# June 8, 2017

### Data\_17F0161

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17F0161-01	WUFF-IN	13-05605-000					•	SM 2340 B-97	0710	Hardness	66.3		mg/L
17F0161-05	WUFF-IN (QA)	13-05605-000						SM 2340 B-97		Hardness	64.2		mg/L
17F0161-03	WUFF-OUT	13-05605-000	Stormwater	06/09/2017	06/09/2017	06/13/2017	06/14/2017	SM 2340 B-97		Hardness	61.0		mg/L
17F0161-01	WUFF-IN	13-05605-000	Stormwater	06/09/2017	06/09/2017	07/24/2017	07/24/2017	ASTM D3977	SC_>63	> 63 µm	66.55		mg/L
17F0161-05	WUFF-IN (QA)	13-05605-000	Stormwater	06/09/2017	06/09/2017	07/24/2017	07/24/2017	ASTM D3977	SC_>63	> 63 µm	59.56		mg/L
17F0161-03	WUFF-OUT	13-05605-000	Stormwater	06/09/2017	06/09/2017	07/24/2017	07/24/2017	ASTM D3977	SC_>63	> 63 µm	6.57		mg/L
17F0161-01	WUFF-IN	13-05605-000	Stormwater	06/09/2017	06/09/2017	07/24/2017	07/24/2017	ASTM D3977	SC_<63	< 63 µm	73.64		mg/L
17F0161-05	WUFF-IN (QA)	13-05605-000	Stormwater	06/09/2017	06/09/2017	07/24/2017	07/24/2017	ASTM D3977	SC_<63	< 63 µm	67.43		mg/L
17F0161-03	WUFF-OUT	13-05605-000							SC_<63	< 63 µm	5.48		mg/L
17F0161-01	WUFF-IN	13-05605-000	Stormwater	06/09/2017	06/09/2017	07/24/2017	07/24/2017	ASTM D3977	SC_TOTAL	Total SSC	140.19		mg/L
17F0161-05	. ,	13-05605-000							SC_TOTAL	Total SSC	126.99		mg/L
17F0161-03	WUFF-OUT	13-05605-000		06/09/2017	06/09/2017			ASTM D3977	SC_TOTAL	Total SSC	12.05		mg/L
BFF0260-BLK1	Blank	13-05605-000						SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFF0260-BS1	LCS	13-05605-000		22/22/22/	20/20/20/			SM 4500-P E-99	1426-54-42	Orthophosphorus	0.146		mg-P/L
17F0161-01	WUFF-IN	13-05605-000						SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0100		mg-P/L
17F0161-05		13-05605-000						SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0090		mg-P/L
17F0161-03	WUFF-OUT	13-05605-000		06/09/2017	06/09/2017			SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0240		mg-P/L
BFF0310-BLK2	Blank	13-05605-000					06/19/2017		7440-50-8	Copper	0.500	U	ug/L
BFF0310-BS2 17F0161-01	LCS WUFF-IN	13-05605-000 13-05605-000		06/00/2017	06/00/2017		06/19/2017 06/19/2017		7440-50-8 7440-50-8	Copper	27.8 79.7	D	ug/L
17F0161-01 17F0161-05		13-05605-000					06/19/2017		7440-50-8	Copper	76.4	D	ug/L ug/L
17F0161-05	WUFF-IN (QA)	13-05605-000					06/19/2017		7440-50-8	Copper Copper	34.9	ט	ug/L ug/L
BFF0310-BLK2	Blank	13-05605-000		00/03/2017	00/03/2017		06/19/2017		7440-50-8	Copper	0.500	U	ug/L ug/L
BFF0310-BLR2	LCS	13-05605-000					06/19/2017		7440-50-8	Copper	27.3	J	ug/L ug/L
BFF0310-BLK2	Blank	13-05605-000					06/19/2017		7440-66-6	Zinc	4.00	U	ug/L
BFF0310-BS2	LCS	13-05605-000					06/19/2017		7440-66-6	Zinc	88.5		ug/L
17F0161-05		13-05605-000		06/09/2017	06/09/2017		06/19/2017		7440-66-6	Zinc	280	D	ug/L
17F0161-03	WUFF-OUT	13-05605-000					06/19/2017		7440-66-6	Zinc	66.7		ug/L
BFF0310-BLK2	Blank	13-05605-000					06/19/2017		7440-66-6	Zinc	4.00	U	ug/L
BFF0310-BS2	LCS	13-05605-000				06/13/2017	06/19/2017	EPA 200.8	7440-66-6	Zinc	86.8		ug/L
17F0161-01	WUFF-IN	13-05605-000	Stormwater	06/09/2017	06/09/2017	06/13/2017	06/19/2017	EPA 200.8	7440-66-6	Zinc	329	D	ug/L
BFF0312-BLK1	Blank	13-05605-000				06/13/2017	06/14/2017	EPA 6010C	7440-70-2	Calcium	0.0500	U	mg/L
BFF0312-BS1	LCS	13-05605-000	Water			06/13/2017	06/14/2017	EPA 6010C	7440-70-2	Calcium	9.82		mg/L
17F0161-01	WUFF-IN	13-05605-000	Stormwater	06/09/2017	06/09/2017	06/13/2017	06/14/2017	EPA 6010C	7440-70-2	Calcium	19.9		mg/L
17F0161-05	WUFF-IN (QA)	13-05605-000	Stormwater	06/09/2017	06/09/2017	06/13/2017	06/14/2017	EPA 6010C	7440-70-2	Calcium	19.2		mg/L
17F0161-03	WUFF-OUT	13-05605-000	Stormwater	06/09/2017	06/09/2017	06/13/2017	06/14/2017	EPA 6010C	7440-70-2	Calcium	18.4		mg/L
BFF0312-BLK1	Blank	13-05605-000						EPA 6010C	7439-95-4	Magnesium	0.0500	U	mg/L
BFF0312-BS1	LCS	13-05605-000						EPA 6010C	7439-95-4	Magnesium	10.2		mg/L
17F0161-01	WUFF-IN	13-05605-000						EPA 6010C	7439-95-4	Magnesium	4.02		mg/L
17F0161-05	. ,	13-05605-000						EPA 6010C	7439-95-4	Magnesium	3.96		mg/L
17F0161-03	WUFF-OUT	13-05605-000		06/09/2017	06/09/2017			EPA 6010C	7439-95-4	Magnesium	3.66		mg/L
BFF0314-BLK1	Blank	13-05605-000						EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFF0314-BS1	LCS WUFF-IN	13-05605-000		06/00/2047	06/00/2047			EPA 200.8 Dissolved	7440-50-8 7440-50-8	Copper	28.0		ug/L
17F0161-02 17F0161-06		13-05605-000 13-05605-000						EPA 200.8-Dissolved EPA 200.8-Dissolved	7440-50-8	Copper	25.3 23.5		ug/L ug/L
17F0161-06	WUFF-IN (QA)							EPA 200.8-Dissolved	7440-50-8	Copper Copper	26.9		ug/L ug/L
BFF0314-BLK1	Blank	13-05605-000		50/03/2017	00/03/2017			EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFF0314-BS1	LCS	13-05605-000						EPA 200.8-Dissolved	7440-50-8	Copper	27.6	J	ug/L ug/L
BFF0314-BLK1	Blank	13-05605-000						EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFF0314-BS1	LCS	13-05605-000						EPA 200.8-Dissolved	7440-66-6	Zinc	85.3		ug/L
17F0161-02	WUFF-IN	13-05605-000		06/09/2017	06/09/2017			EPA 200.8-Dissolved	7440-66-6	Zinc	50.3		ug/L
17F0161-06		13-05605-000						EPA 200.8-Dissolved	7440-66-6	Zinc	42.0		ug/L
17F0161-04		13-05605-000						EPA 200.8-Dissolved	7440-66-6	Zinc	50.5		ug/L
BFF0314-BLK1		13-05605-000						EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFF0314-BS1		13-05605-000						EPA 200.8-Dissolved	7440-66-6	Zinc	80.3		ug/L
BFF0544-BLK1	Blank	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.00800	U	mg-P/L
BFF0544-BLK2	Blank	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.00800	U	mg-P/L
BFF0544-BLK3	Blank	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.00800	U	mg-P/L
BFF0544-BS1	LCS	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.160		mg-P/L
BFF0544-BS2	LCS	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.157		mg-P/L
BFF0544-BS3	LCS	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.156		mg-P/L
BFF0544-DUP1	WUFF-IN	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	0.372		mg-P/L
BFF0544-MS1	WUFF-IN	13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	2.38	D	mg-P/L
17F0161-01	WUFF-IN							SM 4500-P E-99	7723-14-0	Total Phosphorus	0.360		mg-P/L
17F0161-05								SM 4500-P E-99	7723-14-0	Total Phosphorus	0.532		mg-P/L
17F0161-03	WUFF-OUT	13-05605-000	Stormwater	06/09/2017	06/09/2017	06/20/2017	06/22/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.100		mg-P/L



