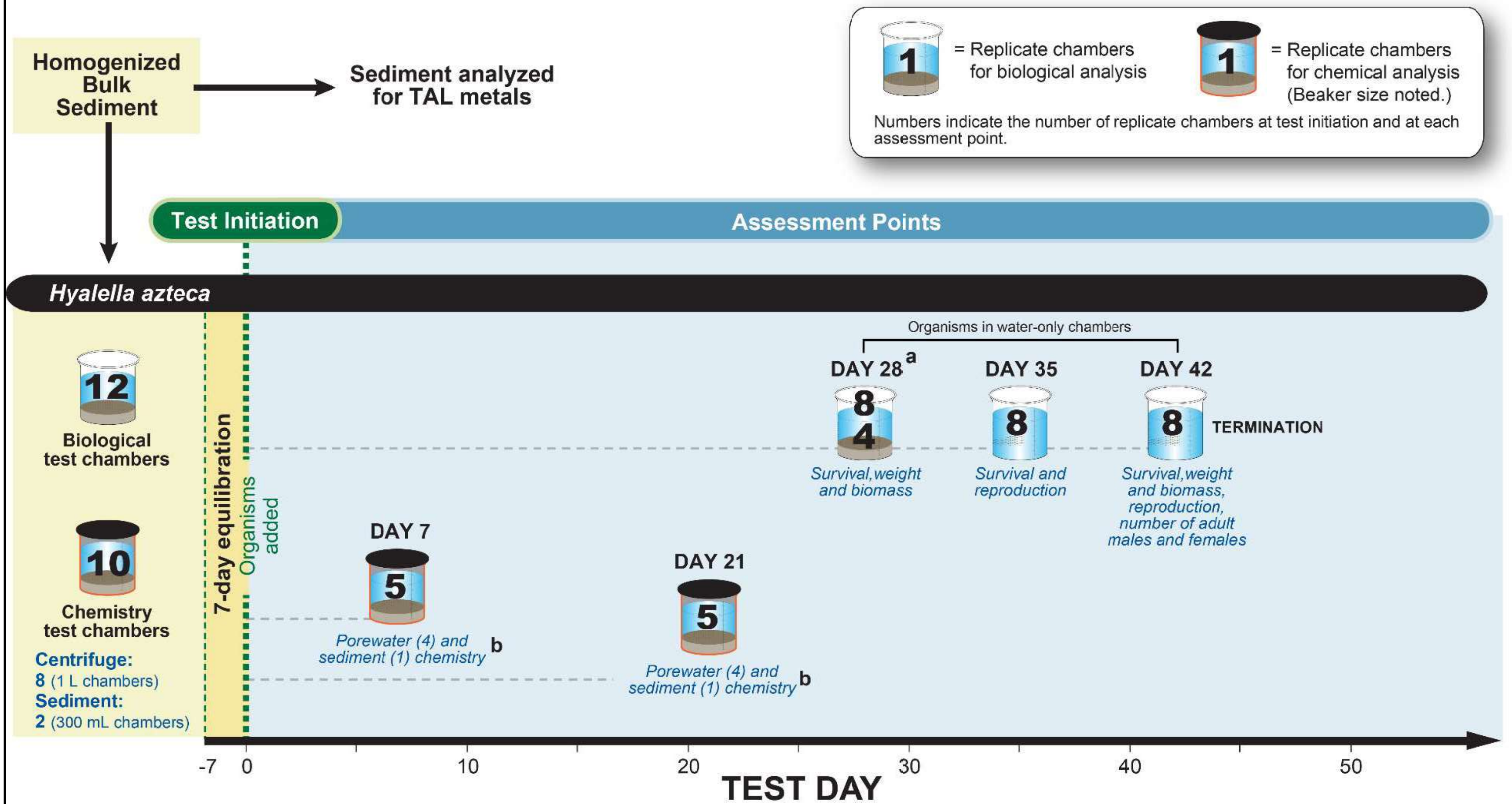
AVS - acid volatile sulfide

DOC - dissolved organic carbon

SEM - simultaneously extracted metals

TOC - total organic carbon

REVISED FIGURE FROM PHASE 3 SEDIMENT STUDY QAPP



a On Day 28, survival evaluated in all 12 replicates; 4 replicates sacrificed to obtain dry weight and biomass, surviving amphipods in 8 replicates transferred to water-only chambers and continued to Day 42

b Porewater from centrifugation analyzed for dissolved metals, DOC, pH, sulfide, alkalinity, sulfate, and chloride; sediment from chemistry test chambers analyzed for AVS, SEM, and TOC.

Figure B4-2. Bioassay Timeline for Sediment Samples

REVISED STANDARD OPERATING PROCEDURES

Hyalella azteca 42-Day Survival, Growth, and Reproduction Sediment Toxicity Test

Upper Columbia River Phase 3 Project Specific Standard Operations Procedure for *Hyalella azteca* 42-Day Survival, Growth, and Reproduction Sediment Toxicity Test

Effective date: April 9, 2020

Revised/Reviewed/Approved by:

Action	Name	Title	Signature	Date
Revised by:	Michael McElroy	Sr. Project Manager		
Reviewed by:	Krista Prosser	QA Manager		
Approved by:	Stephen L. Clark	Vice President		

Hyalella azteca
42-Day Survival, Growth, & Reproduction
Sediment Toxicity Test
UCR Project-Specific Standard Operating Procedures

This standard operating procedure (SOP) has been developed specifically for use in the Upper Columbia River (UCR) Phase 3 Sediment Study for Teck American Incorporated (TAI) and is based upon a modification of the EPA Method 100.4 described in Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition (EPA/600/R-99/064). It is also in general accordance with ASTM Standard E1706-19, Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates.

Modifications from the standard EPA and ASTM methods are based on updated draft guidance from EPA, discussions with EPA during webinars in Spring 2019 (McCaig 2019), and discussions with EPA in Fall 2019 regarding recommendations for Phase 3 sediment study bioassay chemistry data collection (Windward and USGS 2019; USGS et al. 2019).

1. INTRODUCTION

This test is based on a 28-day static-renewal exposure of 7-8 day old *Hyalella azteca* to sediments, followed by a 14-day exposure to water only during which reproduction is evaluated. The final test endpoints include survival, growth, and reproduction (survival and growth on Day 28; survival and reproduction on Day 35; survival, growth, and reproduction on Day 42; and number of adult males and females on Day 42).

H. azteca are often an important component of the benthos in freshwater ecosystems. They have been used in sediment toxicity testing and have been shown to be a sensitive indicator of contaminants associated with sediments. They have a wide tolerance of sediment grain size with acceptable survival in sediments ranging from >90% fines to 100% sand (Ingersoll and Nelson, 1990).

2. TEST PREPARATION

2.1 Equipment and Supplies Needed

1. The analytical lab will provide pre-cleaned and decontaminated sample containers for the field crew to use in the collection of sediment. A minimum volume of 4 L of sediment is necessary (>8 L is preferred) to provide sediment for the bioassay and for the accompanying sediment pore water characterization. Additional volume will be necessary for further characterization of sediment (e.g., grain size characteristics,

contaminant concentrations, porewater generation for Biotic Ligand Model (BLM) constituents).

2. Test organisms, 7-8 day old *H. azteca.*
3. Temperature-controlled room set to 23˚C.
4. Laboratory control water (Type I water and salts to produce SAM-5S reconstituted water per Borgmann (1996) modified to contain 0.4 mg Br/L). Performance based criteria: > 0.02 mg Br/L and > 15 mg Cl/L.
5. Control sediment consists of a field collected freshwater sediment from Spring River, Missouri. In addition, a quartz sand control will also be included in each test batch.
6. Food: YCT (prepared in-house, preferred) and TetraMin® fish flake food.
7. Lexan tubs, stainless steel bowls, plastic scoops, and spatulas (or spoons) to homogenize sediments prior to placement in replicate containers.
8. Sieves, 250 µm, 500 µm, and 1 mm, for removing excess debris and indigenous organisms from test sediments and collecting organisms on Day 28 and Day 42.
9. Test chambers (14 300-mL beakers and eight 1-L beakers per treatment):
    a. 12 for bioassay testing and two for sediment chemistry (AVS, SEM, and TOC) analysis, each consisting of 300 mL tall-form glass beakers, modified as follows:
        i. The flared lip of the beakers should be cut off, and the upper rim flame-polished. The prepared beakers must be appropriately cleaned before further use (See the Glassware & Plasticware Washing SOP).
        ii. Cut a 2.5 cm-wide band of 120 µm Nitex®, approximately 25 cm in length. Using aquarium-safe silicon sealant, attach the band of Nitex around the upper lip of the beaker, such that ~two-thirds of the width of the Nitex band is above the glass. Make sure to completely seal the Nitex such that there are no openings or seams into which the test organisms might become entrapped. Allow the silicon sealant to cure for a minimum of 24 hrs. The resulting test containers must be appropriately cleaned and rinsed, and then pre-soaked for 48 hrs in Type I water [i.e., reverse-osmosis, de-ionized (RO/DI)], before use in testing.
    b. Eight 1-liter beakers for sediment porewater obtained via centrifugation; these 1-L beakers will be modified for use with the Modified Zumwalt-type water delivery system or a Brunson style in-line flow splitter as described in Appendix A.5 of the EPA/600/R-99/064 manual. The 1-liter beakers will be modified as follows:
        i. Two 1-inch diameter holes will be drilled into opposite sides of the beakers at the 800-mL mark. The prepared beakers must be appropriately cleaned before further use (See the Glassware & Plasticware Washing SOP).

ii. Cut two 2-inch squares of 120 µm Nitex®. Using aquarium-safe silicon sealant, attach the squares of Nitex over each of the holes in the beaker. Make sure to completely seal the Nitex such that there are no openings or seams into which the test organisms might become entrapped. Allow the silicon sealant to cure for a minimum of 24 hrs. The resulting test containers must be appropriately cleaned and rinsed, and then pre-soaked for 48 hrs in Type I water [i.e., reverse-osmosis, de-ionized (RO/DI)], before use in testing.

10. Modified Zumwalt-type water delivery system, consisting of a lower plastic tub to hold replicate containers in position, and an upper plastic tub, plumbed with 60 mL syringes with flow restricting frits for delivery of water to replicate containers, or a Brunson style in-line flow splitter.
11. Plastic 25 mL disposable pipette with 120 µm Nitex® screen over one end, for collecting water sub-samples to measure water quality.
12. 50 mL plastic cup, to composite water sub-samples from each replicate to measure water quality.
13. Meters: D.O., pH, and conductivity/salinity, needed to document test water quality, calibrated and used as per the appropriate SOPs.
14. Type I water and wash bottles, for rinsing of probes, etc.
15. Sample bottles, titrators and reagents, calibrated and used as per the appropriate SOPs, required to measure hardness and alkalinity.
16. Colorimeter and reagents, calibrated and used as per the appropriate SOP, required to measure ammonia.
17. Thermometer: NIST certified, for documenting test water temperature.
18. Disposable plastic transfer pipettes, for the collection and transfer of test organisms.
19. Glass tray: for the sorting and collection of test organisms at test initiation and at test termination.
20. Plastic weigh boats for collection of test organisms at test termination.
21. Light boxes: for the sorting and collection of test organisms at test initiation, Day 28, Day 35, and at test termination.
22. Aeration system, in cases where the chambers need to be aerated when the D.O. drops below acceptable levels.
23. Methanol for euthanizing organisms prior to placing them in the drying oven.
24. Fine-tip forceps for organism handling when sacrificing organisms at test initiation (for initial weight measurements), Day 28, and Day 42 for dry weight determinations.

25. Aluminum Foil Weighing Pans, for drying and weighing of *H. azteca* for Test Initiation, Day 28, and Day 42 weights.
26. Drying oven, at 60˚C for drying *H. azteca* at Day 28 and test termination.
27. Desiccators, for holding dried organisms.
28. Balance, capable of weighing to 0.01 mg. Calibrate and use as per the appropriate SOP.
29. Reference weights, for calibration of balance.
30. Microscope and calibrated software for determining sex at Day 42 if necessary.
31. 5 mL clean quartz sand for each replicate beaker for the post-28 day water exposure.

2.2 Ordering and Holding of Test Organisms

2.2.1 Ordering and Holding of Test Organisms from Commercial Supplier

1. Test organisms should be ordered far enough in advance so as to ensure the arrival of 6-7 day old organisms 24 hrs prior to Day 0 (7-8 days old at Day 0). Approximately 15-25% more animals should be ordered than are actually needed for the test, so as to allow for some attrition of organisms that are stressed from the shipping, etc.
2. Order *H. azteca* from:
    a. Aquatic BioSystems, Inc. (800) 331-5916.
    b. Aquatic Research Organisms. (800) 927-1650.
    c. Aquatic Indicators. (904) 829-2780.
3. Upon receipt, the test organism culture should be transferred into 4 L HDPE tanks containing test water at 23˚C; the culture should be gently aerated, and should be fed YCT and TetraMin®. For additional instruction on the receipt and handling of the test organisms, see the **Test Organism Receipt and Handling SOP**.

2.2.2 Organism Health

Test organisms must appear healthy (not pale in color, not noticeably injured), behave normally (active when disturbed, not continually floating and getting stuck in the water surface tension), have been fed well, and have low mortality in the cultures during holding. There should be <10% mortality in the cultures prior to test initiation.

2.3 Collection and Holding of Sediment Samples

Grab or composite samples should be collected into appropriately-cleaned glass or plastic container(s), and immediately be placed on ice (or "blue ice" type product) to bring the temperature to ≤ 4°C. The sample should be handled and transported according to UCR Phase 3 sediment study Quality Assurance Project Plan (QAPP) specifications. Upon receipt of the sample(s) in the laboratory, each sample should be logged in, and then placed in the sample refrigerator at 4°C in the dark. For instruction on the log-in of incoming samples, see the **Sample Receipt and Handling SOP**. The test sample(s) used to start the test should be < 8 weeks old; however, the UCR Phase 3 sediment study Quality Assurance Project Plan (QAPP) may have project-specific established sediment hold times; the QAPP will supersede method recommendations. For each site tested, a minimum of 4 L of sample will be needed for this testing, but >8 L is preferred. This includes the volume needed for chemistry analyses as planned for the Phase 3 study.

NOTE: Samples can be tested up to eight weeks after collection or as established in the UCR Phase 3 QAPP; however, it is recommended to test them as soon as possible after collection. Depending on chemicals of interest and composition of the sediment, degradation and decomposition can occur the longer the sample is in storage.

3. TEST INITIATION

Before test initiation begins, be aware of any client-specific testing requirements and read the attached "**Summary of Test Conditions and Test Acceptability Criteria for Conducting the 42-Day *Hyalella azteca* Survival, Growth, and Reproduction Sediment Toxicity Test.**"

3.1 Pre-Test: Obtaining Test Organisms (Day –8, or before):

1. If in-house organisms are to be used for testing. A sufficient number of neonate *H. azteca* will be obtained and isolated from the culture. The neonate culture will be maintained for the next 7-8 days until test initiation per the **Test Organism Receipt and Handling SOP**.

2. If organisms for testing will be obtained from a test organism supplier, on Day -10 or before, an order for 4, 5, 6, or 7 day old amphipods (as needed to provide sufficient 7 or 8 day old organisms on Day 0) will be ordered for receipt 1 to 3 days in advance of test initiation. Once received, the amphipods will be maintained prior to testing per the **Test Organism Receipt and Handling SOP**.

3.2 Pre-test: Sediment Loading/Equilibration, Sample Collection Prior to Test Initiation (Day -7):

1. Remove the sediment from the sample storage refrigerator and allow thermal equilibration to room temperature. Re-homogenize the sediment along with any overlying water that has developed.

2. Label 14 test replicate containers. Label the test containers with their treatment and replicate ID code (Replicates "A" through "L" for bioassay test replicates, Replicates "M" and "N" for sediment chemistry replicates).

a. For each sediment sample, use a stainless steel spoon or spatula to transfer approximately 100 mL of homogenized sediment into each of the replicates, carefully "tamping" down the sediments. Carefully pour approximately 175 mL of SAM-5S water modified to contain 0.4 mg Br/L into each beaker, taking care to minimize disturbance of the sediment. Sediment chemistry replicates will be similarly established following the **UCR Phase 3 Sediment Chemistry SOP**. Place the test replicates into the water bath or test room, with the temperature controlled at 23˚C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

3. Label eight 1-L beakers with their treatment and replicate ID code for the centrifuged porewater replicates.

    a. For each sediment sample, use a stainless steel spoon or spatula to transfer approximately 286 mL of homogenized sediment into each of the eight replicates, carefully "tamping" down the sediments. Carefully pour approximately 500 mL of SAM-5S water modified to contain 0.4 mg Br/L into each beaker, taking care to minimize disturbance of the sediment. Place the test replicates into the water bath or test room, with the temperature controlled at 23˚C, under cool-white fluorescent lighting on a 16L:8D photoperiod.

3.3 Sediment Equilibration Period (Day -7 to Day 0):

Water changes will be performed twice daily during the sediment equilibrium period. Use the pre-calibrated modified Zumwalt water delivery system or modified Brunson system to add approximately 175 mL of control water to each test chamber. Place the test chambers in the lower plastic tub to hold them in place. Place the tub with the test chambers directly under the syringes connected to the upper splitting chamber of the Zumwalt or Brunson water delivery system and add 1.8 L of overlying water to the splitting chamber. Once the upper reservoir has completely drained into the test chambers, adjust the volume of water in each test chamber so the surface of the water is approximately 1 cm below the mesh screen. If the Zumwalt system is used for performing water changes, drain the water that has overflowed into the lower plastic tub and return the test chambers to the test area. If the Brunson system is used for water changes, the overflow from the tubs will be plumbed to go to a drain in the test room and the test replicates will not need to be removed from the shelf. The 1-L chambers established for centrifuged porewater extraction will similarly have twice daily water changes performed with the water delivery system modified to deliver a proportional amount of water equivalent to the bioassay test replicates.

3.4 Immediately Prior to Test Initiation (Day 0):

1. Renew water as described in Section 3.3.
2. After the water is renewed, use a plastic 25 mL disposable pipette with 120 µm Nitex® screen over one end to collect approximately 20 mL of overlying water from each replicate.

Overlying water should be sampled 1-2 cm above the sediment surface. Composite into a beaker for a final volume of approximately 240 mL.

3. From the composite, collect sub-samples for analysis of alkalinity, hardness, and ammonia. Measure routine water quality parameters (temperature, pH, D.O., and conductivity) in the remaining composited water (**NOTE –** D.O. levels must be > 2.5 mg/L) and record onto the data sheet. Bring the volume of overlying water in each test chamber back to the appropriate level with overlying water.
4. If the D.O. levels fall below 2.5 mg/L, implement gentle aeration of each test replicate.
5. Isolation and Collection of Individual Test Organisms:
    a. Immediately prior to test initiation, transfer a small portion of test organisms and test water into a shallow glass dish or plastic freezer box placed on top of light box.
    b. Cut the tip off of the transfer pipette so as to not damage organisms when handling.
    c. Using plastic pipette, agitate the culture material. This disturbance will cause the juvenile *H. azteca* to swim up, facilitating their capture. However, if there is substrate present in the culture (e.g., leaves or Nitex screen), use a pair of tweezers to move the substrate to the glass dish/freezer box and gently shake the organisms off. Repeat this step until enough organisms are isolated to initiate the entire test.

3.5 Initiate the Test (Day 0):

1. Identify how many total replicates are in the test and gather an equal number of transfer dishes (e.g., plastic weigh boat). Aliquot a small amount of control water into each transfer dish and begin carefully transferring ten 7 or 8 day old *H. azteca* into each dish (these counts must be confirmed by a second scientist). Periodically verify that the organisms are not escaping from the pan and desiccating; resubmerge or replace any escaping organisms. **NOTE –** do not leave organisms in the transfer dishes for an extended amount of time as this will stress the organisms. If loading a large number of sites, it is possible to load one or two replicates at a time.
2. Allocate ten 7 or 8 day old *H. azteca* into each replicate beaker (30 *H. azteca* to each of the 1-L centrifuged porewater replicate chambers) by gently pouring the organisms from the transfer dishes into the test chambers; make sure that organisms are below the water surface in the test replicate chambers. Use a transfer pipette to rinse organisms from the dish into the test chamber, if necessary. Load all “A” replicate containers first, with the order of test treatments being randomized. Repeat process for the “B” replicates, with the order of test treatments being re-randomized. Continue until all test replicates are loaded. Place the weigh boat above the chamber to show that it has been loaded. Once every chamber is loaded carefully remove the weigh boat and double check that no organisms are stuck to the bottom.

3. Immediately re-examine the replicates, replacing any dead or injured animals. Due to surface tension, some organisms may be "trapped" on the water surface. Examine each replicate to ensure that all test organisms are below the water surface. Using a transfer pipette, organisms that are at the water surface should be moved into the water by gently squirting the organisms with test water.
4. Randomly place the replicate containers into the temperature-controlled water bath or room at 23°C, under cool-white fluorescent lighting on a 16L:8D photoperiod.
5. After the water is changed in the afternoon each replicate should get fed by adding 1.0 mL of the YCT and 0.25 mg Tetramin® Tropical Flakes (sieved through 300-µm screen) to each of the 300 mL beakers. The 1-Liter beakers will be fed 3.0 mL of YCT and 0.75 mg Tetramin® Tropical Flakes.
6. At t=0, a minimum of 80 organisms should be dried as described below in Section 5.1.12 to assess growth (as per EPA guidelines).

4. TEST MAINTENANCE (DAYS 1-27)

1. AM Maintenance:
   a. Examine each replicate container. Any dead organisms observed on the water surface are to be removed via pipette, and the number of mortalities is recorded onto the test data sheet.
   b. Measure the temperature in the test water from one randomly-selected replicate for each treatment and record data onto test datasheet.
   c. Using a plastic 25 mL disposable pipette with 120 µm Nitex® screen over one end, collect "old" test water from 1-2 cm above the sediment from a replicate chamber being careful not to remove any *H. azteca* (multiple replicates may need to be sampled). Composite the replicate water samples for each treatment into a 50 mL plastic cup to provide a total volume of ~40 mL; the pipet must be inspected to ensure no organisms were removed during sampling.
   d. Measure the "old" D.O. and record data onto the test data sheet. If the D.O. levels fall below 2.5 mg/L, implement gentle aeration of each test replicate. Measure pH in addition to D.O. three times per week (e.g. Tuesday, Thursday, Saturday) and measure conductivity once per week.
   e. Every 7 days, collect sub-samples for analysis of alkalinity, hardness, and ammonia analysis as described in Section 3.4, Step 3.
   f. Renew the overlying water using the Zumwalt or Brunson water delivery system to deliver at least one replicate water volume to each replicate container as described above in Section 3.3.

g. Return the test to the test area.

h. Collect "new" test water and measure "new" D.O. and record data onto the test data sheet as described in Sections 4.1.c and 4.1d.

2. PM Maintenance:

a. Examine each replicate container. Any dead organisms observed on the water surface are to be removed via pipette, and the number of mortalities recorded onto the test data sheet.

b. Renew the overlying water using the Zumwalt or Brunson water delivery system to deliver at least one replicate water volume to each replicate container as described above in Section 3.3.

c. Return the test replicates to the test area, and feed each replicate YCT+flake fish food. The YCT is fed at 1.0 mL/replicate/day for the entire test period in the 300-mL beakers and 3.0 mL/replicate/day in the 1-L beakers. The Tetramin® food amount is increased each week to account for organism growth.

i. Week 1: 0.25 mg/300-mLbeaker/day and 0.75 mg/1-L beaker/day Tetramin® fish flake suspension

ii. Week 2: 0.5 mg/300-mL beaker/day and 1.5 mg/1-L beaker/day Tetramin® fish flake suspension

iii. Week 3: 1.0 mg/300-mL beaker/day and 3.0 mg/1-L beaker/day Tetramin® fish flake suspension

iv. Week 4: 1.5 mg/300-mL beaker/day Tetramin® fish flake suspension

d. Initial "PM" maintenance on data sheet.

3. Day 7:

a. Collect sediment from one sediment chemistry replicate. Collect samples for analytical chemistry analysis following the **UCR Phase 3 Sediment Chemistry Collection SOP**.

b. Sample porewater for chemical analysis from four of the 1-L beaker centrifuged porewater replicates following the **UCR Phase 3 Project Specific Sediment Porewater Extraction via Centrifugation SOP**:

i. Place the approximately 1000 mL of sediment into two 750-mL centrifuge bottles (~500 mL/bottle), add nitrogen to the overlying headspace, and centrifuge at 4,300 g-force for 30 min.

ii. Decant sediment porewater following **Sediment Porewater Extraction via Centrifugation SOP**, measure pH, and submit porewater samples for chemical analyses (as per Phase 3 QAPP).

4. Day 21:

a. Collect samples for analytical chemistry analysis following the **UCR Phase 3 Sediment Chemistry Collection SOP**.

b. Sample porewater for chemical analysis from four of the 1-L beaker treatment replicates following the **UCR Phase 3 Sediment Porewater Extraction via Centrifugation SOP** and as described above in Section 4.3.

5. DAY 28 TEST TERMINATION & INITIATION OF WATER-ONLY EXPOSURES

5.1 Day 28: Interim Assessment of Survival and Growth

<u>NOTE:</u> Survival and growth at 28 days will be assessed in <u>**four** of the original 12 replicates</u>, as follows.

1. Examine each replicate container. Any dead organisms should be removed via pipette, and the number of mortalities recorded onto the test data sheet.
2. Measure the temperature in the test water in one randomly-selected replicate for each treatment and record data onto test data sheet.
3. Collect sub-samples and measure water quality parameters per Sections 3.4.2 and 3.4.3.
4. Label plastic weigh boats with the corresponding treatment and replicate identification for each test chamber and fill with a small volume of clean test water.
5. Terminating growth replicates:
    a. Using a squirt bottle containing clean test water, vigorously squirt water onto the surface of the sediment so as to disturb the surficial layer – this will facilitate the collection of the *H. azteca*. Swirl and pour the slurry of water and sediment into a glass sorting dish atop a light box.
    b. Using a plastic transfer pipettes with the tip cut, remove the *H. azteca* (adult or young) from the dish and place them into the corresponding weigh boat. Sort through the slurry until all of the *H. azteca* have been removed.
    c. In order to monitor for early reproduction and quantify if it does occur (observation of neonates), pour the slurry of water and sediment from the glass sorting dish through stacked 1-mm opening, 500-µm opening, and 250-µm opening sieves. The contents of the sieves will then be washed, transferred into the glass sorting dish atop a light box, and any observed surviving organisms (adult or young) will be recovered. The presence or absence of neonates in growth replicates should be noted.
    d. If the turbidity of the transferred material is too high to effectively locate the amphipods, the contents will be rinsed again in the 250-µm sieve and re-examined.
    e. Repeat steps 5.a. – 5.d. If no young are recovered after two cycles, it is assumed that there are no young present. If no young are present and all 10 adult amphipods have been recovered, then recovery is considered complete and the remaining sediment can be discarded. If no young are present but all 10 adult amphipods have <u>not</u> yet been recovered, then all the remaining sediment is sieved through a 500-µm opening (or smaller) sieve using a gentle stream of water. Material retained by the sieve is then rinsed into a glass sorting dish, and checked for additional amphipods. If young are

recovered, repeat steps 5.a. – 5.d. until all sediment in the test replicate has been processed.

6. Recovering organisms from reproduction replicates:
   a. If no young are found during processing of the growth replicates, then it can be assumed no reproduction has occurred in that treatment and the reproduction replicates can be processed without monitoring for young.
   b. If young are recovered in the growth replicates, then it should be assumed that the reproduction replicates may contain young and steps 5.c.-5.e. should be performed on the reproduction replicates until no further young are recovered in two consecutive cycles of decanting.
   c. Any recovered neonates in reproduction replicates should be counted and recorded on Day 28 of the "*Hyalella azteca* 42-Day Test: Survival and Reproduction Data" test data sheets.
   d. Once all the *H. azteca* have been removed, dump the slurry into a waste bucket and rinse the sorting dish with test water.
7. Record the number of live adult amphipods in each replicate.
8. Using a squirt bottle, rinse the adult organisms with clean test water to remove any sediment or other clinging material. Using the transfer pipette, transfer the individual *H. azteca* into weigh boats containing methanol. Once euthanized, use forceps to transfer the organisms to Type I water to rinse the organisms.
9. Place a piece of Nitex screen on a paper towel. Using a pipette, transfer the organisms from the Type I rinse to the Nitex screen. This removes excess water from the organisms.
10. Lastly, use forceps to transfer the organisms to a pre-labeled, -dried, and -weighed aluminum foil drying pan corresponding to the appropriate treatment replicate. Make sure to fold down the edges of the weigh pan so the organisms do not "pop out" once dry. When fold the pan do not create any holes in the foil as organisms can be lost.
11. Repeat Sections 5.1.5- 5.1.10 for each test replicate.
12. Growth - When all of the replicates have been transferred into their respective drying pans, place the pans into the drying oven, and dry at 60˚C for 24 hrs. After 24 hrs, the pans should be removed from the oven and allowed to cool in a desiccator. Once cool, the pans should be weighed as per the **Weighing of Test Organisms SOP**.
13. Data analysis – Day 28 test endpoints include:
   a. Day 28 % survival, and
   b. Day 28 growth (as dry weight and biomass).

   The survival and weight data for each replicate, which are recorded on the appropriate data sheets, are entered into the most current CETIS^{TM} statistical software data file labeled for identification of the specific test. Statistical analyses are performed in accordance with EPA guidelines.

5.2 Day 28: Initiation of Water-Only Exposures for Survival, Reproduction, and Growth

1. For each of the remaining **eight** replicates, prepare a new 'water only' replicate (300 mL glass beakers); labeled each replicate appropriately, and filled with ~270 mL control water.
2. Add 5 mL of clean quartz sand per replicate.
3. Process each test replicate as described above (Section 5.1, Steps 1-6). For each replicate, record the number of young recovered (if any), record adult survival, and transfer adults to new "water only" exposure chambers.
    a. If no young are found during processing of the growth replicates, then it can be assumed no reproduction has occurred in that treatment and the reproduction replicates can be processed without monitoring for young. If young are recovered in the growth replicates, then it should be assumed that the reproduction replicates may contain young and should also be sieved so that young are recovered and counted.
4. Return the "water only" replicates to the temperature-controlled room under the same test conditions used in the initial 28-days of testing.

6. TEST MAINTENANCE FOR WATER-ONLY EXPOSURE (DAY 28-42)

1. Perform test maintenance as described in Section 4.0, with the below adjustments to feeding rates:
    a. YCT+flake fish food. The YCT is fed at 1.0 mL/replicate/day for the entire test period. The Tetramin® food amount is increased each week to account for organism growth.
        i. Week 5: 2.0 mg/beaker-day Tetramin® fish flake suspension
        ii. Week 6: 2.5 mg/beaker-day Tetramin® fish flake suspension
2. On Day 35, reproduction of the amphipods is measured. Obtain the test chambers and a sorting tray filled with Control Water.
    b. Collect sub-samples for analysis of alkalinity, hardness, and ammonia. Measure routine water quality parameters (temperature, pH, D.O., and conductivity) per Section 3.4.2 and 3.4.3.
    c. Carefully pour the contents of the test chamber into the sorting tray. Fill up the test chamber with control water. Add 5 mL of new rinsed sand to the test chamber at this time.
    d. Using a wide bore pipette, count and then return the adult *H. azteca* to the test chamber.

e. Count the offspring in the sorting tray and then discard them. Be sure not to count debris as offspring. It is helpful to do this over a light box.

f. Return the test replicates to the test room, and continue to maintain the test for the remaining six days per Section 4.0.

7. TEST TERMINATION FOR WATER ONLY EXPOSURE (DAY 42)

1. On Day 42, collect ~25 mL of test water from each test replicate using a 25 mL disposable pipet. Composite the replicate water samples for each test treatment to provide a total volume of ~240 mL; the pipet must be inspected to ensure no organisms were removed during sampling.
2. From the composite, collect sub-samples for analysis of alkalinity, hardness, and ammonia, which are recorded in their respective logbooks. Then measure routine water quality parameters (temperature, pH, D.O., and conductivity) in the remaining composited water. Record the final water quality data onto the appropriate data sheet.
3. Remove and count adults and young in each replicate, and record on test data sheet. This is best accomplished by pouring the contents of the test chambers into a sorting tray on a light box.
4. Fill a weigh pan with methanol and euthanize the adult organisms.
5. Determine and record the number of adult males and females for each replicate. Mature male amphipods are distinguished by the presence of an enlarged second gnathopod. If necessary, a microscope and calibrated software may be used in assisting the determination sex at this time.
6. From the number of young produced from Day 28 to 42 and the number of adult females at Day 42, calculate and record the number of young produced per female for each replicate.
7. Measure dry weight and biomass as described above in Section 5.1, Step 12.

8. DATA ANALYSIS

Test endpoints include:

- Day 28: % survival,
- Day 28: growth (biomass and dry weight)
- Day 35: % survival,
- Day 35: number of offspring,
- Day 42: % survival,
- Day 42: growth (biomass and dry weight),
- Day 42: number of males and females, and
- Day 42: reproduction (as number of young/female).

The survival, weight, and reproduction data for each replicate, which are recorded on the appropriate data sheets, are entered into the most current CETIS statistical software data file labeled for identification of the specific test. Statistical analyses are performed in accordance with EPA guidelines.

9. PROJECT SPECIFIC TEST ACCEPTABILITY REQUIREMENTS

As per the UCR Phase 3 QAPP, "It is recommended that the following test performance requirements[1] be met":

1. Mean % survival must be ≥ 80% in the Control treatment on Day 28; target performance based criteria of ≥ 80% in the Control treatment on Day 42.
2. Performance goal of Control mean dry weight ≥ 0.35 mg/individual on Day 28 and ≥ 0.50 mg/individual on Day 42.
3. Performance goal for reproduction of ≥ 6.0 young/female from Day 28 to Day 42.
4. Test organisms must come from a single culture cohort, must be within 24 hours of age, and should be between 7 and 8 days old at the start of the test. Initial dry weights of the test organisms must be determined.

5. Hardness, alkalinity, and ammonia in the overlying water typically should not vary by more than 50% during the test, and dissolved oxygen should be maintained above 2.5 mg/L in the overlying water.

10. QUALITY CONTROL

1. Control water, consisting of SAM-5S reconstituted water per Borgmann (1996) modified to contain 0.4 mg Br/L, culture water will be used as the overlying water in this test. Performance based criteria indicate that the water used in testing should have > 0.02 mg Br/L and > 15 mg Cl/L.
2. To ensure that the organisms being used in the test are responding to test conditions in a "typical" manner, a lab "Control" sediment of known quality is run side-by-side with the test sediment. The control sediment consists of a field collected freshwater sediment from Spring River, Missouri; other project specific controls sediments (such as rinsed quartz sand) may be included. Reference test set-up, maintenance, and termination are identical to those described

[1] EPA (2000) guidance uses the term test acceptability requirements, which includes criteria that must be met for a test to be considered acceptable and other criteria that should be met as a goal for conducting a good test. For the purposes of providing clear language for the Phase 3 Sediment Study and as was used in the Phase 2 sediment study, the two types of requirements are distinguished as follows: test acceptability criteria that must be met are referred to as criteria and those that should be met are referred to as performance goals.

above.

3. All equipment is calibrated and operated as described in each applicable equipment SOP.
4. All staff working independently on any test shall have previously demonstrated familiarity and competency with the test, analytical equipment used, and the corresponding SOPs.

11. REFERENCE TOXICANT TESTING

To ensure that the organisms being used in the test are responding to chemical stress in a "typical" manner, a reference toxicant test may be performed side-by-side with the sediment test. The reference toxicant results are then compared with an in-house database to make this determination. Information regarding the reference toxicity test is presented in the ***Hyalella* Reference Toxicant Test SOP**.

12. TEST INTERFERENCES

Characteristics of a sediment, aside from sediment-associated chemical constituents of concern, that can potentially affect test organism survival and growth should be assessed prior to preparing data submittals to the client. Interferences for this test generally fall into the categories of contaminant and non-contaminant factors.

1. Contaminant Interferences
    a. All efforts should be made to avoid contaminating any component of the test system or sediments used in testing so as to avoid both false positives and false negatives. Standard "clean techniques" should be used in the lab at all times.
    b. Measurable concentrations of ammonia are common in the pore water of many sediments and have been found to be a common cause of toxicity in pore water. Total ammonia concentrations should be measured to determine if they exceed the reported tolerance limit for this test species.
2. Non-contaminant Interferences
    a. Natural geomorphological and physico-chemical characteristics, such as sediment texture, may influence the response of test organisms. A control sediment that includes characteristics (e.g., grain size, organic carbon) that are within the tolerance range of the test organism should be included in the study design. This may best be accomplished by using a formulated sediment.
    b. Morphologically similar indigenous organisms in a sediment sample may be confused with the test species during test termination, and result in overestimates in survival. In addition, indigenous organisms may also compete for food or prey on the test species. Should indigenous organisms be observed during test termination, the scientist should immediately notify the Project Manager, as it may be necessary to identify the indigenous

organism, and determine the number or biomass in order to better interpret the growth data.

c. During water changes, it is important to observe the water stream from the syringes as they clog easily. If clogged, the corresponding test replicate will not receive a sufficient water renewal, which could result in low D.O. levels. To un-clog the syringe, insert the end of a paperclip into the tip of the syringe.

13. SAFETY

There is little risk to those performing the 42-d *Hyalella* toxicity test. Staff should wear appropriate PPE. Sediments can contain pathogenic organisms and appropriate precautions should be observed when handling this material. After the test is complete, the sediments should be disposed of in an appropriate fashion.

14. REFERENCES

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Windward, USGS. 2019. Upper Columbia River. Draft. Porewater extraction method study. Stage 1. Prepared for Teck American Incorporated. Windward Environmental LLC, Seattle, WA.

SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR CONDUCTING THE 42-DAY *HYALELLA AZTECA* SURVIVAL GROWTH, AND REPRODUCTION SEDIMENT TOXICITY TEST		
1.	Test type	Whole-sediment toxicity test; 28 days of sediment exposure followed by 14 days of reproduction monitoring in clean water.
2.	Test duration	42 days + 7 day pre-test equilibrium period
3.	Temperature	23 ± 1°C
4.	Light quality	Wide-spectrum fluorescent lights
5.	Light intensity	About 500 lux
6.	Photoperiod	16L:8D
7.	Test chamber size	300-mL high-form lipless beaker or 1-L beaker
8.	Test sediment volume	100 mL for 300 mL replicates 286 mL for 1-L replicates
9.	Overlying water	SAM-5S Reconstituted Water (Borgmann 1996) modified to contain 0.4 mg Br/L. Performance based criteria: > 0.02 mg Br/L and > 15 mg Cl/L.
10.	Overlying water volume	300 mL replicates: 175 mL for Days 0-28, 270 mL for Days 28-42. 1-L replicates: 500 mL
11.	Overlying water quality	Hardness, alkalinity, and ammonia are measured at Day 0, 28, 35, and 42. Temperature and D.O. daily. pH three times per week. Conductivity weekly.
12.	Overlying water renewal	2 intermittent volume additions per day (i.e., one volume addition twice per day).
13.	Age of test organisms	7- or 8-d old at the start of the test
14.	No. of organisms per test chamber	10 for 300 mL replicates; 30 for 1-L replicates
15.	No. of rep. chambers/concentration	22 chambers: 8 replicates for 42-day endpoints, 4 replicates for 28-day endpoints; 2 replicates for TOC, AVS/SEM and 8 replicates for porewater chemistry.

16.	Feeding regime 300 mL replicates	YCT+flake fish food. YCT: 1.0 mL/beaker-day. Flake fish food suspension: Week 1: 0.25 mg/beaker-day. Week 2: 0.5 mg/beaker-day. Week 3:1.0 mg/beaker-day. Week 4: 1.5 mg/beaker-day. Week 5: 2.0 mg/beaker-day. Week 6: 2.5 mg/beaker-day.
17.	Feeding regime 1-L replicates	YCT+flake fish food. YCT: 3.0 mL/beaker-day. Flake fish food suspension: Week 1: 0.75 mg/beaker-day. Week 2: 1.5 mg/beaker-day. Week 3: 3.0 mg/beaker-day.
18.	Test chamber cleaning	If screens become clogged during the test, gently brush the *outside* of the screen
19.	Test solution aeration	None, unless DO in overlying water drops below 2.5 mg/L.
20.	Endpoints	Survival (Day 28, 35, and 42), growth (as dry weight and biomass on Day 28 and 42), reproduction (number of young/female from Day 28-42), and number of adult males and females on Day 42.
21.	Sample and sample holding requirements	Grab or composite samples should be stored at 4°C in the dark.
22.	Sample volume required	4 Liter minimum, 8 L preferred
23.	Project specific test acceptability requirements-	1. Mean 28-d control survival must be ≥ 80%. 2. Mean 28-d control weight performance-based goal ≥ 0.35 mg/individual. 3. Mean 42-d control survival performance-based goal ≥ 80%. 4. Mean 42-d control weight performance-based goal ≥ 0.50 mg/individual. 5. Mean 42-d control reproduction performance-based goal ≥ 6.0 young/female (Day 42). Test organisms must come from a single culture cohort, must be within 24 h of age, and should be between 7 and 8 d old at the start of the test. Initial dry weights of the test organisms must be determined.

General Activity Schedule for Conducting a Long-term Sediment Toxicity Test with the amphipod *Hyalella azteca* (adapted ASTM 2019 and USEPA 2000).	
Day	Activity
About -10	Inform organism supplier of the need to isolate <24-h old amphipods from mass culture, and to observe isolated amphipods daily to evaluate health.
-7	Sample sediments for physical and chemical characteristics and sample pore water for water quality analyses. Analytical program will follow approved UCR Phase 3 QAPP. Place sediments into exposure beakers, two sediment chemistry beakers for AVS, SEM, and TOC analysis, and eight 1-L beakers for porewater collection via centrifugation. Add overlying water for a 7-d equilibration period at 23°C. Start delivery of overlying water to the exposure beakers.
-3 to -1	4, 5, 6,or 7 day old amphipods (as needed to provide sufficient 7 or 8 day old organisms on Day 0) are received from the test organism supplier and maintained prior to testing. Amphipods are fed and observed daily to evaluate health.
0	Measure total water quality of overlying water (pH, temperature, dissolved oxygen, hardness, alkalinity, conductivity, ammonia). Transfer ten test organisms into each test chamber (30 test organisms for 1-L beaker exposures). Release organisms under the surface of the water. Add appropriate food to each test chamber. Isolate 80 amphipods for T0 weight measurement.
1–27	Feed test organisms 1.0 mL/300 mL beaker/day of YCT and 0.25 mg/300 mL beaker/day of Tetramin®. Feeding will be adjusted accordingly for 1-L beaker exposures with 3.0 mL of YCT and 0.75 mg Tetramin® added to each beaker. Perform AM and PM water changes (2 volume additions per day). Measure temperature and dissolved oxygen (DO) daily, pH three times a week, and conductivity weekly. Observe behavior of test organisms.
7	Collect sediment from one sediment chemistry beaker, and centrifuge sediment from four porewater 1-L beakers that were loaded on Day -7. Analytical program will follow approved UCR Phase 3 QAPP.
7-13	Increase Tetramin® feeding to 0.5 mg/300-mL beaker/day. 1-L beakers will be increased to 1.5 mg/1-L beaker/day
14–20	Increase Tetramin® feeding to 1.0 mg/300-mL beaker/day. 1-L beakers will be increased to 3.0 mg/1-L beaker/day
21	Collect sediment from one sediment chemistry beaker, and centrifuge sediment from four porewater 1-L beakers that were loaded on Day -7. Analytical program will follow approved UCR Phase 3 QAPP.
21–27	Increase Tetramin® feeding to 1.5 mg/ mg/300-mL beaker/day.
28	Measure temperature, dissolved oxygen, pH, hardness, alkalinity, conductivity, and ammonia. End the sediment-exposure portion of the test by collecting the test organisms via rinsing and decanting with the assistance of a 500-µm mesh size sieve as needed. Count survivors in test replicates A-L. For test replicates A-D, weigh test organisms for biomass and mean dry weight test endpoints. Prepare eight amphipod replicate beakers for reproduction measurements: Place survivors from test replicates E-L in individual water-only beakers containing control water and 5 mL clean quartz sand,. Add food to each test beaker.
28–34	Increase Tetramin® feeding to 2.0 mg/beaker-day. Measure temperature and dissolved oxygen (DO) daily, pH three times a week, and conductivity weekly. Perform AM and PM water changes (2 volume additions per day).
35	Record the number of surviving adults and remove offspring. Return adults to their original individual beakers and add food.
35–41	Increase Tetramin® feeding to 2.5 mg/beaker-day. Measure temperature and dissolved oxygen (DO) daily, pH three times a week, and conductivity weekly. Perform AM and PM water changes (2 volume additions per day).

42	Measure total water quality (pH, temperature, dissolved oxygen, hardness, alkalinity, conductivity, ammonia). Record the number of surviving adults and offspring. Surviving adult amphipods on Day 42 are observed for determination of the number of males and females in each replicate. This information is used to calculate the number of young produced per female per replicate from Day 28 to Day 42. Weigh adult test organisms for biomass and mean dry weight test endpoints.

Supplemental SOP Language

Definitions:

ACS:	American Chemical Society
ASAP :	As soon as possible
ASTM :	American Society for Testing Materials
°C :	degrees Celsius
dH_2O :	distilled water
D.O.:	dissolved oxygen
ECx:	Effective concentration in X% of the population.
hrs :	hours
ICx:	Inhibitory concentration in X% of the population.
LCx:	Lethal concentration in X% of the population.
LOEC:	Lowest Observed Effect Concentration
mg :	milligram
mg/L :	milligram per liter
mL :	milliliter
NOEC:	No Observed Effect Concentration
NPDES :	National Pollutant Discharge Elimination System
S.O.P.:	Standard Operation Procedure
TIE:	Toxicity Identification Evaluation
U.S. EPA :	United States Environmental Protection Agency

Interferences:
In an effort to eliminate interferences, SOPs have been established for every procedure involved in conducting a successful bioassay test. Additionally, a rigorous daily QA/QC inspection is designed to identify potential sources of interference. Prior to the initiation of toxicity tests every effort is made to identify and eliminate potential sources of interference that could compromise test results. These can include but are not limited to the following: clean and functional facilities, equipment and test chambers; sample storage and handling; test organism and food quality; laboratory water quality.

Pollution Prevention
As a pollution prevention measure, wastes generates during toxicity testing must be properly handled and disposed of in an appropriate manner. Care should be taken not to generate excessive wastes when preparing solutions for testing. All materials identified as hazardous should be labeled and appropriately stored for hazardous waste disposal.

Data Assessment
Bioassay and water quality data are assessed each day during the course of testing for accuracy and compliance with established criteria. At test termination, the data for each replicate, which

are recorded on the appropriate data sheets, are entered into a CETIS™ data file labeled for identification of the specific test. Statistical analyses are performed in accordance with EPA guidelines for statistical analysis. Control data for all endpoints are evaluated for compliance with established test acceptability criteria. Water Quality data are assessed for compliance with specifications outlined in the appropriate USEPA testing manuals.

Corrective Actions and Contingencies for Out-of-Control Data

If control performance is not met, a project manager should be notified immediately and, upon approval, the test is to be repeated. The potential cause(s) of poor control performance will be documented by scientific staff and evaluated and assessed by a project manager. Corrective actions will be determined on a case-by-case basis. The results of all tests will be summarized in reports for the regulatory authorities with an explanation of the results.

Sediment Porewater Extraction via Centrifugation

Upper Columbia River Phase 3 Project Specific Standard Operating Procedure for Sediment Porewater Extraction via Centrifugation

Effective Date: April 9, 2020

Revised/Reviewed/Approved by:

Action	Name	Title	Signature	Date
Revised by:	Michael McElroy	Sr. Project Manager		
Reviewed by:	Krista Prosser	QA Manager		
Approved by:	Stephen L. Clark	Vice President		

Sediment Porewater Extraction via Centrifugation

Standard Operating Procedures

1.0 INTRODUCTION

This standard operating procedure provides instructions for the extraction of porewater samples via centrifugation for the Upper Columbia River (UCR) Phase 3 Sediment Study for Teck American Incorporated (TAI). Sediment porewater (or interstitial water), consists of the water occupying the spaces between sediment particles. A centrifuge can be used to separate the sediment (precipitate) and pore water (supernatant liquid) of a sediment mixture using centrifugal force. Sediment porewater will be obtained from each site and reference sediment sample from sediment equilibrated with overlying water as described in the project specific UCR Phase 3 Sediment Study 42-day Hyalella Survival, Growth, and Reproduction SOP and to support the porewater analytical chemistry program outlined in the Upper Columbia River (UCR) Phase 3 Quality Assurance Project Plan (QAPP).

2.0 PREPARATION

2.1 Equipment and Supplies Needed

1. Thermo Forma General Purpose Centrifuge
2. 750 mL Centrifuge Bottles
3. Homogenized Sediment Sample
4. Mettler Toledo MS4002S Balance
5. Paper Towels
6. Large Water Quality Cup or Beaker
7. Stainless Steel Spoons/Spatulas
8. Pre-cleaned and preserved (as necessary) sample bottles provided by the analytical laboratory.
9. Pre-cleaned polyethersulfone (PES) luer lock disc filters (0.45-µm) approved for use in the study by the analytical laboratory for dissolved metals analysis.
10. Pre-cleaned Whatman® Puradisc 25 polyvinylidene difluoride (PVDF) luer lock disc filters (0.45 µm) provided by the analytical laboratory for dissolved organic carbon analysis. Filters will be batch tested by the analytical laboratory for DOC contamination.
11. Syringes of appropriate size for needed volumes
12. American Society for Testing and Materials (ASTM) Type 1 deionized water (DI) provided by the analytical laboratory for rinsing filters and syringes.

3.0 PROCEDURE

3.1 Loading Sediment into Centrifuge Bottles

1. Carefully syphon the overlying water off the top of the sediment within the bioassay test replicate.
2. Ensure that the balance calibration has been performed prior to use. If the calibration has not been performed, calibrate the balance according to the **“Mettler Toledo MS4002S/03 Top Loading Balance SOP”**.
3. Turn on the balance and make sure it is level. Tare the balance.
4. Put a piece of labeling tape on each of the centrifuge bottles and label that tape corresponding to the sample that is in that bottle.
5. Place the centrifuge bottle with the cap onto the balance. Fill the centrifuge bottles equally with sediment using a spoon. Record the weight of the container on the label.
6. Once the weight of the first sediment sample has been determined, all other samples must be within 1 g of that weight or the centrifuge will not function properly.
7. Add nitrogen headspace to the centrifuge bottle before capping
8. Clean the bottles of any debris before putting in the centrifuge.

3.2 Centrifuging Samples

1. Before turning on the centrifuge, clear the centrifuge area of any debris and loose paper. Allow 6 inches of clearance near the rear ventilation grill.
2. Press the On/Off switch on the lower right-hand corner of the front panel.
3. Press the OPEN key to open the centrifuge lid. A yellow light will turn on as long as the lid is open and it will turn off once the lid is closed.
4. Place either 2 or 4 of the centrifuge bottles in the rotor assembly making sure the bottles that are within 1 g of each other are in opposing positions.
5. Adjust the run parameters using the touch switches on the front panel. Adjust the parameters to the following settings. Press the arrow keys to change each parameter:

Run Parameters	Settings
Temperature	4 ºC
g-force	4300 g
Time	30 minutes
Accelerate	Maximum
Brake	Maximum

6. Close the cover by lowering the centrifuge lid so that the cover rests on the chamber gasket. Place hands on both sides of the cover and press down firmly.
   a. Always assure the lid is locked and secure before starting. The machine will make a loud "clicking" sound when it locks or unlocks.
7. Press START.
8. Do not walk way immediately after pressing start as an imbalance could occur. When an imbalance occurs, a sensor shuts the unit down and triggers a warning message (BAL) on the screen.
9. Once the centrifuge has completed its run and come to a complete stop, open the centrifuge lid and recover the centrifuge bottles. A separated layer of supernatant (the pore water) and precipitate should be visible.
10. Carefully decant and composite the supernatant from each centrifuge bottle into a beaker. See Section 3.3 for details on filtration and procedures for prioritizing analyses if sufficient supernatant was not produced during the centrifugation process.
11. Pour the composited porewater into pre-cleaned sample bottles provided by the analytical chemistry lab, fill out the provided Chain of Custody (COC), and prepare for shipment to the analytical laboratory.

3.3 Porewater Collection and Filtration

1. The volume of pore water obtained from one liter of sediment will vary by sediment sample characteristics (i.e. grain size). Recovery of pore water from coarse sand may be more difficult than from finer-grained material. After centrifugation of the sediment samples, assess the volume of pore water available for analysis. Use the guide in Table 1 with target and minimum volumes of pore water (adapted from Table B3-1 of the UCR Phase 3 Sediment Study QAPP) in order of collection priority if insufficient volume can be obtained for all parameters. The absolute minimum volume that can be used if even the minimum volume cannot be obtained is also listed in Table 1. After determining which analytes can be obtained with the available pore water sample volume, use the guide in Table 2 for the order subsamples should be collected. For example, sufficient volume of pore water may not be available for all samples. But if enough volume is available for sulfide, subsample the sulfide aliquot before subsampling for metals and DOC.

Table 1. Priority of Subsampling

Priority	Analysis	Absolute Minimum Volume [a]	Minimum Volume	Target Volume	Notes
1	EPA 6020A metals[b]	15 mL	20 mL	60 mL	Filter using 0.45µm PES filter
	EPA 6010 metals[c]				
	DOC	25 mL	40 mL	80 mL	Filter using 0.45µm PVDS filter provided by analytical lab
	pH	1 mL[d]	10 mL	10 mL	Use a microprobe to measure pH if less than 10 mL is available for pH[d]
2	Sulfide	10 mL	25 mL	40 mL	
3	Chloride, sulfate	5 mL	10 mL	100 mL	Pore water for chloride, sulfate, and alkalinity are combined into one sample jar
4	Alkalinity	25 mL	35 mL		

[a] In anticipation that some coarse sediment samples may not provide the minimum porewater volume needed for all parameters, the absolute minimum volume that can be used at ALS are listed in Table 1.

[b] EPA 6020A metals are: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium cobalt, copper, lead, manganese, nickel selenium, silver, thallium, vanadium, and zinc.

[c] EPA 6010 metals are: calcium, iron, magnesium, potassium, and sodium.

[d] A microprobe for measuring pH in smaller than 10 mL volume may be available for use in the study.

Table 2. Sampling Order

Priority	Analysis
1	pH
2	Sulfide
3	EPA 6020A metals
	EPA 6010 metals
	DOC
4	Chloride, sulfate, alkalinity

2. Filtration steps:

   Soak syringes in ASTM Type 1 DI water provided by the analytical laboratory for a minimum of 30 minutes to remove potential contaminants in the syringes.

   When ready to filter the pore water sample, rinse filter first by drawing up 5 mL of ASTM Type 1 DI water into the syringe, attaching the filter to the syringe and gently pushing the water through the filter. Then remove the filter and draw up the appropriate volume of pore water, reattach the filter, push a small volume (i.e., 3 to 5 mLs) of pore water through the filter to discharge residual DI water from the filter, then push the sample through the filter directly into the appropriate sample bottle. Avoid applying too much pressure. Change filters when resistance is met to avoid break through. For each new filter used in the process, follow rinsing process described above.

4.0 INTERFERENCES

As sulfide is one of the analytes of interest, limiting exposure to air is encouraged to minimize loss of sulfide.

5.0 SAFETY

1. Use caution when closing the centrifuge lid, making sure not to close it on your fingers.
2. Centrifuge operation poses little to no risk to the operator.

Sediment Chemistry Collection

Draft
Upper Columbia River Phase 3 Project Specific Standard Operations Procedures for Sediment Chemistry Collection

Effective date: April 9, 2020

Revised/Reviewed/Approved by:

Action	Name	Title	Signature	Date
Drafted by:	Alison Briden	Sr. Project Manager		
Reviewed by:	Krista Prosser	QA Manager		
Approved by:	Jeffrey Cotsifas	President		

Collection of AVS/SEM Sediment Samples

Standard Operating Procedures

The purpose of this standard operating procedure (SOP) is to describe procedures used for collection of sediment from sediment chemistry replicates during bioassay testing. Sediment samples will be collected from replicate chambers (sediment chemistry replicates) set up and treated similar to bioassay replicates, including the addition of organisms. Sediment samples will be analyzed for AVS, SEM, and TOC at monitoring intervals (i.e., $T_{Day\ 7}$, $T_{Day\ 21}$) outlined in the UCR Phase 3 QAPP.

1. EQUIPMENT AND SUPPLIES NEEDED

1. Type I water and wash bottles, for rinsing of labware, etc.
2. Pre-cleaned sample containers consisting of wide mouth jars and lids provided by analytical lab for AVS/SEM samples.

2. ESTABLISHMENT OF AVS/SEM

1. At the same time as bioassay beakers are prepared, establish two additional replicates (sediment chemistry replicates) for analysis of AVS, SEM, and TOC on $T_{Day\ 7}$ and $T_{Day\ 21}$.

5. COLLECTION OF SEDIMENT FOR AVS/SEM

On $T_{Day\ 7}$ and $T_{Day\ 21}$, sediment from one sediment chemistry replicate will be collected into a single sample container for AVS, SEM, and TOC analyses.

1. Pour off overlying water.
2. Using an acid-cleaned plastic spoon, collect the sediment from the sediment chemistry replicate and place in a pre-cleaned wide-mouth glass sample jar provided by the analytical laboratory. Place the sample jar at an angle while collecting the sediment.
3. Immediately pass nitrogen gas over the sediment in the jar while the sediment from the remaining treatment replicates is being collected.
4. Ensure the jar is no more than 80% full to reduce the likelihood that the jar will crack when frozen.
5. Once the sediment from the sediment chemistry replicates is collected and placed into the sample jar, carefully cap the jar under a flow of nitrogen so ensure sample is capped with nitrogen headspace.
6. <u>Do not</u> tap the jar. If the sediment is compacted the jar will be more likely to break when frozen.

7. Place sample jars in a cardboard box and place the box at an angle in the freezer.
8. If any of the samples crack during freezing, double-bag the cracked jar under nitrogen and then place inside another larger jar with nitrogen headspace prior to shipment to the analytical lab.

FIELD CHANGE REQUEST

UCR Phase 3 Sediment Study | Field Change No.: 1

CHANGE REQUEST

Applicable Reference:

QAPP Section A7.7.7, QAPP Appendix A (Field Sampling Plan) Section 2.1.1

Description of Change:

At Evans AOI, additional samples will be attempted using mechanical sampling method(s) at alternate sampleable sand (SS) locations in the historical river channel (below 1,220 feet) instead of attempting to collect SS from areas outside the historical channel (above 1,220 feet) using the freeze grab method. As a result, at Evans AOI, samples for the SS stratum will be limited to the historical river channel. The Phase 3 Sediment Study QAPP identified 3 primary and 1 alternate SS location outside the historical river channel at Evans AOI.

Reason for Change:

As of 9/25/2019, all 21 primary SS locations and 5 alternate SS locations at Evans have been visited by the sediment sampling personnel. This includes the 3 primary and 1 alternate SS locations above 1,220 ft, where sampling using mechanical means (modified Hamon grab) has not been successful. A total of 18 SS samples have been collected, so an additional 3 SS samples are required to achieve the target of 21. Sampling will be attempted at up to 5 more alternate locations using mechanical samplers (Hamon, Van Veen) before sampling would be attempted using a freeze grab, per the procedure shown in QAPP Figure A7-2. Thus, it is may be possible to obtain 21 SS sediment samples at Evans using mechanical methods if 3 more samples are collected from remaining alternate locations below 1,220 feet. This approach would prioritize collecting sediment for the full triad suite (sediment chemistry, bioassay testing, and BMI survey) over obtaining SS samples from outside the historical river channel, which would require use of a freeze grab method that does not support sediment collection for bioassay testing.

Impact on Present and Completed Work:

This request impacts work being completed currently at Evans AOI; it does impact completed work.

Requested by: Jerry a. Por[illegible] Date: 9-26-19

(Field Supervisor)

Acknowledged by: [illegible] Date: 9/27/19

(EPA Field Representative)

APPROVAL

TAI Project Coordinator: Kris R. McCaig Date: 9-27-19

EPA Project Manager: Katryn Cerise Date: 9/27/19

FIELD CHANGE REQUEST

UCR Phase 3 Sediment Study	Field Change No.: 2

CHANGE REQUEST

Applicable Reference:

QAPP Section A7.7.5, QAPP Appendix A (Field Sampling Plan) Sections 2.1.1 and 2.2.7

Description of Change:

When collecting sediment samples from the mixed coarse strata using the freeze grab method, a reasonable effort to obtain a representative sediment volume will be expended at each location. Reasonable effort is defined as follows:

> After completing the freeze grab(s) required to fill sample containers for sediment chemical/physical analysis, a maximum target volume of one gallon will be collected for benthic macroinvertebrate (BMI) analysis, OR freeze grab attempts will be continued for a total collection time of four hours at the location.

The sampling team will record the total volume of all composite samples for BMI analysis, and the sample will be submitted to the laboratory for BMI analysis, even if the volume is less than one gallon. If refusal is encountered using the freeze grab method per FSP Attachment A2, SOP-5, then no BMI sample will be collected.

Reason for Change:

Collection of sediment samples using the freeze grab method from the mixed-coarse stratum at Evans AOI has proven to be difficult and time consuming. The mixed-coarse stratum is either not present at the proposed primary and alternate sample locations, or, if the stratum is present, it has been very difficult to obtain sufficient sediment volume for both sediment chemical/physical analysis and BMI analysis. Samples from the mixed-coarse stratum are not required to answer the primary study questions identified in the Phase 3 Sediment Study QAPP, which require collection of statistically-based samples from the sampleable sand stratum. It is therefore appropriate to define a reasonable effort for sampling attempts from the mixed-coarse stratum to help ensure that resources are available for collecting the required samples from the sampleable sand stratum.

The rationale for the above definition of reasonable effort is as follows:

- The freeze grab BMI samples are not intended to be compared to the Van Veen or Hamon grab BMI samples. Therefore, the target sample area and volume do not need to be comparable to those BMI samples.
- The feasibility of a one-gallon volume for all samples is not known. Therefore, a post hoc analysis of actual sediment volumes will be done to determine which samples are outliers, in terms of sediment volume. The mean BMI sample volume could be less than one gallon.
- Since the freeze grab sampling method does not readily allow for consistent benthic areas sampled, this method should be considered qualitative or semi-quantitative. Furthermore, these samples are not going to be compared to a reference condition and there will not be enough replicates for inference testing between or among groups. They are intended to characterize the BMI community composition in the mixed-coarse facies, and for limited comparisons to gradients of physical and chemical variables.

Impact on Present and Completed Work:

None. This request is consistent with the procedures that were employed while sampling sediment from the mixed-coarse stratum at Evans AOI.

Date: 10-3-19

Requested by: Jerry a. Pr[illegible]

(AECOM Field Supervisor)

Acknowledged by: [illegible signature]

Date: 10/3/19

(EPA Field Representative)

FIELD CHANGE REQUEST	
UCR Phase 3 Sediment Study	Field Change No.: 2
APPROVAL	
TAI Project Coordinator: Denise Mills for Kris McCaig	Date: 10-03-2019
EPA Project Manager:	Date: 10-3-19

FIELD CHANGE REQUEST

UCR Phase 3 Sediment Study	Field Change No.: 3

CHANGE REQUEST

Applicable Reference:

QAPP Map A7-6, QAPP Appendix A (Field Sampling Plan) Section 2.2.2 and Map A-6

Description of Change:

Field Sampling Plan Section 2.2.2 (Sampling Location Positioning) states that "[r]eference area sampling locations should be moved no more than 50 m if possible; however, locations can be adjusted within the river reach, if necessary, based on field conditions." Three reference sampling locations at Genelle Eddy, BC required adjustment by greater than 50 meters. These locations and the approximate distance and direction of adjustment are as follow:

REF006 – Samples collected approximately 110 meters northwest of target location shown in QAPP
REF009 – Samples collected approximately 71 meters northwest of target location shown in QAPP
REF010 – Samples collected approximately 490 meters west of target location shown in QAPP

The target reference locations shown in the QAPP and the revised locations for these reference samples are shown in the attached figures. These location adjustments were discussed with EPA oversight personnel, who concurred with the revised locations.

Reason for Change:

The adjustments described above were necessary either based low water levels in the Columbia River (REF006 and REF010) or to provide a suitable area of the target sediment type (sand) for the collection of the required sediment volume and porewater. The specific reasons for adjusting each location are provided below.

REF006 – A 0.5 meter drop in water level on September 28-29 resulted in the proposed target REF006 location being too shallow to approach from the sheltered backwater area of the eddy, and the fast river current prevented a safe approach from the thalweg. The modified location was selected because the river bed consists of a sand / mixed sediment and allowed for safe working conditions such that the porewater boat could anchor.

REF009 – The proposed target REF009 location was found to not contain a sufficient area sand / mixed sediment for completion of the required sediment sampling. The river bottom at the revised location consists of a large enough area of sand to facilitate sediment sampling of the target sediment type with a water depth that was sufficient for the porewater boat to successfully obtain a sample.

REF010 – The target REF010 location was estimated visually to be approximately 1 meter out of the water, rendering it not appropriate for sampling porewater or benthic macroinvertebrates. The revised location was identified by performing a camera survey to find the closest down-stream location where the target sediment type was present and that could be accessed/sampled for sediment and porewater. The predominant sediment type between the proposed target and revised locations was cobble/boulder with limited sand.

Impact on Present and Completed Work:

Sediment and porewater sampling was successfully completed at the revised locations.

Requested by: Jerry G. P[illegible] (AECOM Field Supervisor) Date: 10-16-19

Acknowledged by: [signature] (EPA Field Representative) Date: 10/16/19

APPROVAL

TAI Project Coordinator: Kris R McCaig Date: 10-16-19

FIELD CHANGE REQUEST	
UCR Phase 3 Sediment Study	Field Change No.: 3
EPA Project Manager: [illegible]	Date: 10-16-19

N

AECOM

0 30 60 90
Scale In Meters

0 125 250
Scale In Feet

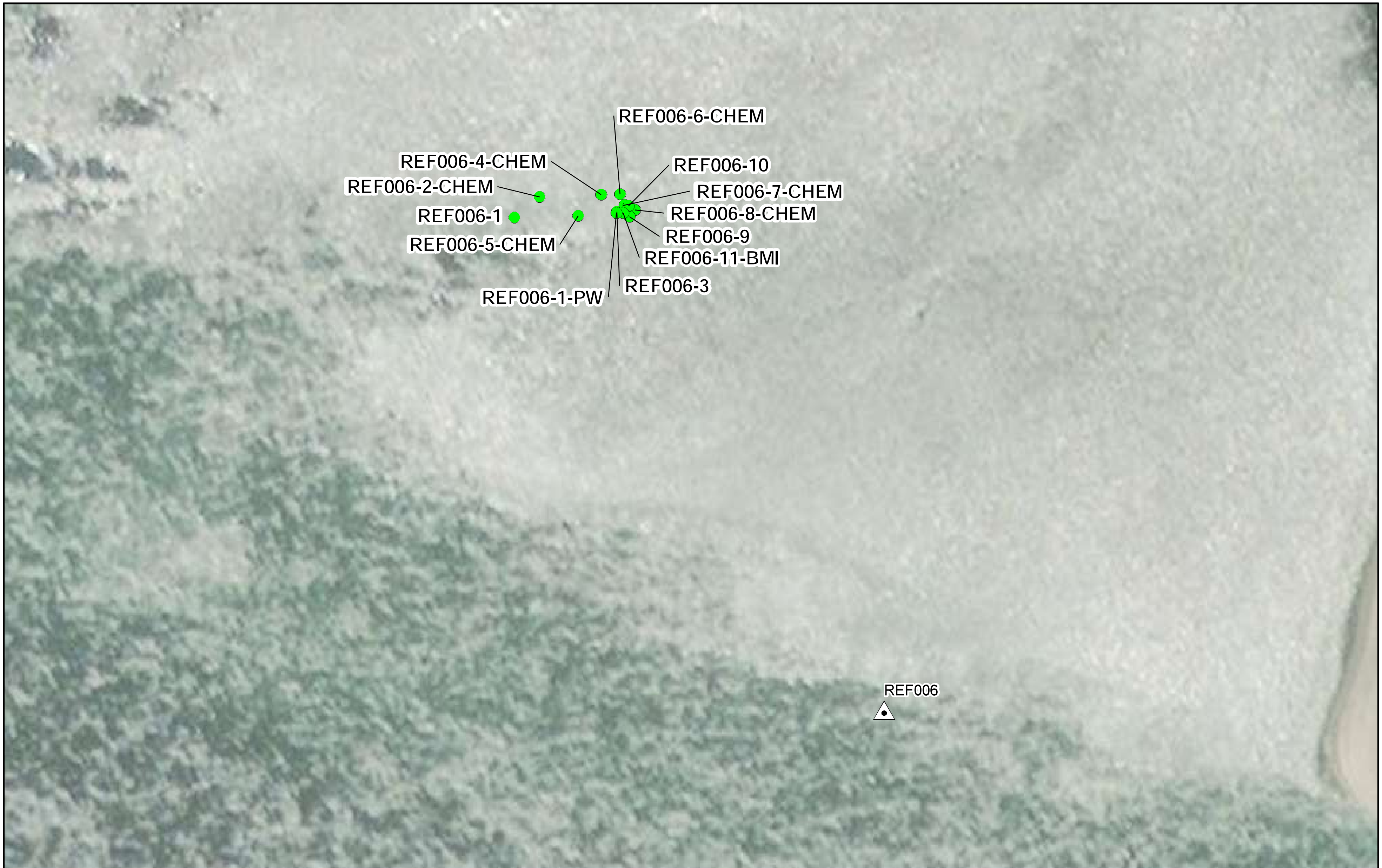
Revised Sampling Location

Target Reference Sampling Location

Field Change Request # 3
Modified Sampling Locations
for REF006, REF009 and REF010
Genelle Reference Area

Columbia River, BC

Document Path: J:\DCS\Projects\ENV\60600843_TeckP3SS\900_CAD_GIS\920_929_GIS_Graphics\01_Data\04_GPS\GPS_Processing\MXD\Field Change Request 3 overview.mxd



N

AECOM

0 10 20 40
Scale In Meters

0 37.5 75 150
Scale In Feet

Revised Sampling Location

Target Reference Sampling Location

Field Change Request # 3
Modified Sampling Locations for REF006
Genelle Reference Area

Columbia River, BC

Document Path: J:\DCS\Projects\ENV\60600843_TeckP3SS\900_CAD_GIS\920_929_GIS_Graphics\01_Data\04_GPS\GPS_Processing\MXD\Change Request REF006.mxd

N

0 2.5 5 10 15 20
Scale In Meters

0 10 20 40 60 80
Scale In Feet

Revised Sampling Location

Target Reference Sampling Location

AECOM

Field Change Request # 3
Modified Sampling Locations for REF009
Genelle Reference Area

Columbia River, BC

Document Path: J:\DCS\Projects\ENV\60600843_TeckP3SS\900_CAD_GIS\920_929_GIS_Graphics\01_Data\04_GPS\GPS_Processing\MXD\Change Request REF009.mxd

N

0 15 30 60 90 120

Scale In Meters

0 50 100 200 300 400

Scale In Feet

AECOM

Revised Sampling Location

Target Reference Sampling Location

Field Change Request # 3
Modified Sampling Locations for REF010
Genelle Reference Area

Columbia River, BC

APPENDIX E

BENTHIC MACROINVERTEBRATE LABORATORY DATA REPORT

UPPER COLUMBIA RIVER PHASE 3 BENTHIC COMMUNITY ASSESSMENT

Prepared for
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Date
October 2020

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APPENDICES

Appendix A: Chain of Custody Forms

Appendix B: Taxonomic Enumeration, Metrics Results

Appendix C: Ash-free Dry Weight and Blotted Dry-Weight Results

Appendix D: Quality Control Forms

ACRONYMS AND ABBREVIATIONS

AFDW:	Ash-free Dry Weight
COC:	Chain of Custody Form
L:	Liters
LIMS:	Laboratory Information Management System
mm:	Millimeters
QAPP:	Quality Assurance Project Plan
QC:	Quality Control
TAI:	Teck American Incorporated

1. INTRODUCTION

As part of the 2019 Phase 3 Sediment study that was performed under the direction of Teck American Incorporated (TAI), EcoAnalysts performed taxonomic analysis on 112 sediments samples collected from the Upper Columbia River near the Washington/Canadian border. This analysis involved the removal and identification of a minimum of 500 organisms using a quantitative subsampling approach for the 0.25-mm, and a 0.5-mm sieve size fractions of each sediment sample. In addition to this, EcoAnalysts performed an assessment of the wet-weight biomass of the 0.25-mm, and a 0.5-mm sieve size fractions of the faunal communities as well as an assessment of the organic material in the residual material following the removal of the organisms. The procedures and deviations from the quality assurance project plan (QAPP; ERM 2019) are contained in the following narrative section. The chain of custody (COC) records, enumeration and identification results, biomass and organic mass results, and quality assurance documentation are included in the Appendix A through C.

2. SAMPLE RECEIPT AND LOG-IN

2.1 Procedure Summary

Sample receipt was performed following the approach outlined in Appendix D of the project specific QAPP (ERM, 2019). Chain of custody forms are provided in Appendix A. Each batch of samples was received by EcoAnalysts after direct coordination between EcoAnalysts and the field sampling team that was managed by AECOM. Some batches were delivered directly to the laboratory in Moscow, Idaho, while others were transferred at the TAI office in Spokane, Washington. Transportation of sample batches were limited based on the total volume of ethanol contained in each shipment to meet Department of Transportation regulations. No more than 11 5-gallon buckets were transported in one vehicle at a time. Upon arriving to the laboratory, the tape that sealed the bucket lid was removed, and the preservative level in each sample was assessed.

Samples were checked against the COC provided, or one was created based on the samples received. If the weight per bucket was not previously documented, the buckets were weighed. Once the samples were confirmed against the COC and all check-in procedures were performed the COC was signed and copies were sent back to the client. Sample receipt information was then entered into our laboratory information management system (LIMS). Sample labels were generated and put on the corresponding buckets; buckets were then stored in a secure area until it was selected for processing.

2.2 Deviations and notes

Some samples were received at the laboratory with less than the desired ratio of ethanol to sample (1-part ethanol to 1-part sample material). Table 2-1 provides a list of the samples where this deviation was noted. In each case, the proper amount of ethanol was added to the sample and no indications of degradation were noted during the processing of these samples. This deviation did not appear to affect the physical condition of the organisms for identification.

Table 2-1. Samples received with insufficient ethanol

EV010-BMI-1-091219	EV013-BMI-1-091319	DM045-BMI-1-091919	EV008-BMI-1-092319
EV060-BMI-1-092119	DM046-BMI-1-092019	DM026-BMI-1-092119	REF006-BMI-1-100219

The project specific quality control plan (ERM, 2019) defined the holding time for the benthic macroinvertebrate samples to be 1 month in 90% ethanol or indicated that the samples be transferred to 70% ethanol for longer-term storage. Most of the samples were processed after being stored for greater than one month from collection but were not transferred to 70% ethanol before being processed which is a deviation from the project quality control plan. However, this deviation did not affect the quality of the specimen for identification.

3. SORTING

3.1 Procedure Summary

Sorting was performed following guidance document in the project specific quality control plan (ERM, 2019). Results are provided in Appendix B. In general, each sample was split into two size fractions, a 0.25-mm, and a 0.5-mm. The final sample volume was obtained from the sieved fractions after any fine sediment had been washed and elutriate material had been removed. Sample matrices varied resulting in some samples retaining large volumes of material while others were left with less than 0.1-L of material. Variances in sample matrices included large volumes of fine organic material (wood pulp), large volumes of silt that would wash through the sieve, and large volumes of sand and/or rock that would be elutriated and removed from that sample prior to sorting. The elutriation process was conducted by adding portions of the sample into a wash tub and rinsing the lighter organic material from the heavier sand/rock; this process continued until the rock/sand was clear of organic debris. The rock/sand was then inspected under a 5x magnification lamp for heavier organism that may not be removed during the elutriate step. The elutriate volume was then measured, recorded, and transferred to jars to be retained for further sorting.

