November 2, 2017

Data_17K0043

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BFK0112-BLK1	Blank	13-05605-000	Water			11/03/2017	11/09/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.100	U	mg/L
BFK0112-BS1	LCS	13-05605-000	Water			11/03/2017	11/09/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.91	1	mg/L
17K0043-01	WUFF-IN	13-05605-000	Water	11/02/2017	11/02/2017	11/03/2017	11/09/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	1.21	1	mg/L
17K0043-02	WUFF-OUT	13-05605-000	Water	11/02/2017	11/02/2017	11/03/2017	11/09/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	1.52	1	mg/L
BFK0112-BLK1	Blank	13-05605-000	Water			11/03/2017	11/09/2017	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
17K0043-01	WUFF-IN	13-05605-000	Water	11/02/2017	11/02/2017	11/03/2017	11/09/2017	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	2.26	1	mg/L
17K0043-02	WUFF-OUT	13-05605-000	Water	11/02/2017	11/02/2017	11/03/2017	11/09/2017	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	2.69	` i	mg/L
BFK0112-BLK1	Blank	13-05605-000	Water			11/03/2017	11/09/2017	NWTPH-Dx	84-15-1	o-Terphenyl	80.1		%
BFK0112-BS1	LCS	13-05605-000	Water			11/03/2017	11/09/2017	NWTPH-Dx	84-15-1	o-Terphenyl	102		%
17K0043-01	WUFF-IN	13-05605-000	Water	11/02/2017	11/02/2017	11/03/2017	11/09/2017	NWTPH-Dx	84-15-1	o-Terphenyl	94.2		%
17K0043-02	WUFF-OUT	13-05605-000	Water	11/02/2017	11/02/2017	11/03/2017	11/09/2017	NWTPH-Dx	84-15-1	o-Terphenyl	105		%



15 November 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>

Associated SDG ID(s)

17K0043



Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, Volgardsen, email=amandav@arilabs.com Date: 2017.11.15 13:35:14 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the regirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Page 2 of 11 17K0043 ARISample FINAL 15 Nov 2017 1333

17KOO43

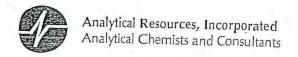


Chain of Custody Record

PORTLAND, OR | MISSOULA, MT | OLYMPIA, WA WINTHROP, WA | GUANGZHOU, CHINA

Williams, wall control of	D 200 14 A	Lucia basis	Client:							Ana	alyses R	equested	1		
Project Name:	Project N		Herrera Envir	onment:	al										-
Hydro International Up-flo Filter	13-056	05-000		Control of the Contro											
Report To:			Сору То:												
Dylan Ahearn													1		
Sampled By: M Nolley			Delivery Method	Delivery Method: 1 ce cooler, hand		ers									
Laboratory: Analytical Resources Inc.		Requested C	ompletion Date:	Total No.	of Contair	ers:	Contain	×							
Lab Use:				Sample Type (see	Preserv- ative?	Matrix (see	Number of Containers	NWTPH-Dx							Lab ID No.
Sample ID	pase	Date	Time	codes)	(Y/N)	codes)									
	11.2.17	1330	13:30	G	N	SW	2	Х							
WUFF-OUT	11.2.17	13.30	3 13:30	G	N	SW	2	Х							
W6F1-001															
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Comments/Special Instructions:															
comments, special															
			- Fee	15	eceived By	/Nama/C	0)		Sign	ature				Date/	Time
Relinquished by (Name/CO/ Signature	M.	1	Date/Time 11.2.17 15.08	R	eceived By	(Name/C	O)		Sign	, cure					
Myhon Muilen Herren Mayh	e 11/h	u							Sign	ature				Date/	Time
Relinquished by (Name/CO/		_	Date/Time	¬ R	eceived By	/ (Name/C	.0)		Sign	ature				0.000	
The state of the s	M	M	1								22.14)_O+b/-	enocify)	
Sample Type: G=Grab C=Composite Ma	trix Codes:	A=Air GW	=Groundwater S	E=Sedime	nt SO=So	oil SW=S	urface	Water	W=Water	(blanks)	M=Ma	terial C	=Other (s	becuy	

HERRERA



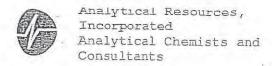
Cooler Receipt Form

ARI Client: Herrya.		1	link	1
COC No(s):		Project Name:	Whenas	
Assigned ARI Job No: 17K0043	NA	Delivered by: Fed-Ex UPS Co	urier Hand Delivered O	ther:
Preliminary Examination Phase:	-	Tracking No:		(NA)
	randa di constant			~
Were custody paper included with the second	seals attached to t	the outside of to cooler?	YES	(NO
Were custody papers included with the cooler?			YES	NO
Were custody papers properly filled out (ink, sig Temperature of Cooler(s) (°C) (recommended 2	ined, etc.)	······································	YES	NO
Inne. — 1208		(2,1)		
If cooler temperature is out of compliance fill out	t form 00070F		Temp Gun ID#: D	002565
Cooler Accepted by: 37		_Date: 11/2/17 Tim	icon	03
Complete	custody forms ar	nd attach all shipping documents		-
Log-In Phase:		Fring accuments		
Was a temperature blank included in the cooler?	?			-
What kind of packing material was used?	Bubble Wron	Wat las Cal Davis	YES	s No
Was sufficient ice used (if appropriate)?	Ednoie MISD	verue Gel Packs Baggies Foan	Block Paper Other:_	
Were all bottles sealed in individual plastic bags	?		NA YES	s 166
Did all bottles arrive in good condition (unbroken	1)?		YES	s (18)
Were all bottle labels complete and legible?	A		XES	1
Did the number of containers listed on COC mate	ch with the numbe	s of contains as a sign to	YES	
Did all bottle labels and tags agree with custody	papers?	or containers received?		100
Were all bottles used correct for the requested a	nalvses?		YES	
Do any of the analyses (bottles) require preserva	ation? (attach prace	enystion about and the trans	YES	NO NO
Were all VOC vials free of air bubbles?	(undon press	ervation sheet, excluding VOCs)	NA YES	s No
Was sufficient amount of sample sent in each bo	ittle?		(NA) YES	S NO
Date VOC Trip Blank was made at ARI			YES	S) NO
	Date/Time:		CNA	
25		Egulpment:	Split b	oy:
Samples Logged by:	Date: _	+6" 11/2/17 Time:	1743	
** Notify F	Project Manager o	of discrepancies or concerns **	13.77	-
CONTRACTOR				
Sample ID on Bottle Sample	ID on COC	Sample ID on Bottle	Sample ID o	n COC
3'			- Cample IB 0	11 000
	4.			-
A.L. Committee of the c	9, 4			
Additional Notes, Discrepancies, & Resolution	ıs:	Tall the second	1	
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4. **		*		
Byr			4	
By: Date:	72	*		
		mall → "sm" (<2 mm)		
		eabubbles \Rightarrow "pb" (2 to < 4 mm)	- i	-
0 0 0	1 1	arge → "lg" (4 to < 6 mm)		
	. Н	leadspace → "hs" (>6 mm)		

0016F 3/2/10

Cooler Receipt Form

Revision 014



Cooler Temperature Compliance Form

Cooler#:	emperature(°C): 12	-1 :
Sample ID	Bottle Count	Bottle Type
Samples recience	- Court	THE STATE OF THE S
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Cooler#:Te	imperature(°C):	
Sample ID	Bottle Count	Bottle Type
*		
Cooler#:Te	mperature(°C):	
Sample ID	Bottle Count	Bottle Type
*		
Cooler#: Ter	mperature(°C):	
Sample ID	Bottle Count	Bottle Type
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completed by:) D.	: 11/2/17 Time: 1508
omported by.	Date	Time: (V)



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn15-Nov-2017 13:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17K0043-01	Water	02-Nov-2017 13:30	02-Nov-2017 15:08
WUFF-OUT	17K0043-02	Water	02-Nov-2017 13:30	02-Nov-2017 15:08

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn15-Nov-2017 13:33

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 2, 2017 under ARI workorder 17K0043. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

There were no target compounds detected in the method blank.

The LCS percent recoveries were within control limits.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 15-Nov-2017 13:33

WUFF-IN 17K0043-01 (Water)

Petroleum Hydrocarbons

 Method: NWTPH-Dx
 Sampled: 11/02/2017 13:30

 Instrument: FID4
 Analyzed: 09-Nov-2017 21:56

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BFK0112 Sample Size: 500 mL Prepared: 03-Nov-2017 Final Volume: 1 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	1.21	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)		1	0.200	2.26	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	94.2	%	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn15-Nov-2017 13:33

WUFF-OUT 17K0043-02 (Water)

Petroleum Hydrocarbons

 Method: NWTPH-Dx
 Sampled: 11/02/2017 13:30

 Instrument: FID4
 Analyzed: 09-Nov-2017 22:15

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BFK0112 Sample Size: 500 mL Prepared: 03-Nov-2017 Final Volume: 1 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	1.52	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	2.69	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	105	%	

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 15-Nov-2017 13:33

Petroleum Hydrocarbons - Quality Control

Batch BFK0112 - EPA 3510C SepF

Instrument: FID4 Analyst: ML

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0112-BLK1)			Prep	ared: 03-Nov	-2017 Ar	alyzed: 09-	Nov-2017 2	20:57		
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl		0.360	mg/L	0.450		80.1	50-150			
LCS (BFK0112-BS1)			Prep	ared: 03-Nov	-2017 Ar	nalyzed: 09-	Nov-2017 2	21:18		
Diesel Range Organics (C12-C24)	2.91	0.100	mg/L	3.00		97.1	56-120			
Surrogate: o-Terphenyl		0.460	mg/L	0.450		102	50-150			

Analytical Resources, Inc.



Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
15-Nov-2017 13:33

Certified Analyses included in this Report

Analyte	Certifications
NWTPH-Dx in Water	
Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	09/01/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn15-Nov-2017 13:33

Notes and Definitions

U This analyte is not detected above the applicable reporting or detection limit.

H Hold time violation - Hold time was exceeded.

D The reported value is from a dilution

* Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.

Data_17K0068

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17K0068-01	WUFF-IN	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/07/2017	11/15/2017	SM 2340 B-97		Hardness	72.1		mg/L
17K0068-02	WUFF-OUT	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/07/2017	11/15/2017	SM 2340 B-97		Hardness	69.3		mg/L
17K0068-01	WUFF-IN	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/09/2017	11/09/2017	ASTM D3977	SC_>63	> 63 µm	36.01		mg/L
17K0068-02	WUFF-OUT	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/09/2017	11/09/2017	ASTM D3977	SC_>63	> 63 µm	1.72		mg/L
17K0068-01	WUFF-IN	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/09/2017	11/09/2017	ASTM D3977	SC_<63	< 63 µm	8.20		mg/L
17K0068-02	WUFF-OUT	13-05605-000		11/03/2017			11/09/2017	ASTM D3977	SC_<63	< 63 µm	5.26		mg/L
17K0068-01	WUFF-IN	13-05605-000		11/03/2017				ASTM D3977	SC_TOTAL	Total SSC	44.21		mg/L
17K0068-02	WUFF-OUT	13-05605-000		11/03/2017				ASTM D3977	SC_TOTAL	Total SSC	6.98		mg/L
BFK0122-BLK1	Blank	13-05605-000					11/04/2017		1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFK0122-BS1	LCS	13-05605-000					11/04/2017		1426-54-42	Orthophosphorus	0.153		mg-P/L
17K0068-01	WUFF-IN	13-05605-000		11/03/2017	11/04/2017		11/04/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0220		mg-P/L
17K0068-02	WUFF-OUT	13-05605-000		11/03/2017	11/04/2017		11/04/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0210		mg-P/L
BFK0177-BLK1	Blank	13-05605-000		11/00/2017	11/01/2017			EPA 6010C	7440-70-2	Calcium	0.0500	U	mg/L
BFK0177-BS1	LCS	13-05605-000						EPA 6010C	7440-70-2	Calcium	10.2		mg/L
BFK0177-DUP1	WUFF-IN	13-05605-000		11/03/2017	11/04/2017	11/07/2017			7440-70-2	Calcium	18.6		mg/L
BFK0177-MS1	WUFF-IN	13-05605-000					11/15/2017	EPA 6010C	7440-70-2	Calcium	29.5		mg/L
17K0068-01	WUFF-IN	13-05605-000					11/15/2017		7440-70-2	Calcium	18.9		mg/L
17K0068-01	WUFF-OUT	13-05605-000						EPA 6010C	7440-70-2	Calcium	18.8		mg/L
BFK0177-BLK1	Blank	13-05605-000		11/03/2017	11/04/2017			EPA 6010C	7439-95-4	Magnesium	0.0500	U	
BFK0177-BEK1	LCS	13-05605-000						EPA 6010C	7439-95-4	Magnesium	11.0	U	mg/L
BFK0177-BS1	WUFF-IN	13-05605-000		11/02/2017	11/04/2017			EPA 6010C	7439-95-4				mg/L
BFK0177-D0P1	WUFF-IN									Magnesium	5.85		mg/L
		13-05605-000		11/03/2017				EPA 6010C	7439-95-4	Magnesium	17.1		mg/L
17K0068-01	WUFF-IN	13-05605-000		11/03/2017				EPA 6010C	7439-95-4	Magnesium	6.02		mg/L
17K0068-02	WUFF-OUT	13-05605-000		11/03/2017	11/04/2017			EPA 6010C	7439-95-4	Magnesium	5.45		mg/L
BFK0234-BLK1	Blank	13-05605-000					11/16/2017		7440-50-8	Copper	0.500	U	ug/L
BFK0234-BS1	LCS	13-05605-000					11/16/2017		7440-50-8	Copper	27.2		ug/L
BFK0234-BS2	LCS	13-05605-000		4.4.100.100.47	44/04/0047		11/17/2017		7440-50-8	Copper	26.1		ug/L
17K0068-01	WUFF-IN	13-05605-000			11/04/2017		11/16/2017		7440-50-8	Copper	26.8		ug/L
17K0068-02	WUFF-OUT	13-05605-000		11/03/2017	11/04/2017		11/16/2017		7440-50-8	Copper	18.9		ug/L
BFK0234-BLK1	Blank	13-05605-000					11/16/2017		7440-50-8	Copper	0.500	U	ug/L
BFK0234-BS1	LCS	13-05605-000					11/16/2017		7440-50-8	Copper	27.4		ug/L
BFK0234-BS2	LCS	13-05605-000					11/17/2017		7440-50-8	Copper	26.1		ug/L
BFK0234-BLK1	Blank	13-05605-000					11/16/2017		7440-66-6	Zinc	4.00	U	ug/L
BFK0234-BS2	LCS	13-05605-000							7440-66-6	Zinc	93.2		ug/L
17K0068-01	WUFF-IN	13-05605-000							7440-66-6	Zinc	112		ug/L
17K0068-02		13-05605-000		11/03/2017	11/04/2017				7440-66-6	Zinc	53.2		ug/L
BFK0234-BLK1	Blank	13-05605-000					11/16/2017		7440-66-6	Zinc	4.00	U	ug/L
BFK0234-BS1	LCS	13-05605-000	Water				11/16/2017		7440-66-6	Zinc	93.2		ug/L
BFK0234-BS2	LCS	13-05605-000	Water			11/09/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	89.4		ug/L
BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	28.2		ug/L
17K0068-04	WUFF-IN	13-05605-000			11/04/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-50-8	Copper	12.2		ug/L
17K0068-05	WUFF-OUT	13-05605-000	Stormwater	1/03/2017	1/04/2017	1/10/2017	1/15/2017	EPA 200.8-Dissolved	7440-50-8	Copper	14.1		ug/L
BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	28.4		ug/L
	Blank	13-05605-000							7440-66-6	Zinc	4.00	U	ug/L
BFK0282-BS1	LCS	13-05605-000							7440-66-6	Zinc	94.7		ug/L
	WUFF-IN			11/03/2017	11/04/2017				7440-66-6	Zinc	36.5		ug/L
	i .						1	EPA 200.8-Dissolved	1	i .	1		ug/L

Data_17K0068

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	86.6		ug/L
BFK0547-BLK1	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BLK3	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BS1	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.306		mg-P/L
BFK0547-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.310		mg-P/L
BFK0547-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.308		mg-P/L
17K0068-02	WUFF-OUT	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0640		mg-P/L
BFK0548-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK3	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK4	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS4	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.320		mg-P/L
17K0068-01	WUFF-IN	13-05605-000	Stormwater	11/03/2017	11/04/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.188		mg-P/L



06 December 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)

Associated SDG ID(s)

17K0068

N/A



Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Client Services, cn=Amanda Volgardsen, email=amandav@arilabs.com Date: 2017.12.06 16:41:14 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202



2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name:	Projec	t Number:	Client:								A	nalyses	Reque	sted				
Hydro International Up-flo Filter	13-0	5605-000	Herrera Environmental				u.	This is	22							11.7		
Report To:			Copy To:				9	tration	100	M 39			100					
Dylan Ahearn							12540D	cent	ids .	AST	5.3	5.3	40B	8.0				
Sampled By: Molley			Delivery Metho	d: Lev, 40	nd delivit	Sug	MS -spile	Sediment Concentration	Suspended solids	Particle size Distribution - ASTM 3977	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	Hardness as CaCO3-SM 2340B	Copper, dissolved - EPA 200.8	200.8	A 200.8	9.8	
Laboratory:		Requested C	ompletion Date:	Total No.	of Contai	ners:	og p	di	edsi	istri	sura	snuc	Sacc	- pə/	EPA	<u> </u>	4 20	
Analytical Resources Inc.					3		ende	d Se	e St	ze D	spho	spho	as (vloss	- E	lved	EP.	
Lab Use:		**		Sample Type (see	Preser- vative?	Matrix (see	Total Suspended Solids-	spende MD3977	Total volatile S SM2540-E	article si	otal pho	rthopho	ardness	pper, dis	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	Tot	Sus	SMI	ď.	Ĕ	0	I	ပိ	ပိ	Zin	Zin	Lat
WUFF-IN		11.3.17	16:20	С	N	SW	X	X	x	X	X	X	Х	X	Χ	X	X	[-1
WUFF-OUT		11.3.17	10:20	С	N	SW	х	Х	X	Х	X	X	Х	Х	X	X	Х	
MUFF-IN QA		11.3.17		e	N	200	+	7	+	X	+	+	+	X	X	X	X	
																		0 - 1
						7												
												74						-
									1									
Comments/Special Instructions:								_										
Send 1 liter to ETS, Inc 975 Trans	sport Way, Suite 2. Pet	aluma, CA	for PSD, TSS, a	nd TVSS.	PSD to	be run f	or >5	00, 50	00-125	, 125-	62.5,	62.5-	4, <4.					
								W 7 (K)								Data F	Tim ~	
Relinquished by (Name/CO/ Wegner MMer Heyrer	Signature	1	Date/Time	Re	ceived By	(Name/CC))		3	Signatur /	re	(1			1	Date/1		7:55
Meghan While Heyrer	Minh, MM	n	8:00	V	LN	Spol	11			V	1	V				11 4 1 Date/1	-	+,>>
Relinquished by (Name/CO/	Signature		Date/Time	Re	ceived By	(Name/CC))		3	Signatu	i e					Date/	ine	
		7 70 7 7 7 7				4 400 100		70 A L					and a f	0.01		:6.3		
Sample Type: G=Grab C=Composite	Matrix Codes:	A=Air GW=	Groundwater SE	=Sediment	SO=Soi	i SW=Su	irface V	vater	W=Wa	iter (bla	inks)	ivi=iviat	erial	U=Uthe	i (spec	.iry)		

db Hydro upflo COC Grab Sample.docx

HERRERA



Cooler Receipt Form

ARI Client: Herver	2	Project Name:	drolntorn	24191101
COC No(s):	NA	Delivered by: Fed-Ex UPS	Couries Hand Dall	- IS
Assigned ARI Job No:	17K0068	Tracking No:	Courier Hand Delly	
Preliminary Examination P	hase:	Tracking No.		NA
Were intact, properly signe	d and dated custody seals attach	ed to the outside of to see less		
Were custody papers include	ded with the cooler?	icd to the odiside of to cooler?		YES NO
Were custody papers prope	erly filled out (ink, signed, etc.)	***************************************		YES NO
remperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for	chemistry)	<	YES NO
Tarries		5.0 60	5.9 5.8	
	of compliance fill out form 00070i	F	Temp Gun ID#	# DUS206
Cooler Accepted by:		Date:	Time: _ 755	
Log-In Phase:	Complete custody for	ms and attach all shipping docume	ents	
Was a temperature blank in	cluded in the cooler?			1/50
What kind of packing mate	erial was used? Bubble V	Wrap Wet Ice Gel Packs Baggies F	nam Block Danes O	YES (NO)
Was sufficient ice used (if a	ppropriate)?	. Of Political Baggles P		
Were all bottles sealed in inc	dividual plastic bags?		NA	NO NO
Did all bottles arrive in good	condition (unbroken)?			YES NO
Were all bottle labels comple	ete and legible?			YES NO
Did the number of containers	s listed on COC match with the n	umber of containers received?		NO NO
Did all bottle labels and tags	agree with custody papers?		ou.	WES NO
Were all bottles used correct	t for the requested analyses?			YES NO
Do any of the analyses (bott	les) require preservation? (attach	preservation sheet, excluding VOCs		YES NO
Were all VOC vials free of ai	r bubbles?	Preservation allest excidding AOCs		YES NO
Was sufficient amount of sar	nple sent in each bottle?	•	(NA)	YES NO
Date VOC Trip Blank was ma	ade at ARI			NO NO
Was Sample Split by ARI:		/	hum	- A1
		/ LquipmentC	ruil 11=	Split by:
amples Logged by:		Pate:	1159	
	** Notify Project Mana	ager of discrepancies or concerns	**	
Sample ID on Bottle				
Cample to on bottle	Sample ID on COC	Sample ID on Bottle	Sampl	e ID on COC
W H	- 14	31		
Additional Notes, Discrepa	noins & Banalutia			
idanional ficies, biscrepar	icles, & Resolutions:			
30			9	
ř ²³		hell.		
Ву:	Date:			
6 H4: 5 4: 3r	18. 1 T=	Small → "sm" (<2 mm)		
	LARGE AT Bubbles of mm > 4 mm	Peabubbles → "pb" (2 to < 4 mm	×	
	0.000	Large > "lg" (4 to < 6 mm)		
		Headspace → "hs" (>6 mm)		

0016F 3/2/10

Cooler Receipt Form

Revision 014

Printed: 11/4/2017 11:50:18AM

WORK ORDER

17K0068

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	pН	
17K0068-01 A	HDPE NM, 1000 mL		
17K0068-01 B	HDPE NM, 1000 mL		
17K0068-01 C	HDPE NM, 1000 mL		
17K0068-01 D	HDPE NM, 500 mL, 1:1 HNO3	Dree	
17K0068-01 E	Small OJ, 500 mL	¥(A))	
17K0068-01 F	Small OJ, 500 mL, 9N H2SO4	Dass	
17K0068-02 A	HDPE NM, 1000 mL	F(X 3 3	
17K0068-02 B	HDPE NM, 1000 mL		
17K0068-02 C	HDPE NM, 1000 mL		
17K0068-02 D	HDPE NM, 500 mL, 1:1 HNO3	Dicc	
17K0068-02 E	Small OJ, 500 mL	M(A,S)	
17K0068-02 F	Small OJ, 500 mL, 9N H2SO4	D. CC	
17K0068-03 A	HDPE NM, 1000 mL	(65)	
17K0068-03 B	HDPE NM, 1000 mL		
17K0068-03 C	HDPE NM, 1000 mL		
17K0068-03 D	HDPE NM, 500 mL, 1:1 HNO3	Pass	
17K0068-03 E	Small OJ, 500 mL	1005	
17K0068-03 F	Small OJ, 500 mL, 9N H2SO4	Pass	
17K0068-04 A	HDPE NM, 500 mL	Faul	
17K0068-05 A	HDPE NM, 500 mL	Faul	
17K0068-06 A	HDPE NM, 500 mL	Fai	

Preservation Confirmed By

Reviewed By

Date

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project:	Hydro International (17K0068)	Date Received:	November 8, 2017
Project #:	16T001-035	Sampled By:	Others
Client :	Analytical Resources, Inc.	Date Reported:	November 30, 2017
Source:	Multiple	Tested By:	B. Goble
MTC Sample#:	Multiple		

CASE NARRATIVE

 Two samples were submitted for sediment concentration by ASTM D3977, Method C. The coarse material was screened over a No. 230 sieve. The suspended solids are reported in mg/L. The data is provided in a summary table. There were no other noted anomalies in this project. 	

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Page 5 of 29 17K0068 ARISample FINAL 06 Dec 2017 1638

Page 6 of 29 17K0068 ARISample FINAL 06 Dec 2017 1638

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0068) Project #: 16T001-035

Date Received: November 8, 2017 Date Tested: November 9, 2017

Sampled by: Others Tested by: B. Goble

Client: Analytical Resources, Inc.