25 July 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)

17F0161

N/A

# Amanda Volgardsen

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: 2017.07.25 15:23:45 -07'00'

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 itentirety.

Cert# 100006



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



## Chain of Custody Record

Project Name:	Project N	lumber:	Client:						Analyses Requested									
The state of the s		05-000	Herrera Envi	nnment	ai			_		77								
Hydro International Up-flo Filter Report To:	13-030	03-000	Copy To:	OTTITICE TELE			8	ratio		39								
Dylan Ahearn			''				2540D	cent	ds.	AST	5.3	5.3	40B	89.				
Sampled By:  M. M. Hen			Delivery Method	nd der			Solids-SM	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	A 200.8	Zinc, dissolved - EPA 200.8	9.00	
Laboratory:	F	Requested Co	ompletion Date:	Total No.	of Contain	ners:	ed S	edir	nsb	Distr	orus	Si	CaC	lved	EP/	d - E	3A 2	
Analytical Resources Inc.					3		pepued	S p	S el	ize	ydso	hdsc	Sas	sso	tal .	olve	<u> </u>	
Lab Use:				Sample Type (see	Preser- vative?	Matrix (see	Total Susp	Suspended S - SMD3977	tal volati 12540-E	articles	otal pho	hthopho	fardnes	opper, d	Copper, total - EPA 200.8	nc, diss	Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	P	S.	SN		_							
WUFF-IN		6-9-77	11:15	С	N	SW	Х	Х	х	Х	Х	Х	X	X	Х	Х	Χ	
WUFF-OUT		6.9.17	11:15	С	N	SW	х	Х	Х	Х	Х	Х	Х	Χ	Х	Х	Х	
WVFF-IN (QA)		6-9-17	11:15	C	N	SW	X	>	X	入	X	$\succ$	×	×	X	4	+	
MUFF- OUT (DUP)				<u> </u>	- KA	SW	X	X	X	X	$\overline{\lambda}$	X	X	X	X	$\overline{}$	X	
														_				
Comments/Special Instructions: Sp	lit samples f	ur dupl	(cates (QA	1														
Send 1 liter to ETS, Inc 975 Transport	t Way, Suite 2, Petal	uma, CA	for PSD, TSS, a	nd TVSS.	PSD to	be run f	or >5	00, 50	0-125	, 125-	62.5,	62.5-4	1, <4.					
			Date/Time		ceived By					Signatur						Date/1		
Meghan Muller/Herrera ?	Mey Me	le		12:00		A	ei.		1	4-Vola	nro	lser	1			6/9/1		200
	gnature		Date/Time	Re	ceived By	. / T			5	ignatur	e					Date/1		
							r		14/-14/-	4 m m / fm l =	mica) !	4-54-5	orial (	2-O+b	ar /spor	ifu)		