At this point, the material from each fraction was then placed into labeled jars, preserved with fresh 70% ethanol, and set aside for subsampling by a technician. This technician would begin by checking out a sample fraction from the post-rinse staging area and then would find the corresponding bench sheet in the project folder and begin the subsampling process.

The appropriately sized Caton subsampling tray, affixed with a 0.25-mm mesh, was then selected based on the final fraction volume. The fraction sample material from each jar was poured into the Caton tray; it was then evenly dispersed within the tray to allow for the selection of random grids during the sorting process. There are 2-inch grids along the bottom of the tray divided into four 1-inch squares, or quadrants, which allow technicians to easily note how much of the sample was selected for the removal of organisms. Quarter-grids, or quadrants, were randomly selected using dice to avoid bias. The randomly selected material was removed from the Caton to a petri dish, where the technician would remove all organisms using forceps under a dissecting microscope.

Organisms removed from the sample were split into three vials: General Taxa, Chironomidae, and Oligochaeta; these are the three common groupings for specialized freshwater taxonomists. The sorted material (sample material from which organisms had been removed) was stored in separate a container(s) from the unsorted material. The technician continued randomly selecting quadrants to sort until the target count of 500 organisms had been reached. Some samples did not contain enough macroinvertebrates to reach target count; these samples were fully sorted by the technician in which the entire volume of material within the sample was inspected.

When the target count was reached, the technician finished sorting the remaining grid of subsample material that had been removed and put in the petri dish. The technician recorded all data and notes pertaining to the sample on the bench sheet including number of organisms in each vial and percent subsampled. The remaining unsorted material was rinsed from the Caton back into the original jar. Labels were placed in the vials and on the jars indicating whether it was sorted or unsorted material. Jars and vials were then grouped together with rubber bands, sample residue was placed in the Quality Control (QC) cabinet to be reviewed, and data was entered into the LIMS database.

3.2 Sort Quality Control Procedure Summary

During the sort quality check, a QC sort technician took the sample material remaining following the removal of the organisms and distributed it evenly into the appropriately sized Caton tray. This material was then assessed for any remaining organisms by evaluating 20% of the total residual material. If the sample passed QC with an efficacy score of 90% or higher, QC data was entered on the bench sheet and in the LIMS database, sort residue was shelved, and vials were organized together ready for data validation. If, based on the 20% inspection, it was determined that more than 10% of organisms from the sorted material had been missed, the sample was either given back to the original technician to be resorted, or a full QC was performed wherein the remaining sorted material was processed by the QC technician. Sorting QC results are provided in Appendix D.

The 0.25-mm samples were more apt to fail due to smaller nematodes and burrowing harpacticoids in circular cases hiding amongst the mica flakes and organic residue. Many samples were comprised of black organic material, primarily small wood pulp, which tended to float around while being processed under the microscope hiding organisms from view.

3.3 Deviations and notes

The first two samples received from AECOM were samples that were processed by one technician. The large volumes of material in these samples were prohibitive to process, and EcoAnalysts coordinated with AECOM to change field sampling protocols to limit the amount of sediment in samples (Upper Columbia River Phase 3 Sediment Study, 2019).

The project specific quality control plan (ERM, 2019) required sort efficiency to meet 90%. Some sort quality control checks determined the removal efficiency to be under 90% (Table 3-1 and Table 3-2). In these cases, either the sort efficiency rounded to 90% or the sample was fully evaluated by the quality control technician. When a full QC resulted in an efficacy score above 80%, the original sort of the sample was deemed to pass the QC process. This is an internal standard procedure that was not adjusted for the project specific requirement. On the other hand, when the full QC was performed and the results demonstrated an efficacy score below 80%, the sample was required to undergo another QC process until a 90% efficacy had been achieved.

Table 3-1. Sample fractions (0.5-mm) which did not meet the 90% sort QC efficiency

EV037-BMI-2-092319	**EV036-BMI-2-100119**	EV022-BMI-1-093019
CB047-BMI-1-101119	**CB009-BMI-1-101219**	CB039-BMI-1-101219
Bold – indicate samples with sort QC results which rounded to 90% (> 89.5%)		

Table 3-2. Sample fractions (0.25-mm) which did not meet the 90% sort QC efficiency

EV013-BMI-1-091319	EV048-BMI-1-092419	REF013-BMI-1-092419
EV001-BMI-1-092619	**EV036-BMI-2-100119**	CB046-BMI-1-100819
CB006-BMI-1-100919	JS001-BMI-1-101019	DM015-BMI-2-101019
DM024-BMI-2-101519	CB027-BMI-1-101519	
Bold – indicate samples with sort QC results which rounded to 90% (> 89.5%)		

After QC(s) and/or resort(s) were completed, some samples exceeded macroinvertebrate count of 600 and required further subsampling. This process reduces bias in taxa richness calculations that happens when more than the targeted number of organisms are sorted and identified. When this occurred, the three vials of separated organisms were then recombined in a petri dish divvied up into eight equal sections. Sections were selected at random from which to pull organisms, which were placed back into the three separate vials until a minimum of 500 organisms were counted. If the count was getting close to 500 and only a portion of the next section was needed, that section was removed to another 8-grid dish to ensure an accurate fraction was pulled. Subsample data was recorded on the bench sheet and in the LIMS database.

Once all initial sorting processes were complete, the data was then validated by the Sorting Laboratory Manager, who mainly ensured the samples had passed QC, any needed subsampling had been performed, and the vials were grouped by category. The Generals and the Chironomidae vials were then forwarded to taxonomists for ID, and the Oligochaetes were ready for slide mounting.

4. TAXONOMY

4.1 Procedure Summary

Specimens were identified by qualified taxonomists following the methods in the project specific QAPP (ERM, 2019). Results are provided in Appendix B. The taxonomists made their identifications to the lowest practical taxonomic level and a reference collection was prepared which contained a few representative individuals. As identifications were made, the taxonomist directly entered the identification and counts into the LIMS database. When the taxonomy department completed processing for the samples, the data were validated, which included a step to verify if there were enough organisms identified to maintain the 500-count minimum. If the identified number of organisms was below 500 and there was still unsorted material remaining from which to retrieve more organisms, technicians sorted additional material to reach the target count of 500.

4.2 Taxonomy Quality Control Procedure Summary

In the 0.5-mm four of the fraction samples needed more organism after identification, and one of the 250µm fractions required this process (Table 4-1).

Table 4-1. Samples which required additional processing following taxonomy.

EV066-BMI-1-092519 (0.5-mm)	REF004-BMI-1-092719 (0.5-mm)
CB020-BMI-1-101419 (0.5-mm)	1-B5-NRT-BMI-1-101519 (0.5-mm)
CB002-BMI-1-101619 (0.25-mm)	

The taxonomy QC process involved re-identification and enumeration of 10% of the samples by a taxonomist that did not perform the original identifications. The results of the QC taxonomist findings were compared to the original taxonomists, and any discrepancies were reconciled. Although some sample components indicated similarity percentages that were less than 90%, full sample similarity was greater than 90% in all samples that were assessed. Taxonomic discrepancies were discussed and reconciled prior to metric calculations and final data submittal. No other issues were encountered during original identification process or during the taxonomy quality checks. Taxonomy QC results are provided in Appendix D.

4.3 Deviations and Notes

When mounting annelid specimen, two samples in the 0.5-mm fraction had one specimen each that were too large to fit on the slide under the coverslip. When this occurred, the specimen was identified without mounting. No other difficulties were encountered during annelid mounting.

During the taxonomy quality assessment, percent similarity between the original identification and the QC identifications was noted to be below 90% for the Chironomidae identifications in two samples (Table 4-2); however, when these samples were compared with all taxonomic components, all samples met the 90% similarity criteria. The identification disagreement between the primary and QC taxonomists was resolved for both samples and the data were updated to reflect this resolution. In addition, occasionally the specimen enumeration was different between the primary and QC taxonomist. In all cases, these differences were minor and should not affect the interpretation of the data.

Table 4-2. Quality control assessment with less than 90% similarity

DM050-BMI-1-092019 (0.5-mm fraction)	REF003-BMI-2-092719 (0.25-mm fraction)

5. WET-WEIGHT ON IDENTIFIED ORGANISMS

5.1 Procedure Summary

Wet-weight analysis was performed following methods outline in the project specific QAPP (ERM, 2019). Results are provided in Appendix C. After the organisms were identified and the taxonomy QC was performed, the organisms were processed for biomass. General taxa and Chironomids from each sample were combined, blotted quickly on a paper towel, and placed into a labeled weigh boat. Drying a specimen by blotting takes a few seconds to perform. The tare weight of the weigh boat was assessed prior to the addition of the organisms and was then weighed again after the organisms were placed inside. Both weights were recorded on a paper bench sheet and entered in an Excel workbook. The workbook and equation which calculated the weight of the organisms only based on these values. The final data column reported the results of the weight of the organisms. In cases where the final weight was less than the detection limit, the final value was reported as <0.001. Paper bench sheets were compared to the electronic data by the Laboratory Manager prior to allowing the data to be delivered. There were no processing issues encountered during wet weight processing. Because all Annelida specimen required slide mounting for identification to the lowest practical level, Oligochaetes were not available for wet weight determination because they were slide mounted for identification.

5.2 Deviations and Notes

Within the 0.5-mm samples four had large mussels which were weighed individually, and then these weights were added to their respective sample's total biomass. Table 5-1 provides the sample identifications for those that contained the large mussel specimen.

Table 5-1. Samples that contained large mussels

DM045-BMI-1-091919	DM050-BMI-1-092019
CB027-BMI-1-101519	DM039-BMI-1-101719

Specimen availability for two samples was not available for biomass assessment (Table 5-2). Both samples had zero total abundance but did not show signs of improper preservation.

Table 5-2. Samples with no specimen available for biomass assessment

REF018-BMI-1-092519 (0.5-mm fraction)	3-R8-2019-BMI-1-101619 (0.5-mm fraction)

6. ASH-FREE DRY WEIGHT ON SORTED FRACTION

6.1 Procedure Summary

Ash-free dry weight analysis was performed following methods outline in the project specific QAPP (ERM, 2019). Results are provided in Appendix C. After sorting validation had occurred on samples that were 100% processed, residual sample material from which the organisms were removed was processed for ash-free dry weight (AFDW) at the EcoAnalysts Port Gamble laboratory in Washington. If only a portion of the sample was processed, the sample was required to pass the taxonomy QC before being sent for AFDW processing.

The sorted sample material was transferred from containers onto a 0.3-mm screen and washed with water to remove the ethanol preservative. This material was then washed into pre-weighed foil weigh boats with as little water as possible and placed into a drying oven at 110°C for 24-hrs. Following the drying process, samples were held in a desiccator until they were weighed. Individual weight of each sample component was assessed. After the dry weight was assessed, the samples were "ashed" in a muffle furnace at 550°C to eliminate organic debris. This is achieved by a "ramp" phase where the furnace heats up to 550°C which takes a half hour, followed by a "soak" phase where the furnace holds that maximum temperature for two hours before ramping down to ambient temp. These samples were held and allowed to cool in a desiccator. Once cooled, the ashed sample boats were weighed to obtain the ashed weight. The "ash-free dry weight" (AFDW) was then calculated by subtracting the ashed sample weight from the dry weight and represents the component of the sample which was removed at the high temperature.

Samples too large to fit within a single weigh boat were split between two to three weigh boats and the AFDW results were combined for a total AFDW measurement for those samples.

6.2 Deviations and Notes

AFDW was not report for seven samples; these samples were inadvertently ashed prior to obtaining the sample dry weights (Table 6-1). Their AFDW is listed thus as "NC" or "Not Calculated".

Table 6-1. Samples ashed prior to dry weight assessment

DM022-BMI-1-092119 (0.5-mm)	DM050-BMI-1-092019 (0.5-mm)	EV052-BMI-1-092619 (0.5-mm)
EV069-BMI-2-092519 (0.5-mm)	REF014-BMI-1-092619 (0.5-mm)	REF016-BMI-1-092519 (0.5-mm)
REF017-BMI-1-092519 (0.5-mm)		

7. REFERENCES

ERM. (2019). *Draft Final Quality Assurance Project Plan for the 2019 Phase 3 Sediment Study.*
Upper Columbia River Phase 3 Sediment Study. (2019). *Change Request Number 3.*

CHAIN OF CUSTODY FORMS

APPENDIX A

8097.1 - samples 1-2
8097.2 - samples 1-2

EcoAnalysts, Inc.
1420 S. Blaine St. Suite 14
Moscow, ID 83843
Ph: (208) 882-2588

CHAIN OF CUSTODY

BMI COC

China Bend ☐
Evans ☒
Deadmans Eddy ☐
Reference ☐

Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date: 9-11-19**	COC No: EV1
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier: James Keithly, ERM**	____ of ____ COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ______			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification												Sample Specific Notes:
EV 063-BMI -1- 091019	9/10/2019	0:00	Benthic Macroinvertebrate	AP	2	x												
EV 064-BMI -1- 091019	9/10/2019	0:00	Benthic Macroinvertebrate	AP	2	x												
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															
			Benthic Macroinvertebrate															

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: Jennifer Pretare	Company: AECOM	Date/Time: 9-11-19 1452	Received by: James Keithly	Company: ERM	Date/Time: 9-11-19 1452
Relinquished by:	Company: ERM	Date/Time: 9/11/19 1815	Received by: Megan Payne	Company: EcoAnalysts	Date/Time: 9-11-19 1815
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

8097.1 - Samples 3-11
8097.2 - Samples 3-11

EcoAnalysts, Inc. 1420 S. Blaine St. Suite 14 Moscow, ID 83843 **Ph: (208) 882-2588**	**CHAIN OF CUSTODY** **BMI COC**	China Bend ☐ Evans X Deadmans Eddy X Reference ☐

Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date:**	COC No: 6
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier:**	Page 1 of 1 COC
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ________			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ________			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass										Sample Specific Notes:
X EV 005-BMI -1- 091219	9/12/2019	1440	Benthic Macroinvertebrate	AP	1	X	X	X										
X EV 010-BMI -1- 091219	9/12/2019	1700	Benthic Macroinvertebrate	AP	1	X	X	X										
X EV 075-BMI -1- 091219	9/12/2019	1215	Benthic Macroinvertebrate	AP	1	X	X	X										
X EV 012-BMI -1- 091319	9/13/2019	1130	Benthic Macroinvertebrate	AP	2 ~~1~~	X	X	X										SMALL JAR ATTACHED TO TOP
X EV 013-BMI -1- 091319	9/13/2019	1400	Benthic Macroinvertebrate	AP	2	X	X	X										
X EV 036-BMI -1- 091419	9/14/2019	1345	Benthic Macroinvertebrate	AP	1	X	X	X										
X DM 045-BMI -1- 091919	9/19/2019	1012	Benthic Macroinvertebrate	SH	1	X	X	X										
X EV 026-BMI -1- 092019	9/20/2019	1431	Benthic Macroinvertebrate	MM	1	X	X	X										
X EV 003-BMI -1- 092019	9/20/2019	1002	Benthic Macroinvertebrate	MM	2	X	X	X										

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: AECOM	Date/Time: 09/23/19 10:30	Received by: ROBERT BOBIER	Company: ECOANALYSTS	Date/Time: 9/23/19 10:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.
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Ph: (208) 882-2588

CHAIN OF CUSTODY

BMI COC

China Bend	☐
Evans	X
Deadmans Eddy	X
Reference	☐

Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date:**	COC No: 6
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier:**	Page 1 of 1 COC

Cristy Kessel 509.496.1160
Cristy.Kessel@teck.com

Project Name: UCR 2019 Phase 3 Sediment Study

Lab Quote #:

Analysis Turnaround Time
Calendar (C) or Work Days (W) __________

☐
☐ Other ____________

	Sample Identification	**Sample Date**	**Sample Time**	**Matrix**	**Sampler's Initials**	**Total No. of Cont.**	**Taxonomic enumeration and identification**	**Residual AFDM**	**BMI biomass**										**Sample Specific Notes:**
X	EV 005-BMI -1- 091219	9/12/2019	1440	Benthic Macroinvertebrate	AP	1	X	X	X										
X	EV 010-BMI -1- 091219	9/12/2019	1700	Benthic Macroinvertebrate	AP	1	X	X	X										
X	EV 075-BMI -1- 091219	9/12/2019	1215	Benthic Macroinvertebrate	AP	1	X	X	X										
X	EV 012-BMI -1- 091319	9/13/2019	1130	Benthic Macroinvertebrate	AP	1	X	X	X										
X	EV 013-BMI -1- 091319	9/13/2019	1400	Benthic Macroinvertebrate	AP	2	X	X	X										
X	EV 036-BMI -1- 091419	9/14/2019	1345	Benthic Macroinvertebrate	AP	1	X	X	X										
X	DM 045-BMI -1- 091919	9/19/2019	1012	Benthic Macroinvertebrate	SH	1	X	X	X										
X	EV 026-BMI -1- 092019	9/20/2019	1431	Benthic Macroinvertebrate	MM	1	X	X	X										
X	EV 003-BMI -1- 092019	9/20/2019	1002	Benthic Macroinvertebrate	MM	2	X	X	X										

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: AECOM	Date/Time: 09/23/19 10:30	Received by: ROBERT BOBIER	Company: ECOANALYSTS	Date/Time: 9/23/19 10:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

8097.1 12-27
8097.2 12-27

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CHAIN OF CUSTODY

BMI COC

China Bend ☐
Evans X
Deadmans Eddy X
Reference ☐

Client Contact
Teck American Incorporated
Cristy Kessel 509.496.1160
Cristy.Kessel@teck.com

Project Contact: Kevin Lundmark
Tel: + 1 801 204-4313

Site Contact: Jennifer Pretare 510-681-6401
Laboratory Contact: Jay Word

Date:
Carrier:

COC No: 8
1 of 2 COCs

Analysis Turnaround Time
Calendar (C) or Work Days (W) ______
☐
☐ Other ______

Project Name: UCR 2019 Phase 3 Sediment Study
Chelsey.cook@aecom.com
Lab Quote #:

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass								WEIGHT 1 (LBS)	WEIGHT 2 (LBS)	Sample Specific Notes:
DM 050-BMI -1- 092019	9/20/2019	1032	Benthic Macroinvertebrate	SH KM	1	X	X	X								58	-	
DM 046-BMI -1- 092019	9/20/2019	1336	Benthic Macroinvertebrate	SH	1	X	X	X								50	-	Added ~1L EtOH
DM 022-BMI -1- 092119	9/21/2019	1353	Benthic Macroinvertebrate	SH	1	X	X	X								57.4	-	
DM 023-BMI -1- 092119	9/21/2019	0908	Benthic Macroinvertebrate	SH	1	X	X	X								57.4	-	
DM 026-BMI -1- 092119	9/21/2019	1139	Benthic Macroinvertebrate	SH	1	X	X	X								59.4	-	Slightly low, no foam
EV 027-BMI -1- 092119	9/21/2019	925	Benthic Macroinvertebrate	SH MM	2	X	X	X								40	45	2X 5 Gallon buckets
EV 060-BMI -1- 092119	9/21/2019	1255	Benthic Macroinvertebrate	SH MM	2	X	X	X								35	36	ADDED 1L EtOH 2X 5 Gallon buckets
EV 008-BMI -1- 092319	9/23/2019	943	Benthic Macroinvertebrate	SH	2	X	X	X								35	39	ADDED 1L EtOH 2X 5 Gallon buckets
EV 037-BMI -1- 092319	9/23/2019	1228	Benthic Macroinvertebrate	SH CP	1	X	X	X								54	-	
EV 037-BMI -2- 092319	9/23/2019	1359	Benthic Macroinvertebrate	SH CP	1	X	X	X								48	-	
EV 002-BMI -1- 092419	9/24/2019	0831	Benthic Macroinvertebrate	CP	1	X	X	X								65	-	
EV 044-BMI -1- 092419	9/24/2019	1001	Benthic Macroinvertebrate	CP	2	X	X	X								26	27	2X 5 Gallon buckets

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* X *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	10/8/19 11:26	Max Rios [signature]	EcoAnalysts, Inc	10/8/19 11:27
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.	CHAIN OF CUSTODY	BMI COC	China Bend ☐ Evans X Deadmans Eddy ☐ Reference X
1420 S. Blaine St. Suite 14 Moscow, ID 83843 Ph: (208) 882-2588			

Client Contact	Project Contact: Kevin Lundmark	Site Contact: Jennifer Pretare 510-681-6401	Date:	COC No: 8
Teck American Incorporated	Tel: + 1 801 204-4313	Laboratory Contact: Jay Word	Carrier:	2 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	Analysis Turnaround Time Calendar (C) or Work Days (W) ______			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass								WEIGHT 1 (LBS)	WEIGHT 2 (LBS)	Sample Specific Notes:
EV 048-BMI -1- 092419 ✓	9/24/2019 ✓	~~1137~~ 12:17	Benthic Macroinvertebrate	CP ✓	2 ✓	X	X	X								40	41	2X 5 Gallon buckets ✓
REF 003-BMI -2- 092719 ✓	9/27/2019 ✓	0950 ✓	Benthic Macroinvertebrate	DH ✓	1 ✓	X	X	X								37	—	1 5 GAL ✓
EV 054-BMI -1- 092319 ✓	9/23/2019 ✓	1551 ✓	Benthic Macroinvertebrate	SH CP	1 ✓	X	X	X								42	—	1 5-gallon bucket ✓
EV 057-BMI -1- 092319 ✓	9/23/2019 ✓	15:10 ✓	Benthic Macroinvertebrate	SH CP	1 ✓	X	X	X								40	—	1 5-gallon bucket ✓

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	10/8/19 11:26	Max Rios [signature]	EcoAnalysts, Inc.	10/8/19 11:27
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

8097.1 28-39
8097.2 28-39

EcoAnalysts, Inc.
1420 S. Blaine St. Suite 14
Moscow, ID 83843
Ph: (208) 882-2588

CHAIN OF CUSTODY

BMI COC

China Bend	☐
Evans	X
Deadmans Eddy	☐
Reference	X

Client Contact	**Project Contact: Kevin Lundmark**	Site Contact: Jennifer Pretare 510-681-6401	Date:	COC No: 17
Teck American Incorporated	**Tel: + 1 801 204-4313**	Laboratory Contact: Jay Word	Carrier:	1 of 1 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ______			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass	WEIGHT 1 (LBS)	WEIGHT 2 (LBS)	Sample Specific Notes:
EV 051-BMI -1- 092419	9/24/2019	1300	Benthic Macroinvertebrate	CP	2	X	X	X	41	43	2X 5 Gallon buckets
REF 013-BMI -1- 092419	9/24/2019	1301	Benthic Macroinvertebrate	DH	2	X	X	X	37.4	43.8	2X 5 Gallon buckets
REF 015-BMI -1- 092419	9/24/2019	1428	Benthic Macroinvertebrate	DH	2	X	X	X	33.2	33.8	2X 5 Gallon buckets
EV 065-BMI -1- 092519	9/25/2019	0816	Benthic Macroinvertebrate	CP	2	X	X	X	42	27	2X 5 Gallon buckets
EV 066-BMI -1- 092519	9/25/2019	0928	Benthic Macroinvertebrate	CP	2	X	X	X	39	36	2X 5 Gallon buckets
EV 069-BMI -1- 092519	9/25/2019	1049	Benthic Macroinvertebrate	CP	2	X	X	X	44	32	2X 5 Gallon buckets
EV 069-BMI -2- 092519	9/25/2019	1215	Benthic Macroinvertebrate	CP	2	X	X	X	32	35	2X 5 Gallon buckets
EV 071-BMI -1- 092519	9/25/2019	1453	Benthic Macroinvertebrate	CP	2	X	X	X	32	31	2X 5 Gallon buckets
REF 017-BMI -1- 092519	9/25/2019	1505	Benthic Macroinvertebrate	DH	2	X	X	X	33	35.2	2X 5 Gallon buckets
REF 018-BMI -1- 092519	9/25/2019	1100	Benthic Macroinvertebrate	DH	2	X	X	X	35.6	34.8	2X 5 Gallon buckets
REF 016-BMI -1- 092519	9/25/2019	1302	Benthic Macroinvertebrate	DH	2	X	X	X	36.8	38.2	2X 5 Gallon buckets
EV 001-BMI -1- 092619	9/26/2019	1103	Benthic Macroinvertebrate	CP	2	X	X	X	42	36	2X 5 Gallon buckets

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* X *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: AECOM	Date/Time: 10-10-19 1100	Received by: [signature]	Company: ECOANALYSTS	Date/Time: 10-10-19 11:00
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

duplicate CC 10-10-19

EcoAnalysts, Inc.	China Bend ☐
1420 S. Blaine St. Suite 14	Evans X
Moscow, ID 83843	Deadmans Eddy ☐
Ph: (208) 882-2588	Reference X

BMI COC

CHAIN OF CUSTODY

Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date:**	COC No: 19
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier:**	P 1 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ____			
Project Name: UCR 2019 Phase 3 Sediment Study	☐			
	☐ Other ____			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass	Weight 1 (LBS)	Weight 2 (LBS)	Sample Specific Notes:
EV 072-BMI -1- 092619	9/26/2019	1449	Benthic Macroinvertebrate	CP	2	X	X	X	39	35	2 x 5 gallon buckets
EV 052-BMI -1- 092619	9/26/2019	1226	Benthic Macroinvertebrate	CP	1	X	X	X	60	X	1-5 gal bucket
REF 014-BMI -1- 092619	9/26/2019	1340	Benthic Macroinvertebrate	CP DH	2	X	X	X	37.8	38.8	2 x 5 gallon buckets
EV 049-BMI -1- 092719	9/27/2019	1051	Benthic Macroinvertebrate	CP	1	X	X	X	15	X	1-5 gal bucket
REF 003-BMI -1- 092719	9/27/2019	0950	Benthic Macroinvertebrate	DH	2	X	X	X	43.6	38.4	2 x 5 gallon buckets
EV 036-BMI -2- 100119	10/1/2019	1326	Benthic Macroinvertebrate	NM	1	X	X	X	24.5	X	1 5-gallon bucket
REF 004-BMI -1- 092719	9/27/2019	1154	Benthic Macroinvertebrate	DH	2	X	X	X	51.6	47.8	2 x 5 gallon buckets
REF 002-BMI -1- 092819	9/28/2019	0857	Benthic Macroinvertebrate	DH	2	X	X	X	38.6	39.8	2 x 5 gallon buckets
REF 001-BMI -1- 092819	9/28/2009	1014	Benthic Macroinvertebrate	DH	2	X	X	X	37.6	36.2	2 x 5 gallon buckets
EV 022-BMI -1- 093019	9/30/2019	1307	Benthic Macroinvertebrate	NM	1	X	X	X	24	X	1-5 gal bucket
REF 007-BMI -1- 093019	9/30/2019	1301	Benthic Macroinvertebrate	DH	2	X	X	X	38.8	37.4	2 x 5 gallon buckets

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: AECOM	Date/Time: 10-11-19 1109	Received by: Max Rios [signature]	Company: EcoAnalysts, Inc	Date/Time: 10/11/19 1110
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.		BMI COC	China Bend ☐
1420 S. Blaine St. Suite 14	CHAIN OF CUSTODY		Evans ☐
Moscow, ID 83843			Deadmans Eddy ☐
Ph: (208) 882-2588			Reference X

Client Contact	Project Contact: Kevin Lundmark	Site Contact: Jennifer Pretare 510-681-6401	Date:	COC No: 19
Teck American Incorporated	Tel: + 1 801 204-4313	Laboratory Contact: Jay Word	Carrier:	P 2 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	Analysis Turnaround Time Calendar (C) or Work Days (W) ______			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass									Weight 1 (LBS)	Weight 2 (LBS)	Sample Specific Notes:
4-B6-2019-BMI-1- 092619	9/26/2019	0942	Benthic Macroinvertebrate	CP	2	X	X	X									30	27	2 - 5 GAL
4-B1-2019-BMI-1- 092619	9/26/2019	0813	Benthic Macroinvertebrate	CP	2	X	X	X									32	34	2 - 5 GAL
REF 003-BMI -2- 092719	9/27/2019	0950	Benthic Macroinvertebrate	DH	1	X	X	X									422	X	1 - 5 GAL

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
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Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	10-11-19 1109	Max Rios [signature]	EcoAnalysts, Inc	10/11/19 1110
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.	
1420 S. Blaine St. Suite 14	
Moscow, ID 83843	
Ph: (208) 882-2588	

CHAIN OF CUSTODY

BMI COC

China Bend	X
Evans	X
Deadmans Eddy	☐
Reference	X

Client Contact

Teck American Incorporated

Cristy Kessel 509.496.1160
Cristy.Kessel@teck.com

Project Contact: Kevin Lundmark
Tel: + 1 801 204-4313

Site Contact: Jennifer Pretare 510-681-6401
Laboratory Contact: Jay Word

Date:
Carrier:

COC No: 20
1 of 2 COCs

Analysis Turnaround Time

Calendar (C) or Work Days (W) ________

☐

☐ Other ________

Project Name: UCR 2019 Phase 3 Sediment Study

Lab Quote #:

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass		Weight 1 (lbs)	Weight 2 (lbs)	Sample Specific Notes:
REF 008-BMI -1- 093019	9/30/2019	1501	Benthic Macroinvertebrate	DH	2	X	X	X		37	35.4	2 5-gallon bucket
REF 009A-BMI -1- 100219	10/2/2019	1212	Benthic Macroinvertebrate	DH	1	X	X	X		50.6	X	1 5-gallon bucket
REF 006-BMI -1- 100219	10/2/2019	1615	Benthic Macroinvertebrate	DH	1	X	X	X	← SLIGHTLY LOW ON EtOH	57.2	X	1 5-gallon bucket
CB 035-BMI -1- 100319	10/3/2019	1235	Benthic Macroinvertebrate	NM	1	X	X	X		24	X	1 5-gallon bucket
REF 005-BMI -1- 100319	10/3/2019	1250	Benthic Macroinvertebrate	DH	1	X	X	X		51.6	X	1 5-gallon bucket
REF 010-BMI -1- 100319	10/3/2019	1630	Benthic Macroinvertebrate	DH	1	X	X	X		39.4	X	1 5-gallon bucket
REF 012-BMI -1- 100419	10/4/2019	1115	Benthic Macroinvertebrate	DH	1	X	X	X		50	X	1 5-gallon bucket
EV 011-BMI -1- 100119	10/1/2019	1124	Benthic Macroinvertebrate	NM	1	X	X	X		31.5	X	1 5-gallon bucket
REF 011-BMI -1- 100119	10/1/2019	1250	Benthic Macroinvertebrate	DH	2	X	X	X		35.6	36	2 5-gallon bucket
REF 011-BMI -2- 100119	10/1/2019	1315	Benthic Macroinvertebrate	DH	2	X	X	X		34.6	34.8	2 5-gallon bucket
CB 046-BMI -1- 100819	10/8/2019	1048	Benthic Macroinvertebrate	MM	1	X	X	X		32	X	1 5-gallon bucket
CB 036-BMI -1- 100419	10/4/2019	1254	Benthic Macroinvertebrate	DH NM	1	X	X	X		32.5	X	1 5-gallon bucket

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal

☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Josie Smith	AECOM	10-15-19 1100	Max Rios	EcoAnalysts, Inc	10/15/19 11:02
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.
1420 S. Blaine St. Suite 14
Moscow, ID 83843
Ph: (208) 882-2588

CHAIN OF CUSTODY

BMI COC

China Bend X
Evans X
Deadmans Eddy ☐
Reference X

Client Contact	Project Contact: Kevin Lundmark	Site Contact: Jennifer Pretare 510-681-6401	Date:	COC No: 20
Teck American Incorporated	Tel: + 1 801 204-4313	Laboratory Contact: Jay Word	Carrier:	2 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	Analysis Turnaround Time Calendar (C) or Work Days (W) ______			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass	Weight 1 (lbs)	Weight 2 (lbs)	Sample Specific Notes:
CB 006-BMI -1- 100919	10/9/2019	1012	Benthic Macroinvertebrate	MM	2	X	X	X	41	39	2 - 5 GAL
CB 012-BMI -1- 100919	10/9/2019	1136	Benthic Macroinvertebrate	MM	2	X	X	X	42	51	2 - 5 GAL
CB 007-BMI -1- 100919	10/9/2019	1336	Benthic Macroinvertebrate	MM	1	X	X	X	42	X	1 - 5 GAL
JS 001-BMI -1- 101019	10/10/2019	1022	Benthic Macroinvertebrate	MM	1	X	X	X	52	X	1 - 5 GAL

Preservation: Sample preserved in 90% ethanol

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Josie Smith	AECOM	10-15-19 1100	Max Rios	EcoAnalysts, Inc	10/15/19 11:02
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc. 1420 S. Blaine St. Suite 14 Moscow, ID 83843 Ph: (208) 882-2588	**CHAIN OF CUSTODY**	**BMI COC**	China Bend X Evans X Deadmans Eddy ☐ Reference X
Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date:**
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier:**
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W)		COC No 24 1 of 2 COCs
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other		
Lab Quote #:			

EDITS BY CC AECOM 10-21-19

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass	Weight 1 (LBS)	Weight 2 (LBS)	Sample Specific Notes:
DM 018-BMI -1- 100919	10/9/2019	1530	Benthic Macroinvertebrate	DH	1	X	X	X	60.4	X	1 - 5 GAL
DM 002-BMI -1- 100919	10/9/2019	1255	Benthic Macroinvertebrate	DH	1	X	X	X	63.6	X	1 - 5 GAL
JS 002-BMI -1- 101019	10/10/2019	1234	Benthic Macroinvertebrate	MM	1	X	X	X	38	X	1 - 5 GAL
CB 014-BMI -1- 101519	10/15/2019	1358	Benthic Macroinvertebrate	MM	1	X	X	X	49	X	1 - 5 GAL
DM 015-BMI -1- 101019	10/10/2019	1545	Benthic Macroinvertebrate	DH	1	X	X	X	47.4	X	1 - 5 GAL
DM 015-BMI -2- 101019	10/10/2019	~~1400~~ 1611	Benthic Macroinvertebrate	DH	1	X	X	X	49.6	X	1 - 5 GAL
DM 016-BMI -1- 101019	10/10/2019	1400	Benthic Macroinvertebrate	DH	1	X	X	X	59.4	X	1 - 5 GAL
DM 008-BMI -1- 101119	10/11/2019	1520	Benthic Macroinvertebrate	DH	1	X	X	X	39.2	X	1 - 5 GAL
CB 016-BMI -1- 101119	10/11/2019	1422	Benthic Macroinvertebrate	MM	1	X	X	X	28	X	1 - 5 GAL

Preservation: Sample preserved in 90% ethanol

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* [X] *Archive until disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	10/18/19 0902	Max Rios [signature]	EcoAnalysts, Inc	10/18/19 0903
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc. 1420 S. Blaine St. Suite 14 Moscow, ID 83843 Ph: (208) 882-2588	**CHAIN OF CUSTODY**	**BMI COC**	China Bend X Evans X Deadmans Eddy ☐ Reference X

Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date:**	COC No: 24
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier:**	2 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ____			
Project Name: UCR 2019 Phase 3 Sediment Study	☐			
	☐ Other ____			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass	Weight 1 (LBS)	Weight 2 (LBS)	Sample Specific Notes:
DM 010-BMI -1- 101119	10/11/2019	1125	Benthic Macroinvertebrate	DH	1	X	X	X	54.2	X	1 - 5 GAL
CB 018-BMI -1- 101119	10/11/2019	1007	Benthic Macroinvertebrate	MM	1	X	X	X	36	X	1 ~~2~~ - 5 GAL PG 10/18/19
CB 047-BMI -1- 101119	10/11/2019	1124	Benthic Macroinvertebrate	MM	1	X	X	X	26	X	1 - 5 GAL
CB 009-BMI -1- 101219	10/12/2019	1123	Benthic Macroinvertebrate	MM	1	X	X	X	35	X	1 - 5 GAL
CB 010-BMI -1- 101219	10/12/2019	1425	Benthic Macroinvertebrate	MM	2	X	X	X	45	30	2 - 5 GAL
CB 039-BMI -1- 101219	10/12/2019	0952	Benthic Macroinvertebrate	MM	1	X	X	X	22	X	1 - 5 GAL
DM 025-BMI -1- 101219	10/12/2019	1520	Benthic Macroinvertebrate	DH	1	X	X	X	61.8	X	1 - 5 GAL
DM 019-BMI -1- 101419	10/14/2019	1414	Benthic Macroinvertebrate	SH	2	X	X	X	33	41.8	2 - 5 GAL
DM 020-BMI -1- 101419	10/14/2019	1227	Benthic Macroinvertebrate	SH	1	X	X	X	45.6	X	1 - 5 GAL

Preservation: Sample preserved in 90% ethanol

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: ACam	Date/Time: 10/18/19 0902	Received by: Max Rios [signature]	Company: EcoAnalysts, Inc	Date/Time: 10/18/19 0903
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.
1420 S. Blaine St Suite 14
Moscow, ID 83843
Ph: (208) 882-2588

CHAIN OF CUSTODY

BMI COC

China Bend ☐
Evans ☐
Deadmans Eddy ☐
Reference ☐

Client Contact	Project Contact: Kevin Lundmark	Site Contact: Jennifer Pretare 510-681-6401	Date:	COC No 26
Teck American Incorporated	Tel: +1 801 204-4313	Laboratory Contact: Jay Word	Carrier:	1 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	Analysis Turnaround Time Calendar (C) or Work Days (W) ____			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

LAB MADE EDITS UPON RECEIPT VERIFIED BY LC AECOM 10-22-19

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass	Weight 1 (LBS)	Weight 2 (LBS)	Sample Specific Notes:
DM 027-BMI -1- 101419	10 14 2019	1535	Benthic Macroinvertebrate	SH	2	X	X	X	48	34.2	2 5-gallon buckets
CB 020-BMI -1- 101419	10 14 2019	1115	Benthic Macroinvertebrate	MM	1	X	X	X	46	X	1 5-gallon bucket
CB 020-BMI -2- 101419	10 14 2019	1144	Benthic Macroinvertebrate	MM	1	X	X	X	61	X	5-gallon bucket
CB 021-BMI -1- 101419	10 14 2019	1328	Benthic Macroinvertebrate	MM	2	X	X	X	46.5	31	2 5-gallon buckets
CB 024-BMI -1- 101419	10/14/2019	1440	Benthic Macroinvertebrate	MM	1	X	X	X	42	X	1 5 gallon bucket
CB 029-BMI -1- 101519	10/15/2019	1024	Benthic Macroinvertebrate	MM	1	X	X	X	49	X	1 5 gallon bucket
CB 029-BMI -2- 101519	10/15/2019	1050	Benthic Macroinvertebrate	MM	1	X	X	X	39	X	1 5-gallon bucket
~~DM 044-BMI -1- 101619~~ 15 DRH 10/21/19	~~10 16 2019~~	~~1615~~	~~Benthic Macroinvertebrate~~	~~SH~~	~~1~~	~~X~~	~~X~~	~~X~~			~~1 5-gallon bucket~~
CB044-BMI-1-101519	10/15/2019	1228	Benthic Macroinvert	MM	1	X	X	X	57	X	1 5-gal Bucket

Preservation: Sample preserved in 90% ethanol

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal perm tted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
David R. Hoss	AECOM	10/21/19 1100	Max Rios w/EcoAnalysts	EcoAnalyst, Inc	10/21/19 1102
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc.	CHAIN OF CUSTODY	BMI COC	China Bend ☐ Evans ☐ Deadmans Eddy ☐ Reference ☐
1420 S. Blaine St. Suite 14			
Moscow, ID 83843			
Ph: (208) 882-2588			

Client Contact	Project Contact: Kevin Lundmark	Site Contact: Jennifer Pretare 510-681-6401	Date:	COC No: 26
Teck American Incorporated	Tel: + 1 801 204-4313	Laboratory Contact: Jay Word	Carrier:	2 of 2 COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	Analysis Turnaround Time Calendar (C) or Work Days (W) ____			
Project Name: UCR 2019 Phase 3 Sediment Study	☐ ☐ Other ______			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass								Weight 1 (LBS)	Weight 2 (LBS)	Sample Specific Notes:
DM 024-BMI -1- 101519	10/15/2019	1105	Benthic Macroinvertebrate	SH	2	X	X	X								56	56.4	2 5-gallon buckets
DM 024-BMI -2- 101519	10/15/2019	1140	Benthic Macroinvertebrate	SH	2	X	X	X								48.6	52.6	2 5-gallon buckets
3-R7-2019-BMI-1-101519	10/15/2019	1515	Benthic Macroinvertebrate	SH MM	1	X	X	X								43.5	X	1 5-gallon bucket
~~3-R8-2019-BMI-1-101619~~	~~10/16/2019~~	~~1116~~	~~Benthic Macroinvertebrate~~	~~MM~~	~~1~~	~~X~~	~~X~~	~~X~~										~~1 5-gallon bucket~~ DRK 10/21/19
1-B6-NRT-BMI-1-101619	10/16/2019	0942	Benthic Macroinvertebrate	SH	2	X	X	X								50.2	52.6	2 5-gallon buckets
DM 061-BMI -1- 101619	10/16/2019	1035	Benthic Macroinvertebrate	SH	2	X	X	X								44.4	44	2 5-gallon buckets

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal
☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	10/21/19 / 1100	Max Rios [signature]	EcoAnalysts, Inc	10/21/19 1102
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc. 1420 S. Blaine St. Suite 14 Moscow, ID 83843 Ph: (208) 882-2588	**CHAIN OF CUSTODY**	**BMI COC**	China Bend ☐ Evans ☐ Deadmans Eddy ☐ Reference ☐
Client Contact Teck American Incorporated Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Project Contact: Kevin Lundmark** **Tel: + 1 801 204-4313**	**Site Contact: Jennifer Pretare 510-681-6401** **Laboratory Contact: Jay Word**	**Date:** **Carrier:**
Project Name: UCR 2019 Phase 3 Sediment Study Lab Quote #:	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ______ ☐ ☐ Other ______		COC No: 27 1 of 2 COCs

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass								Weight #1	Weight #2	Sample Specific Notes:
DM 044-BMI -1- 101619	10/16/2019	1615	Benthic Macroinvertebrate	SH	1	X	X	X								42.4	X	1-5 Gal
CB 027-BMI -1- 101519	10/15/2019	852	Benthic Macroinvertebrate	MM	2	X	X	X								36	26	2-5 Gal
1-B5-NRT-BMI-1-101519	10/15/2019	1607	Benthic Macroinvertebrate	SH	2	X	X	X								48.2	48	2-5 Gal
DM 007-BMI -1- 101519	10/15/2019	1343	Benthic Macroinvertebrate	SH	2	X	X	X								54.6	55.8	2-5 Gal
CB 056-BMI -1- 101719	10/17/2019	1404	Benthic Macroinvertebrate	MM	1	X	X	X								44	X	1-5 Gal
DM 039-BMI -1- 101719	10/17/2019	1445	Benthic Macroinvertebrate	SH	1	X	X	X								28	X	1-5 Gal
3-R8-2019-BMI-1-101619	10/16/2019	1116	Benthic Macroinvertebrate	MM	1	X	X	X								13	X	1-5 Gal

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal

☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Paul R. Hor	AECOM	10/25/19 / 0930	Max Rios	EcoAnalysts Inc.	10/28/19 0921
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

EcoAnalysts, Inc. 1420 S. Blaine St. Suite 14 Moscow, ID 83843 Ph: (208) 882-2588	**CHAIN OF CUSTODY**	**BMI COC**	China Bend ☐ Evans ☐ Deadmans Eddy ☐ Reference ☐

Client Contact	**Project Contact: Kevin Lundmark**	**Site Contact: Jennifer Pretare 510-681-6401**	**Date:**	COC No: 27
Teck American Incorporated	**Tel: + 1 801 204-4313**	**Laboratory Contact: Jay Word**	**Carrier:**	2 of ____ COCs
Cristy Kessel 509.496.1160 Cristy.Kessel@teck.com	**Analysis Turnaround Time** Calendar (C) or Work Days (W) ________			
Project Name: UCR 2019 Phase 3 Sediment Study	☐			
	☐ Other ________			
Lab Quote #:				

Sample Identification	Sample Date	Sample Time	Matrix	Sampler's Initials	Total No. of Cont.	Taxonomic enumeration and identification	Residual AFDM	BMI biomass									Weight #1	Sample Specific Notes:
CB 040-BMI -1- 101819	10/18/2019	1415	Benthic Macroinvertebrate	MM	1	X	X	X									20	1 5-gallon
CB 005-BMI -1- 101819	10/18/2019	1037	Benthic Macroinvertebrate	MM	1	X	X	X									16	1 5-gallon
DM 047-BMI -1- 101819	10/18/2019	1434	Benthic Macroinvertebrate	AP	1	X	X	X									53	1 5-gallon
DM 036-BMI -1- 101819	10/18/2019	1236	Benthic Macroinvertebrate	AP/SH	1	X	X	X									6.8	1 5-gallon
DM 038-BMI -1- 101919	10/19/2019	1111	Benthic Macroinvertebrate	AP/SH	1	X	X	X									29.2	1 5-gallon
CB 002-BMI -1- 101619	10/16/2019	14:31	Benthic Macroinvertebrate	MM	1	X	X	X									58	1 5-gallon

Preservation: *Sample preserved in 90% ethanol*

Sample Disposal

☐ *Return To Client* ☐ *Disposal By Lab* ☒ *Archive unitl disposal permitted by EPA*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: AECOM	Date/Time: 10/25/19 / 0920	Received by: Max Rios [signature]	Company: EcoAnalysts, Inc	Date/Time: 10/28/19 09:21
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

TAXONOMIC ENUMERATION, METRICS RESULTS

APPENDIX B

Teck America UCR
Phase 3 Sediment
Study Benthos 2019
Data are not adjusted
for subsampling

	Site ID Number	EV063-BMI-1-091019	EV063-BMI-1-091019	EV064-BMI-1-091019	EV064-BMI-1-091019	EV005-BMI-1-091219	EV005-BMI-1-091219	EV010-BMI-1-091219
	Bucket1 Weight (lbs)	31.5	31.5	33.6	33.6	23	23	69
	Bucket2 Weight (lbs)	47.5	47.5	57.2	57.2	N/A	N/A	N/A
	Collection Date	09-10-2019	09-10-2019	09-10-2019	09-10-2019	09-12-2019	09-12-2019	09-12-2019
	EcoAnalysts Sample ID	8097.1-1	8097.2-1	8097.1-2	8097.2-2	8097.1-3	8097.2-3	8097.1-4
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	21.88	14.58	100.00	47.92	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	1	0	1	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	1	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	3	0	53	9	0	0	0
	Cladopelma sp.	0	3	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	1	1	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	3	0	0	0	0	1	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	16	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	2	0	0	0	5	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	4	0	2	0	0	0	0

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EcoAnalysts, Inc.
LIFE IN WATER

	Site ID Number	**EV063-BMI-1-091019**	**EV063-BMI-1-091019**	**EV064-BMI-1-091019**	**EV064-BMI-1-091019**	**EV005-BMI-1-091219**	**EV005-BMI-1-091219**	**EV010-BMI-1-091219**
	Bucket1 Weight (lbs)	**31.5**	**31.5**	**33.6**	**33.6**	**23**	**23**	**69**
	Bucket2 Weight (lbs)	**47.5**	**47.5**	**57.2**	**57.2**	**N/A**	**N/A**	**N/A**
	Collection Date	**09-10-2019**	**09-10-2019**	**09-10-2019**	**09-10-2019**	**09-12-2019**	**09-12-2019**	**09-12-2019**
	EcoAnalysts Sample ID	**8097.1-1**	**8097.2-1**	**8097.1-2**	**8097.2-2**	**8097.1-3**	**8097.2-3**	**8097.1-4**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**21.88**	**14.58**	**100.00**	**47.92**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	0	1	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	4	0
	Paratendipes sp.	0	0	1	0	3	70	4
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	0
	Phaenopsectra sp.	0	0	6	0	0	2	0
	Polypedilum sp.	0	0	0	0	1	2	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	50	137	35	13	3	4	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	1	1	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	1	0	1	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	1	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	6	0	2	0	0	0	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	0	1	0
	Diptera	0	0	1	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	4	4	1	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	2	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	3	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	3	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	1	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	19	1	0	0	0
	tubificoid Naididae w/o cap setae	0	13	10	1	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECO ANALYSTS, INC.
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	Site ID Number	**EV063-BMI-1-091019**	**EV063-BMI-1-091019**	**EV064-BMI-1-091019**	**EV064-BMI-1-091019**	**EV005-BMI-1-091219**	**EV005-BMI-1-091219**	**EV010-BMI-1-091219**
	Bucket1 Weight (lbs)	**31.5**	**31.5**	**33.6**	**33.6**	**23**	**23**	**69**
	Bucket2 Weight (lbs)	**47.5**	**47.5**	**57.2**	**57.2**	**N/A**	**N/A**	**N/A**
	Collection Date	**09-10-2019**	**09-10-2019**	**09-10-2019**	**09-10-2019**	**09-12-2019**	**09-12-2019**	**09-12-2019**
	EcoAnalysts Sample ID	**8097.1-1**	**8097.2-1**	**8097.1-2**	**8097.2-2**	**8097.1-3**	**8097.2-3**	**8097.1-4**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**21.88**	**14.58**	**100.00**	**47.92**	**100.00**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	2	0	0
	Pisidium sp.	0	0	0	0	41	0	0
	Sphaeriidae	120	0	19	1	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	1	0	0	0	0	0	0
Crustacea	Amphipoda	0	5	0	0	0	0	0
	Caecidotea sp.	13	1	33	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	2	0	4	0	1	0
	Crangonyx sp.	2	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	14	0	2	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	20	0	360	0	112	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	2	84	0	110	1	128	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	1	0	2	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	3
	Lebertia sp.	0	0	6	0	5	7	19
	Limnesia sp.	4	0	3	0	0	0	0
	Mideopsis sp.	0	0	1	0	0	0	1
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	1	0	0	1
	Pionidae	0	0	1	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	0	1	6
	Torrenticolidae	0	0	0	1	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	320	205	7	36	5	18	7
	Prostoma sp.	0	0	0	0	15	29	26
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**531**	**513**	**208**	**544**	**79**	**386**	**67**

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ECOANALYSTS, INC.
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	Site ID Number	EV010-BMI-1-091219	EV075-BMI-1-091219	EV075-BMI-1-091219	EV012-BMI-1-091319	EV012-BMI-1-091319	EV013-BMI-1-091319	EV013-BMI-1-091319
	Bucket1 Weight (lbs)	69	42	42	51	51	43	43
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	55	55
	Collection Date	09-12-2019	09-12-2019	09-12-2019	09-13-2019	09-13-2019	09-13-2019	09-13-2019
	EcoAnalysts Sample ID	8097.2-4	8097.1-5	8097.2-5	8097.1-6	8097.2-6	8097.1-7	8097.2-7
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	1
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	1	0	3	0	1	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	1	0	2	1	0	0	2
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	1	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	3	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	1	2	0	0	1	0	2
	Parachironomus sp.	0	0	0	5	12	0	7
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	17	7	10	0	8	4	20

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ECO ANALYSTS, INC.
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	Site ID Number	EV010-BMI-1-091219	EV075-BMI-1-091219	EV075-BMI-1-091219	EV012-BMI-1-091319	EV012-BMI-1-091319	EV013-BMI-1-091319	EV013-BMI-1-091319
	Bucket1 Weight (lbs)	69	42	42	51	51	43	43
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	55	55
	Collection Date	09-12-2019	09-12-2019	09-12-2019	09-13-2019	09-13-2019	09-13-2019	09-13-2019
	EcoAnalysts Sample ID	8097.2-4	8097.1-5	8097.2-5	8097.1-6	8097.2-6	8097.1-7	8097.2-7
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	1	0	1	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	28	30	43	2	21	7	18
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	1	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	0	2	2	0	0	0	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	1	0	1	0	0
	Procladius sp.	0	6	2	0	2	0	1
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	1	0	0	0	2	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	1	0	1	0	6	0	5
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	1
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	1
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	1	2	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	1	0	1
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**EV010-BMI-1-091219**	**EV075-BMI-1-091219**	**EV075-BMI-1-091219**	**EV012-BMI-1-091319**	**EV012-BMI-1-091319**	**EV013-BMI-1-091319**	**EV013-BMI-1-091319**
	Bucket1 Weight (lbs)	**69**	**42**	**42**	**51**	**51**	**43**	**43**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**55**	**55**
	Collection Date	**09-12-2019**	**09-12-2019**	**09-12-2019**	**09-13-2019**	**09-13-2019**	**09-13-2019**	**09-13-2019**
	EcoAnalysts Sample ID	**8097.2-4**	**8097.1-5**	**8097.2-5**	**8097.1-6**	**8097.2-6**	**8097.1-7**	**8097.2-7**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	0
	Sphaeriidae	1	8	0	5	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	6	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	0	0	0	0
	Crangonyx sp.	0	0	0	1	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	1	0	0	0	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	36	0	26	0	80	0	116
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	1	0	36	0	2	0	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	1	0	0	0	0	1
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	2
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	1	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	2	0	0	0	2
	Hygrobates sp.	0	1	0	3	1	3	0
	Lebertia sp.	17	19	6	31	40	21	10
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	2	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	1	0	2	0	7
	Pionidae	0	0	0	0	1	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	5	1	4	19	82	3	26
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	5	0	0
	Nematoda	4	2	7	2	7	1	10
	Prostoma sp.	5	8	11	0	30	0	17
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	8	1	0	0
	TOTAL	**119**	**92**	**155**	**91**	**306**	**42**	**250**

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ECOANALYSTS, INC.
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	Site ID Number	**EV036-BMI-1-091419**	**EV036-BMI-1-091419**	**DM045-BMI-1-091919**	**DM045-BMI-1-091919**	**EV026-BMI-1-092019**	**EV026-BMI-1-092019**	**EV003-BMI-1-092019**
	Bucket1 Weight (lbs)	**10**	**10**	**27**	**27**	**11**	**11**	**34**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**49**
	Collection Date	**09-14-2019**	**09-14-2019**	**09-19-2019**	**09-19-2019**	**09-20-2019**	**09-20-2019**	**09-20-2019**
	EcoAnalysts Sample ID	**8097.1-8**	**8097.2-8**	**8097.1-9**	**8097.2-9**	**8097.1-10**	**8097.2-10**	**8097.1-11**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**40.62**	**100.00**	**75.00**	**100.00**	**100.00**	**100.00**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	1	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	1	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	2	0	0	0	0
	Oecetis sp.	4	0	4	1	0	0	0
	Polycentropodidae	0	0	2	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	1	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	1	0	1	0	0	0	0
	Dicrotendipes sp.	0	0	2	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	3	3	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	1	0	0	0
	Monodiamesa sp.	3	0	0	0	0	0	0
	Nanocladius sp.	0	2	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	1	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	4	3	0	1	0	1	0
	Parachironomus sp.	0	0	0	0	0	0	11
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	2	3	1	4	0	1	3

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	Site ID Number	EV036-BMI-1-091419	EV036-BMI-1-091419	DM045-BMI-1-091919	DM045-BMI-1-091919	EV026-BMI-1-092019	EV026-BMI-1-092019	EV003-BMI-1-092019
	Bucket1 Weight (lbs)	**10**	**10**	**27**	**27**	**11**	**11**	**34**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**49**
	Collection Date	**09-14-2019**	**09-14-2019**	**09-19-2019**	**09-19-2019**	**09-20-2019**	**09-20-2019**	**09-20-2019**
	EcoAnalysts Sample ID	**8097.1-8**	**8097.2-8**	**8097.1-9**	**8097.2-9**	**8097.1-10**	**8097.2-10**	**8097.1-11**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**40.62**	**100.00**	**75.00**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	4	31	0	0	0	2	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	7	179	0	1	0	7	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	9	0	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	43	16	0	0	2	0	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	68	121	0	1	0	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	1	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	1	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	2	6	0	0	0	1	3
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	2	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	11	7	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	2	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	2	0	6	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	2	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	1	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECO ANALYSTS, INC.
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	Site ID Number	EV036-BMI-1-091419	EV036-BMI-1-091419	DM045-BMI-1-091919	DM045-BMI-1-091919	EV026-BMI-1-092019	EV026-BMI-1-092019	EV003-BMI-1-092019
	Bucket1 Weight (lbs)	10	10	27	27	11	11	34
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	49
	Collection Date	09-14-2019	09-14-2019	09-19-2019	09-19-2019	09-20-2019	09-20-2019	09-20-2019
	EcoAnalysts Sample ID	8097.1-8	8097.2-8	8097.1-9	8097.2-9	8097.1-10	8097.2-10	8097.1-11
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	40.62	100.00	75.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	1	0	1	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	1	0	0	0	0
	Pisidium sp.	0	0	61	0	0	0	0
	Sphaeriidae	1	0	0	10	3	0	1
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	1	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	3
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	1	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	69	1	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	53	0	0	0	0	0
	Crangonyx sp.	0	0	0	0	0	0	1
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	5	0	4	0	1	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	17	0	89	0	16	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	73	0	169	0	1	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	3	0	7
	Lebertia sp.	5	3	1	0	2	3	36
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	1	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	1	0	1	0	0	1
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	1	0
	Torrenticola sp.	0	0	0	0	0	2	21
	Torrenticolidae	0	1	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	6	9	9	219	1	2	27
	Prostoma sp.	0	0	0	0	3	20	9
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	2
	TOTAL	**154**	**536**	**172**	**513**	**17**	**67**	**125**

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Study Benthos 2019
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	EV003-BMI-1-092019	DM050-BMI-1-092019	DM050-BMI-1-092019	DM046-BMI-1-092019	DM046-BMI-1-092019	DM022-BMI-1-092119	DM022-BMI-1-092119
	Bucket1 Weight (lbs)	34	58	58	50	50	57.4	57.4
	Bucket2 Weight (lbs)	49	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	09-20-2019	09-20-2019	09-20-2019	09-20-2019	09-20-2019	09-21-2019	09-21-2019
	EcoAnalysts Sample ID	8097.2-11	8097.1-12	8097.2-12	8097.1-13	8097.2-13	8097.1-14	8097.2-14
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	37.50	100.00	87.50	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	1	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	2	0	6	1	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	2	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	1	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	1	7	0	1	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	2	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	7	1	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	12	1	3	0	6	0	0

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	Site ID Number	EV003-BMI-1-092019	DM050-BMI-1-092019	DM050-BMI-1-092019	DM046-BMI-1-092019	DM046-BMI-1-092019	DM022-BMI-1-092119	DM022-BMI-1-092119
	Bucket1 Weight (lbs)	34	58	58	50	50	57.4	57.4
	Bucket2 Weight (lbs)	49	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	09-20-2019	09-20-2019	09-20-2019	09-20-2019	09-20-2019	09-21-2019	09-21-2019
	EcoAnalysts Sample ID	8097.2-11	8097.1-12	8097.2-12	8097.1-13	8097.2-13	8097.1-14	8097.2-14
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	37.50	100.00	87.50	100.00	100.00
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	1	1	0	0	1	0	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	0	0	1	2	1	5	1
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	1	0	0	0
	Procladius sp.	4	1	0	0	2	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	1	1	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	46	56
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	2	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	1	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	18	0	1	0	1	0	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	1	4	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	2	12	6	29	1	1
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	1	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	11	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	2	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	3	0	6	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	2	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	1	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	EV003-BMI-1-092019	DM050-BMI-1-092019	DM050-BMI-1-092019	DM046-BMI-1-092019	DM046-BMI-1-092019	DM022-BMI-1-092119	DM022-BMI-1-092119
	Bucket1 Weight (lbs)	34	58	58	50	50	57.4	57.4
	Bucket2 Weight (lbs)	49	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	09-20-2019	09-20-2019	09-20-2019	09-20-2019	09-20-2019	09-21-2019	09-21-2019
	EcoAnalysts Sample ID	8097.2-11	8097.1-12	8097.2-12	8097.1-13	8097.2-13	8097.1-14	8097.2-14
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	37.50	100.00	87.50	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	6	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	1	0	0	0
	Pisidium sp.	0	83	0	87	0	0	0
	Sphaeriidae	0	0	0	0	5	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	1	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	3	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	1	0	0
	Caecidotea sp.	0	5	0	13	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	0	0	0	0
	Crangonyx sp.	0	0	0	1	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	1	0	1	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	97	0	52	0	70	0	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	3	0	127	0	256	0	11
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	4	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	3	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	0
	Lebertia sp.	10	4	0	2	8	0	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	10	0	1	0	2	0	5
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	60	0	0	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	33	73	330	36	133	21	1
	Prostoma sp.	108	0	0	0	0	0	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**386**	**186**	**535**	**167**	**530**	**73**	**75**

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	Site ID Number	DM023-BMI-1-092119	DM023-BMI-1-092119	DM026-BMI-1-092119	DM026-BMI-1-092119	EV027-BMI-1-092119	EV027-BMI-1-092119	EV060-BMI-1-092119
	Bucket1 Weight (lbs)	57.4	57.4	59.4	59.4	40	40	35
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	45	45	36
	Collection Date	09-21-2019	09-21-2019	09-21-2019	09-21-2019	09-21-2019	09-21-2019	09-21-2019
	EcoAnalysts Sample ID	8097.1-15	8097.2-15	8097.1-16	8097.2-16	8097.1-17	8097.2-17	8097.1-18
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	6	1	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	1	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	0	0	0	0	6	7	28

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	Site ID Number	DM023-BMI-1-092119	DM023-BMI-1-092119	DM026-BMI-1-092119	DM026-BMI-1-092119	EV027-BMI-1-092119	EV027-BMI-1-092119	EV060-BMI-1-092119
	Bucket1 Weight (lbs)	57.4	57.4	59.4	59.4	40	40	35
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	45	45	36
	Collection Date	09-21-2019	09-21-2019	09-21-2019	09-21-2019	09-21-2019	09-21-2019	09-21-2019
	EcoAnalysts Sample ID	8097.1-15	8097.2-15	8097.1-16	8097.2-16	8097.1-17	8097.2-17	8097.1-18
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	1	0	0	0	0	56
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	1
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	0	0	0	0	0	1	4
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	1	0
	Procladius sp.	0	0	0	0	0	1	7
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	61	2	26	4	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	0	14	6	1
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	1	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	9	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	3	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	**DM023-BMI-1-092119**	**DM023-BMI-1-092119**	**DM026-BMI-1-092119**	**DM026-BMI-1-092119**	**EV027-BMI-1-092119**	**EV027-BMI-1-092119**	**EV060-BMI-1-092119**
	Bucket1 Weight (lbs)	**57.4**	**57.4**	**59.4**	**59.4**	**40**	**40**	**35**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**45**	**45**	**36**
	Collection Date	**09-21-2019**	**09-21-2019**	**09-21-2019**	**09-21-2019**	**09-21-2019**	**09-21-2019**	**09-21-2019**
	EcoAnalysts Sample ID	**8097.1-15**	**8097.2-15**	**8097.1-16**	**8097.2-16**	**8097.1-17**	**8097.2-17**	**8097.1-18**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	1	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	3
	Pisidium sp.	0	0	0	0	0	0	27
	Sphaeriidae	0	0	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	0	0	0	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	0	0	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	0	0	0	0	6	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	0	0	0	0	2	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	1
	Arrenurus sp.	0	0	0	0	0	0	1
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	1
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	1	0
	Hygrobates sp.	0	0	0	0	6	0	9
	Lebertia sp.	0	0	0	0	15	2	42
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	1
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	0	1	8	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	3	0	15
	Torrenticolidae	0	0	0	0	0	5	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	1	0	3	0	11	5	43
	Prostoma sp.	0	0	0	0	33	73	14
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**62**	**4**	**44**	**5**	**90**	**122**	**254**

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	Site ID Number	**EV060-BMI-1-092119**	**EV008-BMI-1-092319**	**EV008-BMI-1-092319**	**EV037-BMI-1-092319**	**EV037-BMI-1-092319**	**EV037-BMI-2-092319**	**EV037-BMI-2-092319**
	Bucket1 Weight (lbs)	**35**	**35**	**35**	**54**	**54**	**48**	**48**
	Bucket2 Weight (lbs)	**36**	**39**	**39**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**09-21-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**
	EcoAnalysts Sample ID	**8097.2-18**	**8097.1-19**	**8097.2-19**	**8097.1-20**	**8097.2-20**	**8097.1-21**	**8097.2-21**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**54.69**	**100.00**	**100.00**	**100.00**	**100.00**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	1	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	2	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	1	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	103	1	1	0	2	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	1	1	0	0	0	1
	Cryptochironomus sp.	0	0	1	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	1	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	1	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	4	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	1	0
	Parakiefferiella sp.	7	0	4	3	52	8	3

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	Site ID Number	EV060-BMI-1-092119	EV008-BMI-1-092319	EV008-BMI-1-092319	EV037-BMI-1-092319	EV037-BMI-1-092319	EV037-BMI-2-092319	EV037-BMI-2-092319
	Bucket1 Weight (lbs)	35	35	35	54	54	48	48
	Bucket2 Weight (lbs)	36	39	39	N/A	N/A	N/A	N/A
	Collection Date	09-21-2019	09-23-2019	09-23-2019	09-23-2019	09-23-2019	09-23-2019	09-23-2019
	EcoAnalysts Sample ID	8097.2-18	8097.1-19	8097.2-19	8097.1-20	8097.2-20	8097.1-21	8097.2-21
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	54.69	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	0	8	9	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	10	33	55	1	2	44	16
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	1	0	0	0	0
	Phaenopsectra sp.	0	35	0	0	0	0	0
	Polypedilum sp.	0	39	6	0	0	0	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	62	22	0	1	2	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	1	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	1	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	1	0	28	17	11
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	1	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	1	0	0	0	0	1
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	1	0	0	1
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	1	13	0	0	1	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	2	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	25	3	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	EV060-BMI-1-092119	EV008-BMI-1-092319	EV008-BMI-1-092319	EV037-BMI-1-092319	EV037-BMI-1-092319	EV037-BMI-2-092319	EV037-BMI-2-092319
	Bucket1 Weight (lbs)	**35**	**35**	**35**	**54**	**54**	**48**	**48**
	Bucket2 Weight (lbs)	**36**	**39**	**39**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**09-21-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**
	EcoAnalysts Sample ID	**8097.2-18**	**8097.1-19**	**8097.2-19**	**8097.1-20**	**8097.2-20**	**8097.1-21**	**8097.2-21**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**54.69**	**100.00**	**100.00**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	96	0	0	0	0	0
	Sphaeriidae	0	0	1	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	17	0	0	0	0	0
	Calanoida	0	0	0	0	1	0	0
	Cladocera	0	0	8	0	2	0	5
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	1
	Cyclopoida	0	0	9	0	4	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	16	0	254	0	16	0	25
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	40	1	140	0	11	2	20
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	1	2	0
	Arrenurus sp.	0	1	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	1	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	1	0	0	0	2	0	0
	Hygrobates sp.	1	4	0	8	1	5	0
	Lebertia sp.	7	17	8	5	1	7	2
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	1	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	2	0	2	0	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	6	0	5	0	8	5	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	1	0	0
	Nematoda	5	21	11	0	26	14	19
	Prostoma sp.	12	2	0	25	122	2	33
	Tardigrada	0	0	0	0	0	0	1
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**106**	**487**	**543**	**44**	**289**	**112**	**139**

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ECO ANALYSTS, INC.
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	Site ID Number	EV002-BMI-1-092419	EV002-BMI-1-092419	EV044-BMI-1-092419	EV044-BMI-1-092419	EV048-BMI-1-092419	EV048-BMI-1-092419	REF003-BMI-2-092719
	Bucket1 Weight (lbs)	65	65	26	26	40	40	37
	Bucket2 Weight (lbs)	N/A	N/A	27	27	41	41	42.2
	Collection Date	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-27-2019
	EcoAnalysts Sample ID	8097.1-22	8097.2-22	8097.1-23	8097.2-23	8097.1-24	8097.2-24	8097.1-25
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	87.50	41.67	43.75	25.00	11.33	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	1	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	4	1	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	1	1	10	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	54	14	2	0	0
	Cladopelma sp.	0	0	0	7	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	1	0	0	0	0	2
	Cryptochironomus sp.	0	0	0	0	1	0	2
	Cryptotendipes sp.	0	0	0	0	1	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	40	22	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	8	3	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	2
	Nanocladius sp.	0	0	0	0	0	8	0
	Orthocladiinae	0	0	0	0	0	0	2
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	1	0	3	4	2	0	0
	Parachironomus sp.	0	1	0	0	0	0	0
	Paracladius sp.	0	0	1	2	0	0	0
	Paracladopelma sp.	0	0	2	0	1	0	1
	Parakiefferiella sp.	0	9	3	2	1	4	0

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	Site ID Number	EV002-BMI-1-092419	EV002-BMI-1-092419	EV044-BMI-1-092419	EV044-BMI-1-092419	EV048-BMI-1-092419	EV048-BMI-1-092419	REF003-BMI-2-092719
	Bucket1 Weight (lbs)	65	65	26	26	40	40	37
	Bucket2 Weight (lbs)	N/A	N/A	27	27	41	41	42.2
	Collection Date	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-27-2019
	EcoAnalysts Sample ID	8097.1-22	8097.2-22	8097.1-23	8097.2-23	8097.1-24	8097.2-24	8097.1-25
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	87.50	41.67	43.75	25.00	11.33	100.00
	Paralauterborniella nigrohalteralis	0	1	7	11	10	8	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	7	50	0	19	192	233	1
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	10	0	5	0
	Phaenopsectra sp.	0	0	0	2	0	0	0
	Polypedilum sp.	0	0	1	0	20	6	18
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	1	0	0	0	0	0	0
	Procladius sp.	3	6	230	124	123	35	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	1	1	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	5	12	32	45	4	5	1
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	0	0	0	2	1	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	1	0	1	1	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	1	7	5	14	26	8	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	2	0	0	0
	Enchytraeidae	0	0	0	0	0	0	1
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	1	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	1	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	1	0	1	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	15	10	11	2	3
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	EV002-BMI-1-092419	EV002-BMI-1-092419	EV044-BMI-1-092419	EV044-BMI-1-092419	EV048-BMI-1-092419	EV048-BMI-1-092419	REF003-BMI-2-092719
	Bucket1 Weight (lbs)	65	65	26	26	40	40	37
	Bucket2 Weight (lbs)	N/A	N/A	27	27	41	41	42.2
	Collection Date	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-27-2019
	EcoAnalysts Sample ID	8097.1-22	8097.2-22	8097.1-23	8097.2-23	8097.1-24	8097.2-24	8097.1-25
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	87.50	41.67	43.75	25.00	11.33	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	12	0	5	0	0
	Pisidium sp.	32	0	0	6	71	0	10
	Sphaeriidae	0	1	40	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	1
	Menetus opercularis	0	0	0	0	0	0	1
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	1
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	6
	Valvata tricarinata	0	0	1	0	0	0	0
Crustacea	Amphipoda	0	0	0	9	0	0	0
	Caecidotea sp.	0	0	20	0	1	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	5	0	3	0	9	0
	Crangonyx sp.	1	0	49	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	10	0	46	0	4	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	148	0	12	0	31	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	92	1	155	0	115	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	1	1	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	1	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	5	0	0	0	0	0
	Hygrobates sp.	7	1	0	0	0	0	0
	Lebertia sp.	22	10	4	0	10	6	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	2	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	10	0	0	0	5	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	1	0	0	0	1	0	0
	Torrenticola sp.	3	12	0	0	1	3	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	28	62	4	9	13	15	126
	Prostoma sp.	20	72	0	0	3	2	3
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	1	0	0	0	0	0
	TOTAL	**136**	**520**	**537**	**537**	**515**	**505**	**181**

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	Site ID Number	REF003-BMI-2-092719	EV054-BMI-1-092319	EV054-BMI-1-092319	EV057-BMI-1-092319	EV057-BMI-1-092319	EV051-BMI-1-092419	EV051-BMI-1-092419
	Bucket1 Weight (lbs)	**37**	**42**	**42**	**40**	**40**	**41**	**41**
	Bucket2 Weight (lbs)	**42.2**	**N/A**	**N/A**	**N/A**	**N/A**	**43**	**43**
	Collection Date	**09-27-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-24-2019**	**09-24-2019**
	EcoAnalysts Sample ID	**8097.2-25**	**8097.1-26**	**8097.2-26**	**8097.1-27**	**8097.2-27**	**8097.1-28**	**8097.2-28**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**25.00**	**29.17**	**58.33**	**87.50**	**100.00**
Ephemeroptera	Baetidae	0	0	0	1	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	1	0	0	1	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	4	0	2	0	1	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	3	0	0	9	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	26	3	33	0	0	0
	Cladopelma sp.	0	0	18	10	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	5	0	1	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	1	0
	Cryptochironomus sp.	1	0	0	0	0	0	0
	Cryptotendipes sp.	0	5	0	0	5	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	29	14	25	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	4	1	1	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	2	0
	Orthocladiinae	1	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	1	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	4	0	2	1	7	1
	Parachironomus sp.	2	0	0	0	0	2	0
	Paracladius sp.	0	1	0	2	1	0	0
	Paracladopelma sp.	1	0	0	3	0	0	0
	Parakiefferiella sp.	8	1	1	0	10	29	19

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	Site ID Number	REF003-BMI-2-092719	EV054-BMI-1-092319	EV054-BMI-1-092319	EV057-BMI-1-092319	EV057-BMI-1-092319	EV051-BMI-1-092419	EV051-BMI-1-092419
	Bucket1 Weight (lbs)	37	42	42	40	40	41	41
	Bucket2 Weight (lbs)	42.2	N/A	N/A	N/A	N/A	43	43
	Collection Date	09-27-2019	09-23-2019	09-23-2019	09-23-2019	09-23-2019	09-24-2019	09-24-2019
	EcoAnalysts Sample ID	8097.2-25	8097.1-26	8097.2-26	8097.1-27	8097.2-27	8097.1-28	8097.2-28
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	25.00	29.17	58.33	87.50	100.00
	Paralauterborniella nigrohalteralis	0	0	6	5	0	2	1
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	1	1	15	1	10	103	97
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	9	2	0	2	2
	Phaenopsectra sp.	0	1	0	0	2	0	0
	Polypedilum sp.	6	1	3	7	0	2	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	2	1
	Procladius sp.	0	125	83	205	54	36	19
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	1	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	1	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	2	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	1	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	14	27	32	0	7	20
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	0	0	2	0	1	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	1	0	0	0	0	1	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	1	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	8	3	1	1
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	1	41	23	22	13	9
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	1
	Dero digitata	0	0	0	3	0	0	0
	Dero sp.	0	0	47	0	20	0	0
	Enchytraeidae	1	0	1	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	9	0	1	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	1
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	1	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	3	1	0	0
	tubificoid Naididae w/o cap setae	3	19	20	7	7	3	0
	Uncinais uncinata	1	0	0	0	0	0	0

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LIFE IN WATER

	Site ID Number	**REF003-BMI-2-092719**	**EV054-BMI-1-092319**	**EV054-BMI-1-092319**	**EV057-BMI-1-092319**	**EV057-BMI-1-092319**	**EV051-BMI-1-092419**	**EV051-BMI-1-092419**
	Bucket1 Weight (lbs)	**37**	**42**	**42**	**40**	**40**	**41**	**41**
	Bucket2 Weight (lbs)	**42.2**	**N/A**	**N/A**	**N/A**	**N/A**	**43**	**43**
	Collection Date	**09-27-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-23-2019**	**09-24-2019**	**09-24-2019**
	EcoAnalysts Sample ID	**8097.2-25**	**8097.1-26**	**8097.2-26**	**8097.1-27**	**8097.2-27**	**8097.1-28**	**8097.2-28**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**25.00**	**29.17**	**58.33**	**87.50**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	54	0	4	0
	Pisidium sp.	0	0	0	0	1	156	0
	Sphaeriidae	0	264	1	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	1	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	2	0	0	0	0	0
Crustacea	Amphipoda	0	0	24	2	0	0	0
	Caecidotea sp.	0	3	2	79	2	3	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	1	0	2	0	20
	Crangonyx sp.	0	27	0	0	0	1	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	1	0	68	0	32	0	6
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	63	0	15	0	76	0	76
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	1	2	116	0	221	1	120
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	7
	Arrenurus sp.	0	0	0	0	0	2	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	1	0
	Frontipoda sp.	0	0	0	0	0	1	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	4	0
	Lebertia sp.	0	0	0	1	0	49	5
	Limnesia sp.	0	0	0	1	1	0	0
	Mideopsis sp.	0	0	0	0	0	2	0
	Neumania sp.	0	0	0	0	0	1	0
	Oribatei	1	0	0	0	0	0	6
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	1	0	0
	Torrenticola sp.	0	0	0	0	0	4	13
	Torrenticolidae	0	0	0	0	1	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	81	10	31	6	31	75	82
	Prostoma sp.	10	0	0	0	0	40	42
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	6	0	3	0	0	0	3
	TOTAL	**191**	**556**	**556**	**523**	**515**	**565**	**552**