Suspended Sediment Concentration ASTM D3977 Method C

	Client Sample ID	MTC Sample ID	Sampling Date	Coarse Fraction SSC (>63µm) (mg/L)	FineFraction SSC (<63µm) (mg/L)	Total Suspended Sediment Concentration (mg/L)
ľ	WUFF-IN	T17-1606	11/3/2017	36.0	8.2	44.2
Γ	WUFF-OUT	T17-1607	11/3/2017	1.7	5.3	7.0

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Regional Offices: Olympia ~ 360.534.9777 Bellingham ~ 360.647.6111 Silverdale ~ 360.698.6787

Tukwila ~ 206.241.1974

Visit our website: www.mtc-inc.net



ETS

Environmental Technical Services

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-Technical Support

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e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

COMPANY:	Analytical Resources, Inc., 4611 S. 134th Place, Suite	100, Tukwila, W	/A 98168		ANALYST(S)	SUPERVISOR
ATTN:	Amanda Volgardsen	DATE	DATE	DATE	S. Santos	D. Jacobson
JOB:	Hydro International Up-Flo Filter	COLLECTED	RECEIVED	COMPLETED	L. Quijano	LAB DIRECTOR
SITE:	Oregon-Washington	11/3/2017	11/7/2017	11/15/2017		G.S. Conrad, PhD

SITE:	Oregon-Was	shington			11/3/2017	11/7/2017	11/15/2017		G.S. Conrad,Phl
		PARTICL	E SIZE DISTI	RIBUTION (PS	D) ANALYSI	S & REPORT	- 5 PART		1
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	SUSPENDED SOLIDS	SUSPENDED SOLIDS I mg/l @ 125 µ	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS, mg/l @ 1 µ	SUSPENDED SEDIMENT CONG TSS mg/l
07557-1	HI-31HEC/RW 17K0068		2.5 5.9%	10.5 24.7%	11.5 27.1%	Total SSC by	5.1 12.0% / Summation →	12.9 30.4% 42.5	40.0
07557-2	HI-32HEC/RW 17K0068		0.0 0.0%	1.0 10.0%	0.5 5.0%	Total SSC by	0.0 0.0% / Summation →	8.5 85.0% 10.0	9.0
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! / Summation →	#DIV/0! 0.0	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] μS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE D SOLIDS (TVSS mg/l

COMMENTS

The matrix has a very low concentration of TSS particles amounting to only about 40 ppm in the input sample; and the output sample is extremely low at 9-10 ppm. For the -IN & -OUT pair of samples, the overall reduction averaged right at 77% (i.e., TSS by summation vs analytical TSS). The specific fraction reductions going from coarsest to finest sizes are as follows: 100%, 90.5%, 95.7%, 100%, and 34.1%. Note that there was a 100% reduction in the 4-63 μ fraction which is somewhat unusual, although there was a 'dip' in mass in the input sample for this fraction. Notice that the distribution is essentially bi-modal with a mode in the mid-range and the other, slightly greater, mode was at the finest fraction (i.e., 1-4 μ class). This sort of distribution seems to be very unusual. The RPDs are essentially excellent as follows: $\pm 3.0\%$, and $\pm 5.3\%$.

\\\ NOTES: Tests were done according to methodology as per Association of Testing Materials (ASTM): Suspended Sediment Concentration

– Modified ASTM D3977 (Practice for Determining Suspended-Sediment Concentration in Water Samples). Standard Methods is followed for
the other tests: Color - 2120 C; Spec Cond. (ECw) - 2510 B; Iron - 3500-Fe B; pH - 4500-H+ B; TRPH - 5520 C.



Herrera Environmental Consultants
Project: Hydro International
2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
06-Dec-2017 16:38

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17K0068-01	Water	03-Nov-2017 16:20	04-Nov-2017 07:55
WUFF-OUT	17K0068-02	Water	03-Nov-2017 16:20	04-Nov-2017 07:55
WUFF-IN QA	17K0068-03	Water	03-Nov-2017 16:20	04-Nov-2017 07:55
WUFF-IN	17K0068-04	Water	03-Nov-2017 16:20	04-Nov-2017 07:55
WUFF-OUT	17K0068-05	Water	03-Nov-2017 16:20	04-Nov-2017 07:55

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 4, 2017 under ARI workorder 17K0068. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS, TVSS and PSD analysis were subcontracted to ETS Labs. The SSC analysis was subcontracted to MTC Labs.

Total Hardness - EPA Method 6010C

The samples were digested and analyzed within the recommended holding times.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

A matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recoveries and duplicate RPD were within QC limits.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

The samples were prepared and analyzed within the recommended holding times.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

WUFF-IN 17K0068-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/03/2017 16:20

 Instrument: ICPMS2
 Analyzed: 16-Nov-2017 21:05

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234 Sample Size: 25 mL

Prepared: 09-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	26.8	ug/L	
Zinc	7440-66-6	1	4.00	112	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

WUFF-IN 17K0068-01 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/03/2017 16:20

 Instrument: ICP2
 Analyzed: 15-Nov-2017 18:17

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0177 Sample Size: 25 mL Prepared: 07-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 18.9 mg/L Magnesium 7439-95-4 1 0.0500 6.02 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

WUFF-IN 17K0068-01 (Water)

Wet		

 Method: SM 4500-P E-99
 Sampled: 11/03/2017 16:20

 Instrument: UV1800-2
 Analyzed: 04-Nov-2017 14:32

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0122 Sample Size: 50 mL Prepared: 04-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0220 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.188 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100

Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 06-Dec-2017 16:38

WUFF-IN 17K0068-01 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/03/2017 16:20 Instrument: [CALC] Analyzed: 15-Nov-2017 18:17

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 07-Nov-2017

Final Volume: 1

Reporting CAS Number Dilution Limit Units Analyte Result Notes Hardness 0.331 72.1 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 06-Dec-2017 16:38

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN 17K0068-01 (Water)

*** DEFAULT GENERAL METHOD ***

 Method: ASTM D3977
 Sampled: 11/03/2017 16:20

 Instrument: MT&C
 Analyzed: 09-Nov-2017 00:00

Sample Preparation: Preparation Method: No Prep Geo

Preparation Batch: B110917

Prepared: 09-Nov-2017 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	36.01	mg/L	
< 63 μm	SC_<63	1	0.1	8.20	mg/L	
Total SSC	SC_TOTAL	1	0.1	44.21	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-OUT 17K0068-02 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/03/2017 16:20

 Instrument: ICPMS2
 Analyzed: 16-Nov-2017 21:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234

Prepared: 09-Nov-2017

Sample Size: 25 mL Final Volume: 25 mL

Reporting Limit Units Analyte CAS Number Dilution Result Notes 7440-50-8 0.500 18.9 ug/L Copper Zinc 7440-66-6 1 4.00 53.2 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

WUFF-OUT 17K0068-02 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/03/2017 16:20

 Instrument: ICP2
 Analyzed: 15-Nov-2017 17:53

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0177 Sample Size: 25 mL Prepared: 07-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 18.8 mg/L Magnesium 7439-95-4 1 0.0500 5.45 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

WUFF-OUT 17K0068-02 (Water)

*** * *	~		
Wet	(Th	emis	trv

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 04-Nov-2017 14:32

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0122 Sample Size: 50 mL Prepared: 04-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0210 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate

Preparation Batch: BFK0547 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0640 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants
Project: Hydro International
2200 6th Avenue, Suite 1100
Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn06-Dec-2017 16:38

WUFF-OUT 17K0068-02 (Water)

Calculation

 Method: SM 2340 B-97
 Sampled: 11/03/2017 16:20

 Instrument: [CALC]
 Analyzed: 15-Nov-2017 17:53

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]

Prepared: 07-Nov-2017 Final Volume: 1

Analyte CAS Number Dilution Result Units Notes

Hardness 1 0.331 69.3 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-OUT 17K0068-02 (Water)

*** DEFAULT GENERAL METHOD ***

 Method: ASTM D3977
 Sampled: 11/03/2017 16:20

 Instrument: MT&C
 Analyzed: 09-Nov-2017 00:00

Sample Preparation: Preparation Method: No Prep Geo

Preparation Batch: B110917

Prepared: 09-Nov-2017 Final Volume:

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	1.72	mg/L	
< 63 μm	SC_<63	1	0.1	5.26	mg/L	
Total SSC	SC_TOTAL	1	0.1	6.98	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN 17K0068-04 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/03/2017 16:20

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 02:14

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL

Prepared: 10-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	12.2	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	36.5	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 06-Dec-2017 16:38

WUFF-OUT 17K0068-05 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/03/2017 16:20

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 02:19

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL

Prepared: 10-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	14.1	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	36.2	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
Project Number: 13-05605-000

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn **Reported:** 06-Dec-2017 16:38

Metals and Metallic Compounds - Quality Control

Batch BFK0177 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0177-BLK1)			Prepa	ared: 07-Nov	v-2017 An	alyzed: 15-	-Nov-2017 1	7:49		
Calcium	ND	0.0500	mg/L			· ·				U
Magnesium	ND	0.0500	mg/L							U
LCS (BFK0177-BS1)			Prepa	ared: 07-Nov	v-2017 An	alyzed: 15-	-Nov-2017 1	8:25		
Calcium	10.2	0.0500	mg/L	10.0		102	80-120			
Magnesium	11.0	0.0500	mg/L	10.0		110	80-120			
Duplicate (BFK0177-DUP1)	Source:	17K0068-01	Prepa	ared: 07-Nov	v-2017 Ana	alyzed: 15-	-Nov-2017 1	8:13		
Calcium	18.6	0.0500	mg/L		18.9			1.62	20	
Magnesium	5.85	0.0500	mg/L		6.02			2.83	20	
Matrix Spike (BFK0177-MS1)	Source:	17K0068-01	Prepa	ared: 07-Nov	v-2017 Ana	alyzed: 15-	-Nov-2017 1	8:21		
Calcium	29.5	0.0500	mg/L	10.0	18.9	106	75-125			
Magnesium	17.1	0.0500	mg/L	10.0	6.02	111	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.

Reported:



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Project: Hydro International Project Number: 13-05605-000 Project Manager: Dylan Ahearn

Seattle WA, 98121

06-Dec-2017 16:38

Metals and Metallic Compounds - Quality Control

Batch BFK0234 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0234-BLK1)				Prep	ared: 09-Nov	v-2017 An	alyzed: 16-	Nov-2017 2	0:23		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0234-BS1)				Prep	ared: 09-Nov	v-2017 An	alyzed: 16-	Nov-2017 2	0:44		
Copper	63	27.2	0.500	ug/L	25.0		109	80-120			
Copper	65	27.4	0.500	ug/L	25.0		110	80-120			
Zinc	67	93.2	4.00	ug/L	80.0		117	80-120			
LCS (BFK0234-BS2)				Prep	ared: 09-Nov	v-2017 An	alyzed: 17-	Nov-2017 1	6:44		
Copper	63	26.1	0.500	ug/L	25.0		104	80-120			
Copper	65	26.1	0.500	ug/L	25.0		104	80-120			
Zinc	66	93.2	4.00	ug/L	80.0		116	80-120			
Zinc	67	89.4	4.00	ug/L	80.0		112	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 06-Dec-2017 16:38

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0282 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0282-BLK1)				Prepa	ared: 10-Nov	v-2017 An	alyzed: 10-	Nov-2017 1	9:51		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFK0282-BS1)				Prepa	ared: 10-Nov	v-2017 An	alyzed: 10-	Nov-2017 2	0:11		
Copper, Dissolved	63	28.2	0.500	ug/L	25.0		113	80-120			
Copper, Dissolved	65	28.4	0.500	ug/L	25.0		114	80-120			
Zinc, Dissolved	66	94.7	4.00	ug/L	80.0		118	80-120			
Zinc, Dissolved	67	86.6	4.00	ug/L	80.0		108	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

Wet Chemistry - Quality Control

Batch BFK0122 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0122-BLK1)			Prepa	ared: 04-Nov	v-2017 An	alyzed: 04-	Nov-2017 1	4:28		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFK0122-BS1)			Prepa	ared: 04-Nov	v-2017 An	alyzed: 04-	Nov-2017 1	4:29		
Orthophosphorus	0.153	0.0040	mg-P/L	0.150		102	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 06-Dec-2017 16:38

Wet Chemistry - Quality Control

Batch BFK0547 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0547-BLK1)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	Nov-2017 1	5:25		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK2)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:34		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK3)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:52		
Total Phosphorus	ND	0.0080	mg-P/L							U
LCS (BFK0547-BS1)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:26		
Total Phosphorus	0.306	0.0080	mg-P/L	0.300		102	90-110			
DL (BFK0547-BS2)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:34		
Total Phosphorus	0.310	0.0080	mg-P/L	0.300		103	90-110			
LCS (BFK0547-BS3)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:52		
Total Phosphorus	0.308	0.0080	mg-P/L	0.300		103	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International Project Number: 13-05605-000 Project Manager: Dylan Ahearn

Reported: 06-Dec-2017 16:38

Wet Chemistry - Quality Control

Batch BFK0548 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0548-BLK2)			Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	6:50		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK3)			Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	7:08		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK4)			Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	7:22		
Total Phosphorus	ND	0.0080	mg-P/L							U
DL (BFK0548-BS2)			Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	6:52		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS3)			Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	7:10		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS4)			Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	7:22		
Total Phosphorus	0.320	0.0080	mg-P/L	0.300		107	90-110			

Analytical Resources, Inc.





Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

Seattle WA, 98121

Project Manager: Dylan Ahearn

Reported: 06-Dec-2017 16:38

Certified Analyses included in this Report

Analyte	Certifications

EPA 200.8 in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP

EPA 6010C in Water

Calcium WADOE,NELAP,DoD-ELAP Magnesium WADOE,NELAP,DoD-ELAP

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Dec-2017 16:38

Notes and Definitions

U	This analyte is not	detected above	the applicable	reporting or	detection limit.

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

* Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.

November 4, 2017

Data_17K0089

1700898-01 WUFF-IN 13-05005-000 Surface Water 1109/2017	ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
1700896-03 WUFF-OUT 13-05665-000 Surface Water 10-06/2017 11-06/2017	17K0089-01	WUFF-IN	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/07/2017	11/15/2017	SM 2340 B-97		Hardness	51.8		mg/L
17K0089-01 WUFF-IN 13-05660-000 Surface Water 1106/2017	17K0089-02	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/07/2017	11/15/2017	SM 2340 B-97		Hardness	50.4		mg/L
17K0089-01 WUFF-IN 13-96660-000 Surface Water 1066/2017 1166/2017	17K0089-03	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/07/2017	11/15/2017	SM 2340 B-97		Hardness	49.8		mg/L
17K0089-03 WUFF-N DUP 13-08505-000 Surface Water 1106/22017 1106/22017 1109/22017 ASTM D93977 SC .83 > 63 µm 0.43 mg/L 17K0089-02 WUFF-N DUP 13-08505-000 Surface Water 1106/22017 1109/22017 1109/22017 ASTM D93977 SC .83 < 63 µm 0.85 mg/L 17K0089-03 WUFF-N 13-08505-000 Surface Water 1106/22017 1109/22017 1109/22017 ASTM D93977 SC .63 < 63 µm 0.70 mg/L 17K0089-01 WUFF-N 13-08505-000 Surface Water 1106/22017 1109/22017 1109/22017 ASTM D93977 SC .63 < 63 µm 2.70 mg/L 17K0089-03 WUFF-N 13-08505-000 Surface Water 1106/22017 1109/22017 1109/22017 ASTM D93977 SC .70TAL Total SSC .63 mg/L 17K0089-03 WUFF-N 13-08505-000 Surface Water 1106/22017 1109/22017 1109/22017 ASTM D93977 SC .70TAL Total SSC .63 mg/L REK0161-BS1 Blank 13-08505-000 Surface Water 1106/22017 1109/22017 1109/22017 ASTM D93977 SC .70TAL Total SSC .63 mg/L REK0161-BS1 LCS 13-08505-000 Surface Water 1106/22017 1106/22017 1106/22017 ASTM D93977 SC .70TAL Total SSC .63 mg/L REK0161-BS1 LCS 13-08505-000 Surface Water 1106/22017 1106/22017 1106/22017 ASTM D93977 SC .70TAL Total SSC .63 mg/L Total SSC 13 mg/L Total	17K0089-01	WUFF-IN	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_>63	> 63 µm	13.55		
17K0089-01 WUFF-IN 13-95805-000 Surface Water 11062/2017 11092/2017 110	17K0089-02	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_>63	> 63 µm	8.16		mg/L
17K0089-02 WUFF-IN DUP 3-05605-000 Surface Water 1/06/2017 1/09/2017 1/09/2017 ASTM D3977 SC. 63 < 8.5 µm 7.80 mg/L	17K0089-03	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_>63	> 63 µm	0.43		mg/L
17K0089-03 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/09/2017	17K0089-01	WUFF-IN	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_<63	< 63 µm	6.95		mg/L
17K0089-01 WUFF-IN 3-95605-000 Surface Water 1106/2017 1109/2017 1109/2017 1309/2017 STM D3977 SC. TOTAL Total SSC 2.5 mgL 17K0089-02 WUFF-IN D1 3-95605-000 Surface Water 1106/2017 1109/2017 1109/2017 1309/2017 STM D3977 SC. TOTAL Total SSC 3.1 mgL MgC017 1109/2017 1109/2017 MgC017	17K0089-02	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_<63	< 63 µm	7.80		mg/L
17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017	17K0089-03	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_<63	< 63 µm	2.70		mg/L
17K0089-03 WUFF-OUT 13-05605-000 Water 17K008-001	17K0089-01	WUFF-IN	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_TOTAL	Total SSC	20.5		mg/L
17K0899-03 WUFF-OUT 13-05605-000 Water 17K082017 17K0820	17K0089-02	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_TOTAL	Total SSC	15.96		
BFK0161-BLK1 Blank 13-95605-000 Water 11/06/2017 11/06/201	17K0089-03	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/09/2017	11/09/2017	ASTM D3977	SC_TOTAL	Total SSC	3.13		
BFK0161-BS1 LCS	BFK0161-BLK1	Blank	13-05605-000	Water			11/06/2017	11/06/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	
BFK0161-DUP1 WUFF-N 13-95605-000 Surface Water 11/06/2017	BFK0161-BS1	LCS					11/06/2017	11/06/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.155		
BFK0161-MS1 WUFF-INT 13-05605-000 Surface Water 11/06/2017	BFK0161-DUP1	WUFF-OUT			11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0150		
17K0089-01 WUFF-IN 13-05605-000 Surface Water 11/06/2017 1	BFK0161-MS1	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99					
17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017		WUFF-IN			11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99					
17K0089-03 WUFF-OUT 13-05605-000 Surface Water 17/06/2017 11/06/2017		WUFF-IN DUP			11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99					
BFK0177-BLK1 Blank 13-05605-000 Water 11/07/2017 11/15/2017 EPA 6010C 7440-70-2 Calcium 0.0500 U mg/L 17K0089-01 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7440-70-2 Calcium 11.0 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7440-70-2 Calcium 13.6 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7440-70-2 Calcium 13.6 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 0.0500 U mg/L 17K0089-01 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 0.0500 U mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 4.08 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 4.08 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 EPA 6010C 7439-95-4 Magnesium 3.99 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 EPA 200.8 7440-50-8 Copper 0.500 U ug/L 17K0089-02 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 EPA 200.8 7440-50-8 Copper 16.5 ug/L 17K0089-02 WUFF-IN 13-05605-000		WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99	1426-54-42				
BFK0177-BS1 LCS	BFK0177-BLK1	Blank	13-05605-000	Water			11/07/2017	11/15/2017	EPA 6010C				U	
TXK0088-01 WUFF-IN DUP 3-05605-000 Surface Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7440-70-2 Calcium 13.6 mg/L 17K0089-02 WUFF-IN DUP 3-05605-000 Surface Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7440-70-2 Calcium 13.6 mg/L 17K0089-03 WUFF-OUT 3-05605-000 Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 0.500 U mg/L 17K0089-01 WUFF-IN DUP 3-05605-000 Surface Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 0.500 U mg/L 17K0089-01 WUFF-IN DUP 3-05605-000 Surface Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 4.08 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 4.08 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 4.08 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/	BFK0177-BS1	LCS					11/07/2017	11/15/2017	EPA 6010C		Calcium			
TXK0089-02 WUFF-IN DUP					11/06/2017	11/06/2017		11/15/2017	EPA 6010C					
17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 0.500 U mg/L			13-05605-000	Surface Water				11/15/2017	EPA 6010C					
BFK0177-BLK1 Blank	17K0089-03	WUFF-OUT	13-05605-000	Surface Water				11/15/2017	EPA 6010C	7440-70-2	Calcium			
BFK0177-BS1 LCS	BFK0177-BLK1	Blank	13-05605-000	Water				11/15/2017	EPA 6010C	7439-95-4	Magnesium		U	
17K0089-01 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.99 mg/L 17K0089-03 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.99 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/09/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L 17K0089-05 Magnesium 3.87 mg/L 11/09/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.89 mg/L 17K0089-05 Magnesium 3.89 mg/L 11/09/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L 17K0089-05 Magnesium 3.87 mg/L 11/09/2017 11/16/2017 EPA 6010C 7439-95-4 Magnesium 3.89 mg/L 17K0089-05 Magnesium 3.89 mg/L 11/09/2017 11/06/2	BFK0177-BS1	LCS					11/07/2017	11/15/2017	EPA 6010C	7439-95-4		11.0		
17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.99 mg/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/07/2017 11/15/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L Magnesium 3.87 mg/L 17K0089-03 WUFF-IN DUP 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.2 ug/L Copper 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.2 ug/L EFK0234-BS2 LCS 13-05605-000 Water 11/06/2017 11/106/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 27.2 ug/L EFK0234-BS2 LCS 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/106/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 26.1 ug/L 17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/06/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 16.5 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 11.2 ug/L EFK0234-BS1 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 11.2 ug/L EFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L EFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L EFK0234-BS1 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/106/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L EFK0234-BS2 LCS 13-05605-000 Water 11/06/2017 11/106/2017 11/106/2017 EPA 200.8 7440-66-6 Zinc 4.00 Ug/L EFK0234-BS2 LCS 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/106/2017 EPA 200.8 7440-66-6 Zinc 57.3 ug/L TK0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/106/2017 EPA 200.8 7440-66-6 Zinc 57.3 ug/L EFK0234-BS1 LCS 13-05605-000	17K0089-01	WUFF-IN	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/07/2017	11/15/2017	EPA 6010C			4.08		
17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/16/2017 EPA 6010C 7439-95-4 Magnesium 3.87 mg/L	17K0089-02	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/07/2017	11/15/2017	EPA 6010C	7439-95-4		3.99		
BFK0234-BLK1 Blank 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.2 ug/L	17K0089-03	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/07/2017	11/15/2017	EPA 6010C		<u> </u>	3.87		
BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.2 ug/L	BFK0234-BLK1	Blank	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-50-8		0.500	U	
BFK0234-BS2 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 16.3 ug/L 17K0089-01 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 16.5 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 16.5 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 11/06/2017 EPA 200.8 7440-50-8 Copper 11.2 ug/L 11/09/2017 11/06/2017 11/06/2017 11/06/2017 EPA 200.8 7440-50-8 Copper 11.2 ug/L 11/09/2017 11/09/2017 11/06/2017 EPA 200.8 7440-50-8 Copper 11.2 ug/L 11/09/2017 11/09/2017 11/09/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L 11/09/2017 11/09/2017 11/09/2017 EPA 200.8 7440-50-8 Copper 26.1 ug/L 11/09/2017 11/09/2017 11/09/2017 EPA 200.8 7440-50-8 Copper 26.1 ug/L 11/09/2017 11/09/2017 11/09/2017 11/09/2017 EPA 200.8 7440-50-8 Copper 26.1 ug/L 11/09/2017 11/09/2017 11/09/2017 11/09/2017 EPA 200.8 7440-60-6 Zinc 93.2 ug/L 11/00/2017 11/09/2017 11/09/2017 11/09/2017 11/09/2017 EPA 200.8 7440-60-6 Zinc 93.2 ug/L 11/00/2017 11/09	BFK0234-BS1	LCS					11/09/2017	11/16/2017	EPA 200.8					
17K0089-01 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 16.3 ug/L 17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 16.5 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 11.2 ug/L 11/06/2014 EPA 200.8 T440-50-8 Copper 11.2 ug/L 11/09/2014 EPA 200.8 T440-50-8 Copper 11.2 ug/L 11/09/2014 EPA 200.8 T440-50-8 Copper 11.2 ug/L 11/09/2014 EPA 200.8 T440-50-8 Copper 27.4 ug/L 11/09/2014 EPA 200.8 T440-50-8 Copper 27.4 ug/L 11/09/2014 EPA 200.8 EPA 200.8 T440-50-8 Copper 27.4 ug/L 11/09/2014 EPA 200.8 EPA 2							11/09/2017	11/17/2017	EPA 200.8					
17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 16.5 Ug/L	17K0089-01	WUFF-IN			11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8		• • • • • • • • • • • • • • • • • • • •			
17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 0.500 U ug/L BFK0234-BLK1 Blank 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 4.0.0 U ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L 17K0089-01 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L 17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 57.3 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 57.8 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 36.5 ug/L BFK0234-BSLK1 Blank 13-05605-000 Water 11/06/2017 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 36.5 ug/L BFK0234-BSL LCS 13-05605-000 Water 11/09/2017 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 89.4 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 89.4 ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 TA40-66-6 Zinc 89.4 ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 TA40-66-6 Zinc 89.4 ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 TA40-66-6 Zinc 89.4 ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 TA40-66-6 Zinc 89.4 ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 DISSOIVED 7440-50-8 COP		WUFF-IN DUP			11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8			16.5		
BFK0234-BLK1 Blank 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 0.500 U ug/L BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 26.1 ug/L BFK0234-BLK1 Blank 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L 17K0089-01 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 57.3 ug/L 17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 57.3 ug/L BFK0234-BLK1 Blank 13-05605-000 Water 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 36.5 ug/L BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/109/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/109/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 89.4 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8-DISSOIVED 7440-50-8 Copper 0.500 U ug/L		WUFF-OUT						11/17/2017	EPA 200.8		• • • • • • • • • • • • • • • • • • • •			
BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-50-8 Copper 27.4 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/17/2017 EPA 200.8 7440-50-8 Copper 26.1 ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFK0234-BS2 LCS 13-05605-000 Water 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L 17K0089-01 WUFF-IN 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 57.3 ug/L 17K0089-02 WUFF-IN DUP 13-05605-000 Surface Water 11/06/2017 11/09/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 57.8 ug/L 17K0089-03 WUFF-OUT 13-05605-000 Surface Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 36.5 ug/L BFK0234-BLK1 Blank 13-05605-000 Water 11/06/2017 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0234-BS1 LCS 13-05605-000 Water 11/09/2017 11/16/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 7440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 T440-66-6 Zinc 93.2 ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/09/2017 11/10/2017 EPA 200.8 DISSOlved 7440-50-8 Copper 0.500 U ug/L		Blank									- ' '		U	
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	17K0089-04	WUFF-IN			11/06/2017	11/06/2017				7440-50-8	Copper	8.47		ug/L