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: Herra Her	rera		Project Name: Hyd	ro Inte	matic	mal
COC No(s):		<b>!</b> A	Delivered by: Fed-Ex UP			
Assigned ARI Job No: 17F	Ollel		Tracking No:		,	ΔIA
Preliminary Examination Phase:						
Were intact, properly signed and	dated custody seals a	attached to	the outside of to cooler?		YES	NO
Were custody papers included wit					-	
Were custody papers properly fille					(YES)	NO
Temperature of Cooler(s) (°C) (re	commended 2.0-6.0 '	°C for chem	nistry)		YES	NO
lime:			40 40	1 6.0 5	7 4.9	4.6
If cooler temperature is out of con		10070F		Temp Gun I	D#: DUUS	5206
Cooler Accepted by:				_Time:(20()_		
Landa Di	Complete custod	ly forms a	nd attach all shipping docum	nents		
Log-In Phase:						
Was a temperature blank included	f in the cooler?				YES	(NG)
What kind of packing material w				Foam Block Paner	Other:	NO
Was sufficient ice used (if appropr	riate)?		Total Buggios	NA	(YES	NO
Were all bottles sealed in individua				147	YES	(NO)
Did all bottles arrive in good condi					(YES)	NO
Were all bottle labels complete an					YES	NO
Did the number of containers lister	d on COC match with	the numbe	er of containers received?		YES	NO
Did all bottle labels and tags agree	e with custody papers	?		•••••	YES	NO
Were all bottles used correct for the	ie requested analyse:	s?	***************************************		YES	NO
Do any of the analyses (bottles) re	equire preservation? (	attach pres	servation sheet, excluding VOC	s) NA	YES	NO
Were all VOC vials free of air bubb	oles?			NA	YES	NO
Was sufficient amount of sample s	ent in each bottle?				YES	NO
Date VOC Trip Blank was made at	t ARI		15 15.4,	NA		
Was Sample Split by ARI: NA	YES Date/Ti	ime: <u>0/9</u>	1/17 3:15 Equipment:	rum Splitte	✓Split by: _	BH-
Samples Logged by:			6/9/17 TI	,		
ourries abgged by.		Manager	of discrepancies or concern	me:	2	
		manager	or discrepancies or concern.	S **		
Sample ID on Bottle	Sample ID on	COC	Semala ID - D III			
,	Campie 15 dri	000	Sample ID on Bottle	Sam	ple ID on CC	OC
	1					
Additional Notes, Discrepancies	, & Resolutions:					ti.
					- standaymond	
By: Date	):			•		
Small Air Bubbles Peabubbles	LAITOR MI EQ	901-23	Small → "sm" (<2 mm)			
= 2mm 2-4 mm	>4 mm		Peabubbles -> "pb" (2 to <4 m	ım) .		
0 0			Large → "lg" (4 to < 6 mm)			
	1	1	Headspace → "hs" (>6 mm)			

0016F 3/2/10

Cooler Receipt Form

Revision 014

Printed: 6/9/2017 3:31:11PM

### **WORK ORDER**

17F0161

Client: Herrera Environmental Consultants Project Manager: Mark Harris

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

### **Preservation Confirmation**

Container ID	Container Type	рН	
17F0161-01 A	Small OJ, 500 mL		
17F0161-01 B	Small OJ, 500 mL, 9N H2SO4	La Pass	
17F0161-01 C	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass	
17F0161-01 D	Large OJ, 1000 mL		
17F0161-01 E	Large OJ, 1000 mL	^	
17F0161-01 F	Large OJ, 1000 mL		
17F0161-01 G	Large OJ, 1000 mL		
17F0161-02 A	HDPE NM, 500 mL	>2 Fail	
17F0161-03 A	Small OJ, 500 mL		
17F0161-03 B	Small OJ, 500 mL, 9N H2SO4	L2 Pass	(-3000000000000000000000000000000000000
17F0161-03 C	HDPE NM, 500 mL, 1:1 HNO3	La Pass	
17F0161-03 D	Large OJ, 1000 mL		
17F0161-03 E	Large OJ, 1000 mL		
17F0161-03 F	Large OJ, 1000 mL		
17F0161-03 G	Large OJ, 1000 mL		
17F0161-04 A	HDPE NM, 500 mL	>2 Fail	
17F0161-05 A	Small OJ, 500 mL	N. A.	
17F0161-05 B	Small OJ, 500 mL, 9N H2SO4	L2 Pass	
17F0161-05 C	HDPE NM, 500 mL, 1:1 HNO3	La Pass	
17F0161-05 D	Large OJ, 1000 mL		
17F0161-05 E	Large OJ, 1000 mL		
17F0161-05 F	Large OJ, 1000 mL		
17F0161-05 G	Large OJ, 1000 mL		
17F0161-06 A	HDPE NM, 500 mL	>3 Fail	

Preservation Confirmed By

<u>6/9/17</u> Date



# SUBCONTRACT ORDER To: Environmental Technical Services ARI Work Order:17F0161

### **SENDING LABORATORY:**

Analytical Resources, Inc. 4611 S. 134th Place, Suite 100

Tukwila, WA 98168 Phone: (206) 695-6200 Fax: (206) 695-6201

Project Manager: Mark Harris E-Mail: markh@arilabs.com

### **RECEIVING LABORATORY:**

Environmental Technical Services 975 Transport Way, Suite 2 Petaluma, CA 94954 Phone :(707) 778-9605

Fax:

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 17F0161-01 Sampled: 06/09/17 11:15 N	latrix: Water			
Solids, Total Volatile Suspende	d SM 2540 E-97 06/23/17	06/16/17 11:15		
Solids, Total Suspended SM 2:	40 D-97 06/23/17	06/16/17 11:15		
PSD (Particle Size Distribution	by Laser) (Subc 06/23/17	06/16/17 11:15		
Containers Supplied:				
17F0161-01 D Large OJ, 1000 mL	17F0161-01 E Large OJ, 1000 mL		0161-01 F ge OJ, 1000 mL	
Solids, Total Volatile Suspende		06/16/17 11:15		
Solids, Total Suspended SM 25		06/16/17 11:15		
PSD (Particle Size Distribution	by Laser) (Subt 06/23/17	06/16/17 11:15		
Containers Supplied:				String-ring .
17F0161-03 D Large OJ, 1000 mL	17F0161-03 E Large OJ, 1000 mL		0161-03 F ge OJ, 1000 mL	
Sample ID: 17F0161-05 Sampled: 06/09/17 11:15 M	latrix: Water			
Solids, Total Volatile Suspende	d SM 2540 E-9°. 06/23/17	06/16/17 11:15		
Solids, Total Suspended SM 25	40 D-97 06/23/17	06/16/17 11:15		
PSD (Particle Size Distribution	by Laser) (Subi 06/23/17	06/16/17 11:15		
Containers Supplied:				
17F0161-05 D Large OJ, 1000 mL	17F0161-05 E Large OJ, 1000 mL	- 11	0161-05 F e OJ, 1000 mL	

Released By	Date	Received By	Date
Released By	Date	Received By	Date

Printed: 6/9/2017 3:31:23PM



### SUBCONTRACT ORDER

To: Materials Testing & Consulting, Inc. (Tukwila)

ARI Work Order:17F0161

### **SENDING LABORATORY:**

Analytical Resources, Inc.