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	REF013-BMI-1-092419	REF013-BMI-1-092419	REF015-BMI-1-092419	REF015-BMI-1-092419	EV065-BMI-1-092519	EV065-BMI-1-092519	EV066-BMI-1-092519
	Bucket1 Weight (lbs)	37.4	37.4	33.2	33.2	42	42	39
	Bucket2 Weight (lbs)	43.8	43.8	33.8	33.8	27	27	36
	Collection Date	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-25-2019	09-25-2019	09-25-2019
	EcoAnalysts Sample ID	8097.1-29	8097.2-29	8097.1-30	8097.2-30	8097.1-31	8097.2-31	8097.1-32
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	5.47	100.00	58.33	100.00	100.00	26.17
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	1	0	2	0	0	0	0
	Cladopelma sp.	2	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	5	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	16	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	11	7	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	1	0	3
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	1	3
	Parachironomus sp.	0	0	0	0	0	1	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	35	3	3	12	15	8	29

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	Site ID Number	**REF013-BMI-1-092419**	**REF013-BMI-1-092419**	**REF015-BMI-1-092419**	**REF015-BMI-1-092419**	**EV065-BMI-1-092519**	**EV065-BMI-1-092519**	**EV066-BMI-1-092519**
	Bucket1 Weight (lbs)	**37.4**	**37.4**	**33.2**	**33.2**	**42**	**42**	**39**
	Bucket2 Weight (lbs)	**43.8**	**43.8**	**33.8**	**33.8**	**27**	**27**	**36**
	Collection Date	**09-24-2019**	**09-24-2019**	**09-24-2019**	**09-24-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**
	EcoAnalysts Sample ID	**8097.1-29**	**8097.2-29**	**8097.1-30**	**8097.2-30**	**8097.1-31**	**8097.2-31**	**8097.1-32**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**5.47**	**100.00**	**58.33**	**100.00**	**100.00**	**26.17**
	Paralauterborniella nigrohalteralis	0	1	0	0	1	0	2
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	0	0	0	17	7	273
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	0	0	0	1	0	0	3
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	4	0	2	0	1	0	10
	Protanypus sp.	0	0	1	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	2	0	6	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	3	0	0	0	10	15	9
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	1	0	1	1	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	0	0	0	0	0	1
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	3
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	2	2	13
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	6	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	1	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	1	0	0	0	0	0	1
	tubificoid Naididae w/o cap setae	2	0	0	1	1	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	REF013-BMI-1-092419	REF013-BMI-1-092419	REF015-BMI-1-092419	REF015-BMI-1-092419	EV065-BMI-1-092519	EV065-BMI-1-092519	EV066-BMI-1-092519
	Bucket1 Weight (lbs)	37.4	37.4	33.2	33.2	42	42	39
	Bucket2 Weight (lbs)	43.8	43.8	33.8	33.8	27	27	36
	Collection Date	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-25-2019	09-25-2019	09-25-2019
	EcoAnalysts Sample ID	8097.1-29	8097.2-29	8097.1-30	8097.2-30	8097.1-31	8097.2-31	8097.1-32
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	5.47	100.00	58.33	100.00	100.00	26.17
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	1	0	0
	Pisidium sp.	0	0	0	0	31	2	9
	Sphaeriidae	3	0	2	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	3	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	3	0	2	0
	Crangonyx sp.	0	0	0	0	1	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	0	4	0	1	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	505	0	159	0	18	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	24	24	0	3	14	37	29
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	4	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	1	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	1	0	3	0	0	0
	Hygrobates sp.	0	0	0	0	4	0	5
	Lebertia sp.	3	2	0	0	13	3	20
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	1	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	4	0	2	0
	Pionidae	0	0	0	0	0	2	0
	Sperchon sp.	0	0	0	0	0	1	0
	Torrenticola sp.	0	0	0	0	3	7	1
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	24	5	40	304	9	8	43
	Prostoma sp.	0	0	0	0	21	65	58
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**130**	**542**	**68**	**508**	**146**	**187**	**515**

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		EV066-BMI-1-092519	EV069-BMI-1-092519	EV069-BMI-1-092519	EV069-BMI-2-092519	EV069-BMI-2-092519	EV071-BMI-1-092519	EV071-BMI-1-092519
	Site ID Number	**EV066-BMI-1-092519**	**EV069-BMI-1-092519**	**EV069-BMI-1-092519**	**EV069-BMI-2-092519**	**EV069-BMI-2-092519**	**EV071-BMI-1-092519**	**EV071-BMI-1-092519**
	Bucket1 Weight (lbs)	**39**	**44**	**44**	**32**	**32**	**32**	**32**
	Bucket2 Weight (lbs)	**36**	**32**	**32**	**35**	**35**	**31**	**31**
	Collection Date	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**
	EcoAnalysts Sample ID	**8097.2-32**	**8097.1-33**	**8097.2-33**	**8097.1-34**	**8097.2-34**	**8097.1-35**	**8097.2-35**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**87.50**	**100.00**	**100.00**	**100.00**	**100.00**	**75.00**	**23.44**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	1	0	0	1	0	0
	Baetis tricaudatus	0	0	0	1	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	1	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	1	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	1	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	2	0	0	1	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	1
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	4	0	0	0	0
	Cricotopus/Orthocladius sp.	1	0	0	0	0	0	1
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	1	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	2	0	0	0	0	1	7
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	1	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	4	0
	Parachironomus sp.	1	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	17	24	10	22	12	1	10

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	Site ID Number	**EV066-BMI-1-092519**	**EV069-BMI-1-092519**	**EV069-BMI-1-092519**	**EV069-BMI-2-092519**	**EV069-BMI-2-092519**	**EV071-BMI-1-092519**	**EV071-BMI-1-092519**
	Bucket1 Weight (lbs)	**39**	**44**	**44**	**32**	**32**	**32**	**32**
	Bucket2 Weight (lbs)	**36**	**32**	**32**	**35**	**35**	**31**	**31**
	Collection Date	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**
	EcoAnalysts Sample ID	**8097.2-32**	**8097.1-33**	**8097.2-33**	**8097.1-34**	**8097.2-34**	**8097.1-35**	**8097.2-35**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**87.50**	**100.00**	**100.00**	**100.00**	**100.00**	**75.00**	**23.44**
	Paralauterborniella nigrohalteralis	0	0	0	0	0	17	19
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	205	15	1	2	1	253	217
	Pentaneura sp.	0	1	0	0	0	0	0
	Pentaneurini	0	0	1	0	0	3	1
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	0	0	0	0	0	28	6
	Potthastia gaedii gr.	0	1	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	5	2	0	0	0	51	13
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	4	8	1	1	3	8	7
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	0	2	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	2	0	0	0	0	1	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	9	0	0	0	0	37	5
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	1	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	3	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	1	0	1	0	1	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	2	0	0	0	0	2
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	**EV066-BMI-1-092519**	**EV069-BMI-1-092519**	**EV069-BMI-1-092519**	**EV069-BMI-2-092519**	**EV069-BMI-2-092519**	**EV071-BMI-1-092519**	**EV071-BMI-1-092519**
	Bucket1 Weight (lbs)	**39**	**44**	**44**	**32**	**32**	**32**	**32**
	Bucket2 Weight (lbs)	**36**	**32**	**32**	**35**	**35**	**31**	**31**
	Collection Date	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**
	EcoAnalysts Sample ID	**8097.2-32**	**8097.1-33**	**8097.2-33**	**8097.1-34**	**8097.2-34**	**8097.1-35**	**8097.2-35**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**87.50**	**100.00**	**100.00**	**100.00**	**100.00**	**75.00**	**23.44**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	6	0
	Sphaeriidae	1	1	0	3	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	2	0	1	0	1	0	40
	Crangonyx sp.	0	0	0	0	0	1	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	3	0	3	0	5
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	64	0	8	0	10	0	56
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	142	2	3	2	10	13	34
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	1	0	1	1	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	2	0	3	0	5	0
	Lebertia sp.	7	7	0	13	2	24	11
	Limnesia sp.	1	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	7	0	0	0	2	0	0
	Pionidae	1	0	0	0	2	0	0
	Sperchon sp.	1	0	0	0	0	1	0
	Torrenticola sp.	12	3	0	1	6	2	5
	Torrenticolidae	0	0	4	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	37	33	15	45	19	6	62
	Prostoma sp.	15	4	5	5	15	58	4
	Tardigrada	0	0	3	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**538**	**108**	**63**	**98**	**90**	**529**	**506**

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	Site ID Number	REF017-BMI-1-092519	REF017-BMI-1-092519	REF018-BMI-1-092519	REF018-BMI-1-092519	REF016-BMI-1-092519	REF016-BMI-1-092519	EV001-BMI-1-092619
	Bucket1 Weight (lbs)	33	33	35.6	35.6	36.8	36.8	42
	Bucket2 Weight (lbs)	35.2	35.2	34.8	34.8	38.2	38.2	36
	Collection Date	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-26-2019
	EcoAnalysts Sample ID	8097.1-36	8097.2-36	8097.1-37	8097.2-37	8097.1-38	8097.2-38	8097.1-39
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	65.62	100.00	100.00	100.00	28.65	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	1
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	2	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	1	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	2	2
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	1	0	3	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	0	0	1
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	0	5	0	0	0	10	16

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**REF017-BMI-1-092519**	**REF017-BMI-1-092519**	**REF018-BMI-1-092519**	**REF018-BMI-1-092519**	**REF016-BMI-1-092519**	**REF016-BMI-1-092519**	**EV001-BMI-1-092619**
	Bucket1 Weight (lbs)	**33**	**33**	**35.6**	**35.6**	**36.8**	**36.8**	**42**
	Bucket2 Weight (lbs)	**35.2**	**35.2**	**34.8**	**34.8**	**38.2**	**38.2**	**36**
	Collection Date	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-25-2019**	**09-26-2019**
	EcoAnalysts Sample ID	**8097.1-36**	**8097.2-36**	**8097.1-37**	**8097.2-37**	**8097.1-38**	**8097.2-38**	**8097.1-39**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**65.62**	**100.00**	**100.00**	**100.00**	**28.65**	**100.00**
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	1
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	0	0	0	0	0	24
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	1	0	0
	Polypedilum sp.	0	0	0	1	0	0	3
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	1	0	0	2	0	2
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	1	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	0	0	2	14
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	1	2	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	4	1	0	0	0	0	1
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	3
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	2	0	1	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	1	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	1	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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EcoAnalysts, Inc.
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	Site ID Number	REF017-BMI-1-092519	REF017-BMI-1-092519	REF018-BMI-1-092519	REF018-BMI-1-092519	REF016-BMI-1-092519	REF016-BMI-1-092519	EV001-BMI-1-092619
	Bucket1 Weight (lbs)	33	33	35.6	35.6	36.8	36.8	42
	Bucket2 Weight (lbs)	35.2	35.2	34.8	34.8	38.2	38.2	36
	Collection Date	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-26-2019
	EcoAnalysts Sample ID	8097.1-36	8097.2-36	8097.1-37	8097.2-37	8097.1-38	8097.2-38	8097.1-39
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	65.62	100.00	100.00	100.00	28.65	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	0
	Sphaeriidae	4	0	0	0	0	2	4
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	1	0	0	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	1	0	0	0	1	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	140	0	0	0	143	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	4	0	0	2	15	16
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	2	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	2	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	3
	Lebertia sp.	0	0	0	0	0	0	20
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	1
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	0	0	0	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	2
	Torrenticola sp.	0	0	0	0	0	0	3
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	29	420	0	66	97	353	22
	Prostoma sp.	0	0	0	0	0	0	27
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**37**	**577**	**0**	**73**	**103**	**537**	**166**

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	Site ID Number	**EV001-BMI-1-092619**	**EV072-BMI-1-092619**	**EV072-BMI-1-092619**	**EV052-BMI-1-092619**	**EV052-BMI-1-092619**	**REF014-BMI-1-092619**	**REF014-BMI-1-092619**
	Bucket1 Weight (lbs)	**42**	**39**	**39**	**60**	**60**	**37.8**	**37.8**
	Bucket2 Weight (lbs)	**36**	**35**	**35**	**N/A**	**N/A**	**38.8**	**38.8**
	Collection Date	**09-26-2019**	**09-26-2019**	**09-26-2019**	**09-26-2019**	**09-26-2019**	**09-26-2019**	**09-26-2019**
	EcoAnalysts Sample ID	**8097.2-39**	**8097.1-40**	**8097.2-40**	**8097.1-41**	**8097.2-41**	**8097.1-42**	**8097.2-42**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**50.00**	**37.50**	**100.00**	**50.00**	**100.00**	**12.50**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	1	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	1	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	1	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	1	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	2	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	16	1
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	5	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	1
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	7	3	9	0	4	58	19

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	Site ID Number	EV001-BMI-1-092619	EV072-BMI-1-092619	EV072-BMI-1-092619	EV052-BMI-1-092619	EV052-BMI-1-092619	REF014-BMI-1-092619	REF014-BMI-1-092619
	Bucket1 Weight (lbs)	42	39	39	60	60	37.8	37.8
	Bucket2 Weight (lbs)	36	35	35	N/A	N/A	38.8	38.8
	Collection Date	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019
	EcoAnalysts Sample ID	8097.2-39	8097.1-40	8097.2-40	8097.1-41	8097.2-41	8097.1-42	8097.2-42
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	50.00	37.50	100.00	50.00	100.00	12.50
	Paralauterborniella nigrohalteralis	0	3	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	10	324	241	2	98	0	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	0	9	1	2	0	1	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	1	0	1	0	0	0
	Procladius sp.	0	3	1	2	0	5	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	3	0	0	0	2	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	4	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	10	10	7	0	6	4	3
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	3	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	1	0	2	1	6	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	1	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	3	9	13	7	12	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	2
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	1	11
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	3	2
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	1	0
	tubificoid Naididae w/o cap setae	0	0	1	0	0	1	1
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	EV001-BMI-1-092619	EV072-BMI-1-092619	EV072-BMI-1-092619	EV052-BMI-1-092619	EV052-BMI-1-092619	REF014-BMI-1-092619	REF014-BMI-1-092619
	Bucket1 Weight (lbs)	42	39	39	60	60	37.8	37.8
	Bucket2 Weight (lbs)	36	35	35	N/A	N/A	38.8	38.8
	Collection Date	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019
	EcoAnalysts Sample ID	8097.2-39	8097.1-40	8097.2-40	8097.1-41	8097.2-41	8097.1-42	8097.2-42
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	50.00	37.50	100.00	50.00	100.00	12.50
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	1	0	0	0
	Pisidium sp.	0	57	0	103	1	5	0
	Sphaeriidae	0	0	0	0	3	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	2	0	2	0	2	0	1
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	6	0	4	0	7	0	1
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	20	0	64	0	85	0	496
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	19	19	82	5	192	0	3
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	2	0	0
	Arrenurus sp.	0	0	0	2	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	1	0	0	0	1	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	1	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	3	0	0	0	0	0	13
	Hygrobates sp.	0	2	0	4	0	0	0
	Lebertia sp.	7	5	4	12	5	1	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	1	0	1	0	4	0	1
	Pionidae	0	0	1	0	0	0	0
	Sperchon sp.	0	2	0	0	0	0	0
	Torrenticola sp.	9	1	6	1	7	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	4	34	48	19	60	39	52
	Prostoma sp.	44	47	36	27	46	0	0
	Tardigrada	0	0	0	0	0	0	1
	Turbellaria	0	1	0	0	0	0	0
	TOTAL	**146**	**540**	**521**	**191**	**538**	**154**	**608**

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ECOANALYSTS, INC.
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	Site ID Number	**EV049-BMI-1-092719**	**EV049-BMI-1-092719**	**REF003-BMI-1-092719**	**REF003-BMI-1-092719**	**EV036-BMI-2-100119**	**EV036-BMI-2-100119**	**REF004-BMI-1-092719**
	Bucket1 Weight (lbs)	**15**	**15**	**43.6**	**43.6**	**24.5**	**24.5**	**51.6**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**38.4**	**38.4**	**N/A**	**N/A**	**47.8**
	Collection Date	**09-27-2019**	**09-27-2019**	**09-27-2019**	**09-27-2019**	**10-01-2019**	**10-01-2019**	**09-27-2019**
	EcoAnalysts Sample ID	**8097.1-43**	**8097.2-43**	**8097.1-44**	**8097.2-44**	**8097.1-45**	**8097.2-45**	**8097.1-46**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**62.50**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	1
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	5	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	11	0	0	0	17	4	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	1	1	0	0	4
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	7	4	0	1	58
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	2	0	0	0	1
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	1
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	2	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	3
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	2
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	1	2	0	0	7	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	1	0	0	0	12
	Parakiefferiella sp.	1	0	0	14	0	0	1

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	Site ID Number	EV049-BMI-1-092719	EV049-BMI-1-092719	REF003-BMI-1-092719	REF003-BMI-1-092719	EV036-BMI-2-100119	EV036-BMI-2-100119	REF004-BMI-1-092719
	Bucket1 Weight (lbs)	15	15	43.6	43.6	24.5	24.5	51.6
	Bucket2 Weight (lbs)	N/A	N/A	38.4	38.4	N/A	N/A	47.8
	Collection Date	09-27-2019	09-27-2019	09-27-2019	09-27-2019	10-01-2019	10-01-2019	09-27-2019
	EcoAnalysts Sample ID	8097.1-43	8097.2-43	8097.1-44	8097.2-44	8097.1-45	8097.2-45	8097.1-46
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	62.50
	Paralauterborniella nigrohalteralis	3	7	4	0	0	16	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	29	145	2	1	22	93	12
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	1	0	2	0	3	0
	Phaenopsectra sp.	0	0	0	0	0	0	1
	Polypedilum sp.	19	6	16	6	39	27	61
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	25	49	0	0	17	34	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	1	0	0	3
	Stempellina sp.	0	0	0	0	0	0	1
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	1	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	17
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	0	0	0	5
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	43
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	0	0	0	1	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	5
	Enchytraeidae	0	0	0	10	0	0	33
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	2	0	0	7
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	1	3	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	1
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	4	2	0	0	0
	Uncinais uncinata	0	0	2	0	0	0	7

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	Site ID Number	**EV049-BMI-1-092719**	**EV049-BMI-1-092719**	**REF003-BMI-1-092719**	**REF003-BMI-1-092719**	**EV036-BMI-2-100119**	**EV036-BMI-2-100119**	**REF004-BMI-1-092719**
	Bucket1 Weight (lbs)	**15**	**15**	**43.6**	**43.6**	**24.5**	**24.5**	**51.6**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**38.4**	**38.4**	**N/A**	**N/A**	**47.8**
	Collection Date	**09-27-2019**	**09-27-2019**	**09-27-2019**	**09-27-2019**	**10-01-2019**	**10-01-2019**	**09-27-2019**
	EcoAnalysts Sample ID	**8097.1-43**	**8097.2-43**	**8097.1-44**	**8097.2-44**	**8097.1-45**	**8097.2-45**	**8097.1-46**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**62.50**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	59	0	19	0	1	0	7
	Sphaeriidae	0	1	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	8
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	2	0	0	0	3
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	1	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	3	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	14	0	0	0	0
	Valvata tricarinata	0	0	1	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	2	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	6	0	0	0	1	0
	Crangonyx sp.	1	0	0	0	0	0	17
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	4	0	4	0	7	0
	Gammarus sp.	2	0	0	0	0	0	0
	Harpacticoida	0	138	0	160	0	198	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	1	89	0	4	0	130	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	1	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	1	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	1
	Lebertia sp.	1	1	0	0	1	0	1
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	1	0	2	0	2	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	2	17	30	105	0	40	189
	Prostoma sp.	0	0	1	2	0	0	2
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	20
	TOTAL	**157**	**468**	**113**	**324**	**104**	**564**	**527**

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	Site ID Number	**REF004-BMI-1-092719**	**REF002-BMI-1-092819**	**REF002-BMI-1-092819**	**REF001-BMI-1-092819**	**REF001-BMI-1-092819**	**EV022-BMI-1-093019**	**EV022-BMI-1-093019**
	Bucket1 Weight (lbs)	**51.6**	**38.6**	**38.6**	**37.6**	**37.6**	**24**	**24**
	Bucket2 Weight (lbs)	**47.8**	**39.8**	**39.8**	**36.2**	**36.2**	**N/A**	**N/A**
	Collection Date	**09-27-2019**	**09-28-2019**	**09-28-2019**	**09-28-2019**	**09-28-2019**	**09-30-2019**	**09-30-2019**
	EcoAnalysts Sample ID	**8097.2-46**	**8097.1-47**	**8097.2-47**	**8097.1-48**	**8097.2-48**	**8097.1-49**	**8097.2-49**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**25.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**87.50**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	1	0	1	1	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	1	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	3	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	2	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	1	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	3	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	2	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	1	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	1	0	4	0	0	0	0
	Cryptochironomus sp.	15	0	1	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	1
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	1	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	1	3	3	1	0	0	0
	Monodiamesa sp.	0	0	0	3	0	0	0
	Nanocladius sp.	0	0	0	1	0	0	0
	Orthocladiinae	0	0	0	0	0	1	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	2	0	0	3	0
	Pagastia sp.	0	0	0	1	0	0	0
	Pagastiella sp.	0	0	0	0	0	1	3
	Parachironomus sp.	0	0	0	0	0	2	16
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	3	0	0	0	0	0	10
	Parakiefferiella sp.	0	0	0	0	0	1	9

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	Site ID Number	REF004-BMI-1-092719	REF002-BMI-1-092819	REF002-BMI-1-092819	REF001-BMI-1-092819	REF001-BMI-1-092819	EV022-BMI-1-093019	EV022-BMI-1-093019
	Bucket1 Weight (lbs)	51.6	38.6	38.6	37.6	37.6	24	24
	Bucket2 Weight (lbs)	47.8	39.8	39.8	36.2	36.2	N/A	N/A
	Collection Date	09-27-2019	09-28-2019	09-28-2019	09-28-2019	09-28-2019	09-30-2019	09-30-2019
	EcoAnalysts Sample ID	8097.2-46	8097.1-47	8097.2-47	8097.1-48	8097.2-48	8097.1-49	8097.2-49
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	25.00	100.00	100.00	100.00	100.00	100.00	87.50
	Paralauterborniella nigrohalteralis	1	0	0	0	0	0	1
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	5	0	3	0	0	3	11
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	15	0	1	0	0	0	0
	Phaenopsectra sp.	4	0	0	0	0	0	0
	Polypedilum sp.	21	0	1	10	4	2	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	0	0	0	0	3	8
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	1	0	0	0	0
	Robackia demeijerei	0	19	18	52	23	0	0
	Stempellina sp.	1	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	1	0	0	16	1	0	0
	Tanypodinae	1	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	1	0	0	0	0	13	119
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	7	0
Diptera	Ceratopogoninae	0	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	1	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	2	0	0	0	0	0	0
	Enchytraeidae	24	10	29	8	5	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	1	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	1	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	1	0	0	0	0	0	0

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	Site ID Number	**REF004-BMI-1-092719**	**REF002-BMI-1-092819**	**REF002-BMI-1-092819**	**REF001-BMI-1-092819**	**REF001-BMI-1-092819**	**EV022-BMI-1-093019**	**EV022-BMI-1-093019**
	Bucket1 Weight (lbs)	**51.6**	**38.6**	**38.6**	**37.6**	**37.6**	**24**	**24**
	Bucket2 Weight (lbs)	**47.8**	**39.8**	**39.8**	**36.2**	**36.2**	**N/A**	**N/A**
	Collection Date	**09-27-2019**	**09-28-2019**	**09-28-2019**	**09-28-2019**	**09-28-2019**	**09-30-2019**	**09-30-2019**
	EcoAnalysts Sample ID	**8097.2-46**	**8097.1-47**	**8097.2-47**	**8097.1-48**	**8097.2-48**	**8097.1-49**	**8097.2-49**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**25.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**87.50**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	0
	Sphaeriidae	1	0	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	4	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	1	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	1	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	1	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	14	0	0	0	0	0	3
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	40	0	0	0	0	0	14
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	123	0	1	0	1	0	76
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	0	0	0	2	0	8
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	1	12
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	4
	Aturidae	0	0	0	0	0	0	2
	Estelloxus sp.	0	0	0	0	1	0	0
	Feltria sp.	0	0	0	0	0	0	3
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	15	0
	Lebertia sp.	1	0	0	0	0	25	23
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	7	0	2	2	5	0	23
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	1	5	86
	Torrenticolidae	1	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	1	0	0	0
	Nematoda	234	6	13	0	5	40	66
	Prostoma sp.	0	1	0	3	1	4	19
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	1	0	0	34	0	0	0
	TOTAL	**523**	**43**	**80**	**141**	**50**	**134**	**517**

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	Site ID Number	REF007-BMI-1-093019	REF007-BMI-1-093019	4-B6-2019-BMI-1-092619	4-B6-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	REF008-BMI-1-093019
	Bucket1 Weight (lbs)	38.8	38.8	30	30	32	32	37
	Bucket2 Weight (lbs)	37.4	37.4	27	27	34	34	35.4
	Collection Date	09-30-2019	09-30-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-30-2019
	EcoAnalysts Sample ID	8097.1-50	8097.2-50	8097.1-51	8097.2-51	8097.1-52	8097.2-52	8097.1-53
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	62.50	31.25	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	1	0	8
	Ephemerellidae	3	6	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	5	0	0	0	0	0	6
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	18	0	0	0	1	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	1	4	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	1
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	10	0	0	0	0	0	3
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	1	0	0	0	0	0	0
	Dicrotendipes sp.	8	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	5	0	0	0	0	0	2
	Monodiamesa sp.	3	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	21	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	1	0	0
	Parachironomus sp.	0	0	0	2	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	11	2	0	0	0	0	0
	Parakiefferiella sp.	4	5	5	1	6	7	0

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	Site ID Number	REF007-BMI-1-093019	REF007-BMI-1-093019	4-B6-2019-BMI-1-092619	4-B6-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	REF008-BMI-1-093019
	Bucket1 Weight (lbs)	38.8	38.8	30	30	32	32	37
	Bucket2 Weight (lbs)	37.4	37.4	27	27	34	34	35.4
	Collection Date	09-30-2019	09-30-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-30-2019
	EcoAnalysts Sample ID	8097.1-50	8097.2-50	8097.1-51	8097.2-51	8097.1-52	8097.2-52	8097.1-53
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	62.50	31.25	100.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	3	0	0	0	0	0	0
	Paratanytarsus sp.	2	0	0	0	0	0	0
	Paratendipes sp.	11	3	6	5	13	25	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	7	0	0	0	1	2
	Phaenopsectra sp.	23	31	0	0	0	0	0
	Polypedilum sp.	23	6	0	2	2	1	17
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	4	0	0	0	0	0	0
	Procladius sp.	3	1	1	0	1	2	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	2	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	32	2	0	0	0	0	1
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	1	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	1	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	20	13	5	9	3	2	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	12	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	1	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	1	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	2	0	0	0	0	0	0
	Enchytraeidae	8	33	0	0	0	4	1
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	6	2	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	2	0	0	0	0	0
	Pristina sp.	0	0	0	3	2	1	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	2	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	1	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	62	11	2	0	0	0	11
	Uncinais uncinata	16	4	0	0	0	0	0

Teck America UCR
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Study Benthos 2019
Data are not adjusted
for subsampling

ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	REF007-BMI-1-093019	REF007-BMI-1-093019	4-B6-2019-BMI-1-092619	4-B6-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	REF008-BMI-1-093019
	Bucket1 Weight (lbs)	38.8	38.8	30	30	32	32	37
	Bucket2 Weight (lbs)	37.4	37.4	27	27	34	34	35.4
	Collection Date	09-30-2019	09-30-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019	09-30-2019
	EcoAnalysts Sample ID	8097.1-50	8097.2-50	8097.1-51	8097.2-51	8097.1-52	8097.2-52	8097.1-53
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	62.50	31.25	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	144	8	8	0	16	0	5
	Sphaeriidae	0	0	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	1	0	0	0	0	0	0
	Stagnicola sp.	1	0	0	0	0	0	0
	Valvata humeralis	4	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	1	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	27	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	1	0
	Cladocera	0	251	0	3	0	1	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	38	0	6	0	4	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	68	0	11	0	8	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	18	10	2	22	9	171	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	4	0	1	0
	Arrenurus sp.	0	0	0	0	1	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	3	0	3	0	0
	Lebertia sp.	2	0	9	4	6	6	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	8	0	3	0
	Pionidae	0	0	0	1	0	0	0
	Sperchon sp.	0	0	0	1	0	0	0
	Torrenticola sp.	1	1	5	6	0	21	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	26	0	15	9	31	46	15
	Prostoma sp.	8	1	24	108	42	91	0
	Tardigrada	0	0	0	1	0	0	0
	Turbellaria	0	3	0	0	0	1	0
	TOTAL	**557**	**513**	**85**	**206**	**139**	**397**	**72**

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EcoAnalysts, Inc.
LIFE IN WATER

	Site ID Number	REF008-BMI-1-093019	REF009A-BMI-1-100219	REF009A-BMI-1-100219	REF006-BMI-1-100219	REF006-BMI-1-100219	CB035-BMI-1-100319	CB035-BMI-1-100319
	Bucket1 Weight (lbs)	37	50.6	50.6	57.2	57.2	24	24
	Bucket2 Weight (lbs)	35.4	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	09-30-2019	10-02-2019	10-02-2019	10-02-2019	10-02-2019	10-03-2019	10-03-2019
	EcoAnalysts Sample ID	8097.2-53	8097.1-54	8097.2-54	8097.1-55	8097.2-55	8097.1-56	8097.2-56
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	56.25	100.00	75.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	3	1	7	0	1	0
	Ephemerellidae	64	0	0	0	3	0	4
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	1	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	1	1	0	0	5	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	1	7	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	2
Odonata	Gomphidae	0	0	0	1	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	1	0	0	0	3	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	1	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	1	0	0	0
	Cricotopus/Orthocladius sp.	4	0	4	0	0	0	0
	Cryptochironomus sp.	3	1	0	5	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	1	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	2	6	32	1	0	1
	Monodiamesa sp.	0	0	0	1	0	0	0
	Nanocladius sp.	0	0	0	0	0	1	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	2	0	6	1	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	0	1	0	0	1	2
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	1	0	1	13	4	0	0
	Parakiefferiella sp.	3	0	2	1	1	17	28

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	REF008-BMI-1-093019	REF009A-BMI-1-100219	REF009A-BMI-1-100219	REF006-BMI-1-100219	REF006-BMI-1-100219	CB035-BMI-1-100319	CB035-BMI-1-100319
	Bucket1 Weight (lbs)	37	50.6	50.6	57.2	57.2	24	24
	Bucket2 Weight (lbs)	35.4	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	09-30-2019	10-02-2019	10-02-2019	10-02-2019	10-02-2019	10-03-2019	10-03-2019
	EcoAnalysts Sample ID	8097.2-53	8097.1-54	8097.2-54	8097.1-55	8097.2-55	8097.1-56	8097.2-56
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	56.25	100.00	75.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	1	0	0	0	0
	Paratendipes sp.	8	0	0	0	1	0	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	2	0	0	0	2	0	0
	Phaenopsectra sp.	3	0	0	3	4	0	0
	Polypedilum sp.	8	0	0	35	10	0	1
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	1	0	0	0	1	0
	Procladius sp.	0	0	0	0	0	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	1	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	1	0	0
	Robackia demeijerei	9	91	42	20	1	2	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	21	1	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	3	0	2	8	6	4	7
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	13	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	1	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	1	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	1	0	0	0
	Enchytraeidae	0	1	4	3	1	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	1	0	1	2	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	2	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	5	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	16	4	2	13	4	0	0
	Uncinais uncinata	1	1	4	10	2	0	0

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	REF008-BMI-1-093019	REF009A-BMI-1-100219	REF009A-BMI-1-100219	REF006-BMI-1-100219	REF006-BMI-1-100219	CB035-BMI-1-100319	CB035-BMI-1-100319
	Bucket1 Weight (lbs)	37	50.6	50.6	57.2	57.2	24	24
	Bucket2 Weight (lbs)	35.4	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	09-30-2019	10-02-2019	10-02-2019	10-02-2019	10-02-2019	10-03-2019	10-03-2019
	EcoAnalysts Sample ID	8097.2-53	8097.1-54	8097.2-54	8097.1-55	8097.2-55	8097.1-56	8097.2-56
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	56.25	100.00	75.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	3	0	0	0
	Sphaeriidae	0	1	1	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	1	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	2	0	0
	Stagnicola sp.	0	0	0	1	0	0	0
	Valvata humeralis	0	1	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	104	0	426	0	28	0	1
	Crangonyx sp.	0	0	0	10	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	4	0	2	0	7	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	241	0	9	0	12	0	1
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	5	0	3	1	1	1	3
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	1	0	0	1	1	0	4
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	3
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	1	1	1	0
	Lebertia sp.	0	0	0	4	0	0	10
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	15	0	22	0	2	5	109
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	1	0	3	14
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	3	0	0	0	0
	Nematoda	11	6	8	10	4	2	2
	Prostoma sp.	1	3	1	2	1	0	3
	Tardigrada	0	0	2	0	0	0	0
	Turbellaria	4	0	7	13	4	0	0
	TOTAL	**519**	**118**	**559**	**253**	**112**	**44**	**195**

Teck America UCR
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Study Benthos 2019
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	Site ID Number	REF005-BMI-1-100319	REF005-BMI-1-100319	REF010-BMI-1-100319	REF010-BMI-1-100319	REF012-BMI-1-100419	REF012-BMI-1-100419	EV011-BMI-1-100119
	Bucket1 Weight (lbs)	**51.6**	**51.6**	**39.4**	**39.4**	**50**	**50**	**31.5**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-03-2019**	**10-03-2019**	**10-03-2019**	**10-03-2019**	**10-04-2019**	**10-04-2019**	**10-01-2019**
	EcoAnalysts Sample ID	**8097.1-57**	**8097.2-57**	**8097.1-58**	**8097.2-58**	**8097.1-59**	**8097.2-59**	**8097.1-60**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**40.62**	**100.00**	**100.00**	**100.00**	**37.50**	**87.50**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	1	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	9	0	0	0	0	0	0
	Ephemerellidae	0	38	0	70	0	0	0
	Rhithrogena sp.	0	0	1	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	1	0	2	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	14	2	0	0	0	0	0
	Cheumatopsyche sp.	4	0	2	0	0	0	0
	Glossosoma sp.	0	0	0	1	0	0	0
	Glossosomatidae	0	0	1	0	0	0	0
	Hydropsyche sp.	1	0	91	7	1	0	0
	Leptoceridae	0	5	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	6	0	2	0	0	0	0
	Oecetis sp.	0	0	1	0	0	0	2
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	2	1	22	1	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	1	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	208
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	1	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	1	2	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	5	0	3	0	0	0
	Cryptochironomus sp.	0	7	0	0	2	3	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	1	0	0
	Dicrotendipes sp.	1	0	1	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	3	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	34	70	1	2	1	0	0
	Monodiamesa sp.	0	0	0	0	3	0	0
	Nanocladius sp.	0	6	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	1	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	9
	Parachironomus sp.	0	2	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	27	0	4	0	1	1
	Parakiefferiella sp.	0	11	0	2	0	0	0

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Study Benthos 2019
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EcoAnalysts, Inc.
LIFE IN WATER

	Site ID Number	REF005-BMI-1-100319	REF005-BMI-1-100319	REF010-BMI-1-100319	REF010-BMI-1-100319	REF012-BMI-1-100419	REF012-BMI-1-100419	EV011-BMI-1-100119
	Bucket1 Weight (lbs)	51.6	51.6	39.4	39.4	50	50	31.5
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-03-2019	10-03-2019	10-03-2019	10-03-2019	10-04-2019	10-04-2019	10-01-2019
	EcoAnalysts Sample ID	8097.1-57	8097.2-57	8097.1-58	8097.2-58	8097.1-59	8097.2-59	8097.1-60
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	40.62	100.00	100.00	100.00	37.50	87.50
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	8
	Paratanytarsus sp.	0	3	0	0	0	0	0
	Paratendipes sp.	0	0	0	1	0	2	41
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	5	0	1	0	0	0
	Phaenopsectra sp.	0	7	0	0	1	1	22
	Polypedilum sp.	6	92	3	30	4	1	103
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	0	0	0	1	0	96
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	70	16	59	37	0	3	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	14	20	14	13	0	4	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	21	1	10	0	0	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	4	3	0	6	1	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	4	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	1	0	0	1	4
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	6	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	1
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	1	2	0	0	3	8	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	3	0	1	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	1	0	0	0	1	0
	Nais behningi	0	2	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	1	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	3	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	7	0
	tubificoid Naididae w/o cap setae	0	0	0	0	8	6	3
	Uncinais uncinata	0	0	0	0	0	2	0

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	REF005-BMI-1-100319	REF005-BMI-1-100319	REF010-BMI-1-100319	REF010-BMI-1-100319	REF012-BMI-1-100419	REF012-BMI-1-100419	EV011-BMI-1-100119
	Bucket1 Weight (lbs)	51.6	51.6	39.4	39.4	50	50	31.5
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-03-2019	10-03-2019	10-03-2019	10-03-2019	10-04-2019	10-04-2019	10-01-2019
	EcoAnalysts Sample ID	8097.1-57	8097.2-57	8097.1-58	8097.2-58	8097.1-59	8097.2-59	8097.1-60
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	40.62	100.00	100.00	100.00	37.50	87.50
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	6	0	0	0	43	0	11
	Sphaeriidae	0	0	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	2	0	2	0	0	0	0
	Galba sp.	0	0	0	0	2	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	2	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	3	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	10	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	1	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	1	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	64	0	22	0	3	0
	Crangonyx sp.	2	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	1	0	0	0	40	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	21	0	11	0	355	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	1	0	1	0	12	2
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	2	0	16	0	1	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	7	0	4	0	0	0
	Aturidae	0	1	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	1	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	0
	Lebertia sp.	1	1	0	0	0	0	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	16	0	43	0	5	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	5	0	1	0	0	0	0
	Torrenticola sp.	0	0	0	0	0	0	0
	Torrenticolidae	0	0	0	1	0	0	0
Other Organisms	Hydra sp.	0	12	2	26	0	0	0
	Nematoda	26	9	0	2	30	58	5
	Prostoma sp.	3	15	4	15	1	1	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	21	0	17	0	0	0	0
	TOTAL	**235**	**500**	**229**	**344**	**119**	**522**	**516**

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	EV011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-2-100119	REF011-BMI-2-100119	CB046-BMI-1-100819	CB046-BMI-1-100819
	Bucket1 Weight (lbs)	**31.5**	**35.6**	**35.6**	**34.6**	**34.6**	**32**	**32**
	Bucket2 Weight (lbs)	**N/A**	**36**	**36**	**34.8**	**34.8**	**N/A**	**N/A**
	Collection Date	**10-01-2019**	**10-01-2019**	**10-01-2019**	**10-01-2019**	**10-01-2019**	**10-08-2019**	**10-08-2019**
	EcoAnalysts Sample ID	**8097.2-60**	**8097.1-61**	**8097.2-61**	**8097.1-62**	**8097.2-62**	**8097.1-63**	**8097.2-63**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**25.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	1	0	3
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	1	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	1
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	1	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	3	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	5	0	0	0	0
	Cricotopus/Orthocladius sp.	0	3	0	0	2	1	0
	Cryptochironomus sp.	0	0	2	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	1	8	13	3	0	0	0
	Monodiamesa sp.	0	0	0	1	0	0	0
	Nanocladius sp.	0	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	3	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	2	0	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	5	14	5	5	0	0
	Parakiefferiella sp.	0	4	0	1	1	3	5

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	EV011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-2-100119	REF011-BMI-2-100119	CB046-BMI-1-100819	CB046-BMI-1-100819
	Bucket1 Weight (lbs)	31.5	35.6	35.6	34.6	34.6	32	32
	Bucket2 Weight (lbs)	N/A	36	36	34.8	34.8	N/A	N/A
	Collection Date	10-01-2019	10-01-2019	10-01-2019	10-01-2019	10-01-2019	10-08-2019	10-08-2019
	EcoAnalysts Sample ID	8097.2-60	8097.1-61	8097.2-61	8097.1-62	8097.2-62	8097.1-63	8097.2-63
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	25.00	100.00	100.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	2	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	144	0	0	0	0	2	6
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	1	0	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	15	13	29	2	0	1	2
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	32	0	0	0	0	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	246	44	117	48	10	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	1	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	1	1	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	1	0	2
	Tanytarsus sp.	0	0	1	0	0	3	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	1	0	2	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	16	60	5	19	2	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	3	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	EV011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-2-100119	REF011-BMI-2-100119	CB046-BMI-1-100819	CB046-BMI-1-100819
	Bucket1 Weight (lbs)	31.5	35.6	35.6	34.6	34.6	32	32
	Bucket2 Weight (lbs)	N/A	36	36	34.8	34.8	N/A	N/A
	Collection Date	10-01-2019	10-01-2019	10-01-2019	10-01-2019	10-01-2019	10-08-2019	10-08-2019
	EcoAnalysts Sample ID	8097.2-60	8097.1-61	8097.2-61	8097.1-62	8097.2-62	8097.1-63	8097.2-63
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	25.00	100.00	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	1	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	0
	Sphaeriidae	0	3	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	1	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	1	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	1	0	0	0	0	0	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	3	0	0	0	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	205	0	2	0	1	0	3
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	41	0	0	0	0	2	24
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	1
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	1
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	1
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	0
	Lebertia sp.	0	0	0	0	0	6	4
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	1	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	6	0	4	0	5	0	18
	Pionidae	0	0	0	0	0	0	1
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	0	2	5
	Torrenticolidae	2	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	56	70	55	36	8	6	0
	Prostoma sp.	0	0	1	0	0	3	3
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**515**	**369**	**233**	**177**	**94**	**45**	**80**

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**CB036-BMI-1-100419**	**CB036-BMI-1-100419**	**CB006-BMI-1-100919**	**CB006-BMI-1-100919**	**CB012-BMI-1-100919**	**CB012-BMI-1-100919**	**CB007-BMI-1-100919**
	Bucket1 Weight (lbs)	**32.5**	**32.5**	**41**	**41**	**42**	**42**	**42**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**39**	**39**	**51**	**51**	**N/A**
	Collection Date	**10-04-2019**	**10-04-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**
	EcoAnalysts Sample ID	**8097.1-64**	**8097.2-64**	**8097.1-65**	**8097.2-65**	**8097.1-66**	**8097.2-66**	**8097.1-67**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	1
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	1
	Oecetis sp.	0	1	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	2
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	1	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	2	0	0	0	10
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	1	0	0	0	0	0	5
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	1	0	1	0	0	1
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	1
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	1	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	1	0	0
	Parakiefferiella sp.	0	8	0	9	1	3	4

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	Site ID Number	**CB036-BMI-1-100419**	**CB036-BMI-1-100419**	**CB006-BMI-1-100919**	**CB006-BMI-1-100919**	**CB012-BMI-1-100919**	**CB012-BMI-1-100919**	**CB007-BMI-1-100919**
	Bucket1 Weight (lbs)	**32.5**	**32.5**	**41**	**41**	**42**	**42**	**42**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**39**	**39**	**51**	**51**	**N/A**
	Collection Date	**10-04-2019**	**10-04-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**
	EcoAnalysts Sample ID	**8097.1-64**	**8097.2-64**	**8097.1-65**	**8097.2-65**	**8097.1-66**	**8097.2-66**	**8097.1-67**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	0	0	1	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	2	19	77	0	0	10
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	3	0	4	0	0	0
	Phaenopsectra sp.	0	0	0	0	0	0	3
	Polypedilum sp.	0	0	7	5	0	1	8
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	1	0	0	2
	Procladius sp.	0	0	0	4	0	0	32
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	7	0	39	4	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	20	0	25	0	0	13
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	18
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	0	1	4
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	1	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	2	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	5	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	1
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	10
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	5	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	1	3	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB036-BMI-1-100419	CB036-BMI-1-100419	CB006-BMI-1-100919	CB006-BMI-1-100919	CB012-BMI-1-100919	CB012-BMI-1-100919	CB007-BMI-1-100919
	Bucket1 Weight (lbs)	32.5	32.5	41	41	42	42	42
	Bucket2 Weight (lbs)	N/A	N/A	39	39	51	51	N/A
	Collection Date	10-04-2019	10-04-2019	10-09-2019	10-09-2019	10-09-2019	10-09-2019	10-09-2019
	EcoAnalysts Sample ID	8097.1-64	8097.2-64	8097.1-65	8097.2-65	8097.1-66	8097.2-66	8097.1-67
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	3
	Pisidium sp.	0	0	33	0	0	0	19
	Sphaeriidae	0	0	0	0	0	1	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	2	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	0	0	0	0
	Crangonyx sp.	0	0	0	0	0	0	13
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	0	1	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	0	0	8	0	0	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	1	1	4	0	0	2
	Pacifastacus leniusculus	0	0	0	0	0	0	1
Acari	Acari	0	1	0	1	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	1	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	1	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	1
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	5	0	0	0	0	0
	Hygrobates sp.	1	0	3	0	2	0	7
	Lebertia sp.	0	3	1	3	0	0	24
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	6
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	45	0	8	0	0	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	1
	Torrenticola sp.	1	9	0	5	0	1	3
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	1
	Nematoda	1	0	20	26	37	6	12
	Prostoma sp.	0	1	8	9	3	4	15
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	1	0	0	0	6
	TOTAL	**4**	**104**	**104**	**206**	**86**	**21**	**240**

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB007-BMI-1-100919	JS001-BMI-1-101019	JS001-BMI-1-101019	DM018-BMI-1-100919	DM018-BMI-1-100919	DM002-BMI-1-100919	DM002-BMI-1-100919
	Bucket1 Weight (lbs)	**42**	**52**	**52**	**60.4**	**60.4**	**63.6**	**63.6**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-09-2019**	**10-10-2019**	**10-10-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**
	EcoAnalysts Sample ID	**8097.2-67**	**8097.1-68**	**8097.2-68**	**8097.1-69**	**8097.2-69**	**8097.1-70**	**8097.2-70**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**31.25**	**100.00**	**27.34**	**100.00**	**100.00**	**100.00**	**100.00**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	1	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	1	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	2	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	5	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	1	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	1	0	0	0	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	1	8	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	2	0
	Parakiefferiella sp.	30	0	25	0	0	0	0

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB007-BMI-1-100919	JS001-BMI-1-101019	JS001-BMI-1-101019	DM018-BMI-1-100919	DM018-BMI-1-100919	DM002-BMI-1-100919	DM002-BMI-1-100919
	Bucket1 Weight (lbs)	**42**	**52**	**52**	**60.4**	**60.4**	**63.6**	**63.6**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-09-2019**	**10-10-2019**	**10-10-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**
	EcoAnalysts Sample ID	**8097.2-67**	**8097.1-68**	**8097.2-68**	**8097.1-69**	**8097.2-69**	**8097.1-70**	**8097.2-70**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**31.25**	**100.00**	**27.34**	**100.00**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	2	11	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	31	4	16	0	0	0	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	11	0	0	0	0	1	0
	Phaenopsectra sp.	1	0	0	0	0	0	0
	Polypedilum sp.	1	0	0	0	1	1	4
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	1	0	0	0	0
	Procladius sp.	4	0	0	0	0	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	214	331	250	61
	Stempellina sp.	1	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	69	1	3	0	0	0	0
	Thienemanniella sp.	0	1	0	0	0	0	0
	Thienemannimyia gr. sp.	0	2	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	2	1	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	20	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	3	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	6	7	4	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	1	0	1	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	1	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	2	0	0	0	0	0	0
	Pristina sp.	1	0	12	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	1	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**CB007-BMI-1-100919**	**JS001-BMI-1-101019**	**JS001-BMI-1-101019**	**DM018-BMI-1-100919**	**DM018-BMI-1-100919**	**DM002-BMI-1-100919**	**DM002-BMI-1-100919**
	Bucket1 Weight (lbs)	**42**	**52**	**52**	**60.4**	**60.4**	**63.6**	**63.6**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-09-2019**	**10-10-2019**	**10-10-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**	**10-09-2019**
	EcoAnalysts Sample ID	**8097.2-67**	**8097.1-68**	**8097.2-68**	**8097.1-69**	**8097.2-69**	**8097.1-70**	**8097.2-70**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**31.25**	**100.00**	**27.34**	**100.00**	**100.00**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	5	0	0	0	0	0
	Pisidium sp.	0	142	0	0	0	0	0
	Sphaeriidae	0	0	1	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	1	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	76	0	2	0	0	0	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	16	0	1	0	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	111	0	329	0	0	0	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	21	6	17	0	1	0	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	1	0	0	0	0
	Arrenurus sp.	0	1	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	11	1	0	0	0	0
	Lebertia sp.	2	17	2	0	0	0	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	6	0	13	0	0	0	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	6	0	2	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	94	44	56	2	3	13	2
	Prostoma sp.	19	76	0	0	0	0	0
	Tardigrada	0	0	3	0	0	0	0
	Turbellaria	1	0	0	0	0	1	0
	TOTAL	**540**	**336**	**500**	**218**	**337**	**268**	**67**

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	JS002-BMI-1-101019	JS002-BMI-1-101019	CB014-BMI-1-101519	CB014-BMI-1-101519	DM015-BMI-1-101019	DM015-BMI-1-101019	DM015-BMI-2-101019
	Bucket1 Weight (lbs)	38	38	49	49	47.4	47.4	49.6
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-10-2019	10-10-2019	10-15-2019	10-15-2019	10-10-2019	10-10-2019	10-10-2019
	EcoAnalysts Sample ID	8097.1-71	8097.2-71	8097.1-72	8097.2-72	8097.1-73	8097.2-73	8097.1-74
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	21.88	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	1
	Ephemerella sp.	0	0	0	0	5	5	7
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	2	0	0
	Ceraclea sp.	1	0	0	0	2	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	1
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	1	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	6	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	1	0	3
	Cryptotendipes sp.	0	1	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	4	0	0	0	0	3
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	1	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	1	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	10	17	43
	Monodiamesa sp.	0	0	0	0	1	0	1
	Nanocladius sp.	0	2	0	0	0	1	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	1	0	0	0	6	0	7
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	1	0	0	0	0	0	0
	Parachironomus sp.	5	1	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	0	9	0	0	0	14	4

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**JS002-BMI-1-101019**	**JS002-BMI-1-101019**	**CB014-BMI-1-101519**	**CB014-BMI-1-101519**	**DM015-BMI-1-101019**	**DM015-BMI-1-101019**	**DM015-BMI-2-101019**
	Bucket1 Weight (lbs)	**38**	**38**	**49**	**49**	**47.4**	**47.4**	**49.6**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-10-2019**	**10-10-2019**	**10-15-2019**	**10-15-2019**	**10-10-2019**	**10-10-2019**	**10-10-2019**
	EcoAnalysts Sample ID	**8097.1-71**	**8097.2-71**	**8097.1-72**	**8097.2-72**	**8097.1-73**	**8097.2-73**	**8097.1-74**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**21.88**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	12	20	0	0	0	1	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	4	0	1	0	0	0	2
	Phaenopsectra sp.	0	0	0	0	1	3	0
	Polypedilum sp.	10	6	0	2	3	30	9
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	1	0	0	0	0	0	0
	Procladius sp.	2	3	0	0	0	0	1
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	2	0	35	12	80	20	31
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	2	0	0	0	7	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	1	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	2	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	1	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	1	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	4	4	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	2	0	0	0	0	0
	Enchytraeidae	0	2	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	1	1	0	0	0	0	0
	Nais behningi	0	0	0	0	0	9	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	9	73	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	1	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	4	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	JS002-BMI-1-101019	JS002-BMI-1-101019	CB014-BMI-1-101519	CB014-BMI-1-101519	DM015-BMI-1-101019	DM015-BMI-1-101019	DM015-BMI-2-101019
	Bucket1 Weight (lbs)	38	38	49	49	47.4	47.4	49.6
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-10-2019	10-10-2019	10-15-2019	10-15-2019	10-10-2019	10-10-2019	10-10-2019
	EcoAnalysts Sample ID	8097.1-71	8097.2-71	8097.1-72	8097.2-72	8097.1-73	8097.2-73	8097.1-74
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	21.88	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	1	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	51	0	0	0	74	0	24
	Sphaeriidae	0	0	1	0	0	0	0
	Unionacea	0	0	0	0	1	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	1	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	4	0	0	0	1	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	13	0	0	0	1	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	38	0	1	0	0	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	5	35	0	1	0	10	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	3	0	0	0	0	0
	Arrenurus sp.	1	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	1
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	1	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	9	0	0	0	0	0	0
	Lebertia sp.	13	5	0	1	2	2	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	4	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	7	0	1	0	0	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	2	0	0	0	0	0	0
	Torrenticola sp.	3	6	0	0	0	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	35	214	6	3	48	43	11
	Prostoma sp.	90	55	0	0	0	2	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	9	1	0	0	0	0	1
	TOTAL	**282**	**514**	**43**	**23**	**237**	**175**	**150**

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	Site ID Number	DM015-BMI-2-101019	DM016-BMI-1-101019	DM016-BMI-1-101019	DM008-BMI-1-101119	DM008-BMI-1-101119	CB016-BMI-1-101119	CB016-BMI-1-101119
	Bucket1 Weight (lbs)	49.6	59.4	59.4	39.2	39.2	28	28
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-10-2019	10-10-2019	10-10-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019
	EcoAnalysts Sample ID	8097.2-74	8097.1-75	8097.2-75	8097.1-76	8097.2-76	8097.1-77	8097.2-77
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	7	0	0	32	62	3	4
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	2	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	1	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	1	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	14
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	1	0	1	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	6	0	0	2	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	3
	Cryptochironomus sp.	0	0	0	0	0	8	2
	Cryptotendipes sp.	0	0	0	0	0	0	1
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	3	1	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	1	0	0	23	5	0	2
	Monodiamesa sp.	0	0	0	1	1	0	1
	Nanocladius sp.	1	0	0	0	5	0	1
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	4	10	0	0
	Pagastia sp.	2	0	0	0	1	0	0
	Pagastiella sp.	0	0	0	0	0	1	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	6	1	0	0	1	0	2
	Parakiefferiella sp.	23	0	0	3	33	0	4

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	Site ID Number	**DM015-BMI-2-101019**	**DM016-BMI-1-101019**	**DM016-BMI-1-101019**	**DM008-BMI-1-101119**	**DM008-BMI-1-101119**	**CB016-BMI-1-101119**	**CB016-BMI-1-101119**
	Bucket1 Weight (lbs)	**49.6**	**59.4**	**59.4**	**39.2**	**39.2**	**28**	**28**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-10-2019**	**10-10-2019**	**10-10-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**
	EcoAnalysts Sample ID	**8097.2-74**	**8097.1-75**	**8097.2-75**	**8097.1-76**	**8097.2-76**	**8097.1-77**	**8097.2-77**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	0	0	0	0	0	2	5
	Paratanytarsus sp.	1	0	1	1	0	0	0
	Paratendipes sp.	0	0	0	0	0	20	87
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	0
	Phaenopsectra sp.	9	0	1	0	5	0	4
	Polypedilum sp.	36	0	0	2	14	42	6
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	0	0	0	0	13	8
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	11	58	34	26	17	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	2	0	0	0	1	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	7	0	0	0	11	2	18
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	3	0	0	4	8	0	7
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	2	0	0	0	1	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	1	0	0	0	2	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	1	2
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	12	37
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	1
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	1	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	6	0	0	0	11	0	0
	Nais sp.	0	0	0	1	0	0	0
	Pristina sp.	0	0	0	0	0	0	2
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	18
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	30	0
	tubificoid Naididae w/ cap setae	0	1	0	0	0	0	18
	tubificoid Naididae w/o cap setae	0	0	0	0	0	16	21
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	DM015-BMI-2-101019	DM016-BMI-1-101019	DM016-BMI-1-101019	DM008-BMI-1-101119	DM008-BMI-1-101119	CB016-BMI-1-101119	CB016-BMI-1-101119
	Bucket1 Weight (lbs)	**49.6**	**59.4**	**59.4**	**39.2**	**39.2**	**28**	**28**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-10-2019**	**10-10-2019**	**10-10-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**
	EcoAnalysts Sample ID	**8097.2-74**	**8097.1-75**	**8097.2-75**	**8097.1-76**	**8097.2-76**	**8097.1-77**	**8097.2-77**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	78	0
	Sphaeriidae	1	0	0	1	0	0	6
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	1	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	1	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	1	0	0	0	0	1	0
	Caecidotea sp.	0	0	0	1	0	0	0
	Calanoida	0	0	1	0	0	0	0
	Cladocera	5	0	0	0	0	0	3
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	1	0	0	0	0	0	3
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	1	0	0	0	0	0	44
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	35	0	1	0	4	2	38
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	2	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	1	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	3	0
	Lebertia sp.	1	0	0	6	5	2	3
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	2	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	0	6	0	1
	Pionidae	0	0	0	0	0	0	1
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	2	0	0
	Torrenticolidae	0	0	0	0	0	0	1
Other Organisms	Hydra sp.	4	0	0	0	1	0	0
	Nematoda	27	0	4	7	30	4	71
	Prostoma sp.	0	0	0	1	3	5	23
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	2	0	2	0	0	0
	TOTAL	**199**	**64**	**43**	**124**	**244**	**249**	**462**

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for subsampling

ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM010-BMI-1-101119	DM010-BMI-1-101119	CB018-BMI-1-101119	CB018-BMI-1-101119	CB047-BMI-1-101119	CB047-BMI-1-101119	CB009-BMI-1-101219
	Bucket1 Weight (lbs)	54.2	54.2	36	36	26	26	35
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-12-2019
	EcoAnalysts Sample ID	8097.1-78	8097.2-78	8097.1-79	8097.2-79	8097.1-80	8097.2-80	8097.1-81
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	1	2	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	1	0	0	0	1	0	0
	Cheumatopsyche sp.	0	0	0	0	2	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	1	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	1	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	1	0	0	0	0	0
	Cryptochironomus sp.	1	0	3	0	0	0	1
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	153	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	1	0	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	1	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	1
	Parachironomus sp.	0	0	0	0	0	8	0
	Paracladius sp.	0	0	0	1	0	0	0
	Paracladopelma sp.	0	1	0	2	0	0	0
	Parakiefferiella sp.	0	0	0	6	1	2	0

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ECO ANALYSTS, INC.
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	Site ID Number	**DM010-BMI-1-101119**	**DM010-BMI-1-101119**	**CB018-BMI-1-101119**	**CB018-BMI-1-101119**	**CB047-BMI-1-101119**	**CB047-BMI-1-101119**	**CB009-BMI-1-101219**
	Bucket1 Weight (lbs)	**54.2**	**54.2**	**36**	**36**	**26**	**26**	**35**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-11-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**	**10-11-2019**	**10-12-2019**
	EcoAnalysts Sample ID	**8097.1-78**	**8097.2-78**	**8097.1-79**	**8097.2-79**	**8097.1-80**	**8097.2-80**	**8097.1-81**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	0	0	0	5	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	3	42	0	0	0	28
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	2	0	0	1	0
	Phaenopsectra sp.	0	0	0	1	0	0	0
	Polypedilum sp.	2	1	33	3	0	0	5
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	0	24	18	0	0	10
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	38	14	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	1	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	2	0	0	6	0	7	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	22	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	0	6	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	1	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	1	0	0	0	1
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	2	40	0	0	1
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	5	0	2	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	1	2	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	1	0	0	0
	Pristina sp.	0	0	0	1	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	48	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	3	4	0	0	1
	tubificoid Naididae w/o cap setae	0	1	3	29	0	0	3
	Uncinais uncinata	0	0	0	0	0	0	0

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ECO ANALYSTS, INC.
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	Site ID Number	DM010-BMI-1-101119	DM010-BMI-1-101119	CB018-BMI-1-101119	CB018-BMI-1-101119	CB047-BMI-1-101119	CB047-BMI-1-101119	CB009-BMI-1-101219
	Bucket1 Weight (lbs)	54.2	54.2	36	36	26	26	35
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-12-2019
	EcoAnalysts Sample ID	8097.1-78	8097.2-78	8097.1-79	8097.2-79	8097.1-80	8097.2-80	8097.1-81
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	1	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	10
	Pisidium sp.	0	0	155	5	0	0	119
	Sphaeriidae	1	0	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	1	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	2	0	1	0
	Crangonyx sp.	0	0	0	0	1	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	1	0	11	0	1	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	0	0	86	0	4	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	1	8	50	0	2	6
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	2	0
	Aturidae	0	0	0	0	0	4	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	0
	Lebertia sp.	0	1	2	1	2	2	4
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	0	12	0	56	0
	Pionidae	0	0	0	1	0	0	0
	Sperchon sp.	0	0	0	0	0	0	1
	Torrenticola sp.	0	0	1	4	3	11	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	7	0	0	0	0	0
	Nematoda	71	9	8	64	16	8	3
	Prostoma sp.	0	0	3	10	4	29	5
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	8	0	0	0	1	1	0
	TOTAL	**126**	**46**	**297**	**592**	**35**	**142**	**199**

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB009-BMI-1-101219	CB010-BMI-1-101219	CB010-BMI-1-101219	CB039-BMI-1-101219	CB039-BMI-1-101219	DM025-BMI-1-101219	DM025-BMI-1-101219
	Bucket1 Weight (lbs)	35	45	45	22	22	61.8	61.8
	Bucket2 Weight (lbs)	N/A	30	30	N/A	N/A	N/A	N/A
	Collection Date	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019
	EcoAnalysts Sample ID	8097.2-81	8097.1-82	8097.2-82	8097.1-83	8097.2-83	8097.1-84	8097.2-84
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	37.50	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	1	0	0	0
	Ephemerellidae	0	0	0	0	2	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	1
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	1	1	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	16	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	1	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	1	0	0	1	0	0
	Cryptochironomus sp.	0	0	2	0	0	4	0
	Cryptotendipes sp.	1	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	1	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	2	0	1	0	2	0	0
	Orthocladiinae	0	0	1	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	2	2	3	0	0	0	0
	Parachironomus sp.	0	1	7	2	4	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	9	0	41	0	9	0	2

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Study Benthos 2019
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB009-BMI-1-101219	CB010-BMI-1-101219	CB010-BMI-1-101219	CB039-BMI-1-101219	CB039-BMI-1-101219	DM025-BMI-1-101219	DM025-BMI-1-101219
	Bucket1 Weight (lbs)	35	45	45	22	22	61.8	61.8
	Bucket2 Weight (lbs)	N/A	30	30	N/A	N/A	N/A	N/A
	Collection Date	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019
	EcoAnalysts Sample ID	8097.2-81	8097.1-82	8097.2-82	8097.1-83	8097.2-83	8097.1-84	8097.2-84
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	37.50	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	5	0	3	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	131	22	121	0	1	0	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	9	0	0	0	0
	Phaenopsectra sp.	1	0	0	0	0	0	0
	Polypedilum sp.	9	30	8	0	0	0	2
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	1	0	0	0	0	0	0
	Procladius sp.	12	0	6	0	1	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	68	8
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	1	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	12	3	41	0	36	0	0
	Thienemanniella sp.	0	0	3	0	0	0	0
	Thienemannimyia gr. sp.	0	1	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	2	0	0	0	3	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	1	0	0	0	4	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	3	0	0	0	0
	Amphichaeta americana	0	0	2	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	1	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	1	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	9	1	5	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	25	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	1	0	0	0	0
	Enchytraeidae	0	0	4	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	1	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	2	0	0
	Nais sp.	1	0	0	0	0	0	0
	Pristina sp.	2	0	8	0	1	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	1	0	0	0	0	0	0
	Specaria josinae	13	0	0	0	1	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	14	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	9	1	2	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB009-BMI-1-101219	CB010-BMI-1-101219	CB010-BMI-1-101219	CB039-BMI-1-101219	CB039-BMI-1-101219	DM025-BMI-1-101219	DM025-BMI-1-101219
	Bucket1 Weight (lbs)	35	45	45	22	22	61.8	61.8
	Bucket2 Weight (lbs)	N/A	30	30	N/A	N/A	N/A	N/A
	Collection Date	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019
	EcoAnalysts Sample ID	8097.2-81	8097.1-82	8097.2-82	8097.1-83	8097.2-83	8097.1-84	8097.2-84
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	37.50	100.00	100.00	100.00	100.00
	Vejdovskyella comata	1	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	25	0	0	0	0	0
	Sphaeriidae	0	0	1	0	0	1	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	1	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	1	0	6	0	3	0	0
	Crangonyx sp.	0	0	0	1	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	1	0	2	0	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	30	0	40	0	0	0	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	49	0	7	0	0	0	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	4	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	4	0	0
	Aturidae	0	0	0	0	7	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	1	0	0
	Hygrobates sp.	0	6	0	0	0	0	0
	Lebertia sp.	4	11	10	2	3	0	0
	Limnesia sp.	0	1	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	12	0	48	0	117	0	0
	Pionidae	1	0	0	0	0	0	0
	Sperchon sp.	0	1	0	0	0	0	0
	Torrenticola sp.	0	0	14	1	28	0	0
	Torrenticolidae	1	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	1	0	1	0	2
	Nematoda	71	18	78	3	6	15	1
	Prostoma sp.	5	11	56	13	43	0	1
	Tardigrada	0	0	2	0	0	0	0
	Turbellaria	0	1	0	0	0	0	0
	TOTAL	**429**	**139**	**566**	**24**	**280**	**92**	**17**

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM019-BMI-1-101419	DM019-BMI-1-101419	DM020-BMI-1-101419	DM020-BMI-1-101419	DM027-BMI-1-101419	DM027-BMI-1-101419	CB020-BMI-1-101419
	Bucket1 Weight (lbs)	33	33	45.6	45.6	48	48	46
	Bucket2 Weight (lbs)	41.8	41.8	N/A	N/A	34.2	34.2	N/A
	Collection Date	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019
	EcoAnalysts Sample ID	8097.1-85	8097.2-85	8097.1-86	8097.2-86	8097.1-87	8097.2-87	8097.1-88
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	70.83
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	1	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	2	0	0	1	2	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	9
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	1	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	2	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	3	0	0	0	4	0	1
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	1	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	2	1	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	1	0	0	0	0	1
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	1	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	8
	Parachironomus sp.	0	0	0	0	0	1	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	5	5	0	0	0	1	0
	Parakiefferiella sp.	0	1	0	3	0	0	1

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM019-BMI-1-101419	DM019-BMI-1-101419	DM020-BMI-1-101419	DM020-BMI-1-101419	DM027-BMI-1-101419	DM027-BMI-1-101419	CB020-BMI-1-101419
	Bucket1 Weight (lbs)	33	33	45.6	45.6	48	48	46
	Bucket2 Weight (lbs)	41.8	41.8	N/A	N/A	34.2	34.2	N/A
	Collection Date	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019
	EcoAnalysts Sample ID	8097.1-85	8097.2-85	8097.1-86	8097.2-86	8097.1-87	8097.2-87	8097.1-88
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	70.83
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	8
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	0	0	0	0	0	135
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	1	0	0	0	0	0
	Phaenopsectra sp.	0	3	0	0	0	1	0
	Polypedilum sp.	0	24	0	1	9	14	50
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	1	0	0	0
	Procladius sp.	0	0	0	0	0	0	49
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	1
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	31	20	27	25	32	2	1
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	0	2	3	2
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	10
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	1	0	13	0	3
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	3	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	1
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	36
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	2	0	2	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	2
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	2	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	1
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	1	0
	tubificoid Naididae w/o cap setae	2	1	0	0	0	0	17
	Uncinais uncinata	0	0	0	0	0	0	2

Teck America UCR
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**DM019-BMI-1-101419**	**DM019-BMI-1-101419**	**DM020-BMI-1-101419**	**DM020-BMI-1-101419**	**DM027-BMI-1-101419**	**DM027-BMI-1-101419**	**CB020-BMI-1-101419**
	Bucket1 Weight (lbs)	**33**	**33**	**45.6**	**45.6**	**48**	**48**	**46**
	Bucket2 Weight (lbs)	**41.8**	**41.8**	**N/A**	**N/A**	**34.2**	**34.2**	**N/A**
	Collection Date	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**
	EcoAnalysts Sample ID	**8097.1-85**	**8097.2-85**	**8097.1-86**	**8097.2-86**	**8097.1-87**	**8097.2-87**	**8097.1-88**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**70.83**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	1
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	111
	Sphaeriidae	0	0	0	0	1	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	3	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	1	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	2	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	1	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	3
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	0	0	1	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	1	0	0	0	1	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	1	0	0	0	18	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	10	0	0	0	6	31
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	3	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	0	1
	Lebertia sp.	0	0	0	0	0	0	7
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	3
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	1	0	0	0	2	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	1
	Torrenticola sp.	0	0	0	0	0	0	1
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	1	0	0	1	6	0
	Nematoda	13	16	6	5	4	29	10
	Prostoma sp.	0	1	0	0	0	0	11
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	1	0	0	0	1	1	2
	TOTAL	**59**	**94**	**34**	**40**	**75**	**96**	**520**

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Study Benthos 2019
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**CB020-BMI-1-101419**	**CB020-BMI-2-101419**	**CB020-BMI-2-101419**	**CB021-BMI-1-101419**	**CB021-BMI-1-101419**	**CB024-BMI-1-101419**	**CB024-BMI-1-101419**
	Bucket1 Weight (lbs)	**46**	**61**	**61**	**46.5**	**46.5**	**42**	**42**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**31**	**31**	**N/A**	**N/A**
	Collection Date	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**	**10-14-2019**
	EcoAnalysts Sample ID	**8097.2-88**	**8097.1-89**	**8097.2-89**	**8097.1-90**	**8097.2-90**	**8097.1-91**	**8097.2-91**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**31.25**	**100.00**	**43.75**	**100.00**	**37.50**	**100.00**	**20.83**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	28	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	1	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	1	0	0
	Cryptochironomus sp.	0	5	0	0	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	7	1	10	0	1	0	2
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	2	2	2	1	0	1	1
	Parachironomus sp.	0	3	1	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	1	0	0	0	0	0
	Parakiefferiella sp.	1	0	9	0	0	0	0

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB020-BMI-1-101419	CB020-BMI-2-101419	CB020-BMI-2-101419	CB021-BMI-1-101419	CB021-BMI-1-101419	CB024-BMI-1-101419	CB024-BMI-1-101419
	Bucket1 Weight (lbs)	46	61	61	46.5	46.5	42	42
	Bucket2 Weight (lbs)	N/A	N/A	N/A	31	31	N/A	N/A
	Collection Date	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019
	EcoAnalysts Sample ID	8097.2-88	8097.1-89	8097.2-89	8097.1-90	8097.2-90	8097.1-91	8097.2-91
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	31.25	100.00	43.75	100.00	37.50	100.00	20.83
	Paralauterborniella nigrohalteralis	9	13	16	0	1	0	3
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	139	98	116	0	12	5	27
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	31	16	0	4	5	2	25
	Phaenopsectra sp.	2	0	2	0	0	0	0
	Polypedilum sp.	5	53	7	2	0	6	2
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	1	0	0	0	0	0	0
	Procladius sp.	16	54	18	5	13	28	19
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	1	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	1	0	6	0	1	0	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	4	0	1	0	3	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	1	0	0	0	1
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	1
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	1	1	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	25	8	16	0	0	0	5
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	1	0	0	0	0
	Dero digitata	0	0	0	0	0	0	2
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	1
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	1	0	1	0	0	0	3
	Specaria josinae	39	0	29	0	9	0	20
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	1	0	1	0	0	0	1
	tubificoid Naididae w/o cap setae	19	10	23	1	8	0	0
	Uncinais uncinata	1	0	0	0	0	0	0

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB020-BMI-1-101419	CB020-BMI-2-101419	CB020-BMI-2-101419	CB021-BMI-1-101419	CB021-BMI-1-101419	CB024-BMI-1-101419	CB024-BMI-1-101419
	Bucket1 Weight (lbs)	46	61	61	46.5	46.5	42	42
	Bucket2 Weight (lbs)	N/A	N/A	N/A	31	31	N/A	N/A
	Collection Date	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019
	EcoAnalysts Sample ID	8097.2-88	8097.1-89	8097.2-89	8097.1-90	8097.2-90	8097.1-91	8097.2-91
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	31.25	100.00	43.75	100.00	37.50	100.00	20.83
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	1	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	3	0	0	0	6	0
	Pisidium sp.	0	73	0	0	0	140	5
	Sphaeriidae	0	0	0	27	1	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	1	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	2	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	1	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	2	0	3	0	21	1
	Calanoida	0	0	0	0	0	0	0
	Cladocera	20	0	13	0	6	0	6
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	5	0	4	0	9	0	6
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	114	0	123	0	421	0	298
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	39	28	53	3	36	11	59
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	1	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	5	0	4	0	5	0
	Lebertia sp.	1	15	6	1	0	4	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	4	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	11	0	12	0	4	0	3
	Pionidae	1	1	3	0	0	0	0
	Sperchon sp.	0	1	0	0	0	0	0
	Torrenticola sp.	0	1	0	0	0	0	0
	Torrenticolidae	0	0	1	0	1	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	54	10	34	3	30	4	27
	Prostoma sp.	1	3	0	0	0	0	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	1	1	0	0	0	1
	TOTAL	**548**	**417**	**541**	**55**	**559**	**238**	**519**

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Phase 3 Sediment
Study Benthos 2019
Data are not adjusted
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	CB029-BMI-1-101519	CB029-BMI-1-101519	CB029-BMI-2-101519	CB029-BMI-2-101519	CB044-BMI-1-101519	CB044-BMI-1-101519	DM024-BMI-1-101519
	Bucket1 Weight (lbs)	49	49	39	39	57	57	56
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	56.4
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019
	EcoAnalysts Sample ID	8097.1-92	8097.2-92	8097.1-93	8097.2-93	8097.1-94	8097.2-94	8097.1-95
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	43.75	100.00	68.75	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	1	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	1	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	1	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	1	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	2	0	0	1	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	1	0
	Nanocladius sp.	0	0	0	0	0	1	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	1	0	1	0	0	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	1	0	0	0	0	0
	Parakiefferiella sp.	0	4	0	0	0	18	0

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	Site ID Number	CB029-BMI-1-101519	CB029-BMI-1-101519	CB029-BMI-2-101519	CB029-BMI-2-101519	CB044-BMI-1-101519	CB044-BMI-1-101519	DM024-BMI-1-101519
	Bucket1 Weight (lbs)	49	49	39	39	57	57	56
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	56.4
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019
	EcoAnalysts Sample ID	8097.1-92	8097.2-92	8097.1-93	8097.2-93	8097.1-94	8097.2-94	8097.1-95
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	43.75	100.00	68.75	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	0	2	0	4	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	1	14	0	7	1	2	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	22	1	7	4	7	0
	Phaenopsectra sp.	0	0	0	0	0	0	0
	Polypedilum sp.	3	1	0	0	3	7	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	1	1	0
	Procladius sp.	18	21	10	18	10	19	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	2	45
	Stempellina sp.	0	1	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	2	0	0	0	1	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	5	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	1	1	6
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	2	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	1	0	0	0	0	0
	Aulodrilus pluriseta	0	3	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	1	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	1	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	3	1	2	0	0	0
	Uncinais uncinata	1	2	0	0	0	0	0

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	Site ID Number	CB029-BMI-1-101519	CB029-BMI-1-101519	CB029-BMI-2-101519	CB029-BMI-2-101519	CB044-BMI-1-101519	CB044-BMI-1-101519	DM024-BMI-1-101519
	Bucket1 Weight (lbs)	49	49	39	39	57	57	56
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	56.4
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019
	EcoAnalysts Sample ID	8097.1-92	8097.2-92	8097.1-93	8097.2-93	8097.1-94	8097.2-94	8097.1-95
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	43.75	100.00	68.75	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	4	0	0	0	3	0	0
	Pisidium sp.	222	0	179	0	155	0	0
	Sphaeriidae	0	3	0	3	0	1	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	2	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	1	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	7	0	13	0	2	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	12	0	10	0	1	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	8	0	12	0	2	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	327	0	390	0	255	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	17	51	9	38	3	12	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	14	0	7	0	20	0	0
	Lebertia sp.	7	7	4	3	19	15	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	2	0	0	0	0
	Neumania sp.	0	0	1	0	0	0	0
	Oribatei	0	2	0	3	0	7	0
	Pionidae	0	0	0	0	2	1	0
	Sperchon sp.	0	0	2	0	0	0	0
	Torrenticola sp.	0	3	0	0	0	0	0
	Torrenticolidae	0	0	0	1	0	0	0
Other Organisms	Hydra sp.	0	1	0	0	0	0	0
	Nematoda	0	15	3	46	8	23	11
	Prostoma sp.	0	0	0	0	0	0	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	1	0	0	0	0	0
	TOTAL	**301**	**511**	**233**	**546**	**236**	**380**	**62**