Data_17K0089

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17K0089-05	WUFF-IN DUP	13-05605-000		11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-50-8	Copper	8.14		ug/L
17K0089-06	WUFF-OUT	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-50-8	Copper	8.79		ug/L
BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	28.4		ug/L
BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017		EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	94.7		ug/L
17K0089-04	WUFF-IN		Surface Water	11/06/2017	11/06/2017	11/10/2017		EPA 200.8-Dissolved	7440-66-6	Zinc	25.7		ug/L
17K0089-05	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	25.1		ug/L
17K0089-06	WUFF-OUT		Surface Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	27.2		ug/L
BFK0282-BLK1	Blank	13-05605-000				11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	86.6		ug/L
BFK0547-BLK1	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BLK3	Blank	13-05605-000				11/20/2017		SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BS1	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.306		mg-P/L
BFK0547-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.310		mg-P/L
BFK0547-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.308		mg-P/L
17K0089-03	WUFF-OUT		Surface Water	11/06/2017	11/06/2017	11/20/2017		SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0280		mg-P/L
BFK0548-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK3	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK4	Blank	13-05605-000				11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS4	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.320		mg-P/L
17K0089-01	WUFF-IN	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0440		mg-P/L
17K0089-02	WUFF-IN DUP	13-05605-000	Surface Water	11/06/2017	11/06/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0540		mg-P/L



30 November 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)

Associated SDG ID(s)

17K0089

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

Cert# 100006

PJLA Testing
Accreditation # 66169





2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name: Project Numb			Client:								An	alyses	Reques	ted				
Hydro International Up-flo Filter	13-09	5605-000	Herrera Envir	onment	al			uo		726								
Report To:			Сору То:				2540D	trati		M 39	24							
Dylan Ahearn							1 254	ıcen	spi	AST	55.3	35.3	340E	8.0				
Sampled By:			Delivery Method	: Man	4.	1	SM -	Sor	os p	- HO	A 36	A 36	M 2;	A 20	œ.	8.00		
M MULLEN X WING	rove		TOR COUNTY	7 11001	MILEP	recl	Solids-	Jent .	nde	ibuti	中	i i	03-8	- EP	200	PA 2	8.0	
Laboratory:)	Requested Co	ompletion Date:	Total No.	of Contain	ners:	Spa	Sediment Concentration	edsr	istri	orus	orus	CaC	ved	EPA	Ξ.	A 20	
Analytical Resources Inc.					2		ende	d Se	le Si	ize	sphe	sph	as	ssol	tal .	olvec	<u>—</u>	
Lab Use:				Sample Type (see	Preser- vative?	Matrix (see	Total Suspended	spende	Total volatile Suspended solids - SM2540-E	Particle size Distribution - ASTM 3977	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	Hardness as CaCO3-SM 2340B	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	P	Su -	SM	Δ.	-						-	_e
WUFF-IN		11.0.1	7 9:30	С	N	SW	Х	X	х	Х	X	X	X	X	Х	Х	Х	
WUFF-OUT		11-10-1=	7 9:30	С	N	SW	x	X	Х	Х	Х	Χ	Χ	X	Х	Х	Х	
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Comments/Special Instructions:						7												
Send 1 liter to ETS, Inc 975 Tran	sport Way, Suite 2, Pet	aluma, CA	for PSD, TSS, a	nd TVSS.	PSD to	be run f	or >5	00, 50	00-125	, 125-	62.5,	62.5-4	1, <4.					
Relinguished by (Name/CO/	Signature		Date/Time	Re	ceived By	(Name/CO))		1	Signatur	e					Date/1		
Relinquished by (Name/CO/ Megha Muller/ Herreta	Megen Mul	in	Date/Time 6 - 17 7	5 1	Brando	on Fi	SK	AR		B	-6	1	4	1		11/6/	17	11:25
Relinquished by (Name/CO/	Signature		Date/Time	Re	ceived By	(Name/CO))		3	Signatur	re					Date/1	ime	
C I T C Cook C Commonito	Matrix Codos:	Λ-Λir G\N-G	Froundwater SE:	-Sediment	SO=Soi	I SW=Su	rface V	Vater	W=Wa	iter (bla	nks) [M=Mat	erial (O=Othe	er (spec	ify)		

Sample Type: G=Grab C=Composite



Printed: 11/6/2017 3:29:56PM

WORK ORDER

17K0089

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

Project Number: [none]

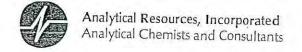
Preservation Confirmation

Container ID	Container Type	рН
17K0089-01 A	Large OJ, 1000 mL	
17K0089-01 B	Large OJ, 1000 mL	
17K0089-01 C	Large OJ, 1000 mL	
17K0089-01 D	Small OJ, 500 mL, 9N H2SO4	<2 pass
17K0089-01 E	Small OJ, 500 mL	7477
17K0089-01 F	HDPE NM, 500 mL, 1:1 HNO3	<z pass<="" td=""></z>
17K0089-02 A	Large OJ, 1000 mL	- C VIII
17K0089-02 B	Large OJ, 1000 mL	
17K0089-02 C	Large OJ, 1000 mL	
17K0089-02 D	Small OJ, 500 mL, 9N H2SO4	< 2 pass
17K0089-02 E	Small OJ, 500 mL	7477
17K0089-02 F	HDPE NM, 500 mL, 1:1 HNO3	< Z pass
17K0089-03 A	Large OJ, 1000 mL	
17K0089-03 B	Large OJ, 1000 mL	
17K0089-03 C	Large OJ, 1000 mL	
17K0089-03 D	Small OJ, 500 mL, 9N H2SO4	<2 pass
17K0089-03 E	Small OJ, 500 mL	- pari
17K0089-03 F	HDPE NM, 500 mL, 1:1 HNO3	6Z 0049
17K0089-04 A	HDPE NM, 500 mL	72 faill
17K0089-05 A	HDPE NM, 500 mL	72 fail
17K0089-06 A	HDPE NM, 500 mL	72 tail

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11/3/17 Date

Preservation Confirmed By



Cooler Receipt Form

ARI Client: Harriera		Pi	roject Name:	Holde	Lasan	ations	1
COC No(s):	NA		elivered by: Fed	Ex LIPS Couri	110		1
Assigned ARI Job No: 17 K 00 89 Preliminary Examination Phase:	-		acking No:		er Hado Deliv	rered Other:	NA
Were intact, properly signed and dated custody	reade attacha	ما المالية المالية	en e				-
Were custody papers included with the cooler?	y seals allache	d to the outs	ide of to cooler	?		YES	NO
						YES	NO
Were custody papers properly filled out (ink, signature of Cooler(s) (°C) (recommended 2 Time:	2.0-6.0 °C for a	chemistry)	b.8	••	-	(YES	NO
If cooler temperature is out of compliance fill ou	it form 00070F				Temp Gun ID	- 1200E	706
Cooler Accepted by:		Data:	11/6/17		1125	1 - 1 - 1	600
Complete	custody for	The second secon	ch all shipping	documents	1160		
Log-In Phase:			un empping	documents	-		
Was a temperature blank included in the cooler What kind of packing material was used?	?	Vran Wat Ion	Col Dasks D	en -		YES	No
Was sufficient ice used (if appropriate)?		ALED ARECICE	Gel Packs Ba	iggies Foam E		-	
Were all bottles sealed in individual plastic bags	3?		***************************************		NA	YES	NO
Did all bottles arrive in good condition (unbroken	n)?		***************************************	orning.		YES	MO
Were all bottle labels complete and legible?				**********		YES	NO
Did the number of containers listed on COC ma	tch with the nu	Imber of con	tainers receive			YES')	NO
Did all bottle labels and tags agree with custody	papers?			J:		YES	NO
Were all bottles used correct for the requested a	analyses?	*******************				AES	NO
Do any of the analyses (bottles) require preserve	ation? (attach	preservation	sheet excludio	na VOCeV	NA	(ES)	NO
Were all VOC vials free of air bubbles?	******************				(NA)	YES	NO
Was sufficient amount of sample sent in each bo	ottle?		******	AAAAAA S	CHA	YES	NO
Date VOC Trip Blank was made at ARI				***********	(NA)		NO
Was Sample Split by ARI: NA YES	Date/Time:	15/5 1	1/6/17 Equipm	ent: <u>Chun</u>	n-901 Aa	-Split by:_{	31=
Samples Logged by:	D	ate:	/17	Time:	1517		
** Notify	Project Mana	ger of disc	repancies or c	oncerns **	1		
Sample ID on Bottle Sample	ID on COC		Sample ID on	Bottle	Samp	ole ID on CO	OC .
	The second						
	*						
Additional Notes, Discrepancies, & Resolutio	ns:						
			***	~			
By: Date:				- 1			
Small Air Bubbles Pesbubbles' LARGI	E Air Butiles	Small →	"sm" (<2 mm	1)			
2-4 mm	≥ å min		oles > "pb" (2	A Secretary of the Control of the Co		-	
	00		"lg" (4 to < 6 r				
<u> </u>	المحاسب		ce -> "hs" (> 6				

0016F 3/2/10

Cooler Receipt Form

Revision 014



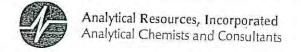


2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name:	ct Number:	Client:				1				Ar	nalyses	Reques	sted		_		-	
Hydro International Up-flo Filte	er 13-0.	5605-000	Herrera Envir	onment	al			6		116								
Report To:			Сору То:				2540D	trati		M 39								
Dylan Ahearn							1 254	cen	Spil	AST	35.3	55.3	340E	8.0				
Sampled By: M Mullen > K Win	arove		Delivery Method	() NOV	gam	red	olids-SM	Sediment Concentration	os papu	bution -	- EPA 3(- EPA 3	3-SM 2:	EPA 20	200.8	A 200.8	8.0	
Laboratory:	0		mpletion Date:		of Contai		d Sc	di E	sbei	istril	rus	snus	acc	- pə	EPA	H.	4 200	
Analytical Resources Inc.					2		ande	d Se	e Su	ze D	spho	spho	as (vloss	<u>=</u>	lved	EP/	
Lab Use:				Sample Type (see	Preser- vative?	Matrix (see	Total Suspended Solids-	spende	Total volatile Suspended solids - SM2540-E	Particle size Distribution - ASTM 3977	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	Hardness as CaCO3-SM 2340B	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Lab ID No.
Sample II)	Date	Time	codes)	(Y/N)	codes)	5	Su -	SM	о.	-			ပိ	-			La
WUFF-IN		11.0.1	7 9:30	С	N	SW	х	X	x	X	Х	Х	Χ	X	Х	Х	X	
WUFF-OUT		11-10-1=	f 9:30	С	N	SW	х	X	X	X	Х	X	Х	Х	Х	X	X	
WUFF-IN DUP		11/6/17	930	C	N	SW	X	X	X	У	X	×	X	X	X	X	X	
													4					
Comments/Special Instructions:								1										
Send 1 liter to ETS, Inc 975 Tra	nsport Way, Suite 2, Pet	aluma, CA f	or PSD, TSS, a	nd TVSS.	PSD to	be run f	or >5	00, 50	00-125	5, 125-	62.5,	62.5-4	1, <4.					
Relinquished by (Name/CO/ Meghan Muller) Herre	Signature Megun Mul	'n	Date/Time 11 6 17 11 2 Date/Time	Re 5	ceived By	(Name/CC ON Fi (Name/CC	1) 15 K	/AR		Signatu	re	6	*	4		Date/1		11:25
Relinquished by (Name/CO/	Signature		Date/Time	Re	ceived By	(Name/CC))			Signatu	re					Date/	ime	
Sample Type: G-Grah C-Composite	Matrix Codes:	Δ=Δir GW=G	roundwater SE:	-Sediment	SO=Soi	I SW=Su	rface V	Vater	W=Wa	ater (bla	inks) I	M=Mat	erial	0=Othe	er (spec	cify)		





Cooler Receipt Form

ARI Client: It Try'ero		Project Name:	Halden Las-	national	1
COC No(s):	NA NA		UPS Courier Hand De		
Assigned ARI Job No: 17 Preliminary Examination Phase	K 0089 se:		COPS Courier Fland De		NA
Were intact, properly signed ar	nd dated custody seals attache	d to the outside of to coolor?		0.22	1
Were custody papers included	with the cooler?	a to the outside of to cooler?		YES	NO:
Were custody papers properly Temperature of Cooler(s) (°C) Time:	filled out (ink, signed, etc.)	. A desired and the second		YES	NO NO
If cooler temperature is out of c	compliance fill out form 00070F	<u>173 2</u>	— — —	200	
Cooler Accepted by:	_	Date: 11/6/17		ID#: 0005	2.06
	***	ns and attach all shipping do	Time:1121	2	
Log-In Phase:		io and attach an Shipping ut	ocuments		
Was a temperature blank inclus	ded in the seales				
Was a temperature blank include What kind of packing materia	l was used? Pubble W.			YES	NO
Was sufficient ice used (if appr	noriate)?	rap Wet Ice Gel Packs Bagg	iles Foam Block Paper		
Were all bottles sealed in indivi	dual plastic bags?		NA	ES	NO
Did all bottles arrive in good co	ndition (unbroken)?			YES	MO
Were all bottle labels complete	and legible?		*******	YES	NO
Did the number of containers lis	sted on COC match with the nu	mber of containers received?		(YES)	NO
Did all bottle labels and tags ag	ree with custody papers?			YES	NO
Were all bottles used correct fo	r the requested analyses?			CAES)	NO
Do any of the analyses (bottles)	require preservation? (attach	preservation sheet excluding	VOCa) NA	(YES)	NO
Were all VOC vials free of air be	ubbles?		VOCs) NA	YES	NO
Was sufficient amount of sampl	e sent in each bottle?		CIVA	YES	NO
Date VOC Trip Blank was made	at ARI			TES	NO
Was Sample Split by ARI:	NA YES Date/Time:	575 11/6/17 Equipment	chunn-split	Split by:	31=
Samples Logged by:		ate: 11/6/17	_Time: 1517		
	** Notify Project Mana	ger of discrepancies or con	cems **	-	
Sample ID on Bottle	Sample ID on COC	Sample ID on Bo	#la l a		
		Cample in thi Bo	tile Sar	nple ID on CC	C
	7.5	340	-	× 1	-
Additional Notes, Discrepanci	ies, & Resolutions:	w **			
		*			
			·		-(
Ву:	11.				
	ate:	Small A ttor n	k .		
Small Air Bubbles Peabub -2mm 2-4 m	Laine Mi Philippin	Small > "sm" (<2 mm)	1		
	0 000	Peabubbles > "pb" (2 to			
0	0 0 0	Large > "lg" (4 to < 6 mm			
No. of the second		Headspace → "hs" (>6 m	m)		8-

0016F 3/2/10

Cooler Receipt Form

Revision 014



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring

-Analytical Labs

-Technical Support

975 Transport Way, Suite 2 Petaluma, CA 94954 (707) 778-9605/FAX 778-9612

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

OMPANY: Analytical Resources, Inc., 4611 S. 134th Place, Suite 100, Tukwila, WA 98168

ATTN: Amanda Volgardsen

JOB: Hydro International Up-Flo Filter

SITE: Oregon-Washington

ANALYST(S)

DATE

DATE

COLLECTED RECEIVED COMPLETED

11/6/2017 11/8/2017 11/20/2017

ANALYST(S)

SUPERVISOR

COLLECTED RECEIVED COMPLETED

L. Quijano

G. Conrad,PhD

	DAPTICIE	SIZE DISTRI	DED MOITIN	ANALVEIC	9 DEDODT	EDADT		1
CAMPLE							CHEDENDED	SUSPENDED
SAMPLE	and the second second							
ID								SEDIMENT CON
ID	WATER	mg/I @ ≥500 μ	mg/1 @ 125 µ	mg/ι @ 63 μ	mg/I @ 32 μ	mg/I @ 4 μ	mg/1 @ 1 μ	TSS mg/l
HI-33HEC/RW	WUFF-IN	3.0	2.5	1.5		9.2	2.3	17.0
17K008	9-01 A/B	16.2%	13.5%	8.1%		49.7%	12.4%	
					Total SSC by	$\text{Summation} \rightarrow$	18.5	
		N 10 10 10 10 10 10 10 10 10 10 10 10 10		1.0		9.8	1.2	17.0
17K008	9-02 A/B	14.3%	17.1%	5.7%		56.0%	6.9%	
					Total SSC by	$\text{Summation} \rightarrow$	17.5	
		A CONTRACTOR OF THE PARTY OF TH	0.0			1.1	1.1	2.0
17K008	9-03 A/B	0.0%	0.0%	0.0%	#DIV/0!	50.0%	50.0%	
					Total SSC by	$\text{Summation} \rightarrow$	2.2	-
		#DIV/0I	#DIV/0!	#DIV/0!	#DIV/01	#DIV/0!	#DIV/0I	
		more viol	#B1470.	#B1470:			0.0	
SAMPLE	SOURCE	Water pH	ECw	COLOR,	COLOR	TOTAL IRON	TOTAL	VOLATILE
	of		[Spec Cond]	TRUE	APPARENT	Fe (diss.)	SUSPENDED	SOLIDS (TVSS
ID	WATER	-log[H+]	μS/cm	PtCo Units	PtCo Units	mg/l		mg/l
	17K0089 HI-34HEC/RW 17K0089 HI-35HEC/RW 17K0089	SAMPLE SOURCE of ID WATER HI-33HEC/RW WUFF-IN 17K0089-01 A/B HI-34HEC/RW WUFF-IN Dup 17K0089-02 A/B HI-35HEC/RW WUFF-OUT 17K0089-03 A/B SAMPLE SOURCE of	SAMPLE SOURCE of SOLIDS mg/l @ ≥500 μ ID WATER mg/l @ ≥500 μ HI-33HEC/RW WUFF-IN 16.2% HI-34HEC/RW WUFF-IN Dup 17K0089-02 A/B 2.5 14.3% HI-35HEC/RW WUFF-OUT 17K0089-03 A/B 0.0 HI-35HEC/RW WUFF-OUT 0.0% #DIV/0! SAMPLE SOURCE of Water pH	SAMPLE SOURCE of SOLIDS SUSPENDED SOLIDS SOLIDS SOLIDS ID WATER mg/l @ ≥500 μ mg/l @ 125 μ HI-33HEC/RW WUFF-IN 17K0089-01 A/B 3.0 16.2% 13.5% HI-34HEC/RW WUFF-IN Dup 17K0089-02 A/B 2.5 3.0 17.1% HI-35HEC/RW WUFF-OUT 17K0089-03 A/B 0.0 0.0 0.0 0.0 #DIV/0! #DIV/0! SAMPLE SOURCE of Water pH ECw [Spec Cond]	SAMPLE SOURCE of SOLIDS SUSPENDED SOLIDS SUSPENDED SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS Mg/I @ 5500 μ mg/I @ 125 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 5500 μ mg/I @ 125 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 63 μ mg/I @ 63 μ μ μ π	SAMPLE SOURCE of SOLIDS SUSPENDED SUSPENDED SUSPENDED SOLIDS SUSPENDED SOLIDS MIGHT MIGHT	SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS Mg/I @ 4 μ	SAMPLE SOURCE of of SOLIDS SUSPENDED SOLIDS SUSPENDED SUSPENDED SUSPENDED SUSPENDED SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SO

COMMENTS

The matrix has a very low concentration of TSS particles amounting to only <20 ppm in the input samples; and the output sample is extremely low at just 2 ppm. For the -IN & -OUT pairs of samples, overall reductions averaged just over 88% in both (i.e., TSS by summation vs analytical TSS). The specific fraction reductions going from coarsest to finest sizes are as follows: 100%, 100%, 88.0%, and 52.2%. The specific reductions using the duplicate input vary in the last two size fractions as follows: 88.8% and 8.3%. So, while the 4-63 μ class is not much different, there is a very significant difference in the 1-4 μ class. While it may be best to take the average of these two data, i.e., 30.25%, as the actual reduction, this may or may not be the best approach in this case. Regradless of how this particular fraction reduction is viewed, the absolute numerical difference in mass is very small. Also, overall reductions for the two, i.e., original and duplicate, are almost identical varying by only about 0.1% (88.1% vs 88.2%)! Notice that the distribution is uni-modal in this case with the mode at the 4-63 μ fraction. The RPDs are all excellent as follows: $\pm 4.3\%$, $\pm 1.5\%$, and $\pm 4.8\%$.

NN NOTES: Tests were done according to methodology as per Association of Testing Materials (ASTM): Suspended Sediment Concentration – Modified ASTM D3977 (Practice for Determining Suspended-Sediment Concentration in Water Samples). Standard Methods is followed for the other tests: Color - 2120 C; Spec Cond. (ECw) - 2510 B; Iron - 3500-Fe B; pH - 4500-H+ B; TRPH - 5520 C.

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0089)	Date Received: November 8, 2017
Project #: 16T001-035	Sampled By: Others
Client: Analytical Resources, Inc.	Date Reported: November 30, 2017
Source: Multiple	Tested By: B. Goble
ATC Sample# Multiple	-

CASE NARRATIVE

 Three samples were submitted for sediment concentration by ASTM D3977, Method C. The coarse material was screened over a No. 230 sieve. The suspended solids are reported in mg/L. The data is provided in a summary table. There were no other noted anomalies in this project. 	

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Regional Offices: Olympia ~ 360.534.9777 Bellingham ~ 360.647.6061 Silverdale ~ 360.698.6787 Tukwila ~ 206.241.1974 Visit our website: www.mtc-inc.net

Page 9 of 37 17K0089 ARISample FINAL 30 Nov 2017 1553

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0089) **Project #:** 16T001-035

Sampled by: Others

Date Received: November 8, 2017 Date Tested: November 9, 2017

Tested by: B. Goble

Client: Analytical Resources, Inc.