4611 S. 134th Place, Suite 100

Tukwila, WA 98168 Phone: (206) 695-6200 Fax: (206) 695-6201

Large OJ, 1000 mL

Project Manager: Mark Harris E-Mail: markh@arilabs.com

### RECEIVING LABORATORY:

Materials Testing & Consulting, Inc. (Tukwila)

4611 S 134th Place, Ste 200

Tukwila, WA 98296

Phone :-

Fax: -

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 17F0161-01 Sampled: 06/09/17 11:15 Matrix: Water				
Stormwater Sed Conc (SSC) ASTM D3977 (Se	06/23/17	06/16/17 11:15		•
Containers Supplied:				
<b>17F0161-01 G</b> Large OJ, 1000 mL				
Sample ID: 17F0161-03 Sampled: 06/09/17 11:15 Matrix: Water				
Stormwater Sed Conc (SSC) ASTM D3977 (Second Stormwater Sed Conc (	06/23/17	06/16/17 11:15		
Containers Supplied:				
17F0161-03 G Large OJ, 1000 mL				
Sample ID: 17F0161-05 Sampled: 06/09/17 11:15 Matrix: Water				
Stormwater Sed Conc (SSC) ASTM D3977 (S	06/23/17	06/16/17 11:15		
Containers Supplied:				
17F0161-05 G				

Released By	Date	Received By	Date	
Released By	Date	Received By	Date	

Printed: 6/9/2017 3:31:23PM



# 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

Serving people and the environment so that both benefit.

e-mail: entech@pacbell.net

OMPANY:	Analytical Resources, Inc., 4611 S. 134th Place, Suite 1	00, Tukwila, W	A 98168		ANALYST(S)	SUPERVISOR
ATTN:	Mark Harris	DATE	DATE	DATE	S. Santos	D. Jacobson
JOB:	Hydro International Up-Flo Filter	COLLECTED	RECEIVED	COMPLETED	G.Hernandez	LAB DIRECTOR
SITE:	Oregon-Washington	6/9/2017	6/16/2017	6/26/2017		G.S. Conrad,PhD

SILE	Oregon-vva	snington			6/9/2017	6/16/2017	6/26/2017		G.S. Conrad,Phi
		DADTIOL							1
1.45	041451.5			RIBUTION (PS					
LAB	SAMPLE	SOURCE	SUSPENDED	SUSPENDED					SUSPENDED
SAMPLE		of	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SEDIMENT CON
NUMBER	ID	WATER	mg/l @ ≥500 μ	ı mg/l @ 125 μ	mg/l @ 63 μ	mg/l @ 32 μ	mg/l @ 4 μ	mg/l @ 1 μ	TSS mg/l
07395-1	HI-26/RW	WUFF-IN	18.5	20.0	17.0		30.8	4.0	98.0
	17F016	61-01 D	20.5%	22.1%	18.8%		34.1%	4.4%	
						Total SSC by	y Summation $ ightarrow$	90.3	
07395-2	HI-27/RW	WUFF-OUT	0.0	1.0	2.0		0.0	1.2	5.0
	17F016	61-03 D	0.0%	23.8%	47.6%		0.0%	28.6%	
					,	Total SSC by	y Summation $ ightarrow$		
07395-3	HI-28/RW	-IN DUP	17.5	16.5	14.0		27.4	4.2	74.0
	17F016	61-05 D	22.0%	20.7%	17.6%	#DIV/0!	34.4%	5.3%	1
						Total SSC by	y Summation →	79.6	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
			#510/0!	#101070:	#1210/0:		#DIV/0: y Summation →		
						Total 330 by	y Summation	0.0	
LAB	SAMPLE	SOURCE	Water pH	ECw	COLOR,	COLOR	TOTAL IRON	TOTAL	VOLATILE
SAMPLE		of		[Spec Cond]	TRUE	APPARENT	Fe (diss.)	SUSPENDED	SOLIDS (TVSS
NUMBER	ID	WATER	-log[H+]	μS/cm	PtCo Units	PtCo Units	mg/l		mg/l
07395-1	HI-26/RW	WUFF-IN							76.0
	17F016	61-01 D	1						
07205.2	111 07/D\A/	VAULEE OUT							F 0
07395-2		WUFF-OUT 61-03 D							5.0
	177010	51-03 D							
07395-3	HI-28/RW	-IN DUP							57.0
		61-05 D							
			1						
				COBABA	ENTO				

### COMMENTS

The matrix has a low concentration of TSS particles amounting to nearly 100 ppm in the input samples; and the output sample is extremely low at 4-5 ppm. For the -IN & -OUT pair of samples, the overall reduction averaged just over 95% (i.e., TSS by summation vs tested TSS). The specific fraction reductions going from coarsest to finest sizes are as follows: 100%, 95.0%, 88.2%, 100%, and 70.0%. The TVSS values are different, but not by a lot. The proportion that is volatile suspended solids in the input samples (-IN & -IN DUP) is at 77%-78%, and for the output sample it is at 100%, different but all are high. Thus, in these cases volatile suspended solids are three-quarters to all of the suspended particulates, depending on which sample, the Input or the output. So, it appears there is greater removal of organics as they go from roughly three-quaters to all being removed by filtration. There is satisfactory agreement between -IN & -IN DUP, all variables considered. The RPDs are excellent to very good as follows: ±4.1%; ±8.7%; and ±3.7%.

\\\ 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.

Page 7 of 36 17F0161 ARISample FINAL 25 Jul 2017 1519

# Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International Up-flo Filter (17F0161)	Date Received: June 14, 2017
Project #: 16T001-035	Sampled By: Others
Client: Analytical Resources, Inc.	Date Reported: July 25, 2017
Source: Multiple	Tested By: B. Goble
MTC Sample#: Multiple	

### **CASE NARRATIVE**

2. 3. 4.	Four samp The coarse The susper The data is There were	mated mates	terial w l solids ovided i	as sc are re n a si	reened eported ummar	ove l in r y tal	r a No. ng/L. ole.	230	sieve.	•				

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

Regional Offices: Olympia ~ 360.534.9777 Bellingham ~ 360.647.6111 Silverdale ~ 360.698.6787 Tukwila ~ 2

Visit our website: www.mtc-inc.net

Tukwila ~ 206.241.1974

# Materials Testing & Consulting, Inc

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Hydro International Up-flo Filter Project: (17F0161)

Date Received: June 14, 2017 Project #: 16T001-035

Date Tested: July 24, 2017

Client: Analytical Resources, Inc.