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	Site ID Number	DM024-BMI-1-101519	DM024-BMI-2-101519	DM024-BMI-2-101519	3-R7-2019-BMI-1-101519	3-R7-2019-BMI-1-101519	1-B6-NRT-BMI-1-101619	1-B6-NRT-BMI-1-101619
	Bucket1 Weight (lbs)	56	48.6	48.6	43.5	43.5	50.2	50.2
	Bucket2 Weight (lbs)	56.4	52.6	52.6	N/A	N/A	52.6	52.6
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-16-2019	10-16-2019
	EcoAnalysts Sample ID	8097.2-95	8097.1-96	8097.2-96	8097.1-97	8097.2-97	8097.1-98	8097.2-98
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	3	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	1	0	0
	Plecoptera	0	0	0	0	0	0	3
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	1	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	1	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	1	0	0	1
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	2
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	13
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	1
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	4
	Cryptochironomus sp.	0	0	0	0	1	1	1
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	1	0	0	9	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	1	0
	Microtendipes pedellus gr.	0	0	0	1	6	2	11
	Monodiamesa sp.	0	0	0	0	0	12	38
	Nanocladius sp.	0	0	0	0	2	0	1
	Orthocladiinae	0	0	0	0	0	2	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	8	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	1	4	0	0	0	10
	Parakiefferiella sp.	1	0	0	2	6	0	6

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	Site ID Number	DM024-BMI-1-101519	DM024-BMI-2-101519	DM024-BMI-2-101519	3-R7-2019-BMI-1-101519	3-R7-2019-BMI-1-101519	1-B6-NRT-BMI-1-101619	1-B6-NRT-BMI-1-101619
	Bucket1 Weight (lbs)	56	48.6	48.6	43.5	43.5	50.2	50.2
	Bucket2 Weight (lbs)	56.4	52.6	52.6	N/A	N/A	52.6	52.6
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-16-2019	10-16-2019
	EcoAnalysts Sample ID	8097.2-95	8097.1-96	8097.2-96	8097.1-97	8097.2-97	8097.1-98	8097.2-98
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	0	0	0	0	0	3	0
	Paratanytarsus sp.	0	0	0	0	0	4	21
	Paratendipes sp.	0	0	0	0	0	1	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	0	1
	Phaenopsectra sp.	0	0	0	0	1	0	46
	Polypedilum sp.	0	0	10	0	1	1	0
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	1
	Procladius sp.	0	0	0	0	0	1	1
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	1	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	31	25	17	1	3	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	2	13	4	12
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	1	1	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	1	0	0	0
	Simuliidae	0	0	20	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	14	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	2	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	3
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

Teck America UCR
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Study Benthos 2019
Data are not adjusted
for subsampling

ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM024-BMI-1-101519	DM024-BMI-2-101519	DM024-BMI-2-101519	3-R7-2019-BMI-1-101519	3-R7-2019-BMI-1-101519	1-B6-NRT-BMI-1-101619	1-B6-NRT-BMI-1-101619
	Bucket1 Weight (lbs)	56	48.6	48.6	43.5	43.5	50.2	50.2
	Bucket2 Weight (lbs)	56.4	52.6	52.6	N/A	N/A	52.6	52.6
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-16-2019	10-16-2019
	EcoAnalysts Sample ID	8097.2-95	8097.1-96	8097.2-96	8097.1-97	8097.2-97	8097.1-98	8097.2-98
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	0
	Sphaeriidae	0	1	0	0	0	1	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	1	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	2	1	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	3	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	1	0
	Caecidotea sp.	0	0	0	0	0	1	1
	Calanoida	0	0	1	0	0	0	0
	Cladocera	0	0	1	0	4	0	1
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	0	0	1	0	1
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	0	1	0	3	0	1
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	0	6	0	8	0	2
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	1	2
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	1	0	1	0
	Lebertia sp.	0	0	0	0	2	0	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	0	1	0	305	0	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	0
	Torrenticola sp.	0	0	0	0	13	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	3	9	25	1	1	9	39
	Prostoma sp.	0	0	0	3	4	1	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	0
	TOTAL	**36**	**37**	**103**	**17**	**379**	**69**	**223**

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Study Benthos 2019
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM061-BMI-1-101619	DM061-BMI-1-101619	DM044-BMI-1-101619	DM044-BMI-1-101619	CB027-BMI-1-101519	CB027-BMI-1-101519	1-B5-NRT-BMI-1-101519
	Bucket1 Weight (lbs)	44.4	44.4	42.4	42.4	36	36	48.2
	Bucket2 Weight (lbs)	44	44	N/A	N/A	26	26	48
	Collection Date	10-16-2019	10-16-2019	10-16-2019	10-16-2019	10-15-2019	10-15-2019	10-15-2019
	EcoAnalysts Sample ID	8097.1-99	8097.2-99	8097.1-100	8097.2-100	8097.1-101	8097.2-101	8097.1-102
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	33.33	5.47	100.00	18.75	100.00	56.25	66.41
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	1
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	0
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	16	0	0	0	0
	Mystacides sp.	9	0	0	0	0	0	0
	Oecetis sp.	8	0	13	0	0	0	6
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	1	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	1
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	1	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	2
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	1
	Cricotopus/Orthocladius sp.	0	0	0	1	0	0	0
	Cryptochironomus sp.	2	2	27	8	2	0	0
	Cryptotendipes sp.	1	0	2	5	0	0	0
	Demicryptochironomus sp.	0	0	8	0	1	0	0
	Dicrotendipes sp.	0	0	1	0	0	0	45
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	1	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	34	0	0	0	1
	Monodiamesa sp.	0	0	2	0	1	0	0
	Nanocladius sp.	0	0	0	0	0	1	1
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	4	3	10	16	1	2	0
	Parachironomus sp.	0	0	0	0	0	0	5
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	0	0
	Parakiefferiella sp.	0	1	10	72	9	1	1

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	Site ID Number	DM061-BMI-1-101619	DM061-BMI-1-101619	DM044-BMI-1-101619	DM044-BMI-1-101619	CB027-BMI-1-101519	CB027-BMI-1-101519	1-B5-NRT-BMI-1-101519
	Bucket1 Weight (lbs)	44.4	44.4	42.4	42.4	36	36	48.2
	Bucket2 Weight (lbs)	44	44	N/A	N/A	26	26	48
	Collection Date	10-16-2019	10-16-2019	10-16-2019	10-16-2019	10-15-2019	10-15-2019	10-15-2019
	EcoAnalysts Sample ID	8097.1-99	8097.2-99	8097.1-100	8097.2-100	8097.1-101	8097.2-101	8097.1-102
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	33.33	5.47	100.00	18.75	100.00	56.25	66.41
	Paralauterborniella nigrohalteralis	0	1	5	4	0	3	0
	Paratanytarsus sp.	0	0	0	0	0	0	2
	Paratendipes sp.	1	5	12	23	9	43	8
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	8	13	3	3	1	25	0
	Phaenopsectra sp.	2	3	0	1	0	0	2
	Polypedilum sp.	7	3	49	6	11	10	6
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	2	0	0	0
	Procladius sp.	5	3	3	1	23	53	33
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	1
	Pseudochironomus sp.	1	0	1	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	1
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	0	0	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	7	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	2	9	14	49	0	0	1
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	6	0	0	0	0	0	4
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	5	1	68	8	4	2	1
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	1	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	1	0	0	0	1	0
	Aulodrilus americanus	6	0	0	0	0	0	0
	Aulodrilus limnobius	4	4	0	0	2	0	0
	Aulodrilus pigueti	9	7	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	7	1
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	1	0	0	0	0	0	0
	Erpobdella sp.	4	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	3
	Helobdella sp.	2	0	0	0	0	0	0
	Helobdella stagnalis	3	0	0	0	0	0	2
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	2	0	0	0	1	0
	Pristina sp.	0	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	30	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	1	0	0	0	1	0
	tubificoid Naididae w/o cap setae	10	7	0	0	2	5	4
	Uncinais uncinata	0	0	0	0	0	0	0

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Study Benthos 2019
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	**DM061-BMI-1-101619**	**DM061-BMI-1-101619**	**DM044-BMI-1-101619**	**DM044-BMI-1-101619**	**CB027-BMI-1-101519**	**CB027-BMI-1-101519**	**1-B5-NRT-BMI-1-101519**
	Bucket1 Weight (lbs)	**44.4**	**44.4**	**42.4**	**42.4**	**36**	**36**	**48.2**
	Bucket2 Weight (lbs)	**44**	**44**	**N/A**	**N/A**	**26**	**26**	**48**
	Collection Date	**10-16-2019**	**10-16-2019**	**10-16-2019**	**10-16-2019**	**10-15-2019**	**10-15-2019**	**10-15-2019**
	EcoAnalysts Sample ID	**8097.1-99**	**8097.2-99**	**8097.1-100**	**8097.2-100**	**8097.1-101**	**8097.2-101**	**8097.1-102**
	Sample Size Fraction	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**
	Percent Subsampled	**33.33**	**5.47**	**100.00**	**18.75**	**100.00**	**56.25**	**66.41**
	Vejdovskyella comata	0	1	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	1	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	3
	Pisidium sp.	256	1	94	0	141	0	35
	Sphaeriidae	0	0	0	1	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	6
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	1	0	0	0	0	0	44
	Helisoma anceps	3	0	0	0	0	0	1
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	168
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	8	0	0	0	0	0	88
Crustacea	Amphipoda	0	0	0	1	0	0	0
	Caecidotea sp.	117	12	29	5	8	0	12
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	2	0	4	0	5	0
	Crangonyx sp.	7	0	1	0	0	0	2
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	2	0	1	0	9	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	15	0	57	0	268	0
	Hyalella sp.	3	0	0	0	0	0	0
	Ostracoda	2	50	33	37	10	34	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	1	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	7	0	7	0	0
	Lebertia sp.	0	0	34	6	4	1	0
	Limnesia sp.	1	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	1	0	9	0	8	0
	Pionidae	1	0	0	0	0	0	0
	Sperchon sp.	0	0	1	0	2	0	0
	Torrenticola sp.	0	0	0	0	0	0	0
	Torrenticolidae	0	0	0	1	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	21	385	53	192	3	25	51
	Prostoma sp.	0	3	0	0	0	1	0
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	7	0	0	0	0	2	0
	TOTAL	**529**	**538**	**540**	**513**	**242**	**538**	**543**

Teck America UCR
Phase 3 Sediment
Study Benthos 2019
Data are not adjusted
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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	1-B5-NRT-BMI-1-101519	DM007-BMI-1-101519	DM007-BMI-1-101519	CB056-BMI-1-101719	CB056-BMI-1-101719	DM039-BMI-1-101719	DM039-BMI-1-101719
	Bucket1 Weight (lbs)	48.2	54.6	54.6	44	44	28	28
	Bucket2 Weight (lbs)	48	55.8	55.8	N/A	N/A	N/A	N/A
	Collection Date	10-15-2019	10-15-2019	10-15-2019	10-17-2019	10-17-2019	10-17-2019	10-17-2019
	EcoAnalysts Sample ID	8097.2-102	8097.1-103	8097.2-103	8097.1-104	8097.2-104	8097.1-105	8097.2-105
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	10.42	100.00	100.00	100.00	16.67	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	2	0	0	0
	Ephemerellidae	0	0	0	0	1	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	1	0	0	1	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	1	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	2	0	0	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	10	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	1
	Monodiamesa sp.	0	0	0	1	0	0	0
	Nanocladius sp.	0	0	0	0	2	0	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	24	1	0	0
	Parachironomus sp.	0	0	0	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	2	0	0	0	0	0
	Parakiefferiella sp.	1	0	0	4	9	0	0

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EcoAnalysts, Inc.
LIFE IN WATER

	Site ID Number	1-B5-NRT-BMI-1-101519	DM007-BMI-1-101519	DM007-BMI-1-101519	CB056-BMI-1-101719	CB056-BMI-1-101719	DM039-BMI-1-101719	DM039-BMI-1-101719
	Bucket1 Weight (lbs)	**48.2**	**54.6**	**54.6**	**44**	**44**	**28**	**28**
	Bucket2 Weight (lbs)	**48**	**55.8**	**55.8**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-15-2019**	**10-15-2019**	**10-15-2019**	**10-17-2019**	**10-17-2019**	**10-17-2019**	**10-17-2019**
	EcoAnalysts Sample ID	**8097.2-102**	**8097.1-103**	**8097.2-103**	**8097.1-104**	**8097.2-104**	**8097.1-105**	**8097.2-105**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**10.42**	**100.00**	**100.00**	**100.00**	**16.67**	**100.00**	**100.00**
	Paralauterborniella nigrohalteralis	0	0	0	16	3	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	16	0	0	58	39	0	0
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	2	0	0	31	21	0	0
	Phaenopsectra sp.	3	0	0	0	0	0	0
	Polypedilum sp.	4	0	1	73	2	0	2
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	2	0	0	85	20	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	407	166	0	0	6	1
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	0
	Synorthocladius sp.	0	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	2	3	0	0
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	8	2	0	0
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	1
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	0
	Pristina sp.	1	0	0	0	0	0	0
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	1	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	1	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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	Site ID Number	**1-B5-NRT-BMI-1- 101519**	**DM007-BMI-1- 101519**	**DM007-BMI-1- 101519**	**CB056-BMI-1- 101719**	**CB056-BMI-1- 101719**	**DM039-BMI-1- 101719**	**DM039-BMI-1- 101719**
	Bucket1 Weight (lbs)	**48.2**	**54.6**	**54.6**	**44**	**44**	**28**	**28**
	Bucket2 Weight (lbs)	**48**	**55.8**	**55.8**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-15-2019**	**10-15-2019**	**10-15-2019**	**10-17-2019**	**10-17-2019**	**10-17-2019**	**10-17-2019**
	EcoAnalysts Sample ID	**8097.2-102**	**8097.1-103**	**8097.2-103**	**8097.1-104**	**8097.2-104**	**8097.1-105**	**8097.2-105**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**10.42**	**100.00**	**100.00**	**100.00**	**16.67**	**100.00**	**100.00**
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	1	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	1	0	0	0	0	0
	Sphaeriidae	0	0	0	4	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	2	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	4	0	0	0
	Calanoida	2	0	0	0	0	0	0
	Cladocera	2	0	0	0	29	0	0
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	20	0	1	0	2	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	22	0	0	0	328	0	5
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	44	0	1	19	22	0	2
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	1	0	0	0	2	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	3	0	0	0
	Lebertia sp.	0	0	0	15	0	0	0
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	1	0	0	0	9	0	1
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	3	0	0	0
	Torrenticola sp.	0	0	0	1	1	0	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	371	45	2	31	38	3	1
	Prostoma sp.	0	0	0	0	0	0	1
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	1	0	0	0	0	0
	TOTAL	**506**	**458**	**171**	**387**	**534**	**10**	**15**

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ECO ANALYSTS, INC.
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	Site ID Number	3-R8-2019-BMI-1-101619	3-R8-2019-BMI-1-101619	CB005-BMI-1-101819	CB005-BMI-1-101819	CB040-BMI-1-101819	CB040-BMI-1-101819	DM047-BMI-1-101819
	Bucket1 Weight (lbs)	13	13	20	20	16	16	53
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-16-2019	10-16-2019	10-18-2019	10-18-2019	10-18-2019	10-18-2019	10-18-2019
	EcoAnalysts Sample ID	8097.1-106	8097.2-106	8097.1-107	8097.2-107	8097.1-108	8097.2-108	8097.1-109
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	0	0	0	0	0	0	5
	Ephemerellidae	0	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	0	0	0	0	1
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	4
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	0	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	0	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	0	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	7
	Cricotopus/Orthocladius sp.	0	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	1	3
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	0	0	0	0	0	0	5
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	1
	Eukiefferiella sp.	0	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	0	0	0	0	0	0	218
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	0	0	0	0	0	1	0
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	5
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	0	0
	Parachironomus sp.	0	0	0	0	0	3	2
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	1	0
	Parakiefferiella sp.	0	0	0	2	0	9	4

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ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	3-R8-2019-BMI-1-101619	3-R8-2019-BMI-1-101619	CB005-BMI-1-101819	CB005-BMI-1-101819	CB040-BMI-1-101819	CB040-BMI-1-101819	DM047-BMI-1-101819
	Bucket1 Weight (lbs)	13	13	20	20	16	16	53
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-16-2019	10-16-2019	10-18-2019	10-18-2019	10-18-2019	10-18-2019	10-18-2019
	EcoAnalysts Sample ID	8097.1-106	8097.2-106	8097.1-107	8097.2-107	8097.1-108	8097.2-108	8097.1-109
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	0	0	0	0	0	5
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	0	0	0	1	0
	Phaenopsectra sp.	0	0	0	0	0	0	4
	Polypedilum sp.	0	0	0	1	0	1	26
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	1
	Procladius sp.	0	0	0	0	0	0	0
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	0	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	1
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	1	0	0	0	3
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	0	0	0	0	0	0	4
	Synorthocladius sp.	0	0	0	0	0	0	10
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	0	0	0	2	0	8	15
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	0	0	0	0	0	0	10
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	0	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	0	0	1
	Diptera	0	0	0	0	0	0	0
	Empididae	0	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	1
	Simuliidae	0	1	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	1
Annelida	Aeolosoma sp.	0	0	0	0	0	0	0
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	0
	Aulodrilus pluriseta	0	0	0	0	0	0	0
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	0	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	0
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	0	0
	Nais behningi	0	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	1
	Pristina sp.	0	0	0	0	0	1	5
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	0
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	0	0
	tubificoid Naididae w/o cap setae	0	0	0	0	0	0	0
	Uncinais uncinata	0	0	0	0	0	0	0

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Study Benthos 2019
Data are not adjusted
for subsampling

ECO ANALYSTS, INC.
LIFE IN WATER

	Site ID Number	3-R8-2019-BMI-1-101619	3-R8-2019-BMI-1-101619	CB005-BMI-1-101819	CB005-BMI-1-101819	CB040-BMI-1-101819	CB040-BMI-1-101819	DM047-BMI-1-101819
	Bucket1 Weight (lbs)	13	13	20	20	16	16	53
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-16-2019	10-16-2019	10-18-2019	10-18-2019	10-18-2019	10-18-2019	10-18-2019
	EcoAnalysts Sample ID	8097.1-106	8097.2-106	8097.1-107	8097.2-107	8097.1-108	8097.2-108	8097.1-109
	Sample Size Fraction	500µm	250µm	500µm	250µm	500µm	250µm	500µm
	Percent Subsampled	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	0	0
	Pisidium sp.	0	0	0	0	0	0	0
	Sphaeriidae	0	0	0	0	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	0	0	0	1
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	1	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	1	0	0	0
	Caecidotea sp.	0	0	0	0	0	0	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	0	0	0	0	0	0	0
	Crangonyx sp.	0	0	1	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	0	0	0	0	0
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	0	0	0	0	0	3	0
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	0	7	0	18	0	3	0
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	1	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	0	4	0	1	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	1	0	0	0	1	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	1	0	0
	Lebertia sp.	0	0	0	0	2	0	3
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	0	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	0	1	0	0	0	4	0
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	0	1
	Torrenticola sp.	0	0	0	2	0	2	3
	Torrenticolidae	0	1	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	0	0	0	0	0
	Nematoda	0	0	0	0	0	1	68
	Prostoma sp.	0	2	1	4	0	3	7
	Tardigrada	0	0	0	0	0	0	0
	Turbellaria	0	0	0	0	0	0	3
	TOTAL	**0**	**17**	**3**	**32**	**4**	**43**	**429**

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Study Benthos 2019
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EcoAnalysts, Inc.
LIFE IN WATER

	Site ID Number	**DM047-BMI-1-101819**	**DM036-BMI-1-101819**	**DM036-BMI-1-101819**	**DM038-BMI-1-101919**	**DM038-BMI-1-101919**	**CB002-BMI-1-101619**	**CB002-BMI-1-101619**
	Bucket1 Weight (lbs)	**53**	**6.8**	**6.8**	**29.2**	**29.2**	**58**	**58**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-18-2019**	**10-18-2019**	**10-18-2019**	**10-19-2019**	**10-19-2019**	**10-16-2019**	**10-16-2019**
	EcoAnalysts Sample ID	**8097.2-109**	**8097.1-110**	**8097.2-110**	**8097.1-111**	**8097.2-111**	**8097.1-112**	**8097.2-112**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**25.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**89.06**
Ephemeroptera	Baetidae	0	0	0	0	0	0	0
	Baetis sp.	0	0	0	0	0	0	0
	Baetis tricaudatus	0	0	0	0	0	0	0
	Caenis latipennis	0	0	0	0	0	0	0
	Caenis sp.	0	0	0	0	0	0	0
	Drunella grandis	0	0	0	0	0	0	0
	Ephemerella sp.	5	0	0	0	0	0	0
	Ephemerellidae	2	0	0	0	0	0	0
	Rhithrogena sp.	0	0	0	0	0	0	0
Plecoptera	Chloroperlidae	0	0	0	0	0	0	0
	Plecoptera	0	0	0	0	0	0	0
Trichoptera	Amiocentrus aspilus	0	0	0	0	0	0	0
	Apatania sp.	0	0	0	0	0	0	0
	Brachycentrus occidentalis	0	0	0	0	0	0	0
	Ceraclea sp.	0	0	1	0	0	0	0
	Cheumatopsyche sp.	0	0	0	0	0	0	0
	Glossosoma sp.	0	0	0	0	0	0	0
	Glossosomatidae	0	0	0	0	0	0	0
	Hydropsyche sp.	0	0	0	0	0	0	0
	Leptoceridae	0	0	0	0	0	0	0
	Mystacides alafimbriata	0	1	0	0	0	0	0
	Mystacides sp.	0	0	0	0	0	0	0
	Oecetis sp.	0	0	0	0	0	0	0
	Polycentropodidae	0	0	0	0	0	0	0
	Protoptila sp.	0	0	0	0	0	0	0
	Trichoptera	20	0	0	0	0	0	0
Odonata	Gomphidae	0	0	0	0	0	0	0
Coleoptera	Haliplus sp.	0	0	0	0	0	0	0
	Zaitzevia sp.	0	0	0	0	0	0	0
Megaloptera	Sialis sp.	0	0	0	0	0	0	0
Diptera-Chironomidae	Ablabesmyia sp.	0	0	0	0	0	0	0
	Brillia sp.	0	0	0	0	0	0	0
	Chironomini	0	0	0	0	0	0	0
	Chironomus sp.	0	0	0	0	0	0	0
	Cladopelma sp.	0	0	0	0	0	0	0
	Cladotanytarsus sp.	6	0	0	0	0	0	0
	Constempellina sp.	0	0	0	0	0	0	0
	Corynoneura sp.	0	0	0	0	0	1	0
	Cricotopus (Nostococladius) nostocicola	0	0	0	0	0	0	0
	Cricotopus sp.	0	0	0	0	0	0	0
	Cricotopus/Orthocladius sp.	13	0	0	0	0	0	0
	Cryptochironomus sp.	0	0	0	0	0	2	0
	Cryptotendipes sp.	0	0	0	0	0	0	0
	Demicryptochironomus sp.	0	0	0	0	0	0	0
	Dicrotendipes sp.	3	0	0	0	0	0	0
	Eukiefferiella claripennis gr.	0	0	0	0	0	0	0
	Eukiefferiella sp.	2	0	0	0	0	0	0
	Harnischia sp.	0	0	0	0	0	0	0
	Heterotrissocladius marcidus gr.	0	0	0	0	0	0	0
	Hydrosmittia sp.	0	0	0	0	0	0	0
	Micropsectra sp.	0	0	0	0	0	0	0
	Microtendipes pedellus gr.	39	0	1	0	0	0	0
	Monodiamesa sp.	0	0	0	0	0	0	0
	Nanocladius sp.	4	0	0	0	0	0	2
	Orthocladiinae	0	0	0	0	0	0	0
	Orthocladius (Euorthocladius)	0	0	0	0	0	0	0
	Orthocladius sp.	0	0	0	0	0	0	0
	Pagastia sp.	0	0	0	0	0	0	0
	Pagastiella sp.	0	0	0	0	0	1	0
	Parachironomus sp.	0	0	1	0	0	0	0
	Paracladius sp.	0	0	0	0	0	0	0
	Paracladopelma sp.	0	0	0	0	0	1	1
	Parakiefferiella sp.	123	0	1	0	4	0	5

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM047-BMI-1-101819	DM036-BMI-1-101819	DM036-BMI-1-101819	DM038-BMI-1-101919	DM038-BMI-1-101919	CB002-BMI-1-101619	CB002-BMI-1-101619
	Bucket1 Weight (lbs)	**53**	**6.8**	**6.8**	**29.2**	**29.2**	**58**	**58**
	Bucket2 Weight (lbs)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
	Collection Date	**10-18-2019**	**10-18-2019**	**10-18-2019**	**10-19-2019**	**10-19-2019**	**10-16-2019**	**10-16-2019**
	EcoAnalysts Sample ID	**8097.2-109**	**8097.1-110**	**8097.2-110**	**8097.1-111**	**8097.2-111**	**8097.1-112**	**8097.2-112**
	Sample Size Fraction	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**	**500µm**	**250µm**
	Percent Subsampled	**25.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**89.06**
	Paralauterborniella nigrohalteralis	0	0	0	0	0	0	0
	Paratanytarsus sp.	0	0	0	0	0	0	0
	Paratendipes sp.	0	0	0	0	0	2	22
	Pentaneura sp.	0	0	0	0	0	0	0
	Pentaneurini	0	0	2	0	0	3	9
	Phaenopsectra sp.	7	0	0	0	0	0	0
	Polypedilum sp.	36	0	0	1	2	18	17
	Potthastia gaedii gr.	0	0	0	0	0	0	0
	Potthastia longimana gr.	0	0	0	0	0	0	0
	Procladius sp.	0	0	0	0	0	2	5
	Protanypus sp.	0	0	0	0	0	0	0
	Psectrocladius sp.	4	0	0	0	0	0	0
	Pseudochironomus sp.	0	0	0	0	0	0	0
	Rheocricotopus sp.	0	0	0	0	0	0	0
	Rheotanytarsus sp.	0	0	0	0	0	0	0
	Robackia demeijerei	0	0	0	7	9	0	0
	Stempellina sp.	0	0	0	0	0	0	0
	Stempellinella sp.	0	0	0	0	0	0	0
	Stenochironomus sp.	0	0	0	0	0	0	0
	Stictochironomus sp.	0	0	0	0	0	0	0
	Sublettea sp.	2	0	0	0	0	0	0
	Synorthocladius sp.	36	0	0	0	0	0	0
	Tanypodinae	0	0	0	0	0	0	0
	Tanytarsini	0	0	0	0	0	0	0
	Tanytarsus sp.	25	0	4	0	0	0	3
	Thienemanniella sp.	0	0	0	0	0	0	0
	Thienemannimyia gr. sp.	25	0	0	0	0	0	0
	Tribelos jucundum	0	0	0	0	0	0	0
	Tvetenia discoloripes gr.	3	0	0	0	0	0	0
	Xenochironomus xenolabis	0	0	0	0	0	0	0
Diptera	Ceratopogoninae	0	0	0	0	1	1	0
	Diptera	0	0	0	0	0	0	0
	Empididae	1	0	0	0	0	0	0
	Hemerodromia sp.	0	0	0	0	0	0	0
	Simuliidae	2	0	0	0	0	0	0
	Simulium sp.	0	0	0	0	0	0	0
Annelida	Aeolosoma sp.	0	0	0	0	0	0	1
	Amphichaeta americana	0	0	0	0	0	0	0
	Arcteonais lomondi	0	0	0	0	0	0	0
	Aulodrilus americanus	0	0	0	0	0	0	0
	Aulodrilus limnobius	0	0	0	0	0	0	0
	Aulodrilus pigueti	0	0	0	0	0	0	2
	Aulodrilus pluriseta	0	0	0	0	0	3	8
	Chaetogaster diaphanus	0	0	0	0	0	0	0
	Chaetogaster diastrophus	20	0	0	0	0	0	0
	Dero digitata	0	0	0	0	0	0	0
	Dero sp.	0	0	0	0	0	0	0
	Enchytraeidae	0	0	0	0	0	0	1
	Erpobdella sp.	0	0	0	0	0	0	0
	Helobdella elongata	0	0	0	0	0	0	0
	Helobdella sp.	0	0	0	0	0	0	0
	Helobdella stagnalis	0	0	0	0	0	0	0
	Limnodrilus hoffmeisteri	0	0	0	0	0	0	0
	Lumbricina	0	0	0	0	0	0	0
	Lumbriculidae	0	0	0	0	0	1	0
	Nais behningi	2	0	0	0	0	0	0
	Nais sp.	0	0	0	0	0	0	1
	Pristina sp.	36	0	1	0	0	0	2
	Quistadrilus multisetosus	0	0	0	0	0	0	0
	Rhyacodrilus sodalis	0	0	0	0	0	0	0
	Ripistes parasita	0	0	0	0	0	0	0
	Slavina appendiculata	0	0	0	0	0	0	1
	Specaria josinae	0	0	0	0	0	0	0
	Theromyzon sp.	0	0	0	0	0	0	0
	Tubifex tubifex	0	0	0	0	0	0	0
	tubificoid Naididae w/ cap setae	0	0	0	0	0	1	1
	tubificoid Naididae w/o cap setae	0	0	0	0	0	12	32
	Uncinais uncinata	0	0	0	0	0	0	0

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ECOANALYSTS, INC.
LIFE IN WATER

	Site ID Number	DM047-BMI-1-101819	DM036-BMI-1-101819	DM036-BMI-1-101819	DM038-BMI-1-101919	DM038-BMI-1-101919	CB002-BMI-1-101619	CB002-BMI-1-101619
	Bucket1 Weight (lbs)	53	6.8	6.8	29.2	29.2	58	58
	Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Collection Date	10-18-2019	10-18-2019	10-18-2019	10-19-2019	10-19-2019	10-16-2019	10-16-2019
	EcoAnalysts Sample ID	8097.2-109	8097.1-110	8097.2-110	8097.1-111	8097.2-111	8097.1-112	8097.2-112
	Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm
	Percent Subsampled	25.00	100.00	100.00	100.00	100.00	100.00	89.06
	Vejdovskyella comata	0	0	0	0	0	0	0
Bivalvia	Anodonta sp.	0	0	0	0	0	0	0
	Corbicula sp.	0	0	0	0	0	0	0
	Corbiculoidea	0	0	0	0	0	0	0
	Musculium sp.	0	0	0	0	0	2	0
	Pisidium sp.	0	0	0	0	0	188	3
	Sphaeriidae	0	0	0	2	0	0	0
	Unionacea	0	0	0	0	0	0	0
Gastropoda	Fluminicola sp.	0	0	0	1	0	0	0
	Galba sp.	0	0	0	0	0	0	0
	Gastropoda	0	0	0	0	0	0	0
	Gyraulus sp.	0	0	0	0	0	0	0
	Helisoma anceps	0	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	0	0
	Menetus opercularis	0	0	0	0	0	0	0
	Physa sp.	0	0	0	0	0	0	0
	Physella sp.	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0
	Stagnicola sp.	0	0	0	0	0	0	0
	Valvata humeralis	0	0	0	0	0	0	0
	Valvata sp.	0	0	0	0	0	0	0
	Valvata tricarinata	0	0	0	0	0	0	0
Crustacea	Amphipoda	0	0	0	0	0	0	0
	Caecidotea sp.	0	0	0	0	0	3	0
	Calanoida	0	0	0	0	0	0	0
	Cladocera	6	0	0	0	0	0	2
	Crangonyx sp.	0	0	0	0	0	0	0
	Cyclopidae	0	0	0	0	0	0	0
	Cyclopoida	0	0	0	0	0	0	5
	Gammarus sp.	0	0	0	0	0	0	0
	Harpacticoida	4	0	1	0	0	0	236
	Hyalella sp.	0	0	0	0	0	0	0
	Ostracoda	6	0	5	0	7	12	96
	Pacifastacus leniusculus	0	0	0	0	0	0	0
Acari	Acari	0	0	0	0	0	0	0
	Arrenurus sp.	0	0	0	0	0	0	0
	Atractides sp.	0	0	0	0	0	0	0
	Aturidae	2	0	0	0	0	0	0
	Estelloxus sp.	0	0	0	0	0	0	0
	Feltria sp.	0	0	0	0	0	0	0
	Forelia sp.	0	0	0	0	0	0	0
	Frontipoda sp.	0	0	0	0	0	0	0
	Halacaridae	0	0	0	0	0	0	0
	Hygrobates sp.	0	0	0	0	0	5	0
	Lebertia sp.	4	1	1	0	2	6	3
	Limnesia sp.	0	0	0	0	0	0	0
	Mideopsis sp.	0	0	0	0	0	2	0
	Neumania sp.	0	0	0	0	0	0	0
	Oribatei	25	0	1	0	2	0	3
	Pionidae	0	0	0	0	0	0	0
	Sperchon sp.	0	0	0	0	0	1	0
	Torrenticola sp.	31	0	3	0	0	1	0
	Torrenticolidae	0	0	0	0	0	0	0
Other Organisms	Hydra sp.	0	0	1	0	0	0	0
	Nematoda	56	0	3	5	5	14	44
	Prostoma sp.	1	1	0	0	1	19	4
	Tardigrada	1	0	0	0	0	0	0
	Turbellaria	0	1	0	0	0	0	0
	TOTAL	**552**	**4**	**26**	**16**	**33**	**301**	**509**

TECK AMERICAN INCORPORATED

TECHNICAL MEMORANDUM

REVISIONS TO LIST OF BENTHIC MACROINVERTEBRATE COMMUNITY METRICS AND TOLERANCE INDICES

UPPER COLUMBIA RIVER 2019 PHASE 3 SEDIMENT STUDY

1. INTRODUCTION

This memorandum describes revisions to the list of community metrics and the tolerance indices that are used to assess the status of the benthic macroinvertebrate (BMI) community as part of the 2019 Phase 3 sediment study of the Upper Columbia River (UCR).

2. SUMMARY OF BMI COMMUNITY METRIC IDENTIFICATION APPROACH

From June 18, 2020 through August 28, 2020, representatives of Teck American Incorporated (TAI) and the United States Environmental Protection Agency (EPA) held a series of conference calls to discuss TAI's approach for answering the specific questions related to BMI community data in the Quality Assurance Project Plan (QAPP) for the 2019 Phase 3 Sediment Study (ERM 2019). In the first presentation, TAI identified an initial *a priori* list of 18 candidate metrics to use in the assessment and stipulated that redundant BMI metrics would be identified and consolidated using tools like principal components analysis (PCA) for efficient analysis. That initial list included three metrics developed to assess the pollution tolerance of the community – metals tolerance index (MTI), Hilsenhoff Biotic Index (HBI), and the Montana Department of Environmental Quality (DEQ) Index. Upon further investigation, it was determined that the Montana DEQ Index replicates the HBI metric and was excluded as redundant, leaving the MTI and HBI as the tolerance indices to be used in the assessment of questions related to the BMI community in the 2019 Phase 3 sediment study.

Following the presentation of TAI's proposed approach for the BMI community assessment on June 18, 2020 and July 1, 2020, USEPA presented their recommended analysis approach for the BMI community study on July 27, 2020. USEPA recommended identifying selected BMI metrics representative of the same types of information that are included in TAI's initial *a priori* list of candidate metrics from the June 18, 2020 slide deck (e.g., richness, abundance, diversity, biomass, metal tolerance, etc.). In that same presentation, USEPA agreed that redundant metrics can be identified and consolidated consistent with TAI's proposed approach presented on June 18 and July 1, 2020.

Based on the discussions with USEPA, TAI evaluated the redundancies and data quality in the initial, *a priori* list of candidate metrics and has identified the following reduced list of 11 community metrics (Table 1).

Table 1. Priority BMI Community Metrics for the 2019 Phase 3 Sediment Study

Type	Community Metric	Units
Abundance	Total Abundance	Individuals per sample
	Density	Individuals per volume
	Biomass	Grams per sample
Composition	Shannon Weaver Diversity (log 10)	Unitless
	Total Richness	No. of taxa per sample
	Predator Richness	No. of predator taxa per sample
	% Dominance	%
Pollution Tolerance/Sensitivity	MTI	Unitless (0-10)
	HBI	Unitless (0-10)
	% Chironomidae	%
	% EPT	%

During the discussions related to the BMI community assessment approach, EPA requested the community metrics that would be the basis for TAI's BMI community assessment. On June 30, 2020, TAI provided the EPA with a Microsoft Excel data file titled, "06-30-20_Ph3_BMI_Data Request_KCerise.xlsx" which included the values for 109 calculated BMI community metrics for the 2019 Phase 3 sediment study dataset. The data file included the metrics calculated by the taxonomic laboratory (EcoAnalysts, Inc.) for the 500 micron (µm) size fraction, the 250 µm size fraction, and the combined 250 µm and 500 µm size fractions. On December 8, 2020, TAI provided EPA with a revised version of the BMI data file ("12-08-20_Ph3_BMI_Data Request_KCerise.xlsx") to address several questions from Shaun Roark from Jacobs[1]. In addition, the December 2020 Draft 2019 Phase 3 Sediment Study Data Summary Report (DSR) included the results for the same comprehensive list of community metrics in the Benthic Macroinvertebrate Laboratory Data Report provided in Appendix E.[2]

3. TOLERANCE METRIC ASSESSMENT

Of the four metrics identified to represent the pollution tolerance or sensitivity of the BMI communities at each sampling location, MTI and HBI are calculated based on tolerance values assigned to the individual taxa found in each sample. The MTI was developed by the Montana DEQ for the Clark Fork River site to provide an indication of the BMI community's tolerance of metals present at the site (McGuire 1993). It is

[1] Email correspondence from Shaun Roark (Jacobs) to Kevin Lundmark (ERM) on December 3, 2020, subject "BMI Data Reference Labels"

[2] Note that the Draft DSR only included the results for the separate 250 µm and 500 µm size fractions. It did not include metric results for the combined 250 µm and 500 µm size fractions.

calculated using tolerance values determined for individual taxon based on documented presence or absence from Montana streams with known concentrations of metals in surface water or sediment. Tolerance values range from 0 to 10: 0 indicates no tolerance for metals and 10 indicates a high degree of tolerance. To calculate the MTI at each location, the tolerance values are weighted based on taxon abundance and averaged for all taxa for which values are available. Therefore, low MTI scores (near 0) are indicative of BMI communities found where metals concentrations (mostly in surface water) are low while high MTI scores (up to 10) are indicative of BMI communities where metals concentrations are high.

HBI is a widely used index for assessing water quality with respect to organic enrichment and nutrient pollution (Hilsenhoff 1987). Similar to MTI, it is calculated using tolerance values that have been determined for individual taxon based on documented presence or absence in aquatic systems with varying levels of organic enrichment. Tolerance values for individual taxon range from 0 to 10 where higher values indicate greater tolerance for organically enriched conditions. The HBI is calculated similar to MTI based on an average of tolerance values for all taxa present weighted based on their relative abundance in the sample. MTI and HBI were used, for example, at the Clark Fork River as diagnostic indices for distinguishing causes of impairment in the BMI community relative to minimally disturbed reference sites (McGuire 1993, Stagliano 2020). Because the overall risk question for the 2019 Phase 3 Sediment Study pertains to assessing risks to benthic organisms posed by “elevated metals concentrations associated with slag deposits,” the most relevant tolerance metric for the BMI community assessment is the MTI.

Because the calculations of both indices rely on the availability of tolerance values for the taxa present in each sample, the overall reliability of each metric can be determined by the percent of individuals in each sample with tolerance values. The data file provided by EcoAnalysts (see Appendix B to Appendix E in the Draft 2019 Phase 3 sediment study DSR) includes these calculations for each metric (e.g., % Individ. w/ MTI Value and % Individ. w/ HBI Value).

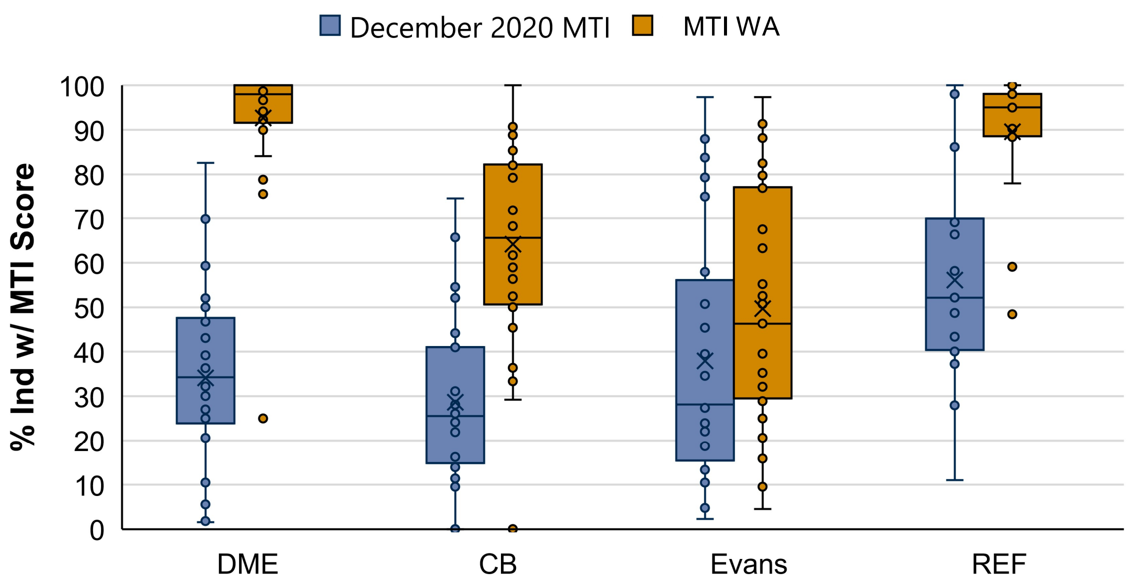
As TAI analyzed the BMI community metrics, it was noted that the percent of individuals with MTI values from the 2019 Phase 3 Sediment Study dataset were relatively low, particularly in the three Areas of Interest (AOIs) where the median percent of individuals with MTI values was below 50% in each AOI (Figure 1). This suggested that the MTI scores might not be representative of the majority of the BMI communities at each location. While investigating the potential metals tolerance of the abundant taxa in the AOIs that were not assigned tolerance values, TAI observed that the MTI tolerance values used by EcoAnalysts were not consistent with those used at other sites in the Pacific Northwest region. A comparison against the MTI tolerance values provided in the most recent Clark Fork River Biomonitoring report (Stagliano 2020) indicates that tolerance values are available for many more of the taxa found in the UCR than were included in the EcoAnalysts list of tolerance values. A data file of tolerance values was obtained from the Washington State Department of Ecology (Ecology) Environmental Assessment Program on February 8, 2021 (Ecology 2021) and was used to compare to tolerance values developed by McGuire (1993) and used at the Clark Fork River site in Montana (Stagliano 2020). TAI confirmed that the tolerance values in McGuire (1993) and Stagliano (2020) are consistent with those used in Washington State by Ecology and as part of the Puget Sound Stream Benthos collaboration site[3]. Because the tolerance values listed in Stagliano (2020) are used for the assessment of BMI communities in Washington and result in MTI values that are representative of a substantially greater proportion of the communities at all locations in the 2019 Phase 3 Sediment Study dataset (Figure 1[4]), TAI is adopting the

[3] pugetsoundstreambenthos.org

[4] December 2020 index values are those provided in the December 8, 2020 data file to USEPA and are identical to those provided with the December 2020 Draft 2019 Phase 3 Sediment Study DSR (Appendix B to Appendix E).

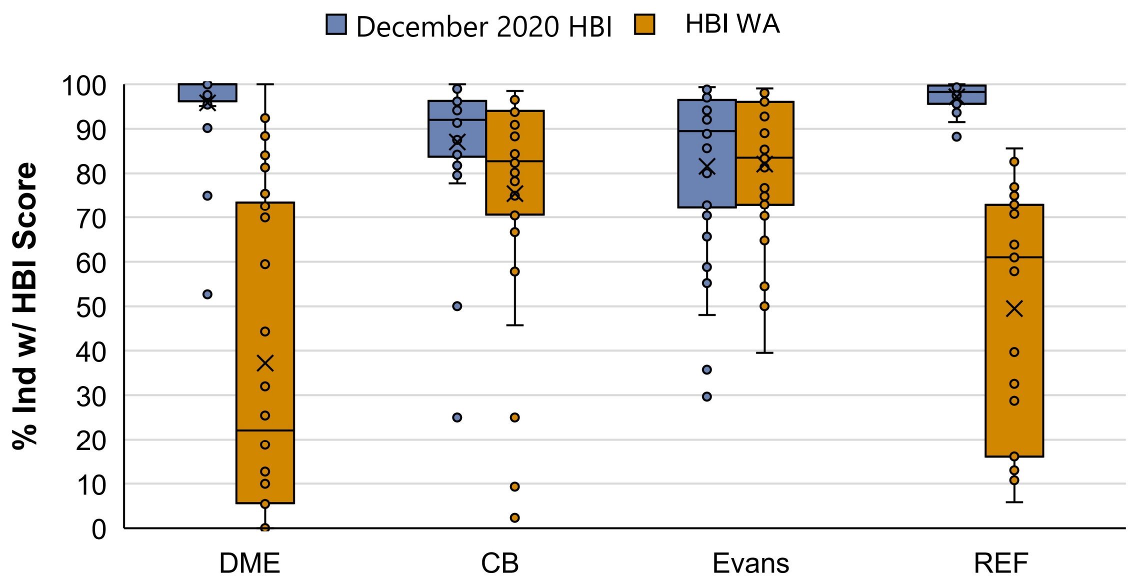
MTI calculated values using these metals tolerance values rather than those provided by the taxonomic laboratory.

Figure 1. Percent of Individuals with MTI Scores



Similarly, TAI noted that the HBI tolerance values used by EcoAnalysts differ from those used by Ecology. The basis for the differences is not clear but, for the sake of consistency with other regional monitoring programs, TAI is adopting the HBI calculated using the same HBI tolerance values as those compiled by Ecology (Ecology 2021). For HBI, this results in a smaller percentage of the community with HBI values (Figure 2), but TAI recommends the consistency of relying on the same HBI metric as used elsewhere in Washington State; this approach is consistent with the basis for the more relevant and reliable MTI value.

Figure 2. Percent of Individuals with HBI Scores



Following EPA's review of TAI's proposal to rely on the MTI and HBI metrics calculated with the same tolerance values used elsewhere in Washington, EPA suggested that TAI calculate hybrid tolerance metrics that use the Washington tolerance values where available and default to EcoAnalysts' tolerance values when tolerance values are not available in Ecology's data table. The objective would be to increase the percent of individuals with tolerance scores, primarily for HBI in DME and Reference as illustrated in Figure 2. TAI has calculated the hybrid MTI and HBI metrics using this approach and is providing both metrics as calculated using solely the Washington tolerance values (MTI_WA and HBI_WA) as well as those calculated using the mixture of tolerance values used in Washington and EcoAnalysts (MTI_Hybrid and HBI_Hybrid). The relative merits and disadvantages of each version of those metrics will be addressed in the Phase 3 Data Analysis Technical Memorandum[5], and the outcome of this evaluation will inform which metrics are used for performing statistical evaluations to answer QAPP study questions.

4. SUMMARY OF REVISED DATA FILE

TAI has recalculated the MTI and HBI values for the 2019 Phase 3 Sediment Study dataset and they are attached to this technical memorandum. TAI has compiled those revised metrics with the values for the other priority metrics identified in Table 1 for use going forward. The BMI community metrics Attachment 1 of this memorandum replace the table of BMI univariate metrics provided to USEPA on December 8, 2020 (12-08-20_Ph3_BMI_Data Request_KCerise.xlsx) as well as the univariate metrics provided in Appendix B of the BMI Laboratory Data Report (Appendix E of the Draft 2019 Phase 3 sediment study DSR).

Finally, please note that this revised data file includes the results for the 250 µm and 500 µm size fractions, but it does not include results calculated for combined 250 µm and 500 µm size fractions. The focus of TAI's BMI community data analyses will be on the >500 µm size class which is consistent with

[5] The Phase 3 Sediment Study Data Analysis Tech Memo will present the results of TAI's analysis of the Phase 3 data and focus on the goals, study questions, and analytical approaches explicitly established in the Phase 3 QAPP.

USEPA guidance on the assessment of benthic macroinvertebrate communities (Barbour et al. 1999) as well as Ecology's protocol for sampling benthos (Ecology 2010). Previous research has shown that different size classes of benthic invertebrates tend to have different counts of taxonomic groups and life stages but that the qualitative relationships of those communities with environmental variables (e.g., stressors) tend to be consistent regardless of the size class (Morin et al. 2004; Gruenert et al. 2007; Baldwin et al. 2018). In light of that, the 250-500 µm size class will be used to assess whether patterns observed with community metrics are qualitatively similar to those observed with the >500 µm size class. The smaller size class data can also provide additional context for specific samples that have divergent community metrics in the >500 µm size class from the remainder of the dataset. The use of metrics calculated with the combined size fraction species counts, therefore, would be redundant with the assessment of the separate size fractions and would provide no added value associated with calculating the updated metrics for the combined size classes or adding an additional interpretation step to the community analyses. TAI will, therefore, not be using the metrics associated with combined size fractions in the 2019 Phase 3 Sediment Study data analysis and has not recalculated those metric values for the revised MTI and HBI.

No revisions are necessary for the BMI taxonomic enumeration results previously provided to EPA and included in Appendix B of the BMI laboratory data report.

5. REFERENCES

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ATTACHMENT 1

BENTHIC MACROINVERTEBRATE COMMUNITY METRICS AND TOLERANCE INDICES FOR APPENDIX B OF THE BENTHIC MACROINVERTEBRATE LABORATORY DATA REPORT

Site ID Number	1-B5-NRT-BMI-1-101519	1-B5-NRT-BMI-1-101519	1-B6-NRT-BMI-1-101619	1-B6-NRT-BMI-1-101619	3-R7-2019-BMI-1-101519	3-R7-2019-BMI-1-101519	3-R8-2019-BMI-1-101619	3-R8-2019-BMI-1-101619	4-B1-2019-BMI-1-092619	4-B1-2019-BMI-1-092619	4-B6-2019-BMI-1-092619	4-B6-2019-BMI-1-092619
Bucket1 Weight (lbs)	48.2	48.2	50.2	50.2	43.5	43.5	13	13	32	32	30	30
Bucket2 Weight (lbs)	48	48	52.6	52.6	N/A	N/A	N/A	N/A	34	34	27	27
Collection Date	10-15-2019	10-15-2019	10-16-2019	10-16-2019	10-15-2019	10-15-2019	10-16-2019	10-16-2019	09-26-2019	09-26-2019	09-26-2019	09-26-2019
EcoAnalysis Sample ID	8097.2-102	8097.1-102	8097.2-98	8097.1-98	8097.2-97	8097.1-97	8097.2-106	8097.1-106	8097.2-52	8097.1-52	8097.2-51	8097.1-51
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	10.42	66.41	100	100	100	100	100	100	100	100	100	100
Abundance Measures												
Total Abundance	4857.6	817.69	223	69	379	17	17	0	397	139	206	85
Density	19430.4	3270.76	892	276	1516	68	113.33	0	1588	556	824	340
Counted Blotted Mass	0.0059	1.5258	0.0025	0.0247	0.0057	0.0085	0.001	0	0.0095	0.0502	0.004	0.0377
Compositional Measures												
Shannon-Weaver H' (log 10)	0.5	1.02	1.06	1.17	0.43	1.04	0.71	NA	0.77	0.92	0.82	0.94
Species Richness	20	34	26	23	20	12	7	0	20	17	19	12
Predator Richness	6	6	5	6	7	4	5	0	9	6	8	6
% Dominant Taxon	73.32	30.94	20.63	17.39	80.47	17.65	41.18	NA	43.07	30.22	52.43	28.24
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.97	2.98	4.32	4.4	3.45	3.12	NA	NA	4.58	4.27	4	4.16
MTI_Hybrid	4.97	2.98	4.33	4.41	3.45	3.11	4	NA	4.59	4.27	4.15	4.16
% Indiv. w/ MTI Value_WA	78.26	78.82	91.03	84.06	8.71	47.06	0	NA	14.36	39.57	10.68	36.47
% Indiv. w/ MTI Value_Hybrid	78.46	79.93	92.38	85.51	8.71	52.94	5.88	NA	14.61	39.57	12.62	36.47
Hilsenhoff Biotic Index (HBI)_WA	7.54	7.64	6.48	6.74	5.87	6	7.8	NA	7.72	6.94	7.75	6.85
HBI_Hybrid	5.57	7.28	6.2	6.5	5.76	5.81	7.8	NA	7.36	6.5	7.57	6.49
% Indiv. w/ HBI Value_WA	21.15	59.48	76.68	84.06	14.25	82.35	58.82	NA	79.6	74.82	80.58	72.94
% Indiv. w/ HBI Value_Hybrid	95.06	69.06	95.52	98.55	15.3	94.12	58.82	NA	91.69	97.12	86.89	90.59
% Chironomidae	7.71	20.99	74.89	72.46	8.71	35.29	0	NA	9.57	19.42	9.22	20
% EPT	0.2	1.29	2.69	1.45	1.32	5.88	0	NA	0	0.72	0	0

Teck American Incorporated UCR Phase 3 Sediment Study Benthos 2019
Data are adjusted for subsampling in the lab

Site ID Number	CB002-BMI-1-101619	CB002-BMI-1-101619	CB005-BMI-1-101819	CB005-BMI-1-101819	CB006-BMI-1-100919	CB006-BMI-1-100919	CB007-BMI-1-100919	CB007-BMI-1-100919	CB009-BMI-1-101219	CB009-BMI-1-101219	CB010-BMI-1-101219	CB010-BMI-1-101219
Bucket1 Weight (lbs)	58	58	20	20	41	41	42	42	35	35	45	45
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	39	39	N/A	N/A	N/A	N/A	30	30
Collection Date	10-16-2019	10-16-2019	10-18-2019	10-18-2019	10-09-2019	10-09-2019	10-09-2019	10-09-2019	10-12-2019	10-12-2019	10-12-2019	10-12-2019
EcoAnalysis Sample ID	8097.2-112	8097.1-112	8097.2-107	8097.1-107	8097.2-65	8097.1-65	8097.2-67	8097.1-67	8097.2-81	8097.1-81	8097.2-82	8097.1-82
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	89.06	100	100	100	100	100	31.25	100	100	100	37.5	100
Abundance Measures												
Total Abundance	571.51	301	32	3	206	104	1728	240	429	199	1509.33	139
Density	3810.07	2006.67	438.36	41.1	1373.33	693.33	11520	1600	2860	1326.67	10062.2	926.67
Counted Blotted Mass	0.0099	0.1841	0.001	0.001	0.0023	0.0339	0.0061	0.0629	0.0037	0.1552	0.0058	0.0333
Compositional Measures												
Shannon-Weaver H' (log 10)	0.82	0.71	0.67	0.48	0.99	0.85	1.06	1.32	1.07	0.67	1.17	0.98
Species Richness	26	24	9	3	21	13	27	33	33	16	35	19
Predator Richness	6	11	4	1	9	6	9	15	8	6	11	9
% Dominant Taxon	46.37	62.46	56.25	33.33	37.38	31.73	20.56	13.33	30.54	59.8	21.38	21.58
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.48	3.34	3.33	4	4.07	3.87	4.26	3.83	4.58	3.3	4.23	3.96
MTI_Hybrid	4.48	3.34	3.75	4	4.09	3.87	4.26	3.84	4.58	3.3	4.24	3.93
% Indiv. w/ MTI Value_WA	23.97	82.06	9.38	33.33	35.44	68.27	39.44	61.67	38	71.86	33.92	59.71
% Indiv. w/ MTI Value_Hybrid	23.97	82.06	12.5	33.33	36.41	68.27	39.44	62.92	38.46	71.86	34.63	60.43
Hilsenhoff Biotic Index (HBI)_WA	7.7	6.48	7.36	7	6.29	6.35	6.73	6.54	6.88	6.37	6.53	6.28
HBI_Hybrid	7.2	6.4	7.31	6	6.1	5.92	6.31	6.45	6.53	6.35	6.26	6.1
% Indiv. w/ HBI Value_WA	42.63	92.03	87.5	66.67	74.76	71.15	56.85	88.33	73.19	98.49	65.55	80.58
% Indiv. w/ HBI Value_Hybrid	53.05	98.01	90.62	100	89.81	97.12	76.3	95.42	89.74	100	81.63	94.96
% Chironomidae	12.57	9.97	15.62	33.33	61.17	34.62	29.26	45.42	47.09	22.61	43.46	43.17
% EPT	0	0	0	0	0	0	0	0.83	0	0	0	0

Site ID Number	CB012-BMI-1-100919	CB012-BMI-1-100919	CB014-BMI-1-101519	CB014-BMI-1-101519	CB016-BMI-1-101119	CB016-BMI-1-101119	CB018-BMI-1-101119	CB018-BMI-1-101119	CB020-BMI-1-101419	CB020-BMI-1-101419	CB020-BMI-2-101419	CB020-BMI-2-101419
Bucket1 Weight (lbs)	42	42	49	49	28	28	36	36	46	46	61	61
Bucket2 Weight (lbs)	51	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Collection Date	10-09-2019	10-09-2019	10-15-2019	10-15-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019
EcoAnalysis Sample ID	8097.2-66	8097.1-66	8097.2-72	8097.1-72	8097.2-77	8097.1-77	8097.2-79	8097.1-79	8097.2-88	8097.1-88	8097.2-89	8097.1-89
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	100	100	100	100	100	100	31.25	70.83	43.75	100
Abundance Measures												
Total Abundance	21	86	23	43	462	249	592	297	1753.6	734.12	1236.57	417
Density	140	573.33	92	172	3080	1660	3946.67	1980	7014.4	2936.48	4946.28	1668
Counted Blotted Mass	0.001	0.0316	0.001	0.0042	0.0049	0.167	0.006	0.1259	0.0096	0.2109	0.019	0.1276
Compositional Measures												
Shannon-Weaver H' (log 10)	0.8	0.51	0.71	0.27	1.2	0.98	1.08	0.73	1.03	1.04	1.1	1.06
Species Richness	8	8	9	4	35	22	32	17	28	32	31	28
Predator Richness	4	3	4	2	11	8	9	8	8	13	9	13
% Dominant Taxon	28.57	45.35	52.17	81.4	18.83	31.33	25.84	52.19	25.36	25.96	22.74	23.5
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.38	4.47	4.18	4.07	4.53	3.94	4.35	3.51	4.39	3.83	4.46	3.91
MTI_Hybrid	4.38	4.47	4.18	4.07	4.53	3.94	4.35	3.51	4.39	3.83	4.46	3.91
% Indiv. w/ MTI Value_WA	61.9	90.7	73.91	100	45.24	79.52	60.98	80.13	32.48	52.5	30.31	56.35
% Indiv. w/ MTI Value_Hybrid	61.9	90.7	73.91	100	45.24	79.52	61.15	80.13	32.85	52.5	30.5	56.35
Hilsenhoff Biotic Index (HBI)_WA	6.44	7.62	6	8	7.14	7.07	6.88	6.45	6.83	6.77	6.99	6.85
HBI_Hybrid	5.5	4.79	4.65	4.28	6.77	7.03	6.64	6.4	6.53	6.73	6.82	6.76
% Indiv. w/ HBI Value_WA	42.86	9.3	21.74	2.33	73.81	96.79	71.62	94.28	61.13	96.54	68.02	90.89
% Indiv. w/ HBI Value_Hybrid	95.24	97.67	86.96	100	89.18	98.8	82.6	99.66	76.82	99.23	74.31	98.32
% Chironomidae	38.1	48.84	65.22	83.72	35.71	35.34	36.99	35.02	39.05	53.08	39.93	59.23
% EPT	0	0	0	0	0.87	1.2	0	0	0	0	0	0

Site ID Number	CB021-BMI-1-101419	CB021-BMI-1-101419	CB024-BMI-1-101419	CB024-BMI-1-101419	CB027-BMI-1-101519	CB027-BMI-1-101519	CB029-BMI-1-101519	CB029-BMI-1-101519	CB029-BMI-2-101519	CB029-BMI-2-101519	CB035-BMI-1-100319	CB035-BMI-1-100319
Bucket1 Weight (lbs)	46.5	46.5	42	42	36	36	49	49	39	39	24	24
Bucket2 Weight (lbs)	31	31	N/A	N/A	26	26	N/A	N/A	N/A	N/A	N/A	N/A
Collection Date	10-14-2019	10-14-2019	10-14-2019	10-14-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-03-2019	10-03-2019
EcoAnalysis Sample ID	8097.2-90	8097.1-90	8097.2-91	8097.1-91	8097.2-101	8097.1-101	8097.2-92	8097.1-92	8097.2-93	8097.1-93	8097.2-56	8097.1-56
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	37.5	100	20.83	100	56.25	100	43.75	100	68.75	100	100	100
Abundance Measures												
Total Abundance	1490.67	55	2491.2	238	956.44	242	1168	301	794.18	233	195	44
Density	5962.68	220	9964.8	952	3825.76	968	4672	1204	3176.72	932	890.41	200.91
Counted Blotted Mass	0.0099	0.0099	0.0082	0.1639	0.0094	0.6376	0.0087	0.1568	0.0148	0.1438	0.0031	0.0043
Compositional Measures												
Shannon-Weaver H' (log 10)	0.48	0.8	0.74	0.68	0.83	0.75	0.68	0.49	0.52	0.45	0.72	0.89
Species Richness	17	12	24	15	24	20	27	13	16	13	17	13
Predator Richness	5	6	5	6	8	8	9	5	6	8	7	4
% Dominant Taxon	75.31	49.09	57.42	58.82	49.81	58.26	63.99	73.75	71.43	76.82	55.9	38.64
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.78	3.5	4.14	3.55	4.44	3.49	3.9	3.21	4.6	3.26	3.62	2.88
MTI_Hybrid	4.78	3.5	4.14	3.55	4.44	3.49	3.9	3.21	4.6	3.26	3.94	3
% Indiv. w/ MTI Value_WA	12.34	83.64	20.81	85.71	29	82.23	15.07	85.38	14.1	88.84	6.67	36.36
% Indiv. w/ MTI Value_Hybrid	12.34	83.64	21	85.71	29	82.23	15.07	85.38	14.1	88.84	8.72	38.64
Hilsenhoff Biotic Index (HBI)_WA	7.79	8	7.3	6.67	7.38	6.46	7.59	6.36	8.01	6.36	5.1	4.23
HBI_Hybrid	7.09	7.63	6.87	6.63	7.01	6.43	7.17	6.36	6.97	6.34	5.15	4.26
% Indiv. w/ HBI Value_WA	17.35	78.18	31.98	94.12	39.03	93.8	27.4	95.02	17.95	94.85	30.77	70.45
% Indiv. w/ HBI Value_Hybrid	23.61	92.73	42	97.9	48.7	97.11	34.64	95.02	27.84	96.57	33.85	79.55
% Chironomidae	6.08	21.82	15.22	17.65	25.65	23.97	13.89	9.3	6.78	4.72	20	59.09
% EPT	0	0	0	0	0	0	0	0.33	0.18	0	3.08	13.64

Site ID Number	CB036-BMI-1-100419	CB036-BMI-1-100419	CB039-BMI-1-101219	CB039-BMI-1-101219	CB040-BMI-1-101819	CB040-BMI-1-101819	CB044-BMI-1-101519	CB044-BMI-1-101519	CB046-BMI-1-100819	CB046-BMI-1-100819	CB047-BMI-1-101119	CB047-BMI-1-101119
Bucket1 Weight (lbs)	32.5	32.5	22	22	16	16	57	57	32	32	26	26
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Collection Date	10-04-2019	10-04-2019	10-12-2019	10-12-2019	10-18-2019	10-18-2019	10-15-2019	10-15-2019	10-08-2019	10-08-2019	10-11-2019	10-11-2019
EcoAnalysis Sample ID	8097.2-64	8097.1-64	8097.2-83	8097.1-83	8097.2-108	8097.1-108	8097.2-94	8097.1-94	8097.2-63	8097.1-63	8097.2-80	8097.1-80
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	100	100	100	100	100	100	100	100	100	100
Abundance Measures												
Total Abundance	104	4	280	24	43	4	380	236	80	45	142	35
Density	237.44	9.13	1866.67	160	196.35	18.26	1520	944	365.3	205.48	946.67	233.33
Counted Blotted Mass	0.001	0.001	0.0044	0.0026	0.001	0.0101	0.0068	0.1132	0.0017	0.0039	0.0033	0.009
Compositional Measures												
Shannon-Weaver H' (log 10)	0.83	0.6	0.88	0.67	1.06	0.45	0.63	0.61	0.96	1.06	0.88	0.83
Species Richness	17	4	25	8	16	3	22	17	16	15	18	12
Predator Richness	11	3	10	4	7	2	7	9	8	6	9	5
% Dominant Taxon	43.27	25	41.79	54.17	20.93	50	67.11	65.68	30	22.22	39.44	45.71
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	3.22	4.5	3.58	3.86	3.53	NA	4.38	3.2	3	4.04	3.93	4.42
MTI_Hybrid	3.29	4.5	3.61	3.86	3.53	NA	4.37	3.21	3.5	4.04	3.93	4.42
% Indiv. w/ MTI Value_WA	25.96	50	20.36	29.17	39.53	0	16.84	79.24	3.75	57.78	19.01	68.57
% Indiv. w/ MTI Value_Hybrid	26.92	50	21.79	29.17	39.53	0	17.63	79.66	5	57.78	19.01	68.57
Hilsenhoff Biotic Index (HBI)_WA	5.62	6	6.66	7.3	6.26	6.33	6.61	6.19	6.52	6.42	7.43	5.38
HBI_Hybrid	5.66	5.5	6.58	7	6.21	6.33	6.21	6.14	6.51	5.64	7.12	5.19
% Indiv. w/ HBI Value_WA	38.46	25	42.86	83.33	72.09	75	22.11	84.32	62.5	57.78	40.85	45.71
% Indiv. w/ HBI Value_Hybrid	42.31	50	45	95.83	76.74	75	30.79	89.83	63.75	93.33	47.18	91.43
% Chironomidae	33.65	25	20	8.33	58.14	0	15.53	8.47	18.75	51.11	12.68	2.86
% EPT	0.96	0	1.07	8.33	0	0	0	0.42	5	0	1.41	14.29

Site ID Number	CB056-BMI-1-101719	CB056-BMI-1-101719	DM002-BMI-1-100919	DM002-BMI-1-100919	DM007-BMI-1-101519	DM007-BMI-1-101519	DM008-BMI-1-101119	DM008-BMI-1-101119	DM010-BMI-1-101119	DM010-BMI-1-101119	DM015-BMI-1-101019	DM015-BMI-1-101019
Bucket1 Weight (lbs)	44	44	63.6	63.6	54.6	54.6	39.2	39.2	54.2	54.2	47.4	47.4
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	55.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A
Collection Date	10-17-2019	10-17-2019	10-09-2019	10-09-2019	10-15-2019	10-15-2019	10-11-2019	10-11-2019	10-11-2019	10-11-2019	10-10-2019	10-10-2019
EcoAnalysis Sample ID	8097.2-104	8097.1-104	8097.2-70	8097.1-70	8097.2-103	8097.1-103	8097.2-76	8097.1-76	8097.2-78	8097.1-78	8097.2-73	8097.1-73
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	16.67	100	100	100	100	100	100	100	100	100	100	100
Abundance Measures												
Total Abundance	3204	387	67	268	171	458	244	124	46	126	175	237
Density	21945.21	2650.68	446.67	1786.67	684	1832	1626.67	826.67	306.67	840	1166.67	1580
Counted Blotted Mass	0.0073	0.0292	0.0013	0.0133	0.0034	0.0254	0.004	0.0269	0.001	0.018	0.0016	0.0471
Compositional Measures												
Shannon-Weaver H' (log 10)	0.67	1.02	0.16	0.13	0.07	0.18	1.13	0.99	0.89	0.51	1.03	0.72
Species Richness	19	21	3	6	5	6	28	21	13	10	20	15
Predator Richness	7	10	1	3	1	2	8	5	4	4	3	3
% Dominant Taxon	61.42	21.96	91.04	93.28	97.08	88.86	25.41	25.81	30.43	56.35	24.57	33.76
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.15	4.21	4.03	4.04	4.01	4.1	3.85	3.88	4.36	4.6	4.57	3.85
MTI_Hybrid	4.17	4.21	4.03	4.04	4.01	4.09	3.85	3.88	4.36	4.6	4.57	3.85
% Indiv. w/ MTI Value_WA	16.48	63.05	100	100	98.83	99.56	75.82	90.32	84.78	100	81.14	98.73
% Indiv. w/ MTI Value_Hybrid	16.85	63.05	100	100	98.83	100	76.64	91.13	84.78	100	81.71	98.73
Hilsenhoff Biotic Index (HBI)_WA	7.08	7.12	6	6	7.33	6	3.98	4.23	6.33	5.06	5.83	5.74
HBI_Hybrid	6.54	6.84	4.15	4.09	4.07	4.12	4.12	4.23	5.32	4.71	5.4	4.97
% Indiv. w/ HBI Value_WA	24.91	80.88	5.97	1.49	1.75	1.31	76.64	72.58	45.65	12.7	62.86	44.3
% Indiv. w/ HBI Value_Hybrid	36.7	98.97	100	100	100	100	96.31	100	95.65	100	99.43	99.16
% Chironomidae	18.73	76.49	97.01	94.78	97.66	89.3	46.72	55.65	43.48	34.92	57.14	43.04
% EPT	0.19	0.78	0	0	0	0	26.23	27.42	2.17	0.79	2.86	3.8

Site ID Number	DM015-BMI-2-101019	DM015-BMI-2-101019	DM016-BMI-1-101019	DM016-BMI-1-101019	DM018-BMI-1-100919	DM018-BMI-1-100919	DM019-BMI-1-101419	DM019-BMI-1-101419	DM020-BMI-1-101419	DM020-BMI-1-101419	DM022-BMI-1-092119	DM022-BMI-1-092119
Bucket1 Weight (lbs)	49.6	49.6	59.4	59.4	60.4	60.4	33	33	45.6	45.6	57.4	57.4
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	41.8	41.8	N/A	N/A	N/A	N/A
Collection Date	10-10-2019	10-10-2019	10-10-2019	10-10-2019	10-09-2019	10-09-2019	10-14-2019	10-14-2019	10-14-2019	10-14-2019	09-21-2019	09-21-2019
EcoAnalysis Sample ID	8097.2-74	8097.1-74	8097.2-75	8097.1-75	8097.2-69	8097.1-69	8097.2-85	8097.1-85	8097.2-86	8097.1-86	8097.2-14	8097.1-14
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	100	100	100	100	100	100	100	100	100	100
Abundance Measures												
Total Abundance	199	150	43	64	337	218	94	59	40	34	75	73
Density	1326.67	1000	286.67	426.67	2246.67	1453.33	626.67	393.33	266.67	226.67	300	292
Counted Blotted Mass	0.0042	0.0451	0.001	0.0026	0.0109	0.0106	0.001	0.008	0.001	0.0019	0.0019	0.0087
Compositional Measures												
Shannon-Weaver H' (log 10)	1.12	0.93	0.37	0.19	0.05	0.05	0.97	0.63	0.55	0.26	0.37	0.39
Species Richness	26	17	7	5	5	3	20	8	7	3	6	4
Predator Richness	5	6	1	2	2	2	6	3	3	2	3	2
% Dominant Taxon	18.09	28.67	79.07	90.62	98.22	98.17	25.53	52.54	62.5	79.41	74.67	63.01
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.37	3.93	4.07	4.05	4.01	4.01	4.21	4.53	4.21	4.18	4.02	4.29
MTI_Hybrid	4.37	3.93	4.07	4.05	4.01	4.01	4.21	4.53	4.3	4.18	4.02	4.29
% Indiv. w/ MTI Value_WA	65.33	96.67	95.35	100	99.7	100	81.91	100	82.5	100	78.67	100
% Indiv. w/ MTI Value_Hybrid	65.83	96.67	95.35	100	99.7	100	81.91	100	92.5	100	78.67	100
Hilsenhoff Biotic Index (HBI)_WA	6.03	5.7	6.25	6.25	7	NA	6.42	7.27	4.86	NA	7.83	6
HBI_Hybrid	5.78	5.28	4.31	4.2	4.03	4.03	5.64	5.05	4.42	4.24	4.7	4.45
% Indiv. w/ HBI Value_WA	78.89	70	9.3	6.25	0.59	0	58.51	25.42	17.5	0	16	6.85
% Indiv. w/ HBI Value_Hybrid	98.99	100	97.67	100	100	100	97.87	100	100	100	93.33	100
% Chironomidae	54.27	69.33	86.05	92.19	98.52	98.17	60.64	72.88	75	79.41	76	69.86
% EPT	3.52	6	0	0	0	0	3.19	0	0	0	0	0

Site ID Number	DM023-BMI-1-092119	DM023-BMI-1-092119	DM024-BMI-1-101519	DM024-BMI-1-101519	DM024-BMI-2-101519	DM024-BMI-2-101519	DM025-BMI-1-101219	DM025-BMI-1-101219	DM026-BMI-1-092119	DM026-BMI-1-092119	DM027-BMI-1-101419	DM027-BMI-1-101419
Bucket1 Weight (lbs)	57.4	57.4	56	56	48.6	48.6	61.8	61.8	59.4	59.4	48	48
Bucket2 Weight (lbs)	N/A	N/A	56.4	56.4	52.6	52.6	N/A	N/A	N/A	N/A	34.2	34.2
Collection Date	09-21-2019	09-21-2019	10-15-2019	10-15-2019	10-15-2019	10-15-2019	10-12-2019	10-12-2019	09-21-2019	09-21-2019	10-14-2019	10-14-2019
EcoAnalysis Sample ID	8097.2-15	8097.1-15	8097.2-95	8097.1-95	8097.2-96	8097.1-96	8097.2-84	8097.1-84	8097.2-16	8097.1-16	8097.2-87	8097.1-87
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	100	100	100	100	100	100	100	100	100	100
Abundance Measures												
Total Abundance	4	62	36	62	103	37	17	92	5	44	96	75
Density	16	248	144	248	412	148	113.33	613.33	20	176	640	500
Counted Blotted Mass	0.001	0.0034	0.0012	0.005	0.0017	0.0025	0.001	0.0113	0.0013	0.0102	0.0011	0.0223
Compositional Measures												
Shannon-Weaver H' (log 10)	0.45	0.04	0.23	0.33	0.89	0.39	0.7	0.38	0.22	0.47	0.99	0.83
Species Richness	3	2	4	3	13	5	7	6	2	4	20	14
Predator Richness	1	1	2	2	3	2	3	3	1	3	4	5
% Dominant Taxon	50	98.39	86.11	72.58	24.27	67.57	47.06	73.91	80	59.09	30.21	42.67
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	3.67	4.02	4.09	4.18	4.56	4.22	3.92	4.2	4.2	4.2	4.37	3.96
MTI_Hybrid	3.67	4.02	4.09	4.18	4.44	4.22	3.92	4.18	4.2	4.2	4.33	3.96
% Indiv. w/ MTI Value_WA	75	100	97.22	100	68.93	100	76.47	98.91	100	100	64.58	97.33
% Indiv. w/ MTI Value_Hybrid	75	100	97.22	100	88.35	100	76.47	100	100	100	68.75	97.33
Hilsenhoff Biotic Index (HBI)_WA	6	NA	4	NA	6.66	7.5	5.43	7.67	8	8	6.29	6.62
HBI_Hybrid	5	4.02	4.14	4.37	5.79	4.49	4.69	4.47	4.8	5.02	5.74	5.27
% Indiv. w/ HBI Value_WA	50	0	2.78	0	56.31	5.41	41.18	6.52	20	13.64	46.88	32
% Indiv. w/ HBI Value_Hybrid	100	100	100	100	97.09	100	94.12	100	100	100	79.17	97.33
% Chironomidae	100	98.39	88.89	72.58	31.07	70.27	70.59	78.26	100	72.73	23.96	64
% EPT	0	0	0	0	0	0	5.88	0	0	0	2.08	1.33