Suspended Sediment Concentration ASTM D3977 Method C

Client Sample ID	MTC Sample ID	Sampling Date	Coarse Fraction SSC (>63µm) (mg/L)	FineFraction SSC (<63µm) (mg/L)	Total Suspended Sediment Concentration (mg/L)
WUFF-IN	T17-1603	11/6/2017	13.6	7.0	20.5
WUFF-IN DUP	T17-1604	11/6/2017	8.2	7.8	16.0
WUFF-OUT	T17-1605	11/6/2017	0.4	2.7	3.1

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Silverdale ~ 360.698.6787

Tukwila ~ 206.241.1974

Visit our website: www.mtc-inc.net

Regional Offices: Olympia ~ 360.534.9777

Bellingham ~ 360.647.6061



Herrera Environmental ConsultantsProject: Hydro International2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17K0089-01	Water	06-Nov-2017 09:30	06-Nov-2017 11:25
WUFF-IN DUP	17K0089-02	Water	06-Nov-2017 09:30	06-Nov-2017 11:25
WUFF-OUT	17K0089-03	Water	06-Nov-2017 09:30	06-Nov-2017 11:25
WUFF-IN	17K0089-04	Water	06-Nov-2017 09:30	06-Nov-2017 11:25
WUFF-IN DUP	17K0089-05	Water	06-Nov-2017 09:30	06-Nov-2017 11:25
WUFF-OUT	17K0089-06	Water	06-Nov-2017 09:30	06-Nov-2017 11:25

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 06, 2017 under ARI workorder 17K0089. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS, TVSS and PSD analysis were subcontracted to ETS Labs. The SSC analysis was subcontracted to MTC Labs.

Total Hardness - EPA Method 6010C

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

The samples were prepared and analyzed within the recommended holding times.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

An O-Phos matrix spike and dupicate were prepared in conjunction with sample WUFF-OUT. The matrix spike percent recovery and duplicate RPD were within QC limits.

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

WUFF-IN 17K0089-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/06/2017 09:30

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 17:02

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234 Sample Size: 25 mL

Prepared: 09-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	16.3	ug/L	
Zinc	7440-66-6	1	4.00	57.3	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

WUFF-IN 17K0089-01 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/06/2017 09:30

 Instrument: ICP2
 Analyzed: 15-Nov-2017 18:01

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0177 Sample Size: 25 mL Prepared: 07-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 14.0 mg/L Magnesium 7439-95-4 0.0500 4.08 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn30-Nov-2017 15:53

WUFF-IN 17K0089-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 06-Nov-2017 17:44

Sample Preparation: Preparation Method: SM 5310 A-00, 0.45um filtration

Preparation Batch: BFK0161 Sample Size: 50 mL Prepared: 06-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0250 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0440 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants
Project: Hydro International
2200 6th Avenue, Suite 1100
Project Number: 13-05605-000

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

WUFF-IN 17K0089-01 (Water)

Calculation

 Method: SM 2340 B-97
 Sampled: 11/06/2017 09:30

 Instrument: [CALC]
 Analyzed: 15-Nov-2017 18:01

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]

Prepared: 07-Nov-2017

v-2017 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	51.8	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN 17K0089-01 (Water)

*** DEFAULT GENERAL METHOD ***

 Method: ASTM D3977
 Sampled: 11/06/2017 09:30

 Instrument: MT&C
 Analyzed: 09-Nov-2017 00:00

Sample Preparation: Preparation Method: No Prep Geo

Preparation Batch: B110917

Prepared: 09-Nov-2017 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
> 63 µm	SC_>63	1	0.1	13.55	mg/L	
< 63 μm	SC_<63	1	0.1	6.95	mg/L	
Total SSC	SC_TOTAL	1	0.1	20.5	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)
WUFF-IN DUP
17K0089-02 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/06/2017 09:30

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 17:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234 Sample Size: 25 mL

Prepared: 09-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	16.5	ug/L	
Zinc	7440-66-6	1	4.00	57.8	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

WUFF-IN DUP 17K0089-02 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/06/2017 09:30

 Instrument: ICP2
 Analyzed: 15-Nov-2017 18:05

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0177 Sample Size: 25 mL Prepared: 07-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 13.6 mg/L Magnesium 7439-95-4 0.0500 3.99 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

WUFF-IN DUP 17K0089-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 06-Nov-2017 17:44

Sample Preparation: Preparation Method: SM 5310 A-00, 0.45um filtration

Preparation Batch: BFK0161 Sample Size: 50 mL Prepared: 06-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0200 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0540 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000

Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 30-Nov-2017 15:53

> **WUFF-IN DUP** 17K0089-02 (Water)

Calculation

Sampled: 11/06/2017 09:30 Method: SM 2340 B-97 Instrument: [CALC] Analyzed: 15-Nov-2017 18:05

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 07-Nov-2017 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	50.4	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN DUP 17K0089-02 (Water)

*** DEFAULT GENERAL METHOD ***

 Method: ASTM D3977
 Sampled: 11/06/2017 09:30

 Instrument: MT&C
 Analyzed: 09-Nov-2017 00:00

Sample Preparation: Preparation Method: No Prep Geo

Preparation Batch: B110917

Prepared: 09-Nov-2017 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	8.16	mg/L	
< 63 μm	SC_<63	1	0.1	7.80	mg/L	
Total SSC	SC_TOTAL	1	0.1	15.96	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-OUT 17K0089-03 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/06/2017 09:30

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 17:12

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234 Sample Size: 25 mL Prepared: 09-Nov-2017 Final Volume: 25 mL

Reporting Limit Analyte CAS Number Dilution Result Units Notes 7440-50-8 1 0.500 11.2 ug/L Copper Zinc 7440-66-6 1 4.00 36.5 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

WUFF-OUT 17K0089-03 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/06/2017 09:30

 Instrument: ICP2
 Analyzed: 15-Nov-2017 18:09

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0177 Sample Size: 25 mL Prepared: 07-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 13.6 mg/L Magnesium 7439-95-4 0.0500 3.87 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

WUFF-OUT 17K0089-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 06-Nov-2017 17:45

Sample Preparation: Preparation Method: SM 5310 A-00, 0.45um filtration

Preparation Batch: BFK0161 Sample Size: 50 mL

Prepared: 06-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0130 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate

Preparation Batch: BFK0547 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0280 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

WUFF-OUT 17K0089-03 (Water)

Calculation

 Method: SM 2340 B-97
 Sampled: 11/06/2017 09:30

 Instrument: [CALC]
 Analyzed: 15-Nov-2017 18:09

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]

Prepared: 07-Nov-2017 Final Volume: 1

Analyte CAS Number Dilution Result Units Notes

Hardness 1 0.331 49.8 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-OUT 17K0089-03 (Water)

*** DEFAULT GENERAL METHOD ***

 Method: ASTM D3977
 Sampled: 11/06/2017 09:30

 Instrument: MT&C
 Analyzed: 09-Nov-2017 00:00

Sample Preparation: Preparation Method: No Prep Geo

Preparation Batch: B110917

Prepared: 09-Nov-2017 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	0.43	mg/L	
< 63 μm	SC_<63	1	0.1	2.70	mg/L	
Total SSC	SC_TOTAL	1	0.1	3.13	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN 17K0089-04 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/06/2017 09:30

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 02:24

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL Prepared: 10-Nov-2017 Final Volume: 25 mL

Reporting

CAS Number Diluting Limit Book Heit

Limit Analyte CAS Number Dilution Result Units Notes Copper, Dissolved 7440-50-8 0.500 8.47 ug/L Zinc, Dissolved 7440-66-6 1 4.00 25.7 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

WUFF-IN DUP 17K0089-05 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/06/2017 09:30

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 02:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL

Prepared: 10-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	8.14	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	25.1	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 15:53

WUFF-OUT 17K0089-06 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/06/2017 09:30

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 02:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL

Prepared: 10-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	8.79	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	27.2	ug/L	

Analytical Resources, Inc.

Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

Metals and Metallic Compounds - Quality Control

Batch BFK0177 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0177-BLK1)			Prepa	ared: 07-Nov	7-2017 An	alyzed: 15-	Nov-2017 1	7:49		
Calcium	ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L							U
LCS (BFK0177-BS1)			Prepa	ared: 07-Nov	7-2017 An	alyzed: 15-	Nov-2017 1	8:25		
Calcium	10.2	0.0500	mg/L	10.0		102	80-120			
Magnesium	11.0	0.0500	mg/L	10.0		110	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants

 2200 6th Avenue, Suite 1100
 Project Number:
 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager:
 Dylan Ahearn
 30-Nov-2017 15:53

Project: Hydro International

Metals and Metallic Compounds - Quality Control

Batch BFK0234 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

			Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFK0234-BLK1)				Prepa	ared: 09-Nov	v-2017 An	alyzed: 16-	Nov-2017 2	0:23		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0234-BS1)				Prepa	ared: 09-Nov	v-2017 An	alyzed: 16-	Nov-2017 2	0:44		
Copper	63	27.2	0.500	ug/L	25.0		109	80-120			
Copper	65	27.4	0.500	ug/L	25.0		110	80-120			
Zinc	67	93.2	4.00	ug/L	80.0		117	80-120			
LCS (BFK0234-BS2)				Prepa	ared: 09-Nov	v-2017 An	alyzed: 17-	Nov-2017 1	6:44		
Copper	63	26.1	0.500	ug/L	25.0	·	104	80-120		·	
Copper	65	26.1	0.500	ug/L	25.0		104	80-120			
Zinc	66	93.2	4.00	ug/L	80.0		116	80-120			
Zinc	67	89.4	4.00	ug/L	80.0		112	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0282 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0282-BLK1)				Prepa	ared: 10-Nov	7-2017 An	alyzed: 10-	Nov-2017 1	9:51		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFK0282-BS1)				Prepa	ared: 10-Nov	7-2017 An	alyzed: 10-	Nov-2017 2	0:11		
Copper, Dissolved	63	28.2	0.500	ug/L	25.0		113	80-120			
Copper, Dissolved	65	28.4	0.500	ug/L	25.0		114	80-120			
Zinc, Dissolved	66	94.7	4.00	ug/L	80.0		118	80-120			
Zinc, Dissolved	67	86.6	4.00	ug/L	80.0		108	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

Wet Chemistry - Quality Control

Batch BFK0161 - SM 5310 A-00, 0.45um filtration

Instrument: UV1800-2 Analyst: CDE

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0161-BLK1)			Prepa	red: 06-Nov	v-2017 An	alyzed: 06-	Nov-2017 1	7:43		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFK0161-BS1)			Prepa	red: 06-Nov	v-2017 Ana	alyzed: 06-	Nov-2017 1	7:44		
Orthophosphorus	0.155	0.0040	mg-P/L	0.150		103	90-110			
Duplicate (BFK0161-DUP1)	Source:	17K0089-03	Prepa	red: 06-Nov	v-2017 Ana	alyzed: 06-	Nov-2017 1	7:45		
Orthophosphorus	0.0150	0.0040	mg-P/L		0.0130			14.30	20	
Matrix Spike (BFK0161-MS1)	Source:	17K0089-03	Prepa	red: 06-Nov	v-2017 An	alyzed: 06-	Nov-2017 1	7:45		
Orthophosphorus	0.220	0.0040	mg-P/L	0.200	0.0130	104	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000
Project Manager: Dylan Ahearn

Reported: 30-Nov-2017 15:53

Wet Chemistry - Quality Control

Batch BFK0547 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0547-BLK1)			Prepa	ared: 20-Nov	v-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:25		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK2)			Prepa	ared: 20-Nov	v-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:34		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK3)			Prepa	ared: 20-Nov	v-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:52		
Total Phosphorus	ND	0.0080	mg-P/L							U
LCS (BFK0547-BS1)			Prepa	ared: 20-Nov	v-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:26		
Total Phosphorus	0.306	0.0080	mg-P/L	0.300		102	90-110			
DL (BFK0547-BS2)			Prepa	ared: 20-Nov	v-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:34		
Total Phosphorus	0.310	0.0080	mg-P/L	0.300		103	90-110			
LCS (BFK0547-BS3)			Prepa	ared: 20-Nov	v-2017 Ar	nalyzed: 21-	-Nov-2017 1	5:52		
Total Phosphorus	0.308	0.0080	mg-P/L	0.300		103	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000
Project Manager: Dylan Ahearn

Reported: 30-Nov-2017 15:53

Wet Chemistry - Quality Control

Batch BFK0548 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0548-BLK2)			Prepa	ared: 20-Nov	-2017 An	alyzed: 21-	Nov-2017 1	6:50		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK3)			Prepa	ared: 20-Nov	-2017 An	alyzed: 21-	Nov-2017 1	7:08		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK4)			Prepa	ared: 20-Nov	-2017 An	alyzed: 21-	Nov-2017 1	7:22		
Total Phosphorus	ND	0.0080	mg-P/L							U
DL (BFK0548-BS2)			Prepa	ared: 20-Nov	-2017 An	alyzed: 21-	Nov-2017 1	6:52		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS3)			Prepa	ared: 20-Nov	-2017 An	alyzed: 21-	Nov-2017 1	7:10		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS4)			Prepa	ared: 20-Nov	-2017 An	alyzed: 21-	Nov-2017 1	7:22		
Total Phosphorus	0.320	0.0080	mg-P/L	0.300		107	90-110			

Analytical Resources, Inc.





Herrera Environmental Consultants
Project: Hydro International
2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Seattle WA, 98121
Project Manager: Dylan Ahearn

Reported: 30-Nov-2017 15:53

Certified Analyses included in this Report

Analyte Cert	tifications
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EPA 200.8 in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP

EPA 6010C in Water

Calcium WADOE,NELAP,DoD-ELAP
Magnesium WADOE,NELAP,DoD-ELAP

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 30-Nov-2017 15:53

Notes and Definitions

U This analyte is not detected above the applicable reporting or detection limit.

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

* Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.

November 6, 2017 – Rinsate Blank 2

Data_17K0092

BERKOR1-BLK1 Blank	ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BRYO161-BS1 LCS	BFK0161-BLK1	Blank			•				SM 4500-P E-99	1426-54-42	•	0.0040	U	mg-P/L
17K0069-03 WUFF-CHURN BLANK 13-05605-000 Water 11069/2017 11069/2017 11069/2017 SM 4500-P E-99 1426-54-42 Orthophosphorus 0.0040 U mg-PAL 17K0069-002 WUFF-CUT BLANK 13-05605-000 Water 11069/2017 11069/2017 11069/2017 SM 4500-P E-99 1426-54-42 Orthophosphorus 0.0040 U mg-PAL 17K0069-000 Water 11069/2017 11069/2017 11069/2017 11069/2017 M 4500-P E-99 1426-54-42 Orthophosphorus 0.0040 U mg-PAL 17K0069-000 Water 11069/2017 11069/2017 11069/2017 M 4500-P E-99 1426-54-42 Orthophosphorus 0.0040 U mg-PAL 17K0069-000 Water 11069/2017 WUFF-CHURN BLANK 13-05605-000 Water 11069/20		LCS	13-05605-000	Water			11/06/2017	11/06/2017	SM 4500-P E-99		<u> </u>	0.155		
17K0092-01 WUFF-IN BLANK 13-95605-000 Water 11/06/2017 11/06	17K0092-03	WUFF-CHURN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99				U	
17K0092-02 WUFF-OUT BLANK 13-05605-000 Water 1109/2017 11109/2017 11109/2017 171	17K0092-01	WUFF-IN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99			0.0040	U	
BFK0234-BIX Blank	17K0092-02	WUFF-OUT BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/06/2017	11/06/2017	SM 4500-P E-99			0.0040	U	
BFK0234+BS1 CS	BFK0234-BLK1	Blank	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-50-8		0.500	U	
17K0092-03 WUFF-OLIRN BLANK 3-05605-000 Water 1706/2017 1706/2017 1717/2017 EPA 20.0.8 7440-50-8 Copper 0.00 u.g.L 17K0092-02 WUFF-OLIR BLANK 3-05605-000 Water 1706/2017 1716/2017 1717/2017 EPA 20.0.8 7440-50-8 Copper 0.00 u.g.L 17K0092-02 WUFF-OLIR BLANK 3-05605-000 Water 1706/2017 1716/2017 1716/2017 EPA 20.0.8 7440-50-8 Copper 0.500 U.g.L U.g.L EFK0234-BS1 LCS 13-05605-000 Water 1706/2017 1716/2017 1716/2017 EPA 20.0.8 7440-50-8 Copper 0.500 U.g.L U.g	BFK0234-BS1	LCS	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-50-8	Copper	27.2		ug/L
17K0992-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/06/2017 11/07/2017 EPA 20.0.8 7440-56.8 Copper 0.741 ug/L	BFK0234-BS2	LCS	13-05605-000	Water			11/09/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	26.1		
17K0992-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/06/2017 11/07/2017 EPA 20.0.8 7440-56.8 Copper 0.741 ug/L	17K0092-03	WUFF-CHURN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFK0234-BLK1 Blank	17K0092-01	WUFF-IN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8	7440-50-8		1.00		ug/L
BFK0234-BS1 LCS	17K0092-02	WUFF-OUT BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	0.741		ug/L
BFK0234-BS1 LCS	BFK0234-BLK1	Blank	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-50-8	Copper	0.500	U	
BFK0234-BS2	BFK0234-BS1	LCS	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-50-8		27.4		ug/L
BFK0234-BLK1 Blank	BFK0234-BS2	LCS	13-05605-000	Water			11/09/2017	11/17/2017	EPA 200.8	7440-50-8		26.1		ug/L
17K0092-03 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/07/2017 12/	BFK0234-BLK1	Blank	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8			4.00	U	ug/L
17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/09/2017 11/17/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L 17K0092-02 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/06/20	BFK0234-BS2	LCS	13-05605-000	Water			11/09/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	93.2		
TYK0092-02 WUFF-OUT BLANK	17K0092-03	WUFF-CHURN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
17K092-02 WUFF-OUT BLANK	17K0092-01	WUFF-IN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
BFK0234-BS1 LCS	17K0092-02	WUFF-OUT BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/09/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
BFK0234-BS1 CS	BFK0234-BLK1	Blank	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
BFK0234-BSZ LCS	BFK0234-BS1	LCS	13-05605-000	Water			11/09/2017	11/16/2017	EPA 200.8	7440-66-6	Zinc	93.2		
BFK0282-BLK1 Blank	BFK0234-BS2	LCS	13-05605-000	Water			11/09/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	89.4		
BFK0282-BS1 LCS	BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	
17K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L Coppe	BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8		28.2		
17K0092-04 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/106/2017 11/10/2017 11/	17K0092-06	WUFF-CHURN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-50-8		0.500	U	
BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L BFK0282-BSLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BSL1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 11/10/2017 14/40-66-6 Zinc 4.00 U ug/L 17K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/10/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 94.7 ug/L 17K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank	17K0092-04	WUFF-IN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-50-8		0.500	U	
BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L BFK0282-BSLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BSL1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 11/10/2017 14/40-66-6 Zinc 4.00 U ug/L 17K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/10/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 94.7 ug/L 17K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank	17K0092-05	WUFF-OUT BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0282-BS1 LCS 13-05605-000 Water Mater 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.4 ug/L	BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8		0.500	U	ug/L
BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17/K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 94.7 ug/L 17/K0092-04 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17/K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17/K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 11/10/2017	BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-50-8		28.4		
17K0092-06 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17K0092-04 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 11/10/2017 2PA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P	BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6		4.00	U	ug/L
17K0092-04 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank 13-05605-000 Water 11/20/2017 11/10/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK2 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-0560	BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	94.7		ug/L
17K0092-04 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L 17K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank 13-05605-000 Water 11/20/2017 11/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-0560	17K0092-06	WUFF-CHURN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	
17K0092-05 WUFF-OUT BLANK 13-05605-000 Water 11/06/2017 11/10/2017 11/15/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0547-BLK1 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L B	17K0092-04	WUFF-IN BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	
BFK0282-BLK1 Blank 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0282-BS1 LCS 13-05605-000 Water 11/10/2017 11/10/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 86.6 ug/L BFK0547-BLK1 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L	17K0092-05	WUFF-OUT BLANK	13-05605-000	Water	11/06/2017	11/06/2017	11/10/2017	11/15/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	
BFK0547-BLK1 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK2 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 11/20/2013 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 U mg-P/L 11/20092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 11/20/2017 UNDEF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 11/20/2017 UNDEF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 11/20/2017 UNDEF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/20/2017 UNDEF-IN BLANK 13-05605-000 Water 11/06/2017 UNDEF-IN BLANK 13-05605-000 Water 11/	BFK0282-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	
BFK0547-BLK1 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK2 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L	BFK0282-BS1	LCS	13-05605-000	Water			11/10/2017	11/10/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	86.6		ug/L
BFK0547-BLK2 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L	BFK0547-BLK1	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	
BFK0547-BLK3 Blank 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L	BFK0547-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus		U	
BFK0547-BS1 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.306 mg-P/L BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L		Blank									•		U	
BFK0547-BS2 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.310 mg-P/L BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L							11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	·			
BFK0547-BS3 LCS 13-05605-000 Water 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.308 mg-P/L 17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L							11/20/2017	11/21/2017	SM 4500-P E-99		· ·			
17K0092-03 WUFF-CHURN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L 17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L											•			
17K0092-01 WUFF-IN BLANK 13-05605-000 Water 11/06/2017 11/06/2017 11/20/2017 11/21/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-P/L					11/06/2017	11/06/2017					•		U	
											-		U	
										7723-14-0	Total Phosphorus	0.0080	U	mg-P/L



27 November 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)

Associated SDG ID(s)

17K0092

N/A



Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Client Services, cn=Amanda Volgardsen, email=amandav@arilabs.com

Date: 2017.11.27 12:17:11 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

Cert# 100006

PJLA Testing

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202





2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108

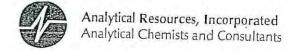
Chain of Custody Record

Project Name:	Project Number:	Client:					F-1_		Analyses Requested							
Hydro International Up-flo Filter	13-05605-000	Herrera Envi	ronment	al												
Report To:		Copy To:	ору То:									ė				
Dylan Ahearn							w	65	9.00		_		254			
Sampled By: K. VINGTHE M Mullen Delivery Meth		Delivery Metho	d:	1 horde		5	EPA 365	EPA 365	- EPA 2(1 200.8	PA 200.8	8.00	S -spile			
Laboratory:	Requested	Completion Date:	Total No.	of Contain	ners:	aine	-Su	- sn	ved	EP/	4-E	A 20	d Sc			
Analytical Resources Inc.				3		Sont	hor	hor	ssol	<u>ta</u>	olvec	д.	in/le			
Lab Use:			Sample Type (see	Preser- vative?	Matrix (see	Number of Containers	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Total Suspended Solids-SM 2540D.			Lab ID No.
Sample ID	Date	Time	codes)	(Y/N)	codes)	Z	To.	o	Ö	Ö	Z	Ż	P			Lat
WUFF-IN BLANK	11-6-1	7 10:60	C	N	W	-	1	×	6	X	X	X	K			
WUFF-OUT BLANK	11.6.	F 10:00	C	N	W	1	X	X	X	×	X	X	~			
WUFF-CHURN BLANK	11.10.		C	N	M	_)	X	X	X	×	×	3	*		1	
											-			-		
Comments/Special Instructions:																
Relinquished by (Name/CO/ Megher Mullin/Herrer Mu	Mm	Date/Time	5 B	wen do	(Name/CO	K/	ARI		Signatu				W-	1	/Time	11/6/17
Relinquished by (Name/CO/ Signature	e	Date/Time	Re	ceived By	(Name/CC))			Signatu	re				Date	e/Time	

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)





Cooler Receipt Form

ARI Client: Hevr	ara	Pre	oject Name:	volum 1	interna	Linnal	
COC No(s):	N		elivered by: Fed-Ex l	1			-
Assigned ARI Job No:			acking No:				NA
Were intact, properly signed a	and dated custody seals a	ttached to the outsi	ide of to spolar?				6
Were custody papers included						YES	NO
Were custody papers properly						(ES)	NO
Temperature of Cooler(s) (°C) Time:	(recommended 2.0-6.0 °	C for chemistry)	5.8		-	(ES)	NO
If cooler temperature is out of	compliance fill out form 0	0070F		-	Temp Gun IE	# 1200 K	206
Cooler Accepted by:	13F	Date: _	11/6/17		1125		
	Complete custod	ly forms and attac	h all shipping doc	uments			
Log-In Phase:							
Was a temperature blank inclu	uded in the cooler?		Andrea Compression and Compression			1/50	0
What kind of packing materia	al was used? But	oble Wrap Wet Ice	Gel Packs Bannie	s Foam Bi	ock Dance (YES	(NO)
Was sufficient ice used (if appr	ropriate)?		Duggio	o i cam bi	NA	VES)	NO
Were all bottles sealed in indiv	vidual plastic bags?				11/1	YES	NO
Did all bottles arrive in good co	ondition (unbroken)?		***************************************	0.00		KES .	NO
Were all bottle labels complete	and legible?					YES	NO
Did the number of containers li	isted on COC match with	the number of cont	tainers received?			YES	NO
Did all bottle labels and tags ag	gree with custody papers?	?				YES	NO
Were all bottles used correct for	or the requested analyses	?				(YES)	NO
Do any of the analyses (bottles	s) require preservation? (a	ittach preservation	sheet, excluding V	OCs)	NA	YES	NO
Were all VOC vials free of air b	ologostis and but o		***************************************		CNA	YES	NO
Was sufficient amount of samp Date VOC Trip Blank was mad	he sent in each bottle?		***************************************	****		YES	NO
Was Sample Split by ARI:	NA YES Date/Tir	me:13:38	16/17 Equipment:	chuan	Splitter	Split by:	3F+SF
Samples Logged by:		Date:	11 2		1/101	0	
	11		11/4/	_Time:	10.1	<u> </u>	
	** Notify Project	Manager of discr	epancies or conce	ems **			
Sample ID on Bottle					1		
Sample ID on Bottle	** Notify Project Sample ID on C		Sample ID on Bott		Sam	ple ID on CO	DC DC
Sample ID on Bottle					Sam	ple ID on Co	DC
Sample ID on Bottle					Sam	ple ID on CO	DC
)	Sample ID on C				Sam	ple ID on CO	DC
Sample ID on Bottle Sample ID on Bottle	Sample ID on C				Sam	ple ID on Co	OC .
)	Sample ID on C				Sam	ple ID on CO	DC .
Additional Notes, Discrepand	Sample ID on C				Sam	ple ID on CO	000
Additional Notes, Discrepand	Sample ID on C	COC Small A	Sample ID on Bott		Sam	ple ID on CC	DC
Additional Notes, Discrepand By: Small Air Bubbles Pastul 24 r	Sample ID on Concession of Con	COC Small →	Sample ID on Bott	le	Sam	ple ID on Co	DC .
Additional Notes, Discrepand By: Small Air Bubbles Pastul 24 r	Sample ID on C	COC Small → Peabubb	Sample ID on Bott	le	Sam	ple ID on CC	DC