Sampled by: Others
Tested by: B. Goble

Suspended Sediment Concentration ASTM D3977 Method C

Total Suspended Sediment Concentration (mg/L)	140.2	12.1	127.0
FineFraction SSC (<63µm) (mg/L)	73.6	5.5	67.4
Coarse Fraction SSC (>63µm) (mg/L)	66.5	6.6	59.6
Sampling Date	6/9/2017	6/9/2017	6/9/2017
MTC Sample ID	T17-1058	T17-1059	T17-1060
Client Sample ID	WUFF-IN	WUFF-OUT	WUFF-IN (QA)

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: Sah Arbele

Tukwila ~ 206.241.1974 Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980 Silverdale  $\sim 360.698.6787$ Bellingham  $\sim 360.647.6111$ Regional Offices: Olympia ~ 360.534.9777

Visit our website: www.mtc-inc.net



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 25-Jul-2017 15:19

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17F0161-01	Water	09-Jun-2017 11:15	09-Jun-2017 12:00
WUFF-IN	17F0161-02	Water	09-Jun-2017 11:15	09-Jun-2017 12:00
WUFF-OUT	17F0161-03	Water	09-Jun-2017 11:15	09-Jun-2017 12:00
WUFF-OUT	17F0161-04	Water	09-Jun-2017 11:15	09-Jun-2017 12:00
WUFF-IN (QA)	17F0161-05	Water	09-Jun-2017 11:15	09-Jun-2017 12:00
WUFF-IN (QA)	17F0161-06	Water	09-Jun-2017 11:15	09-Jun-2017 12:00

Analytical Resources, Inc.



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

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

**Reported:** 25-Jul-2017 15:19

### Case Narrative

### Sample receipt

Seattle WA, 98121

Samples as listed on the preceding page were received June 9, 2017 under ARI workorder 17F0161. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS, PSD and TVS were subcontracted to ETS Labs. The SSC was subcontracted to MTC Labs.

### Total and Dissolved Metals - EPA Method 200.8

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

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.

### Total Metals - EPA Method 6010C

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

There were no target compounds detected in the method blank.

The LCS percent recoveries were within control limits.

### Wet Chemistry (O-Phos and T-Phos)

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

The method blank has total phosphorus detected above the reporting limit. Associated detected results have been flagged with a "B" qualifier. No further corrective action was taken.

The LCS percent recoveries were within control limits.

A total phosphorus 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 1100 Seattle WA, 98121 Project Number: 13-05605-000 Project Manager: Dylan Ahearn Reported:

25-Jul-2017 15:19

### WUFF-IN 17F0161-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 06/09/2017 11:15

 Instrument: ICPMS1
 Analyzed: 19-Jun-2017 18:49

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

Preparation Batch: BFF0310 Sample Size: 25 mL

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

			 Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	2	1.00	79.7	ug/L	D
Zinc	7440-66-6	2	 8.00	329	ug/L	D



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

25-Jul-2017 15:19

WUFF-IN 17F0161-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/09/2017 11:15

Analyzed: 14-Jun-2017 16:37

Instrument: ICP2
Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0312

Prepared: 13-Jun-2017

Sample Size: 25 mL

Final Volume: 25 mL

Reporting Limit Analyte CAS Number Dilution Result Units Notes 7440-70-2 Calcium 0.0500 19.9 mg/L 7439-95-4 0.0500 Magnesium 4.02 mg/L

Analytical Resources, Inc.

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

**Reported:** 25-Jul-2017 15:19

WUFF-IN 17F0161-01 (Water)

Wet Chemistry

Seattle WA, 98121

Method: SM 4500-P E-99 Sampled: 06/09/2017 11:15
Instrument: UV1800-2 Analyzed: 09-Jun-2017 19:10

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0260 Sample Size: 10 mL Prepared: 09-Jun-2017 Final Volume: 10 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: BFF0544 Sample Size: 25 mL

Prepared: 20-Jun-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.00800 0.360 mg-P/L

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:

25-Jul-2017 15:19

WUFF-IN 17F0161-01 (Water)

Calculation

Method: SM 2340 B-97 Instrument: [CALC]

Sample Preparation:

Sampled: 06/09/2017 11:15 Analyzed: 14-Jun-2017 16:37

Preparation Method: [CALC]

Preparation Batch: [CALC]

Final Volume: 1

Prepared: 13-Jun-2017

	2			Reporting			
Analyte		CAS Number	Dilution	Limit	Result	Units	Notes
Hardness			1	0.331	66.3	mg/L	

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:** 25-Jul-2017 15:19

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

17F0161-01 (Water)

\*\*\* DEFAULT GENERAL METHOD \*\*\*

Method: ASTM D3977

Sampled: 06/09/2017 11:15 Analyzed: 24-Jul-2017 00:00

Instrument: MT&C
Sample Preparation:

Preparation Method: No Prep Geo

Preparation Batch: B072417

Prepared: 24-Jul-2017

Final Volume:

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	66.55	mg/L	
< 63 μm	SC_<63	1	0.1	73.64	mg/L	
Total SSC	SC_TOTAL	1 -	0.1	140.19	mg/L	



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

Reported:

Seattle WA, 98121

Project Manager: Dylan Ahearn

25-Jul-2017 15:19

Sampled: 06/09/2017 11:15

# Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN

17F0161-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Instrument: ICPMS2 Analyzed: 14-Jun-2017 19:31

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

Preparation Batch: BFF0314 Sample Size: 25 mL Prepared: 13-Jun-2017 Final Volume: 25 mL

Reporting Analyte Limit CAS Number Dilution Result Units Notes 7440-50-8 0.500 Copper, Dissolved 25.3 ug/L Zinc, Dissolved 7440-66-6 1 4.00 50.3 ug/L

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:

25-Jul-2017 15:19

### WUFF-OUT 17F0161-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 06/09/2017 11:15
Instrument: ICPMS1 Analyzed: 19-Jun-2017 18:53