Site ID Number	DM036-BMI-1-101819	DM036-BMI-1-101819	DM038-BMI-1-101919	DM038-BMI-1-101919	DM039-BMI-1-101719	DM039-BMI-1-101719	DM044-BMI-1-101619	DM044-BMI-1-101619	DM045-BMI-1-091919	DM045-BMI-1-091919	DM046-BMI-1-092019	DM046-BMI-1-092019
Bucket1 Weight (lbs)	6.8	6.8	29.2	29.2	28	28	42.4	42.4	27	27	50	50
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Collection Date	10-18-2019	10-18-2019	10-19-2019	10-19-2019	10-17-2019	10-17-2019	10-16-2019	10-16-2019	09-19-2019	09-19-2019	09-20-2019	09-20-2019
EcoAnalysis Sample ID	8097.2-110	8097.1-110	8097.2-111	8097.1-111	8097.2-105	8097.1-105	8097.2-100	8097.1-100	8097.2-9	8097.1-9	8097.2-13	8097.1-13
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	100	100	100	100	18.75	100	75	100	87.5	100
Abundance Measures												
Total Abundance	26	4	33	16	15	10	2736	540	684	172	605.71	167
Density	356.16	54.79	226.03	109.59	102.74	68.49	9369.86	1849.32	4560	1146.67	2422.84	668
Counted Blotted Mass	0.001	0.0047	0.001	0.0122	0.001	15.2455	0.005	0.1705	0.016	19.143	0.0136	0.086
Compositional Measures												
Shannon-Weaver H' (log 10)	1.05	0.6	0.85	0.58	0.86	0.39	0.94	1.2	0.6	0.72	0.67	0.7
Species Richness	14	4	9	5	9	3	25	30	17	18	22	17
Predator Richness	6	3	5	1	3	1	8	11	5	5	8	5
% Dominant Taxon	19.23	25	27.27	43.75	33.33	60	37.43	17.41	42.69	40.12	48.3	52.1
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	3.31	5	4.29	4.2	3.67	4.33	4.57	3.98	4.88	4.06	4.72	3.7
MTI_Hybrid	3.31	5	4.29	4.2	3.67	4.33	4.57	3.98	4.88	4.04	4.72	3.7
% Indiv. w/ MTI Value_WA	50	25	51.52	93.75	40	90	53.61	75.56	46.98	94.19	33.58	95.21
% Indiv. w/ MTI Value_Hybrid	50	25	51.52	93.75	40	90	54	75.56	46.98	95.93	33.58	96.41
Hilsenhoff Biotic Index (HBI)_WA	6.62	5.5	6.5	7.33	6.71	6	5.94	6.45	7.86	6.93	7.76	6.23
HBI_Hybrid	6.33	5.5	5.52	5	6.22	4.5	5.54	6.24	6.35	6.77	6.84	5.95
% Indiv. w/ HBI Value_WA	61.54	100	48.48	18.75	46.67	10	47.17	75.37	38.4	88.37	55.85	73.65
% Indiv. w/ HBI Value_Hybrid	80.77	100	93.94	100	60	100	86.74	98.52	82.46	100	86.42	98.8
% Chironomidae	34.62	0	45.45	50	26.67	60	37.23	35	1.56	4.07	3.96	3.59
% EPT	3.85	25	0	0	0	0	0	5.37	0.39	4.65	0.19	4.19

Site ID Number	DM047-BMI-1-101819	DM047-BMI-1-101819	DM050-BMI-1-092019	DM050-BMI-1-092019	DM061-BMI-1-101619	DM061-BMI-1-101619	EV001-BMI-1-092619	EV001-BMI-1-092619	EV002-BMI-1-092419	EV002-BMI-1-092419	EV003-BMI-1-092019	EV003-BMI-1-092019
Bucket1 Weight (lbs)	53	53	58	58	44.4	44.4	42	42	65	65	34	34
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	44	44	36	36	N/A	N/A	49	49
Collection Date	10-18-2019	10-18-2019	09-20-2019	09-20-2019	10-16-2019	10-16-2019	09-26-2019	09-26-2019	09-24-2019	09-24-2019	09-20-2019	09-20-2019
EcoAnalysis Sample ID	8097.2-109	8097.1-109	8097.2-12	8097.1-12	8097.2-99	8097.1-99	8097.2-39	8097.1-39	8097.2-22	8097.1-22	8097.2-11	8097.1-11
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	25	100	37.5	100	5.47	33.33	100	100	87.5	100	100	100
Abundance Measures												
Total Abundance	2208	429	1426.67	186	9837.71	1587	146	166	594.29	136	386	125
Density	15123.29	2938.36	5706.68	744	39350.84	6348	584	664	2377.16	544	2573.33	833.33
Counted Blotted Mass	0.0048	0.138	0.0086	31.9539	0.0111	1.231	0.0019	0.0079	0.0112	0.0634	0.0069	0.0127
Compositional Measures												
Shannon-Weaver H' (log 10)	1.22	0.87	0.47	0.6	0.57	0.86	0.98	1.06	0.96	0.93	0.9	0.87
Species Richness	33	33	10	14	27	36	15	20	25	17	18	13
Predator Richness	9	10	3	6	7	12	7	9	10	10	8	7
% Dominant Taxon	22.28	50.82	61.68	44.62	71.56	48.39	30.14	16.27	28.46	23.53	27.98	28.8
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	3.97	4.15	4.96	3.96	4.85	3.77	3.57	4.37	4.74	3.91	4.26	4.57
MTI_Hybrid	3.97	4.15	4.96	3.96	4.85	3.76	3.57	4.37	4.74	3.93	4.26	4.57
% Indiv. w/ MTI Value_WA	51.63	93.01	64.3	91.4	84.57	92.25	9.59	29.52	16.35	50.74	16.84	35.2
% Indiv. w/ MTI Value_Hybrid	51.99	93.24	64.3	91.4	84.57	93.95	9.59	29.52	16.35	51.47	16.84	35.2
Hilsenhoff Biotic Index (HBI)_WA	5.59	6.02	7.79	6.23	7.66	6.65	7.21	6.56	7.32	6.49	7.46	6.87
HBI_Hybrid	5.51	5.84	5.83	5.74	5.65	6.57	7.13	6.34	6.9	6.15	7.08	6.34
% Indiv. w/ HBI Value_WA	71.74	81.35	26.17	59.68	22.86	92.44	73.97	81.33	53.85	70.59	46.11	55.2
% Indiv. w/ HBI Value_Hybrid	82.61	99.3	90.09	100	97.03	98.87	76.71	95.18	65.77	91.91	54.66	76.8
% Chironomidae	59.42	75.52	2.24	2.69	7.99	7.37	18.49	37.95	15.38	12.5	11.66	13.6
% EPT	4.89	2.33	0	1.08	0	3.4	0	0.6	0.19	0	0	0

Site ID Number	EV005-BMI-1-091219	EV005-BMI-1-091219	EV008-BMI-1-092319	EV008-BMI-1-092319	EV010-BMI-1-091219	EV010-BMI-1-091219	EV011-BMI-1-100119	EV011-BMI-1-100119	EV012-BMI-1-091319	EV012-BMI-1-091319	EV013-BMI-1-091319	EV013-BMI-1-091319
Bucket1 Weight (lbs)	23	23	35	35	69	69	31.5	31.5	51	51	43	43
Bucket2 Weight (lbs)	N/A	N/A	39	39	N/A	N/A	N/A	N/A	N/A	N/A	55	55
Collection Date	09-12-2019	09-12-2019	09-23-2019	09-23-2019	09-12-2019	09-12-2019	10-01-2019	10-01-2019	09-13-2019	09-13-2019	09-13-2019	09-13-2019
EcoAnalysis Sample ID	8097.2-3	8097.1-3	8097.2-19	8097.1-19	8097.2-4	8097.1-4	8097.2-60	8097.1-60	8097.2-6	8097.1-6	8097.2-7	8097.1-7
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	54.69	100	100	100	25	87.5	100	100	100	100
Abundance Measures												
Total Abundance	386	79	992.91	487	119	67	2060	589.71	306	91	250	42
Density	2573.33	526.67	3971.64	1948	793.33	446.67	14109.59	4039.11	2040	606.67	1666.67	280
Counted Blotted Mass	0.011	0.104	0.0103	0.3807	0.0033	0.0125	0.0087	0.5025	0.0127	0.1105	0.0025	0.0084
Compositional Measures												
Shannon-Weaver H' (log 10)	0.75	0.69	0.72	1.03	0.83	0.7	0.72	0.75	0.91	0.93	0.86	0.68
Species Richness	16	10	21	24	14	8	16	15	21	16	20	8
Predator Richness	6	4	7	10	4	7	6	4	11	7	10	4
% Dominant Taxon	33.16	51.9	46.78	21.15	30.25	38.81	39.81	40.31	26.8	34.07	46.4	50
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.61	3.34	4.87	4.83	5.14	5	4.83	5.57	3.91	4.07	4.52	1.5
MTI_Hybrid	4.61	3.34	4.87	4.83	5.14	5	4.83	5.57	3.94	4.07	4.52	1.5
% Indiv. w/ MTI Value_WA	8.55	63.29	8.84	82.96	5.88	10.45	21.17	88.18	11.11	32.97	10.8	9.52
% Indiv. w/ MTI Value_Hybrid	8.55	63.29	8.84	82.96	5.88	10.45	21.17	88.18	11.44	32.97	10.8	9.52
Hilsenhoff Biotic Index (HBI)_WA	7.33	6.72	7.53	7.76	5.79	7.04	6.84	8.33	6.73	6.28	6.37	5.57
HBI_Hybrid	7.17	6.61	7.42	7.63	5.75	6.79	6.5	8.28	6.64	6.24	6.18	5.56
% Indiv. w/ HBI Value_WA	65.8	93.67	49.54	94.25	61.34	74.63	47.57	98.26	43.14	70.33	33.2	83.33
% Indiv. w/ HBI Value_Hybrid	70.73	100	51.75	98.77	64.71	85.07	58.64	100	45.75	72.53	37.6	85.71
% Chironomidae	23.06	8.86	18.78	58.32	41.18	5.97	38.25	94.57	16.99	9.89	22.4	30.95
% EPT	0	0	0	0.41	0	0	0	0.39	0	3.3	0.4	2.38

Site ID Number	EV022-BMI-1-093019	EV022-BMI-1-093019	EV026-BMI-1-092019	EV026-BMI-1-092019	EV027-BMI-1-092119	EV027-BMI-1-092119	EV036-BMI-1-091419	EV036-BMI-1-091419	EV036-BMI-2-100119	EV036-BMI-2-100119	EV037-BMI-1-092319	EV037-BMI-1-092319
Bucket1 Weight (lbs)	24	24	11	11	40	40	10	10	24.5	24.5	54	54
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	45	45	N/A	N/A	N/A	N/A	N/A	N/A
Collection Date	09-30-2019	09-30-2019	09-20-2019	09-20-2019	09-21-2019	09-21-2019	09-14-2019	09-14-2019	10-01-2019	10-01-2019	09-23-2019	09-23-2019
EcoAnalysis Sample ID	8097.2-49	8097.1-49	8097.2-10	8097.1-10	8097.2-17	8097.1-17	8097.2-8	8097.1-8	8097.2-45	8097.1-45	8097.2-20	8097.1-20
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	87.5	100	100	100	100	100	40.62	100	100	100	100	100
Abundance Measures												
Total Abundance	590.86	134	67	17	122	90	1319.38	154	564	104	289	44
Density	1618.79	367.12	446.67	113.33	813.33	600	18073.7	2109.59	3863.01	712.33	1156	176
Counted Blotted Mass	0.0076	0.0178	0.0018	0.5117	0.0023	0.0106	0.0105	0.0121	0.0098	0.0264	0.005	0.0117
Compositional Measures												
Shannon-Weaver H' (log 10)	1.04	1.01	0.93	0.91	0.71	0.78	0.86	0.76	0.8	0.7	0.85	0.57
Species Richness	22	22	16	9	15	9	19	15	15	9	23	7
Predator Richness	10	9	5	5	7	6	6	4	6	5	11	3
% Dominant Taxon	23.02	29.85	29.85	17.65	59.84	36.67	33.4	44.16	35.11	37.5	42.21	56.82
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	3.79	4.18	4.6	3.57	4	3.88	4.62	4.57	4.74	4.78	3.97	6
MTI_Hybrid	3.86	4.19	4.6	3.57	4.07	3.88	4.62	4.57	4.75	4.78	3.98	6
% Indiv. w/ MTI Value_WA	42.36	55.22	7.46	41.18	10.66	28.89	30.6	83.77	19.33	76.92	21.45	4.55
% Indiv. w/ MTI Value_Hybrid	44.68	55.97	7.46	41.18	11.48	28.89	30.6	83.77	19.5	76.92	21.8	4.55
Hilsenhoff Biotic Index (HBI)_WA	6.69	6.16	7.15	6.92	7.47	6.84	7.34	7.44	7.36	7.12	6.82	7.36
HBI_Hybrid	6.33	5.75	7.06	6.79	7.35	6.59	7.27	7.34	7.09	7.11	6.64	7.36
% Indiv. w/ HBI Value_WA	48.16	54.48	70.15	76.47	78.69	76.67	93.1	96.1	56.74	98.08	79.93	81.82
% Indiv. w/ HBI Value_Hybrid	63.25	85.07	73.13	82.35	82.79	88.89	96.46	100	64.54	99.04	89.27	81.82
% Chironomidae	34.43	29.85	19.4	11.76	13.11	23.33	69.78	89.61	32.8	91.35	30.45	11.36
% EPT	0	1.49	0	5.88	0	0	0	2.6	0	4.81	0.35	0

Site ID Number	EV037-BMI-2-092319	EV037-BMI-2-092319	EV044-BMI-1-092419	EV044-BMI-1-092419	EV048-BMI-1-092419	EV048-BMI-1-092419	EV049-BMI-1-092719	EV049-BMI-1-092719	EV051-BMI-1-092419	EV051-BMI-1-092419	EV052-BMI-1-092619	EV052-BMI-1-092619
Bucket1 Weight (lbs)	48	48	26	26	40	40	15	15	41	41	60	60
Bucket2 Weight (lbs)	N/A	N/A	27	27	41	41	N/A	N/A	43	43	N/A	N/A
Collection Date	09-23-2019	09-23-2019	09-24-2019	09-24-2019	09-24-2019	09-24-2019	09-27-2019	09-27-2019	09-24-2019	09-24-2019	09-26-2019	09-26-2019
EcoAnalysis Sample ID	8097.2-21	8097.1-21	8097.2-23	8097.1-23	8097.2-24	8097.1-24	8097.2-43	8097.1-43	8097.2-28	8097.1-28	8097.2-41	8097.1-41
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	43.75	41.67	11.33	25	100	100	100	87.5	50	100
Abundance Measures												
Total Abundance	139	112	1227.43	1288.8	4457.93	2060	468	157	552	645.71	1076	191
Density	556	448	4909.72	5155.2	17831.72	8240	6410.96	2150.68	2208	2582.84	4304	764
Counted Blotted Mass	0.0017	0.016	0.0437	0.635	0.0204	0.6224	0.0083	0.1792	0.0095	0.1945	0.0107	0.1691
Compositional Measures												
Shannon-Weaver H' (log 10)	0.91	0.87	1.02	0.91	0.79	0.86	0.74	0.79	1.01	1.02	0.83	0.72
Species Richness	14	14	29	23	20	27	15	14	23	38	20	16
Predator Richness	4	7	6	5	8	9	5	4	10	14	8	8
% Dominant Taxon	23.74	39.29	28.86	42.83	46.14	37.28	30.98	37.58	21.74	27.61	35.69	53.93
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.45	4.14	4.54	4.89	4.48	4.24	4.75	3.98	4.64	3.83	4.65	3.39
MTI_Hybrid	4.45	4.18	4.54	4.89	4.48	4.24	4.75	3.98	4.66	3.84	4.66	3.4
% Indiv. w/ MTI Value_WA	23.74	32.14	46.18	82.5	15.25	50.87	16.24	77.07	23.19	52.57	13.38	67.54
% Indiv. w/ MTI Value_Hybrid	23.74	33.93	46.18	82.5	15.25	50.87	16.24	77.07	24.64	52.92	13.75	68.06
Hilsenhoff Biotic Index (HBI)_WA	7.22	6.1	7.91	8.2	6.82	7	7.17	6.84	7.1	6.34	7.33	6.47
HBI_Hybrid	6.83	5.95	7.83	8.18	6.75	6.94	7.05	6.81	6.7	6.15	7	6.32
% Indiv. w/ HBI Value_WA	65.47	76.79	93.67	99.07	88.12	96.89	66.45	98.09	66.3	83.54	70.26	85.34
% Indiv. w/ HBI Value_Hybrid	79.86	91.07	97.58	100	92.28	99.81	70.3	100	82.79	97.52	81.97	96.34
% Chironomidae	22.3	66.96	49.72	71.14	60.2	71.46	45.09	56.05	28.99	35.4	20.26	4.19
% EPT	0	0	0.19	0.74	0	0	0	0	0	0.35	0.19	0

Site ID Number	EV054-BMI-1-092319	EV054-BMI-1-092319	EV057-BMI-1-092319	EV057-BMI-1-092319	EV060-BMI-1-092119	EV060-BMI-1-092119	EV063-BMI-1-091019	EV063-BMI-1-091019	EV064-BMI-1-091019	EV064-BMI-1-091019	EV065-BMI-1-092519	EV065-BMI-1-092519
Bucket1 Weight (lbs)	42	42	40	40	35	35	31.5	31.5	33.6	33.6	42	42
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	36	36	47.5	47.5	57.2	57.2	27	27
Collection Date	09-23-2019	09-23-2019	09-23-2019	09-23-2019	09-21-2019	09-21-2019	09-10-2019	09-10-2019	09-10-2019	09-10-2019	09-25-2019	09-25-2019
EcoAnalysis Sample ID	8097.2-26	8097.1-26	8097.2-27	8097.1-27	8097.2-18	8097.1-18	8097.2-1	8097.1-1	8097.2-2	8097.1-2	8097.2-31	8097.1-31
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	25	100	58.33	29.17	100	100	14.58	21.88	47.92	100	100	100
Abundance Measures												
Total Abundance	2224	556	882.86	1793.14	106	254	3517.71	2427.43	1135.3	208	187	146
Density	8896	2224	3531.44	7172.56	706.67	1693.33	14070.84	9709.72	4541.2	832	748	584
Counted Blotted Mass	0.0131	0.2935	0.047	0.9493	0.0026	0.1245	0.0558	0.4803	0.0157	0.1476	0.0038	0.0322
Compositional Measures												
Shannon-Weaver H' (log 10)	1.11	0.78	0.88	0.95	0.83	0.96	0.73	0.53	0.48	1	0.94	1.03
Species Richness	26	23	25	30	11	17	17	15	17	21	20	18
Predator Richness	4	4	6	7	6	11	2	5	4	8	9	7
% Dominant Taxon	20.86	47.48	42.91	39.2	37.74	22.05	39.96	60.26	66.18	25.48	34.76	21.23
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.66	3.91	4.82	4.94	5	4.24	4.78	4.51	5.31	5.33	3.65	3.43
MTI_Hybrid	4.66	3.91	4.82	4.94	5	4.25	4.78	4.51	5.31	5.33	3.83	3.43
% Indiv. w/ MTI Value_WA	43.88	91.37	25.44	79.73	4.72	32.68	73.29	97.36	11.76	89.42	13.9	36.3
% Indiv. w/ MTI Value_Hybrid	43.88	91.37	25.44	79.73	4.72	33.07	73.29	97.36	11.76	89.42	16.04	36.3
Hilsenhoff Biotic Index (HBI)_WA	7.94	8.1	8.01	8.1	7.18	5.96	8.44	8.05	8.2	8.78	7.38	6.37
HBI_Hybrid	7.74	8.04	7.79	8.05	7.05	5.78	7.01	6.21	7.56	8.65	7.22	6.28
% Indiv. w/ HBI Value_WA	90.11	98.02	78.83	97.71	72.64	72.05	56.14	39.55	26.65	94.23	78.07	89.04
% Indiv. w/ HBI Value_Hybrid	97.3	100	85.05	100	77.36	89.76	96.1	99.81	33.27	97.6	84.49	95.21
% Chironomidae	33.27	38.67	18.25	62.72	16.04	38.19	31.19	12.43	4.78	48.56	17.11	30.82
% EPT	0.18	0.72	0	0.57	0	0	0	0.19	0	0.48	0	0

Teck American Incorporated UCR Phase 3 Sediment Study Benthos 2019
Data are adjusted for subsampling in the lab

Site ID Number	EV066-BMI-1-092519	EV066-BMI-1-092519	EV069-BMI-1-092519	EV069-BMI-1-092519	EV069-BMI-2-092519	EV069-BMI-2-092519	EV071-BMI-1-092519	EV071-BMI-1-092519	EV072-BMI-1-092619	EV072-BMI-1-092619	EV075-BMI-1-091219	EV075-BMI-1-091219
Bucket1 Weight (lbs)	39	39	44	44	32	32	32	32	39	39	42	42
Bucket2 Weight (lbs)	36	36	32	32	35	35	31	31	35	35	N/A	N/A
Collection Date	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-26-2019	09-26-2019	09-12-2019	09-12-2019
EcoAnalysis Sample ID	8097.2-32	8097.1-32	8097.2-33	8097.1-33	8097.2-34	8097.1-34	8097.2-35	8097.1-35	8097.2-40	8097.1-40	8097.2-5	8097.1-5
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	87.5	26.17	100	100	100	100	23.44	75	37.5	50	100	100
Abundance Measures												
Total Abundance	614.86	1967.76	63	108	90	98	2158.93	705.33	1389.33	1080	155	92
Density	2459.44	7871.04	252	432	360	392	8635.72	2821.32	5557.32	4320	1033.33	613.33
Counted Blotted Mass	0.0287	0.1712	0.001	0.0046	0.001	0.0091	0.0093	0.0651	0.0164	0.1636	0.0015	0.0109
Compositional Measures												
Shannon-Weaver H' (log 10)	0.81	0.77	1.04	0.92	1.02	0.71	0.88	0.85	0.75	0.68	0.9	0.91
Species Richness	23	19	16	17	17	11	20	26	17	21	16	15
Predator Richness	9	7	5	7	7	5	6	11	7	10	7	7
% Dominant Taxon	38.1	53.01	23.81	30.56	21.11	45.92	42.89	47.83	46.26	60	27.74	32.61
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.85	4.48	5.83	4.5	4.91	4.84	4.75	4.36	4.74	3.75	5.43	3.83
MTI_Hybrid	4.85	4.48	5.79	4.49	4.88	4.84	4.75	4.36	4.74	3.76	5.4	3.83
% Indiv. w/ MTI Value_WA	10.04	15.92	36.51	46.3	25.56	51.02	19.57	20.6	11.13	21.3	9.03	25
% Indiv. w/ MTI Value_Hybrid	10.04	15.92	38.1	47.22	27.78	51.02	19.57	20.79	11.13	21.48	9.68	25
Hilsenhoff Biotic Index (HBI)_WA	6.75	6.35	6.58	5.69	6.73	5.51	6.56	6.74	6.62	6.31	6.69	6.41
HBI_Hybrid	6.61	6.24	6.06	5.47	6.21	5.27	6.34	6.71	6.45	6.23	6.59	6.38
% Indiv. w/ HBI Value_WA	77.32	90.29	49.21	64.81	54.44	50	75.3	96.41	76.97	92.78	72.9	94.57
% Indiv. w/ HBI Value_Hybrid	84.2	98.83	76.19	95.37	77.78	95.92	87.75	98.68	86.18	99.26	77.42	96.74
% Chironomidae	43.87	64.47	30.16	47.22	18.89	25.51	55.73	69.57	49.71	66.85	40	55.43
% EPT	0	0	0	1.85	1.11	1.02	0	0.19	0	0	0	1.09

Site ID Number	JS001-BMI-1-101019	JS001-BMI-1-101019	JS002-BMI-1-101019	JS002-BMI-1-101019	REF001-BMI-1-092819	REF001-BMI-1-092819	REF002-BMI-1-092819	REF002-BMI-1-092819	REF003-BMI-1-092719	REF003-BMI-1-092719	REF003-BMI-2-092719	REF003-BMI-2-092719
Bucket1 Weight (lbs)	52	52	38	38	37.6	37.6	38.6	38.6	43.6	43.6	37	37
Bucket2 Weight (lbs)	N/A	N/A	N/A	N/A	36.2	36.2	39.8	39.8	38.4	38.4	42.2	42.2
Collection Date	10-10-2019	10-10-2019	10-10-2019	10-10-2019	09-28-2019	09-28-2019	09-28-2019	09-28-2019	09-27-2019	09-27-2019	09-27-2019	09-27-2019
EcoAnalysis Sample ID	8097.2-68	8097.1-68	8097.2-71	8097.1-71	8097.2-48	8097.1-48	8097.2-47	8097.1-47	8097.2-44	8097.1-44	8097.2-25	8097.1-25
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	27.34	100	21.88	100	100	100	100	100	100	100	100	100
Abundance Measures												
Total Abundance	1828.57	336	2349.71	282	50	141	80	43	324	113	191	181
Density	12190.47	2240	15664.73	1880	200	564	320	172	3240	1130	1910	1810
Counted Blotted Mass	0.0078	0.1564	0.0036	0.0875	0.001	0.0171	0.0017	0.0047	0.006	0.0939	0.0017	0.034
Compositional Measures												
Shannon-Weaver H' (log 10)	0.61	0.79	0.91	1.03	0.8	0.85	0.83	0.64	0.64	1	0.73	0.56
Species Richness	22	20	28	27	12	18	14	6	18	19	20	17
Predator Richness	7	6	9	12	4	4	4	2	5	3	6	3
% Dominant Taxon	65.8	42.26	41.63	31.91	46	36.88	36.25	44.19	49.38	26.55	42.41	69.61
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.72	3.48	4.89	3.89	3.66	3.69	3.29	3.37	4.53	3.77	4.87	4.65
MTI_Hybrid	4.73	3.48	4.89	3.9	3.66	3.67	3.29	3.37	4.53	3.77	4.87	4.64
% Indiv. w/ MTI Value_WA	14.2	58.93	46.69	45.39	76	95.04	91.25	88.37	42.28	90.27	54.45	95.58
% Indiv. w/ MTI Value_Hybrid	14.6	58.93	47.28	45.74	76	95.74	91.25	88.37	42.28	90.27	54.45	96.13
Hilsenhoff Biotic Index (HBI)_WA	6.6	6.71	7.53	7	7.5	5.43	8.76	9	7	7.03	6.55	6.77
HBI_Hybrid	6.01	6.48	6.35	6.7	5.29	4.89	6.88	5.86	5.67	6.47	5.55	5.52
% Indiv. w/ HBI Value_WA	19	83.04	47.86	80.14	28	60.99	51.25	32.56	16.67	70.8	23.04	28.73
% Indiv. w/ HBI Value_Hybrid	30.4	96.43	90.08	95.39	84	97.87	91.25	100	50	98.23	65.97	98.9
% Chironomidae	10.6	6.25	9.53	13.83	56	60.28	42.5	51.16	9.26	30.97	10.47	16.02
% EPT	0	0.3	0	0.35	2	4.26	1.25	0	0	0	0	0

Site ID Number	REF004-BMI-1-092719	REF004-BMI-1-092719	REF005-BMI-1-100319	REF005-BMI-1-100319	REF006-BMI-1-100219	REF006-BMI-1-100219	REF007-BMI-1-093019	REF007-BMI-1-093019	REF008-BMI-1-093019	REF008-BMI-1-093019	REF009A-BMI-1-100219	REF009A-BMI-1-100219
Bucket1 Weight (lbs)	51.6	51.6	51.6	51.6	57.2	57.2	38.8	38.8	37	37	50.6	50.6
Bucket2 Weight (lbs)	47.8	47.8	N/A	N/A	N/A	N/A	37.4	37.4	35.4	35.4	N/A	N/A
Collection Date	09-27-2019	09-27-2019	10-03-2019	10-03-2019	10-02-2019	10-02-2019	09-30-2019	09-30-2019	09-30-2019	09-30-2019	10-02-2019	10-02-2019
EcoAnalysis Sample ID	8097.2-46	8097.1-46	8097.2-57	8097.1-57	8097.2-55	8097.1-55	8097.2-50	8097.1-50	8097.2-53	8097.1-53	8097.2-54	8097.1-54
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	25	62.5	40.62	100	100	100	31.25	62.5	56.25	100	75	100
Abundance Measures												
Total Abundance	2092	843.2	1230.77	235	112	253	1641.6	891.2	922.67	72	745.33	118
Density	20920	8432	8205.13	1566.67	746.67	1686.67	6566.4	3564.8	3690.68	288	4968.87	786.67
Counted Blotted Mass	0.0078	0.0758	0.0093	0.0792	0.0015	0.102	0.0138	0.2683	0.011	0.0184	0.0133	0.018
Compositional Measures												
Shannon-Weaver H' (log 10)	0.8	1.02	1.23	1.04	1.23	1.3	0.85	1.27	0.81	0.91	0.5	0.47
Species Richness	28	31	37	24	30	35	25	43	26	12	28	14
Predator Richness	9	7	11	6	7	11	5	7	7	3	6	3
% Dominant Taxon	44.74	35.86	18.4	29.79	25	13.83	48.93	25.85	46.44	23.61	76.21	77.12
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	4.45	4.09	3.75	3.74	3.87	3.79	3.06	3.99	4.74	4.29	4.22	4.01
MTI_Hybrid	4.45	4.07	3.76	3.72	3.89	3.78	3.06	4	4.74	4.29	4.21	4.02
% Indiv. w/ MTI Value_WA	63.1	91.84	63	91.91	48.21	88.54	25.34	89.77	14.07	100	16.1	96.61
% Indiv. w/ MTI Value_Hybrid	63.1	93.36	63.6	94.47	49.11	91.7	25.34	90.48	14.26	100	16.28	97.46
Hilsenhoff Biotic Index (HBI)_WA	7.76	6.71	5.9	4.93	6.85	6.11	7.77	7.08	5.95	6.06	7.85	6.42
HBI_Hybrid	6.04	6.07	5.82	4.66	6.72	5.88	7.73	6.79	5.84	5.81	7.49	4.45
% Indiv. w/ HBI Value_WA	26.96	62.05	84.8	57.87	77.68	82.61	84.02	85.64	45.28	75	83.54	16.1
% Indiv. w/ HBI Value_Hybrid	74.57	98.48	91.2	100	84.82	95.26	85.77	96.23	49.71	100	92.49	98.31
% Chironomidae	13.77	42.69	59.4	55.32	33.04	63.24	14.42	39.32	8.86	36.11	10.55	82.2
% EPT	0	0.19	9.6	15.32	2.68	5.53	1.17	1.44	12.33	19.44	0.72	3.39

Site ID Number	REF010-BMI-1-100319	REF010-BMI-1-100319	REF011-BMI-1-100119	REF011-BMI-1-100119	REF011-BMI-2-100119	REF011-BMI-2-100119	REF012-BMI-1-100419	REF012-BMI-1-100419	REF013-BMI-1-092419	REF013-BMI-1-092419	REF014-BMI-1-092619	REF014-BMI-1-092619
Bucket1 Weight (lbs)	39.4	39.4	35.6	35.6	34.6	34.6	50	50	37.4	37.4	37.8	37.8
Bucket2 Weight (lbs)	N/A	N/A	36	36	34.8	34.8	N/A	N/A	43.8	43.8	38.8	38.8
Collection Date	10-03-2019	10-03-2019	10-01-2019	10-01-2019	10-01-2019	10-01-2019	10-04-2019	10-04-2019	09-24-2019	09-24-2019	09-26-2019	09-26-2019
EcoAnalysis Sample ID	8097.2-58	8097.1-58	8097.2-61	8097.1-61	8097.2-62	8097.1-62	8097.2-59	8097.1-59	8097.2-29	8097.1-29	8097.2-42	8097.1-42
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	100	100	100	100	100	100	37.5	100	5.47	100	12.5	100
Abundance Measures												
Total Abundance	344	229	233	369	94	177	1392	119	9910.86	130	4864	154
Density	2293.33	1526.67	932	1476	376	708	13920	1190	39643.44	520	19456	616
Counted Blotted Mass	0.0066	0.2671	0.0021	0.0272	0.0024	0.0073	0.0082	0.0973	0.0106	0.03	0.0077	0.04
Compositional Measures												
Shannon-Weaver H' (log 10)	1.18	0.8	0.84	0.49	0.68	0.51	0.57	0.9	0.14	0.94	0.35	0.86
Species Richness	32	20	15	10	11	13	23	20	8	17	16	19
Predator Richness	10	7	5	1	2	2	6	6	3	5	3	5
% Dominant Taxon	20.35	39.74	25.75	66.67	51.06	66.1	68.01	36.13	93.17	26.92	81.58	37.66
Tolerance/Sensitivity Measures												
Metals Tolerance Index (MIT)_WA	3.69	4.08	3.56	4.09	3.55	4.12	4.41	3.68	5	5.16	4.81	4.62
MTI_Hybrid	3.82	4.07	3.56	4.09	3.55	4.12	4.41	3.67	5	5.16	4.81	4.62
% Indiv. w/ MTI Value_WA	44.77	96.07	96.57	98.92	87.23	98.31	19.73	96.64	1.11	48.46	11.84	59.09
% Indiv. w/ MTI Value_Hybrid	49.42	96.94	96.57	98.92	87.23	98.31	19.92	98.32	1.11	48.46	11.84	59.09
Hilsenhoff Biotic Index (HBI)_WA	4.6	4.02	8.1	7.38	8.47	7.09	8.08	6.86	7.48	6.62	6.14	5.3
HBI_Hybrid	4.61	4.03	6.54	4.65	5.65	4.61	6.86	6.33	7.14	6.3	5.55	5.25
% Indiv. w/ HBI Value_WA	65.99	72.93	54.08	13.55	31.91	12.99	18.58	63.87	5.72	76.92	7.24	70.78
% Indiv. w/ HBI Value_Hybrid	82.27	100	97	99.19	91.49	99.44	30.65	89.08	6.64	96.15	15.95	100
% Chironomidae	34.01	34.5	47.21	75.61	63.83	75.71	3.07	11.76	0.74	53.08	3.95	62.34
% EPT	23.55	52.4	0.43	0	1.06	0	0	0.84	0	0	0	0

Site ID Number	REF015-BMI-1-092419	REF015-BMI-1-092419	REF016-BMI-1-092519	REF016-BMI-1-092519	REF017-BMI-1-092519	REF017-BMI-1-092519	REF018-BMI-1-092519	REF018-BMI-1-092519
Bucket1 Weight (lbs)	33.2	33.2	36.8	36.8	33	33	35.6	35.6
Bucket2 Weight (lbs)	33.8	33.8	38.2	38.2	35.2	35.2	34.8	34.8
Collection Date	09-24-2019	09-24-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019	09-25-2019
EcoAnalysis Sample ID	8097.2-30	8097.1-30	8097.2-38	8097.1-38	8097.2-36	8097.1-36	8097.2-37	8097.1-37
Sample Size Fraction	250µm	500µm	250µm	500µm	250µm	500µm	250µm	500µm
Percent Subsampled	58.33	100	28.65	100	65.62	100	100	100
Abundance Measures								
Total Abundance	870.86	68	1874.62	103	879.24	37	73	0
Density	3483.44	272	7498.48	412	3516.96	148	292	0
Counted Blotted Mass	0.0041	0.0073	0.0048	0.0047	0.0054	0.0039	0.001	0
Compositional Measures								
Shannon-Weaver H' (log 10)	0.47	0.61	0.42	0.13	0.32	0.29	0.22	NA
Species Richness	13	9	12	5	10	3	8	0
Predator Richness	4	3	3	3	4	2	1	0
% Dominant Taxon	59.84	58.82	65.74	94.17	72.79	78.38	90.41	NA
Tolerance/Sensitivity Measures								
Metals Tolerance Index (MIT)_WA	4.91	4.85	4.99	4.97	4.97	4.68	4.93	NA
MTI_Hybrid	4.91	4.85	4.99	4.97	4.97	4.68	4.93	NA
% Indiv. w/ MTI Value_WA	61.61	77.94	67.23	98.06	73.66	100	97.26	NA
% Indiv. w/ MTI Value_Hybrid	61.61	77.94	67.6	98.06	73.66	100	97.26	NA
Hilsenhoff Biotic Index (HBI)_WA	6.26	6.3	6.27	7.83	6.71	8	7	NA
HBI_Hybrid	5.14	5.52	5.12	5.17	5.06	5.43	5.19	NA
% Indiv. w/ HBI Value_WA	7.48	39.71	6.89	5.83	2.43	10.81	9.59	NA
% Indiv. w/ HBI Value_Hybrid	67.32	98.53	73	100	75.39	100	100	NA
% Chironomidae	4.13	38.24	3.91	3.88	1.04	0	5.48	NA
% EPT	0	0	0	0	0	0	0	NA

ASH-FREE DRY WEIGHT AND BLOTTED DRY-WEIGHT RESULTS

APPENDIX C

Teck America UCR Phase 3 Sediment Study Benthos 2019
Blotted Wet Weights on ID'd Organisms Not in the Reference Collection and not Slide-Mounted
No Annalids were included in the results

ECO ANALYSTS, INC.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Tare (weigh boat mass) (g)	Gross Mass (weigh boat+sample) (g)	Blotted Wet Weight (g)	Notes
EV063-BMI-1-091019	31.5	47.5	9/10/2019	8097.1-1	500µm	2.220	2.325	0.105	
EV063-BMI-1-091019	31.5	47.5	9/10/2019	8097.2-1	250µm	2.270	2.282	0.012	
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.1-2	500µm	2.203	2.351	0.148	
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.2-2	250µm	2.261	2.277	0.016	
EV005-BMI-1-091219	23	N/A	9/12/2019	8097.1-3	500µm	2.237	2.341	0.104	
EV005-BMI-1-091219	23	N/A	9/12/2019	8097.2-3	250µm	2.257	2.268	0.011	
EV010-BMI-1-091219	69	N/A	9/12/2019	8097.1-4	500µm	2.229	2.241	0.012	
EV010-BMI-1-091219	69	N/A	9/12/2019	8097.2-4	250µm	2.234	2.237	0.003	
EV075-BMI-1-091219	42	N/A	9/12/2019	8097.1-5	500µm	2.242	2.253	0.011	
EV075-BMI-1-091219	42	N/A	9/12/2019	8097.2-5	250µm	2.238	2.240	0.001	
EV012-BMI-1-091319	51	N/A	9/13/2019	8097.1-6	500µm	2.250	2.360	0.111	
EV012-BMI-1-091319	51	N/A	9/13/2019	8097.2-6	250µm	2.242	2.254	0.013	
EV013-BMI-1-091319	43	55	9/13/2019	8097.1-7	500µm	2.223	2.232	0.008	
EV013-BMI-1-091319	43	55	9/13/2019	8097.2-7	250µm	2.217	2.220	0.002	
EV036-BMI-1-091419	10	N/A	9/14/2019	8097.1-8	500µm	2.239	2.251	0.012	
EV036-BMI-1-091419	10	N/A	9/14/2019	8097.2-8	250µm	2.251	2.261	0.011	
DM045-BMI-1-091919	27	N/A	9/19/2019	8097.1-9	500µm	2.232	21.375	19.143	Large bivalve=19.0237g
DM045-BMI-1-091919	27	N/A	9/19/2019	8097.2-9	250µm	2.250	2.266	0.016	
EV026-BMI-1-092019	11	N/A	9/20/2019	8097.1-10	500µm	2.229	2.741	0.512	
EV026-BMI-1-092019	11	N/A	9/20/2019	8097.2-10	250µm	2.239	2.241	0.002	
EV003-BMI-1-092019	34	49	9/20/2019	8097.1-11	500µm	2.227	2.240	0.013	
EV003-BMI-1-092019	34	49	9/20/2019	8097.2-11	250µm	2.214	2.221	0.007	
DM050-BMI-1-092019	58	N/A	9/20/2019	8097.1-12	500µm	2.243	34.196	31.954	Large bivalve=31.7513g
DM050-BMI-1-092019	58	N/A	9/20/2019	8097.2-12	250µm	2.255	2.264	0.009	
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.1-13	500µm	2.227	2.313	0.086	
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.2-13	250µm	2.241	2.254	0.014	
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-14	500µm	2.207	2.216	0.009	
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.2-14	250µm	2.229	2.231	0.002	
DM023-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-15	500µm	2.218	2.222	0.003	
DM023-BMI-1-092119	57.4	N/A	9/21/2019	8097.2-15	250µm	2.214	2.215	<0.001	
DM026-BMI-1-092119	59.4	N/A	9/21/2019	8097.1-16	500µm	2.223	2.233	0.010	
DM026-BMI-1-092119	59.4	N/A	9/21/2019	8097.2-16	250µm	2.232	2.233	0.001	
EV027-BMI-1-092119	40	45	9/21/2019	8097.1-17	500µm	2.219	2.230	0.011	
EV027-BMI-1-092119	40	45	9/21/2019	8097.2-17	250µm	2.254	2.257	0.002	
EV060-BMI-1-092119	35	36	9/21/2019	8097.1-18	500µm	2.233	2.357	0.125	
EV060-BMI-1-092119	35	36	9/21/2019	8097.2-18	250µm	2.254	2.257	0.003	
EV008-BMI-1-092319	35	39	9/23/2019	8097.1-19	500µm	2.240	2.620	0.381	
EV008-BMI-1-092319	35	39	9/23/2019	8097.2-19	250µm	2.261	2.271	0.010	
EV037-BMI-1-092319	54	N/A	9/23/2019	8097.1-20	500µm	2.222	2.234	0.012	
EV037-BMI-1-092319	54	N/A	9/23/2019	8097.2-20	250µm	2.257	2.262	0.005	
EV037-BMI-2-092319	48	N/A	9/23/2019	8097.1-21	500µm	2.263	2.279	0.016	
EV037-BMI-2-092319	48	N/A	9/23/2019	8097.2-21	250µm	2.251	2.253	0.002	
EV002-BMI-1-092419	65	N/A	9/24/2019	8097.1-22	500µm	2.225	2.289	0.063	
EV002-BMI-1-092419	65	N/A	9/24/2019	8097.2-22	250µm	2.257	2.268	0.011	
EV044-BMI-1-092419	26	27	9/24/2019	8097.1-23	500µm	2.252	2.516	0.265	
EV044-BMI-1-092419	26	27	9/24/2019	8097.2-23	250µm	2.262	2.280	0.018	
EV048-BMI-1-092419	40	41	9/24/2019	8097.1-24	500µm	2.250	2.406	0.156	
EV048-BMI-1-092419	40	41	9/24/2019	8097.2-24	250µm	2.250	2.255	0.005	
REF003-BMI-2-092719	37	42.2	9/27/2019	8097.1-25	500µm	2.228	2.262	0.034	
REF003-BMI-2-092719	37	42.2	9/27/2019	8097.2-25	250µm	2.237	2.238	0.002	
EV054-BMI-1-092319	42	N/A	9/23/2019	8097.1-26	500µm	2.219	2.512	0.294	
EV054-BMI-1-092319	42	N/A	9/23/2019	8097.2-26	250µm	2.268	2.281	0.013	
EV057-BMI-1-092319	40	N/A	9/23/2019	8097.1-27	500µm	2.251	2.527	0.277	
EV057-BMI-1-092319	40	N/A	9/23/2019	8097.2-27	250µm	2.260	2.274	0.014	
EV051-BMI-1-092419	41	43	9/24/2019	8097.1-28	500µm	2.248	2.418	0.170	
EV051-BMI-1-092419	41	43	9/24/2019	8097.2-28	250µm	2.238	2.247	0.008	
REF013-BMI-1-092419	37.4	43.8	9/24/2019	8097.1-29	500µm	2.234	2.264	0.030	
REF013-BMI-1-092419	37.4	43.8	9/24/2019	8097.2-29	250µm	2.246	2.257	0.011	
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.1-30	500µm	2.232	2.239	0.007	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Blotted Wet Weights on ID'd Organisms Not in the Reference Collection and not Slide-Mounted
No Annalids were included in the results

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Tare (weigh boat mass) (g)	Gross Mass (weigh boat+sample) (g)	Blotted Wet Weight (g)	Notes
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.2-30	250µm	2.219	2.223	0.004	
EV065-BMI-1-092519	42	27	9/25/2019	8097.1-31	500µm	2.218	2.250	0.032	
EV065-BMI-1-092519	42	27	9/25/2019	8097.2-31	250µm	2.246	2.250	0.004	
EV066-BMI-1-092519	39	36	9/25/2019	8097.1-32	500µm	2.211	2.256	0.045	
EV066-BMI-1-092519	39	36	9/25/2019	8097.2-32	250µm	2.213	2.220	0.007	
EV069-BMI-1-092519	44	32	9/25/2019	8097.1-33	500µm	2.216	2.221	0.005	
EV069-BMI-1-092519	44	32	9/25/2019	8097.2-33	250µm	2.240	2.240	<0.001	
EV069-BMI-2-092519	32	35	9/25/2019	8097.1-34	500µm	2.241	2.250	0.009	
EV069-BMI-2-092519	32	35	9/25/2019	8097.2-34	250µm	2.240	2.241	<0.001	
EV071-BMI-1-092519	32	31	9/25/2019	8097.1-35	500µm	2.235	2.283	0.049	
EV071-BMI-1-092519	32	31	9/25/2019	8097.2-35	250µm	2.225	2.232	0.007	
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.1-36	500µm	2.257	2.261	0.004	
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.2-36	250µm	2.214	2.219	0.005	
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.1-37	500µm	No Specime	No Specime	N/A	No Specimens
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.2-37	250µm	2.229	2.229	<0.001	
REF016-BMI-1-092519	36.8	38.2	9/25/2019	8097.1-38	500µm	2.248	2.252	0.005	
REF016-BMI-1-092519	36.8	38.2	9/25/2019	8097.2-38	250µm	2.222	2.227	0.005	
EV001-BMI-1-092619	42	36	9/26/2019	8097.1-39	500µm	2.251	2.259	0.008	
EV001-BMI-1-092619	42	36	9/26/2019	8097.2-39	250µm	2.249	2.251	0.002	
EV072-BMI-1-092619	39	35	9/26/2019	8097.1-40	500µm	2.219	2.301	0.082	
EV072-BMI-1-092619	39	35	9/26/2019	8097.2-40	250µm	2.247	2.255	0.008	
EV052-BMI-1-092619	60	N/A	9/26/2019	8097.1-41	500µm	2.213	2.382	0.169	
EV052-BMI-1-092619	60	N/A	9/26/2019	8097.2-41	250µm	2.221	2.232	0.011	
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.1-42	500µm	2.216	2.256	0.040	
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.2-42	250µm	2.216	2.224	0.008	
EV049-BMI-1-092719	15	N/A	9/27/2019	8097.1-43	500µm	2.201	2.380	0.179	
EV049-BMI-1-092719	15	N/A	9/27/2019	8097.2-43	250µm	2.220	2.228	0.008	
REF003-BMI-1-092719	43.6	38.4	9/27/2019	8097.1-44	500µm	2.238	2.332	0.094	
REF003-BMI-1-092719	43.6	38.4	9/27/2019	8097.2-44	250µm	2.232	2.238	0.006	
EV036-BMI-2-100119	24.5	N/A	10/1/2019	8097.1-45	500µm	2.234	2.260	0.026	
EV036-BMI-2-100119	24.5	N/A	10/1/2019	8097.2-45	250µm	2.241	2.251	0.010	
REF004-BMI-1-092719	51.6	47.8	9/27/2019	8097.1-46	500µm	2.205	2.252	0.047	
REF004-BMI-1-092719	51.6	47.8	9/27/2019	8097.2-46	250µm	2.249	2.254	0.005	
REF002-BMI-1-092819	38.6	39.8	9/28/2019	8097.1-47	500µm	2.208	2.213	0.005	
REF002-BMI-1-092819	38.6	39.8	9/28/2019	8097.2-47	250µm	2.240	2.241	0.002	
REF001-BMI-1-092819	37.6	36.2	9/28/2019	8097.1-48	500µm	2.228	2.245	0.017	
REF001-BMI-1-092819	37.6	36.2	9/28/2019	8097.2-48	250µm	2.227	2.227	<0.001	
EV022-BMI-1-093019	24	N/A	9/30/2019	8097.1-49	500µm	2.216	2.234	0.018	
EV022-BMI-1-093019	24	N/A	9/30/2019	8097.2-49	250µm	2.233	2.241	0.008	
REF007-BMI-1-093019	38.8	37.4	9/30/2019	8097.1-50	500µm	2.224	2.392	0.168	
REF007-BMI-1-093019	38.8	37.4	9/30/2019	8097.2-50	250µm	2.240	2.248	0.009	
4-B6-2019-BMI-1-092619	30	27	9/26/2019	8097.1-51	500µm	2.250	2.288	0.038	
4-B6-2019-BMI-1-092619	30	27	9/26/2019	8097.2-51	250µm	2.217	2.221	0.004	
4-B1-2019-BMI-1-092619	32	34	9/26/2019	8097.1-52	500µm	2.252	2.302	0.050	
4-B1-2019-BMI-1-092619	32	34	9/26/2019	8097.2-52	250µm	2.242	2.252	0.009	
REF008-BMI-1-093019	37	35.4	9/30/2019	8097.1-53	500µm	2.217	2.235	0.018	
REF008-BMI-1-093019	37	35.4	9/30/2019	8097.2-53	250µm	2.262	2.273	0.011	
REF009A-BMI-1-100219	50.6	N/A	10/2/2019	8097.1-54	500µm	2.212	2.230	0.018	
REF009A-BMI-1-100219	50.6	N/A	10/2/2019	8097.2-54	250µm	2.240	2.253	0.013	
REF006-BMI-1-100219	57.2	N/A	10/2/2019	8097.1-55	500µm	2.222	2.324	0.102	
REF006-BMI-1-100219	57.2	N/A	10/2/2019	8097.2-55	250µm	2.222	2.224	0.002	
CB035-BMI-1-100319	24	N/A	10/3/2019	8097.1-56	500µm	2.211	2.215	0.004	
CB035-BMI-1-100319	24	N/A	10/3/2019	8097.2-56	250µm	2.221	2.224	0.003	
REF005-BMI-1-100319	51.6	N/A	10/3/2019	8097.1-57	500µm	2.205	2.284	0.079	
REF005-BMI-1-100319	51.6	N/A	10/3/2019	8097.2-57	250µm	2.231	2.240	0.009	
REF010-BMI-1-100319	39.4	N/A	10/3/2019	8097.1-58	500µm	2.249	2.516	0.267	
REF010-BMI-1-100319	39.4	N/A	10/3/2019	8097.2-58	250µm	2.248	2.255	0.007	
REF012-BMI-1-100419	50	N/A	10/4/2019	8097.1-59	500µm	2.253	2.350	0.097	
REF012-BMI-1-100419	50	N/A	10/4/2019	8097.2-59	250µm	2.228	2.236	0.008	
EV011-BMI-1-100119	31.5	N/A	10/1/2019	8097.1-60	500µm	2.227	2.667	0.440	
EV011-BMI-1-100119	31.5	N/A	10/1/2019	8097.2-60	250µm	2.225	2.233	0.008	
REF011-BMI-1-100119	35.6	36	10/1/2019	8097.1-61	500µm	2.230	2.257	0.027	

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ECO ANALYSTS, INC.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Tare (weigh boat mass) (g)	Gross Mass (weigh boat+sample) (g)	Blotted Wet Weight (g)	Notes
REF011-BMI-1-100119	35.6	36	10/1/2019	8097.2-61	250µm	2.216	2.218	0.002	
REF011-BMI-2-100119	34.6	34.8	10/1/2019	8097.1-62	500µm	2.242	2.249	0.007	
REF011-BMI-2-100119	34.6	34.8	10/1/2019	8097.2-62	250µm	2.231	2.233	0.002	
CB046-BMI-1-100819	32	N/A	10/8/2019	8097.1-63	500µm	2.260	2.264	0.004	
CB046-BMI-1-100819	32	N/A	10/8/2019	8097.2-63	250µm	2.235	2.237	0.002	
CB036-BMI-1-100419	32.5	N/A	10/4/2019	8097.1-64	500µm	2.235	2.236	<0.001	
CB036-BMI-1-100419	32.5	N/A	10/4/2019	8097.2-64	250µm	2.252	2.253	0.001	
CB006-BMI-1-100919	41	39	10/9/2019	8097.1-65	500µm	2.228	2.262	0.034	
CB006-BMI-1-100919	41	39	10/9/2019	8097.2-65	250µm	2.226	2.229	0.002	
CB012-BMI-1-100919	42	51	10/9/2019	8097.1-66	500µm	2.228	2.260	0.032	
CB012-BMI-1-100919	42	51	10/9/2019	8097.2-66	250µm	2.227	2.228	<0.001	
CB007-BMI-1-100919	42	N/A	10/9/2019	8097.1-67	500µm	2.227	2.290	0.063	
CB007-BMI-1-100919	42	N/A	10/9/2019	8097.2-67	250µm	2.260	2.266	0.006	
JS001-BMI-1-101019	52	N/A	10/10/2019	8097.1-68	500µm	2.200	2.356	0.156	
JS001-BMI-1-101019	52	N/A	10/10/2019	8097.2-68	250µm	2.236	2.244	0.008	
DM018-BMI-1-100919	60.4	N/A	10/9/2019	8097.1-69	500µm	2.212	2.222	0.011	
DM018-BMI-1-100919	60.4	N/A	10/9/2019	8097.2-69	250µm	2.238	2.249	0.011	
DM002-BMI-1-100919	63.6	N/A	10/9/2019	8097.1-70	500µm	2.225	2.238	0.013	
DM002-BMI-1-100919	63.6	N/A	10/9/2019	8097.2-70	250µm	2.221	2.222	0.001	
JS002-BMI-1-101019	38	N/A	10/10/2019	8097.1-71	500µm	2.245	2.332	0.087	
JS002-BMI-1-101019	38	N/A	10/10/2019	8097.2-71	250µm	2.241	2.245	0.004	
CB014-BMI-1-101519	49	N/A	10/15/2019	8097.1-72	500µm	2.221	2.225	0.004	
CB014-BMI-1-101519	49	N/A	10/15/2019	8097.2-72	250µm	2.235	2.235	<0.001	
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.1-73	500µm	2.235	2.282	0.047	
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.2-73	250µm	2.237	2.238	0.002	
DM015-BMI-2-101019	49.6	N/A	10/10/2019	8097.1-74	500µm	2.213	2.258	0.045	
DM015-BMI-2-101019	49.6	N/A	10/10/2019	8097.2-74	250µm	2.239	2.243	0.004	
DM016-BMI-1-101019	59.4	N/A	10/10/2019	8097.1-75	500µm	2.248	2.251	0.003	
DM016-BMI-1-101019	59.4	N/A	10/10/2019	8097.2-75	250µm	2.244	2.245	<0.001	
DM008-BMI-1-101119	39.2	N/A	10/11/2019	8097.1-76	500µm	2.241	2.268	0.027	
DM008-BMI-1-101119	39.2	N/A	10/11/2019	8097.2-76	250µm	2.238	2.242	0.004	
CB016-BMI-1-101119	28	N/A	10/11/2019	8097.1-77	500µm	2.235	2.402	0.167	
CB016-BMI-1-101119	28	N/A	10/11/2019	8097.2-77	250µm	2.220	2.225	0.005	
DM010-BMI-1-101119	54.2	N/A	10/11/2019	8097.1-78	500µm	2.247	2.265	0.018	
DM010-BMI-1-101119	54.2	N/A	10/11/2019	8097.2-78	250µm	2.239	2.239	<0.001	
CB018-BMI-1-101119	36	N/A	10/11/2019	8097.1-79	500µm	2.217	2.343	0.126	
CB018-BMI-1-101119	36	N/A	10/11/2019	8097.2-79	250µm	2.217	2.223	0.006	
CB047-BMI-1-101119	26	N/A	10/11/2019	8097.1-80	500µm	2.253	2.262	0.009	
CB047-BMI-1-101119	26	N/A	10/11/2019	8097.2-80	250µm	2.210	2.213	0.003	
CB009-BMI-1-101219	35	N/A	10/12/2019	8097.1-81	500µm	2.249	2.404	0.155	
CB009-BMI-1-101219	35	N/A	10/12/2019	8097.2-81	250µm	2.214	2.218	0.004	
CB010-BMI-1-101219	45	30	10/12/2019	8097.1-82	500µm	2.247	2.280	0.033	
CB010-BMI-1-101219	45	30	10/12/2019	8097.2-82	250µm	2.228	2.234	0.006	
CB039-BMI-1-101219	22	N/A	10/12/2019	8097.1-83	500µm	2.262	2.265	0.003	
CB039-BMI-1-101219	22	N/A	10/12/2019	8097.2-83	250µm	2.220	2.224	0.004	
DM025-BMI-1-101219	61.8	N/A	10/12/2019	8097.1-84	500µm	2.276	2.287	0.011	
DM025-BMI-1-101219	61.8	N/A	10/12/2019	8097.2-84	250µm	2.221	2.222	<0.001	
DM019-BMI-1-101419	33	41.8	10/14/2019	8097.1-85	500µm	2.260	2.268	0.008	
DM019-BMI-1-101419	33	41.8	10/14/2019	8097.2-85	250µm	2.238	2.239	<0.001	
DM020-BMI-1-101419	45.6	N/A	10/14/2019	8097.1-86	500µm	2.194	2.196	0.002	
DM020-BMI-1-101419	45.6	N/A	10/14/2019	8097.2-86	250µm	2.249	2.249	<0.001	
DM027-BMI-1-101419	48	34.2	10/14/2019	8097.1-87	500µm	2.200	2.222	0.022	
DM027-BMI-1-101419	48	34.2	10/14/2019	8097.2-87	250µm	2.261	2.263	0.001	
CB020-BMI-1-101419	46	N/A	10/14/2019	8097.1-88	500µm	2.213	2.363	0.149	
CB020-BMI-1-101419	46	N/A	10/14/2019	8097.2-88	250µm	2.262	2.268	0.007	
CB020-BMI-2-101419	61	N/A	10/14/2019	8097.1-89	500µm	2.199	2.326	0.128	
CB020-BMI-2-101419	61	N/A	10/14/2019	8097.2-89	250µm	2.266	2.274	0.008	
CB021-BMI-1-101419	46.5	31	10/14/2019	8097.1-90	500µm	2.218	2.228	0.010	
CB021-BMI-1-101419	46.5	31	10/14/2019	8097.2-90	250µm	2.230	2.240	0.010	
CB024-BMI-1-101419	42	N/A	10/14/2019	8097.1-91	500µm	2.220	2.384	0.164	
CB024-BMI-1-101419	42	N/A	10/14/2019	8097.2-91	250µm	2.250	2.258	0.008	
CB029-BMI-1-101519	49	N/A	10/15/2019	8097.1-92	500µm	2.211	2.368	0.157	
CB029-BMI-1-101519	49	N/A	10/15/2019	8097.2-92	250µm	2.247	2.255	0.009	

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ECO ANALYSTS, INC.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Tare (weigh boat mass) (g)	Gross Mass (weigh boat+sample) (g)	Blotted Wet Weight (g)	Notes
CB029-BMI-2-101519	39	N/A	10/15/2019	8097.1-93	500µm	2.258	2.402	0.144	
CB029-BMI-2-101519	39	N/A	10/15/2019	8097.2-93	250µm	2.239	2.249	0.010	
CB044-BMI-1-101519	57	N/A	10/15/2019	8097.1-94	500µm	2.235	2.348	0.113	
CB044-BMI-1-101519	57	N/A	10/15/2019	8097.2-94	250µm	2.211	2.218	0.007	
DM024-BMI-1-101519	56	56.4	10/15/2019	8097.1-95	500µm	2.263	2.268	0.005	
DM024-BMI-1-101519	56	56.4	10/15/2019	8097.2-95	250µm	2.243	2.244	0.001	
DM024-BMI-2-101519	48.6	52.6	10/15/2019	8097.1-96	500µm	2.225	2.228	0.002	
DM024-BMI-2-101519	48.6	52.6	10/15/2019	8097.2-96	250µm	2.276	2.278	0.002	
3-R7-2019-BMI-1-101519	43.5	N/A	10/15/2019	8097.1-97	500µm	2.255	2.264	0.009	
3-R7-2019-BMI-1-101519	43.5	N/A	10/15/2019	8097.2-97	250µm	2.279	2.285	0.006	
1-B6-NRT-BMI-1-101619	50.2	52.6	10/16/2019	8097.1-98	500µm	2.221	2.246	0.025	
1-B6-NRT-BMI-1-101619	50.2	52.6	10/16/2019	8097.2-98	250µm	2.282	2.285	0.002	
DM061-BMI-1-101619	44.4	44	10/16/2019	8097.1-99	500µm	2.219	2.629	0.410	
DM061-BMI-1-101619	44.4	44	10/16/2019	8097.2-99	250µm	2.260	2.264	0.004	
DM044-BMI-1-101619	42.4	N/A	10/16/2019	8097.1-100	500µm	2.279	2.449	0.171	
DM044-BMI-1-101619	42.4	N/A	10/16/2019	8097.2-100	250µm	2.256	2.261	0.005	
CB027-BMI-1-101519	36	26	10/15/2019	8097.1-101	500µm	2.251	2.889	0.638	Large bivalve=0.4887g
CB027-BMI-1-101519	36	26	10/15/2019	8097.2-101	250µm	2.235	2.244	0.009	
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.1-102	500µm	2.254	3.267	1.013	
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.2-102	250µm	2.250	2.254	0.004	
DM007-BMI-1-101519	54.6	55.8	10/15/2019	8097.1-103	500µm	2.227	2.253	0.025	
DM007-BMI-1-101519	54.6	55.8	10/15/2019	8097.2-103	250µm	2.247	2.250	0.003	
CB056-BMI-1-101719	44	N/A	10/17/2019	8097.1-104	500µm	2.239	2.268	0.029	
CB056-BMI-1-101719	44	N/A	10/17/2019	8097.2-104	250µm	2.258	2.265	0.007	
DM039-BMI-1-101719	28	N/A	10/17/2019	8097.1-105	500µm	2.207	17.452	15.246	Large bivalve=15.2433g
DM039-BMI-1-101719	28	N/A	10/17/2019	8097.2-105	250µm	2.239	2.239	<0.001	
3-R8-2019-BMI-1-101619	13	N/A	10/16/2019	8097.1-106	500µm	No Specime	No Specime	N/A	No Specimens
3-R8-2019-BMI-1-101619	13	N/A	10/16/2019	8097.2-106	250µm	2.236	2.236	<0.001	
CB005-BMI-1-101819	20	N/A	10/18/2019	8097.1-107	500µm	2.238	2.238	<0.001	
CB005-BMI-1-101819	20	N/A	10/18/2019	8097.2-107	250µm	2.218	2.218	<0.001	
CB040-BMI-1-101819	16	N/A	10/18/2019	8097.1-108	500µm	2.229	2.239	0.010	
CB040-BMI-1-101819	16	N/A	10/18/2019	8097.2-108	250µm	2.221	2.221	<0.001	
DM047-BMI-1-101819	53	N/A	10/18/2019	8097.1-109	500µm	2.210	2.348	0.138	
DM047-BMI-1-101819	53	N/A	10/18/2019	8097.2-109	250µm	2.217	2.222	0.005	
DM036-BMI-1-101819	6.8	N/A	10/18/2019	8097.1-110	500µm	2.216	2.221	0.005	
DM036-BMI-1-101819	6.8	N/A	10/18/2019	8097.2-110	250µm	2.227	2.228	<0.001	
DM038-BMI-1-101919	29.2	N/A	10/19/2019	8097.1-111	500µm	2.222	2.234	0.012	
DM038-BMI-1-101919	29.2	N/A	10/19/2019	8097.2-111	250µm	2.221	2.222	<0.001	
CB002-BMI-1-101619	58	N/A	10/16/2019	8097.1-112	500µm	2.238	2.422	0.184	
CB002-BMI-1-101619	58	N/A	10/16/2019	8097.2-112	250µm	2.224	2.234	0.010	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Ash-Free Dry Mass on Sorted Detritus
* NC = not calculated; dry weights not obtained prior to ashing material

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Boat	Tare Weight (g)	Dry Weight (g)	Ashed Weight (g)	Total AFDW (g)	Note
EV063-BMI-1-091019	31.5	47.5	9/10/2019	8097.1-1	500µm	1	13.9	18.3	17.0	1.3	
EV063-BMI-1-091019	31.5	47.5	9/10/2019	8097.2-1	250µm	1	14.1	18.0	16.8	1.2	
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.1-2	500µm	1	11.9	205.2	26.3	361.6	
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.1-2	500µm	2	11.9	207.8	25.1		
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.2-2	250µm	1	13.9	140.3	28.7	111.6	
EV005-BMI-1-091219	23	N/A	9/12/2019	8097.1-3	500µm	1	3.2	7.4	6.7	0.7	
EV005-BMI-1-091219	23	N/A	9/12/2019	8097.2-3	250µm	1	3.2	3.6	3.4	0.2	
EV010-BMI-1-091219	69	N/A	9/12/2019	8097.1-4	500µm	1	3.2	5.4	5.2	0.2	
EV010-BMI-1-091219	69	N/A	9/12/2019	8097.2-4	250µm	1	3.2	9.2	9.2	0.0	
EV075-BMI-1-091219	42	N/A	9/12/2019	8097.1-5	500µm	1	3.2	7.9	6.6	1.3	
EV075-BMI-1-091219	42	N/A	9/12/2019	8097.2-5	250µm	1	3.2	3.5	3.4	0.1	
EV012-BMI-1-091319	51	N/A	9/13/2019	8097.1-6	500µm	1	3.4	42.8	26.5	16.3	
EV012-BMI-1-091319	51	N/A	9/13/2019	8097.2-6	250µm	1	3.3	4.5	4.4	0.1	
EV013-BMI-1-091319	43	55	9/13/2019	8097.1-7	500µm	1	3.3	18.4	16.9	1.5	
EV013-BMI-1-091319	43	55	9/13/2019	8097.2-7	250µm	1	3.3	7.6	7.5	0.1	
EV036-BMI-1-091419	10	N/A	9/14/2019	8097.1-8	500µm	1	3.2	3.5	3.4	0.1	
EV036-BMI-1-091419	10	N/A	9/14/2019	8097.2-8	250µm	1	3.2	3.5	3.3	0.2	
DM045-BMI-1-091919	27	N/A	9/19/2019	8097.1-9	500µm	1	3.2	29.8	9.9	19.9	
DM045-BMI-1-091919	27	N/A	9/19/2019	8097.2-9	250µm	1	3.2	14.4	6.9	7.5	
EV026-BMI-1-092019	11	N/A	9/20/2019	8097.1-10	500µm	1	3.2	7.5	7.2	0.3	
EV026-BMI-1-092019	11	N/A	9/20/2019	8097.2-10	250µm	1	3.3	3.5	3.5	0.0	
EV003-BMI-1-092019	34	49	9/20/2019	8097.1-11	500µm	1	3.2	50.0	34.5	15.5	
EV003-BMI-1-092019	34	49	9/20/2019	8097.2-11	250µm	1	3.4	6.5	6.4	0.1	
DM050-BMI-1-092019	58	N/A	9/20/2019	8097.1-12	500µm	1	14.2	--	86.1	NC	
DM050-BMI-1-092019	58	N/A	9/20/2019	8097.2-12	250µm	1	14.1	24.1	17.4	6.7	
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.1-13	500µm	1	3.2	54.0	9.5	90.1	
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.1-13	500µm	2	3.3	56.5	10.9		
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.2-13	250µm	1	14.1	19.8	18.4	1.4	
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-14	500µm	1	14.3	--	90.2		
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-14	500µm	2	14.3	--	65.1	NC	
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-14	500µm	3	14.2	--	106.5		
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.2-14	250µm	1	3.3	5.8	5.4	0.4	
DM023-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-15	500µm	1	3.3	75.8	66.4	9.4	
DM023-BMI-1-092119	57.4	N/A	9/21/2019	8097.2-15	250µm	1	3.3	3.4	3.3	0.1	
DM026-BMI-1-092119	59.4	N/A	9/21/2019	8097.1-16	500µm	1	3.3	3.5	3.5	0.0	
DM026-BMI-1-092119	59.4	N/A	9/21/2019	8097.2-16	250µm	1	3.2	3.6	3.6	0.0	
EV027-BMI-1-092119	40	45	9/21/2019	8097.1-17	500µm	1	3.3	7.6	7.4	0.2	
EV027-BMI-1-092119	40	45	9/21/2019	8097.2-17	250µm	1	3.1	3.3	3.2	0.1	
EV060-BMI-1-092119	35	36	9/21/2019	8097.1-18	500µm	1	3.3	14.3	11.1	3.2	
EV060-BMI-1-092119	35	36	9/21/2019	8097.2-18	250µm	1	3.2	3.2	3.2	0.0	
EV008-BMI-1-092319	35	39	9/23/2019	8097.1-19	500µm	1	3.2	11.5	8.8	2.7	
EV008-BMI-1-092319	35	39	9/23/2019	8097.2-19	250µm	1	3.3	3.5	3.3	0.2	
EV037-BMI-1-092319	54	N/A	9/23/2019	8097.1-20	500µm	1	3.2	14.0	13.8	0.2	
EV037-BMI-1-092319	54	N/A	9/23/2019	8097.2-20	250µm	1	3.0	5.4	5.3	0.1	
EV037-BMI-2-092319	48	N/A	9/23/2019	8097.1-21	500µm	1	3.2	3.6	3.5	0.1	
EV037-BMI-2-092319	48	N/A	9/23/2019	8097.2-21	250µm	1	3.1	3.2	3.1	0.1	
EV002-BMI-1-092419	65	N/A	9/24/2019	8097.1-22	500µm	1	3.2	14.1	12.5	1.6	
EV002-BMI-1-092419	65	N/A	9/24/2019	8097.2-22	250µm	1	3.1	3.4	3.3	0.1	
EV044-BMI-1-092419	26	27	9/24/2019	8097.1-23	500µm	1	3.3	15.0	4.4	10.6	
EV044-BMI-1-092419	26	27	9/24/2019	8097.2-23	250µm	1	3.2	11.8	5.9	5.9	
EV048-BMI-1-092419	40	41	9/24/2019	8097.1-24	500µm	1	3.3	6.9	5.9	1.0	
EV048-BMI-1-092419	40	41	9/24/2019	8097.2-24	250µm	1	3.2	3.4	3.2	0.2	
REF003-BMI-2-092719	37	42.2	9/27/2019	8097.1-25	500µm	1	11.8	139.8	28.6	111.2	
REF003-BMI-2-092719	37	42.2	9/27/2019	8097.2-25	250µm	1	3.2	4.5	4.0	0.5	
EV054-BMI-1-092319	42	N/A	9/23/2019	8097.1-26	500µm	1	14.0	45.8	26.0	19.8	
EV054-BMI-1-092319	42	N/A	9/23/2019	8097.2-26	250µm	1	12.2	41.4	15.6	25.8	
EV057-BMI-1-092319	40	N/A	9/23/2019	8097.1-27	500µm	1	14.0	53.8	23.0	30.8	
EV057-BMI-1-092319	40	N/A	9/23/2019	8097.2-27	250µm	1	12.2	46.8	15.5	31.3	
EV051-BMI-1-092419	41	43	9/24/2019	8097.1-28	500µm	1	3.3	8.1	6.7	1.4	
EV051-BMI-1-092419	41	43	9/24/2019	8097.2-28	250µm	1	3.1	3.2	3.2	0.0	
REF013-BMI-1-092419	37.4	43.8	9/24/2019	8097.1-29	500µm	1	11.7	276.8	63.4	213.4	
REF013-BMI-1-092419	37.4	43.8	9/24/2019	8097.2-29	250µm	1	3.2	4.1	3.7	0.4	
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.1-30	500µm	1	11.7	326.0	52.7		Corrected
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.1-30	500µm	2	11.7	350.4	88.3	809.5	
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.1-30	500µm	3	11.7	330.7	56.6		
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.2-30	250µm	1	12.0	109.1	28.4	80.7	
EV065-BMI-1-092519	42	27	9/25/2019	8097.1-31	500µm	1	3.2	7.1	6.7	0.4	
EV065-BMI-1-092519	42	27	9/25/2019	8097.2-31	250µm	1	3.0	3.2	3.2	0.0	
EV066-BMI-1-092519	39	36	9/25/2019	8097.1-32	500µm	1	3.3	3.8	3.5	0.3	
EV066-BMI-1-092519	39	36	9/25/2019	8097.2-32	250µm	1	3.2	4.0	3.7	0.3	
EV069-BMI-1-092519	44	32	9/25/2019	8097.1-33	500µm	1	3.2	9.3	9.0	0.3	
EV069-BMI-1-092519	44	32	9/25/2019	8097.2-33	250µm	1	3.1	5.9	5.9	0.0	
EV069-BMI-2-092519	32	35	9/25/2019	8097.1-34	500µm	1	3.3	--	7.8	NC	
EV069-BMI-2-092519	32	35	9/25/2019	8097.2-34	250µm	1	3.1	3.3	3.3	0.0	
EV071-BMI-1-092519	32	31	9/25/2019	8097.1-35	500µm	1	3.2	3.6	3.2	0.4	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Ash-Free Dry Mass on Sorted Detritus
* NC = not calculated; dry weights not obtained prior to ashing material