0016F 3/2/10

Cooler Receipt Form

Revision 014



Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
27-Nov-2017 12:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN BLANK	17K0092-01	Water	06-Nov-2017 10:00	06-Nov-2017 11:25
WUFF-OUT BLANK	17K0092-02	Water	06-Nov-2017 10:00	06-Nov-2017 11:25
WUFF-CHURN BLANK	17K0092-03	Water	06-Nov-2017 10:00	06-Nov-2017 11:25
WUFF-IN BLANK	17K0092-04	Water	06-Nov-2017 10:00	06-Nov-2017 11:25
WUFF-OUT BLANK	17K0092-05	Water	06-Nov-2017 10:00	06-Nov-2017 11:25
WUFF-CHURN BLANK	17K0092-06	Water	06-Nov-2017 10:00	06-Nov-2017 11:25

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 6, 2017 under ARI workorder 17K0092. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

The samples were prepared and analyzed within the recommended holding times.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 27-Nov-2017 12:15

WUFF-IN BLANK 17K0092-01 (Water)

Metals and Metallic Compounds

Sampled: 11/06/2017 10:00 Method: EPA 200.8 Instrument: ICPMS2 Analyzed: 17-Nov-2017 17:33

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Sample Preparation:

Sample Size: 25 mL Preparation Batch: BFK0234

Prepared: 09-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	1.00	ug/L	
Zinc	7440-66-6	1	4.00	ND	ug/L	U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 27-Nov-2017 12:15

WUFF-IN BLANK 17K0092-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 06-Nov-2017 17:48

Sample Preparation: Preparation Method: SM 5310 A-00, 0.45um filtration

Preparation Batch: BFK0161 Sample Size: 50 mL Prepared: 06-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 ND mg-P/L U

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate

Preparation Batch: BFK0547 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 ND mg-P/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-OUT BLANK 17K0092-02 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/06/2017 10:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 17:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234 Sample Size: 25 mL Prepared: 09-Nov-2017 Final Volume: 25 mL

Reporting Dilution Limit Units Analyte CAS Number Result Notes 7440-50-8 0.500 0.741 ug/L Copper Zinc 7440-66-6 1 4.00 ND ug/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-OUT BLANK 17K0092-02 (Water)

Wet Chemistry

 Method: SM 4500-P E-99
 Sampled: 11/06/2017 10:00

 Instrument: UV1800-2
 Analyzed: 06-Nov-2017 17:48

Sample Preparation: Preparation Method: SM 5310 A-00, 0.45um filtration

Preparation Batch: BFK0161 Sample Size: 50 mL Prepared: 06-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 ND mg-P/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-OUT BLANK 17K0092-02RE1 (Water)

Wet Chemistry

 Method: SM 4500-P E-99
 Sampled: 11/06/2017 10:00

 Instrument: UV1800-2
 Analyzed: 21-Nov-2017 15:51

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate

Preparation Batch: BFK0547 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 ND mg-P/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-CHURN BLANK 17K0092-03 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/06/2017 10:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 17:42

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0234 Sample Size: 25 mL Prepared: 09-Nov-2017 Final Volume: 25 mL

Reporting Dilution Limit Analyte CAS Number Result Units Notes 7440-50-8 0.500 ND ug/L U Copper Zinc 7440-66-6 1 4.00 ND ug/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-CHURN BLANK 17K0092-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 06-Nov-2017 17:49

Sample Preparation: Preparation Method: SM 5310 A-00, 0.45um filtration

Preparation Batch: BFK0161 Sample Size: 50 mL

Prepared: 06-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 ND mg-P/L U

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate

Preparation Batch: BFK0547 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 ND mg-P/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-IN BLANK 17K0092-04 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/06/2017 10:00

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 20:10

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL

Prepared: 10-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 27-Nov-2017 12:15

WUFF-OUT BLANK 17K0092-05 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/06/2017 10:00

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 20:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL

Prepared: 10-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

WUFF-CHURN BLANK 17K0092-06 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/06/2017 10:00

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 20:20

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0282 Sample Size: 25 mL Prepared: 10-Nov-2017 Final Volume: 25 mL

Reporting Dilution Limit Analyte CAS Number Result Units Notes Copper, Dissolved 7440-50-8 0.500 ND ug/L U Zinc, Dissolved 7440-66-6 1 4.00 ND ug/L U

Analytical Resources, Inc.

Reported:



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000
Project Manager: Dylan Ahearn

Project Manager: Dylan Ahearn 27-Nov-2017 12:15

Metals and Metallic Compounds - Quality Control

Batch BFK0234 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0234-BLK1)				Prep	ared: 09-Nov	v-2017 An	alyzed: 16-	Nov-2017 2	0:23		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0234-BS1)				Prep	pared: 09-Nov	v-2017 An	alyzed: 16-	Nov-2017 2	0:44		
Copper	63	27.2	0.500	ug/L	25.0		109	80-120			
Copper	65	27.4	0.500	ug/L	25.0		110	80-120			
Zinc	67	93.2	4.00	ug/L	80.0		117	80-120			
LCS (BFK0234-BS2)				Prep	pared: 09-Nov	v-2017 An	alyzed: 17-	Nov-2017 1	6:44		
Copper	63	26.1	0.500	ug/L	25.0		104	80-120			
Copper	65	26.1	0.500	ug/L	25.0		104	80-120			
Zinc	66	93.2	4.00	ug/L	80.0		116	80-120			
Zinc	67	89.4	4.00	ug/L	80.0		112	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000
Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 27-Nov-2017 12:15

Metals and Metallic Compounds (dissolved) - Quality Control

Project: Hydro International

Batch BFK0282 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0282-BLK1)				Prepa	ared: 10-Nov	v-2017 An	alyzed: 10-	Nov-2017 1	9:51		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFK0282-BS1)				Prepa	ared: 10-Nov	v-2017 An	alyzed: 10-	Nov-2017 2	0:11		
Copper, Dissolved	63	28.2	0.500	ug/L	25.0		113	80-120			
Copper, Dissolved	65	28.4	0.500	ug/L	25.0		114	80-120			
Zinc, Dissolved	66	94.7	4.00	ug/L	80.0		118	80-120			
Zinc, Dissolved	67	86.6	4.00	ug/L	80.0		108	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 27-Nov-2017 12:15

Wet Chemistry - Quality Control

Batch BFK0161 - SM 5310 A-00, 0.45um filtration

Instrument: UV1800-2 Analyst: CDE

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0161-BLK1)			Prepa	ared: 06-Nov	v-2017 An	alyzed: 06-	Nov-2017 1	7:43		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFK0161-BS1)			Prepa	ared: 06-Nov	v-2017 An	alyzed: 06-	Nov-2017 1	7:44		
Orthophosphorus	0.155	0.0040	mg-P/L	0.150		103	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International Project Number: 13-05605-000 Project Manager: Dylan Ahearn

Reported: 27-Nov-2017 12:15

Wet Chemistry - Quality Control

Batch BFK0547 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0547-BLK1)			Prepa	ared: 20-No	v-2017 A1	nalyzed: 21-	Nov-2017 1	5:25		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK2)			Prepa	ared: 20-No	v-2017 A1	nalyzed: 21-	Nov-2017 1	5:34		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK3)			Prepa	ared: 20-No	v-2017 A1	nalyzed: 21-	Nov-2017 1	5:52		
Total Phosphorus	ND	0.0080	mg-P/L							U
LCS (BFK0547-BS1)			Prepa	ared: 20-No	v-2017 A1	nalyzed: 21-	Nov-2017 1	5:26		
Total Phosphorus	0.306	0.0080	mg-P/L	0.300		102	90-110			
DL (BFK0547-BS2)			Prepa	ared: 20-No	v-2017 A1	nalyzed: 21-	Nov-2017 1	5:34		
Total Phosphorus	0.310	0.0080	mg-P/L	0.300		103	90-110			
LCS (BFK0547-BS3)			Prepa	ared: 20-No	v-2017 A1	nalyzed: 21-	Nov-2017 1	5:52		
Total Phosphorus	0.308	0.0080	mg-P/L	0.300		103	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants
Project: Hydro International
2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Seattle WA, 98121
Project Manager: Dylan Ahearn

Reported: 27-Nov-2017 12:15

Certified Analyses included in this Report

Analyte	Certifications
EDA 200 9 in 14/otor	

Copper-63NELAP,WADOE,WA-DW,DoD-ELAPCopper-65NELAP,WADOE,WA-DW,DoD-ELAPZinc-66NELAP,WADOE,WA-DW,DoD-ELAPZinc-67NELAP,WADOE,WA-DW,DoD-ELAPCopper-63NELAP,WADOE,WA-DW,DoD-ELAPCopper-65NELAP,WADOE,WA-DW,DoD-ELAP	EPA 200.8 In Water	
Zinc-66NELAP,WADOE,WA-DW,DoD-ELAPZinc-67NELAP,WADOE,WA-DW,DoD-ELAPCopper-63NELAP,WADOE,WA-DW,DoD-ELAP	Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67 NELAP,WADOE,WA-DW,DoD-ELAP Copper-63 NELAP,WADOE,WA-DW,DoD-ELAP	Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63 NELAP,WADOE,WA-DW,DoD-ELAP	Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
7 - 2 7 7	Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65 NELAP,WADOE,WA-DW,DoD-ELAP	Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
	Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP

SM 4500-P E-99 in Water

Zinc-66

Zinc-67

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

NELAP,WADOE,WA-DW,DoD-ELAP

NELAP,WADOE,WA-DW,DoD-ELAP

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn27-Nov-2017 12:15

Notes and Definitions

T	T	Tri :	1 4 .	. 1	1 1	41	1' 11	4.	or detection li	

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

B This analyte was detected in the method blank.

* Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.

November 8, 2017

Data_17K0170

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17K0170-01	WUFF-IN	13-05605-000	Water	11/10/2017	11/10/2017	11/13/2017	11/14/2017	SM 2340 B-97		Hardness	78.5		mg/L
17K0170-02	WUFF-IN DUP	13-05605-000	Water	11/10/2017	11/10/2017	11/13/2017	11/15/2017	SM 2340 B-97		Hardness	68.3		mg/L
17K0170-03	WUFF-OUT	13-05605-000	Water	11/10/2017	11/10/2017	11/13/2017	11/15/2017	SM 2340 B-97		Hardness	96.4		mg/L
BFK0321-BLK1	Blank	13-05605-000	Water			11/10/2017	11/10/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFK0321-BS1	LCS	13-05605-000					11/10/2017	SM 4500-P E-99		Orthophosphorus	0.152		mg-P/L
BFK0321-DUP1	WUFF-IN	13-05605-000		11/10/2017	11/10/2017		11/10/2017	SM 4500-P E-99		Orthophosphorus	0.0140	L	mg-P/L
BFK0321-MS1	WUFF-IN	13-05605-000		11/10/2017			11/10/2017	SM 4500-P E-99		Orthophosphorus	0.112		mg-P/L
17K0170-01	WUFF-IN	13-05605-000			11/10/2017		11/10/2017	SM 4500-P E-99		Orthophosphorus	0.0100		mg-P/L
17K0170-02	WUFF-IN DUP	13-05605-000			11/10/2017		11/10/2017	SM 4500-P E-99		Orthophosphorus	0.0100		mg-P/L
17K0170-03	WUFF-OUT	13-05605-000				11/10/2017		SM 4500-P E-99		Orthophosphorus	0.0070		mg-P/L
BFK0327-BLK1	Blank	13-05605-000						EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFK0327-BS1	LCS	13-05605-000						EPA 200.8	7440-50-8	Copper	29.0		ug/L
17K0170-01	WUFF-IN	13-05605-000		11/10/2017	11/10/2017			EPA 200.8	7440-50-8	Copper	26.9		ug/L
17K0170-02	WUFF-IN DUP	13-05605-000		11/10/2017				EPA 200.8	7440-50-8	Copper	25.5		ug/L
17K0170-03	WUFF-OUT	13-05605-000			11/10/2017			EPA 200.8	7440-50-8	Copper	17.0		ug/L
BFK0327-BLK1	Blank	13-05605-000		11,10,2011	11,10,2011			EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFK0327-BS1	LCS	13-05605-000							7440-50-8	Copper	28.8		ug/L
BFK0327-BLK1	Blank	13-05605-000					11/18/2017		7440-66-6	Zinc	4.00	U	ug/L
BFK0327-BS3	LCS	13-05605-000							7440-66-6	Zinc	92.2		ug/L
17K0170-01	WUFF-IN	13-05605-000		11/10/2017	11/10/2017	11/13/2017		EPA 200.8	7440-66-6	Zinc	88.6		ug/L
17K0170-01	WUFF-IN DUP	13-05605-000			11/10/2017		11/18/2017		7440-66-6	Zinc	82.5		ug/L
17K0170-02	WUFF-OUT	13-05605-000			11/10/2017		11/18/2017		7440-66-6	Zinc	51.8		ug/L
BFK0327-BLK1	Blank	13-05605-000		11/10/2017	11/10/2017		11/18/2017		7440-66-6	Zinc	4.00	U	ug/L
BFK0327-BS1	LCS	13-05605-000					11/18/2017		7440-66-6	Zinc	95.0	0	ug/L
BFK0327-BS3	LCS	13-05605-000					11/21/2017		7440-66-6	Zinc	89.1		ug/L
BFK0328-BLK1	Blank	13-05605-000						EPA 6010C	7440-00-0	Calcium	0.0500	U	mg/L
BFK0328-BS1	LCS	13-05605-000							7440-70-2	Calcium	10.5	0	mg/L
BFK0328-DUP1	WUFF-IN	13-05605-000		11/10/2017	11/10/2017				7440-70-2	Calcium	23.6		mg/L
BFK0328-MS1	WUFF-IN	13-05605-000			11/10/2017		11/14/2017	EPA 6010C	7440-70-2	Calcium	34.5	*	mg/L
17K0170-01	WUFF-IN	13-05605-000		11/10/2017				EPA 6010C	7440-70-2	Calcium	21.5		mg/L
17K0170-01	WUFF-IN DUP	13-05605-000		11/10/2017				EPA 6010C	7440-70-2	Calcium	18.5		mg/L
17K0170-02	WUFF-OUT	13-05605-000			11/10/2017			EPA 6010C	7440-70-2	Calcium	26.1		mg/L
BFK0328-BLK1	Blank	13-05605-000		11/10/2017	11/10/2017			EPA 6010C	7439-95-4	Magnesium	0.0500	U	mg/L
BFK0328-BS1	LCS	13-05605-000							7439-95-4	Magnesium	11.0	0	mg/L
	WUFF-IN	13-05605-000		11/10/2017	11/10/2017						6.65		mg/L
BFK0328-MS1	WUFF-IN	13-05605-000	1					EPA 6010C	7439-95-4	Magnesium Magnesium	17.5		mg/L
17K0170-01	WUFF-IN	13-05605-000						EPA 6010C	7439-95-4	Magnesium	6.04		mg/L
17K0170-01	WUFF-IN DUP	13-05605-000						EPA 6010C	7439-95-4	Magnesium	5.38		
17K0170-02	WUFF-OUT	13-05605-000						EPA 6010C	7439-95-4	•	7.61		mg/L
				11/10/2017	11/10/2017			EPA 200.8-Dissolved	7439-93-4	Magnesium		U	mg/L
BFK0406-BLK1 BFK0406-BS1	Blank LCS	13-05605-000 13-05605-000						EPA 200.8-Dissolved	7440-50-8	Copper	0.500 25.8	U	ug/L
	WUFF-IN			11/10/2017	11/10/2017					Copper			ug/L
BFK0406-DUP1 BFK0406-MS1	WUFF-IN	13-05605-000 13-05605-000						EPA 200.8-Dissolved EPA 200.8-Dissolved	7440-50-8 7440-50-8	Copper	12.1 37.9		ug/L
										Copper	12.3		ug/L
17K0170-04	WUFF-IN	13-05605-000		11/10/2017	11/10/2017			EPA 200.8 Dissolved	7440-50-8	Copper		11	ug/L
BFK0406-BLK1	Blank	13-05605-000						EPA 200.8 Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0406-BS1	LCS	13-05605-000						EPA 200.8 Dissolved	7440-50-8	Copper	26.5	11	ug/L
BFK0447-BLK1	Blank	13-05605-000						EPA 200.8 Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0447-BS1	LCS	13-05605-000		44/40/0047	44/40/0047			EPA 200.8-Dissolved	7440-50-8	Copper	29.5		ug/L
17K0170-05	WUFF-IN DUP	13-05605-000	vvater	11/10/2017	11/10/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-50-8	Copper	12.8		ug/L

Data_17K0170

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17K0170-06	WUFF-OUT	13-05605-000	Water	11/10/2017	11/10/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-50-8	Copper	11.0		ug/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	29.3		ug/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	95.8		ug/L
17K0170-04RE1	WUFF-IN	13-05605-000		11/10/2017	11/10/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	40.6		ug/L
17K0170-05	WUFF-IN DUP	13-05605-000	Water	11/10/2017	11/10/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	44.9		ug/L
17K0170-06	WUFF-OUT	13-05605-000	Water	11/10/2017	11/10/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	34.8		ug/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	89.2		ug/L
BFK0547-BLK1	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BLK3	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0547-BS1	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.306		mg-P/L
BFK0547-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.310		mg-P/L
BFK0547-BS3	LCS	13-05605-000					11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.308		mg-P/L
BFK0547-DUP1	WUFF-OUT	13-05605-000			11/10/2017		11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0340		mg-P/L
BFK0547-MS1	WUFF-OUT	13-05605-000			11/10/2017		11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.234		mg-P/L
17K0170-03	WUFF-OUT	13-05605-000		11/10/2017	11/10/2017		11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0380		mg-P/L
BFK0548-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK3	Blank	13-05605-000				= =	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK4	Blank	13-05605-000					11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS4	LCS	13-05605-000					11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.320		mg-P/L
17K0170-01	WUFF-IN	13-05605-000	Water	11/10/2017	11/10/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0820		mg-P/L
17K0170-02	WUFF-IN DUP	13-05605-000	Water	11/10/2017	11/10/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0800		mg-P/L



01 December 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)

Associated SDG ID(s)

17K0170

Amanda Volgardsen, Services, cn=Amanda Volgardsen, email=amanday@arilabs.com

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Client email=amandav@arilabs.com Date: 2017.12.01 11:04:47 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the regirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.



2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108

Chain of Custody Record

Project Name:	Projec	t Number:	Client:					0			Ar	alyses	Reques	ted				
Hydro International Up-flo Filter	13-05	605-000	Herrera Environmental				uo	7	3977									
Report To:			Сору То:		100	trati		M 35										
Dylan Ahearn						A 254	neor	lids	ASTM	65.3	65.3	340E	8.0		- X			
Sampled By: Mullen		Delivery Method	nd de	livere	d	Total Suspended Solids- SM 2540D	Sediment Concentration	Total volatile Suspended solids SM2540-E	Particle size Distribution -	Total phosphorus - EPA 365.3	- EPA 365.3	Hardness as CaCO3-SM 2340B	- EPA 200.8	200.8	Zinc, dissolved - EPA 200.8	8.0		
Laboratory:		Requested Co	ompletion Date:		of Contain		S pa	din	edsr	Jistri	orus	orus	CaC	ved	EPA	<u> </u>	A 20	
Analytical Resources Inc.					2		ende	d Se	le Si	ize [spho	spho	as (ssol	ta -	olved	H.	
Lab Use:				Sample Type (see	Preser- vative?	Matrix (see	tal Susp	Suspended 9	al volati 2540-E	article s	otal pho	Orthophosphorus	ardness	Copper, dissolved	Copper, total - EPA 200.8	ıc, disso	Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	Ď	Su	SM					-				E
WUFF-IN		11.10.17	10.00	С	N	SW	X	X	x	Х	Х	X	X	Х	Х	X	X	
WUFF-OUT		11.10.17	10:00	С	N	SW	x	X	X	Х	X	Х	X	Х	Х	Х	X	
MAEE-IM DA6		1(.0.1	7. 10:00	C	14	SM	×	λ	×	×	X	7	×	×	X	X	X	
													4					
														T				
										1								
														/	× * .		1	7
										4								
Comments/Special Instructions:					1									1				14
Send 1 liter to ETS, Inc 975 Trans	port Way, Suite 2, Pet	aluma, CA	for PSD, TSS, a	nd TVSS.	PSD to	be run f	or >5	00, 50	0-125	, 125	-62.5,	62.5-	4, <4.					
Relinquished by (Name/CO/ MegMon Muller / Herrera	Signature Mozu M		Date/Time	17	roundo	Name/CO		AR	1 5	Signatu		6	- F	Ta	1	Date/	2/17	1190
Relinquished by (Name/CO/	Signature		Date/Time	Red	ceived By	(Name/CC))		0	Signatu	re					Date/	Time	

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)



Printed: 11/10/2017 12:58:07PM

WORK ORDER

17K0170

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

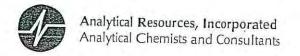
Project: Hydro International

Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	рН	
17K0170-01 A	Large OJ, 1000 mL		
17K0170-01 B	Large OJ, 1000 mL		
17K0170-01 C	Large OJ, 1000 mL		
17K0170-01 D	Small OJ, 500 mL, 9N H2SO4	<2 pass	
17K0170-01 E	Small OJ, 500 mL	Pagi	
17K0170-01 F	HDPE NM, 500 mL, 1:1 HNO3	67- Dall	
17K0170-02 Ā	Large OJ, 1000 mL		
17K0170-02 B	Large OJ, 1000 mL		
17K0170-02 C	Large OJ, 1000 mL		
17K0170-02 D	Small OJ, 500 mL, 9N H2SO4	17- 00P1	
17K0170-02 E	Small OJ, 500 mL		
17K0170-02 F	HDPE NM, 500 mL, 1:1 HNO3	LZ pass	
17K0170-03 A	Large OJ, 1000 mL	// CS3	
17K0170-03 B	Large OJ, 1000 mL		
17K0170-03 C	Large OJ, 1000 mL		
17K0170-03 D	Small OJ, 500 mL, 9N H2SO4	17- Dari	
17K0170-03 E	Small OJ, 500 mL		
17K0170-03 F	HDPE NM, 500 mL, 1:1 HNO3	LZ pass	
17K0170-04 A	HDPE NM, 500 mL	72 fail	
17K0170-05 A	HDPE NM, 500 mL	72 fail	
17K0170-06 A	HDPE NM, 500 mL	>2 fail	