Sample Preparation:

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

Preparation Batch: BFF0310

Sample Size: 25 mL Final Volume: 25 mL

	Prepared: 13-Jun-2017	Final Volume: 25 mL				
Analyte		CAS Number Dilution	Reporting Limit	Result	Units	Notes
Copper	,	7440-50-8 1	0.500	34.9	ug/L	
Zinc		7440-66-6 1	4.00	66.7	ug/L	



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

25-Jul-2017 15:19

**WUFF-OUT** 17F0161-03 (Water)

**Metals and Metallic Compounds** 

Method: EPA 6010C

Sampled: 06/09/2017 11:15 Analyzed: 14-Jun-2017 16:41

Instrument: ICP2 Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0312 Prepared: 13-Jun-2017

Sample Size: 25 mL

Final Volume: 25 mL

		(0)	Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	18.4	mg/L	
Magnesium	7439-95-4	1	0.0500	3.66	mg/L	

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: 25-Jul-2017 15:19

Sampled: 06/09/2017 11:15

Analyzed: 09-Jun-2017 19:12

**WUFF-OUT** 17F0161-03 (Water)

**Wet Chemistry** 

Method: SM 4500-P E-99

Instrument: UV1800-2 Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0260 Prepared: 09-Jun-2017

Sample Size: 10 mL Final Volume: 10 mL

CAS Number

1426-54-42

Dilution

1

1

Reporting Limit 0.0040

0.00800

Result 0.0240

0.100

Notes

Sample Preparation:

Orthophosphorus

Total Phosphorus

Analyte

Analyte

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

Preparation Batch: BFF0544

Sample Size: 25 mL

Prepared: 20-Jun-2017

Final Volume: 50 mL

CAS Number 7723-14-0

Dilution

Reporting Limit Result

Units mg-P/L

Units

mg-P/L

Notes

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:

25-Jul-2017 15:19

WUFF-OUT 17F0161-03 (Water)

Calculation

Method: SM 2340 B-97

Sampled: 06/09/2017 11:15 Analyzed: 14-Jun-2017 16:41

Instrument: [CALC]
Sample Preparation:

Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 13-Jun-2017

Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	61.0	mg/L	

Analytical Resources, Inc.



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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn Reported: 25-Jul-2017 15:19

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

**WUFF-OUT** 

17F0161-03 (Water)

\*\*\* DEFAULT GENERAL METHOD \*\*\*

 Method: ASTM D3977
 Sampled: 06/09/2017 11:15

 Instrument: MT&C
 Analyzed: 24-Jul-2017 00:00

Sample Preparation:

Seattle WA, 98121

Preparation Method: No Prep Geo

Preparation Batch: B072417

Prepared: 24-Jul-2017 Final Volume:

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	6.57	mg/L	
<63 μm	SC_<63	1	0.1	5.48	mg/L	
Total SSC	SC_TOTAL	1	0.1	12.05	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

25-Jul-2017 15:19

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

WUFF-OUT

17F0161-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/09/2017 11:15

Instrument: ICPMS2
Sample Preparation:

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

Preparation Batch: BFF0314

Analyzed: 14-Jun-2017 17:33

Prepared: 13-Jun-2017

Sample Size: 25 mL Final Volume: 25 mL

	a a		Reporting	0		
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	26.9	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	50.5	ug/L	

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:** 25-Jul-2017 15:19

WUFF-IN (QA) 17F0161-05 (Water)

Metals and Metallic Compounds

Sample Preparation:

Method: EPA 200.8 Sampled: 06/09/2017 11:15

Instrument: ICPMS1 Analyzed: 19-Jun-2017 18:58

Preparation Batch: BFF0310 Sample Size: 25 mL
Prepared: 13-Jun-2017 Final Volume: 25 mL

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

Reporting Limit CAS Number Dilution Result Units Notes Analyte Copper 7440-50-8 2 1.00 76.4 D ug/L Zinc 7440-66-6 2 8.00 280 ug/L D

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:

25-Jul-2017 15:19

WUFF-IN (QA) 17F0161-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C Instrument: ICP2

Sampled: 06/09/2017 11:15

Analyzed: 14-Jun-2017 16:45

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0312

Sample Size: 25 mL

Prepared: 13-Jun-2017

Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	19.2	mg/L	
Magnesium	7439-95-4	1	0.0500	3.96	mg/L	

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: 25-Jul-2017 15:19

WUFF-IN (QA) 17F0161-05 (Water)

Wet	Chen	nistry

Sampled: 06/09/2017 11:15 Method: SM 4500-P E-99 Instrument: UV1800-2 Analyzed: 09-Jun-2017 19:12

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0260 Prepared: 09-Jun-2017

Sample Size: 10 mL

Final Volume: 10 mL

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

Sample Preparation:

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

Preparation Batch: BFF0544

Prepared: 20-Jun-2017

Sample Size: 25 mL Final Volume: 50 mL

Reporting Limit Dilution Analyte CAS Number Units Notes Result Total Phosphorus 7723-14-0 1 0.00800 0.532 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

25-Jul-2017 15:19

WUFF-IN (QA) 17F0161-05 (Water)

Calculation

Analyte

Hardness

Method: SM 2340 B-97 Instrument: [CALC]

Sample Preparation:

Sampled: 06/09/2017 11:15 Analyzed: 14-Jun-2017 16:45

Preparation Method: [CALC]

Preparation Batch: [CALC]

Final Volume: 1

1

Prepared: 13-Jun-2017

		Reporting	×		
CAS Number	Dilution	Limit	Result	Units	Notes

0.331

64.2

mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

**Reported:** 25-Jul-2017 15:19

Seattle WA, 98121

Project Manager: Dylan Ahearn

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

WUFF-IN (QA)

17F0161-05 (Water)

\*\*\* DEFAULT GENERAL METHOD \*\*\*

Method: ASTM D3977

Sampled: 06/09/2017 11:15

Instrument: MT&C

Analyzed: 24-Jul-2017 00:00

Sample Preparation:

Preparation Method: No Prep Geo

Preparation Batch: B072417

Prepared: 24-Jul-2017

Final Volume:

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	59.56	mg/L	
< 63 μm	SC_<63	1	0.1	67.43	mg/L	
Total SSC	SC_TOTAL	1	0.1	126.99	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