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Boat	Tare Weight (g)	Dry Weight (g)	Ashed Weight (g)	Total AFDW (g)	Note
EV071-BMI-1-092519	32	31	9/25/2019	8097.2-35	250µm	1	3.2	3.4	3.2	0.2	
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.1-36	500µm	1	14.3	--	48.6	NC	
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.1-36	500µm	2	14.2	--	76.5		
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.2-36	250µm	1	12.1	137.7	23.4	114.3	
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.1-37	500µm	1	11.6	253.8	43.4		
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.1-37	500µm	2	11.6	189.5	44.1	534.5	
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.1-37	500µm	3	11.6	217.5	38.8		
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.2-37	250µm	1	14.1	174.9	38.4		
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.2-37	250µm	2	14.0	104.3	31.9	332.2	
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.2-37	250µm	3	14.0	169.9	46.6		
REF016-BMI-1-092519	36.8	38.2	9/25/2019	8097.1-38	500µm	1	14.1	--	245.4	NC	
REF016-BMI-1-092519	36.8	38.2	9/25/2019	8097.2-38	250µm	1	12.1	26.2	15.7	10.5	
EV001-BMI-1-092619	42	36	9/26/2019	8097.1-39	500µm	1	3.2	4.4	4.3	0.1	
EV001-BMI-1-092619	42	36	9/26/2019	8097.2-39	250µm	1	3.1	3.2	3.2	0.0	
EV072-BMI-1-092619	39	35	9/26/2019	8097.1-40	500µm	1	3.2	4.6	4.0	0.6	
EV072-BMI-1-092619	39	35	9/26/2019	8097.2-40	250µm	1	3.2	3.4	3.2	0.2	
EV052-BMI-1-092619	60	N/A	9/26/2019	8097.1-41	500µm	1	3.2	--	8.5	NC	
EV052-BMI-1-092619	60	N/A	9/26/2019	8097.2-41	250µm	1	3.2	4.5	4.2	0.3	
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.1-42	500µm	1	14.2	--	167.0	NC	
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.1-42	500µm	2	14.3	--	122.8		
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.2-42	250µm	1	3.2	4.5	3.9	0.6	
EV049-BMI-1-092719	15	N/A	9/27/2019	8097.1-43	500µm	1	3.2	15.8	6.8	9.0	
EV049-BMI-1-092719	15	N/A	9/27/2019	8097.2-43	250µm	1	3.1	3.4	3.2	0.2	
REF003-BMI-1-092719	43.6	38.4	9/27/2019	8097.1-44	500µm	1	11.7	162.5	34.0	128.5	
REF003-BMI-1-092719	43.6	38.4	9/27/2019	8097.2-44	250µm	1	3.1	16.8	7.4	9.4	
EV036-BMI-2-100119	24.5	N/A	10/1/2019	8097.1-45	500µm	1	3.3	3.5	3.4	0.1	
EV036-BMI-2-100119	24.5	N/A	10/1/2019	8097.2-45	250µm	1	3.1	3.6	3.3	0.3	
REF004-BMI-1-092719	51.6	47.8	9/27/2019	8097.1-46	500µm	1	14.0	17.7	15.1	2.6	
REF004-BMI-1-092719	51.6	47.8	9/27/2019	8097.2-46	250µm	1	3.2	3.5	3.3	0.2	
REF002-BMI-1-092819	38.6	39.8	9/28/2019	8097.1-47	500µm	1	3.2	6.9	6.8	0.1	
REF002-BMI-1-092819	38.6	39.8	9/28/2019	8097.2-47	250µm	1	3.1	4.0	4.0	0.0	
REF001-BMI-1-092819	37.6	36.2	9/28/2019	8097.1-48	500µm	1	3.2	13.0	6.3	6.7	
REF001-BMI-1-092819	37.6	36.2	9/28/2019	8097.2-48	250µm	1	3.1	3.3	3.3	0.0	
EV022-BMI-1-093019	24	N/A	9/30/2019	8097.1-49	500µm	1	3.2	3.3	3.2	0.1	
EV022-BMI-1-093019	24	N/A	9/30/2019	8097.2-49	250µm	1	3.2	3.9	3.2	0.7	
REF007-BMI-1-093019	38.8	37.4	9/30/2019	8097.1-50	500µm	1	3.3	23.1	10.9	12.2	
REF007-BMI-1-093019	38.8	37.4	9/30/2019	8097.2-50	250µm	1	3.1	4.1	3.7	0.4	
4-B6-2019-BMI-1-092619	30	27	9/26/2019	8097.1-51	500µm	1	11.6	62.5	23.8	38.7	
4-B6-2019-BMI-1-092619	30	27	9/26/2019	8097.2-51	250µm	1	3.1	3.3	3.3	0.0	
4-B1-2019-BMI-1-092619	32	34	9/26/2019	8097.1-52	500µm	1	3.2	4.1	4.0	0.1	
4-B1-2019-BMI-1-092619	32	34	9/26/2019	8097.2-52	250µm	1	3.1	3.6	3.6	0.0	
REF008-BMI-1-093019	37	35.4	9/30/2019	8097.1-53	500µm	1	3.1	13.9	11.1	2.8	
REF008-BMI-1-093019	37	35.4	9/30/2019	8097.2-53	250µm	1	3.3	3.5	3.3	0.2	
REF009A-BMI-1-100219	50.6	N/A	10/2/2019	8097.1-54	500µm	1	3.1	7.0	5.9	1.1	
REF009A-BMI-1-100219	50.6	N/A	10/2/2019	8097.2-54	250µm	1	3.1	4.3	4.1	0.2	
REF006-BMI-1-100219	57.2	N/A	10/2/2019	8097.1-55	500µm	1	3.1	9.2	5.3	3.9	
REF006-BMI-1-100219	57.2	N/A	10/2/2019	8097.2-55	250µm	1	3.1	5.1	3.3	1.8	
CB035-BMI-1-100319	24	N/A	10/3/2019	8097.1-56	500µm	1	3.1	14.9	5.6	9.3	
CB035-BMI-1-100319	24	N/A	10/3/2019	8097.2-56	250µm	1	3.1	3.3	3.3	0.0	
REF005-BMI-1-100319	51.6	N/A	10/3/2019	8097.1-57	500µm	1	3.1	5.8	5.2	0.6	
REF005-BMI-1-100319	51.6	N/A	10/3/2019	8097.2-57	250µm	1	3.2	5.7	3.2	2.5	
REF010-BMI-1-100319	39.4	N/A	10/3/2019	8097.1-58	500µm	1	3.1	4.0	3.6	0.4	
REF010-BMI-1-100319	39.4	N/A	10/3/2019	8097.2-58	250µm	1	3.1	3.4	3.4	0.0	
REF012-BMI-1-100419	50	N/A	10/4/2019	8097.1-59	500µm	1	3.1	23.1	7.8	15.3	
REF012-BMI-1-100419	50	N/A	10/4/2019	8097.2-59	250µm	1	12.2	14.2	13.5	0.7	
EV011-BMI-1-100119	31.5	N/A	10/1/2019	8097.1-60	500µm	1	3.2	12.5	6.0	6.5	
EV011-BMI-1-100119	31.5	N/A	10/1/2019	8097.2-60	250µm	1	12.2	17.9	12.5	5.4	
REF011-BMI-1-100119	35.6	36	10/1/2019	8097.1-61	500µm	1	11.5	22.6	18.9	3.7	
REF011-BMI-1-100119	35.6	36	10/1/2019	8097.2-61	250µm	1	3.2	9.7	5.1	4.6	
REF011-BMI-2-100119	34.6	34.8	10/1/2019	8097.1-62	500µm	1	3.0	12.9	12.1	0.8	
REF011-BMI-2-100119	34.6	34.8	10/1/2019	8097.2-62	250µm	1	3.1	5.4	5.3	0.1	
CB046-BMI-1-100819	32	N/A	10/8/2019	8097.1-63	500µm	1	11.6	80.5	17.2	63.3	
CB046-BMI-1-100819	32	N/A	10/8/2019	8097.2-63	250µm	1	3.1	5.9	3.3	2.6	
CB036-BMI-1-100419	32.5	N/A	10/4/2019	8097.1-64	500µm	1	11.5	22.9	12.7	10.2	
CB036-BMI-1-100419	32.5	N/A	10/4/2019	8097.2-64	250µm	1	3.1	3.5	3.4	0.1	
CB006-BMI-1-100919	41	39	10/9/2019	8097.1-65	500µm	1	3.1	12.8	4.3	8.5	
CB006-BMI-1-100919	41	39	10/9/2019	8097.2-65	250µm	1	3.0	9.2	7.0	2.2	
CB012-BMI-1-100919	42	51	10/9/2019	8097.1-66	500µm	1	11.6	17.2	16.8	0.4	
CB012-BMI-1-100919	42	51	10/9/2019	8097.2-66	250µm	1	3.1	10.1	4.2	5.9	
CB007-BMI-1-100919	42	N/A	10/9/2019	8097.1-67	500µm	1	11.6	37.5	13.3	24.2	
CB007-BMI-1-100919	42	N/A	10/9/2019	8097.2-67	250µm	1	3.3	3.7	3.4	0.3	
JS001-BMI-1-101019	52	N/A	10/10/2019	8097.1-68	500µm	1	11.5	128.1	20.6	107.5	
JS001-BMI-1-101019	52	N/A	10/10/2019	8097.2-68	250µm	1	12.1	18.6	13.1	5.5	
DM018-BMI-1-100919	60.4	N/A	10/9/2019	8097.1-69	500µm	1	3.2	11.2	5.3	5.9	
DM018-BMI-1-100919	60.4	N/A	10/9/2019	8097.2-69	250µm	1	3.0	4.9	4.9	0.0	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Ash-Free Dry Mass on Sorted Detritus
* NC = not calculated; dry weights not obtained prior to ashing material

ECOANALYSTS, INC.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Boat	Tare Weight (g)	Dry Weight (g)	Ashed Weight (g)	Total AFDW (g)	Note
DM002-BMI-1-100919	63.6	N/A	10/9/2019	8097.1-70	500µm	1	3.2	16.0	6.3	9.7	
DM002-BMI-1-100919	63.6	N/A	10/9/2019	8097.2-70	250µm	1	3.1	4.2	4.1	0.1	
JS002-BMI-1-101019	38	N/A	10/10/2019	8097.1-71	500µm	1	11.7	15.4	13.8	1.6	
JS002-BMI-1-101019	38	N/A	10/10/2019	8097.2-71	250µm	1	3.2	3.5	3.3	0.2	
CB014-BMI-1-101519	49	N/A	10/15/2019	8097.1-72	500µm	1	3.1	3.7	3.6	0.1	
CB014-BMI-1-101519	49	N/A	10/15/2019	8097.2-72	250µm	1	3.1	5.1	5.1	0.0	
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.1-73	500µm	1	11.6	167.7	41.2	249.0	
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.1-73	500µm	2	11.5	151.9	29.4		
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.2-73	250µm	1	3.1	3.7	3.5	0.2	
DM015-BMI-2-101019	49.6	N/A	10/10/2019	8097.1-74	500µm	1	11.5	25.5	18.0	7.5	
DM015-BMI-2-101019	49.6	N/A	10/10/2019	8097.2-74	250µm	1	3.2	10.9	10.5	0.4	
DM016-BMI-1-101019	59.4	N/A	10/10/2019	8097.1-75	500µm	1	3.1	4.4	4.0	0.4	
DM016-BMI-1-101019	59.4	N/A	10/10/2019	8097.2-75	250µm	1	3.3	4.6	4.5	0.1	
DM008-BMI-1-101119	39.2	N/A	10/11/2019	8097.1-76	500µm	1	3.1	3.4	3.4	0.0	
DM008-BMI-1-101119	39.2	N/A	10/11/2019	8097.2-76	250µm	1	3.2	8.6	4.2	4.4	
CB016-BMI-1-101119	28	N/A	10/11/2019	8097.1-77	500µm	1	11.6	122.7	24.5	98.2	
CB016-BMI-1-101119	28	N/A	10/11/2019	8097.2-77	250µm	1	14.0	21.4	19.7	1.7	
DM010-BMI-1-101119	54.2	N/A	10/11/2019	8097.1-78	500µm	1	3.0	6.5	6.0	0.5	
DM010-BMI-1-101119	54.2	N/A	10/11/2019	8097.2-78	250µm	1	3.3	8.6	8.5	0.1	
CB018-BMI-1-101119	36	N/A	10/11/2019	8097.1-79	500µm	1	11.6	193.5	30.1	163.4	
CB018-BMI-1-101119	36	N/A	10/11/2019	8097.2-79	250µm	1	14.1	45.0	26.2	18.8	
CB047-BMI-1-101119	26	N/A	10/11/2019	8097.1-80	500µm	1	3.1	4.8	4.0	0.8	
CB047-BMI-1-101119	26	N/A	10/11/2019	8097.2-80	250µm	1	3.2	12.9	3.4	9.5	
CB009-BMI-1-101219	35	N/A	10/12/2019	8097.1-81	500µm	1	11.6	187.2	27.7	159.5	
CB009-BMI-1-101219	35	N/A	10/12/2019	8097.2-81	250µm	1	14.0	23.7	15.8	7.9	
CB010-BMI-1-101219	45	30	10/12/2019	8097.1-82	500µm	1	11.7	80.0	19.3	60.7	
CB010-BMI-1-101219	45	30	10/12/2019	8097.2-82	250µm	1	12.1	19.2	12.9	6.3	
CB039-BMI-1-101219	22	N/A	10/12/2019	8097.1-83	500µm	1	3.0	8.0	4.1	3.9	
CB039-BMI-1-101219	22	N/A	10/12/2019	8097.2-83	250µm	1	3.2	6.9	4.1	2.8	
DM025-BMI-1-101219	61.8	N/A	10/12/2019	8097.1-84	500µm	1	3.0	6.8	6.6	0.2	
DM025-BMI-1-101219	61.8	N/A	10/12/2019	8097.2-84	250µm	1	3.2	7.2	7.1	0.1	
DM019-BMI-1-101419	33	41.8	10/14/2019	8097.1-85	500µm	1	11.5	55.8	19.6	36.2	
DM019-BMI-1-101419	33	41.8	10/14/2019	8097.2-85	250µm	1	14.0	18.7	17.9	0.8	
DM020-BMI-1-101419	45.6	N/A	10/14/2019	8097.1-86	500µm	1	11.6	91.9	33.1	58.8	
DM020-BMI-1-101419	45.6	N/A	10/14/2019	8097.2-86	250µm	1	3.2	18.7	16.1	2.6	
DM027-BMI-1-101419	48	34.2	10/14/2019	8097.1-87	500µm	1	3.2	4.6	4.1	0.5	
DM027-BMI-1-101419	48	34.2	10/14/2019	8097.2-87	250µm	1	3.2	5.9	5.7	0.2	
CB020-BMI-1-101419	46	N/A	10/14/2019	8097.1-88	500µm	1	14.6	61.2	20.3	40.9	
CB020-BMI-1-101419	46	N/A	10/14/2019	8097.2-88	250µm	1	12.3	25.6	13.5	12.1	
CB020-BMI-2-101419	61	N/A	10/14/2019	8097.1-89	500µm	1	11.5	75.1	17.3	57.8	
CB020-BMI-2-101419	61	N/A	10/14/2019	8097.2-89	250µm	1	12.2	23.9	14.1	9.8	
CB021-BMI-1-101419	46.5	31	10/14/2019	8097.1-90	500µm	1	11.6	187.1	24.5	162.6	
CB021-BMI-1-101419	46.5	31	10/14/2019	8097.2-90	250µm	1	12.2	44.4	15.4	29.0	
CB024-BMI-1-101419	42	N/A	10/14/2019	8097.1-91	500µm	1	11.6	264.1	32.3	231.8	
CB024-BMI-1-101419	42	N/A	10/14/2019	8097.2-91	250µm	1	12.3	30.1	13.0	17.1	
CB029-BMI-1-101519	49	N/A	10/15/2019	8097.1-92	500µm	1	3.1	33.5	6.3	27.2	
CB029-BMI-1-101519	49	N/A	10/15/2019	8097.2-92	250µm	1	12.2	13.5	13.0	0.5	
CB029-BMI-2-101519	39	N/A	10/15/2019	8097.1-93	500µm	1	11.5	120.2	19.2	101.0	
CB029-BMI-2-101519	39	N/A	10/15/2019	8097.2-93	250µm	1	12.2	16.2	14.8	1.4	
CB044-BMI-1-101519	57	N/A	10/15/2019	8097.1-94	500µm	1	11.6	68.1	22.8	45.3	
CB044-BMI-1-101519	57	N/A	10/15/2019	8097.2-94	250µm	1	3.3	34.0	26.5	7.5	
DM024-BMI-1-101519	56	56.4	10/15/2019	8097.1-95	500µm	1	3.0	6.0	5.7	0.3	
DM024-BMI-1-101519	56	56.4	10/15/2019	8097.2-95	250µm	1	3.3	23.0	22.9	0.1	
DM024-BMI-2-101519	48.6	52.6	10/15/2019	8097.1-96	500µm	1	11.4	141.2	49.8	91.4	
DM024-BMI-2-101519	48.6	52.6	10/15/2019	8097.2-96	250µm	1	3.2	21.1	20.7	0.4	
3-R7-2019-BMI-1-101519	43.5	N/A	10/15/2019	8097.1-97	500µm	1	3.0	31.5	6.9	24.6	
3-R7-2019-BMI-1-101519	43.5	N/A	10/15/2019	8097.2-97	250µm	1	3.2	3.7	3.5	0.2	
1-B6-NRT-BMI-1-101619	50.2	52.6	10/16/2019	8097.1-98	500µm	1	3.0	7.5	7.0	0.5	
1-B6-NRT-BMI-1-101619	50.2	52.6	10/16/2019	8097.2-98	250µm	1	3.2	12.5	5.0	7.5	
DM061-BMI-1-101619	44.4	44	10/16/2019	8097.1-99	500µm	1	14.1	57.8	26.3	31.5	
DM061-BMI-1-101619	44.4	44	10/16/2019	8097.2-99	250µm	1	12.2	24.9	12.8	12.1	
DM044-BMI-1-101619	42.4	N/A	10/16/2019	8097.1-100	500µm	1	3.0	21.1	6.5	14.6	
DM044-BMI-1-101619	42.4	N/A	10/16/2019	8097.2-100	250µm	1	3.1	3.6	3.3	0.3	
CB027-BMI-1-101519	36	26	10/15/2019	8097.1-101	500µm	1	3.1	24.4	6.4	18.0	
CB027-BMI-1-101519	36	26	10/15/2019	8097.2-101	250µm	1	12.2	18.4	13.6	4.8	
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.1-102	500µm	1	14.0	169.8	38.0		
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.1-102	500µm	2	14.0	133.1	59.2	298.8	
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.1-102	500µm	3	14.0	125.7	32.6		
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.2-102	250µm	1	12.2	15.2	14.0	1.2	
DM007-BMI-1-101519	54.6	55.8	10/15/2019	8097.1-103	500µm	1	3.1	13.9	12.1	1.8	
DM007-BMI-1-101519	54.6	55.8	10/15/2019	8097.2-103	250µm	1	3.2	10.0	4.5	5.5	
CB056-BMI-1-101719	44	N/A	10/17/2019	8097.1-104	500µm	1	11.5	33.2	13.6	19.6	
CB056-BMI-1-101719	44	N/A	10/17/2019	8097.2-104	250µm	1	12.0	12.3	12.0	0.3	
DM039-BMI-1-101719	28	N/A	10/17/2019	8097.1-105	500µm	1	2.9	6.0	5.8	0.2	
DM039-BMI-1-101719	28	N/A	10/17/2019	8097.2-105	250µm	1	3.2	9.7	4.6	5.1	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Ash-Free Dry Mass on Sorted Detritus
* NC = not calculated; dry weights not obtained prior to ashing material

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Boat	Tare Weight (g)	Dry Weight (g)	Ashed Weight (g)	Total AFDW (g)	Note
3-R8-2019-BMI-1-101619	13	N/A	10/16/2019	8097.1-106	500µm	1	3.0	3.2	3.2	0.0	
3-R8-2019-BMI-1-101619	13	N/A	10/16/2019	8097.2-106	250µm	1	3.2	3.2	3.2	0.0	
CB005-BMI-1-101819	20	N/A	10/18/2019	8097.1-107	500µm	1	3.1	3.2	3.2	0.0	
CB005-BMI-1-101819	20	N/A	10/18/2019	8097.2-107	250µm	1	3.2	3.2	3.2	0.0	
CB040-BMI-1-101819	16	N/A	10/18/2019	8097.1-108	500µm	1	3.1	4.3	3.7	0.6	
CB040-BMI-1-101819	16	N/A	10/18/2019	8097.2-108	250µm	1	3.2	8.8	3.7	5.1	
DM047-BMI-1-101819	53	N/A	10/18/2019	8097.1-109	500µm	1	3.1	7.0	4.8	2.2	
DM047-BMI-1-101819	53	N/A	10/18/2019	8097.2-109	250µm	1	12.3	14.6	12.5	2.1	
DM036-BMI-1-101819	6.8	N/A	10/18/2019	8097.1-110	500µm	1	3.1	3.8	3.4	0.4	
DM036-BMI-1-101819	6.8	N/A	10/18/2019	8097.2-110	250µm	1	3.2	9.6	9.6	0.0	
DM038-BMI-1-101919	29.2	N/A	10/19/2019	8097.1-111	500µm	1	3.1	7.6	7.0	0.6	
DM038-BMI-1-101919	29.2	N/A	10/19/2019	8097.2-111	250µm	1	3.2	5.5	5.4	0.1	
CB002-BMI-1-101619	58	N/A	10/16/2019	8097.1-112	500µm	1	11.6	72.3	18.9	53.4	
CB002-BMI-1-101619	58	N/A	10/16/2019	8097.2-112	250µm	1	3.2	9.0	8.1	0.9	

QUALITY CONTROL FORMS

APPENDIX D

Teck America UCR Phase 3 Sediment Study Benthos 2019
Sort QC Report

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Sorter	% of Sample Sorted	Primary Matrix	QC Sorter	Estimated % Efficacy	QC Comment
EV063-BMI-1-091019	31.5	47.5	9/10/2019	8097.1-1	500µm	K. Lerch	21.88	Fine Organic	C. Pike	100.00	
EV063-BMI-1-091019	31.5	47.5	9/10/2019	8097.2-1	250µm	K. Lerch	14.58	Fine Organic	C. Pike	90.54	
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.1-2	500µm	D. Franklin	100.00	Fine Organic	C. Pike	100.00	
EV064-BMI-1-091019	33.6	57.2	9/10/2019	8097.2-2	250µm	K. Guild	47.92	Fine Organic	M. Payne	91.75	
EV005-BMI-1-091219	23	N/A	9/12/2019	8097.1-3	500µm	L. Smith	100.00	Inorganic	B. Alexander	93.26	
EV005-BMI-1-091219	23	N/A	9/12/2019	8097.2-3	250µm	L. Smith	100.00	Inorganic	K. Guild	97.58	
EV010-BMI-1-091219	69	N/A	9/12/2019	8097.1-4	500µm	L. Smith	100.00	Inorganic	B. Alexander	92.54	
EV010-BMI-1-091219	69	N/A	9/12/2019	8097.2-4	250µm	L. Smith	100.00	Inorganic	C. Ziegler	91.97	
EV075-BMI-1-091219	42	N/A	9/12/2019	8097.1-5	500µm	L. Smith	100.00	Inorganic	B. Alexander	100.00	
EV075-BMI-1-091219	42	N/A	9/12/2019	8097.2-5	250µm	L. Smith	100.00	Inorganic	B. Alexander	98.80	
EV012-BMI-1-091319	51	N/A	9/13/2019	8097.1-6	500µm	D. Franklin	100.00	Coarse Organic	B. Alexander	90.10	
EV012-BMI-1-091319	51	N/A	9/13/2019	8097.2-6	250µm	L. Smith	100.00	Fine Organic	B. Alexander	98.56	
EV013-BMI-1-091319	43	55	9/13/2019	8097.1-7	500µm	D. Franklin	100.00	Coarse Organic	B. Alexander	95.92	
EV013-BMI-1-091319	43	55	9/13/2019	8097.2-7	250µm	L. Smith	100.00	Inorganic	B. Alexander	80.07	Low Abundance lab MQO met
EV036-BMI-1-091419	10	N/A	9/14/2019	8097.1-8	500µm	D. Franklin	100.00	Coarse Organic	B. Alexander	97.40	
EV036-BMI-1-091419	10	N/A	9/14/2019	8097.2-8	250µm	L. Smith	40.63	Fine Organic	B. Alexander	98.43	
DM045-BMI-1-091919	27	N/A	9/19/2019	8097.1-9	500µm	D. Franklin	100.00	Coarse Organic	B. Alexander	92.63	
DM045-BMI-1-091919	27	N/A	9/19/2019	8097.2-9	250µm	L. Smith	75.00	Fine Organic	M. Walker	100.00	
EV026-BMI-1-092019	11	N/A	9/20/2019	8097.1-10	500µm	D. Franklin	100.00	Coarse Organic	B. Alexander	100.00	
EV026-BMI-1-092019	11	N/A	9/20/2019	8097.2-10	250µm	L. Smith	100.00	Fine Organic	M. Walker	100.00	
EV003-BMI-1-092019	34	49	9/20/2019	8097.1-11	500µm	D. Franklin	100.00	Coarse Organic	B. Alexander	93.85	
EV003-BMI-1-092019	34	49	9/20/2019	8097.2-11	250µm	L. Smith	100.00	Inorganic	K. Guild	100.00	
DM050-BMI-1-092019	58	N/A	9/20/2019	8097.1-12	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	100.00	
DM050-BMI-1-092019	58	N/A	9/20/2019	8097.2-12	250µm	L. Smith	37.50	Fine Organic	K. Guild	99.53	
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.1-13	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	94.83	
DM046-BMI-1-092019	50	N/A	9/20/2019	8097.2-13	250µm	L. Smith	87.50	Fine Organic	K. Guild	99.42	
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-14	500µm	L. Smith	100.00	Coarse Organic	C. Ziegler	100.00	
DM022-BMI-1-092119	57.4	N/A	9/21/2019	8097.2-14	250µm	L. Smith	100.00	Fine Organic	K. Guild	100.00	
DM023-BMI-1-092119	57.4	N/A	9/21/2019	8097.1-15	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	93.85	
DM023-BMI-1-092119	57.4	N/A	9/21/2019	8097.2-15	250µm	L. Smith	100.00	Fine Organic	K. Guild	100.00	
DM026-BMI-1-092119	59.4	N/A	9/21/2019	8097.1-16	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	100.00	
DM026-BMI-1-092119	59.4	N/A	9/21/2019	8097.2-16	250µm	L. Smith	100.00	Fine Organic	K. Guild	100.00	
EV027-BMI-1-092119	40	45	9/21/2019	8097.1-17	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	91.00	
EV027-BMI-1-092119	40	45	9/21/2019	8097.2-17	250µm	L. Smith	100.00	Fine Organic	K. Guild	100.00	
EV060-BMI-1-092119	35	36	9/21/2019	8097.1-18	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	91.30	
EV060-BMI-1-092119	35	36	9/21/2019	8097.2-18	250µm	L. Smith	100.00	Fine Organic	C. Pike	100.00	
EV008-BMI-1-092319	35	39	9/23/2019	8097.1-19	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	91.76	
EV008-BMI-1-092319	35	39	9/23/2019	8097.2-19	250µm	L. Smith	54.69	Fine Organic	C. Pike	99.69	
EV037-BMI-1-092319	54	N/A	9/23/2019	8097.1-20	500µm	L. Smith	100.00	Coarse Organic	C. Ziegler	93.62	
EV037-BMI-1-092319	54	N/A	9/23/2019	8097.2-20	250µm	D. Franklin	100.00	Coarse Organic	C. Pike	99.02	
EV037-BMI-2-092319	48	N/A	9/23/2019	8097.1-21	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	86.40	Low Abundance lab MQO met
EV037-BMI-2-092319	48	N/A	9/23/2019	8097.2-21	250µm	L. Smith	100.00	Fine Organic	K. Guild	99.32	
EV002-BMI-1-092419	65	N/A	9/24/2019	8097.1-22	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	94.70	
EV002-BMI-1-092419	65	N/A	9/24/2019	8097.2-22	250µm	L. Smith	87.50	Fine Organic	K. Guild	100.00	
EV044-BMI-1-092419	26	27	9/24/2019	8097.1-23	500µm	D. Franklin	41.67	Fine Organic	C. Ziegler	97.63	
EV044-BMI-1-092419	26	27	9/24/2019	8097.2-23	250µm	L. Smith	43.75	Fine Organic	K. Guild	100.00	
EV048-BMI-1-092419	40	41	9/24/2019	8097.1-24	500µm	D. Franklin	25.00	Coarse Organic	C. Ziegler	99.26	
EV048-BMI-1-092419	40	41	9/24/2019	8097.2-24	250µm	D. Franklin	11.33	Coarse Organic	K. Guild	85.92	Low Abundance lab MQO met
REF003-BMI-2-092719	37	42.2	9/27/2019	8097.1-25	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	97.62	
REF003-BMI-2-092719	37	42.2	9/27/2019	8097.2-25	250µm	L. Smith	100.00	Fine Organic	C. Pike	100.00	
EV054-BMI-1-092319	42	N/A	9/23/2019	8097.1-26	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	94.57	
EV054-BMI-1-092319	42	N/A	9/23/2019	8097.2-26	250µm	C. Pike	25.00	Fine Organic	K. Guild	97.39	
EV057-BMI-1-092319	40	N/A	9/23/2019	8097.1-27	500µm	D. Franklin	29.17	Fine Organic	C. Ziegler	94.34	
EV057-BMI-1-092319	40	N/A	9/23/2019	8097.2-27	250µm	K. Guild	58.33	Fine Organic	C. Ziegler	97.35	
EV051-BMI-1-092419	41	43	9/24/2019	8097.1-28	500µm	D. Franklin	87.50	Fine Organic	C. Ziegler	90.50	
EV051-BMI-1-092419	41	43	9/24/2019	8097.2-28	250µm	D. Franklin	100.00	Fine Organic	C. Ziegler	95.54	
REF013-BMI-1-092419	37.4	43.8	9/24/2019	8097.1-29	500µm	D. Franklin	100.00	Coarse Organic	C. Ziegler	90.49	
REF013-BMI-1-092419	37.4	43.8	9/24/2019	8097.2-29	250µm	D. Franklin	5.47	Fine Organic	K. Guild	83.12	Low Abundance lab MQO met
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.1-30	500µm	L. Smith	100.00	Coarse Organic	C. Ziegler	93.74	
REF015-BMI-1-092419	33.2	33.8	9/24/2019	8097.2-30	250µm	K. Guild	58.33	Fine Organic	C. Ziegler	91.44	
EV065-BMI-1-092519	42	27	9/25/2019	8097.1-31	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	90.85	
EV065-BMI-1-092519	42	27	9/25/2019	8097.2-31	250µm	L. Smith	100.00	Fine Organic	K. Guild	96.89	
EV066-BMI-1-092519	39	36	9/25/2019	8097.1-32	500µm	D. Franklin	26.17	Fine Organic	C. Ziegler	95.78	
EV066-BMI-1-092519	39	36	9/25/2019	8097.2-32	250µm	L. Smith	87.50	Fine Organic	K. Guild	98.59	
EV069-BMI-1-092519	44	32	9/25/2019	8097.1-33	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	92.37	
EV069-BMI-1-092519	44	32	9/25/2019	8097.2-33	250µm	L. Smith	100.00	Fine Organic	K. Guild	98.46	
EV069-BMI-2-092519	32	35	9/25/2019	8097.1-34	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	97.17	
EV069-BMI-2-092519	32	35	9/25/2019	8097.2-34	250µm	L. Smith	100.00	Fine Organic	K. Guild	92.39	
EV071-BMI-1-092519	32	31	9/25/2019	8097.1-35	500µm	D. Franklin	75.00	Fine Organic	C. Ziegler	97.64	
EV071-BMI-1-092519	32	31	9/25/2019	8097.2-35	250µm	D. Franklin	23.44	Fine Organic	K. Guild	100.00	
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.1-36	500µm	K. Lerch	100.00	Coarse Organic	C. Ziegler	100.00	
REF017-BMI-1-092519	33	35.2	9/25/2019	8097.2-36	250µm	L. Smith	65.63	Fine Organic	K. Guild	97.99	
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.1-37	500µm	K. Lerch	100.00	Coarse Organic	C. Ziegler	100.00	
REF018-BMI-1-092519	35.6	34.8	9/25/2019	8097.2-37	250µm	K. Lerch	100.00	Fine Organic	M. Walker	94.38	
REF016-BMI-1-092519	36.8	38.2	9/25/2019	8097.1-38	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	95.63	
REF016-BMI-1-092519	36.8	38.2	9/25/2019	8097.2-38	250µm	D. Franklin	28.65	Fine Organic	K. Guild	99.16	
EV001-BMI-1-092619	42	36	9/26/2019	8097.1-39	500µm	K. Lerch	100.00	Fine Organic	C. Ziegler	96.67	
EV001-BMI-1-092619	42	36	9/26/2019	8097.2-39	250µm	K. Lerch	100.00	Fine Organic	M. Payne	89.80	Low Abundance lab MQO met
EV072-BMI-1-092619	39	35	9/26/2019	8097.1-40	500µm	L. Smith	50.00	Fine Organic	C. Ziegler	92.08	
EV072-BMI-1-092619	39	35	9/26/2019	8097.2-40	250µm	K. Lerch	37.50	Fine Organic	M. Payne	93.63	
EV052-BMI-1-092619	60	N/A	9/26/2019	8097.1-41	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	96.95	
EV052-BMI-1-092619	60	N/A	9/26/2019	8097.2-41	250µm	K. Lerch	50.00	Fine Organic	K. Guild	93.74	
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.1-42	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	95.10	
REF014-BMI-1-092619	37.8	38.8	9/26/2019	8097.2-42	250µm	K. Lerch	12.50	Fine Organic	C. Ziegler	96.82	
EV049-BMI-1-092719	15	N/A	9/27/2019	8097.1-43	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	95.73	
EV049-BMI-1-092719	15	N/A	9/27/2019	8097.2-43	250µm	L. Smith	100.00	Fine Organic	K. Guild	93.89	
REF003-BMI-1-092719	43.6	38.4	9/27/2019	8097.1-44	500µm	S. Little	100.00	Coarse Organic	C. Ziegler	91.91	
REF003-BMI-1-092719	43.6	38.4	9/27/2019	8097.2-44	250µm	S. Little	100.00	Fine Organic	C. Ziegler	98.82	
EV036-BMI-2-100119	24.5	N/A	10/1/2019	8097.1-45	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	89.66	Low Abundance lab MQO met
EV036-BMI-2-100119	24.5	N/A	10/1/2019	8097.2-45	250µm	D. Franklin	100.00	Fine Organic	M. Payne	89.56	Low Abundance lab MQO met
REF004-BMI-1-092719	51.6	47.8	9/27/2019	8097.1-46	500µm	S. Little	62.50	Coarse Organic	C. Ziegler	92.00	
REF004-BMI-1-092719	51.6	47.8	9/27/2019	8097.2-46	250µm	K. Lerch	25.00	Fine Organic	M. Payne	99.26	
REF002-BMI-1-092819	38.6	39.8	9/28/2019	8097.1-47	500µm	S. Little	100.00	Inorganic	C. Ziegler	95.35	
REF002-BMI-1-092819	38.6	39.8	9/28/2019	8097.2-47	250µm	K. Lerch	100.00	Inorganic	L. Beckley	100.00	
REF001-BMI-1-092819	37.6	36.2	9/28/2019	8097.1-48	500µm	S. Little	100.00	Coarse Organic	C. Ziegler	95.65	
REF001-BMI-1-092819	37.6	36.2	9/28/2019	8097.2-48	250µm	K. Lerch	100.00	Inorganic	M. Payne	92.00	
EV022-BMI-1-093019	24	N/A	9/30/2019	8097.1-49	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	88.32	Low Abundance lab MQO met
EV022-BMI-1-093019	24	N/A	9/30/2019	8097.2-49	250µm	K. Lerch	87.50	Fine Organic	K. Guild	95.05	
REF007-BMI-1-093019	38.8	37.4	9/30/2019	8097.1-50	500µm	D. Franklin	62.50	Fine Organic	C. Ziegler	93.39	
REF007-BMI-1-093019	38.8	37.4	9/30/2019	8097.2-50	250µm	K. Lerch	31.25	Fine Organic	M. Payne	97.08	
4-B6-2019-BMI-1-092619	30	27	9/26/2019	8097.1-51	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	92.23	
4-B6-2019-BMI-1-092619	30	27	9/26/2019	8097.2-51	250µm	K. Lerch	100.00	Fine Organic	M. Payne	98.71	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Sort QC Report

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Sorter	% of Sample Sorted	Primary Matrix	QC Sorter	Estimated % Efficacy	QC Comment
4-B1-2019-BMI-1-092619	32	34	9/26/2019	8097.1-52	500µm	S. Little	100.00	Coarse Organic	C. Ziegler	100.00	
4-B1-2019-BMI-1-092619	32	34	9/26/2019	8097.2-52	250µm	K. Lerch	100.00	Fine Organic	M. Payne	98.05	
REF008-BMI-1-093019	37	35.4	9/30/2019	8097.1-53	500µm	S. Little	100.00	Coarse Organic	C. Ziegler	95.83	
REF008-BMI-1-093019	37	35.4	9/30/2019	8097.2-53	250µm	K. Lerch	56.25	Fine Organic	M. Payne	100.00	
REF009A-BMI-1-100219	50.6	N/A	10/2/2019	8097.1-54	500µm	S. Little	100.00	Coarse Organic	C. Ziegler	96.72	
REF009A-BMI-1-100219	50.6	N/A	10/2/2019	8097.2-54	250µm	C. Evans	75.00	Inorganic	M. Payne	99.28	
REF006-BMI-1-100219	57.2	N/A	10/2/2019	8097.1-55	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	91.27	
REF006-BMI-1-100219	57.2	N/A	10/2/2019	8097.2-55	250µm	K. Lerch	100.00	Fine Organic	L. Beckley	99.11	
CB035-BMI-1-100319	24	N/A	10/3/2019	8097.1-56	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	100.00	
CB035-BMI-1-100319	24	N/A	10/3/2019	8097.2-56	250µm	K. Lerch	100.00	Fine Organic	L. Beckley	98.48	
REF005-BMI-1-100319	51.6	N/A	10/3/2019	8097.1-57	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	93.09	
REF005-BMI-1-100319	51.6	N/A	10/3/2019	8097.2-57	250µm	K. Lerch	40.63	Inorganic	L. Beckley	99.23	
REF010-BMI-1-100319	39.4	N/A	10/3/2019	8097.1-58	500µm	L. Smith	100.00	Inorganic	C. Ziegler	99.18	
REF010-BMI-1-100319	39.4	N/A	10/3/2019	8097.2-58	250µm	K. Lerch	100.00	Inorganic	M. Payne	99.27	
REF012-BMI-1-100419	50	N/A	10/4/2019	8097.1-59	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	91.24	
REF012-BMI-1-100419	50	N/A	10/4/2019	8097.2-59	250µm	K. Lerch	37.50	Fine Organic	M. Payne	96.38	
EV011-BMI-1-100119	31.5	N/A	10/1/2019	8097.1-60	500µm	L. Smith	87.50	Fine Organic	C. Ziegler	97.89	
EV011-BMI-1-100119	31.5	N/A	10/1/2019	8097.2-60	250µm	K. Lerch	25.00	Fine Organic	M. Payne	97.76	
REF011-BMI-1-100119	35.6	36	10/1/2019	8097.1-61	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	96.01	
REF011-BMI-1-100119	35.6	36	10/1/2019	8097.2-61	250µm	D. Franklin	100.00	Inorganic	M. Walker	93.26	
REF011-BMI-2-100119	34.6	34.8	10/1/2019	8097.1-62	500µm	L. Smith	100.00	Inorganic	C. Ziegler	94.09	
REF011-BMI-2-100119	34.6	34.8	10/1/2019	8097.2-62	250µm	C. Evans	100.00	Inorganic	M. Payne	99.00	
CB046-BMI-1-100819	32	N/A	10/8/2019	8097.1-63	500µm	D. Franklin	100.00	Fine Organic	C. Ziegler	100.00	
CB046-BMI-1-100819	32	N/A	10/8/2019	8097.2-63	250µm	C. Evans	100.00	Fine Organic	M. Payne	88.10	Low Abundance lab MQO met
CB036-BMI-1-100419	32.5	N/A	10/4/2019	8097.1-64	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	100.00	
CB036-BMI-1-100419	32.5	N/A	10/4/2019	8097.2-64	250µm	C. Evans	100.00	Fine Organic	M. Payne	100.00	
CB006-BMI-1-100919	41	39	10/9/2019	8097.1-65	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	95.76	
CB006-BMI-1-100919	41	39	10/9/2019	8097.2-65	250µm	C. Evans	100.00	Inorganic	K. Guild	84.91	Low Abundance lab MQO met
CB012-BMI-1-100919	42	51	10/9/2019	8097.1-66	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	90.00	
CB012-BMI-1-100919	42	51	10/9/2019	8097.2-66	250µm	D. Franklin	100.00	Inorganic	M. Payne	100.00	
CB007-BMI-1-100919	42	N/A	10/9/2019	8097.1-67	500µm	L. Smith	100.00	Inorganic	C. Ziegler	95.20	
CB007-BMI-1-100919	42	N/A	10/9/2019	8097.2-67	250µm	D. Franklin	31.25	Inorganic	M. Payne	93.46	
JS001-BMI-1-101019	52	N/A	10/10/2019	8097.1-68	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	93.57	
JS001-BMI-1-101019	52	N/A	10/10/2019	8097.2-68	250µm	C. Evans	27.34	Inorganic	K. Guild	84.86	Low Abundance lab MQO met
DM018-BMI-1-100919	60.4	N/A	10/9/2019	8097.1-69	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	100.00	
DM018-BMI-1-100919	60.4	N/A	10/9/2019	8097.2-69	250µm	K. Lerch	100.00	Inorganic	K. Guild	98.55	
DM002-BMI-1-100919	63.6	N/A	10/9/2019	8097.1-70	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	99.27	
DM002-BMI-1-100919	63.6	N/A	10/9/2019	8097.2-70	250µm	K. Lerch	100.00	Inorganic	K. Guild	100.00	
JS002-BMI-1-101019	38	N/A	10/10/2019	8097.1-71	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	92.41	
JS002-BMI-1-101019	38	N/A	10/10/2019	8097.2-71	250µm	K. Lerch	21.88	Inorganic	K. Guild	96.86	
CB014-BMI-1-101519	49	N/A	10/15/2019	8097.1-72	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	100.00	
CB014-BMI-1-101519	49	N/A	10/15/2019	8097.2-72	250µm	D. Franklin	100.00	Inorganic	K. Guild	96.00	
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.1-73	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	91.18	
DM015-BMI-1-101019	47.4	N/A	10/10/2019	8097.2-73	250µm	D. Franklin	100.00	Inorganic	K. Guild	96.14	
DM015-BMI-2-101019	49.6	N/A	10/10/2019	8097.1-74	500µm	L. Smith	100.00	Inorganic	C. Ziegler	100.00	
DM015-BMI-2-101019	49.6	N/A	10/10/2019	8097.2-74	250µm	K. Lerch	100.00	Inorganic	K. Guild	86.67	Low Abundance lab MQO met
DM016-BMI-1-101019	59.4	N/A	10/10/2019	8097.1-75	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	100.00	
DM016-BMI-1-101019	59.4	N/A	10/10/2019	8097.2-75	250µm	K. Lerch	100.00	Inorganic	K. Guild	95.83	
DM008-BMI-1-101119	39.2	N/A	10/11/2019	8097.1-76	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	98.40	
DM008-BMI-1-101119	39.2	N/A	10/11/2019	8097.2-76	250µm	K. Lerch	100.00	Inorganic	K. Guild	91.14	
CB016-BMI-1-101119	28	N/A	10/11/2019	8097.1-77	500µm	L. Smith	100.00	Inorganic	L. Beckley	100.00	
CB016-BMI-1-101119	28	N/A	10/11/2019	8097.2-77	250µm	K. Lerch	100.00	Inorganic	K. Guild	91.04	
DM010-BMI-1-101119	54.2	N/A	10/11/2019	8097.1-78	500µm	L. Smith	100.00	Inorganic	L. Beckley	99.20	
DM010-BMI-1-101119	54.2	N/A	10/11/2019	8097.2-78	250µm	C. Evans	100.00	Inorganic	K. Guild	91.30	
CB018-BMI-1-101119	36	N/A	10/11/2019	8097.1-79	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	96.95	
CB018-BMI-1-101119	36	N/A	10/11/2019	8097.2-79	250µm	C. Evans	100.00	Inorganic	K. Guild	92.11	
CB047-BMI-1-101119	26	N/A	10/11/2019	8097.1-80	500µm	L. Smith	100.00	Fine Organic	M. Payne	83.33	Low Abundance lab MQO met
CB047-BMI-1-101119	26	N/A	10/11/2019	8097.2-80	250µm	D. Franklin	100.00	Inorganic	K. Guild	94.66	
CB009-BMI-1-101219	35	N/A	10/12/2019	8097.1-81	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	89.79	Low Abundance lab MQO met
CB009-BMI-1-101219	35	N/A	10/12/2019	8097.2-81	250µm	D. Franklin	100.00	Inorganic	K. Guild	90.70	
CB010-BMI-1-101219	45	30	10/12/2019	8097.1-82	500µm	L. Smith	100.00	Inorganic	C. Ziegler	94.59	
CB010-BMI-1-101219	45	30	10/12/2019	8097.2-82	250µm	D. Franklin	37.50	Inorganic	K. Guild	98.55	
CB039-BMI-1-101219	22	N/A	10/12/2019	8097.1-83	500µm	D. Franklin	100.00	Inorganic	M. Payne	85.19	Low Abundance lab MQO met
CB039-BMI-1-101219	22	N/A	10/12/2019	8097.2-83	250µm	K. Lerch	100.00	Inorganic	C. Ziegler	97.87	
DM025-BMI-1-101219	61.8	N/A	10/12/2019	8097.1-84	500µm	D. Franklin	100.00	Inorganic	M. Payne	100.00	
DM025-BMI-1-101219	61.8	N/A	10/12/2019	8097.2-84	250µm	K. Lerch	100.00	Inorganic	K. Guild	100.00	
DM019-BMI-1-101419	33	41.8	10/14/2019	8097.1-85	500µm	D. Franklin	100.00	Inorganic	K. Guild	100.00	
DM019-BMI-1-101419	33	41.8	10/14/2019	8097.2-85	250µm	K. Lerch	100.00	Inorganic	K. Guild	92.52	
DM020-BMI-1-101419	45.6	N/A	10/14/2019	8097.1-86	500µm	L. Smith	100.00	Coarse Organic	C. Ziegler	100.00	
DM020-BMI-1-101419	45.6	N/A	10/14/2019	8097.2-86	250µm	K. Hall	100.00	Inorganic	C. Ziegler	92.59	
DM027-BMI-1-101419	48	34.2	10/14/2019	8097.1-87	500µm	L. Smith	100.00	Fine Organic	M. Payne	100.00	
DM027-BMI-1-101419	48	34.2	10/14/2019	8097.2-87	250µm	K. Lerch	100.00	Inorganic	K. Guild	92.08	
CB020-BMI-1-101419	46	N/A	10/14/2019	8097.1-88	500µm	L. Smith	70.83	Fine Organic	C. Ziegler	93.88	
CB020-BMI-1-101419	46	N/A	10/14/2019	8097.2-88	250µm	K. Lerch	31.25	Fine Organic	K. Guild	93.70	
CB020-BMI-2-101419	61	N/A	10/14/2019	8097.1-89	500µm	L. Smith	100.00	Fine Organic	K. Guild	95.65	
CB020-BMI-2-101419	61	N/A	10/14/2019	8097.2-89	250µm	K. Hall	43.75	Fine Organic	C. Pike	98.40	
CB021-BMI-1-101419	46.5	31	10/14/2019	8097.1-90	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	92.23	
CB021-BMI-1-101419	46.5	31	10/14/2019	8097.2-90	250µm	C. Evans	37.50	Fine Organic	K. Guild	92.58	
CB024-BMI-1-101419	42	N/A	10/14/2019	8097.1-91	500µm	L. Smith	100.00	Coarse Organic	K. Guild	94.61	
CB024-BMI-1-101419	42	N/A	10/14/2019	8097.2-91	250µm	K. Hall	20.83	Fine Organic	K. Guild	94.32	
CB029-BMI-1-101519	49	N/A	10/15/2019	8097.1-92	500µm	D. Franklin	100.00	Inorganic	K. Guild	98.69	
CB029-BMI-1-101519	49	N/A	10/15/2019	8097.2-92	250µm	K. Hall	43.75	Fine Organic	C. Ziegler	94.18	
CB029-BMI-2-101519	39	N/A	10/15/2019	8097.1-93	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	96.11	
CB029-BMI-2-101519	39	N/A	10/15/2019	8097.2-93	250µm	D. Franklin	68.75	Inorganic	C. Ziegler	90.33	
CB044-BMI-1-101519	57	N/A	10/15/2019	8097.1-94	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	92.31	
CB044-BMI-1-101519	57	N/A	10/15/2019	8097.2-94	250µm	K. Hall	100.00	Inorganic	C. Ziegler	94.17	
DM024-BMI-1-101519	56	56.4	10/15/2019	8097.1-95	500µm	L. Smith	100.00	Inorganic	K. Guild	92.06	
DM024-BMI-1-101519	56	56.4	10/15/2019	8097.2-95	250µm	K. Lerch	100.00	Inorganic	K. Guild	88.89	Low Abundance lab MQO met
DM024-BMI-2-101519	48.6	52.6	10/15/2019	8097.1-96	500µm	L. Smith	100.00	Coarse Organic	C. Ziegler	100.00	
DM024-BMI-2-101519	48.6	52.6	10/15/2019	8097.2-96	250µm	K. Lerch	100.00	Inorganic	C. Pike	96.58	
3-R7-2019-BMI-1-101519	43.5	N/A	10/15/2019	8097.1-97	500µm	D. Franklin	100.00	Inorganic	K. Guild	100.00	
3-R7-2019-BMI-1-101519	43.5	N/A	10/15/2019	8097.2-97	250µm	K. Hall	100.00	Fine Organic	C. Ziegler	90.08	
1-B6-NRT-BMI-1-101619	50.2	52.6	10/16/2019	8097.1-98	500µm	D. Franklin	100.00	Inorganic	K. Guild	98.57	
1-B6-NRT-BMI-1-101619	50.2	52.6	10/16/2019	8097.2-98	250µm	K. Hall	100.00	Inorganic	K. Guild	93.31	
DM061-BMI-1-101619	44.4	44	10/16/2019	8097.1-99	500µm	L. Smith	33.33	Fine Organic	C. Ziegler	93.20	
DM061-BMI-1-101619	44.4	44	10/16/2019	8097.2-99	250µm	C. Evans	5.47	Fine Organic	M. Walker	98.49	
DM044-BMI-1-101619	42.4	N/A	10/16/2019	8097.1-100	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	100.00	
DM044-BMI-1-101619	42.4	N/A	10/16/2019	8097.2-100	250µm	K. Lerch	18.75	Fine Organic	K. Guild	94.87	
CB027-BMI-1-101519	36	26	10/15/2019	8097.1-101	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	95.29	
CB027-BMI-1-101519	36	26	10/15/2019	8097.2-101	250µm	K. Hall	56.25	Fine Organic	K. Guild	85.90	Low Abundance lab MQO met
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.1-102	500µm	L. Smith	66.41	Fine Organic	C. Ziegler	92.22	
1-B5-NRT-BMI-1-101519	48.2	48	10/15/2019	8097.2-102	250µm	K. Hall	10.42	Fine Organic	K. Guild	92.07	

Teck America UCR Phase 3 Sediment Study Benthos 2019
Sort QC Report

EcoAnalysts, Inc.
LIFE IN WATER

Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)	Collection Date	EcoA Sample ID	Fraction	Sorter	% of Sample Sorted	Primary Matrix	QC Sorter	Estimated % Efficacy	QC Comment
DM007-BMI-1-101519	54.6	55.8	10/15/2019	8097.1-103	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	99.79	
DM007-BMI-1-101519	54.6	55.8	10/15/2019	8097.2-103	250µm	K. Lerch	100.00	Inorganic	K. Guild	99.40	
CB056-BMI-1-101719	44	N/A	10/17/2019	8097.1-104	500µm	D. Franklin	100.00	Inorganic	C. Ziegler	98.03	
CB056-BMI-1-101719	44	N/A	10/17/2019	8097.2-104	250µm	K. Lerch	16.67	Fine Organic	K. Guild	97.60	
DM039-BMI-1-101719	28	N/A	10/17/2019	8097.1-105	500µm	L. Smith	100.00	Inorganic	C. Ziegler	100.00	
DM039-BMI-1-101719	28	N/A	10/17/2019	8097.2-105	250µm	D. Franklin	100.00	Inorganic	K. Guild	93.75	
3-R8-2019-BMI-1-101619	13	N/A	10/16/2019	8097.1-106	500µm	L. Smith	100.00	Inorganic	C. Ziegler	100.00	
3-R8-2019-BMI-1-101619	13	N/A	10/16/2019	8097.2-106	250µm	D. Franklin	100.00	Inorganic	K. Guild	93.75	
CB005-BMI-1-101819	20	N/A	10/18/2019	8097.1-107	500µm	L. Smith	100.00	Inorganic	C. Ziegler	100.00	
CB005-BMI-1-101819	20	N/A	10/18/2019	8097.2-107	250µm	D. Franklin	100.00	Inorganic	K. Guild	100.00	
CB040-BMI-1-101819	16	N/A	10/18/2019	8097.1-108	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	100.00	
CB040-BMI-1-101819	16	N/A	10/18/2019	8097.2-108	250µm	D. Franklin	100.00	Inorganic	M. Walker	91.49	
DM047-BMI-1-101819	53	N/A	10/18/2019	8097.1-109	500µm	L. Smith	100.00	Fine Organic	C. Ziegler	94.79	
DM047-BMI-1-101819	53	N/A	10/18/2019	8097.2-109	250µm	D. Franklin	25.00	Inorganic	M. Walker	90.00	
DM036-BMI-1-101819	6.8	N/A	10/18/2019	8097.1-110	500µm	K. Lerch	100.00	Coarse Organic	C. Ziegler	100.00	
DM036-BMI-1-101819	6.8	N/A	10/18/2019	8097.2-110	250µm	C. Evans	100.00	Inorganic	C. Pike	100.00	
DM038-BMI-1-101919	29.2	N/A	10/19/2019	8097.1-111	500µm	K. Lerch	100.00	Coarse Organic	C. Ziegler	100.00	
DM038-BMI-1-101919	29.2	N/A	10/19/2019	8097.2-111	250µm	C. Evans	100.00	Inorganic	K. Guild	97.06	
CB002-BMI-1-101619	58	N/A	10/16/2019	8097.1-112	500µm	K. Lerch	100.00	Coarse Organic	C. Ziegler	94.31	
CB002-BMI-1-101619	58	N/A	10/16/2019	8097.2-112	250µm	C. Evans	89.06	Inorganic	K. Guild	91.44	

Taxonomy ID QC Percent Similarity

8097.1-3 **Comparison Date: 01/21/2020 09:43:32**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/12/2019	EV005-BMI-1-091219	23	N/A

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
970	Paratendipes		2	2	0	0	3	3	0	0		-1	Original taxonomist failed to record 1 *Paratendipes* sp. This error was corrected in the data set.
988	Polypedilum		0	0	0	0	0	0	0	0		0	
799	Procladius		3	3	0	0	3	3	0	0		0	
			5				6				Difference =	-1	
											Percent Similarity =	90.00	

8097.1-3 **Comparison Date: 01/21/2020 11:34:38**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/12/2019	EV005-BMI-1-091219	23	N/A

		Original Taxonomist - J. Pfeiffer					QC Taxonomist - A. Navesky						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
2992	Lebertia		5	0	0	5	5	0	0	5		0	No changes were made to the original data.
102	Musculium		2	2	0	0	1	1	0	0		1	
67	Nematoda		5	5	0	0	6	6	0	0		-1	
121	Ostracoda		1	1	0	0	1	1	0	0		0	
103	Pisidium		39	39	0	0	38	38	0	0		1	
2659	Prostoma		15	15	0	0	15	15	0	0		0	
			67				66				Difference =	1	
											Percent Similarity =	97.90	

8097.1-3 **Comparison Date: 01/20/2020 10:28:38**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/12/2019	EV005-BMI-1-091219	23	N/A

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
21	Limnodrilus hoffmeisteri	RC#5	2	2	0	0	2	2	0	0		0	No changes were made in the final data set.
			2				2				Difference =	0	
											Percent Similarity =	100.00	_

Taxonomy ID QC Percent Similarity

8097.1-12 **Comparison Date: 01/21/2020 09:58:13**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/20/2019	DM050-BMI-1-092019	58	N/A

TIN	TAXON	NOTE	Original Taxonomist - G. Wallace AB	L	P	A	QC Taxonomist - W. Hoiland AB	L	P	A	NOTE	DIFF.
938	Cryptotendipes		0	0	0	0	1	1	0	0	very small but confirmed... most likely lost during mounting process	-1
1368	Pagastiella		1	1	0	0	0	0	0	0		1
964	Parachironomus		1	1	0	0	1	1	0	0		0
894	Parakiefferiella		1	1	0	0	1	1	0	0		0
970	Paratendipes		1	1	0	0	0	0	0	0		1
799	Procladius		1	1	0	0	1	1	0	0		0
			5				4				Difference =	1
											Percent Similarity =	60.00

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 1 *Cryptotendipes* sp. as *Pagastiella* sp. This error was corrected in the data set. In addition, 1 specimen was lost prior to QC.

8097.1-12 **Comparison Date: 01/21/2020 11:58:22**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/20/2019	DM050-BMI-1-092019	58	N/A

TIN	TAXON	NOTE	Original Taxonomist - J. Pfeiffer AB	L	P	A	QC Taxonomist - A. Navesky AB	L	P	A	NOTE	DIFF.
106	Anodonta		6	6	0	0	6	6	0	0		0
115	Caecidotea		5	5	0	0	3	3	0	0		2
1032	Ceratopogoninae		2	2	0	0	2	2	0	0		0
74	Helobdella stagnalis		3	3	0	0	3	3	0	0		0
2992	Lebertia		4	4	0	0	4	0	0	4		0
67	Nematoda		73	73	0	0	72	72	0	0		1
597	Oecetis		2	2	0	0	2	2	0	0		0
103	Pisidium		83	83	0	0	81	81	0	0		2
1167	Valvata tricarinata		3	3	0	0	2	2	0	0		1
			181				175				Difference =	6
											Percent Similarity =	98.44

COMPONENT QC NARRATIVE

No changes were made to the original data.

Eco Analysts, Inc. LIFE IN WATER

Teck America UCR Phase 3 Sediment Study Benthos 2019

Taxonomy ID QC Percent Similarity

8097.1-12 **Comparison Date: 01/20/2020 10:23:10**

Component: Oligochaete

Collection Date	**Site ID Number**	**Bucket1 Weight (lbs)**	**Bucket2 Weight (lbs)**
09/20/2019	**DM050-BMI-1-092019**	**58**	**N/A**

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
													This QC sample contained no worms. No changes were made in the final data set.
											Difference =	N/A	
											Percent Similarity =	N/A	

8097.1-28 **Comparison Date: 01/21/2020 10:57:46**

Component: Chironomidae

Collection Date	**Site ID Number**	**Bucket1 Weight (lbs)**	**Bucket2 Weight (lbs)**
09/24/2019	**EV051-BMI-1-092419**	**41**	**43**

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1331	Cricotopus/Orthocladius		1	1	0	0	1	1	0	0		0	The original taxonomist incorrectly identified 1 *Potthastia longimana* gr. as *Parakiefferiella* sp. This error was corrected in the data set.
789	Larsia		2	2	0	0	2	2	0	0		0	
878	Nanocladius		0	0	0	0	0	0	0	0		0	
880	Orthocladius (Euorthocladius)		0	0	0	0	0	0	0	0		0	
1368	Pagastiella		7	7	0	0	7	7	0	0		0	
964	Parachironomus		2	2	0	0	1	1	0	0		1	
894	Parakiefferiella		30	30	0	0	29	29	0	0		1	
967	Paralauterborniella nigrohalteralis		2	2	0	0	2	2	0	0		0	
970	Paratendipes		103	103	0	0	97	97	0	0		6	
988	Polypedilum		2	2	0	0	2	2	0	0		0	
817	Potthastia longimana gr.		1	1	0	0	2	2	0	0		-1	
799	Procladius		36	36	0	0	36	36	0	0		0	
989	Pseudochironomus		1	1	0	0	0	0	0	0		1	
1389	Robackia demeijerei		1	1	0	0	1	1	0	0		0	
1023	Stempellinella		2	2	0	0	1	1	0	0		1	
1029	Tanytarsus		7	7	0	0	7	7	0	0		0	
			197				188				Difference =	9	
											Percent Similarity =	97.84	

8097.1-28 **Comparison Date: 01/22/2020 11:32:20**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/24/2019	EV051-BMI-1-092419	41	43

		Original Taxonomist - A. Navesky					QC Taxonomist - J. Pfeiffer					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
3080	Arrenurus		2	0	0	2	2	2	0	0		0
115	Caecidotea		3	3	0	0	3	3	0	0		0
1032	Ceratopogoninae		1	1	0	0	1	1	0	0		0
2436	Crangonyx		1	1	0	0	0	0	0	0		1
154	Ephemerellidae		1	1	0	0	1	1	0	0		0
3094	Forelia		1	0	0	1	1	1	0	0		0
3202	Frontipoda		0	0	0	0	0	0	0	0		0
3040	Hygrobates		4	0	0	4	5	5	0	0		-1
2992	Lebertia		49	0	0	49	46	46	0	0		3
3143	Mideopsis		2	0	0	2	2	2	0	0		0
102	Musculium		3	3	0	0	4	4	0	0		-1
67	Nematoda		75	75	0	0	64	64	0	0		11
3225	Neumania		0	0	0	0	0	0	0	0		0
597	Oecetis		1	1	0	0	1	1	0	0		0
121	Ostracoda		1	1	0	0	1	1	0	0		0
103	Pisidium		156	156	0	0	154	154	0	0		2
2659	Prostoma		40	40	0	0	37	37	0	0		3
3006	Torrenticola		4	0	0	4	4	4	0	0		0
			344				326				Difference =	18
											Percent Similarity =	97.13

COMPONENT QC NARRATIVE

No changes were made to the original data.

8097.1-28 **Comparison Date: 01/20/2020 10:35:24**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/24/2019	EV051-BMI-1-092419	41	43

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1350	Aeolosoma		1	1	0	0	1	1	0	0		0
12	Aulodrilus limnobius		0	0	0	0	1	1	0	0		-1
13	Aulodrilus pigueti		1	1	0	0	0	0	0	0		1
14	Aulodrilus pluriseta		13	13	0	0	13	13	0	0		0
1348	tubificoid Naididae w/o cap setae		3	3	0	0	3	3	0	0		0
			18				18				Difference =	0
											Percent Similarity =	94.44

COMPONENT QC NARRATIVE

One *Aulodrilus* worm was originally counted as *A. pigueti*; after QC, it was agreed that it lacked hairs and was *A. limnobius* instead. This change was made in the final data set.

8097.1-37 **Comparison Date: 01/21/2020 10:00:34**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/25/2019	REF018-BMI-1-092519	35.6	34.8

Original Taxonomist - G. Wallace; QC Taxonomist - W. Hoiland

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
											Difference =	N/A
											Percent Similarity =	N/A

COMPONENT QC NARRATIVE

No Chironomidae were present in this sample.

8097.1-37 **Comparison Date: 01/22/2020 09:43:08**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/25/2019	REF018-BMI-1-092519	35.6	34.8

Original Taxonomist - A. Navesky; QC Taxonomist - J. Pfeiffer

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
											Difference =	N/A
											Percent Similarity =	N/A

COMPONENT QC NARRATIVE

There were no general organisms in the sample to ID

8097.1-37 **Comparison Date: 01/20/2020 10:24:15**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/25/2019	REF018-BMI-1-092519	35.6	34.8

Original Taxonomist - L. Flaherty; QC Taxonomist - G. Wallace

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
											Difference =	N/A
											Percent Similarity =	N/A

COMPONENT QC NARRATIVE

This QC sample contained no worms. No changes were made in the final data set.

8097.1-47 **Comparison Date: 01/21/2020 11:15:08**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/28/2019	REF002-BMI-1-092819	38.6	39.8

Original Taxonomist - G. Wallace; QC Taxonomist - W. Hoiland

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
956	Microtendipes pedellus gr.	immatures aggregated	3	3	0	0	2	2	0	0		1
1389	Robackia demeijerei		19	19	0	0	19	19	0	0		0
			22				21				Difference =	1
											Percent Similarity =	95.89

COMPONENT QC NARRATIVE

No changes were made to the dataset. 1 specimen was lost prior to QC.

Taxonomy ID QC Percent Similarity

8097.1-47 **Comparison Date: 01/22/2020 09:49:04**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/28/2019	REF002-BMI-1-092819	38.6	39.8

		Original Taxonomist - A. Navesky					QC Taxonomist - J. Pfeiffer						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1274	Fluminicola		2	2	0	0	1	1	0	0		1	No changes were made to the original data. The sample abundance was low and several specimens were lost during the QC process.
67	Nematoda		6	6	0	0	5	5	0	0		1	
2659	Prostoma		1	1	0	0	1	1	0	0		0	
			9				7				Difference =	2	
											Percent Similarity =	92.06	

8097.1-47 **Comparison Date: 01/20/2020 10:36:52**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/28/2019	REF002-BMI-1-092819	38.6	39.8

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
9	Enchytraeidae		10	10	0	0	10	10	0	0		0	No changes were made in the final data set.
			10				10				Difference =	0	
											Percent Similarity =	100.00	

8097.1-57 **Comparison Date: 01/21/2020 11:50:20**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/03/2019	REF005-BMI-1-100319	51.6	N/A

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
838	Corynoneura		1	1	0	0	1	1	0	0		0	No changes were made to the data set. 3 specimens were lost prior to QC.
944	Dicrotendipes		1	1	0	0	1	1	0	0		0	
956	Microtendipes pedellus gr.		34	34	0	0	33	33	0	0		1	
988	Polypedilum		6	6	0	0	5	5	0	0		1	
1389	Robackia demeijerei		70	70	0	0	69	69	0	0		1	
915	Synorthocladius		14	14	0	0	14	14	0	0		0	
805	Thienemannimyia gr.		4	4	0	0	4	4	0	0		0	
			130				127				Difference =	3	
											Percent Similarity =	99.15	

Taxonomy ID QC Percent Similarity

8097.1-57 **Comparison Date: 01/21/2020 12:07:14**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/03/2019	REF005-BMI-1-100319	51.6	N/A

		Original Taxonomist - J. Pfeiffer					QC Taxonomist - A. Navesky						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
115	Caecidotea		1	1	0	0	1	1	0	0		0	No changes were made to the original data.
590	Ceraclea		14	14	0	0	13	13	0	0		1	
544	Cheumatopsyche		3	3	0	0	3	3	0	0		0	
2436	Crangonyx		2	2	0	0	2	2	0	0		0	
183	Ephemerella		9	9	0	0	9	9	0	0		0	
1274	Fluminicola		2	2	0	0	2	2	0	0		0	
565	Hydropsyche		1	1	0	0	1	1	0	0		0	
2992	Lebertia		1	1	0	0	1	0	0	1		0	
592	Mystacides		6	6	0	0	5	5	0	0		1	
67	Nematoda		26	26	0	0	27	27	0	0		-1	
103	Pisidium		6	6	0	0	6	6	0	0		0	
2659	Prostoma		3	3	0	0	4	4	0	0		-1	
538	Protoptila		0	0	0	0	0	0	0	0		0	
3002	Sperchon		5	5	0	0	5	0	0	5		0	
2	Turbellaria		21	21	0	0	19	19	0	0		2	
480	Zaitzevia		0	0	0	0	0	0	0	0		0	
			100				98				Difference =	2	
											Percent Similarity =	96.76	

8097.1-57 **Comparison Date: 01/20/2020 10:24:58**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/03/2019	REF005-BMI-1-100319	51.6	N/A

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
9	Enchytraeidae		1	1	0	0	1	1	0	0		0	No changes were made in the final data set.
			1				1				Difference =	0	
											Percent Similarity =	100.00	

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Taxonomy ID QC Percent Similarity

8097.1-62 **Comparison Date: 01/21/2020 04:22:33**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/01/2019	REF011-BMI-2-100119	34.6	34.8

TIN	TAXON	NOTE	Original Taxonomist - G. Wallace AB	L	P	A	QC Taxonomist - W. Hoiland AB	L	P	A	NOTE	DIFF.
956	Microtendipes pedellus gr.	immature aggregated	3	3	0	0	3	3	0	0		0
822	Monodiamesa		1	1	0	0	1	1	0	0		0
890	Orthocladius		3	3	0	0	3	3	0	0		0
966	Paracladopelma		5	5	0	0	5	5	0	0		0
894	Parakiefferiella		0	0	0	0	1	1	0	0		-1
988	Polypedilum		2	2	0	0	2	2	0	0		0
1389	Robackia demeijerei		112	112	0	0	112	112	0	0		0
915	Synorthocladius		1	1	0	0	1	1	0	0		0
805	Thienemannimyia gr.		1	1	0	0	1	1	0	0		0
			128				129				Difference =	-1
											Percent Similarity =	99.22

COMPONENT QC NARRATIVE

The original taxonomist failed to record 1 *Parakiefferiella* sp. this error was corrected in the data set.

8097.1-62 **Comparison Date: 01/21/2020 12:15:38**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/01/2019	REF011-BMI-2-100119	34.6	34.8

TIN	TAXON	NOTE	Original Taxonomist - J. Pfeiffer AB	L	P	A	QC Taxonomist - A. Navesky AB	L	P	A	NOTE	DIFF.
3827	Corbiculoidea		0	0	0	0	0	0	0	0		0
77	Gastropoda		0	0	0	0	0	0	0	0		0
67	Nematoda		36	36	0	0	36	36	0	0		0
1389	Robackia demeijerei		5	5	0	0	5	5	0	0		0
			41				41				Difference =	0
											Percent Similarity =	100.00

COMPONENT QC NARRATIVE

No changes were made to the original data.

8097.1-62 **Comparison Date: 01/20/2020 10:56:31**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/01/2019	REF011-BMI-2-100119	34.6	34.8

TIN	TAXON	NOTE	Original Taxonomist - L. Flaherty AB	L	P	A	QC Taxonomist - G. Wallace AB	L	P	A	NOTE	DIFF.
9	Enchytraeidae		5	5	0	0	6	6	0	0		-1
			5				6				Difference =	-1
											Percent Similarity =	100.00

COMPONENT QC NARRATIVE

No changes were made in the final data set.

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Taxonomy ID QC Percent Similarity

8097.1-76 **Comparison Date: 01/21/2020 02:22:21**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/11/2019	DM008-BMI-1-101119	39.2	N/A

Original Taxonomist - G. Wallace; QC Taxonomist - W. Hoiland

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
853	Cricotopus		0	0	0	0	2	2	0	0		-2
944	Dicrotendipes		3	2	1	0	3	2	1	0		0
956	Microtendipes pedellus gr.		23	23	0	0	23	23	0	0		0
822	Monodiamesa		1	1	0	0	1	1	0	0		0
890	Orthocladius		6	5	1	0	4	3	1	0		2
894	Parakiefferiella		3	3	0	0	3	3	0	0		0
1015	Paratanytarsus		1	1	0	0	1	1	0	0		0
988	Polypedilum		2	2	0	0	2	2	0	0		0
1389	Robackia demeijerei		26	26	0	0	26	26	0	0		0
805	Thienemannimyia gr.		4	4	0	0	4	4	0	0	lost one	0
			69				69				Difference =	0
											Percent Similarity =	97.10

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 2 Cricotopus sp. as Orthocladius sp. These errors were corrected in the data set.

8097.1-76 **Comparison Date: 01/21/2020 12:25:58**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/11/2019	DM008-BMI-1-101119	39.2	N/A

Original Taxonomist - J. Pfeiffer; QC Taxonomist - A. Navesky

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
115	Caecidotea		1	1	0	0	1	1	0	0		0
590	Ceraclea		2	2	0	0	2	2	0	0		0
183	Ephemerella		32	32	0	0	31	31	0	0		1
1274	Fluminicola		0	0	0	0	0	0	0	0		0
2992	Lebertia		6	6	0	0	6	0	0	6		0
85	Lymnaeidae		1	1	0	0	1	1	0	0		0
67	Nematoda		7	7	0	0	6	6	0	0		1
2659	Prostoma		1	1	0	0	1	1	0	0		0
101	Sphaeriidae		1	1	0	0	1	1	0	0		0
2	Turbellaria		2	2	0	0	2	2	0	0		0
			53				51				Difference =	2
											Percent Similarity =	98.56

COMPONENT QC NARRATIVE

No changes were made to the original data.

8097.1-76 **Comparison Date: 01/20/2020 10:25:34**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/11/2019	DM008-BMI-1-101119	39.2	N/A

Original Taxonomist - L. Flaherty; QC Taxonomist - G. Wallace

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
51	Nais		1	1	0	0	1	1	0	0		0

COMPONENT QC NARRATIVE

No changes were made in the final data set.

1	1	Difference =	0
		Percent Similarity =	100.00

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Taxonomy ID QC Percent Similarity

8097.1-90 **Comparison Date: 01/21/2020 02:33:09**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/14/2019	CB021-BMI-1-101419	46.5	31

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1368	Pagastiella		1	1	0	0	1	1	0	0		0	No changes were made to the data set. 1 specimen was lost prior to QC.
798	Pentaneurini		4	4	0	0	4	4	0	0		0	
988	Polypedilum		2	2	0	0	1	1	0	0		1	
799	Procladius		5	5	0	0	5	5	0	0		0	
			12				11				Difference =	1	
											Percent Similarity =	92.42	

8097.1-90 **Comparison Date: 01/21/2020 12:28:35**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/14/2019	CB021-BMI-1-101419	46.5	31

		Original Taxonomist - J. Pfeiffer					QC Taxonomist - A. Navesky						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
115	Caecidotea		3	3	0	0	3	3	0	0		0	One mite, originally identified as Torrenticola sp, was determined to be Feltria sp. and corrected in the original data.
1032	Ceratopogoninae		1	1	0	0	1	1	0	0		0	
3040	Hygrobates		4	4	0	0	4	0	0	4		0	
2992	Lebertia		1	1	0	0	1	0	0	1		0	
67	Nematoda		3	3	0	0	4	4	0	0		-1	
121	Ostracoda		3	3	0	0	2	2	0	0		1	
101	Sphaeriidae		25	25	0	0	27	27	0	0		-2	
			40				42				Difference =	-2	
											Percent Similarity =	96.19	

8097.1-90 **Comparison Date: 01/20/2020 10:25:56**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/14/2019	CB021-BMI-1-101419	46.5	31

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1348	tubificoid Naididae w/o cap setae		1	1	0	0	1	1	0	0		0	No changes were made in the final data set.
			1				1				Difference =	0	
											Percent Similarity =	100.00	

Taxonomy ID QC Percent Similarity

8097.1-92 **Comparison Date: 01/21/2020 02:46:04**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB029-BMI-1-101519	49	N/A

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
772	Ablabesmyia		1	1	0	0	1	1	0	0		0	No changes were made to the data set. 1 specimen was lost prior to QC.
970	Paratendipes		1	1	0	0	0	0	0	0		1	
988	Polypedilum		3	3	0	0	3	3	0	0		0	
799	Procladius		18	18	0	0	18	18	0	0		0	
805	Thienemannimyia gr.		5	5	0	0	5	5	0	0		0	
			28				27				Difference =	1	
											Percent Similarity =	96.43	

8097.1-92 **Comparison Date: 01/21/2020 12:41:04**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB029-BMI-1-101519	49	N/A

		Original Taxonomist - J. Pfeiffer					QC Taxonomist - A. Navesky						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
115	Caecidotea		7	7	0	0	7	7	0	0		0	No changes were made to the original data.
3040	Hygrobates		14	14	0	0	14	0	0	14		0	
2992	Lebertia		7	7	0	0	7	0	0	7		0	
102	Musculium		4	4	0	0	4	4	0	0		0	
2660	Mystacides alafimbriata		0	0	0	0	0	0	0	0		0	
121	Ostracoda		17	17	0	0	16	16	0	0		1	
103	Pisidium		222	222	0	0	222	222	0	0		0	
			271				270				Difference =	1	
											Percent Similarity =	99.65	

8097.1-92 **Comparison Date: 01/20/2020 10:26:25**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB029-BMI-1-101519	49	N/A

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
3232	Uncinais uncinata		1	1	0	0	1	1	0	0		0	No changes were made in the final data set.
			1				1				Difference =	0	
											Percent Similarity =	100.00	

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Taxonomy ID QC Percent Similarity

8097.1-101 **Comparison Date: 01/21/2020 03:16:20**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB027-BMI-1-101519	36	26

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
934	Cryptochironomus		2	2	0	0	2	2	0	0		0	The original taxonomist failed to record 1 *Polypedilum* sp. and 1 *Procladius* sp. These errors were corrected in the data set.
939	Demicryptochironomus		1	1	0	0	1	1	0	0		0	
822	Monodiamesa		1	1	0	0	1	1	0	0		0	
1368	Pagastiella		1	1	0	0	1	1	0	0		0	
894	Parakiefferiella		9	9	0	0	9	9	0	0		0	
970	Paratendipes		9	9	0	0	9	9	0	0		0	
798	Pentaneurini		1	1	0	0	1	1	0	0		0	
988	Polypedilum		10	10	0	0	11	11	0	0		-1	
799	Procladius		22	22	0	0	23	23	0	0		-1	
			56				58				Difference =	-2	
											Percent Similarity =	98.52	

8097.1-101 **Comparison Date: 01/21/2020 12:55:10**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB027-BMI-1-101519	36	26

		Original Taxonomist - J. Pfeiffer					QC Taxonomist - A. Navesky						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
106	Anodonta		1	1	0	0	1	1	0	0		0	No changes were made to the original data.
115	Caecidotea		8	8	0	0	8	8	0	0		0	
1032	Ceratopogoninae		4	4	0	0	4	4	0	0		0	
3040	Hygrobates		7	7	0	0	7	0	0	7		0	
2992	Lebertia		4	4	0	0	3	0	0	3		1	
67	Nematoda		3	3	0	0	3	3	0	0		0	
121	Ostracoda		10	10	0	0	10	10	0	0		0	
103	Pisidium		141	141	0	0	141	141	0	0		0	
3002	Sperchon		2	2	0	0	2	0	0	2		0	
			180				179				Difference =	1	
											Percent Similarity =	99.45	

8097.1-101 **Comparison Date: 01/20/2020 10:27:14**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB027-BMI-1-101519	36	26

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
12	Aulodrilus limnobius		2	2	0	0	2	2	0	0		0	No changes were made in the final data set.
1348	tubificoid Naididae w/o cap setae		2	2	0	0	2	2	0	0		0	
			4				4				Difference =	0	

Taxonomy ID QC Percent Similarity

Percent Similarity = 100.00

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Taxonomy ID QC Percent Similarity

8097.2-6 **Comparison Date: 01/20/2020 01:55:06**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/13/2019	EV012-BMI-1-091319	51	N/A

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1368	Pagastiella	tiny	1	1	0	0	1	1	0	0		0	No changes were made to the data set. 3 specimens were lost prior to QC.
964	Parachironomus	immatures aggregated based onmorphology	12	12	0	0	12	12	0	0		0	
894	Parakiefferiella		8	8	0	0	8	8	0	0		0	
970	Paratendipes	immatures aggregated	21	21	0	0	20	20	0	0		1	
798	Pentaneurini		1	1	0	0	1	1	0	0		0	
817	Potthastia longimana gr.		1	1	0	0	1	1	0	0		0	
799	Procladius		2	2	0	0	2	2	0	0		0	
1029	Tanytarsus		6	6	0	0	4	4	0	0		2	
			52				49				Difference =	3	
											Percent Similarity =	96.62	

8097.2-6 **Comparison Date: 01/23/2020 10:23:30**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/13/2019	EV012-BMI-1-091319	51	N/A

		Original Taxonomist - J. Pfeiffer					QC Taxonomist - A. Navesky						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
3095	Harpacticoida		80	80	0	0	78	78	0	0		2	The original taxonomist forgot to enter 2 Ostracoda. This error was fixed, no other changes made. Final QC score 98.46%.
1	Hydra		3	3	0	0	1	1	0	0		2	
3040	Hygrobates		1	1	0	0	1	0	0	1		0	
2992	Lebertia		40	0	0	40	41	0	0	41		-1	
67	Nematoda		7	7	0	0	7	7	0	0		0	
3229	Oribatei		2	2	0	0	2	0	0	2	Oribatida	0	
121	Ostracoda		0	0	0	0	2	2	0	0		-2	
3100	Pionidae		1	1	0	0	1	0	0	1		0	
2659	Prostoma		29	29	0	0	27	27	0	0		2	
3006	Torrenticola		82	0	0	82	82	82	0	0		0	
2	Turbellaria		1	1	0	0	1	1	0	0		0	
			246				243				Difference =	3	
											Percent Similarity =	98.09	

8097.2-6 **Comparison Date: 01/22/2020 02:53:48**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/13/2019	EV012-BMI-1-091319	51	N/A

		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
14	Aulodrilus pluriseta		2	2	0	0	2	2	0	0		0	No changes were made in the final data set.
57	Pristina		1	1	0	0	1	1	0	0		0	

2659	Prostoma	1	1	0	0	1	1	0	0		0
		4				4				Difference =	0
										Percent Similarity =	100.00

8097.2-20 **Comparison Date: 01/20/2020 03:20:36**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/23/2019	EV037-BMI-1-092319	54	N/A

		Original Taxonomist - G. Wallace					QC Taxonomist - W. Hoiland						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
944	Dicrotendipes		1	1	0	0	1	1	0	0		0	The original taxonomist failed to record 1 *Procladius* sp. This error was corrected in the data set. In addition, 5 specimens were lost prior to QC.
964	Parachironomus		4	4	0	0	4	4	0	0		0	
894	Parakiefferiella		52	52	0	0	52	52	0	0		0	
970	Paratendipes		2	2	0	0	2	2	0	0		0	
799	Procladius		0	0	0	0	1	1	0	0		-1	
1029	Tanytarsus		28	28	0	0	23	23	0	0		5	
			87				83				Difference =	4	
											Percent Similarity =	95.53	

8097.2-20 **Comparison Date: 01/23/2020 01:41:00**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/23/2019	EV037-BMI-1-092319	54	N/A

		Original Taxonomist - A. Navesky					QC Taxonomist - J. Pfeiffer						
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
126	Acari	and in molting process	1	0	0	1	0	0	0	0		1	Counting discrepancies and lost specimens accounted for the QC score. No changes were made to the data set.
3146	Aturidae		0	0	0	0	0	0	0	0		0	
3083	Calanoida		1	1	0	0	0	0	0	0		1	
1309	Cladocera		2	2	0	0	4	4	0	0		-2	
3298	Cyclopoida		4	4	0	0	7	7	0	0		-3	
183	Ephemerella		0	0	0	0	0	0	0	0		0	
3174	Halacaridae		2	0	0	2	0	0	0	0		2	
3095	Harpacticoida		16	16	0	0	15	15	0	0		1	
1	Hydra		1	1	0	0	0	0	0	0		1	
3040	Hygrobates		1	0	0	1	1	1	0	0		0	
2992	Lebertia		1	0	0	1	2	2	0	0		-1	
67	Nematoda		26	26	0	0	25	25	0	0		1	
3229	Oribatei	Oribatida	2	0	0	2	1	1	0	0		1	
121	Ostracoda		11	11	0	0	10	10	0	0		1	
2659	Prostoma		122	122	0	0	120	120	0	0		2	
3006	Torrenticola		8	0	0	8	5	5	0	0		3	
			198				190				Difference =	8	
											Percent Similarity =	95.10	

8097.2-20 **Comparison Date: 01/22/2020 02:46:04**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/23/2019	EV037-BMI-1-092319	54	N/A

Original Taxonomist - L. Flaherty   QC Taxonomist - G. Wallace

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Taxonomy ID QC Percent Similarity

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
14	Aulodrilus pluriseta		1	1	0	0	1	1	0	0		0	No changes were made in the final data set.
			1				1				Difference =	0	
											Percent Similarity =	100.00	

8097.2-25 **Comparison Date: 01/20/2020 03:55:34**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/27/2019	REF003-BMI-2-092719	37	42.2

			Original Taxonomist - G. Wallace				QC Taxonomist - W. Hoiland					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1331	Cricotopus/Orthocladius		5	5	0	0	0	0	0	0		5
934	Cryptochironomus		1	1	0	0	1	1	0	0		0
964	Parachironomus		2	2	0	0	2	2	0	0		0
966	Paracladopelma		1	1	0	0	1	1	0	0		0
894	Parakiefferiella		3	3	0	0	8	8	0	0		-5
970	Paratendipes		1	1	0	0	1	1	0	0		0
988	Polypedilum		6	6	0	0	6	6	0	0		0
			19				19				Difference =	0
											Percent Similarity =	73.68

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 5 *Parakiefferiella* sp. as *Cricotopus*/*Orthocladius*. These errors were corrected in the data set.