Preservation Confirmed By



Cooler Receipt Form

ARI Client: Herre	VOL	Project Name:		-	
COC No(s):	NA	Delivered by: Fed-Ex UP:		Porod Othor	
Assigned ARI Job No:	<0176	Tracking No:			
Preliminary Examination Phas	e:			NA	
Were intact, properly signed an	d dated custody seals attached	d to the outside of to cooler?		YES (NO	2
Were custody papers included)
Were custody papers properly f	illed out (ink, signed, etc.)		,	NO NO	
Temperature of Cooler(s) (°C) (Time:	recommended 2.0-6.0 °C for c	hemistry	3	YES NO	
If cooler temperature is out of c	ompliance fill out form 000705	6.3			. 0
	7-	11/12/1-	Temp Gun ID	# 1005 R	202566
Cooler Accepted by:		Date:(//(O/ 1 /	Time:	0 7	
Log-In Phase:	Complete custody form	ns and attach all shipping docum	ents		_
			44	_	
Was a temperature blank includ				YES NO	
What kind of packing material		rap Wet Ice Gel Packs Baggies	oam Block Paper (Other:	
vvas sufficient ice used (if appro	priate)?	***************************************	NA	YES NO	5
Were all bottles sealed in individ	dual plastic bags?			YES (NO)	
Did all bottles arrive in good cor	ndition (unbroken)?			YES NO	
Did the number of contain and it	and legible?			YES NO	
Did all hottle labels and tags ag	ted on COC match with the nui	mber of containers received?	*******	YES NO	
Were all bottles used correct for	the requested one lypes?			(YES) NO	
Do any of the analyses (bottles)	require presentation? (attack	preservation sheet, excluding VOC		YES NO	
Were all VOC vials free of air bu	hbles?	preservation sheet, excluding VOC	s) NA	YES NO	
Was sufficient amount of sample	sent in each bottle?	······································	(NA)	YES NO	
Date VOC Trip Blank was made	at ARI	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		YES NO	
Was Sample Split by ARI: N	IA YES Date/Time:	[/10/17 Equipment: Cr		C =	2.
CT			ion spin	Split by:	
Samples Logged by:	Da	ite: 11/10/17	me: 17 44		
	** Notify Project Manag	ger of discrepancies or concern	3 **		
F					
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Samp	ole ID on COC	
	1		W. H. T. T. T.		
Additional Notes, Discrepanci	es & Resolutions				
The same of the sa	o, a resolutions.				
(e)					
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By: Da	ite:		3		
Small Air Bubbles Peabubt	les' LARGE AT Bubbles	Small → "sm" (<2 mm)			-
= 2mm 2-4 m	™ >4mm	Peabubbles > "pb" (2 to <4 m	m) .		-
	000	Large -> "lg" (4 to < 6 mm)	*		
The state of the s					

0016F 3/2/10

Cooler Receipt Form

Revision 014

Printed: 11/10/2017 12:58:07PM

WORK ORDER

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Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	pH ·	
17K0170-01 A	Large OJ, 1000 mL		*
17K0170-01 B	Large OJ, 1000 mL		
17K0170-01 C	Large OJ, 1000 mL		
17K0170-01 D	Small OJ, 500 mL, 9N H2SO4	<2 pass	
17K0170-01 E	Small OJ, 500 mL		
17K0170-01 F	HDPE NM, 500 mL, 1:1 HNO3	62 Dall	
17K0170-02 Ā	Large OJ, 1000 mL		
17K0170-02 B	Large OJ, 1000 mL		
17K0170-02 C	Large OJ, 1000 mL		e e e e e e e e e e e e e e e e e e e
17K0170-02 D	Small OJ, 500 mL, 9N H2SO4	17- 00SI	
17K0170-02 E	Small OJ, 500 mL		
17K0170-02 F	HDPE NM, 500 mL, 1:1 HNO3	LZ pass	
17K0170-03 A	Large OJ, 1000 mL	70003	
17K0170-03 B	Large OJ, 1000 mL		
17K0170-03 C	Large OJ, 1000 mL		
17K0170-03 D	Small OJ, 500 mL, 9N H2SO4	17- Dari	
17K0170-03 E	Small OJ, 500 mL		
17K0170-03 F	HDPE NM, 500 mL, 1:1 HNO3	LZ pass	
17K0170-04 A	HDPE NM, 500 mL	72 fail	
17K0170-05 A	HDPE NM, 500 mL	72 fail	
17K0170-06 A	HDPE NM, 500 mL	>2 fail	

Preservation Confirmed By

11/10/17
Date

filtesed+preserved

11/15/17/PP



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring

-Analytical Labs

-Technical Support

975 Transport Way, Suite 2 Petaluma, CA 94954 (707) 778-9605/FAX 778-9612

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

COMPANY:	Analytical Resources, Inc., 4611 S. 134th Place, Suite 10	0, Tukwila, WA	98168		ANALYST(S)	SUPERVISOR
ATTN:	Amanda Volgardsen	DATE	DATE	DATE	S. Santos	D. Jacobson
JOB:	Hydro International Up-Flo Filter	COLLECTED	RECEIVED	COMPLETED	L. Quijano	LAB DIRECTOR
SITE:	Oregon-Washington	11/10/2017	11/15/2017	11/27/2017		G. Conrad, PhD

SITE:	Oregon-Was	hington			11/10/2017	11/15/2017	11/27/2017		G. Conrad,PhD
		PARTICLE	SIZE DISTRI	BUTION (PSD) ANALYSIS	& REPORT -	- 5 PART		1
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	SUSPENDED SOLIDS	SUSPENDED SOLIDS mg/l @ 125 µ	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS mg/l @ 1 µ	SUSPENDED SEDIMENT CONG TSS mg/l
07568-1	HI-36HEC/RW 17K0	WUFF-IN 170-01	1.5 7.7%	2.5 12.9%	3.0 15.5%	Total SSC by	8.7 44.8% Summation →	3.7 19.1% 19.4	21.0
07568-2		WUFF-IN Dup 170-02	1.5 7.4%	3.0 14.8%	3.5 17.2%		9.0 44.3% Summation →	3.3 16.3%	24.0
07568-3		WUFF-OUT 170-03	0.0 0.0%	0.5 6.1%	2.0 24.4%	#DIV/0! Total SSC by	4.6 56.1% Summation →	1.1 13.4% 8.2	7.0
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! Summation →	#DIV/0! 0.0	
LAB SAMPLE NUMBER	SAMPLE.	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE) SOLIDS (TVSS) mg/l
								3	

COMMENTS

The matrix has a very low concentration of TSS particles amounting to only ~20 ppm in the input samples; and the output sample is extremely low at <10 ppm. Considering all samples, overall average reductions are in the range of 60%-65% (i.e., TSS by summation vs analytical TSS). The specific fraction reductions going from coarsest to finest sizes taking into account both input samples is as follows: 100%/100%, 80.0%/83.3%, 33.3%/42.9%, 47.1%/48.9%, and 66.7%/57.7%. So while not perfect, there is reasonable agreement between the two input samples when comparing to the output sample. The agreement is reasonable considering the extremely low levels of TSS in total and, especially, in the various fractions. Regradless of how the particular fraction reductions are viewed (total range is 57.7% to 70.8%), the absolute numerical difference in mass is extremely small. The distribution is uni-modal, again, with the mode at the 4-63 μ fraction. The RPDs in this case are excellent to very good as follows: $\pm 4.0\%$, $\pm 8.4\%$, and $\pm 7.9\%$.

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Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project:	Hydro International (17K0170)	Date Received:	November 14, 2017
Project #:	16T001-035	Sampled By:	Others
Client :	Analytical Resources, Inc.	Date Reported:	November 29, 2017
Source:	Multiple	Tested By:	B. Goble
MTC Sample#:	Multiple		

CASE NARRATIVE

1. Three samples were submitted for sediment concentration by ASTM D3977, Method C.
2. The coarse material was screened over a No. 230 sieve.
3. The suspended solids are reported in mg/L.
4. The data is provided in a summary table.
5. There were no other noted anomalies in this project.
1 7

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Page 7 of 36 17K0170 ARISample FINAL 01 Dec 2017 1101

Page 8 of 36 17K0170 ARISample FINAL 01 Dec 2017 1101

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0170) Project #: 16T001-035

Date Received: November 14, 2017

Date Tested: November 15, 2017

Client: Analytical Resources, Inc.

Sampled by: Others Tested by: B. Goble

Suspended Sediment Concentration ASTM D3977 Method C

Client Sample ID	MTC Sample ID	Sampling Date	Coarse Fraction SSC (>63µm) (mg/L)	FineFraction SSC (<63µm) (mg/L)	Total Suspended Sediment Concentration (mg/L)
WUFF-IN	T17-1646	11/10/2017	11.2	13.6	24.9
WUFF-IN DUP	T17-1647	11/10/2017	11.4	12.5	23.8
WUFF-OUT	T17-1648	11/10/2017	0.9	4.7	5.5

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Silverdale ~ 360.698.6787

Tukwila ~ 206.241.1974

Visit our website: www.mtc-inc.net

Regional Offices: Olympia ~ 360.534.9777

Bellingham ~ 360.647.6061



Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
01-Dec-2017 11:01

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17K0170-01	Water	10-Nov-2017 10:00	10-Nov-2017 11:00
WUFF-IN DUP	17K0170-02	Water	10-Nov-2017 10:00	10-Nov-2017 11:00
WUFF-OUT	17K0170-03	Water	10-Nov-2017 10:00	10-Nov-2017 11:00
WUFF-IN	17K0170-04	Water	10-Nov-2017 10:00	10-Nov-2017 11:00
WUFF-IN DUP	17K0170-05	Water	10-Nov-2017 10:00	10-Nov-2017 11:00
WUFF-OUT	17K0170-06	Water	10-Nov-2017 10:00	10-Nov-2017 11:00

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 10, 2017 under ARI workorder 17K0170. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS, TVSS and PSD analysis were subcontracted to ETS Labs. The SSC analysis was subcontracted to MTC Labs.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A dissolved Copper matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery and duplicate RPD were within QC limits.

Total Hardness - EPA Method 6010C

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

A matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The duplicate RPD was within QC limits. The matrix spike has high spike recovery for Calcium. The results are advisory. No corrective action was taken.

Wet Chemistry (O-Phos, T-Phos)

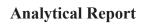
The samples were prepared and analyzed within the recommended holding times.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A O-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery was within QC limits. The duplicate has a concentration <=5 times the reporting limits, and the replicate control limit defaults to +/- the reporting limit instead of 20% of the RPD. The O-Phos has been flagged with an "L" qualifier on the duplicate.

Analytical Resources, Inc.





Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

A T-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-OUT. The matrix spike percent recovery and duplicate RPD were within QC limits.

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN 17K0170-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 19:47

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0327 Sample Size: 25 mL

Prepared: 13-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	26.9	ug/L	
Zinc	7440-66-6	1	4.00	88.6	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN 17K0170-01 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/10/2017 10:00

 Instrument: ICP2
 Analyzed: 14-Nov-2017 13:27

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0328 Sample Size: 25 mL Prepared: 13-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 21.5 mg/L Magnesium 7439-95-4 1 0.0500 6.04 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN 17K0170-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 10-Nov-2017 17:20

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0321 Sample Size: 50 mL Prepared: 10-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0100 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0820 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000

Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 01-Dec-2017 11:01

WUFF-IN 17K0170-01 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/10/2017 10:00 Instrument: [CALC] Analyzed: 14-Nov-2017 13:27

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 13-Nov-2017 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	78.5	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN DUP 17K0170-02 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 21:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0327 Sample Size: 25 mL

Prepared: 13-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	25.5	ug/L	
Zinc	7440-66-6	1	4.00	82.5	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN DUP 17K0170-02 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/10/2017 10:00

 Instrument: ICP2
 Analyzed: 15-Nov-2017 19:03

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0328 Sample Size: 25 mL Prepared: 13-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 18.5 mg/L Magnesium 7439-95-4 1 0.0500 5.38 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:01

WUFF-IN DUP 17K0170-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 10-Nov-2017 17:22

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0321 Sample Size: 50 mL Prepared: 10-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0100 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0800 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 01-Dec-2017 11:01

WUFF-IN DUP 17K0170-02 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/10/2017 10:00 Instrument: [CALC] Analyzed: 15-Nov-2017 19:03

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 13-Nov-2017 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	68.3	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-OUT 17K0170-03 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 21:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0327 Sample Size: 25 mL

Prepared: 13-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	17.0	ug/L	
Zinc	7440-66-6	1	4.00	51.8	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-OUT 17K0170-03 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/10/2017 10:00

 Instrument: ICP2
 Analyzed: 15-Nov-2017 19:07

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0328 Sample Size: 25 mL Prepared: 13-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 26.1 mg/L Magnesium 7439-95-4 1 0.0500 7.61 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-OUT 17K0170-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-2

Analyzed: 10-Nov-2017 17:22

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0321 Sample Size: 50 mL Prepared: 10-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0070 mg-P/L

Sample Preparation: Preparation Method: SM 4500-P B-5 Persulfate

Preparation Batch: BFK0547 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0380 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 01-Dec-2017 11:01

WUFF-OUT 17K0170-03 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/10/2017 10:00 Instrument: [CALC] Analyzed: 15-Nov-2017 19:07

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 13-Nov-2017 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	96.4	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN 17K0170-04 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 15-Nov-2017 14:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0406 Sample Size: 25 mL

Prepared: 15-Nov-2017 Final Volume: 25 mL

Analyte CAS Number Dilution Result Units Notes

Copper, Dissolved 7440-50-8 1 0.500 12.3 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN 17K0170-04RE1 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 18:11

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

Analyte CAS Number Dilution Result Units Notes

Zinc, Dissolved 7440-66-6 1 4.00 40.6 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-IN DUP 17K0170-05 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 18:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	12.8	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	44.9	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

WUFF-OUT 17K0170-06 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/10/2017 10:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 18:20

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL Prepared: 16-Nov-2017 Final Volume: 25 mL

Reporting Dilution Limit Analyte CAS Number Result Units Notes Copper, Dissolved 7440-50-8 0.500 11.0 ug/L Zinc, Dissolved 7440-66-6 1 4.00 34.8 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000
Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:01

Metals and Metallic Compounds - Quality Control

Project: Hydro International

Batch BFK0327 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0327-BLK1)				Prepa	ared: 13-Nov	v-2017 An	alyzed: 18-	Nov-2017 1	9:28		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0327-BS1)				Prepa	ared: 13-Nov	v-2017 An	alyzed: 18-	Nov-2017 2	0:12		
Copper	63	29.0	0.500	ug/L	25.0		116	80-120			
Copper	65	28.8	0.500	ug/L	25.0		115	80-120			
Zinc	67	95.0	4.00	ug/L	80.0		119	80-120			
LCS (BFK0327-BS3)				Prepa	ared: 13-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	4:42		
Zinc	66	92.2	4.00	ug/L	80.0		115	80-120			
Zinc	67	89.1	4.00	ug/L	80.0		111	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:01

Metals and Metallic Compounds - Quality Control

Batch BFK0328 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

		Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFK0328-BLK1)			Prepa	ared: 13-Nov	v-2017 Ana	alyzed: 14-	Nov-2017 1	3:05		
Calcium	ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L							U
LCS (BFK0328-BS1)			Prepa	ared: 13-Nov	v-2017 Ana	alyzed: 14-	Nov-2017 1	3:36		
Calcium	10.5	0.0500	mg/L	10.0		105	80-120			
Magnesium	11.0	0.0500	mg/L	10.0		110	80-120			
Duplicate (BFK0328-DUP1)	Source:	17K0170-01	Prepa	ared: 13-Nov	v-2017 Ana	alyzed: 14-	Nov-2017 1	3:23		
Calcium	23.6	0.0500	mg/L		21.5			9.22	20	
Magnesium	6.65	0.0500	mg/L		6.04			9.60	20	
Matrix Spike (BFK0328-MS1)	Source:	17K0170-01	Prepa	ared: 13-Nov	v-2017 Ana	alyzed: 14-	Nov-2017 1	3:31		
Calcium	34.5	0.0500	mg/L	10.0	21.5	130	75-125			*
Magnesium	17.5	0.0500	mg/L	10.0	6.04	115	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International Project Number: 13-05605-000 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:01

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0406 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

			Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFK0406-BLK1)				Prepa	ared: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	4:22		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
LCS (BFK0406-BS1)				Prepa	ared: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	4:42		
Copper, Dissolved	63	25.8	0.500	ug/L	25.0		103	80-120			
Copper, Dissolved	65	26.5	0.500	ug/L	25.0		106	80-120			
Duplicate (BFK0406-DUP1)		Source	e: 17K0170-04	Prepa	ared: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	4:27		
Copper, Dissolved	63	12.1	0.500	ug/L		12.3			1.88	20	
Matrix Spike (BFK0406-MS1)		Source	e: 17K0170-04	Prepa	ared: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	4:36		
Copper, Dissolved	63	37.9	0.500	ug/L	25.0	12.3	102	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0447 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0447-BLK1)				Prepa	ared: 16-Nov	7-2017 An	alyzed: 16-	Nov-2017 1	4:33		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFK0447-BS1)				Prepa	ared: 16-Nov	7-2017 Ana	alyzed: 16-	Nov-2017 1	5:20		
Copper, Dissolved	63	29.5	0.500	ug/L	25.0		118	80-120			
Copper, Dissolved	65	29.3	0.500	ug/L	25.0		117	80-120			
Zinc, Dissolved	66	95.8	4.00	ug/L	80.0		120	80-120			
Zinc, Dissolved	67	89.2	4.00	ug/L	80.0		111	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International Project Number: 13-05605-000 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:01

Wet Chemistry - Quality Control

Batch BFK0321 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0321-BLK1)			Prepa	red: 10-Nov	7-2017 Ana	alyzed: 10-	Nov-2017 1	7:19		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFK0321-BS1)			Prepa	red: 10-Nov	7-2017 An	alyzed: 10-	Nov-2017 1	7:19		
Orthophosphorus	0.152	0.0040	mg-P/L	0.150		101	90-110			
Duplicate (BFK0321-DUP1)	Source:	17K0170-01	Prepa	red: 10-Nov	7-2017 An	alyzed: 10-	Nov-2017 1	7:21		
Orthophosphorus	0.0140	0.0040	mg-P/L		0.0100			33.30	20	L
Matrix Spike (BFK0321-MS1)	Source:	17K0170-01	Prepa	red: 10-Nov	7-2017 An	alyzed: 10-	Nov-2017 1	7:21		
Orthophosphorus	0.112	0.0040	mg-P/L	0.0999	0.0100	102	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Project: Hydro International Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

Wet Chemistry - Quality Control

Batch BFK0547 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0547-BLK1)			Prena	ared: 20-No	v-2017 An	alvzed: 21-	-Nov-2017 1	5:25		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK2)			Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:34		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0547-BLK3)			Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:52		
Total Phosphorus	ND	0.0080	mg-P/L							U
LCS (BFK0547-BS1)			Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:26		
Total Phosphorus	0.306	0.0080	mg-P/L	0.300		102	90-110			
DL (BFK0547-BS2)			Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:34		
Total Phosphorus	0.310	0.0080	mg-P/L	0.300		103	90-110			
LCS (BFK0547-BS3)			Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:52		
Total Phosphorus	0.308	0.0080	mg-P/L	0.300		103	90-110			
Duplicate (BFK0547-DUP1)	Source	17K0170-03	Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:28		
Total Phosphorus	0.0340	0.0080	mg-P/L		0.0380			11.10	20	
Matrix Spike (BFK0547-MS1)	Source	17K0170-03	Prepa	ared: 20-No	v-2017 An	alyzed: 21-	-Nov-2017 1	5:28		
Total Phosphorus	0.234	0.0080	mg-P/L	0.200	0.0380	98.1	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100 Seattle WA, 98121 Project: Hydro International

Project Number: 13-05605-000 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:01

Wet Chemistry - Quality Control

Batch BFK0548 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0548-BLK2)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	6:50		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK3)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:08		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK4)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:22		
Total Phosphorus	ND	0.0080	mg-P/L							U
DL (BFK0548-BS2)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	6:52		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS3)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:10		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS4)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:22		
Total Phosphorus	0.320	0.0080	mg-P/L	0.300		107	90-110			

Analytical Resources, Inc.





Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:01

Certified Analyses included in this Report

Analyte	Certifications

EPA 200.8 in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP

EPA 6010C in Water

Calcium WADOE,NELAP,DoD-ELAP Magnesium WADOE,NELAP,DoD-ELAP

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.





Herrera Environmental Consultants

Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:01

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

This analyte was detected in the method blank.

Flagged value is not within established control limits.

NR Not Reported

В

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.

November 12, 2017

Data_17K0197

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	SM 2340 B-97		Hardness	37.0		mg/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	SM 2340 B-97		Hardness	40.2		mg/L
BFK0365-BLK1	Blank	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFK0365-BS1	LCS	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	25.8		ug/L
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/14/2017	11/18/2017	EPA 200.8	7440-50-8	Copper	22.0		ug/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/14/2017	11/18/2017	EPA 200.8	7440-50-8	Copper	18.1		ug/L
BFK0365-BLK1	Blank	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFK0365-BS1	LCS	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-50-8	Copper	26.1		ug/L
BFK0365-BLK1	Blank	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BFK0365-BS1	LCS	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	90.7		ug/L
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/14/2017	11/18/2017	EPA 200.8	7440-66-6	Zinc	71.7		ug/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/14/2017	11/18/2017	EPA 200.8	7440-66-6	Zinc	62.9		ug/L
BFK0365-BLK1	Blank	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BFK0365-BS1	LCS	13-05605-000	Water			11/14/2017	11/17/2017	EPA 200.8	7440-66-6	Zinc	87.4		ug/L
BFK0378-BLK1	Blank	13-05605-000	Water			11/14/2017	11/14/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFK0378-BS1	LCS	13-05605-000	Water			11/14/2017	11/14/2017	SM 4500-P E-99		Orthophosphorus	0.147		mg-P/L
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/14/2017	11/14/2017	SM 4500-P E-99		Orthophosphorus	0.0090		mg-P/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/14/2017	11/14/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0070		mg-P/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	29.5		ug/L
17K0197-03	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-50-8	Copper	7.14		ug/L
17K0197-04	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-50-8	Copper	7.18		ug/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	29.3		ug/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	95.8		ug/L
17K0197-03	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	24.2		ug/L
17K0197-04	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	24.6		ug/L
BFK0447-BLK1	Blank	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0447-BS1	LCS	13-05605-000	Water			11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	89.2		ug/L
BFK0454-BLK1	Blank	13-05605-000	Water			11/16/2017	11/17/2017	EPA 6010C	7440-70-2	Calcium	0.0500	U	mg/L
BFK0454-BS1	LCS	13-05605-000	Water			11/16/2017	11/17/2017	EPA 6010C	7440-70-2	Calcium	10.2		mg/L
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 6010C	7440-70-2	Calcium	10.5		mg/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 6010C	7440-70-2	Calcium	11.3		mg/L
BFK0454-BLK1	Blank	13-05605-000	Water			11/16/2017	11/17/2017	EPA 6010C	7439-95-4	Magnesium	0.0500	U	mg/L
BFK0454-BS1	LCS	13-05605-000	Water			11/16/2017	11/17/2017	EPA 6010C	7439-95-4	Magnesium	10.9		mg/L
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 6010C	7439-95-4	Magnesium	2.58		mg/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/16/2017	11/17/2017	EPA 6010C	7439-95-4	Magnesium	2.90		mg/L
BFK0548-BLK2	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK3	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK4	Blank	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS4	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.320		mg-P/L
17K0197-01	WUFF-IN	13-05605-000	Water	11/13/2017	11/13/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0700		mg-P/L
17K0197-02	WUFF-OUT	13-05605-000	Water	11/13/2017	11/13/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0420		mg-P/L



01 December 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>

Associated SDG ID(s)

17K0197



Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, Services, cn=Amanda Volgardsen, email=amandav@arilabs.com Date: 2017.12.01 11:34:52 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the regirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.