25-Jul-2017 15:19

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

WUFF-IN (QA) 17F0161-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/09/2017 11:15

Instrument: ICPMS2 Sample Preparation:

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

Preparation Batch: BFF0314

Analyzed: 14-Jun-2017 17:38

Sample Size: 25 mL

Prepared: 13-Jun-2017

Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	23.5	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	42.0	ug/L	

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: 25-Jul-2017 15:19

### Metals and Metallic Compounds - Quality Control

### Batch BFF0310 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0310-BLK2)			_	Prepa	red: 13-Jun	-2017 Anal	yzed: 19-J	un-2017 18	:44		
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 (BFF0310-BS2)				Prepa	red: 13-Jun	-2017 Anal	yzed: 19-J	un-2017 19	:24		
Copper	63	27.8	0.500	ug/L	25.0		111	80-120			
Copper	65	27.3	0.500	ug/L	25.0		109	80-120			
Zinc	66	88.5	4.00	ug/L	80.0		111	80-120			
Zinc	67	86.8	4.00	ug/L	80.0		109	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:

25-Jul-2017 15:19

### Metals and Metallic Compounds - Quality Control

### Batch BFF0312 - TWC EPA 3010A

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0312-BLK1)			Prepa	ared: 13-Jun	-2017 Ana	lyzed: 14-J	un-2017 14:	13		
Calcium	, ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L							U
LCS (BFF0312-BS1)			Prepa	ared: 13-Jun	-2017 Ana	lyzed: 14-J	un-2017 15:	54		
Calcium	9.82	0.0500	mg/L	10.0		98.2	80-120			
Magnesium	10.2	0.0500	mg/L	10.0		102	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:** 25-Jul-2017 15:19

### Metals and Metallic Compounds (dissolved) - Quality Control

### Batch BFF0314 - 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 (BFF0314-BLK1)				Prepa	ared: 13-Jun	-2017 Ana	lyzed: 13-J	un-2017 21:32		4
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			21 -1		•	U
LCS (BFF0314-BS1)				Prepa	ared: 13-Jun	-2017 Ana	lyzed: 13-J	un-2017 22:16		
Copper, Dissolved	63	28.0	0.500	ug/L	25.0		112	80-120		
Copper, Dissolved	65	27.6	0.500	ug/L	25.0		110	80-120		
Zinc, Dissolved	66	85.3	4.00	ug/L	80.0		107	80-120		
Zinc, Dissolved	67	80.3	4.00	ug/L	80.0		100	80-120		

Analytical Resources, Inc.



### **Analytical Report**

Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

25-Jul-2017 15:19

### **Wet Chemistry - Quality Control**

### Batch BFF0260 - 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 (BFF0260-BLK1) Prepared: 09-Jun-2017 Analyzed: 09-Jun-2017 19:03										
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFF0260-BS1)			Prepa	red: 09-Jun	-2017 Ana	ılyzed: 09-J	un-2017 19	:03		
Orthophosphorus	0.146	0.0040	mg-P/L	0.150		97.3	90-110			



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

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

Reported:

25-Jul-2017 15:19

### Wet Chemistry - Quality Control

### Batch BFF0544 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0544-BLK1)			Prepa	red: 20-Jun	n-2017 An	alyzed: 22-	Jun-2017 14:2	4		
Total Phosphorus	ND	0.00800	mg-P/L			O.				U
Blank (BFF0544-BLK2)			Prepa	ıred: 20-Jun	1-2017 An	alyzed: 22-	Jun-2017 14:2	8		
Total Phosphorus	ND	0.00800	mg-P/L							U
DL (BFF0544-BLK3)			Prepa	ared: 20-Jun	n-2017 An	alyzed: 22-	Jun-2017 14:3	2		
Total Phosphorus	ND	0.00800	mg-P/L				101			U
LCS (BFF0544-BS1)	1 100.5		Prepa	red: 20-Jun	1-2017 An	alyzed: 22-	Jun-2017 14:2	4		
Total Phosphorus	0.160	0.00800	mg-P/L	0.150		107	90-110			
DL (BFF0544-BS2)		"	Prepa	red: 20-Jun	1-2017 An	alyzed: 22-	Jun-2017 14:3	0		
Total Phosphorus	0.157	0.00800	mg-P/L	0.150		105	90-110			
DL (BFF0544-BS3)			Prepa	red: 20-Jun	n-2017 An	alyzed: 22-	Jun-2017 14:3	2		
Total Phosphorus	0.156	0.00800	mg-P/L	0.150		104	90-110			
Duplicate (BFF0544-DUP1)	Source	: 17F0161-01	Prepa	ared: 20-Jun	n-2017 An	alyzed: 22-	Jun-2017 14:2	.5		
Total Phosphorus	0.372	0.00800	mg-P/L		0.360			3.28	20	
Matrix Spike (BFF0544-MS1)	Source	: 17F0161-01	Prepa	ared: 20-Jun	1-2017 An	alyzed: 22-	Jun-2017 14:2	6		
Total Phosphorus	2.38	0.0800	mg-P/L	2.00	0.360	101	75-125			D

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



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 25-Jul-2017 15:19

### **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	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.





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Seattle WA, 98121

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

Project Manager: Dylan Ahearn

**Reported:** 25-Jul-2017 15:19

### **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

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.

# June 15, 2017

### Data\_17F0273

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BFF0453-BLK1	Blank	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.100	U	mg/L
BFF0453-BS1	LCS	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.43		mg/L
BFF0453-BSD1	LCS Dup	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.25		mg/L
17F0273-01	WUFF-IN	13-05605-000	Stormwater	06/15/2017	06/15/2017	06/19/2017	06/23/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	1.61		mg/L
17F0273-02	WUFF-OUT	13-05605-000	Stormwater	06/15/2017	06/15/2017	06/19/2017	06/23/2017	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.543		mg/L
BFF0453-BLK1	Blank	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
17F0273-01	WUFF-IN	13-05605-000	Stormwater	06/15/2017	06/15/2017	06/19/2017	06/23/2017	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	6.34		mg/L
17F0273-02	WUFF-OUT	13-05605-000	Stormwater	06/15/2017	06/15/2017	06/19/2017	06/23/2017	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.886		mg/L
BFF0453-BLK1	Blank	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx	84-15-1	o-Terphenyl	69.2		%
BFF0453-BS1	LCS	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx	84-15-1	o-Terphenyl	87.5		%
BFF0453-BSD1	LCS Dup	13-05605-000	Water			06/16/2017	06/23/2017	NWTPH-Dx	84-15-1	o-Terphenyl	75.6		%
17F0273-01	WUFF-IN	13-05605-000	Stormwater	06/15/2017	06/15/2017	06/19/2017	06/23/2017	NWTPH-Dx	84-15-1	o-Terphenyl	83.4		%
17F0273-02	WUFF-OUT	13-05605-000	Stormwater	06/15/2017	06/15/2017	06/19/2017	06/23/2017	NWTPH-Dx	84-15-1	o-Terphenyl	76.2		%