8097.2-25 **Comparison Date: 01/23/2020 01:43:10**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/27/2019	REF003-BMI-2-092719	37	42.2

			Original Taxonomist - A. Navesky				QC Taxonomist - J. Pfeiffer					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1032	Ceratopogoninae		1	1	0	0	1	1	0	0		0
3298	Cyclopoida		1	1	0	0	1	1	0	0		0
3095	Harpacticoida		63	63	0	0	62	62	0	0		1
67	Nematoda		81	81	0	0	84	84	0	0		-3
3229	Oribatei	Oribatida	1	0	0	1	1	1	0	0		0
121	Ostracoda		1	1	0	0	1	1	0	0		0
2659	Prostoma		10	10	0	0	12	12	0	0		-2
2	Turbellaria		6	6	0	0	6	6	0	0		0
			164				168				Difference =	-4
											Percent Similarity =	98.34

COMPONENT QC NARRATIVE

No changes were made to the data set.

8097.2-25 **Comparison Date: 01/22/2020 02:55:14**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/27/2019	REF003-BMI-2-092719	37	42.2

			Original Taxonomist - L. Flaherty				QC Taxonomist - G. Wallace					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1350	Aeolosoma		1	1	0	0	1	1	0	0		0
30	Arcteonais lomondi		1	1	0	0	1	1	0	0		0
9	Enchytraeidae		1	1	0	0	1	1	0	0		0
826	Orthocladiinae		1	1	0	0	1	1	0	0		0
1348	tubificoid Naididae w/o cap setae		3	3	0	0	3	3	0	0		0
3232	Uncinais uncinata		1	1	0	0	1	1	0	0		0

COMPONENT QC NARRATIVE

No changes were made in the final data set.

8	8	Difference =	0
		Percent Similarity =	100.00

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8097.2-37 **Comparison Date: 01/20/2020 04:14:55**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/25/2019	REF018-BMI-1-092519	35.6	34.8

Original Taxonomist - G. Wallace; QC Taxonomist - W. Hoiland

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
845	Cricotopus (Nostococladius) nostocicola		0	0	0	0	0	0	0	0		0	No changes were made to the data set.
865	Heterotrissocladius marcidus gr.		1	1	0	0	1	1	0	0		0	
988	Polypedilum		1	1	0	0	1	1	0	0		0	
1023	Stempellinella		1	1	0	0	1	1	0	0		0	
			3				3				Difference =	0	
											Percent Similarity =	100.00	

8097.2-37 **Comparison Date: 01/22/2020 02:54:45**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/25/2019	REF018-BMI-1-092519	35.6	34.8

Original Taxonomist - A. Navesky; QC Taxonomist - J. Pfeiffer

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1309	Cladocera		1	1	0	0	1	1	0	0		0	No changes were made to the data set.
67	Nematoda		66	66	0	0	65	65	0	0		1	
			67				66				Difference =	1	
											Percent Similarity =	99.98	

8097.2-37 **Comparison Date: 01/22/2020 02:57:31**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/25/2019	REF018-BMI-1-092519	35.6	34.8

Original Taxonomist - L. Flaherty; QC Taxonomist - G. Wallace

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
9	Enchytraeidae		1	1	0	0	1	1	0	0		0	No changes were made in the final data set.
1161	Quistadrilus multisetosus	RC#12	0	0	0	0	0	0	0	0		0	
			1				1				Difference =	0	
											Percent Similarity =	100.00	

8097.2-48 **Comparison Date: 01/20/2020 12:14:36**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/28/2019	REF001-BMI-1-092819	37.6	36.2

Original Taxonomist - W. Hoiland; QC Taxonomist - G. Wallace

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
988	Polypedilum		4	4	0	0	3	3	0	0		1	No changes were made to the dataset.
1389	Robackia demeijerei		23	23	0	0	23	23	0	0		0	
915	Synorthocladius		1	1	0	0	1	1	0	0		0	
			28				27				Difference =	1	
											Percent Similarity =	96.83	

Taxonomy ID QC Percent Similarity

8097.2-48 **Comparison Date: 01/23/2020 12:10:01**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/28/2019	REF001-BMI-1-092819	37.6	36.2

TIN	TAXON	NOTE	AB (Original Taxonomist - A. Navesky)	L	P	A	AB (QC Taxonomist - J. Pfeiffer)	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
154	Ephemerellidae		1	1	0	0	1	1	0	0		0	No changes were made to the data set.
3246	Estelloxus		0	0	0	0	0	0	0	0		0	
3095	Harpacticoida		1	1	0	0	1	1	0	0		0	
67	Nematoda		5	5	0	0	4	4	0	0		1	
3229	Oribatei	Oribatida	5	0	0	5	5	5	0	0		0	
121	Ostracoda		2	2	0	0	2	2	0	0		0	
2659	Prostoma		1	1	0	0	1	1	0	0		0	
3006	Torrenticola		1	0	0	1	1	1	0	0		0	
			16				15				Difference =	1	
											Percent Similarity =	95.42	

8097.2-48 **Comparison Date: 01/22/2020 02:48:18**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
09/28/2019	REF001-BMI-1-092819	37.6	36.2

TIN	TAXON	NOTE	AB (Original Taxonomist - L. Flaherty)	L	P	A	AB (QC Taxonomist - G. Wallace)	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
9	Enchytraeidae		5	5	0	0	5	5	0	0		0	No changes were made in the final data set.
			5				5				Difference =	0	
											Percent Similarity =	100.00	

8097.2-54 Comparison Date: 01/20/2020 01:04:10

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/02/2019	REF009A-BMI-1-100219	50.6	N/A

TIN	TAXON	NOTE	AB (Original Taxonomist - W. Hoiland)	L	P	A	AB (QC Taxonomist - G. Wallace)	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1331	Cricotopus/Orthocladius		1	1	0	0	4	4	0	0		-3	The original taxonomist incorrectly identified 3 *Cricotopus/Orthocladius sp* . as *Parakiefferiella* sp. and 1 *Paracladopelma* sp. as *Microtendipes pedellus* gr. These errors were corrected in the dataset.
956	Microtendipes pedellus gr.		7	7	0	0	6	6	0	0		1	
964	Parachironomus		1	1	0	0	1	1	0	0		0	
966	Paracladopelma		0	0	0	0	1	1	0	0		-1	
894	Parakiefferiella		4	4	0	0	2	2	0	0		2	
1015	Paratanytarsus		1	1	0	0	0	0	0	0		1	
970	Paratendipes		1	1	0	0	0	0	0	0		1	
1389	Robackia demeijerei		42	42	0	0	39	39	0	0		3	
1029	Tanytarsus		2	2	0	0	2	2	0	0		0	
			59				55				Difference =	4	
											Percent Similarity =	92.23	

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Taxonomy ID QC Percent Similarity

8097.2-54 **Comparison Date: 01/23/2020 11:54:03**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/02/2019	REF009A-BMI-1-100219	50.6	N/A

			Original Taxonomist - A. Navesky				QC Taxonomist - J. Pfeiffer					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
590	Ceraclea		1	1	0	0	1	1	0	0		0
1309	Cladocera		426	426	0	0	437	437	0	0		-11
3298	Cyclopoida		2	2	0	0	3	3	0	0		-1
183	Ephemerella		0	0	0	0	1	1	0	0		-1
154	Ephemerellidae		1	1	0	0	0	0	0	0		1
3095	Harpacticoida		9	9	0	0	10	10	0	0		-1
1	Hydra		3	3	0	0	2	2	0	0		1
588	Leptoceridae	Mystaicdes or Nectopsyche	1	1	0	0	0	0	0	0		1
592	Mystacides		0	0	0	0	1	1	0	0		-1
67	Nematoda		8	8	0	0	7	7	0	0		1
3229	Oribatei	Oribatida	22	0	0	22	20	20	0	0		2
121	Ostracoda		3	3	0	0	3	3	0	0		0
307	Plecoptera		0	0	0	0	1	1	0	0		-1
2659	Prostoma		5	5	0	0	0	0	0	0		5
101	Sphaeriidae		1	1	0	0	1	1	0	0		0
3530	Tardigrada		2	2	0	0	2	2	0	0		0
2	Turbellaria		2	2	0	0	6	6	0	0		-4
			486				495				Difference =	-9
											Percent Similarity =	97.60

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 1 Ephemerella as Ephemerellidae, 1 Mystacides as Leptoceridae, and 5 Turbellaria as Prostoma. These errors were fixed, all other discrepancies due to abundances or lost specimens. No other changes were made. Final score 98.81%.

8097.2-54 **Comparison Date: 01/22/2020 02:58:53**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/02/2019	REF009A-BMI-1-100219	50.6	N/A

			Original Taxonomist - L. Flaherty				QC Taxonomist - G. Wallace					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
31	Chaetogaster diaphanus	RC#5	0	0	0	0	0	0	0	0		0
9	Enchytraeidae		4	4	0	0	4	4	0	0		0
6	Lumbriculidae		1	1	0	0	1	1	0	0		0
2659	Prostoma		1	1	0	0	1	1	0	0		0
1348	tubificoid Naididae w/o cap setae		2	2	0	0	2	2	0	0		0
3232	Uncinais uncinata		4	4	0	0	4	4	0	0		0
			12				12				Difference =	0
											Percent Similarity =	100.00

COMPONENT QC NARRATIVE

No changes were made in the final data set.

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Taxonomy ID QC Percent Similarity

8097.2-70 **Comparison Date: 01/20/2020 11:52:08**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/09/2019	DM002-BMI-1-100919	63.6	N/A

TIN	TAXON	NOTE	Original Taxonomist - W. LaVoie AB	L	P	A	QC Taxonomist - W. Hoiland AB	L	P	A	NOTE	DIFF.
988	Polypedilum		3	3	0	0	4	4	0	0		-1
1389	Robackia demeijerei		60	60	0	0	61	61	0	0		-1
			63				65				Difference =	-2
											Percent Similarity =	98.61

COMPONENT QC NARRATIVE

The QC taxonomist found 1 extra specimen each of *Polypedilum* and *Robackia demeijerei* . This error was corrected in the sample.

8097.2-70 **Comparison Date: 01/22/2020 02:43:20**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/09/2019	DM002-BMI-1-100919	63.6	N/A

TIN	TAXON	NOTE	Original Taxonomist - A. Navesky AB	L	P	A	QC Taxonomist - J. Pfeiffer AB	L	P	A	NOTE	DIFF.
67	Nematoda		2	2	0	0	2	2	0	0		0
			2				2				Difference =	0
											Percent Similarity =	100.00

COMPONENT QC NARRATIVE

No changes were made to the data set.

8097.2-70 **Comparison Date: 01/22/2020 02:49:22**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/09/2019	DM002-BMI-1-100919	63.6	N/A

TIN	TAXON	NOTE	Original Taxonomist - L. Flaherty AB	L	P	A	QC Taxonomist - G. Wallace AB	L	P	A	NOTE	DIFF.
											Difference =	N/A
											Percent Similarity =	N/A

COMPONENT QC NARRATIVE

This QC sample contained no worms. No changes were made to the data set.

8097.2-71 **Comparison Date: 01/21/2020 08:17:12**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/10/2019	JS002-BMI-1-101019	38	N/A

TIN	TAXON	NOTE	Original Taxonomist - G. Wallace AB	L	P	A	QC Taxonomist - W. Hoiland AB	L	P	A	NOTE	DIFF.
938	Cryptotendipes		0	0	0	0	1	1	0	0		-1
944	Dicrotendipes		3	3	0	0	4	4	0	0		-1
878	Nanocladius		2	2	0	0	2	2	0	0		0
964	Parachironomus		0	0	0	0	1	1	0	0		-1
894	Parakiefferiella		9	9	0	0	9	9	0	0		0
970	Paratendipes		23	23	0	0	19	19	0	0		4
988	Polypedilum		6	6	0	0	6	6	0	0		0
799	Procladius		3	3	0	0	3	3	0	0		0
1029	Tanytarsus		2	2	0	0	2	2	0	0		0

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 1 *Cryptotendipes* sp., 1 *Dicrotendipes* sp. and 1 *Parachironomus* sp. as *Paratendipes* sp. These errors were corrected in the data set.

Taxonomy ID QC Percent Similarity

805	Thienemannimyia gr.	1	1	0	0	1	1	0	0		0
		49				48				Difference =	1
										Percent Similarity =	92.64

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Taxonomy ID QC Percent Similarity

8097.2-71 **Comparison Date: 01/23/2020 12:07:25**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/10/2019	JS002-BMI-1-101019	38	N/A

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
		Original Taxonomist - A. Navesky					QC Taxonomist - J. Pfeiffer					
126	Acari	very small and color washed out	3	0	0	3	3	3	0	0		0
1309	Cladocera		4	4	0	0	2	2	0	0		2
3298	Cyclopoida		13	13	0	0	12	12	0	0		1
3095	Harpacticoida		38	38	0	0	40	40	0	0		-2
2992	Lebertia		5	0	0	5	5	5	0	0		0
67	Nematoda		214	214	0	0	180	180	0	0		34
3229	Oribatei	Oribatida	7	0	0	7	5	5	0	0		2
121	Ostracoda		35	35	0	0	37	37	0	0		-2
2659	Prostoma		53	53	0	0	47	47	0	0		6
3006	Torrenticola		6	0	0	6	7	7	0	0		-1
2	Turbellaria		1	1	0	0	1	1	0	0		0
			379				339				Difference =	40
											Percent Similarity =	95.68

COMPONENT QC NARRATIVE

34 Nematoda specimens were lost during the QC process. Aside from that only minor counting discrepancies accounted for the QC score.

8097.2-71 **Comparison Date: 01/22/2020 03:03:17**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/10/2019	JS002-BMI-1-101019	38	N/A

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
		Original Taxonomist - L. Flaherty					QC Taxonomist - G. Wallace					
1350	Aeolosoma		1	1	0	0	1	1	0	0		0
14	Aulodrilus pluriseta		4	4	0	0	4	4	0	0		0
41	Dero		2	2	0	0	2	2	0	0		0
9	Enchytraeidae		2	2	0	0	2	2	0	0		0
6	Lumbriculidae		1	1	0	0	1	1	0	0		0
57	Pristina		73	73	0	0	72	72	0	0		1
2659	Prostoma		2	2	0	0	2	2	0	0		0
62	Slavina appendiculata		1	1	0	0	1	1	0	0		0
			86				85				Difference =	1
											Percent Similarity =	99.82

COMPONENT QC NARRATIVE

No changes were made to the data set.

Taxonomy ID QC Percent Similarity

8097.2-87 **Comparison Date: 01/21/2020 08:37:09**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/14/2019	DM027-BMI-1-101419	48	34.2

Original Taxonomist - G. Wallace; QC Taxonomist - W. Hoiland

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1006	Cladotanytarsus		1	1	0	0	1	1	0	0		0	No changes were made to the data set.
964	Parachironomus		1	1	0	0	1	1	0	0		0	
966	Paracladopelma		1	1	0	0	1	1	0	0		0	
973	Phaenopsectra		1	1	0	0	1	1	0	0		0	
988	Polypedilum	immatures aggregated (2 lost)	12	14	0	0	12	12	0	0		0	
1389	Robackia demeijerei		2	2	0	0	2	2	0	0		0	
1029	Tanytarsus		3	3	0	0	3	3	0	0		0	
			21				21				Difference =	0	
											Percent Similarity =	100.00	

8097.2-87 **Comparison Date: 01/21/2020 04:36:06**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/14/2019	DM027-BMI-1-101419	48	34.2

Original Taxonomist - J. Pfeiffer; QC Taxonomist - A. Navesky

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
1309	Cladocera		1	1	0	0	1	1	0	0		0	Only minor counting discrepancies. No changes were made to the data set.
3298	Cyclopoida		1	1	0	0	1	1	0	0		0	
3095	Harpacticoida		18	18	0	0	18	18	0	0		0	
1	Hydra		6	6	0	0	4	4	0	0		2	
588	Leptoceridae		2	2	0	0	2	2	0	0		0	
85	Lymnaeidae		1	1	0	0	1	1	0	0		0	
67	Nematoda		29	29	0	0	28	28	0	0		1	
3229	Oribatei		2	2	0	0	2	0	0	2	Oribatida	0	
121	Ostracoda		6	6	0	0	6	6	0	0		0	
724	Simuliidae		3	3	0	0	3	3	0	0		0	
2	Turbellaria		1	1	0	0	1	1	0	0		0	
			70				67				Difference =	3	
											Percent Similarity =	97.40	

8097.2-87 **Comparison Date: 01/22/2020 02:51:11**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/14/2019	DM027-BMI-1-101419	48	34.2

Original Taxonomist - L. Flaherty; QC Taxonomist - G. Wallace

TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.	COMPONENT QC NARRATIVE
44	Nais behningi		2	2	0	0	2	2	0	0		0	No changes were made to the data set.
1347	tubificoid Naididae w/ cap setae		1	1	0	0	1	1	0	0		0	
			3				3				Difference =	0	

Percent Similarity = 100.00

8097.2-93 — **Comparison Date: 01/22/2020 03:19:06**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB029-BMI-2-101519	39	N/A

			Original Taxonomist - W. LaVoie				QC Taxonomist - W. Hoiland					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1368	Pagastiella		1	1	0	0	1	1	0	0		0
967	Paralauterborniella nigrohalteralis		4	4	0	0	4	4	0	0		0
970	Paratendipes		7	7	0	0	7	7	0	0		0
798	Pentaneurini	Thien. Grp?	7	7	0	0	6	6	0	0		1
799	Procladius		18	18	0	0	20	20	0	0		-2
			37				38				Difference =	-1
											Percent Similarity =	96.02

COMPONENT QC NARRATIVE

The QC taxonomist found 1 extra specimen of *Procladius* sp.. This error was corrected in the sample.

8097.2-93 — **Comparison Date: 01/23/2020 12:03:37**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB029-BMI-2-101519	39	N/A

			Original Taxonomist - A. Navesky				QC Taxonomist - J. Pfeiffer					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1415	Amiocentrus aspilus		1	1	0	0	1	1	0	0		0
1309	Cladocera		10	10	0	0	9	9	0	0		1
3298	Cyclopoida		12	12	0	0	12	12	0	0		0
3095	Harpacticoida		390	390	0	0	403	403	0	0		-13
2992	Lebertia		3	0	0	3	3	3	0	0		0
67	Nematoda	Oribatida	46	46	0	0	42	42	0	0		4
3229	Oribatei	Oribatida	3	0	0	3	2	2	0	0		1
121	Ostracoda		38	38	0	0	36	36	0	0		2
101	Sphaeriidae		3	3	0	0	8	8	0	0		-5
3006	Torrenticola		0	0	0	0	1	1	0	0		-1
3171	Torrenticolidae		1	0	0	1	0	0	0	0		1
			507				517				Difference =	-10
											Percent Similarity =	97.82

COMPONENT QC NARRATIVE

Only minor counting discrepancies. No changes were made to the data set.

8097.2-93 — **Comparison Date: 01/22/2020 02:51:34**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/15/2019	CB029-BMI-2-101519	39	N/A

			Original Taxonomist - L. Flaherty				QC Taxonomist - G. Wallace					
TIN	TAXON	NOTE	AB	L	P	A	AB	L	P	A	NOTE	DIFF.
1348	tubificoid Naididae w/o cap setae		2	2	0	0	2	2	0	0		0
			2				2				Difference =	0
											Percent Similarity =	100.00

COMPONENT QC NARRATIVE

No changes were made to the data set.

Taxonomy ID QC Percent Similarity

8097.2-108 **Comparison Date: 01/20/2020 12:57:44**

Component: Chironomidae

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/18/2019	CB040-BMI-1-101819	16	N/A

TIN	TAXON	NOTE (Original Taxonomist - W. Hoiland)	AB	L	P	A	AB (QC Taxonomist - G. Wallace)	L	P	A	NOTE	DIFF.
934	Cryptochironomus		1	1	0	0	1	1	0	0		0
878	Nanocladius		1	1	0	0	1	1	0	0		0
964	Parachironomus		4	4	0	0	3	3	0	0		1
966	Paracladopelma		1	1	0	0	1	1	0	0		0
894	Parakiefferiella		9	9	0	0	9	9	0	0		0
798	Pentaneurini		1	1	0	0	1	1	0	0		0
988	Polypedilum		0	0	0	0	1	1	0	0		-1
1029	Tanytarsus		8	8	0	0	8	8	0	0		0
			25				25				Difference =	0
											Percent Similarity =	96.00

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 1 *Polypedilum* sp. as *Parachironomus* sp. This error was corrected in the dataset.

8097.2-108 **Comparison Date: 01/21/2020 04:41:06**

Component: General

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/18/2019	CB040-BMI-1-101819	16	N/A

TIN	TAXON	NOTE (Original Taxonomist - J. Pfeiffer)	AB	L	P	A	AB (QC Taxonomist - A. Navesky)	L	P	A	NOTE	DIFF.
3185	Feltria		0	0	0	0	1	0	0	1		-1
3095	Harpacticoida		3	3	0	0	3	3	0	0		0
67	Nematoda		1	1	0	0	1	1	0	0		0
3229	Oribatei		4	4	0	0	4	0	0	4	Oribatida	0
121	Ostracoda		3	3	0	0	4	4	0	0		-1
2659	Prostoma		3	3	0	0	3	3	0	0		0
3006	Torrenticola		3	3	0	0	2	0	0	2		1
			17				18				Difference =	-1
											Percent Similarity =	89.87

COMPONENT QC NARRATIVE

The original taxonomist incorrectly identified 1 Feltria sp. as Torrenticola sp. This erroe was fixed, no other changes were made. Final QC score 95.42%.

8097.2-108 **Comparison Date: 01/22/2020 03:04:40**

Component: Oligochaete

Collection Date	Site ID Number	Bucket1 Weight (lbs)	Bucket2 Weight (lbs)
10/18/2019	CB040-BMI-1-101819	16	N/A

TIN	TAXON	NOTE (Original Taxonomist - L. Flaherty)	AB	L	P	A	AB (QC Taxonomist - G. Wallace)	L	P	A	NOTE	DIFF.
57	Pristina		1	1	0	0	1	1	0	0		0
			1				1				Difference =	0
											Percent Similarity =	100.00

COMPONENT QC NARRATIVE

No changes were made to the data set.

AB = Abundance | L = Larvae | P = Pupae | A = Adults

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8097 - Teck Lake Roosevelt Benthos and QC Support 2019

Sample Group 2: (.2) 250um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 9/12/2019 11:08:05AM

SIN	Coll. Date	Jars	Site ID Number	Weight (lbs)	Weight
1	09/10/19	2	EVO63-BMI-1-091019	31.5	47.5
2	09/10/19	2	EVO64-BMI-1-091019	33.6	57.2

Received Number of Samples: 2

Expected Number of Samples: 123

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 2: (.2) 250um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/14/2019 10:06:30AM

SIN	Coll. Date	Jars	Site ID Number	Weight (lbs)	Weight
1	09/10/19	2	EV063-BMI-1-091019	31.5	47.5
2	09/10/19	2	EV064-BMI-1-091019	33.6	57.2
3	09/12/19	1	EV005-BMI-1-091219		
4	09/12/19	1	EV010-BMI-1-091219		
5	09/12/19	1	EV075-BMI-1-091219		
6	09/13/19	2	EV012-BMI-1-091319		
7	09/13/19	2	EV013-BMI-1-091319		
8	09/14/19	1	EV036-BMI-1-091419		
9	09/19/19	1	DM045-BMI-1-091919		
10	09/20/19	1	EV026-BMI-1-092019		
11	09/20/19	2	EV003-BMI-1-092019		
12	09/20/19	1	DM050-BMI-1-092019		
13	09/20/19	1	DM046-BMI-1-092019		
14	09/21/19	1	DM022-BMI-1-092119		
15	09/21/19	1	DM023-BMI-1-092119		
16	09/21/19	1	DM026-BMI-1-092119		
17	09/21/19	2	EV027-BMI-1-092119		
18	09/21/19	2	EV060-BMI-1-092119		
19	09/23/19	2	EV008-BMI-1-092319		
20	09/23/19	1	EV037-BMI-1-092319		

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Sample Group 2: (.2) 250um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/14/2019 10:06:30AM

21	09/23/19	1	EV037-BMI-2-092319
22	09/24/19	1	EV002-BMI-1-092419
23	09/24/19	2	EV044-BMI-1-092419
24	09/24/19	2	EV048-BMI-1-092419
25	09/27/19	2	REF 003-BMI-2-092719
26	09/23/19	1	EV054-BMI-1-092319
27	09/23/19	1	EV057-BMI-1-092319
28	09/24/19	2	EV051-BMI-1-092419
29	09/24/19	2	REF013-BMI-1-092419
30	09/24/19	2	REF015-BMI-1-092419
31	09/25/19	2	EV065-BMI-1-092519
32	09/25/19	2	EV066-BMI-1-092519
33	09/25/19	2	EV069-BMI-1-092519
34	09/25/19	2	EV069-BMI-2-092519
35	09/25/19	2	EV071-BMI-1-092519
36	09/25/19	2	REF017-BMI-1-092519
37	09/25/19	2	REF018-BMI-1-092519
38	09/25/19	2	REF016-BMI-1-092519
39	09/26/19	2	EV001-BMI-1-092619
40	09/26/19	2	EV072-BMI-1-092619
41	09/26/19	1	EV052-BMI-1-092619
42	09/26/19	2	REF014-BMI-1-092619

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Sample Group 2: (.2) 250um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/14/2019 10:06:30AM

43	09/27/19	1	EV049-BMI-1-092719
44	09/27/19	2	REF003-BMI-1-092719
45	10/01/19	1	EV036-BMI-2-100119
46	09/27/19	2	REF004-BMI-1-092719
47	09/28/19	2	REF002-BMI-1-092819
48	09/28/19	2	REF001-BMI-1-092819
49	09/30/19	1	EV022-BMI-1-093019
50	09/30/19	2	REF007-BMI-1-093019
51	09/26/19	2	4-B6-2019-BMI-1-09261 9
52	09/26/19	2	4-B1-2019-BMI-1-09261 9

Received Number of Samples: 52

Expected Number of Samples: 123

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 2: (.2) 250um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/21/2019 8:32:10AM

64	10/04/19	1	CB036-BMI-1-100419
65	10/09/19	2	CB006-BMI-1-100919
66	10/09/19	2	CB012-BMI-1-100919
67	10/09/19	1	CB007-BMI-1-100919
68	10/10/19	1	JS001-BMI-1-101019
69	10/09/19	1	DM018-BMI-1-100919
70	10/09/19	1	DM002-BMI-1-100919
71	10/10/19	1	JS002-BMI-1-101019
72	10/15/19	1	CB014-BMI-1-101519
73	10/10/19	1	DM015-BMI-1-101019
74	10/10/19	1	DM015-BMI-2-101019
75	10/10/19	1	DM016-BMI-1-101019
76	10/11/19	1	DM008-BMI-1-101119
77	10/11/19	1	CB016-BMI-1-101119
78	10/11/19	1	DM010-BMI-1-101119
79	10/11/19	1	CB018-BMI-1-101119
80	10/11/19	1	CB047-BMI-1-101119
81	10/12/19	1	CB009-BMI-1-101219
82	10/12/19	2	CB010-BMI-1-101219
83	10/12/19	1	CB039-BMI-1-101219
84	10/12/19	1	DM025-BMI-1-101219
85	10/14/19	2	DM019-BMI-1-101419

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 2: (.2) 250um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/21/2019 8:32:10AM

86	10/14/19	1	DM020-BMI-1-101419

Received Number of Samples: 86

Expected Number of Samples: 123

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Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxoı

8097 - 2 - 1

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes:

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Kyle Lerch	9/16/19	4	24	319	163	18	X	9.75	1.00	X

500

Primary Matrix: Fine organic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
18.5	0.45						2

Sort Comments: 17.7 = Kept Sediment / 0.35 = 500um Fraction Sort

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	9/25/19	1.25	6	45	18	4	3	3	821.6	60.86	N

67
321.6

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count
Kyle Lerch	10/8/19	56	17	7	2	4.75	643	240

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	11.04.19	1.25	6	12	1	1	3	1.00	710	90.67	N

622

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Madalyn Walker	11.05.19	7	8	329	174	24	3	1.50

527

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 2**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

534

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Kate Guild	12/23/19	11.5	24	505	26	3	1	19.75	0.75	—

Primary Matrix: Fine Org.
Secondary Matrix: Inorg.

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
19.0	0.7	—	—	—	—	—	2

Sort Comments:

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26Dec2019	1.25	6	8	2	0	0	1.0	582	92%	N

QC 1 Comments: 10

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

1.

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Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

Void this sort

8097 - 2 - 2

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes:

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	9.21.19	24	24	241	24	3	15	20	4	/

Counts: 268

Primary Matrix: Finest Organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
19.0	.7	—	—	—	-	—	1

Sort Comments:

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	9/30/19	5	24	34	4	5	3	7.25	474	56.54	N

QC Counts: 43

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count
L Smith	10.2.19	210	11	0	5	13.0	532	159

Re-Sort Counts: 221

Re-Sort 1 Comments:

QC 2 Information

X

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	10.31.19	5	24	116	4	7	4	5.00	1,141	46.67	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

Re-Sort Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 2

ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Re-Sort 2 Information

Re-Sort 2 Counts 318

Re-Sort 2 Technician	Re-Sort 2 Date	G	M	W	PNC	Re-Sort 2 Time	Total Count	Target Count
L Smith	11.7.19	299	14	0	0	21.0	977	

Re-Sort 2 Comments:

QC 3 Information

QC 3 Technician	QC 3 Date	Grids: QC'd	Grids: Total	QC 3 Counts: G	M	W	PNC	QC 3 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/19/19	1.25	24	38	3	0	3	5.0			~

QC 3 Comments: 41 in 1.25 = 787.2 more bugs

Re-Sort 3 Information

Re-Sort 3 Technician	Re-Sort 3 Date	G	M	W	PNC	Re-Sort 3 Time	Total Count	Target Count

Re-Sort 3 Comments:

QC 4 Information

QC 4 Technician	QC 4 Date	Grids: QC'd	Grids: Total	QC 4 Counts: G	M	W	PNC	QC 4 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 4 Comments:

Re-Sort 4 Information

Re-Sort 4 Technician	Re-Sort 4 Date	G	M	W	PNC	Re-Sort 4 Time	Total Count	Target Count

Re-Sort 4 Comments:

QC 5 Information

QC 5 Technician	QC 5 Date	Grids: QC'd	Grids: Total	QC 5 Counts: G	M	W	PNC	QC 5 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 5 Comments:

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

8097 - 2 - 3

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes:

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Counts 255

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	4.24.19	24	24	173	82	Ø	Ø	4.5	1.25	/

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.7	.7	Dan	10/05/2019	.25	—	—	1

Sort Comments: Initial=2.7

QC 1 Information

QC Counts 149

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Gruid	11/18/19	8	8	142	6	1	—	2.0	404	63%	

QC 1 Comments: elutriated .65L of sand and QC'd 20% - found no bugs

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

X

QC 2 Information

QC 2 Counts 10

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-19-19	8	8	1	9	—	—	.5	414	97%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

8097 - 2 - 4

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes:

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	9.25.19	42	42	71	55	0	0	2.0	1.75	/

Counts: 126

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.5	2.5	—	—	—	—	—	3

Sort Comments: Initial = 11.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-19-19	8	8	9	2	-	-	1.5	137	91%	N

QC Counts: 11

QC 1 Comments: Elutriated out 2.45 of sand/Gravel - elutriate check Markle Ziegler
- elutriate kept

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxoı

8097 - 2 - 5

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes:

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	9.26.19	1	1	48	47	Ø	Ø	1.0	1.5	/

Counts: 95
Time: 35↑

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.7	.01	Dan	10/05/2019	.25	–	–	2

Sort Comments: ~~Sortable material~~ E.ONL ; 1 Jar elutriate , initial = 6.5

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alvarado	10/2	8	8	3	6	1	12	.5	105	90%	N

QC Counts: 10

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/18/19	8	8	46	11	2	–	.75	184	64%	

QC 2 Counts: 59

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Re-Sort Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 5

ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Re-Sort 2 Information

Re-Sort 2 Technician	Re-Sort 2 Date	G	M	W	PNC	Re-Sort 2 Time	Total Count	Target Count

Re-Sort 2 Comments:

QC 3 Information

QC 3 Technician	QC 3 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 3 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-19-19	8	8	1	1	-	-	.25	156	98%	N

QC 3 Counts: 2

QC 3 Comments:

Re-Sort 3 Information

Re-Sort 3 Technician	Re-Sort 3 Date	G	M	W	PNC	Re-Sort 3 Time	Total Count	Target Count

Re-Sort 3 Comments:

QC 4 Information

QC 4 Technician	QC 4 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 4 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 4 Comments:

Re-Sort 4 Information

Re-Sort 4 Technician	Re-Sort 4 Date	G	M	W	PNC	Re-Sort 4 Time	Total Count	Target Count

Re-Sort 4 Comments:

QC 5 Information

QC 5 Technician	QC 5 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 5 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 5 Comments:

ECO ANALYSTS, INC.
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Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

8097 - 2 - 6

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 225

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Laine Smith	10.3.19	1	1	164	59	2	0	2.0	.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.01	Chris P	10.3.19	.25	/	/	3

Sort Comments: Inital =80

QC 1 Information

QC Counts: 4

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ron Alexander	10/1/24	2	8	–	1	–	–	.25	229	98%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Counts: 117

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/18/19		8	101	12	4	–	1.5	343	65%	

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Re-Sort Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 6

ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

☐ **Re-Sort 2 Information**

Re-Sort 2 Technician	Re-Sort 2 Date	G	M	W	PNC	Re-Sort 2 Time	Total Count	Target Count

Re-Sort 2 Comments:

☒ **QC 3 Information**

QC 3 Technician	QC 3 Date	Grids QC'd	Grids Total	QC 3 Counts G	M	W	PNC	QC 3 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-19-19	8	8	4	1	–	–	.25	398	98%	N

5

QC 3 Comments:

☐ **Re-Sort 3 Information**

Re-Sort 3 Technician	Re-Sort 3 Date	G	M	W	PNC	Re-Sort 3 Time	Total Count	Target Count

Re-Sort 3 Comments:

☐ **QC 4 Information**

QC 4 Technician	QC 4 Date	Grids QC'd	Grids Total	QC 4 Counts G	M	W	PNC	QC 4 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 4 Comments:

☐ **Re-Sort 4 Information**

Re-Sort 4 Technician	Re-Sort 4 Date	G	M	W	PNC	Re-Sort 4 Time	Total Count	Target Count

Re-Sort 4 Comments:

☐ **QC 5 Information**

QC 5 Technician	QC 5 Date	Grids QC'd	Grids Total	QC 5 Counts G	M	W	PNC	QC 5 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 5 Comments:

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Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

K2 8097 - 2 - 7

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10.4.19	1	1	156	57	Ø	Ø	2.25	1.75	/

Counts: 213

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
25	.01	Lauren B	10.4.19	- 0	/	/	2

Sort Comments: ~~OL L sortable material~~ Initial=160

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/18/19	8	8	3	4	1	1	.5	221	96%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/15/19	8	8	49	5	1	-	1.5		80%	

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

8097 - 2 - 8

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10.5.19	4	8	76	435	1	0	3.0	.75	/

Counts: 511

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.1	.02	Dan	10.5.19	0	N	N	3

Sort Comments: Inital = 1.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/11/19	2	8	2	8	-	-	.5	551	92%	N

QC Counts: 10

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K.Guild	11/18/19	8	8	136	30	1	-	1.25	687	76%	

QC 2 Counts: 166

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Camper Ziegler	11-22-19	6.5	8	163	381	-	-	1.75

Subsample Counts: 544

10/4/2019 2:01:35PM

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Re-Sort Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 8**

ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Re-Sort 2 Information

Re-Sort 2 Technician	Re-Sort 2 Date	G	M	W	PNC	Re-Sort 2 Time	Total Count	Target Count

Re-Sort 2 Counts (G, M, W, PNC)

Re-Sort 2 Comments:

QC 3 Information ☒

QC 3 Technician	QC 3 Date	Grids QC'd	Grids Total	QC 3 Counts G	M	W	PNC	QC 3 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Connor Fiedler	11-19-19	8	8	4	7	-	-	.5	698	98%	N

11

QC 3 Comments:

Re-Sort 3 Information

Re-Sort 3 Technician	Re-Sort 3 Date	G	M	W	PNC	Re-Sort 3 Time	Total Count	Target Count

Re-Sort 3 Counts (G, M, W, PNC)

Re-Sort 3 Comments:

QC 4 Information

QC 4 Technician	QC 4 Date	Grids QC'd	Grids Total	QC 4 Counts G	M	W	PNC	QC 4 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 4 Comments:

Re-Sort 4 Information

Re-Sort 4 Technician	Re-Sort 4 Date	G	M	W	PNC	Re-Sort 4 Time	Total Count	Target Count

Re-Sort 4 Counts (G, M, W, PNC)

Re-Sort 4 Comments:

QC 5 Information

QC 5 Technician	QC 5 Date	Grids QC'd	Grids Total	QC 5 Counts G	M	W	PNC	QC 5 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 5 Comments:

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

8097 - 2 - 9

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
~~Daniel Franklin~~ Laine Smith	10-6-19	4	4	433	11	1	Ø	3.0	1.5	/

Counts: 445

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
17	.05	Dan F	10.5.19	Ø	N	N	2

Sort Comments: muddy sample most of it washout Initial 5.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	11.04.19	1	4	68	Ø	1	-	1.00	721	61.77	N

QC Counts: 69

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count
L Smith	11.8.19	114	2	2	Ø	3.25	635	240

Re-Sort Counts: 123

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/20/19	4	4	117	1	2	5	4.5	757	84.12	N

QC 2 Counts: 120

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-22-19	6	8	510	9	3	-	1.25

Subsample Counts: 521

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LIFE IN WATER

Re-Sort Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

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ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Re-Sort 2 Information

Re-Sort 2 Technician	Re-Sort 2 Date	G	M	W	PNC	Re-Sort 2 Time	Total Count	Target Count

Re-Sort 2 Comments:

☒ QC 3 Information

QC 3 Technician	QC 3 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 3 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-21-19	1	4	—	—	—	—	.25	757	100%	N

QC 3 Comments:

Re-Sort 3 Information

Re-Sort 3 Technician	Re-Sort 3 Date	G	M	W	PNC	Re-Sort 3 Time	Total Count	Target Count

Re-Sort 3 Comments:

QC 4 Information

QC 4 Technician	QC 4 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 4 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 4 Comments:

Re-Sort 4 Information

Re-Sort 4 Technician	Re-Sort 4 Date	G	M	W	PNC	Re-Sort 4 Time	Total Count	Target Count

Re-Sort 4 Comments:

QC 5 Information

QC 5 Technician	QC 5 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 5 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 5 Comments:

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

KD

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DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10.8.19	1	1	34	13	7	Ø	.75	.75	/

Counts: 54
Non-Scope: 1.4

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.5	.005	Dan F	10.8.19	Ø	N	N	2

Sort Comments: Inital = 1.1

☒

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Waller	11.04.19	8	8	11	1	2	2	0.50	68	79.4%	N

QC 1 Comments:

☐

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/4/19	8	8	Ø	Ø	Ø	1	.25	68	100%	N

QC 2 Counts: Ø

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

ECO ANALYSTS, INC. LIFE IN WATER

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.2) 250um Fraction Sort,Taxo

8097 - 2 - 11

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Laine Smith	10.8.19	1	1	182	32	Ø	Ø	2.25	1.75	/

Counts: 214 Time (hrs): 1.00

Primary Matrix: Inorganic
Secondary Matrix: Fine Organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.3	.01	Dan F	10.7.19	Ø	N	N	2

Sort Comments: Inital = 147

QC 1 Information

QC Technician	QC Date	QC'd	Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/19/19	8	8	143	15	17	-	2		55%	

QC Counts: 175

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-21-19	8	8	—	—	—	—	.25	389	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

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8097 - 2 - 12

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	M	W	PNC	Time (hrs) Scope	Non-Scope	L/R
~~Daniel Franklin~~ Laine Smith	10.10.19	3	6	528	10	Ø	Ø	6	2	/

Counts: 538
Time (hrs): ~~8.00~~ 8.5

Primary Matrix: Fine Organic
Secondary Matrix: Inorganics

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.9	.15	Dan F	10.8.19	Ø	N	N	3

Sort Comments: Initial = 10.6

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/19/19	4	4	285	18	-	-	6.75	841	64%	

QC Counts: 303

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

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QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-21-19	1	4	1	-	-	-	.5	845	99%	N

QC 2 Comments:

Subsample Information

☒

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-22-19	6	8	521	13	-	-	1.5

Subsample Counts: 534

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 13**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10.12.19	6	6	488	21	3	0	5.0	2.0	/

Counts: 512 Time (hrs): 1.00

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.9	.25	Laura - Ray	10.10.19	0	N	N	3

Sort Comments: Initial = 8.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/20/19	4	4	170	7	–	–	3.25	689	74%	

QC Counts: 177

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-21-19	1	4	1	–	–	–	.5	693	99%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-22-19	7	8	495	24	2	–	1.25

Subsample Counts: 521

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097 - 2 - 14

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Counts: 64 — Time (hrs): 1.75+.5

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	10.15.19	1	1	6	58	Ø	Ø	2.25	2.25	/

Primary Matrix: Fine Organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.5	.05	Laura-Ray	10.13.19	Ø	/	N	2

Sort Comments: Elutriate in 5 gal Initial = 10.0

QC 1 Information

QC Counts: 19

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/20/19	1	1	14	5	–	–	1.25	83	77%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-21-19	8	8	—	—	—	—	.5	83	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 15**

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DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	10.16.19	1	1	Ø	3	Ø	Ø	.5	1.0	/

.5 — .5 .5

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.7?	.005	Dan F	10.16.19	Ø	N	/	2

Sort Comments: Inital = 9.8

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/20/19	8	8	–	–	–	–	0.25		100%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 16

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10.16.19	1	1	1	6	Ø	Ø	.25	.1.0	/

Time (hrs) .75 + .25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	1005	Dan F	10.16.19	Ø	N	/	2

Sort Comments: Initial = 10.6

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/20/19	1	1	0	0	0	0	0.25		100%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
	/										

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 17

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Counts 67 — Time (hrs) 1.0+.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Lane Smith	10.16.19	1	1	53	14	0	0	.75	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.0	.005	Dan F	10.16.19	0	N	/	2

Sort Comments: Initial = 11.5

QC 1 Information

QC Counts 63

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/20/19	1	1	54	6	3		.75		51%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-21-19	8	8	—	—	—	—	.25	130	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 18**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	M	W	PNC	Time (hrs) Scope	Non-Scope	L/R
~~Daniel Franklin~~ Lane Smith	10.17.19	1	1	45	80	0	0	1.0	1.0	/

Counts: 75 Time (hrs): 1.50

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.6	.005	Dan F	10.17.19	0	N	/	2

Sort Comments: Initial = 11.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/20/19	1	1	40	3	2	4	1.0	120	62.50	N

QC Counts: 45

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-21-19	8	8	—	—	—	—	.25	120	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 19**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10.18.19	5	8	431	97	7	Ø	3.0	2.0	/

Counts: 535 — Time (hrs): 1.0 + 1.0

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.4	.02	Dan F	10.17.19	Ø	N	/	3

Sort Comments: 12.0 initial

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/21/19	8	8	96	8	12	7	3.0	651	82.18	N

QC Counts: 116

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-22-19	8	8	2	-	-	-	.25	653	99%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-25-19	7	8	432	88	5	-	1.75

Subsample Counts: 524

Sort & QC Bench Sheet

EcoAnalysts, Inc. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, KD **8097 - 2 - 20**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	10/18/2019	8	8	100	98	01	1	3.00	1.00	

Counts total: 199

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.02	Blake	10/18/2019	Ø	—	N	—

Sort Comments: .14 Elutriat and 8.5 initial

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/21/19	8	8	97	5	1	4	3.0	302	65.89	N

QC Counts total: 103

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-22-19	8	8	1	2	-	-	.5	305	99%	N

QC 2 Counts total: 3

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 21

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Counts: 66 — Time (hrs): 1.0 +.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	10-20-19	1	1	42	23	1	Ø	.75	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.5	.01	Laura Ray	10-20-19	Ø	N	/	2

Sort Comments: Inital = 8.5

QC 1 Information

QC Counts: 80

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/20/19	1	1	68	12	-	-	1.0	146	45%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-21-19	8	8	-	1	-	-	.23	147	99%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097 - 2 - 22

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 361 — Time (hrs): 1.75+.15 / 1.0+.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	10.22.19	1	1	276	77	8	0	3.25	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.01	Laura Ray	10-22-19	.25	N	/	2

Sort Comments: 11.6 Initial vol

QC 1 Information

QC Counts: 297

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/21/19	1	1	263	16	18	1	3	658	55%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-22-19	8	8	—	—	—	—	.25	658	100%	N

QC 2 Comments:

Subsample Information

Subsample Counts: 522

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-25-19	7	8	426	86	10	1	1.75

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 23**

DATA ENTERED ☐

Sample Information
Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10.24.19	3.	6	165	332	27	0	7.0	1.0	/

Counts: 524; Time: 3.5+3.5, .75+.25

Primary Matrix: Fine Organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.15	.15	—	—	—	—	/	2

Sort Comments: 9.0 initial

☐ **QC 1 Information**

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Gulld	11/22/19	4	4	130	19	8	2	4.0	681	77%	

QC Counts: 157

QC 1 Comments:

☐ **Re-Sort 1 Information**

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☒ **QC 2 Information**

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-27-19	1	4	—	—	—	—	.25	681	100%	N

QC 2 Comments:

☒ **Subsample Information**

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-27-19	7	8	245	265	26	—	1.5

Subsample Counts: 535

Eco ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 24**

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	M	W	PNC	Time (hrs) Scope	Non-Scope	L/R
Daniel Franklin	10/24/2019	1	8	200	325	18	0	5.25	1.50	N

Counts: 542

Primary Matrix: Coarse
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.1	.02	Kyle	10/13/2019	∅	–	N	2

Sort Comments: Initial = 12.2 E= 1.08

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/21/19	1	1	79	7	3	–	1.25	632	86%	

QC Counts: 89

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	11-25-19	7.25	8	191	315	10	1	1.5

Subsample Counts: 516

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort 8097 - 2 - 25

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10.26.19	1	1	88	13	1	0	2.5	2.0	/

Counts: 102 — Time (hrs): 1.5 + .5

Primary Matrix: Fine Organic
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.7	.05	Lauren H	10.25.19	.25	N	/	2

Sort Comments: Initial = 120 Elutriate in 5gal

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/25/19	4	4	75	3	5	5	4.5	185	55.14	N

QC Counts: 83

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-27-19	8	8	—	—	—	—	.5	185	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097-2-26 7092

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10.30.19	5.5	6	124	337	51	10	14.0	.75	/

Counts: 512
Time (hrs): .5+.25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.2	—	—	—	—	—	2

Sort Comments: Inital = 8.2, no elutriate

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	11/25/19	.75	12	31	9	14	4	3	864		

QC Counts: 54

QC 1 Comments: reset & sort in 5 grids 11= Bags/grid

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count
Chris Pike	11/27/19	241	190	107	12	12.25	538	/

Re-Sort Counts: 538

Re-Sort 1 Comments: Start over from scratch 3 of 12 grids - entered in Aegis as Sorter - Put L.S. as extra tech time

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Kate Guild	12.12.19	1.25	6	1	2	0	–	0.75	552	97.4%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 27**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500 | Count Range: Target Count Minimum | Large/Rare: No
Reject Organisms: None | Mesh Size: 250 Micron
QC Type: 20% of each samples | Efficacy Minimum: 90% | Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Kate Guild	12/11/19	3.5	6	372	100	58	2	9.0	0.5	/

Counts: 530

Primary Matrix: Fine Organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.25	.15						2

Sort Comments: washout dirt = 0.1L; failed primary QC, so restarted sample b/c faster than sorting all material again

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-16-19	1.25	6	-	3	-	-	.5	544	97%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 27**

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Time (hrs) .75+.5

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Lane Smith	11.2.19	11	12	150	277	76	5	12.0	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.25	.25	—	—	—	—	—	2

Sort Comments: 7.6 initial vol.

QC 1 Information

QC Technician	QC Date	QC'd	Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/ /19		6								

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

MM [initials]

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 28**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	M	W	PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	11/01/2019	8	8	201	158	14	0	4.58	1.25	N

Counts: 376 — Time (hrs): 1.0

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.5	.01	Erin	10/30/2019	Ø	–	10	1

Sort Comments: 12.7 .49 = E

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-2-19	8	8	168	30	5	–	4	579	64%	N

QC Counts: 203

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Ewald	12/3/19	8	8	27	–	–	–	0.75	–	95%	

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 29**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 527 Time (hrs): 1.75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	11/06/2019	.25	4	521	05	01	0	4.25	2.00	N

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.0	.05	Blaine	11/2/2019	.50	N	N	2

Sort Comments: 13.8 Int vol. E=5.95 7.2 washout

QC 1 Information

QC Counts: 107

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/4/19	8	8	103	4	-	-	1.0	634	83%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Counts: 530

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	12-10-19	7	8	525	4	1	—	1.5

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 30**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Kate Guild	12/3/19	7	12	482	22	9	–	21	0.75	

Counts: 513

Primary Matrix: Fine org.
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.5						

Sort Comments: Dan originally washed sample - see attached benchsheet

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	2.5	12	10	–	–	–	1.75	561	91%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 30**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2Bm

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 251 Time (hrs): 1.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	11/13/2019	24	24	229	17	5	Ø	28.25	2.00	N

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.50	Blaine	11/08/2019	.25	N	N	1

Sort Comments: 12.2 int vol. 9.6 washout E = .50

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K.Guild	11/ /19										

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,' **8097 - 2 - 31**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Counts 107 — Time (hrs) 1.0+.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	11.13.19	1	1	75	30	2	Ø	1.25	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.5	.005	Blaine M	11.12.19	Ø	N	/	2

Sort Comments: Inital = 7.4

QC 1 Information

QC Counts 80

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K Guild	12/5/19	8	8	75	5	0	0	1.0	187	57%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

X

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	8	8	6	-	-	-	.5	193	96%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, ✓

8097 - 2 - 32

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	11.14.19	1	1	250	271	7	5	4.0	1.0	/

Counts: 528
Time (hrs): .75+.25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.6	.005	Dan F	11.13.19	Ø	N	/	2

Sort Comments: Initial = 9.5

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/3/19	8	8	113	43	16		2.5	700	75%	

QC Counts: 172

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☒

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	8	8	8	2	-	-	.25	710	98%	N

QC 2 Counts: 10

QC 2 Comments:

Subsample Information ☒

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Camper Ziegler	12-9-19	7	8	284	233	13	-	1.75

Subsample Counts: 530

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 33**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2 BM

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ L Smith	11-14-19	1	1	12	11	Ø	Ø	.75	1.0	/

Counts: 23; Time (hrs): .75+.25

Primary Matrix: Fine Organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.30	.01	Blame	11/13/2019	Ø	N	/	2

Sort Comments: 9, in tvol, .29 = E

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/4/19	8	8	32	8	1	–	0.75	64	36%	

QC Counts: 41

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Carper Ziegler	12-6-19	8	8	–	1	–	–	.25	65	98%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 34

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 38
Time (hrs): .75+.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	11.15.14	1	1	25	13	Ø	Ø	.75	1.0	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.2	.005	Blaine	11.14.19	Ø	N	/	2

Sort Comments: Inital = 8.25

QC 1 Information

QC Counts: 47

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/4/19	8	8	41	5	1	-	0.75	85	45%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Counts: 7

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	8	8	6	1	-	-	.25	92	92%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

GSW

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 35

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	11/15/2019	2	8	203	325	14	0	5.50	1.25	N

Counts: 542
Time (hrs): 1.00

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.7	.03	Blake	11/14/2019	0	N	N	2

Sort Comments: 10.0 int vol 2.0 washout %E = .67

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	11/25/19	8	8	133	21	22	1	2.5	718	75%	

QC Counts: 176

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-27-19	8	8	—	—	—	—	.5	718	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Camper Ziegler	11-27-19	7.5	8	217	315	7	—	1.5

Subsample Counts: 538

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 36**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts 501 | 29 | Time (hrs) 1.00+.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Laine Smith	11.21.19	18	24	486	14	1	4	31	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.50	Blaine	11/14/2019	Ø	N	N	3

Sort Comments: 14.0 mkl vol, 11.0 washout E= .50

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/1/19	12	12	200	—	—	—	11.0	701	71%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26Dec2019	1.25	6	3	Ø	Ø	Ø	.75	715	98%	N

QC 2 Comments: 3

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)
K.Guild	1/16/20	7	8	566	5	5	2	0.75

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 37**

DATA ENTERED ☐

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Kyle Lerch	1/17/20	1	1	76	4	3	X	42.5	9.0	X

83 17.75

Primary Matrix: Fin organic
Secondary Matrix: Inorgat

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.9	1.3	blaine Ahern	1/16/20	0	1.3	0.9	3

Sort Comments: e = 9.0 17.75 = Kristin left extra tech time

QC 1 Information ☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	01.17.20	8.5	42	1	0	0	–	1.00	87	94.3%	N

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 38**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	M	W	PNC	Time (hrs) Scope	Non-Scope	L/R
Daniel Franklin	11/22/2019	2.5	6	495	25	2	0	18.00	1.50	N

Counts: 522 Time (hrs): 1.25

Primary Matrix: Fine
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.2	Blaine	11/19/2019	0	N	//	2

Sort Comments: 12.6 int vol 7.6 washout E=.80

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K.Guild	12/7/19	4	4	405	14	5	1	10.0	946	55%	

QC Counts: 424

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-9-19	1	4	2	-	-	-	.5	954	99%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Camper Ziegler	12-10-19	5.5	8	513	23	-	-	2

Subsample Counts: 536

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	11/25/19	4	4	70	28	34	X	1.25	0.25	X

Counts: 132
Time (hrs): 1.0

Primary Matrix: Fin organic
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.2	.01	Dan F	11.21.19	Ø	N	/	1

Sort Comments: Initial = 8.8 elutriate in 1 Jar; 1.00 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	6 Dec 2019	8	8	14	1	Ø	Ø	.25	147	90%	N

QC 1 Comments: 15

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

CJ **8097 - 2 - 40**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	11/26/19	1.5	4	246	271	12	X	4.75	0.25	X

Counts: 529
Time (hrs): 1.0

Primary Matrix: Fin organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.5	.01	Dan	11.21.19	Ø	N	/	2

Sort Comments: Initial = 9.0 elutriate in 1 jar; 1.00 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	6 Dec 2019	1	4	8	Ø	1	Ø	.25	565	94%	N

QC 1 Comments: 9

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

ECO ANALYSTS, INC. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 41**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	11/27/19	2	4	401	109	14	X	4.00	0.25	X

Time (hrs): .75

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.20	.03	Blaine	11/21/2019	Ø	N	N	2

Sort Comments: 7.8 int vol E = .17; 0.75 extra tech time DF for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/4/19	8	8	30	5	–	–	1.0		93%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 42**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts 523 — Time (hrs) 6.00

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	12/2/19	1.5	12	486	23	14	X	6.00	1.5	X

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.2	.10	Blake	11/21/2019	.50	N	N	2

Sort Comments: 13.2 int vol 10.2 washout E=2.10; 1.00 extra tech time DF for sample setup

QC 1 Information

QC Counts 26

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-13-19	1	4	24	-	2	-	.5	627	83%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Counts 59

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count
Kyle Lerch	12/15/19	56	1	2	X	1.75	608	47

Re-Sort 1 Comments:

QC 2 Information

QC 2 Counts 5

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-16-19	1	4	4	—	1	—	.25	628	96%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 43**

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	11-29-19	8	8	254	207	Ø	Ø	40	.75	/

Time (hrs): 5+.25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.15	.01	Blaine	11.22.19	Ø	N	/	2

Sort Comments: Initial=1.0 E in 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/5/19	8	8	26	4	–	–	1.0		94%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 44**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts (240) G	M	W	PNC	Time (hrs) 1.75 Scope	Non-Scope	L/R
~~Laine Smith~~ Steven Little	12-3-19	8	8	209	22	9	1	8.00	—	/

Primary Matrix: Fine Organic
Secondary Matrix: —

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.6	.03	Dan	11.22.19	Ø	N	/	1

Sort Comments: Initial = 12.8 E in 1 jar 30bph; 1.75 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts (94) G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-16-19	6	6	76	11	7	-	4	334	71%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	1	4	0	0	1	0	.75	335	98%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 45

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Counts: 532 — Time (hrs): 5

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan Franklin	12/03/2019	8	8	340	191	01		5.00	.75	

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.15	.01	Lauren H	11.22.19	0.5	N	/	

Sort Comments: Inital = 25 E in 1 jar; 0.50 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	6 Dec 2019	4	4	47	15	Ø	Ø	1.0	594	90%	N

QC 1 Comments: 62

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

65W

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 46**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	12/2/19	1.5	6	428	75	31	X	6.00	0.50	X

Counts: 534
Time (hrs): 1.25

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.5	.02	Lauren H	11-23-19	0.25	N	/	2

Sort Comments: Initial = 13.5 E in 1 jar; 1.25 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	6 Dec 2019	8	8	4	∅	∅	∅	.25	538	99%	

(4)

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 47**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) 1.00 Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Leech	12/2/19	4	4	14	26	30	X	0.5	0.25	X

Primary Matrix: Inorgan
Secondary Matrix: Fin orgr

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.30	.02	Blaine	11/23/2019	∅	N	N	1

Sort Comments: 12.4 ml vol E= .28; 1.00 extra tech time DF for sample set up

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	8	8	0	0	0	0	.25	78	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 48**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Leach	12/3/19	4	4	12	29	5	X	0.5	0.25	✓

46 .75

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.3	.005	Dan	11.23.19	Ø	N	/	1

Sort Comments: Initial = 9.0 E = 1 jar; 0.75 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	6 Dec 2019	1	4	1	Ø	Ø	Ø	.25	50	92%	N

QC 1 Comments: 0

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 49**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	12/3/19	7	8	311	203	X	X	5.00	0.25	X

.5

Primary Matrix: Fin organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.01	Blaine	11.23.19	Ø	N	/	2

Sort Comments: Initial = 2.8 E = 1 jar; 0.50 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	12/4/19	8	8	24	3	–	–	1.0		95%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 50**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Leach	12/4/19	1.25	4	407	74	51	X	5.75	0.25	X

Counts: 532 Time (hrs): 1.0

Primary Matrix: Fine mark
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.2	.01	Blaine	11.23.19	Ø	N	/	2

Sort Comments: Initial = 10.4 E = 1 jar; 1.00 extra tech time LS for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	6 Dec 2019	1	4	1	Ø	3	Ø	.25	548	97%	N

QC 1 Comments: 4

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 51

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Lane Smith~~ Kyle Lerch	12/5/19	8	8	193	26	87	X	3.75	.025	X

Counts: 306 — Time (hrs): 1.0

Primary Matrix: Fine organic — Secondary Matrix: Inorgan

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.8	.01	Blaine	11.24.19	0	N	/	1

Sort Comments: Initial = 7.7 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	6Dec2019	8	8	4	0	0	0	.25	310	99%	N

QC 1 Comments: 4

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 52**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Cook	12/5/19	4	4	355	39	9	K	3.5	0.25	X

Counts: 303 — Time (hrs): .75

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.8	.01	Lauren H	11.26.19	Ø	N	/	1

Sort Comments: Initial 8.4 E - 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	6 Dec 2019	1	4	2	Ø	Ø	Ø	.25	311	97%	N

QC 1 Comments: 23

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 53**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Lane Smith~~ Kyle Lerch	12/6/19	2.25	4	452	53	26	X	4.5	0.25	X

Counts: 531 — Time (hrs): 1.0

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.6	.01	Camper	11.26.19	Ø	N	/	2

Sort Comments: Initial=8.2 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
H Payne	6 Dec 2019	1	4	Ø	Ø	Ø	Ø	.25	531	100%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

* There was an unsorted Jar?!?

Sort & QC Bench Sheet

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 54**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids ~~*~~ Sorted	Grids Total	Counts (550) G	M	W	PNC	Time (hrs) .75 Scope	Non-Scope	L/R
~~Laine Smith~~ Conn Evans	12/17/19	3	4	496	39	15		7	.5	

Primary Matrix:
Secondary Matrix:

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.2	.01	Lauren H	11-26-19	Ø	N	/	

Sort Comments: Initial = 7.3 E = 1 Jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	26 Dec 2019	8	8	13	1	Ø	Ø	.5	564	98%	N

QC 1 Comments: (14)

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 55**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Lattie Smith~~ Kyle Lerch	12/8/19	8	8	67	33	11	X	1.25	0.25	X

Time (hrs) .75

Primary Matrix: Fine organ
Secondary Matrix: Inorgan

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.01	Kyle	11-27-19	Ø	N	/	1

Sort Comments: Initial = 7.7 E = 1 jar

QC 1 Information

QC Technician	QC Date	QC'd	Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	8	8	0	0	1	0	.25	112	99%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 56**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lorel	12/12/19	6	8	153	41	1	X	2.25	2.25	X

Time (hrs): .5

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.1	.01	Dan	11-27-19	Ø	N	/	1

Sort Comments: Initial=3.0 E=1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	8	8	3	0	0	0	.5	198	98%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Jar P

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 57**

DATA ENTERED ☐

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) 1.00 Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Loch	12/12/19	1.05	4	161	316	5	X	4.25	0.25	X

Primary Matrix: Inorganic
Secondary Matrix: Fin organ

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.7	.03	Laine	11/27/2019	Ø	10	10	2

Sort Comments: 7.4 int vol E = 6.67

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	8	8	3	1	0	0	.25	521	99%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 58**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/12/19	8	8	225	131	2	X	2.75	0.25	X

Counts: 408
Time (hrs): .50

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.01	Lame	11/27/2019	Ø	N	10	1

Sort Comments: 4.4 int vol E = .19

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26 Dec 2019	8	8	3	0	0	0	.25	411	99%	N

QC 1 Comments: 3

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 59**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 533 — Time (hrs): 1.00

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	12/15/19	1.5	4	481	18	34	X	12.90	0.25	X

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.0	.05	Laine	11/27/2019	Ø	N	N	2

Sort Comments: 7.0 int vol. 2.0 washout E= 1.05

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	26 Dec 2019	1	4	5	Ø	Ø	Ø	.25	553	96%	N

QC 1 Comments: 5

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 60**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 524 — Time (hrs): 1.75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	12/20/19	1	4	313	207	4	X	4.5	0.25	X

Primary Matrix: Fine
Secondary Matrix: InorganiZ

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.30	.05	Laine	11/27/2019	Ø	N	N	2

Sort Comments: 3.5 int vol 2.0 washout E=.25

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26Dec2019	1	4	3	Ø	Ø	Ø	.25	536	98%	N

QC 1 Comments: 3

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 61**

AM

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 2

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500

Reject Organisms: None

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: No

Mesh Size: 250 Micron

Worms (Mount/ID): Y/Class

Sorting Information

Counts: 249 Time (hrs): 1.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith Dan F	11/20/2019	8	8	73	110	66	0	3.25	.25	N

Primary Matrix: Inorganic

Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.5	.01	Chris	11-28-19	0	N	/	1

Sort Comments: Initial=10.5 E= 1 jar 1.25 extra tech time for Li's for setup of sample

QC 1 Information

[X]

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	12.20.19	8	8	5	5	8	-	0.75	267	93.22	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

* [illegible]

Sort & QC Bench Sheet

EcoAnalysts, Inc. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 62**

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 2

Sorting Protocols

Target Count: 500

Reject Organisms: None

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: No

Mesh Size: 250 Micron

Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Grids: 8 — Counts: 99 — Time (hrs): 1.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Conn Evans	12/20/19	8	8	67	13	19		2	.5	\

Primary Matrix: Inorganic

Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.5	.01	Dan	11-29-19	Ø	N	/	

Sort Comments: Initial = 10.9 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26 Dec 2019	8	8	1	Ø	Ø	Ø	.5	100	99%	N

QC 1 Comments: 1 Had to write note about issues

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

EcoAnalysts, Inc. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 63**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Conn Evans	12/20/19	8	8	59	15	0		2	0.5	\

Counts: 74 Time (hrs): .5

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.1	.01	Dan	11-29-19	Ø	N	/	

Sort Comments: Initial=3.6 E= 1 jar

QC 1 Information ☑

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	26 Dec 2019	8	8	7	3	Ø	Ø	.5	84	88%	N

QC 1 Comments: (10)

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 64

DATA ENTERED ☑

Sample Information

Shelf Location:

Residue Loc.:

Jars: 1

Sorting Protocols

Target Count: 500

Reject Organisms: None

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: No

Mesh Size: 250 Micron

Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 114 — Time (hrs): 1.75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Conn Evans	12/23/19	8	8	75	38	1		1.75	.5	

Primary Matrix: Inorganic

Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.10	.01	Lauren H	11/30/2019	Ø	N	N	

Sort Comments: 3.9 int vol E = .09

QC 1 Information ☑

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26 Dec 2019	1	4	Ø	Ø	Ø	Ø	.25	114	100%	N

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 65

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Conn Evans	12/27/19	8	8	40	135	22		7	0.5	\

Time (hrs) 1.50

Primary Matrix: Inorganic
Secondary Matrix: Fine

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.00	.04	Lauren H	11/30/2019	Ø	N	N	

Sort Comments: 1 Hint vol E = 2.96

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/2/20	8	8	26	7	2		1.0		85%	

QC 1 Comments: nematodes + mites

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097 - 2 - 66

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	12/26/2019	8	8	12	9	0	0	.50	∅	N

Counts: 21 Time (hrs): 1.5

Primary Matrix: Inorganic
Secondary Matrix:

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
9.2	.01	laike	11-30-19	0	N	/	1

Sort Comments: Initial=124 E=1 jar 1.5 extra tech time For L.S For setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	27 Dec 2019	8	8	∅	∅	∅	∅	.25	21	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097 - 2 - 67

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	12/26/2019	1.25	4	316	164	49		6.00	1.00	N

Counts: 529

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.90	.15	Blaine	12/03/2019	Ø	N	N	2

Sort Comments: 6.2 int vol. 1.3 washout E = .75

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	27 Dec 2019	8	8	31	5	1	Ø	.5	566	93%	

QC 1 Comments: 37

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 68**

DATA ENTERED ✓

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Conn Evans	12/30/19	1.25	4	435	56	36		8	0.5	

1.00

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.1	.10	Blame	12/03/2019	Ø	N	N	

Sort Comments: 7.2 int vol. 2.8 washout E=2.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/2/20	4	4	82	9	3	–	1.25		85%	

QC 1 Comments: nematodes, harpacticoids in sand cases and prostoma

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)
K. Guild	1/2/20	7	8	442	54	22	–	10

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 69**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) 1.25 Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	12/27/19	4	4	4	336	X	X	1.00	0.25	X

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
9.0	.01	Blaine	12/03/2019	.75	N	N	1

Sort Comments: 9.2 int vol. E= 8.99

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/2/20	8	8	1	3	1		0.25		99%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097-2-70

DATA ENTERED ☐

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information ☐

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	12/27/19	4	4	2	17	X	X	1.00	0.25	X

Time (hrs): 1.25

Primary Matrix: Inorganic
Secondary Matrix: Fine

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.2	.01	Blaine	12/04/2019	Ø	N	N	1

Sort Comments: 9 int vol. E= 1.19

QC 1 Information ☐

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/2/20	8	8	-	-	-	-	0		100%	

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 71**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	12/25/19	0.875	4	367	52	85	X	9.25	0.5	X

Time (hrs) .50

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.50	.08	Blaine	12/04/2019	Ø	Ø	Ø	2

Sort Comments: 4.5 int vol, .30 washout E= .42

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/3/20	8	8	7	-	10	-	0.5		97%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 72

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	12/28/2019	8	8	4	11	0	0	.75	1.00	N

Counts: 15

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.6	.01	Blaine	12/04/2019	Ø	N	N	1

Sort Comments: 6.9 int vol. E = 1.59

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K Guild	1/2/20	8	8	5	4	—	—	0.25	24	62%	

QC Counts: 9

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/13/20	8	8	Ø	1	Ø	Ø	.25	25	96%	N

QC 2 Counts: 1

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 73**

GBW

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	12/28/2019	8	8	72	108	19	0	4.50	1.75	

Counts: 199

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.7	.03	Blaine	12/05/2019	.75	N	N	1

Sort Comments: 6.0 int vol. E = 3.67

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
R. Guild	1/2/20	8	8	7	1	—	—	0.5		96%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

EcoAnalysts, Inc. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 74**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ K. Lerch	12/30/19	4	4	80	69	7	X	3.25	0.5	X

Time (hrs): 1.00

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.2	.10	Blaine	12/05/2019	.75	N	N	1

Sort Comments: 7.6 int vol. E = 5.10 1.00 extra tech time For D.F for setup sample.