Chain of Custody Record

Project Name:	Project	Number:	Client:								An	alyses	Reques	ted				
Hydro International Up-flo Filter	13-05	605-000	Herrera Env	ironment	al		10.1	5		11								
Report To:			Copy To:				9	trati		ME39								
Dylan Ahearn							SM 2540D	cen	· spi	AST	5.3	5.3	40B	8.0				
iampled By: Neghow Milm			Delivery Metho	Y	pred			ent Cor	los papu	button	- EPA 36	- EPA 36	3-SM 23	EPA 20(200.8	A 200.8	9.8	
aboratory:		Requested C	ompletion Date:		. of Contair	ners:	oS p	dim	sbei	İstri	rus	LIR	acc	- pa	PA	- E	A 200	
nalytical Resources Inc.					2		ande	d Se	e Su	Q az	spho	spho	as C	Nos	<u>a</u>	lved	EP/	
ab Use:				Sample Type (see	Preser- vative?	Matrix (see	Total Suspended Solids-	spende SMD3977	Total volatile Suspended solids - SM2540-E	Particle size Distribution - ASTM-3977	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	Hardness as CaCO3-SM 2340B	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	P		SN									La
WUFF-IN		11-13.	17 13:00	С	N	SW	X	Х	x	X	Х	Х	X	Х	Х	Х	Х	
WUFF-OUT		11.13.1	17 13:00	С	N	SW	х	X	Х	X	Х	Х	Χ	X	Х	Х	Χ	
								-										
									-									
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					-			-		-								
			-															
											-							
	- i																	
Comments/Special Instructions:								I .										-
end 1 liter to ETS, Inc 975 Trans	sport Way, Suite 2, Peta	aluma, CA	for PSD, TSS,	and TVSS	. PSD to	be run f	or >5	00, 50	0-125	, 125-	62.5,	62.5-4	1, <4.					
elinquished by (Name/CO/	Signature	,	Date/Time	Re	eceived By				9	Signatur	e		,			Date/1	ime	1406
lyhan Muiler/Herren	Meg W	ul	Date/Time (1, 12, 17 2 : 0	e B	svanden	1 Fok	/A	RI	0	1		1	#	-		11/13	1/17-	16:00
elinquished by (Name/CO/	Signature		Date/Time	Re	eceived By	(Name/CO	ó)	1,	9	Signatur	e		A			Date/1	ime	

Sample Type: G=Grab C=Composite



Printed: 11/13/2017 4:27:34PM

WORK ORDER

17K0197

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

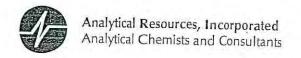
Project Number: [none]

Preservation Confirmation

Container ID	Container Type	рН
17K0197-01 A	Large OJ, 1000 mL	
17K0197-01 B	Large OJ, 1000 mL	
17K0197-01 C	Small OJ, 500 mL, 9N H2SO4	LZ Dags
17K0197-01 D	Small OJ, 500 mL	Post
17K0197-01 E	HDPE NM, 500 mL, 1:1 HNO3	12 pape
17K0197-02 A	Large OJ, 1000 mL	
17K0197-02 B	Large OJ, 1000 mL	
17K0197-02 C	Small OJ, 500 mL, 9N H2SO4	LZ Dass
17K0197-02 D	Small OJ, 500 mL	
17K0197-02 E	HDPE NM, 500 mL, 1:1 HNO3	LZ pass
17K0197-03 A	HDPE NM, 500 mL	22 fail
17K0197-04 A	HDPE NM, 500 mL	27 fail

Preservation Confirmed By

11/13/17 Date



Cooler Receipt Form

ARI Client: TENTERM		Project Name:		ŧ.	
COC No(s):	NA	Delivered by: Fed-Ex UPS Cou	oine III-refficie	Ac.	-
Assigned ARI Job No: 17 FO 197					
Preliminary Examination Phase:		Tracking No:			NA
Were intact, properly signed and dated custody s	eals attached to	the outside of to socio-2			
Were custody papers included with the cooler?			3	YES	(NO.)
Were custody papers properly filled out (ink, signe			(YES	NO
Temperature of Cooler(s) (°C) (recommended 2.0	0-6.0 °C for chem	nistry)		YES	NO
Time: If cooler temperature is out of compliance fill out f		5,4		_	
	om 00070F	11-1	Temp Gun II	#: POD	2565
Cooler Accepted by: 3F		_Date:1//3 / / 7 Time	1400	5	
Log-In Phase:	ustody forms a	nd attach all shipping documents			
Log-III i liase.			*		
Was a temperature blank included in the cooler?.				YES	(NO)
What kind of packing material was used?	Bubble Wrap	Wet Ice Gel Packs Baggies Foam	Block Paner	Other: A	1317 0
was sufficient ice used (if appropriate)?		***************************************	NA	YES	NO
Were all bottles sealed in individual plastic bags?				YES	(NO)
Did all bottles arrive in good condition (unbroken)?	?			YES	NO
Were all bottle labels complete and legible?				(ES)	NO
Did the number of containers listed on COC match	with the number	er of containers received?		YES	NO
Did all bottle labels and tags agree with custody pa	apers?			YES	NO
Were all bottles used correct for the requested and	alyses?		ā.	YES	NO
Do any of the analyses (bottles) require preservati	on? (attach pres	ervation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?			NA	YES	NO
Was sufficient amount of sample sent in each bottl	le?	••••		YES	NO
Date VOC Trip Blank was made at ARI. Was Sample Split by ARI: NA YES Date of the NA YES	117:	12. /	NA	1	
Was Sample Split by ART: NA YES D	ate/Time:	13/17 Equipment: Chur.	2 Split	Split by:_	SE
Samples Logged by:	Date:	Time:	1122	7	
		Time: _ of discrepancies or concerns **	102		
		or alcorepancies of concerns			
Sample ID on Bottle Sample ID	O on COC	Sample ID on Bottle			
5		Campie is on Bottle	Sam	ple ID on C	OC
	1.	F -2 F 19			
				_	
	4 1				
Additional Notes, Discrepancies, & Resolutions	S: 1				
			3		
* *					
By: Date:	- T				
1 = 3mm 1	10 00 000	Small → "sm" (<2 mm)			
		Peabubbles -> "pb" (2 to < 4 mm)	· -		
		Large → "lg" (4 to < 6 mm)			
· · · · · · · · · · · · · · · · · · ·	I	Headspace → "hs" (>6 mm)			

0016F 3/2/10

Cooler Receipt Form

Revision 014



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring

-Analytical Labs

-Technical Support

975 Transport Way, Suite 2 Petaluma, CA 94954 (707) 778-9605/FAX 778-9612

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

COMPANY: Analytical Resources, Inc., 4611 S. 134th Place, Suite 100, Tukwila, WA 98168

ATTN: Amanda Volgardsen

JOB: Hydro International Up-Flo Filter

SITE: Oregon-Washington

ANALYST(S)

SUPERVISOR

DATE

COLLECTED RECEIVED COMPLETED

L. Quijano

LAB DIRECTOR

11/10/2017 11/15/2017 11/27/2017

G.S. Conrad, PhD

Oregon-Wa	shington			11/10/2017	11/15/2017	11/27/2017		G.S. Conrad,Phl
	PARTICL	E SIZE DISTE	RIBUTION (PS	D) ANALYSIS	S & REPORT	- 5 PART		1
SAMPLE ID	SOURCE of WATER	SUSPENDED SOLIDS mg/l @ ≥500 µ	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SUSPENDED SOLIDS mg/l @ 1 µ	SUSPENDED SEDIMENT CONG TSS mg/l
HI-39HEC/RW 17K01		1.5 5.7%	3.0 11.4%	5.0 18.9%	Total SSC by	14.5 54.9% y Summation →	2.4 9.1% 26.4	28.0
		0.5 3.8%	1.5 11.4%	2.0 15.2%	Total SSC by	8.1 61.4% y Summation →	1.1 8.3% 13.2	14.0
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
SAMPLE ID	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	I VOLATILE) SOLIDS (TVSS) mg/I
	SAMPLE ID HI-39HEC/RW 17K01 HI-40HEC/RW 17K01	SAMPLE SOURCE of ID WATER HI-39HEC/RW WUFF-IN 17K0197-01 HI-40HEC/RW WUFF-OUT 17K0197-02 SAMPLE SOURCE of	PARTICLE SIZE DISTICATION SAMPLE SOURCE of SOLIDS ID WATER mg/l @ ≥500 µ HI-39HEC/RW WUFF-IN 1.5 17K0197-01 5.7% HI-40HEC/RW WUFF-OUT 0.5 17K0197-02 3.8% #DIV/0! SAMPLE SOURCE Water pH of	PARTICLE SIZE DISTRIBUTION (PS	PARTICLE SIZE DISTRIBUTION (PSD) ANALYSIS SAMPLE SOURCE SUSPENDED SUSPENDED SOLIDS SOLIDS SOLIDS Mg/I @ ≥500 μ mg/I @ 125 μ mg/I @ 63 μ HI-39HEC/RW WUFF-IN 1.5 3.0 5.0 17K0197-01 5.7% 11.4% 18.9% HI-40HEC/RW WUFF-OUT 1.5 2.0 17K0197-02 #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! SAMPLE SOURCE Water pH ECw COLOR, [Spec Cond] TRUE TRUE TRUE TRUE TRUE TRUE SAMPLE SOURCE Water pH ECw COLOR, [Spec Cond] TRUE TRUE TRUE TRUE TRUE TRUE SAMPLE SOURCE Water pH ECw COLOR, [Spec Cond] TRUE TRUE TRUE TRUE TRUE TRUE SAMPLE SOURCE Water pH ECw COLOR, [Spec Cond] TRUE TRUE TRUE TRUE TRUE TRUE SAMPLE SOURCE Water pH ECw COLOR, [Spec Cond] TRUE TRUE TRUE TRUE TRUE TRUE SAMPLE SOURCE Water pH ECw COLOR, [Spec Cond] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE T	PARTICLE SIZE DISTRIBUTION (PSD) ANALYSIS & REPORT	PARTICLE SIZE DISTRIBUTION (PSD) ANALYSIS & REPORT - 5 PART	PARTICLE SIZE DISTRIBUTION (PSD) ANALYSIS & REPORT - 5 PART

COMMENTS

The matrix has a very low concentration of TSS particles amounting to only <30 ppm in the input sample; likewise the output sample is very low at <15 ppm. In this case the overall reduction averaged right at 50% coincidentally in both analytics (i.e., TSS by summation vs analytical TSS). The specific fraction reductions going from coarsest to finest fractions are as follows: 66.7%, 50.0%, 60.0%, 44.1%, and 54.2%. The distribution is uni-modal with the mode in the second finest size class (i.e., $4-63 \mu$ class). In this case the RPDs are exactly the same as both are excellent as follows: $\pm 2.9\%$, and $\pm 2.9\%$.

\\\ NOTES: Tests were done according to methodology as per Association of Testing Materials (ASTM): Suspended Sediment Concentration – Modified ASTM D3977 (Practice for Determining Suspended-Sediment Concentration in Water Samples). Standard Methods is followed for the other tests: Color - 2120 C; Spec Cond. (ECw) - 2510 B; Iron - 3500-Fe B; pH - 4500-H+ B; TRPH - 5520 C.

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0197)	Date Received: November 14, 2017
Project #: 16T001-035	Sampled By: Others
Client: Analytical Resources, Inc.	Date Reported: November 29, 2017
Source: Multiple	Tested By: B. Goble
ATC Sample# Multiple	

CASE NARRATIVE

 Three samples were submitted for sediment concentration by ASTM D3977, Method C. The coarse material was screened over a No. 230 sieve. 	
3. The suspended solids are reported in mg/L. 4. The data is provided in a support table.	
4. The data is provided in a summary table.5. There were no other noted anomalies in this project.	

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Page 6 of 26 17K0197 ARISample FINAL 01 Dec 2017 1125

Page 7 of 26 17K0197 ARISample FINAL 01 Dec 2017 1125

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0197) Project #: 16T001-035

Date Received: November 14, 2017 Date Tested: November 15, 2017 Sampled by: Others

Tested by: B. Goble

Client: Analytical Resources, Inc.

Suspended Sediment Concentration ASTM D3977 Method C

Client Sample ID	MTC Sample ID	Sampling Date	Coarse Fraction SSC (>63µm) (mg/L)	FineFraction SSC (<63µm) (mg/L)	Total Suspended Sediment Concentration (mg/L)
WUFF-IN	T17-1644	11/13/2017	13.2	24.8	38.0
WUFF-OUT	T17 - 1645	11/13/2017	4.6	12.9	17.5

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Silverdale ~ 360.698.6787

Tukwila ~ 206.241.1974

Visit our website: www.mtc-inc.net

Regional Offices: Olympia ~ 360.534.9777

Bellingham ~ 360.647.6061



Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
01-Dec-2017 11:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17K0197-01	Water	13-Nov-2017 13:00	13-Nov-2017 14:06
WUFF-OUT	17K0197-02	Water	13-Nov-2017 13:00	13-Nov-2017 14:06
WUFF-IN	17K0197-03	Water	13-Nov-2017 13:00	13-Nov-2017 14:06
WUFF-OUT	17K0197-04	Water	13-Nov-2017 13:00	13-Nov-2017 14:06

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:25

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 13, 2017 under ARI workorder 17K0197. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS and TVSS analysis were subcontracted to ETS Labs. The SSC analysis was subcontracted to MTC Labs.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total Hardness - EPA Method 6010C

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

The samples were prepared and analyzed within the recommended holding times.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

WUFF-IN 17K0197-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/13/2017 13:00

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 22:18

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0365 Sample Size: 25 mL

Prepared: 14-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	22.0	ug/L	
Zinc	7440-66-6	1	4.00	71.7	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

WUFF-IN 17K0197-01 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/13/2017 13:00

 Instrument: ICP2
 Analyzed: 17-Nov-2017 11:53

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0454 Sample Size: 25 mL Prepared: 16-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 10.5 mg/L Magnesium 7439-95-4 1 0.0500 2.58 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:25

WUFF-IN 17K0197-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99

Instrument: UV1800-1

Analyzed: 14-Nov-2017 12:32

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0378 Sample Size: 50 mL Prepared: 14-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes
Orthophosphorus 1426-54-42 1 0.0040 0.0090 mg-P/L

Instrument: UV1800-2 Analyzed: 21-Nov-2017 17:12

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0700 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 01-Dec-2017 11:25

WUFF-IN 17K0197-01 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/13/2017 13:00 Instrument: [CALC] Analyzed: 17-Nov-2017 11:53

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 16-Nov-2017 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	37.0	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

WUFF-OUT 17K0197-02 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/13/2017 13:00

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 21:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0365 Sample Size: 25 mL

Prepared: 14-Nov-2017 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	18.1	ug/L	
Zinc	7440-66-6	1	4.00	62.9	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:25

WUFF-OUT 17K0197-02 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/13/2017 13:00

 Instrument: ICP2
 Analyzed: 17-Nov-2017 11:57

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0454 Sample Size: 25 mL Prepared: 16-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 11.3 mg/L Magnesium 7439-95-4 1 0.0500 2.90 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

WUFF-OUT 17K0197-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 11/13/2017 13:00
Instrument: UV1800-1 Analyzed: 14-Nov-2017 12:33

Analyzed: 14-Nov-2017 12:33

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0378 Sample Size: 50 mL Prepared: 14-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0070 mg-P/L

Instrument: UV1800-2 Analyzed: 21-Nov-2017 17:13

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0420 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000

Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 01-Dec-2017 11:25

> **WUFF-OUT** 17K0197-02 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/13/2017 13:00 Instrument: [CALC] Analyzed: 17-Nov-2017 11:57

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 16-Nov-2017 Final Volume: 1

Reporting CAS Number Dilution Limit Units Analyte Result Notes Hardness 0.331 40.2 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

WUFF-IN 17K0197-03 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/13/2017 13:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 18:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	7.14	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	24.2	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

WUFF-OUT 17K0197-04 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/13/2017 13:00

 Instrument: ICPMS2
 Analyzed: 17-Nov-2017 18:49

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	7.18	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	24.6	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn01-Dec-2017 11:25

Metals and Metallic Compounds - Quality Control

Batch BFK0365 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0365-BLK1)				Prepa	ared: 14-Nov	v-2017 An	alyzed: 17-	Nov-2017 1	4:53		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0365-BS1)				Prepa	ared: 14-Nov	v-2017 Ana	alyzed: 17-	Nov-2017 1	9:55		
Copper	63	25.8	0.500	ug/L	25.0		103	80-120			
Copper	65	26.1	0.500	ug/L	25.0		104	80-120			
Zinc	66	90.7	4.00	ug/L	80.0		113	80-120			
Zinc	67	87.4	4.00	ug/L	80.0		109	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

Metals and Metallic Compounds - Quality Control

Batch BFK0454 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0454-BLK1)			Prepa	ared: 16-Nov	7-2017 An	alyzed: 17-	Nov-2017 1	0:47		
Calcium	ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L							U
LCS (BFK0454-BS1)			Prepa	ared: 16-Nov	7-2017 An	alyzed: 17-	Nov-2017 1	1:32		
Calcium	10.2	0.0500	mg/L	10.0		102	80-120			
Magnesium	10.9	0.0500	mg/L	10.0		109	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International Project Number: 13-05605-000 2200 6th Avenue, Suite 1100 Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:25

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0447 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0447-BLK1)				Prepa	ared: 16-Nov	7-2017 An	alyzed: 16-1	Nov-2017 1	4:33		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFK0447-BS1)				Prepa	ared: 16-Nov	7-2017 Ana	alyzed: 16-1	Nov-2017 1	5:20		
Copper, Dissolved	63	29.5	0.500	ug/L	25.0		118	80-120			
Copper, Dissolved	65	29.3	0.500	ug/L	25.0		117	80-120			
Zinc, Dissolved	66	95.8	4.00	ug/L	80.0		120	80-120			
Zinc, Dissolved	67	89.2	4.00	ug/L	80.0		111	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000
Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:25

Wet Chemistry - Quality Control

Batch BFK0378 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: GM

Seattle WA, 98121

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0378-BLK1)			Prepa	ared: 14-Nov	v-2017 An	alyzed: 14-	Nov-2017 1	2:28		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFK0378-BS1)			Prepa	ared: 14-Nov	v-2017 An	alyzed: 14-	Nov-2017 1	2:28		
Orthophosphorus	0.147	0.0040	mg-P/L	0.150		98.0	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:25

Wet Chemistry - Quality Control

Batch BFK0548 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0548-BLK2)			Prepa	ared: 20-Nov	v-2017 Aı	nalyzed: 21-	Nov-2017	6:50		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK3)			Prepa	ared: 20-Nov	v-2017 A1	nalyzed: 21-	Nov-2017	7:08		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK4)			Prepa	ared: 20-Nov	v-2017 A1	nalyzed: 21-	Nov-2017	7:22		
Total Phosphorus	ND	0.0080	mg-P/L							U
DL (BFK0548-BS2)			Prepa	ared: 20-Nov	v-2017 A1	nalyzed: 21-	Nov-2017	6:52		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS3)			Prepa	ared: 20-Nov	v-2017 A1	nalyzed: 21-	Nov-2017	7:10		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS4)			Prepa	ared: 20-Nov	v-2017 A1	nalyzed: 21-	Nov-2017	7:22		
Total Phosphorus	0.320	0.0080	mg-P/L	0.300		107	90-110			

Analytical Resources, Inc.





Herrera Environmental Consultants
Project: Hydro International
2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Seattle WA, 98121
Project Manager: Dylan Ahearn

Reported: 01-Dec-2017 11:25

Certified Analyses included in this Report

Analyte	Certifications

EPA 200.8 in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP

EPA 6010C in Water

Calcium WADOE,NELAP,DoD-ELAP
Magnesium WADOE,NELAP,DoD-ELAP

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 01-Dec-2017 11:25

Notes and Definitions

U This analyte is not detected above the applicable reporting or detection limit.

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

* Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.

November 13, 2017

Data_17K0224

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17K0224-01	WUFF-IN	13-05605-000	Water	11/14/2017	11/14/2017	11/16/2017	11/17/2017	SM 2340 B-97		Hardness	34.0		mg/L
17K0224-02	WUFF-OUT	13-05605-000	Water	11/14/2017	11/14/2017	11/16/2017	11/17/2017	SM 2340 B-97		Hardness	50.6		mg/L
BFK0423-BLK1	Blank	13-05605-000	Water			11/15/2017	11/15/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFK0423-BS1	LCS	13-05605-000	Water			11/15/2017	11/15/2017	SM 4500-P E-99		Orthophosphorus	0.146		mg-P/L
BFK0423-DUP1	WUFF-IN	13-05605-000		11/14/2017	11/14/2017	11/15/2017	11/15/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0140		mg-P/L
BFK0423-MS1	WUFF-IN	13-05605-000		11/14/2017	11/14/2017	11/15/2017	11/15/2017	SM 4500-P E-99		Orthophosphorus	0.114		mg-P/L
17K0224-01	WUFF-IN	13-05605-000	Water	11/14/2017	11/14/2017	11/15/2017	11/15/2017	SM 4500-P E-99		Orthophosphorus	0.0140		mg-P/L
17K0224-02	WUFF-OUT	13-05605-000			11/14/2017	11/15/2017	11/15/2017	SM 4500-P E-99		Orthophosphorus	0.0180		mg-P/L
BFK0447-BLK1	Blank	13-05605-000				11/16/2017		EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0447-BS1	LCS	13-05605-000				11/16/2017		EPA 200.8-Dissolved	7440-50-8	Copper	29.5		ug/L
17K0224-03	WUFF-IN	13-05605-000	Water	11/14/2017	11/14/2017	11/16/2017	11/18/2017	EPA 200.8-Dissolved	7440-50-8	Copper	12.8		ug/L
17K0224-04	WUFF-OUT	13-05605-000			11/14/2017	11/16/2017		EPA 200.8-Dissolved	7440-50-8	Copper	12.6		ug/L
BFK0447-BLK1	Blank	13-05605-000					11/16/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFK0447-BS1	LCS	13-05605-000				11/16/2017		EPA 200.8-Dissolved	7440-50-8	Copper	29.3		ug/L
BFK0447-BLK1	Blank	13-05605-000				11/16/2017		EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0447-BS1	LCS	13-05605-000				11/16/2017	11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	95.8		ug/L
17K0224-03	WUFF-IN	13-05605-000		11/14/2017	11/14/2017	11/16/2017		EPA 200.8-Dissolved	7440-66-6	Zinc	41.0		ug/L
17K0224-04	WUFF-OUT	13-05605-000			11/14/2017		11/18/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	36.5		ug/L
BFK0447-BLK1	Blank	13-05605-000	1	,,	,,		11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFK0447-BS1	LCS	13-05605-000					11/16/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	89.2		ug/L
BFK0449-BLK1	Blank	13-05605-000					11/16/2017		7440-50-8	Copper	0.500	U	ug/L
BFK0449-BS1	LCS	13-05605-000					11/16/2017		7440-50-8	Copper	28.4		ug/L
17K0224-02	WUFF-OUT	13-05605-000		11/14/2017	11/14/2017				7440-50-8	Copper	34.2		ug/L
BFK0449-BLK1	Blank	13-05605-000	1	11/14/2017	11/14/2017				7440-50-8	Copper	0.500	U	ug/L
BFK0449-BS1	LCS	13-05605-000				11/16/2017			7440-50-8	Copper	28.6		ug/L
17K0224-01	WUFF-IN	13-05605-000	1	11/14/2017	11/14/2017		11/18/2017		7440-50-8	Copper	49.1		ug/L
BFK0449-BLK1	Blank	13-05605-000		11/14/2017	11/14/2017	11/16/2017			7440-66-6	Zinc	4.00	U	ug/L
BFK0449-BS1	LCS	13-05605-000					11/16/2017		7440-66-6	Zinc	102	*	ug/L
BFK0449-BLK1	Blank	13-05605-000						EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BFK0449-BS1	LCS	13-05605-000				11/16/2017			7440-66-6	Zinc	94.2		ug/L
BFK0454-BLK1	Blank	13-05605-000				11/16/2017		EPA 6010C	7440-70-2	Calcium	0.0500	U	mg/L
BFK0454-BS1	LCS	13-05605-000				11/16/2017			7440-70-2	Calcium	10.2		mg/L
17K0224-01	WUFF-IN	13-05605-000		11/14/2017	11/14/2017	11/16/2017	11/17/2017	EPA 6010C	7440-70-2	Calcium	9.87		mg/L
17K0224-01	WUFF-OUT	13-05605-000			11/14/2017	11/16/2017		EPA 6010C	7440-70-2	Calcium	13.7		mg/L
BFK0454-BLK1	Blank	13-05605-000		11/14/2017	11/14/2017		11/17/2017			Magnesium	0.0500	IJ	mg/L
BFK0454-BS1	LCS	13-05605-000						EPA 6010C	7439-95-4	Magnesium	10.9		mg/L
17K0224-01	WUFF-IN	13-05605-000		11/14/2017	11/1//2017			EPA 6010C	7439-95-4	Magnesium	2.28		mg/L
17K0224-01	WUFF-OUT	13-05605-000						EPA 6010C	7439-95-4	Magnesium	3.98		mg/L
BFK0532-BLK1	Blank	13-05605-000		11/14/2017	11/14/2017		11/20/2017			Zinc	4.00	U	ug/L
BFK0532-BS1	LCS	13-05605-000					11/20/2017			Zinc	103	*	ug/L
BFK0532-BS2	LCS	13-05605-000					11/20/2017			Zinc	95.8		ug/L ug/L
BFK0532-BLK1	Blank	13-05605-000					11/20/2017			Zinc	4.00	U	ug/L
BFK0532-BS1	LCS	13-05605-000					11/20/2017			Zinc	96.1	U	ug/L ug/L
BFK0532-BS1	LCS	13-05605-000	1				11/20/2017			Zinc	90.8		ug/L ug/L
	WUFF-IN	13-05605-000		11/1//2017	11/14/2017		11/21/2017			Zinc	158		ug/L ug/L
		13-05605-000			11/14/2017		11/20/2017			Zinc	86.5		ug/L ug/L
BFK0548-BLK2	Blank	13-05605-000		11/14/2017	11/14/2017			SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BFK0548-BLK3	Blank	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	
													mg-P/L
BFK0548-BLK4	Blank	13-05605-000	vvaler			11/20/2017	1 1/2 1/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L

Data_17K0224

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BFK0548-BS2	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS3	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.324		mg-P/L
BFK0548-BS4	LCS	13-05605-000	Water			11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.320		mg-P/L
17K0224-01	WUFF-IN	13-05605-000	Water	11/14/2017	11/14/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.148		mg-P/L
17K0224-02	WUFF-OUT	13-05605-000	Water	11/14/2017	11/14/2017	11/20/2017	11/21/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0960		mg-P/L



21 December 2017

Dylan Ahearn Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Seattle, WA 98121