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/6/20	4	4	10	15	3		1.0		87%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 75**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	12/30/19	4	4	5	29	1	X	1.00	0.25	X

Counts: 35 Time (hrs): 1.25

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.7	.01	Steven L	12.10.19	Ø	N	/	

Sort Comments: Initial = 4.4 E = 1 jar ; 1.00 extra tech time L.S. for sample setup

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Gwild	1/3/20	8	8	—	11	—	—	0.5	46	76%	

QC Counts: 11

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/13/20	8	8	2	Ø	Ø	Ø	.25	48	95.83%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 76**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	12/30/K	4	4	120	116	11	X	2.00	0.25	X

Time (hrs): .75

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.3	.01	Dan	12-10-19	Ø	N	/	1

Sort Comments: Initial = 5.0 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/3/20	2	8	2	3	1		0.5		91%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 77

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) .50 Scope	Time Non-Scope	L/R
~~Daniel Franklin~~ K. Lerch	1/3/20	4	4	165	174	116	X	8.25	0.25	X

Primary Matrix: Inorganic
Secondary Matrix: Fine

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.0	.10	Blaire	12/10/2019	.25	N	N	1

Sort Comments: 3.6 int vol. 1.1 washout E= 1.90 .50 extra tech time for D.F for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/6/20	1	4	6	1	5	0	0.75		91%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 78

DATA ENTERED ✓

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Conn Evans	12/30/19	8	8	21	9 (30)	0		2	0.25	

Primary Matrix: Inorganic
Secondary Matrix: Fine Org

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.80	.02	Blaike	12/10/2019	.75	✓	✓	

Sort Comments: 7.0 int vol. E=4.78

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/2/20	8	8	9	3	—	—	0.5	42	71%	

QC 1 Comments: hydra + nematodes

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

X

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	01·14·20	8	8	2	Ø	2	5	0.50	46	91.3%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,   **8097 - 2 - 79**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Conn Evans	1/7/20	4	4	170	173	81		19	0.5	

Counts total: 423

Primary Matrix: Inorganic
Secondary Matrix: Fine

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.0	.05	Blaine	12/10/2019	.25	N	N	

Sort Comments: 6.0 intool. 1.60 washout E= 1.95

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/11/20	4	4	126	62	88	1	9.0	699	60%	N

QC Counts total: 276

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☒

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/14/20	1	4	4	5	6	Ø	2.0	759	92.09	

QC 2 Counts total: 15

60

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
K. Guild	1/16/20	8	8	255	219	117	10	1.25

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 80**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F	01/02/2020	8	8	79	13	0	0	11.50	Ø	N

Counts: 92 · Time (hrs): .5

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.5	.01	Dan	12-11-19	Ø	N	/	1

Sort Comments: Initial = 27 E = 1 jar .5 Extra tech time for 1.5 For setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/6/20	8	8	31	1	—	—	0.5	124	74%	

QC Counts: 32

QC 1 Comments: mites

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/14/20	8	8	7	Ø	Ø	Ø	.5	131	94.66	N

QC 2 Counts: 7

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 81**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	1/03/2020	4	4	105	178	31	0	7.75	.25	N

Counts: 314; Time (hrs): .75

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.4	.08	Erin	12-11-19	Ø	N	/	1

Sort Comments: Initial = 4.5 6-1 Jar 1.7 washout .75 extra tech time For L.S For setup of Sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K Guild	1/7/20	4	4	76	44	34	0	5.75	468	67%	

QC Counts: 154

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

X

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	01.15.20	1	4	6	4	2	2	1.00	516	90.7%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 82**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	M	W	PNC	Time (hrs) Scope	Non-Scope	L/R
Daniel Franklin	01/07/2020	2	4	182	282	75	0	10.25	1.25	N

Counts: 539

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.5	.05	Blaine	12/11/2019	.75	N	N	2

Sort Comments: 8.7 int vol. .20 washout E = 5.45

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K.Guild	1/15/20	4	4	223	31	20	6	9.25	809	66 %	

QC Counts: 270

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☒

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-16-2020	1	4	3	-	-	-	.5	821	98%	N

QC 2 Comments:

Subsample Information

☒

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)
Madelyn Walker	01.16.20	6	8	258	244	52	4	1.25

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 83**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Counts: 276 — Time (hrs): 75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lerch	1/6/20	4	4	215	57	4	X	2.75	0.25	X

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.20	.01	Blaine	12/11/2019	Ø	N	N	1

Sort Comments: 3.0 in + vol. E=.19

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Connor Tedder	1-16-2020	8	8	6	-	-	-	.5	282	97%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 84**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lorch	1/6/14	4	4	5	12	0	X	0.25	0.25	X

Time (hrs): 1.0

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.2	.005	Laine Smith	12-12-19	0	N	/	1

Sort Comments: Initial=10.2 E=1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/16/20	8	8	—	—	—	—	0.25		100%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 85**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lord	1/6/20	4	4	23	44	3	∝	3.25	0.25	X

25
1.0

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.5	.01	Dan	12-12-19	Ø	N	/	1

Sort Comments: Initial = 10.0 1.2 washout E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/10/20	8	8	18	9	2		1.75	104	76%	

29

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

2

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/14/20	2	8	Ø	1	1	Ø	.5	112	92.86%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 86**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/6/2020	4	4	9	33	8	3	2.5		

Counts: 50 Time (hrs): 1.0

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.0	.03	Kyle L	12-15-19	Ø	N	/	1

Sort Comments: Inital = 6.7 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	1-16-2020	1	4	-	1	-	-	.5	54	92%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 87

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	1/6/20	4	4	67	23	3	X	2.00	0.25	X

Time (hrs): 1.25

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.2	.01	Steven L	12-17-19	Ø	N	/	1

Sort Comments: Initial = 10.6 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	7	1	0		0.5		92%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 88**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lord	1/4/20	1.25	4	233	217	85	X	1.00	0.5	X

Time (hrs): 1.0

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.2	.05	Dylan	12-17-19	Ø	N	/	

Sort Comments: Initial = 6.7 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/15/20	8	8	23	5	8		1.0		93%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 89

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

[X]

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/7/2020	2	4	245	200	89	6	4.5	0	

Counts: 534
Time (hrs): 1.0

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.4	.05	Dan	12-18-19	0	N	/	2

Sort Comments: 8.9 initial E= 1 jar

QC 1 Information

[ ]

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/15/20	8	8	133	51	18	6	6.5	736	72.55	N

QC Counts: 202

QC 1 Comments:

Re-Sort 1 Information

[ ]

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

[X]

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	1-16-2020	1	4	3	-	-	-	.5	748	98%	N

QC 2 Comments:

Subsample Information

[X]

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Madelyn Walker	01.16.20	7	8	248	231	74	5	1.50

Subsample Counts: 553

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 90**

DATA ENTERED ✓

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Conn Evans	1/9/20	2.25	6	491	37	21		15	0.5	

Time (hrs): 1.25

Primary Matrix: Fine Org
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.3	.2	Lauren B	12/19/19	Ø	N	/	

Sort Comments: Initial = 9.7 5.4 washout E=3.1 / 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	1	4	10	0	1	3	0.75		93%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 91**

DATA ENTERED X

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts (532) G	M	W	PNC	Time (hrs) (1.0) Scope	Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/8/2020	1.25	6	407	79	45	5	3.75	0	

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.9	.1	Dan	12/19/19	Ø	N	/	2

Sort Comments: Initial = 5.9 1.4 washout 3.8 elutriate / 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/16/20	1	4	8	—	—	—	0.25		94%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 92**

DATA ENTERED X

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/8/2020	1.75	4	432	71	15	4	2.75	0	

Counts: 518
Time (hrs): 1.0

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.2	.02	Dan	12/20/19	Ø	N	/	2

Sort Comments: Initial = 6.9 .5 washout Elutritae = 6.18 / 1 jar

QC 1 Information

X

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	1	4	6	2	-	-	.5	550	94%	N

QC Counts: 8

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 93**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F.	01/04/2020	2.75	4	486	35	2	0	10.50	Ø	N

Counts: 523
Time (hrs): .75

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.0	.01	Laine	12/20/19	Ø	N	/	2

Sort Comments: Initial = 5.7 Washout = 2.55 E = 2.99 / 1 jar .75 extra tech time for L.S for setup of same

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-15-2020	4	4	51	4	1	-	1.5	579	90%	N

QC Counts: 56

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 94**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information [X]

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Kristin Hall	1/9/2020	6	6	207	50	2	1	4.5	0	

Counts: 259 — Time (hrs): 1.25

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.1	.06	Laine	12/21/2019	Ø	N	N	1

Sort Comments: 9.2 int vol 2.3 washout E=6.04

QC 1 Information [X]

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-16-2020	6	6	112	17	–	–	4.5	388	66%	N

QC Counts: 129

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/16/20	1.25	6	5	—	—	—	0.5		94%	

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 95

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Time (hrs) 2.00

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lrch	1/9/20	4	4	3	29	x	x	0.75	0.25	X

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

7.5

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
14.9	.03	Laine	12/21/2019	∅	N	N	1

Sort Comments: 16.4 int vol. F = 14.87

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	1	3	0	0	0.5		89%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 96

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lool	1/6/20	4	4	21	23	X	X	2.25	0.25	X

Counts: 46 — Time (hrs): 1.5

Primary Matrix: Inorganic — Secondary Matrix: Fine organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.0	.01	Dan	12/24/19	0	N	/	1

Sort Comments: Initial = 14.6 E = 8.49 / 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/16/20	4	4	39	13	15	4	6.25	113	40.71%	

QC Counts: 67

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-17-2020	1	4	–	1	–	–	.5	117	96%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 97**

DATA ENTERED

X

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/9/2020	8	8	293	43	0	3	2	0	

Counts: 337 — Time (hrs): .75

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.1	.02	Mackie	12-27-19	Ø	N	/	1

Sort Comments: Initial = 5.4 E = .08 L

X

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-16-2020	8	8	37	-	-	-	.75	374	90%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 98**

DATA ENTERED [X]

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/9/2020	8	8	49	180	8	1	1.5	0	

Counts: 237 — Time (hrs): 1.25

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.3	.01	Conn	12/31/19	Ø	N	/	1

Sort Comments: Initial = 14.0 E= 3.29

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	7	10	0		0.5		93%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 99**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information ☑

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Conn Evans	1/11/20	0.75	12	461	47	21		10	0.5	

Counts total: 529; Time total: 1.75

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.0	.20	Blaire	1/1/2020	.25	N	N	

Sort Comments: 13.2 int vol. 10.4 washout E = 1.80

QC 1 Information ☑

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	01.16.20	4	4	242	2	9	-	3.50	782	67.67	N

QC Counts total: 253

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/16/20	1	4	3	Ø	Ø	Ø	.75	794	98.49	N

QC 2 Counts total: 3

QC 2 Comments:

Subsample Information ☒

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Madalyn Walker	01.17.20	7	8	471	44	25	7	1.75

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 100**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	1/10/20	0.15	4	311	202	x	X	5.25	0.25	X

Time (hrs): 1.0

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.2	.02	Blaine	1-2-20	Ø	N	/	2

Sort Comments: Initial = 5.3 washout = 1.1 E = 1.18

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	19	9	0		0.75		95%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 101**

DATA ENTERED [X]

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/10/2020	2.25	4	350	131	55	1	3.5	0	

Counts: 536 Time (hrs): 1.0

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.2	.05	Dan	1-2-20	Ø	N	/	2

Sort Comments: Initial - 9.0 1.6 washout 7.15 elutriate

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K.Guild	1/15/20	4	4	59	23	6	0	1.25		86%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
K. Guild	1/15/20	8	8	362	144	43	5	1.0

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 102**

DATA ENTERED X

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kristin Hall	1/13/2020	2.5	24	470	39	2	1	7.25	0	

Counts: 511 Time (hrs): 1.5

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.6	.4	Dan	1-3-20	Ø	N	/	2

Sort Comments: Initial = 15.2 Washout = 11.1 E = 2.2

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/15/20	1	4	10	0	1	1	0.75		92%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 103**

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lend	1/10/20	4	4	3	1(4	X	X	1.75	0.25	X

Time (hrs): 1.75

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.0	.01	Blaine	01/03/2020	Ø	N	N	1

Sort Comments: 15.0 init vol. E= 4.99

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/16/20	8	8	1	—	—	—	0.25		99%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 104**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) .5 Scope	Non-Scope	L/R
~~Laine Smith~~ Kyl. Lord	1/12/20	1	6	425	104	X	X	5.75	0.25	X

Primary Matrix: Fin orgnt
Secondary Matrix: Inorganic

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.25	.05	Dan	1-4-20	Ø	N	/	2

Sort Comments: Initial = 4.9 washout = 1.95 E = .2

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	12	1	0		0.25		98%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 105**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	1/11/2020	8	8	10	4	1	0	1.50	Ø	10

15 .75

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.7	.05	Kyle	1-5-20	Ø	N	/	1

Sort Comments: Initial=3.8 E=.695 .75 extra tech time for LS for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	1	—	—	—	0.25		94%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097 - 2 - 106

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	1/11/2020	8	8	15	0	0	0	.25	Ø	N

.15 .25

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.01	.005	Laine	1-8-20	Ø	N	/	1

Sort Comments: Inital = .8 E = .005 .25 extra tech time for L.S for setup of sample.

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	1	—	—	—	0.25		93%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 107**

DATA ENTERED ☐

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

26 .25

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	1/11/2020	8	8	20	6	0	0	.50	0	N

Primary Matrix: Inorgain.
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.01	.005	Laine.	1-8-20	Ø	N	/	1

Sort Comments: Inital= 1.3 E= 1.285 .25 extra tech time For L.S for setup of sample.

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/14/20	8	8	7	1	0		0.25	34	76%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/14/20	8	8	Ø	Ø	Ø	Ø	.25	34	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,

8097 - 2 - 108

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

43 .25

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	1/11/2020	8	8	17	26	0	0	1.25	.25	N

Primary Matrix: Inorganic

Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.05	.01	Laine	1-8-20	0	N	/	1

Sort Comments: Initial = 1.1 E = .04 .25 extra tech time for L.S. for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	01.15.20	8	8	1	3	0	1	0.50	47	91.57	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 109**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	1/14/2020	2	8	141	356	43	0	5.50	Ø	N

Counts: 540
Time (hrs): .75

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.3	.01	Blaine	1-9-20	Ø	N	/	2

Sort Comments: Initial = 6.4 E = .29. .75 extra tech time For L.S For setup of Sample

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	01.15.20	8	8	30	16	14	11	2.00	600	90.0%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, 8097 - 2 - 110

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Conn Evans	1/11/20	8	8	12	8	1		1.0.	0.25	

21 .25

Primary Matrix: Inorganic
Secondary Matrix: Fine org.

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.21	.21	—	—	—	—	—	

Sort Comments: Initial = .21

QC 1 Information ☐

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	1/14/20	8	8	6	1	Ø	Ø	.75	28	75%	N

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☒

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	8	8	—	—	—	—	.25	28	100%	N

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 111**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols
Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Conn Evans	1/11/20	8	8	27	6	0		0.75	0.25	

Time (hrs): .5

Primary Matrix: Inorganic
Secondary Matrix: Fine Org.

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.5	.01	Kyle	1-9-20	0	N	/	

Sort Comments: Initial=3.4 E=.49

QC 1 Information ☐

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K Guild	1/14/20	8	8	1	—	—	—	0.25		97%	

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort, **8097 - 2 - 112**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Notes: Keep all Elutriate in a seperate container for this project.

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Conn Evans	1/13/20	3.5	4	373	62	58		9	0.5	

Time (hrs) .75

Primary Matrix: Inorganic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.4	.1	Dan	1-9-20	0	N	/	

Sort Comments: 7.9 = initial E = 63

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K Guild	1/ /20	1	4	9	3	0	3	0.5		91%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Short Pick Bench Sheet

kAmerica UCR Phase3 Sediment Study Benthos 2019: (.2) 250um Fraction Sort,Taxo **8097 - 2 . 112**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes: Keep all Elutriate in a seperate container for this project.

Sorting Protocols

Target Count: 500
Reject Organisms: None
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: No
Mesh Size: 250 Micron
Worms (Mount/ID): Y/Class

Sort Data

Original Grids Sorted	Original Grids Total	Generals	Midges	Worms		Sorted Total	PNC
3.5000	4.0000	402	65	58	=	525	3

Original Technician: Conn Evans
QC Technician: Kate Guild
Subsample?: N
Last Sort Activity: Sort QC - Passed

Taxonomy Data

	Generals	Midges	Worms		Total
Identified:	384	62	46	=	492
Rejects:	0	0	14	=	14

General Taxonomist: A2 Navesky
Chiro Taxonomist: Wade Holland
Olig Taxonomist: Laurie Flaherty

Bugs Needed = 8

Short Pick 1

X

Short Pick Technician	Short Pick Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Madalyn Walker	01.21.20	1	8	12	2	3	-	0.25	0.25	N

Short Pick Comments: Bugs from unsorted material

Short Pick 2

Short Pick 2 Technician	Short Pick 2 Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R

Short Pick 2 Comments:

Short Pick 3

Short Pick 3 Technician	Short Pick 3 Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R

Short Pick 3 Comments:

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 1: (.1) 500um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/14/2019 10:05:54AM

SIN	Coll. Date	Jars	Site ID Number	Weight (lbs)	Weight
1	09/10/19	2	EV063-BMI-1-091019	31.5	47.5
2	09/10/19	2	EV064-BMI-1-091019	33.6	57.2
3	09/12/19	1	EV005-BMI-1-091219	23	N/A
4	09/12/19	1	EV010-BMI-1-091219	69	N/A
5	09/12/19	1	EV075-BMI-1-091219	42	N/A
6	09/13/19	2	EV012-BMI-1-091319	51	N/A
7	09/13/19	2	EV013-BMI-1-091319	43	55
8	09/14/19	1	EV036-BMI-1-091419	10	N/A
9	09/19/19	1	DM045-BMI-1-091919	27	N/A
10	09/20/19	1	EV026-BMI-1-092019	11	N/A
11	09/20/19	2	EV003-BMI-1-092019	34	49
12	09/20/19	1	DM050-BMI-1-092019	58	N/A
13	09/20/19	1	DM046-BMI-1-092019	50	N/A
14	09/21/19	1	DM022-BMI-1-092119	57.4	N/A
15	09/21/19	1	DM023-BMI-1-092119	57.4	N/A
16	09/21/19	1	DM026-BMI-1-092119	59.4	N/A
17	09/21/19	2	EV027-BMI-1-092119	40	45
18	09/21/19	2	EV060-BMI-1-092119	35	36
19	09/23/19	2	EV008-BMI-1-092319	35	39
20	09/23/19	1	EV037-BMI-1-092319	54	N/A

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 1: (.1) 500um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/14/2019 10:05:54AM

21	09/23/19	1	EV037-BMI-2-092319	48	N/A
22	09/24/19	1	EV002-BMI-1-092419	65	N/A
23	09/24/19	2	EV044-BMI-1-092419	26	27
24	09/24/19	2	EV048-BMI-1-092419	40	41
25	09/27/19	2	REF 003-BMI-2-092719	37	42.2
26	09/23/19	1	EV054-BMI-1-092319	42	N/A
27	09/23/19	1	EV057-BMI-1-092319	40	N/A
28	09/24/19	2	EV051-BMI-1-092419	41	43
29	09/24/19	2	REF013-BMI-1-092419	37.4	43.8
30	09/24/19	2	REF015-BMI-1-092419	33.2	33.8
31	09/25/19	2	EV065-BMI-1-092519	42	27
32	09/25/19	2	EV066-BMI-1-092519	39	36
33	09/25/19	2	EV069-BMI-1-092519	44	32
34	09/25/19	2	EV069-BMI-2-092519	32	35
35	09/25/19	2	EV071-BMI-1-092519	32	31
36	09/25/19	2	REF017-BMI-1-092519	33	35.2
37	09/25/19	2	REF018-BMI-1-092519	35.6	34.8
38	09/25/19	2	REF016-BMI-1-092519	36.8	38.2
39	09/26/19	2	EV001-BMI-1-092619	42	36
40	09/26/19	2	EV072-BMI-1-092619	39	35
41	09/26/19	1	EV052-BMI-1-092619	60	N/A
42	09/26/19	2	REF014-BMI-1-092619	37.8	38.8

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(Cont'd.)

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 1: (.1) 500um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/14/2019 10:05:54AM

43	09/27/19	1	EV049-BMI-1-092719	15	N/A
44	09/27/19	2	REF003-BMI-1-092719	43.6	38.4
45	10/01/19	1	EV036-BMI-2-100119	24.5	N/A
46	09/27/19	2	REF004-BMI-1-092719	51.6	47.8
47	09/28/19	2	REF002-BMI-1-092819	38.6	39.8
48	09/28/19	2	REF001-BMI-1-092819	37.6	36.2
49	09/30/19	1	EV022-BMI-1-093019	24	N/A
50	09/30/19	2	REF007-BMI-1-093019	38.8	37.4
51	09/26/19	2	4-B6-2019-BMI-1-09261 9	30	27
52	09/26/19	2	4-B1-2019-BMI-1-09261 9	32	34

Received Number of Samples: 52

Expected Number of Samples: 123

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 1: (.1) 500um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/21/2019 8:31:32AM

64	10/04/19	1	CB036-BMI-1-100419	32.5	N/A
65	10/09/19	2	CB006-BMI-1-100919	41	39
66	10/09/19	2	CB012-BMI-1-100919	42	51
67	10/09/19	1	CB007-BMI-1-100919	42	N/A
68	10/10/19	1	JS001-BMI-1-101019	52	N/A
69	10/09/19	1	DM018-BMI-1-100919	60.4	N/A
70	10/09/19	1	DM002-BMI-1-100919	63.6	N/A
71	10/10/19	1	JS002-BMI-1-101019	38	N/A
72	10/15/19	1	CB014-BMI-1-101519	49	N/A
73	10/10/19	1	DM015-BMI-1-101019	47.4	N/A
74	10/10/19	1	DM015-BMI-2-101019	49.6	N/A
75	10/10/19	1	DM016-BMI-1-101019	59.4	N/A
76	10/11/19	1	DM008-BMI-1-101119	39.2	N/A
77	10/11/19	1	CB016-BMI-1-101119	28	N/A
78	10/11/19	1	DM010-BMI-1-101119	54.2	N/A
79	10/11/19	1	CB018-BMI-1-101119	36	N/A
80	10/11/19	1	CB047-BMI-1-101119	26	N/A
81	10/12/19	1	CB009-BMI-1-101219	35	N/A
82	10/12/19	2	CB010-BMI-1-101219	45	30
83	10/12/19	1	CB039-BMI-1-101219	22	N/A
84	10/12/19	1	DM025-BMI-1-101219	61.8	N/A
85	10/14/19	2	DM019-BMI-1-101419	33	41.8

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8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019

Sample Group 1: (.1) 500um Fraction Sort,Taxonomy,WW, AFDM
.See AJERA
Login Date: 10/21/2019 8:31:32AM

86	10/14/19	1	DM020-BMI-1-101419	45.6	N/A

Received Number of Samples: 86

Expected Number of Samples: 123

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 1

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes:

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Sorting Information

525

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Kyle Lerch	9/15/19	3	12	468	56	1	X	5.5	8.5	X

Primary Matrix: Fine organic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
18.5	0.35						2

Sort Comments: 17.7 = Kept Sediment / 0.45 = 250um Fraction Sort

QC 1 Information

124

80.4

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	9/23/19	6	6	105	19	Ø	6	3.5	649	80.89	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

X

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Madalyn Walker	10.03.19	1.25	6	Ø	Ø	Ø	1	0.50	649	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)
Chris Pike	10/5/19	7	8	458	69	1	Ø	1.5

Snk: 7.0

Eco ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 2

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2
Notes:

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Daniel Franklin	9/20/2019	24	24	54	69	14		7.75	3.5/.75	

Counts: 137

Primary Matrix: Fine
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
19.0	.8	—		—			1

Sort Comments: "Laine started the sample then gave it to me his sort time was 1.0 and found 8 bugs

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Chris Pike	9/26/19	5	24	10	9	6	6	4	257	53.31	N

QC Counts: 25

120

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count
Daniel Franklin	10/3/2019	16	26	15	0	18.75	219	95

Re-Sort Counts: 57

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	10-7-19	5	24	—	—	—	—	1	219	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

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EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 3

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes:

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids: Sorted	Grids: Total	Counts (83): G	M	W	PNC	Time (hrs): Scope	Non-Scope (.5+)	L/R
Laine Smith	9.26.19	1	1	74	6	3	Ø	1.0	1.5	/

Primary Matrix: Inorganic
Secondary Matrix:

Sample Volume (liters): Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.7	2.0	—	—	—	—	-	2

Sort Comments: Sortable material = oil , 1 Jar elutriate

QC 1 Information

QC Technician	QC Date	Grids: QC'd	Grids: Total	QC Counts: G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/1/19	8	8	5	1	-	2	.5	89	93%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts: G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids: QC'd	Grids: Total	QC 2 Counts: G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids: Picked	Grids: Total	Subsample Counts: G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 4

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes:

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	9.26.19	1	1	59	3	0	0	1.25	2.0	/

62
1.25 + .75

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.0	8.5	Dan	10/05/2019	.75	—	N	4

Sort Comments: 3 Jars elutriate, SORTABLE Material = .01 L

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/9/19	8	8	3	2	-	-	.25	67	92%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sink: 1.5

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort, Taxo

8097 - 1 - 5

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1
Notes:

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	4.27.19	1	1	41	60	0	0	1.25	.75+1.25 2.25	/

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.5	5.8	—	—	—	—	—	3

Sort Comments: Sortable material = .02 L ; 2 jars elutriate

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/10/19	2	8	—	—	—	—	.25	101	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

6SW

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo — **8097 - 1 - 6**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
~~Laine Smith~~ Dan Franklin	10/3/2019	4	4	82	8	1	0	3.25	3.0	

Primary Matrix: Coarse
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.0	7.0	Laine	10/03/2019	.50	—	N	1

Sort Comments: .10 sort and 6.90 was Elutriated There is 2 Jars of ELUTRIATE

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/10/19	4	4	4	6	–	–	.75	101	90%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

6SW

Sort & QC Bench Sheet

ECO ANALYSTS, INC. LIFE IN WATER

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 7

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope (hrs)	Time Non-Scope (hrs)	L/R
Laine Smith	10/04/2019	4	4	33	14	0	0	2.25	3.50	

47

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
16.0	13.0	Laine	10/04/2019	Ø	—	N	1

Sort Comments: 12.96 was Elutriated .04 was Left to sort

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/10/19	2	4	1	–	–	1	.5	49	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 8

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10/05/2019	6	8	16	134	0	0	2.50	1.00	

Counts: 150

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.5	Laine	10/04/2019	Ø	–	N	

Sort Comments: .47 Elutriated and .03 Left to Sort

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/10/19	2	8	–	1	–	–	.25	154	97%	N

QC Counts: 4

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 - 9

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	10/05/2019	6	6	173	8	0		3.0	1.80	

Counts: 182

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.0	.3	Laine	10/05/2019	0	—	N	

Sort Comments: Muddy sample most of it washed out .2 Elutriate and .1 sorting

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/10/19	1.25	6	3	—	—	1	.5	196	92%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

6 5W

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 10

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope (hrs)	Time Non-Scope (hrs)	L/R
Laine Smith	10/08/2019	8	8	17	2	0	0	.75	.75	

19

Primary Matrix: Course
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.1	.2	Eno	10/08/2019	Ø	—	N	1

Sort Comments: .17 Elutriated, .03 sorting,

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/10/19	2	8	—	—	—	—	.25	19	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

10/8/2019 12:53:38PM

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - Teck Lake Roosevelt Benthos and QC Support 2019: (.1) 500um Fraction Sort,Taxo

AN

8097 - 1 - 11

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in ~~a seperate~~ container. Keep all Elutriate in a seperate co

Sorting Information

122

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	10/04/2019	4	4	103	19	0		3.00	2.75	N

f10

Primary Matrix: Coarse
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
14.7	12.4	Blaine	10/05/2019	.50	—	N	1

Sort Comments: 12.36 Elutriate and .04 Sorting

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Ben Alexander	10/0/19	1	4	2	–	–	–	.25	130	93%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

6sa

Sort & QC Bench Sheet

EcoANALYSTS, INC. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 12**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 216 — Time (hrs) 1.15

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	10/15/2019	12	12	210	6	0	0	15.25	2.50	

Primary Matrix: Coavrs
Secondary Matrix: Inorgain

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
10.6	.7	Lauren Beckley	10/11/2019	.8	—	N	

Sort Comments: .3 Elutriate .4 left for sorting

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-13-19	25	12	—	—	—		1.5	216	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

1.75

GSW

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 13

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 1

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10/5/2019	6	6	171	5	0	0	2.75	2.00	

Counts: 176

Primary Matrix: Coarse

Secondary Matrix: Inorganics

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8	.8	Kyle	10/5/2019	9	—	N	

Sort Comments: .7 Elutriated and .1 Sorted

QC 1 Information

QC Counts: 2

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-13-19	1.25	6	1	1	-	-	.3	186	94%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

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DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 76 — Time (hrs): 1.75 .15

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	10.16.19	24	24	27	49	Ø	Ø	2.0	3.25	/

Primary Matrix: Coarse Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
10.0	3.5	Laura-Ray	10.15.19	Ø	/	N	2

Sort Comments:

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-13-19	8.5	42	—	—	—	—	1	76	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Eco ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 15**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	10/14/2019	6	6	61	0	0	0	2.30	1.75	N

Time (hrs) 1.50

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
9.8	7.0	Blaine	10/15/2019	.50	–	10	

Sort Comments: 6.9 Eluriate .1 storting

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Fields	11-13-19	1	4	–	1	-	–	.25	65	93%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

ANP

8097 - 1 - 16

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan Franklin	10/10/2019	8	8	13	31	0	0	.50	1.25	

44

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
10	9.1	Laine	10/16/2019	Ø	—	N	—

Sort Comments: 8.99 Elutriate .01 sorting

QC 1 Information

QC Technician	QC Date	QC'd	Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Carpper Flagler	11-13-19	8	8	—	—	—	—	.25	44	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 17

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	10/16/2019	8	8	72	19	0	0	1.25	1.00	

Counts: 91 Time (hrs): 1.00

Primary Matrix: Coarse
Secondary Matrix: Inorgan

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.5	10.5	Lam	10/16/2019	0	-	2	

Sort Comments: 10/16/19 Elutriate .01 sorting.

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-13-19	8	8	2	7	-	-	.25	100	91%	N

QC Counts: 9

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

GSW

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 18**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope (hrs)	Time Non-Scope (hrs)	L/R
Daniel Franklin	10/17/2019	8	8	172	101	0	0	3.25	1.50	

Counts: 273

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.0	10.4	Baine	10/16/2019	.50	—	N	

Sort Comments: 10.38 Elutriate .02 Left For Sorting.

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-13-19	8	8	13	13	-	-	.5	299	91%	N

QC Counts: 26

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ANC [redacted]

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 19**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10/18/2019	4	4	154	285	51	0	6.25	2.00	

490

Primary Matrix: Coarse
Secondary Matrix: Inorganics

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
12.0	7.5	Laine	10/17/2019	Ø	–	N	–

Sort Comments: 7.42 Elutriate .08 Left For Sorting

☒ QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cramer Zeigler	11-13-19	1	4	3	8	-	-	.5	534	91%	N

11

QC 1 Comments:

☐ Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐ QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐ Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 20

DATA ENTERED ☐

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Lane Smith	10.18.19	8	8	39	4	1	0	.5	1.5	/

Counts: 44 Time (hrs): 2.00

Primary Matrix: Cavan
Secondary Matrix: Inorganics

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.0	7.8	Blaire	10/18/2019	.50	–	N	1

Sort Comments:

QC 1 Information ☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Tingley	11-13-19	8	8	–	3	–	–	.25	47	93%	N

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

GSW

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 21**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 108 | Time (hrs): 1.05+.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	10-20-19	1	1	37	71	Ø	Ø	.75	1.5	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.5	8.0	Kyle	10-20-19	Ø	N	/	2

Sort Comments: Elutriate in 5 gal bucket

QC 1 Information

QC Counts: 17

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-13-19	8	8	2	15	-	-	.25	125	86%	N

QC 1 Comments: full QC pass above 80% w/permission

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

AN

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 22

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	10/22/2019	4	4	125	17	1	0	1.50	1.50	

Counts: 143 — Time (hrs): 1.25

Primary Matrix: Coarse
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
10.6	.05	Laura Ray	10.22.19	.25	–	10	–

Sort Comments: 11.6 initial vol E= 10.55

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-15-19	8	8	6	2	–	–	.5	151	94%	N

QC Counts: 8

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 23

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	10/23/2019	2.5	6	147	377	12	4	5.25	1.25	

Counts: 536

Primary Matrix: Fine
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.10	.10	—	—	—	—	—	2

Sort Comments: 9.0 initial very muddy most of it washed out

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-15-19	8	8	-	13	-	-	.5	549	97%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

6SW

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 24

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 2

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

535

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	10/25/2019		4	119	367	49	0	4.25	1.50	U

Primary Matrix: coarse

Secondary Matrix: Inorganics

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.1	.10	Kyle	10/23/2019	0	—	N	2

Sort Comments: Initial = 12.2 E = 11.0

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-5-19	8	8	1	3	—	—	.9	539	99%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 25

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	10/26/2019	12	12	162	29	6	0	10.25	1.75	

Counts: 197 Time (hrs): 1.5

Primary Matrix: Coarse
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.2	.3	Lauren H	10-26-19	.25	N	N	1

Sort Comments: Initial = 120 E = 6.9

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	11-15-19	2.5	12	1	-	-	-	.5	202	97%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (1) 500um Fraction Sort, **8097 - 1 - 26**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 585 — Time (hrs): .5

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Daniel Franklin	10/29/2019	6	6	285	184	36	0	6.00	.75	N

Primary Matrix: Fine
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.1	.1	—	—	—	—	—	1

Sort Comments: Initial = 8.2

QC 1 Information

QC Counts: 22

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-15-19	1.25	6	3	19	-	-	.5	610	82%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Counts: 58

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count
Dan Franklin	11/19/2019	34	17	7	0	3.75	585	53

Re-Sort 1 Comments:

QC 2 Information

QC 2 Counts: 7

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-20-19	1.25	6	3	3	1	-	.5	618	94%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Eco ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 27

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 533 — Time (hrs): .75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	10/30/2019	3.5	12	153	328	52	2	6.00	1.00	N

Primary Matrix: Fine
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.3	.3	—	—	—	N	N	2

Sort Comments: 7.6 initial vol. real muddy sample most washed away.

QC 1 Information

QC Counts: 8

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Conner Zleeples	11-18-19	1	4	3	5	-	-	.25	565	94%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 28

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 547 | Time (hrs): 1.0

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	11/02/2019	3.50	4	356	163	25		6.00	1.25	N

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
12.2	.04	Erin	10/30/2019	.25	–	N	2

Sort Comments: 12.7 init vol. 12.16 = E

QC 1 Information

QC Counts: 57

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Zieder	11-27-19	8	8	11	46	–	–	1	601	90%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Eco ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 29**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 137 Time (hrs): 1.75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	11/07/2019	24	24	67	67	3	0	8.75	2.00	N

Primary Matrix: Coarse
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.6	.5	Blaine	11/2/2019	Ø	N	N	1

Sort Comments: 13.8 int vol E=.1 7.2 washout

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Zeeks	11-18-19	2.5	12	-	3	-	-	.75	151	90%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 30**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2B M

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 74 — Time (hrs) 4+7.5+1.5 — 1.25+1.0

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ L Smith	11-12-19	48	48	48	26	0	0	13	2.25	/

Primary Matrix: Coarse Organic
Secondary Matrix: Fine Organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.6	1.5	Blaine	11/08/2019	0	/	/	2

Sort Comments: 12.2 Int vol. 9.6 washout E= .10

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Zeigler	11-18-19	8.5	42	1	-	-	1	1.5	79	98%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 31**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	11.13.19	1	1	95	41	3	0	1.75	1.25	/

Counts: 139
Time (hrs): 1.0 +.25

Primary Matrix: Fine Organic
Secondary Matrix:

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.7	.005	Blaine M	11.12.19	0	N	/	2

Sort Comments: Initial=7.4 Elutriate in 5gal

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Eiegler	11-18-19	8	8	1	13	-	-	.25	153	90%	N

QC Counts: 14

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

6SW

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 32

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan	11/14/2019	1	4	179	323	20	Ø	4.25	1.50	N

Counts: 522

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.6	.04	Laine	11.13.19	.50	N	/	2

Sort Comments: Inital = 9.5 E = 7.56

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Zeder	11-18-19	8	8	2	21	–	–	.5	545	95%	N

QC Counts: 23

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Short Pick Bench Sheet

kAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,Taxo **8097 - 1 . 32**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sort Data

Original Grids Sorted	Original Grids Total	Generals	Midges	Worms		Sorted Total	PNC
1.0000	4.0000	181	344	20	=	545	0

Original Technician: Daniel Franklin
QC Technician: Camper Ziegler
Subsample?: N
Last Sort Activity: Sort QC - Passed

Taxonomy Data

	Generals	Midges	Worms		Total
Identified:	152	319	16	=	487
Rejects:	0	0	1	=	1

General Taxonomist: J3 Pfeiffer
Chiro Taxonomist: G3 Wallace
Olig Taxonomist: Laurie Flaherty

Bugs Needed = 13

Short Pick 1

[X]

Short Pick Technician	Short Pick Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Madalyn Walker	01.20.20	0.0625	4	14	16	1	–	0.25	0.25	N

Short Pick Comments:

Short Pick 2

[ ]

Short Pick 2 Technician	Short Pick 2 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 2 Comments:

Short Pick 3

[ ]

Short Pick 3 Technician	Short Pick 3 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 3 Comments:

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 33

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2 BM

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	11/14/2019	8	8	61	55	5	0	1.75	1.00	N

Counts: 121 Time (hrs): 1.75

Primary Matrix: Fine **Secondary Matrix:** Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.7	.03	Blaine	11/18/2019	.50	N	N	1

Sort Comments: 9 int vol. E=8.67

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cameron Zlepper	11-18-19	8	8	6	4	-	-	.5	131	92%	N

QC Counts: 10

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 34**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

103 .25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
~~Lane Smith~~ Dan Franklin	11/7/19	8	8	77	26	0	0	1.50	1.00	

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
70	.01	Blaine	11.14.A	.25	N	/	1

Sort Comments: Initial=8.25 F=6.94

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cameron Ziegler	11-18-19	8	8	1	2	-	-	.25	106	97%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 35

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	11/19/2019	6	8	130	367	41	0	4:00	1.25	N

Counts: 538 — Time (hrs): 1.00

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.3	.03	Blaine	11/14/2019	.50	N	N	2

Sort Comments: 10.0 init Vol. 2.0 washout E=7.27

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Reeks	11-21-19	8	8	3	10	-	-	.5	551	97%	N

QC Counts: 13

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 36

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) 1.00 Scope	Non-Scope	L/R
~~Daniel Franklin~~ Kyle Lorch	11/16/19	42	42	38	X	X	X	3.5	2.00	X

Primary Matrix: coarse organic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.0	1.0	Blaine	11/14/2019	.50	N	N	1

Sort Comments: 14.0 intial vol 11.0 washout E= 1.0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Zbojs	11-18-19	8.5	42	—	—	—	—	.75	38	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 37**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2 LS

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Kyle Lerch	1/12/20	48	48	X	X	X	X	2.25	4.75	X

Primary Matrix:
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.1	1.075	Dan Franklin	1/11/20	0	1.075	0.025	2

Sort Comments: e = 0.075 inorganic / wet 10.75

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	8.5	42	—	—	—	—	1.25	0	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 38**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	11/23/2019	24	24	102	3	0	0	5.25	1.50	N

Counts: 105 Time (hrs): 1.25

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.0	.5	Blaine	.50	11/19/2019	N	N	1

Sort Comments: 12.6 int vol 7.6 washout E= 3.5

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11.26.19	5	24	-	1	-	-	.5	110	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

6SW

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 39**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 174 — Time (hrs) 1.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Kyle Leach	11/25-/K	4	4	81	63	30	X	1.75	0.25	K

Primary Matrix: Fine organic
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.6	.01	Dan F	11.21.19	0	N	/	1

Sort Comments: Initial = 8.8 E = 1-jar ; 1.25 extra tech time LS for setup of sample

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	11-27-19	8	8	-	6	-	-	.5	180	96%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 40

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	11.27.19	4	8	179	335	9	4	3.5	1.75	/

Counts: 523 Time (hrs): 1.25 + .5

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.5	.04	Dan	11.21.19	0	N	/	3

Sort Comments: Inital = 9.0 elutriate in 1 Jar

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-2-19	8	8	1	44	-	-	1.25	568	92%	N

QC Counts: 45

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 41**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Daniel Franklin	11/29/2019	4	4	169	10	12	0	2.00	1.00	

Counts: 191 Time (hrs): 1.75

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.6	.10	Blaine	11/21/2019	.50	10	10	

Sort Comments: 7.8 int vol. E=7.5

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-2-19	8	8	5	1	-	-	.5	197	96%	N

QC Counts: 6

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 42

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples

Count Range: Target Count Minimum
Efficacy Minimum: 90%

Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	11/29/2019	42	42	62	121	9	0	8.50	1.75	

Counts: 192 — Time (hrs): 1.60

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.80	.80	Blake	11/21/2019	Ø	N	N	

Sort Comments: 13.2 int vol 10.2 washout

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-2-19	8.5	42	-	2	-	-	1.5	202	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

GSW

Sort & QC Bench Sheet

EcoAnalysts, Inc. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 43**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	11-28-19	8	8	68	89	Ø	Ø	1.75	.75	/

Counts: 157   Time (hrs): 5 +.25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.4	.03	Blaine	11.22.19	Ø	N	/	2

Sort Comments: Initial = 1.0   E in 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-2-19	8	8	2	5	-	-	.5	164	95%	N

QC Counts: 7

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

9:50

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 44**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope Xtra time	LR
~~Laine Smith~~ Steven Little	11-30-19	12	12	60	11	6	0	4.50	—	/

Counts: 77 Time (hrs): 1.75

Primary Matrix: Coarse Organic
Secondary Matrix: —

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.2	.3	Dan	11-22-19	0	N	/	1

Sort Comments: Initial = 12.8 E in 1 jar 17bph; 1.75 extra tech time LS for setup of sample

☒

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Carper Ziegler	12-4-19	12	12	15	15	2	—	5.75	109	70%	N

QC Counts: 32

QC 1 Comments:

☐

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/12/19	2.5	12	1	1	0	0	1.75	111	91%	N

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 45**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	11-30-19	8	8	10	94	0	0	1.5	1.0	/

Counts: 104 — Time (hrs): .75+.25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.3	.01	Lauren B	11.22.19	.25	N	/	2

Sort Comments: Inital = 2.5 E in 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-2-19	8	8	-	12	-	-	.5	116	90% (89.6)	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

6.2
7.3

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 46**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Steven Little	12-4-19	2	4	228	212	66	26	6.50	.25	/

Counts: 506 — Time (hrs): 1.25

Primary Matrix: Coarse Organic
Secondary Matrix: —

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
11.0	.1	Dan	11.23.19	0	N	/	2

Sort Comments: Initial: 13.5 E in 1 jar .5hr break 78bph; 1.25 extra tech time LS for setup of sample

☒ **QC 1 Information**

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-5-19	1	4	6	5	-	-	.5	550	92%	N

QC Counts: 11

QC 1 Comments:

☐ **Re-Sort 1 Information**

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐ **QC 2 Information**

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐ **Subsample Information**

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Short Pick Bench Sheet

kAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,Taxo

8097 - 1 . 46

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sort Data

-------- Original Grids --------

Sorted	Total	Generals	Midges	Worms		Sorted Total	PNC
2.0000	4.0000	234	217	66	=	517	26

Original Technician: Steven Little
QC Technician: Camper Ziegler
Subsample?: N
Last Sort Activity: Sort QC - Passed

Taxonomy Data

	Generals	Midges	Worms		Total
Identified:	229	208	50	=	487
Rejects:	20	0	15	=	35

General Taxonomist: A2 Navesky
Chiro Taxonomist: G3 Wallace
Olig Taxonomist: Laurie Flaherty

Bugs Needed = 13

Short Pick 1

[X]

Short Pick Technician	Short Pick Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Madalyn Walker	01·20·20	0.25	4	16	17	4	-	0.50	0.25	N

Short Pick Comments:

Short Pick 2

[ ]

Short Pick 2 Technician	Short Pick 2 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 2 Comments:

Short Pick 3

[ ]

Short Pick 3 Technician	Short Pick 3 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 3 Comments:

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 47

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 2

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts (41) — Time (hrs) 1.00

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Steven Little	12-4-19	8	8	30	2	9	5	.75	Ø	✓

Primary Matrix: Inorganic

Secondary Matrix: —

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
12.1	.02	Blaine	11/23/2019	.50	N	N	1

Sort Comments: 12.4 int vol E= 12.08 55bph; 1.00 extra tech time DF for setup .1 sample

QC 1 Information

QC Counts 2

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-5-19	8	8	1	1	—	—	.25	43	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 48**

DATA ENTERED ☑

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts (132) G	M	W	PNC	Time (hrs) .75 Scope	Non-Scope	L/R
~~Laine Smith~~ / Steven Little	12-4-19	8	8	93	29	10	11	1.00	0	/

Primary Matrix: Coarse Organic
Secondary Matrix: —

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.7	.07	Blaine	11-23-19	0	N	/	1

Sort Comments: Initial = 90   E = 1 jar   132 bgh

QC 1 Information ☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts (6) G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-6-19	8	8	2	4	-	-	.5	138	95%	N

QC 1 Comments:

Re-Sort 1 Information ☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information ☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information ☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ARQ

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 49

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 120 — Time (hrs) .5

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan Franklin	12/04/2019	8	8	84	33	4	0	1.50	.75	

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.5	.01	Blaine	11.23.19	Ø	N	/	1

Sort Comments: Initial: 2.8 E = 1 jar; 0.5 extra tech time LS for setup of sample

☒

QC 1 Information

QC Counts 16

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	8	8	6	10	—	—	.5	136	88%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Eco ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 50

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

DATA ENTERED

Sorting Information

Counts: 565
Time (hrs): 1.0

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F	12/05/2019	2.5	4	214	215	106	0	5.25	.25	N

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.0	.1	Blaine	11.23.19	0	N	/	2

Sort Comments: Initial = 10.4 E = 1 jar 1.00 extra tech time for LS for sample setup

QC 1 Information

QC Counts: 10

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	1	4	2	6	2	—	.5	605	93%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 51

KD

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F	12/05/2018	4	4	51	11	6	0	1.00	.25	N

Counts: 68
Time (hrs): 1.0

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.9	.1	Blaine	11-24-19	Ø	N	/	1

Sort Comments: Initial=7.7 E=1 jar 1.00 extra tech time for L.S for setup of sample.

QC 1 Information

☒

QC Technician	QC Date	QC'd	Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-6-19	1	4	5	2	-	-	.5	96	70%	N

QC Counts: 7

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count
Dan F	12/06/19	14	6	0	0	.50	95	16

Re-Sort Counts: 20

Re-Sort 1 Comments:

QC 2 Information

☒

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-10-19	1	4	1	1	-	-	.5	103	92%	N

QC 2 Counts: 2

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 52**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 120 — Time (hrs): 1.0

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ / Steven Little	12-6-19	8	8	88	27	5	19	2.50	.25	✓

Primary Matrix: Coarse Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.6	.03	Lauren H	11.26.19	0.25	N	/	1

Sort Comments: Initial=8.4 E=1 jar .25hr break 1hr extra tech time

QC 1 Information

[X]

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-10-19	8	8	—	—	—	—	.5	120	100%	N

QC 1 Comments:

Re-Sort 1 Information

[ ]

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

[ ]

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

[ ]

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 53

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith Steven Little	12-7-19	4	4	55	25	12	4	2.50	.25	/

Counts: 92

Primary Matrix: Coarse Organic
Secondary Matrix: —

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.6	.050	Camper	11-26-19	0	N	/	1

Sort Comments: Initial = 8.2 E=1 jar .020L transfered to .250 Sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-10-19	1	4	—	1	—	—	.5	96	98%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 54

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 1

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Steven Little	12-8-19	8	8	104	6	8	1	4.25	.25	/

Counts: 118 Time (hrs): 1.0

Primary Matrix: Coarse Organic

Secondary Matrix: —

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.1	.05	Lauren H	11-26-19	Ø	N	/	1

Sort Comments: Initial=7.3 E=1 jar 1hr extra time 10/0L given to 8097 2-54

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-10-19	8	8	3	1	-	-	.5	122	96%	N

QC Counts: 4

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 55**

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DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ DMF	12/10/2019	4	4	64	158	29	0	4.00	.25	N

Counts: 251 Time: 1.0

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.7	.1	Kyle	11-27-19	Ø	N	/	1

Sort Comments: Initial = 7.7 E = 1 jar 1.00 extra tech time for L.S for setup of sample

☒

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-11-19	1	4	2	3	1	-	.5	275	91%	N

QC Counts: 6

QC 1 Comments:

☐

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 56 AN

DATA ENTERED ☐

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F	12/10/2019	4	4	22	36	0	0	1.50	.25	N

Counts: 58 Time (hrs): .75

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.9	.1	Laine	11-27-19	0	N	/	1

Sort Comments: Initial = 3.0 E: 1 jar .75 extra tech time for LS for setup of sample.

☒

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-11-19	1	4	—	—	—	—	.25	58	100%	N

QC 1 Comments:

☐

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 67

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/10/2019	8	8	93	135	1	0	1.25	1.25	N

224

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.7	.03	Laik	11/27/2019	Ø	N	N	1

Sort Comments: 7.4 int vol E = 6.67

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-11-19	8	8	15	2	-	-	.75	246	93%	N

17

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 58

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 242 — Time (hrs): .520

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Laine Smith	12-10-19	8	8	165	77	Ø	Ø	1.5	.25	/

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.2	.02	~~[illegible]~~ Dan	11/27/2019	Ø	N	N	2

Sort Comments: 4.4 int vol E=4.18

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Zeigler	12-11-19	8	8	2	-	-	-	.25	250	96%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 59**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/10/2019	4	4	93	12	70	0	2.00	1.25	N

Counts: 125

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.0	.05	Laine	11/27/2019	Ø	N	N	1

Sort Comments: 7.0 inf vol. 2.0 washout E=2.95

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-12-19	1	4	1	2	-	-	.25	137	91%	N

QC Counts: 3

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 60 AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Laine	12-11-19	7	8	25	486	0	0	3.25	.25	/

Counts: 511 Time (hrs): .75

Primary Matrix: Fik
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.1	.04	Dan	11/27/2019	0	N	N	3

Sort Comments: 3.5 int vol 2.0 washout E=1.06

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-12-19	8	8	1	5	5	-	.5	522	97%	N

QC Counts: 11

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 61**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 382 — Time (hrs) 1.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F.	12/11/2019	4	4	84	279	19	0	2.00	.25	N

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
50	.05	Chris	11-28-14	Ø	N	/	1

Sort Comments: Initial = 10.5 E = 1 jar 1.25 extra tech time For L.S For schpof Sample

QC 1 Information

QC Counts 16

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-12-19	8	8	9	4	3	–	.75	398	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 62**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	12-11-19	8	8	34	136	Ø	Ø	1.0	1.25	/

Counts: 175 Time (hrs): 1.0 + .25

Primary Matrix: Inorganic
Secondary Matrix: Fine Organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.4	.02	Dan	11-29-19	Ø	N	/	2

Sort Comments: Initial = 10.9 E = 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Connor Ziegler	12-12-19	8	8	5	–	6	–	.5	185	95%	N

QC Counts: 11

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 63

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F.	12/12/2019	4	4	15	23	2	0	2.75	.25	

Counts: 40 — Time (hrs): .5

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.5	.1	Laine	1-29-19	0	N	/	1

Sort Comments: Initial: 3.6 E-1 jar .50 extra tech time For LS for Setup of Sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-13-19	1	4	5	1	-	-	.5	64	62%	N

QC Counts: 6

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count
Dan F.	12/13/2019	3	5	0	0	1.00	46	15

Re-Sort Counts: 8

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-13-19	1	4	—	—	—	—	.25	54	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 64

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Daniel Franklin	12/12/2019	4	4	3	1	0	0	.50	.75	N

4

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.8	.10	Lauren H	11/30/2019	.25	N	N	1

Sort Comments: 3.4 int vol E = 3.7

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Fegles	12-13-19	8	8	—	—	—	—	.5	4	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 65

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/12/2019	4	4	68	43	2	0	1.00	1.75	N

Counts: 113

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.00	.05	Lauren H	11/30/2019	50	N	N	1

Sort Comments: 11 int vol E= 7.95

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Connor Zeaks	12-13-19	8	8	1	4	-	-	.5	118	95%	N

QC Counts: 5

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 66**

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Dan F	12/12/2019	8	8	42	48	0	0	.75	0	N

Counts: 90 Time (hrs): 1.25

Primary Matrix: Inorganic
Secondary Matrix:

Sample Volume (liters)

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.0	.01	Lauren H	11-30-19	0	N	/	1

Sort Comments: Initial: 13.2 E=1 jar 1.25 extra tech time for L.S for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Zeigler	12-13-19	8	8	4	6	-	-	.5	100	90%	N

QC Counts: 10

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 67

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 238 — Time (hrs) .75

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ Laine	12-12-19	4	4	116	112	10	0	2.25	.25	/

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.0	.20	Blaine	12/03/2019	.25	N	N	2

Sort Comments: 6.2 infool. 1.3 washout E= 3.80

QC 1 Information

QC Counts 3

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-13-19	1	4	2	-	1	-	.25	250	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 68**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	12/13/2019	6	6	316	20	13	0	8.50	.25	N

Counts: 349 Time (hrs): 1.0

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
4.30	.20	Blaine	12/03/2019	.50	N	N	1

Sort Comments: 7.2 int vol. 2.8 washout E= 4.10

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ricketts	12-16-19	2.5	12	3	2	-	-	.75	373	93%	N

QC Counts: 5

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 69**

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 1

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/14/2019	8	8	5	221	0		1.00	1.50	N

Counts: 226

Primary Matrix: Inorganic

Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.20	.01	Blaine	12/03/2019	Ø	N	N	1

Sort Comments: 9.2 int vol. E = .19

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-16-19	8	8	—	—	—	—	.5	226	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 70

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/11/2019	8	8	14	259	0	0	1.00	1.50	N

Counts: 273

Primary Matrix: Inorganic
Secondary Matrix: Fine

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
7.8	.03	Blaine	12/04/2019	.75	N	N	1

Sort Comments: 9 int vol. E = 7.77

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-6-19	8	8	1	1	-	-	.5	275	99%	N

QC Counts: 2

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, 8097 - 1 - 71

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 292

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Daniel Franklin	12/14/2019	4	4	228	46	18	0	4.00	.75	N

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.7	.10	Blaine	12/04/2019	.50	N	N	1

Sort Comments: 4.5 int vol. .30 washout E= 3.60

QC 1 Information

QC Counts: 6

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	12-16-19	1	4	3	1	2	—	.5	316	92%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 72

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Daniel Franklin	12/4/2019	8	8	6	37	0	0	.50	1.00	N

Counts: 43

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.3	.01	Blaine	12/04/2019	.50	N	N	1

Sort Comments: 6.9 int vd. E= 5.29

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-16-19	8	8	—	—	—	—	.25	43	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 73**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 246 — Time (hrs): 1.00

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin	12/20/2019	24	24	140	108	0	0	7.00	1.50	N

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.25	.55	Blaine	12/05/2019	0	N	N	1

Sort Comments: 6.0 int vol. E=1.70

QC 1 Information

QC Counts: 5

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ekeler	12-20-19	5	24	4	1	-	-	.75	272	91%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, RW

8097 - 1 - 74

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts 162 — Time (hrs) 1.00

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Daniel Franklin~~ L Smith	12-15-19	4	4	58	104	Ø	Ø	1.75	.25	/

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.4	.20	Blaine	12/05/2019	Ø	N	N	2

Sort Comments: 7.6 cht vol, E 2.20 1.00 extra tech time For D.F For setup sample

☒ QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-16-19	1	4	—	—	—	—	.5	162	100%	N

QC 1 Comments:

☐ Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐ QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐ Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 75**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 63 — Time (hrs): 1.0

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	12-16-19	1	1	4	58	1	Ø	.75	.25	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.5	.01	Steven L	12-10-19	Ø	N	/	2

Sort Comments: Initial = 9.4 E = 1 jar

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Zeder	12-16-19	8	8	—	—	—	—	.5	63	100%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 76**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	12-15-19	1	1	53	70	Ø	Ø	.75	.25	/

Counts: 123
Time (hrs): .75

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.7	.01	Dan	12-10-19	Ø	N	/	2

Sort Comments: Initial=5.0 E=1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	12-16-19	8	8	1	-	1	-	.25	125	98%	N

QC Counts: 2

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1977 K3

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ L Smith	12-18-19	6	6	84	83	43	0	4.25	.25	

Counts 210; Time (hrs) .50

Primary Matrix: Inorganic
Secondary Matrix: Fine

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.50	.22	Blaire	12/10/2019	0	N	N	

Sort Comments: 3.6 int vol. 1.1 washout E=.28 .50 extra tech time For D.F for 12 sc top of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	1.25	6	5	2	5	2	1.25	222	78%	N

QC Counts 12

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count
L Smith	12/19/19	10	7	14	0	2.5	253	31

Re-Sort Counts 31

Re-Sort 1 Comments:

QC 2 Information

X

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	12-30-19	1.25	6	—	—	—	—	.25	253	100%	N

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECOANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 78**

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	12-18-19	1	1	81	43	0	0	1.25	.25	/

Time (hrs): 1.00

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.20	.03	Blaire	12/10/2019	Ø	N	N	2

Sort Comments: 7.0 int vol. E = 2.17

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Lauren Beckley	12/19/19	8	8	1	0	0	0	.5	125	99%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

Eco ANALYSTS, INC.
LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

AM

8097 - 1 - 79

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

285

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Daniel Franklin	12/12/2019	12	12	184	93	08	0	8.00	1.50	N

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.40	.40	Blaine	12/10/2019	.25	N	N	1

Sort Comments: 6.0 int vol. 1.60 washout E=2.0

☒

QC 1 Information

9

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	1-6-2020	2.5	12	1	7	1	-	1.25	328	86%	N

QC 1 Comments:

☐

Re-Sort 1 Information

11

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count
Dan F	01/07/2020	6	5	0	0	2.00	305	18

Re-Sort 1 Comments:

☒

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	1-13-2020	2.5	12	-	2	-	-	.75	315	96%	N

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 80

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	12/20/19	1	1	27	1	2	Ø	.75	.25	/

.75

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.2	.01	Dan	12-11-19	Ø	N	/	2

Sort Comments: 2.7 initial E=1jar / 2.19

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
MPayne	26 Dec 2019	8	8	6	Ø	Ø	Ø	.25	36	83%	N

QC 1 Comments: 6

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 81**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
~~Laine Smith~~ Dan F.	12/4/2019	12	12	159	44	08	0	6.00	.25	N

Counts: 211 Time (hrs): .75

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.4	.3	Erin	12-11-19	0	N	/	1

Sort Comments: Initial = 4.5 E = 1 jar 1.7 washout .75 extra tech time for L.S for Setup of Sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-6-2020	2.5	6	1	4	-	1	1.5	235	90%	N

QC Counts: 5 Est. % Efficacy: .897

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 82**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
~~Daniel Franklin~~ Larne Smith	12/21/19	4	4	78	60	2	0	3.25	.5	/

Counts: 140 Time (hrs): 1.00

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.0	.10	Blaine	12/11/2019	0	N	N	2

Sort Comments: 8.7 int vol .20 washout E=2.90

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-6-2020	1	4	–	1	1	–	.5	148	94%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 83**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	12/24/2019	8	8	18	02	03	0	.50	1.00	N

23

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.8	.03	Blake	12/11/2019	.25	N	N	1

Sort Comments: 3.0 int vol. E = 2.77

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Prince	26 Dec 2019	8	8	4	0	0	0	0	27	85%	N

QC 1 Comments: 4

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

Eco ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 84

DOP

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	12/24/2019	8	8	22	76	0	0	.75	.25	N

Counts: 98 — Time (hrs): 1.0

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
8.0	.005	Kyle L	12-12-19	Ø	N	/	1

Sort Comments: Initial = 10.2 E = 1 jar 1.00 extra tech time for L.S For Setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	26 Dec 2019	8	8	Ø	Ø	Ø	Ø	.25	98	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

JJP

Sort & QC Bench Sheet

EcoAnalysts, Inc. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 85**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
~~Laine Smith~~ Dan F	12/21/2019	4	4	15	44	3	0	2.25	.25	

Counts: 62 — Time (hrs): 1.0

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.3	.1	Laine	12-12-19	Ø	N	/	1

Sort Comments: Initial = 10.0 1.2 washout E = 1 jar 1.0 extra tech time for L.S for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/9/20	1	4	—	—	—	—	0.25		100%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 86**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) 1.0 Scope	Non-Scope	L/R
Laine Smith	12/21/19	6	6	7	26	0	0	1.75	.25	/

Primary Matrix: Coarse Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.6	.2	Kyle L	12-15-19	0	N	/	2

Sort Comments: Initial = 6.7 E = 1 jar / .4 L

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-14-2020	1.25	6	–	–	–	–	.5	33	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 87**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90% (83)
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	12/21/19	8	8	31	52	Ø	Ø	1.00	.25	/

Time (hrs) 1.25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.1	.01	Blaine	12-17-19	Ø	N	/	2

Sort Comments: Initial = 10.6 E = 1 jar / 6.59L

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
M Payne	26 Dec 2019	8	8	Ø	Ø	Ø	Ø	Ø	83	100%	N

QC 1 Comments: Ø

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

QAP

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 88

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

515 1.0

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time Scope	Time Non-Scope	L/R
Laine Smith	12-26-19	4	6	174	280	61	0	6	1.25	/

Primary Matrix: Fine Organic
Secondary Matrix: Coarse Organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.7	.2	Dylan	12-17-19	0	N	/	3

Sort Comments: Initial=6.7 E=1 jar / .5L

QC 1 Information

7

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-14-2020	1.25	6	1	2	4	-	.5	549	93%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Short Pick Bench Sheet

kAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,Taxo **8097 - 1 . 88**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sort Data

Original Grids

Sorted	Total	Generals	Midges	Worms		Sorted Total	PNC
4.0000	6.0000	175	282	65	=	522	0

Original Technician: Laine Smith
QC Technician: Camper Ziegler
Subsample?: N
Last Sort Activity: Sort QC - Passed

Taxonomy Data

	Generals	Midges	Worms		Total
Identified:	172	260	55	=	487
Rejects:	1	0	8	=	9

General Taxonomist: A2 Navesky
Chiro Taxonomist: G3 Wallace
Olig Taxonomist: Laurie Flaherty

Bugs Needed = 13

Short Pick 1

[X]

Short Pick Technician	Short Pick Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Madelyn Walker	01 20 20	0.5	4	13	17	4	–	0.50	0.25	N

Short Pick Comments:

Short Pick 2

[ ]

Short Pick 2 Technician	Short Pick 2 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 2 Comments:

Short Pick 3

[ ]

Short Pick 3 Technician	Short Pick 3 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 3 Comments:

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, KW

8097 - 1 - 89

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	12-26-19	6	6	155	248	19	Ø	5.25	1.25	/

Time (hrs) 1.0

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.5	.15	Dan	12-18-19	Ø	N	/	2

Sort Comments: 8.9 initial E = 1 jar / 1.35 L

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/9/20	1.25	6	1	1	2	-	0.5		95%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoANALYSTS, INC. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 90**

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 2

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F	12/27/2019	12	12	42	14	1	0	4.00	1.50	N

57 1.25

Primary Matrix: Inorganic

Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.0	.4	Lauren B	12/19/19	0	N	/	1

Sort Comments: Initial=9.7 5.4 washout E=.6/1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-14-2020	2.5	12	1	-	-	1	.5	62	91%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 91**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Time (hrs) 1.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	12-24-19	12	12	207	46	Ø	Ø	8.5	1.75	/

Primary Matrix: Coarse Organic
Secondary Matrix: Fine Organic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.6	.4	Dan	12/19/19	Ø	N	/	2

Sort Comments: Initial=5.9 1.4 washout .2 elutriate / 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/9/20	2.5	12	3	—	—	—	0.5		94%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 92**

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F	12/18/2019	4	4	273	27	1		1.25	.25	N

Counts: 301 — Time (hrs): 1.0

Primary Matrix: Inorganic
Secondary Matrix: Fine

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.1	Laine	12/20/19	0	N	/	1

Sort Comments: Initial = 6.9 .5 washout Elutriate = .1 1/1 jar 1.0 extra tech time for LIS for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/9/20	1	4	0	1	—	—	0.25		98%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 93

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	12/31/19	6	6	225	11	1	0	4.0	1.0	/

Counts: 227 Time (hrs): .75

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.15	.1	Dan	12/20/19	0	N	/	2

Sort Comments: Initial = 5.7 Washout = 2.55 e = .05 / 1 Jar

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-14-2020	2.5	12	2	-	-	-	.5	237	95%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 94**

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	01/02/2020	4	4	221	19	0	0	3.75	1.50	N

Counts: 240

Primary Matrix: Inorganic
Secondary Matrix:

Sample Volume (liters) Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.80	.10	Laine	12/21/2019	Ø	N	N	1

Sort Comments: 9.2 int.vol. 2.3 washout E= .70

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-14-2020	1	4	3	2	-	-	.25	260	92%	N

QC Counts: 5

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

AN

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 95**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Daniel Franklin~~ Laine	1-2-20	1	1	9	49	Ø	Ø	.5	.25	/

Time (hrs): 2.00

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.5	.02	~~Laine~~ Dan	12/21/2019	Ø	/	/	2

Sort Comments: 16.4 in tvol. E= 1.48

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Gmild	1/9/20	8	8	5	—	—	—	0.25		92%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 96

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	1-3-20	12	12	11	28	0	0	2.0	1.75	/

Counts: 39 — Time (hrs): 1.5

Primary Matrix: Coarse Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.4	.4	Steve C	12/24/19	.25	N	/	2

Sort Comments: Initial=14.6 E=5.0 / 1 jar

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Casper Ziegler	1-14-2020	2.5	12	-	-	-	-	.5	39	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,

8097 - 1 - 97

ARI

DATA ENTERED

Sample Information
Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols
Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F	1/03/2020	4	4	9	8	2	0	.50	Ø	N

19

.75

Primary Matrix: Inorganics
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
5.3	.1	Markie	12-27-19	Ø	N	/	1

Sort Comments: Initial = 5.4 E = 5.2 L .75 extra tech time for L.S for school of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/9/20	1	4	—	—	—	—	0.25		100%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 98**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

69 1.25

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Dan F.	01/07/2020	8	8	18	51	0	0	.75	.25	N

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
10.7	.01	Conn	12/31/19	Ø	N	/	1

Sort Comments: Inital = 14.0 E = 10.69 1.25 extra tech time For LS For setup of Sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
K. Guild	1/9/20	8	8	1	—	—	—	0.25		99%	

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	Re-Sort Counts M	Re-Sort Counts W	Re-Sort Counts PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 99**

AN

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Daniel Franklin L Smith	1-4-20	8	24	459	41	26	5	8.0	.5	/

Counts: 526 — Time (hrs): 1.75

Primary Matrix: Fine
Secondary Matrix: Inorganic

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.80	.80	—	—	—	N	N	3

Sort Comments: 13.2 int vol, 10.4 washout

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-14-2020	1.25	6	5	-	3	-	.5	564	93%	N

QC Counts: 8

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 100**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	1-8-20	4	4	349	190	Ø	Ø	4.5	1.25	/

Counts: 539 — Time (hrs): 1.0 + .25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.0	.04	Blaine	1-2-20	Ø	N	/	2

Sort Comments: Initial = 5.3 Washout = 1.1 E = 2.96

QC 1 Information

☒

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-15-2020	1	4	—	—	—	—	.25	539	100%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 101**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician: ~~Laine Smith~~ Dan F.

Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
01/08/2020	4	4	186	49	08	0	2.75	.25	N

Counts: 243
Time: 1.0

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.1	Laine	1-2-20	Ø	N	/	1

Sort Comments: Initial-9.0 1.6 washout .1 elutriate 1.0 extra tech time For L.S. for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-14-2020	1	4	-	3	-	-	.5	255	95%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 102**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	1-11-20	30	48	414	93	5	5	16.0	1.75	/

Counts: 512
Time (hrs): 1.25 + .5

Primary Matrix: Fine Organic
Secondary Matrix: Coarse Organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.5	1.5	—	—	—	—	—	2

Sort Comments: Initial=16.2 Washout=11.1 E=0

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	5	24	1	8	-	-	1.75	555	92%	N

QC Counts: 9

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Short Pick Bench Sheet

kAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,Taxo 8097 - 1 . 102

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sort Data

--- Original Grids ---

Sorted	Total	Generals	Midges	Worms		Sorted Total	PNC
30.0000	48.0000	415	101	5	=	521	5

Original Technician: Laine Smith
QC Technician: Camper Ziegler
Subsample?: N
Last Sort Activity: Sort QC - Passed

Taxonomy Data

	Generals	Midges	Worms		Total
Identified:	407	73	5	=	485
Rejects:	7	1	0	=	8

General Taxonomist: A2 Navesky
Chiro Taxonomist: G3 Wallace
Olig Taxonomist: Laurie Flaherty

Bugs Needed = 15

Short Pick 1

Short Pick Technician	Short Pick Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R
Madelyn Walker	01.20.20	1.25	12	15	14	Ø	-	0.75	0.25	N

Short Pick Comments:

Short Pick 2

Short Pick 2 Technician	Short Pick 2 Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R

Short Pick 2 Comments:

Short Pick 3

Short Pick 3 Technician	Short Pick 3 Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope (hrs)	Non-Scope (hrs)	L/R

Short Pick 3 Comments:

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Short Pick Bench Sheet

kAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,Taxo

Worms
8097 - 1 . 102

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sort Data

Original Grids Sorted	Original Grids Total	Generals	Midges	Worms		Sorted Total	PNC
30.0000	48.0000	415	101	5	=	521	5

Original Technician: Laine Smith
QC Technician: Camper Ziegler
Subsample?: N
Last Sort Activity: Sort QC - Passed

Taxonomy Data

	Generals	Midges	Worms		Total
Identified:	407	73	5	=	485
Rejects:	7	1	0	=	8

General Taxonomist: A2 Navesky
Chiro Taxonomist: G3 Wallace
Olig Taxonomist: Laurie Flaherty

Bugs Needed = 15

Short Pick 1

Short Pick Technician	Short Pick Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Madelyn Walker	01.20.20	1.25	12	15	14	Ø	-	0.75	0.25	N

Short Pick Comments:

Short Pick 2

Short Pick 2 Technician	Short Pick 2 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 2 Comments:

Short Pick 3

Short Pick 3 Technician	Short Pick 3 Date	Grids Sorted	Grids Total	G	M	W	PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R

Short Pick 3 Comments:

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Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,' **8097 - 1 - 103**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 2

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Daniel Franklin	01/09/2020	8	8	44	427	0	0	2.00	1.75	N

471

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
10.00	.03	Blake	01/03/2020	.50	N	N	1

Sort Comments: 15.0 int vol E= 9.97

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Zeaker	1-5-2020	8	8	1	–	–	–	.25	472	99%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

ECO ANALYSTS, INC.
LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort,' **8097 - 1 - 104**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	01/11/2020	4	4	88	310	1	0	8.00	Ø	N

399 .5

Primary Matrix Inorganic **Secondary Matrix**

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.7	.1	Karine	1-4-20	Ø	N	/	1

Sort Comments: Initial = 4.9 Washout = 1.95 E = 2.6 .5 extra tech time for L.S for setup of sample

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	1	4	1	1	-	-	.25	407	98%	N

2

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 105**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	1-12-20	1	1	5	7	Ø	Ø	.5	1.0	Y

Counts: 12 Time (hrs): .75+.25

Primary Matrix: Inorganic
Secondary Matrix: Fine Organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
3.1	.01	Kyle	1-5-20	Ø	N	/	3

Sort Comments: Initial=3.8 E=3.09

☒ QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	8	8	—	—	—	—	.25	12	100%	N

QC 1 Comments:

☐ Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐ QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐ Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 106**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	1-12-20	1	1	Ø	Ø	Ø	Ø	Ø	.75 (.5+.25)	/

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.79	.005	Dan	1-8-20	Ø	N	/	2

Sort Comments: Initial = .8 E = .785

QC 1 Information

☒

QC Technician	QC Date	QC'd	Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-15-2020	8	8	—	—	—	—	—	Ø	100%	N

QC 1 Comments:

Re-Sort 1 Information

☐

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

☐

QC 2 Technician	QC 2 Date	QC'd	Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

☐

Subsample Technician	Subsample Date	Picked	Total	G	M	W	PNC	Sub. Time (hrs)

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LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 107**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
Laine Smith	1-12-20	1	1	2	1	0	0	.25	.5 (.25 + .25)	/

Primary Matrix: Inorganic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.29	.005	Dan	1-8-20	0	N	/	2

Sort Comments: Initial = 1.3 E = 1.285

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-15-2020	8	8	—	—	—	—	—	3	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	QC 2 Counts M	QC 2 Counts W	QC 2 Counts PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	Subsample Counts M	Subsample Counts W	Subsample Counts PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 108**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	Time (hrs) L/R
Laine Smith	1-12-20	1	1	4	0	0	0	.25	.5	/

.25 .25

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.02	.03	Dan	1-8-20	0	N	/	2

Sort Comments: 1.1 initial E= .99

☒ QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cameron Brooks	1-15-2020	8	8	—	—	—	—	.25	4	100%	N

QC 1 Comments:

☐ Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐ QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐ Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

EcoAnalysts, Inc. — Life in Water

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 109**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 437 — Time (hrs): .75 +.25

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
Laine Smith	1-12-20	4	4	102	329	6	5	4.0	1.0	/

Primary Matrix: Fine Organic
Secondary Matrix:

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
6.1	.01	Blaine	1-9-20	Ø	N	/	2

Sort Comments: Initial=6.4 E= 6.09

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	1	4	-	6	-	-	.25	461	94%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

ECO ANALYSTS, INC. LIFE IN WATER

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 110**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time (hrs) Scope	Time (hrs) Non-Scope	L/R
~~Laine Smith~~ Kyle Lock	1/12/20	4	4	3	X	X	X	0.25	0.25	X

.25

Primary Matrix: Large organic
Secondary Matrix: Fine organic

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
.2	.01	Steven L	1-9-20	Ø	N	/	1

Sort Comments: Initial=.215 E=.19

☒

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	8	8	—	—	—	1	.25	3	100%	N

QC 1 Comments:

☐

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

EcoAnalysts, Inc. LIFE IN WATER

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 111**

DATA ENTERED

Sample Information

Shelf Location:

Residue Loc.:

Jars: 1

Sorting Protocols

Target Count: 500

Reject Organisms: Standard

QC Type: 20% of each samples

Count Range: Target Count Minimum

Efficacy Minimum: 90%

Large/Rare: Yes

Mesh Size: 500 Micron

Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Technician	Sort Date	Grids Sorted	Grids Total	Counts G	Counts M	Counts W	Counts PNC	Time Scope	Time Non-Scope	L/R
~~Laine Smith~~ Kyle Lerch	1/12/20	4	4	11	8	X	X	0.5	0.25	X

Counts: 19 Time (hrs): .75

Primary Matrix: Course organic

Secondary Matrix: Fines

Initial Volume	Final Volume	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
2.9	.05	Kyle	1-9-20	0	N	/	1

Sort Comments: Initial = 3.4 E = 2.85

QC 1 Information

QC Technician	QC Date	Grids QC'd	Grids Total	QC Counts G	QC Counts M	QC Counts W	QC Counts PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Camper Ziegler	1-15-2020	8	8	—	—	—	—	.25	19	100%	N

QC 1 Comments:

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	Re-Sort Counts G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	QC 2 Counts G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	Subsample Counts G	M	W	PNC	Sub. Time (hrs)

Sort & QC Bench Sheet

8097 - TeckAmerica UCR Phase3 Sediment Study Benthos 2019: (.1) 500um Fraction Sort, **8097 - 1 - 112**

DATA ENTERED

Sample Information

Shelf Location:
Residue Loc.:
Jars: 1

Sorting Protocols

Target Count: 500
Reject Organisms: Standard
QC Type: 20% of each samples
Count Range: Target Count Minimum
Efficacy Minimum: 90%
Large/Rare: Yes
Mesh Size: 500 Micron
Worms (Mount/ID): Y/Class

Notes: Place a 250 sieve underneath the 500um to capture the material that rinses through, retain this in a seperate container. Keep all Elutriate in a seperate co

Sorting Information

Counts: 318 Time (hrs): .5

Technician	Sort Date	Grids Sorted	Grids Total	G	M	W	PNC	Scope	Non-Scope	L/R
~~Laine Smith~~ Kyle [illegible]	1/12/20	6	1	273	26	19	X	2.75	0.5	X

Primary Matrix: coarse
Secondary Matrix: Fine

Initial Volume (liters)	Final Volume (liters)	Elutriate Check Technician	E Check Date	E Check Hours	Organics Retained	Inorganics Discarded	Post Sorting Jar Count
1.5	2	Dan	1-9-20	0	N	/	1

Sort Comments: 7.9 initial E= 1.3

☒

QC 1 Information

QC Counts: 4

QC Technician	QC Date	Grids QC'd	Grids Total	G	M	W	PNC	QC Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers
Cooper Ziegler	1-15-2020	1.25	6	1	2	1	-	.5	337	94%	N

QC 1 Comments:

☐

Re-Sort 1 Information

Re-Sort Technician	Re-Sort Date	G	M	W	PNC	Re-Sort Time	Total Count	Target Count

Re-Sort 1 Comments:

☐

QC 2 Information

QC 2 Technician	QC 2 Date	Grids QC'd	Grids Total	G	M	W	PNC	QC 2 Time (hrs)	Est. Total Count	Est. % Efficacy	Stragglers

QC 2 Comments:

☐

Subsample Information

Subsample Technician	Subsample Date	Grids Picked	Grids Total	G	M	W	PNC	Sub. Time (hrs)