RE: Hydro International

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)

Associated SDG ID(s)

17K0224

Amanda Volgardsen l=Tukwila, o=Analytical Resources, Inc., ou=Client Services, cn=Area vol

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, Volgardsen, email=amandav@arilabs.com Date: 2017.12.21 11:02:11 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the regirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202



Chain of Custody Record

Project Name:	Projec	t Number:	Client:					7			Ar	alyses	Reques	ted				1111
Hydro International Up-flo Filter	13-0	5605-000	Herrera Envi	ronment	al			5		Nat			1		i Taili			
Report To:	10000	24 600 31 63	Copy To:				8	ratio		W-39			- 1)		
Dylan Ahearn							254	cent	- sp	AST	5.3	5.3	40B	8.				
Sampled By: Muller			Delivery Metho	d:	ivered		lids-SM	ent Con	lded sol	ution	. EPA 36	. EPA 36	3-SM 23	EPA 200	200.8	A 200.8	89	
Laboratory:		Requested C	ompletion Date:		of Contain		oS p	ä	sper	THE SE	rus.	rus	aCO	ed -	PA	H.	500	
Analytical Resources Inc.					2		nde	Se	e Su	G-92	ohq	ohda	as C	solv	a - E	ved	EPA	
Lab Use:		11.		Sample Type (see	Preser- vative?	Matrix (see	Total Suspended Solids- SM 2540D	Suspended Sediment Concentration – SMD3977	al volatile 2540-E	Particle size Distribution ASTM 3977	Total phosphorus - EPA 365,3	Orthophosphorus - EPA 365.3	Hardness as CaCO3-SM 2340B	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	Tot	Sus -	SMS	F	ř	0	Ï	ပိ	ပိ	Zin	Zin	Lat
WUFF-IN		11.14.1	12:45	C	N	SW	х	X	x	X	X	X	X	X	Χ	Х	X	
WUFF-OUT		11.19.15	1 12.45	С	N	SW	х	Х	Х	×	Х	Х	Х	Х	Х	Х	Х	
						120												
								-										
							-											
		-						-		-								
												55						
			4					-										
Comments/Special Instructions:																		
Send 1 liter to ETS, Inc 975 Tran	sport Way, Suite 2, Pet	aluma, CA	for PSD, TSS, a	and TVSS.	PSD to	be run f	or >5	00, 50	0-125	, 125-	62.5,	62.5-4	1, <4.					
Relinquished by (Name/CO/ MEGNAN Muller/Herrer	Signature Nuna	who	Date/Time 11-14-17 13:3	- Re	ceived By	(Name/CC	-1SV	n	AN	Signatur	e	A	~	-,		Date/	Time H/	F) 30
Relinquished by (Name/CO/	Signature		Date/Time	Re	ceived By	(Name/CC	0)			Signatui	e U			9		Date/	Time	
				- C - II		L CM/-Co	rface V	Matas	10/-10/-	tos /blo	nke\ I	NA-NA-+	orial	n-Oth	or Ispac	if _v)		

Sample Type: G=Grab C=Composite

Matrix Codes: A=Air GW=Groundwater SE=Sediment SO=Soil SW=Surface Water W=Water (blanks) M=Material O=Other (specify)



Printed: 11/14/2017 4:04:15PM

WORK ORDER

17K0224

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

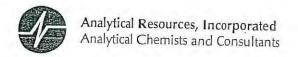
Project Number: 13-05605-000

Preservation Confirmation

000 mL 000 mL 00 mL, 9N H2SO4	LZ pass	
00 mL, 9N H2SO4	LZ pass	
	LZ pass	
0 mL		
500 mL, 1:1 HNO3	62 pags	
000 mL	F	
000 mL		
00 mL, 9N H2SO4	LZ Dasc	
00 mL	Poli	
500 mL, 1:1 HNO3	17- Dass	
500 mL	72 Fail	
500 mL	72 Fail	
() () () ()	500 mL, 1:1 HNO3 00 mL 00 mL 0 mL, 9N H2SO4 0 mL 500 mL, 1:1 HNO3 500 mL	500 mL, 1:1 HNO3 00 mL 1:1 HNO3 22 Pass 500 mL 72 Fass 500 mL

Preservation Confirmed By

Date



Cooler Receipt Form

ARI Client: There		Project Name: TIM	o internat	000
COC No(s):	NA NA			alwi
Assigned ARI Job No:			Courier Hand Delivered Other:_	0
Preliminary Examination Phase:		Tracking No:		_(NA)
Were intact, properly signed and	dated custody seals attache	ed to the outside of to each 2	2000	
Were custody papers included wi			YES	(10)
Were custody papers properly fille			(YES)	NO
Temperature of Cooler(s) (°C) (re	commended 2.0-6.0 °C for c	chemistry) 5, 2	(ES)	NO
If cooler temperature is out of con	npliance fill out form 00070F	_	Temp Gun ID#: Demo	52 00
Cooler Accepted by:	SF	Date: \\ 14 17 T	ime: 1330	3200
	Complete custody form	ns and attach all shipping documer		
Log-In Phase:		and the process of th	713	_
Was a temperature blank included	d in the cooler?			1
What kind of packing material w	ras usad? Dubble M	In Mark 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	YES	(10)
Was sufficient ice used (if sopron	ristal?	Irap Wet Ice Gel Packs Baggies Fo	am Block Paper Other:	UE
Was sufficient ice used (if appropriate all bottles sealed in individue	al plantic haza?	***************************************	NA (ES)	NO
Did all bottles series in and and	ai piasuc pags?		YES	NO
Did all bottles arrive in good condi	ition (unbroken)?		(YES)	NO
vvere all bottle labels complete an	d legible?		YES	NO
Did the number of containers lister	d on COC match with the nu	umber of containers received?	VES	NO
Did all bottle labels and tags agree	e with custody papers?	******	VES	NO
Were all bottles used correct for the	ne requested analyses?			
Do any of the analyses (bottles) re	equire preservation? (attach	preservation sheet, excluding VOCs).		NO
Were all VOC vials free of air bubb	bles?	presentation enest, excitating vocs).	NA YES	NO
Was sufficient amount of sample s	sent in each hottle?		NA YES	NO
Was sufficient amount of sample s	sent in each bottle?	***************************************	VES	NO
Was sufficient amount of sample s Date VOC Trip Blank was made at	t ARI		VES	
Was sufficient amount of sample s Date VOC Trip Blank was made a	t ARI		VES	
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA	t ARIDate/Time:	1/14/17 Equipment: <u>C/</u>	YES	
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA	t ARIDate/Time:	1/14/17 Equipment: <u>CM</u>	VES UCN SP11+ Split by: S e: 1556	
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA	t ARIDate/Time:	1/14/17 Equipment Ch	VES UCN SP11+ Split by: S e: 1556	
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA samples Logged by:	t ARIDate/Time:	ate: 11/14/17 Equipment Character Time	VES UCN SP11+ Split by: S e: 1556	
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA	t ARIDate/Time:	1/14/17 Equipment: <u>CM</u>	VES UCN SP11+ Split by: S e: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA amples Logged by:	t ARIDate/Time:	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA amples Logged by:	t ARIDate/Time:	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made ai Was Sample Split by ARI: NA amples Logged by:	t ARIDate/Time:	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA amples Logged by: 5 Sample ID on Bottle	Date/Time: Date/Notify Project Mana	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA samples Logged by: 5F Sample ID on Bottle	Date/Time: Date/Notify Project Mana	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA samples Logged by: 5F Sample ID on Bottle	Date/Time: Date/Notify Project Mana	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO RO
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA amples Logged by: 5 Sample ID on Bottle	Date/Time: Date/Notify Project Mana	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA samples Logged by: 5F Sample ID on Bottle	Date/Time: Date/Notify Project Mana	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA amples Logged by: SF Sample ID on Bottle	t ARI	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample so Date VOC Trip Blank was made at Was Sample Split by ARI: NA samples Logged by: Sample ID on Bottle Sample ID on Bottle Additional Notes, Discrepancies By: Date Small Air Bubbles Pesbubbles	Date/Time: ** Notify Project Mana Sample ID on COC ** Resolutions:	ate: 11/14/17 Equipment Character Time	NA) YES UCD SPII+ Split by: S E: 1556	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA Samples Logged by: Sample ID on Bottle Sample ID on Bottle Additional Notes, Discrepancies Small Air Bubbles -2 mm Pasbubbles 2-4 mm	Date/Time:	Small > "sm" (<2 mm)	YES WCD SPII+ Split by: S E: 1556 Sample ID on COO	RO E
Was sufficient amount of sample s Date VOC Trip Blank was made at Was Sample Split by ARI: NA Samples Logged by: Sample ID on Bottle Sample ID on Bottle By: Date Small Air Bubbles Pesbubbles	Date/Time: ** Notify Project Mana Sample ID on COC ** Resolutions: ** LARGE Air Bubbles ** 4 mm	ate: 11/14/17 Equipment: Characteristic Time ager of discrepancies or concerns * Sample ID on Bottle	YES WCD SPII+ Split by: S E: 1556 Sample ID on COO	RO E

0016F 3/2/10

Cooler Receipt Form

Revision 014



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring

-Analytical Labs

-Technical Support

975 Transport Way, Suite 2 Petaluma, CA 94954 (707) 778-9605/FAX 778-9612

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

OMPANY: Analytical Resources, Inc., 4611 S. 134th Place, Suite 100, Tukwila, WA 98168

ATTN: Amanda Volgardsen

JOB: Hydro International Up-Flo Filter

SITE: Oregon-Washington

ANALYST(S)

DATE

DATE

COLLECTED RECEIVED COMPLETED

11/14/2017 11/20/2017 11/30/2017

ANALYST(S)

SUPERVISOR

COLLECTED RECEIVED COMPLETED

11/14/2017 11/20/2017 11/30/2017

G.S. Conrad,PhD

		PARTICL	E SIZE DIST	RIBUTION (PS	D) ANALYSIS	& REPORT	- 5 PART		
LAB SAMPLE NUMBER	SAMPLE	SOURCE of WATER	SUSPENDED SOLIDS mg/l @ ≥500 μ	SUSPENDED SOLIDS mg/l @ 125 µ	SOLIDS	SOLIDS	SOLIDS	SUSPENDED SOLIDS mg/l @ 1 µ	SUSPENDED SEDIMENT CONC TSS mg/l
07576-1	HI-31HEC/RW 17K02	The second secon	2.5 3.3%	6.5 8.6%	5.5 7.3%	Total SSC by	35.1 46.4% √ Summation →	26.0 34.4% 75.6	74.0
07576-2	HI-32HEC/RW 17K02		0.5 1.6%	1.5 4.9%	2.0 6.6%	Total SSC by	12.6 41.4% √ Summation →	13.8 45.4% 30.4	28.0
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! √ Summation →	#DIV/0! 0.0	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE) SOLIDS (TVSS) mg/l

COMMENTS

The matrix has a very low concentration of TSS particles amounting to roughly 75 ppm in the input sample; and the output sample is also very low at ~30 ppm. For this pair of samples, the overall reduction averaged right at 61% (i.e., TSS by summation vs analytical TSS). The specific fraction reductions going from coarsest to finest fraction sizes are as follows: 80.0%, 76.9%, 63.6%, 64.1%, and 46.9%. Note there was a more or less continually delcining proportion of removal going from the coarsed to finest size fractions, i.e., removal is more efficient at the coarser end of the range and less efficient at the finer end of the size range. Also in this case, the distribution is essentially uni-modal with the great preponderance of particles in the finest two size fractions (i.e., 4-63 & 1-4 μ fractions) with >80% in these two classes. This sort of distribution is not uncommon. The RPDs are essentially excellent as follows: $\pm 1.1\%$, and $\pm 4.1\%$.

\\\ NOTES: Tests were done according to methodology as per Association of Testing Materials (ASTM): Suspended Sediment Concentration

- Modified ASTM D3977 (Practice for Determining Suspended-Sediment Concentration in Water Samples). Standard Methods is followed for
the other tests: Color - 2120 C; Spec Cond. (ECw) - 2510 B; Iron - 3500-Fe B; pH - 4500-H+ B; TRPH - 5520 C.

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Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project:	Hydro International (17K0224)	Date Received:	November 16, 2017
Project #:	16T001-035	Sampled By:	Others
Client :	Analytical Resources, Inc.	Date Reported:	December 20, 2017
Source:	Multiple	Tested By:	B. Goble
MTC Sample#:	Multiple		

CASE NARRATIVE

	Two samples were submitted for sediment concentration by ASTM D3977, Method C.
	The coarse material was screened over a No. 230 sieve.
	The suspended solids are reported in mg/L.
5.	There were no other noted anomalies in this project.

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Page 7 of 29 17K0224 ARISample FINAL 21 Dec 2017 1059

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (17K0224) Project #: 16T001-035

Date Received: November 16, 2017 Date Tested: December 13, 2017

Client: Analytical Resources, Inc.

Sampled by: Others Tested by: B. Goble

Suspended Sediment Concentration ASTM D3977 Method C

Client Sample ID	MTC Sample ID	Sampling Date	Coarse Fraction SSC (>63µm) (mg/L)	FineFraction SSC (<63µm) (mg/L)	Total Suspended Sediment Concentration (mg/L)
WUFF-IN	T17-1664	11/29/2017	39.1	27.7	66.8
WUFF-OUT	T17-1665	11/29/2017	9.0	7.0	16.0

All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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Visit our website: www.mtc-inc.net

Regional Offices: Olympia ~ 360.534.9777

Bellingham ~ 360.647.6111



Herrera Environmental ConsultantsProject:Hydro International2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn21-Dec-2017 10:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17K0224-01	Water	14-Nov-2017 12:45	14-Nov-2017 13:30
WUFF-OUT	17K0224-02	Water	14-Nov-2017 12:45	14-Nov-2017 13:30
WUFF-IN	17K0224-03	Water	14-Nov-2017 12:45	14-Nov-2017 13:30
WUFF-OUT	17K0224-04	Water	14-Nov-2017 12:45	14-Nov-2017 13:30

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

Case Narrative

Sample receipt

Samples as listed on the preceding page were received November 14, 2017 under ARI workorder 17K0224. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS and TVSS analysis were subcontracted to ETS Labs. The SSC analysis was subcontracted to MTC Labs.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The BFK0449 LCS has high percent recovery for Zinc. The LCS was reprepped and BFK0532 also has high LCS percent recovery for Zinc. This is likely matrix interference. No further corrective action was taken.

Total Hardness - EPA Method 6010C

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

The samples were prepared and analyzed within the recommended holding times.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A O-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery and duplicate RPD were within QC limits.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

WUFF-IN 17K0224-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/14/2017 12:45

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 23:40

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0449 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

Analyte CAS Number Dilution Result Units Notes

Copper 7440-50-8 1 0.500 49.1 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

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WUFF-IN 17K0224-01 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/14/2017 12:45

 Instrument: ICP2
 Analyzed: 17-Nov-2017 12:42

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0454 Sample Size: 25 mL Prepared: 16-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 9.87 mg/L Magnesium 7439-95-4 1 0.0500 2.28 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

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WUFF-IN 17K0224-01 (Water)

Wet Chemistry

 Method: SM 4500-P E-99
 Sampled: 11/14/2017 12:45

 Instrument: UV1800-1
 Analyzed: 15-Nov-2017 13:35

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0423 Sample Size: 50 mL Prepared: 15-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0140 mg-P/L

Instrument: UV1800-2 Analyzed: 21-Nov-2017 17:14

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.148 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

 2200 6th Avenue, Suite 1100
 Project Number: 13-05605-000
 Reported:

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 21-Dec-2017 10:59

WUFF-IN 17K0224-01 (Water)

Calculation

Hardness

 Method: SM 2340 B-97
 Sampled: 11/14/2017 12:45

 Instrument: [CALC]
 Analyzed: 17-Nov-2017 12:42

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]

Prepared: 16-Nov-2017 Final Volume: 1

Reporting
Analyte CAS Number Dilution Limit Result Units Notes

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

0.331

34.0

mg/L



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WUFF-IN 17K0224-01RE1 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/14/2017 12:45

 Instrument: ICPMS1
 Analyzed: 20-Nov-2017 17:04

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0532 Sample Size: 25 mL

Prepared: 20-Nov-2017 Final Volume: 25 mL

Analyte CAS Number Dilution Result Units Notes

Zinc 7440-66-6 1 4.00 158 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

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WUFF-OUT 17K0224-02 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/14/2017 12:45

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 23:45

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0449 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

Analyte CAS Number Dilution Result Units Notes

Copper 7440-50-8 1 0.500 34.2 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

WUFF-OUT 17K0224-02 (Water)

Metals and Metallic Compounds

 Method: EPA 6010C
 Sampled: 11/14/2017 12:45

 Instrument: ICP2
 Analyzed: 17-Nov-2017 12:46

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BFK0454 Sample Size: 25 mL Prepared: 16-Nov-2017 Final Volume: 25 mL

Reporting CAS Number Dilution Limit Units Analyte Result Notes Calcium 7440-70-2 0.0500 13.7 mg/L Magnesium 7439-95-4 1 0.0500 3.98 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

WUFF-OUT 17K0224-02 (Water)

Wet Chemistry

 Method: SM 4500-P E-99
 Sampled: 11/14/2017 12:45

 Instrument: UV1800-1
 Analyzed: 15-Nov-2017 13:37

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0423 Sample Size: 50 mL Prepared: 15-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0180 mg-P/L

Instrument: UV1800-2 Analyzed: 21-Nov-2017 17:14

Sample Preparation: Preparation Method: SM 4500-P B-4 Strong Acid

Preparation Batch: BFK0548 Sample Size: 25 mL Prepared: 20-Nov-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0080 0.0960 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100

Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 21-Dec-2017 10:59

WUFF-OUT 17K0224-02 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 11/14/2017 12:45 Instrument: [CALC] Analyzed: 17-Nov-2017 12:46

Sample Preparation: Preparation Method: [CALC] Preparation Batch: [CALC]

Prepared: 16-Nov-2017 Final Volume: 1

Reporting CAS Number Dilution Limit Units Analyte Result Notes Hardness 0.331 50.6 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

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WUFF-OUT 17K0224-02RE1 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 11/14/2017 12:45

 Instrument: ICPMS1
 Analyzed: 20-Nov-2017 17:00

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0532 Sample Size: 25 mL

Prepared: 20-Nov-2017 Final Volume: 25 mL

Analyte CAS Number Dilution Result Units Notes

Zinc 7440-66-6 1 4.00 86.5 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

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WUFF-IN 17K0224-03 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/14/2017 12:45

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 23:50

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL

Prepared: 16-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	12.8	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	41.0	ug/L	

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WUFF-OUT 17K0224-04 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 11/14/2017 12:45

 Instrument: ICPMS2
 Analyzed: 18-Nov-2017 22:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Preparation Batch: BFK0447 Sample Size: 25 mL Prepared: 16-Nov-2017 Final Volume: 25 mL

Reporting Dilution Limit Analyte CAS Number Result Units Notes Copper, Dissolved 7440-50-8 0.500 12.6 ug/L Zinc, Dissolved 7440-66-6 1 4.00 36.5 ug/L

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2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn21-Dec-2017 10:59

Project: Hydro International

Metals and Metallic Compounds - Quality Control

Batch BFK0449 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0449-BLK1)				Prepa	ared: 16-Nov	v-2017 An	alyzed: 16-	Nov-2017 1	4:38		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0449-BS1)				Prepa	ared: 16-Nov	v-2017 An	alyzed: 16-	Nov-2017 1	4:58		
Copper	63	28.4	0.500	ug/L	25.0		114	80-120			
Copper	65	28.6	0.500	ug/L	25.0		115	80-120			
Zinc	66	102	4.00	ug/L	80.0		128	80-120			*
Zinc	67	94.2	4.00	ug/L	80.0		118	80-120			

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Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

Metals and Metallic Compounds - Quality Control

Batch BFK0454 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0454-BLK1)			Prep	ared: 16-Nov	-2017 An	alyzed: 17-	Nov-2017 1	0:47		
Calcium	ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L							U
LCS (BFK0454-BS1)			Prep	ared: 16-Nov	-2017 An	alyzed: 17-	Nov-2017 1	1:32		
Calcium	10.2	0.0500	mg/L	10.0		102	80-120			
Magnesium	10.9	0.0500	mg/L	10.0		109	80-120			

Analytical Resources, Inc.

Reported:



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Project: Hydro International Project Number: 13-05605-000

Seattle WA, 98121

Project Manager: Dylan Ahearn 21-Dec-2017 10:59

Metals and Metallic Compounds - Quality Control

Batch BFK0532 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0532-BLK1)				Prepa	ared: 20-Nov	v-2017 An	alyzed: 20-	Nov-2017 1	6:04		
Zinc	66	ND	4.00	ug/L			-				U
Zinc	67	ND	4.00	ug/L							U
LCS (BFK0532-BS1)				Prepa	ared: 20-Nov	v-2017 An	alyzed: 20-	Nov-2017 1	6:08		
Zinc	66	103	4.00	ug/L	80.0		129	80-120			*
Zinc	67	96.1	4.00	ug/L	80.0		120	80-120			
Instrument: ICPMS2 Analy	rst: CC										
			Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
LCS (BFK0532-BS2)				Prepa	ared: 20-Nov	v-2017 An	alyzed: 21-	Nov-2017 1	4:46		
Zinc	66	95.8	4.00	ug/L	80.0		120	80-120			
Zinc	67	90.8	4.00	ug/L	80.0		114	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0447 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0447-BLK1)				Prepa	ared: 16-Nov	-2017 Ana	alyzed: 16-1	Nov-2017 1	4:33		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFK0447-BS1)				Prepa	ared: 16-Nov	7-2017 Ana	alyzed: 16-1	Nov-2017 1	5:20		
Copper, Dissolved	63	29.5	0.500	ug/L	25.0		118	80-120			
Copper, Dissolved	65	29.3	0.500	ug/L	25.0		117	80-120			
Zinc, Dissolved	66	95.8	4.00	ug/L	80.0		120	80-120			
Zinc, Dissolved	67	89.2	4.00	ug/L	80.0		111	80-120			

Analytical Resources, Inc.

Reported:

Herrera Environmental Consultants 2200 6th Avenue, Suite 1100 Project: Hydro International
Project Number: 13-05605-000

Seattle WA, 98121

Project Manager: Dylan Ahearn 21-Dec-2017 10:59

Wet Chemistry - Quality Control

Batch BFK0423 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: GM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0423-BLK1)			Prepa	red: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	3:34		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFK0423-BS1)			Prepa	red: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	3:34		
Orthophosphorus	0.146	0.0040	mg-P/L	0.150		97.3	90-110			
Duplicate (BFK0423-DUP1)	Source:	17K0224-01	Prepa	red: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	3:35		
Orthophosphorus	0.0140	0.0040	mg-P/L		0.0140			0.00		
Matrix Spike (BFK0423-MS1)	Source:	17K0224-01	Prepa	red: 15-Nov	v-2017 Ana	alyzed: 15-	Nov-2017 1	3:36		
Orthophosphorus	0.114	0.0040	mg-P/L	0.0999	0.0140	100	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International Project Number: 13-05605-000

Reported: Project Manager: Dylan Ahearn 21-Dec-2017 10:59

Wet Chemistry - Quality Control

Batch BFK0548 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0548-BLK2)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	6:50		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK3)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:08		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFK0548-BLK4)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:22		
Total Phosphorus	ND	0.0080	mg-P/L							U
DL (BFK0548-BS2)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	6:52		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS3)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:10		
Total Phosphorus	0.324	0.0080	mg-P/L	0.300		108	90-110			
LCS (BFK0548-BS4)			Prepa	ared: 20-Nov	-2017 Ar	nalyzed: 21	-Nov-2017 1	7:22		
Total Phosphorus	0.320	0.0080	mg-P/L	0.300		107	90-110			

Analytical Resources, Inc.

Reported:

21-Dec-2017 10:59



Herrera Environmental Consultants Project: Hydro International 2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn

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Certified Analyses included in this Report

Analyte	Certifications	
EPA 200.8 in Water		
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP	
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP	
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP	
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP	
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP	
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP	
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP	
EPA 6010C in Water		
Calcium	WADOE,NELAP,DoD-ELAP	
Magnesium	WADOE,NELAP,DoD-ELAP	
SM 4500-P E-99 in Water		

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NIEL AD	ODELAD. Organia Laboratoria Approditation Dromana	WW 40000C	05/44/0040

WADOE, NELAP

WADOE, NELAP

ORELAP - Oregon Laboratory Accreditation Program NELAP WA100006 05/11/2018 WA Dept of Ecology C558 **WADOE** 06/30/2018 WA-DW **Ecology - Drinking Water** C558 06/30/2018

Analytical Resources, Inc.

Orthophosphorus Total Phosphorus



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Dec-2017 10:59

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.	
0		

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

[2C] Indicates this result was quantified on the second column on a dual column analysis.