29 June 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)

17F0273

N/A



Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, email=amandav@arilabs.com Date: 2017.06.29 14:30:02 -07'00'

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-

Accreditation # 66169

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

# Page 2 of 10 17F0273 ARISample FINAL 29 Jun 2017 1429

17F0273



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

### Chain of Custody Record

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

Project Name: Project Num			Client:								Analyse	s Reque	ested			
Hydro International Up-flo Filter	13-0	05605-000	Herrera Envi	ronment	al											
Report To:			Copy To:				1									
Dylan Ahearn																
Sampled By:			Delivery Metho				1									
Katie wingson	و		name de	i frasi	(00)	1eR	E E									
Laboratory:		Requested C	ompletion Date:		of Contain		ajie									
Analytical Resources Inc.					4		Cont	<sub>×</sub>								
Lab Use:				Sample Type (see	Preserv- ative?	Matrix (see	Number of Containers	NWTPH-Dx								Lab ID No.
Sample ID	·	Date	Time	codes)	(Y/N)	codes)	Ž	Ž			-					Lat
WUFF-IN		61.511	7 14:30	G	N	SW	2	Х								
WUFF-OUT		6/15/	17 14:45	G	N	SW	2	X								
	- 14(1/2-14) (pm-12)															
											+					
									_		-					
							<del>                                     </del>									
												<u> </u>				
														-		
Comments/Special Instructions:												1	<u> </u>			
	8															
	Te:		Date/Time	D-	ceived By	Mama /CC	1	_	Sign	nature	_				Date/Tir	no
Relinquished by (Name/CO/ / Catil wingrowl   Henres	Signature	_							Sig	liature	7					1 1-1XX
1 cotie wingrove Henres	how w	ruli	6/1917	1700 4	1. Volg	wxxu	1/HE	4	Sie			-			70/15 Date/Tir	
Relinquished by (Name/CO/	Signature		Date/Time	Re	ceived By	wame/CC	וי		Sig	nature					Date/ III	ne
												4.0	· ·		· · · · ·	
Sample Type: G=Grab C=Composite	Matrix Codes:	A=Air GW=0	Groundwater SE	=Sediment	: SO=Soi	∣ SW=Su	rtace W	∕ater V	v≃Wate	r (blanks	) M≐Ma	iterial	U=Uthe	r (spec	лту)	

Sample Type: G=Grab C=Composite



# **Cooler Receipt Form**

ARI Client: Hewere	Project Name: Hydro	International
COC No(s):NA		urier Hand Delivered Other:
Assigned ARI Job No: 17 F 0 2 7 3  Preliminary Examination Phase:	Tracking No:	( )
Were intact, properly signed and dated custody seals attac	ched to the outside of the seeks of	
Were custody papers included with the cooler?		YES NO
		YES NO
Were custody papers properly filled out (ink, signed, etc.) Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C f		YES NO
Time:	or chemistry)	
If cooler temperature is out of compliance fill out form 0007		Temp Gun ID#: 0005000
Cooler Accepted by:	Date: 1015/17 Tim	e: 1760
	forms and attach all shipping documents	
Log-In Phase:		
Was a temperature blank included in the cooler?		YES (NO)
What kind of packing material was used? Bubble	Wrap Wetlice Gel Packs Baggies Foan	1 Block Paper Other:
Was sufficient ice used (if appropriate)?		NA WES 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?		(YES) NO
Did the number of containers listed on COC match with the		YES NO
Did all bottle labels and tags agree with custody papers?		
Were all bottles used correct for the requested analyses? .		
Do any of the analyses (bottles) require preservation? (atta		
Were all VOC vials free of air bubbles?	ion preservation sheet, excluding voes)	NA YES NO
Was sufficient amount of sample sent in each bottle?		NA YES NO
		YES NO
Date VOC Trip Blank was made at ARI		(NA)
Was Sample Split by ARI: NA YES Date/Time	:Equipment:	Split by:
	Date: Lellel Time:	9:05
** Notify Project Ma	anager of discrepancies or concerns **	
Sample ID on Bottle Sample ID on CO		
Sample ID on Bottle Sample ID on CO	C Sample ID on Bottle	Sample ID on COC
		Something of the second
Additional Notes, Discrepancies, & Resolutions:		(11: 11:
labels for WUFF-OUT had to	me of 14:50,000 time	was 19.45.
By: B. H. Date: 6/16/17		
Small Air Bubbles Peabubbles LARGE Air Bubble	Small → "sm" (<2 mm)	
- 2mm 2-4 mm > 4 mm	Peabubbles $\rightarrow$ "pb" (2 to <4 mm)	
	Large → "lg" (4 to < 6 mm)	•
	Headspace > "hs" (>6 mm)	

0016F 3/2/10

Cooler Receipt Form

Revision 014





Project: Hydro International

2200 6th Avenue, Suite 1100 Seattle WA, 98121 Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 29-Jun-2017 14:29

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17F0273-01	Water	15-Jun-2017 14:30	15-Jun-2017 17:00
WUFF-OUT	17F0273-02	Water	15-Jun-2017 14:45	15-Jun-2017 17:00

Analytical Resources, Inc.



Project: Hydro International

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 29-Jun-2017 14:29

### **Case Narrative**

### Sample receipt

Seattle WA, 98121

Samples as listed on the preceding page were received June 15, 2017 under ARI workorder 17F0273. 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/LCSD percent recoveries and RPD were within control limits.

### **Analytical Report**

Herrera Environmental Consultants

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

2200 6th Avenue, Suite 1100

Project Manager: Dylan Ahearn

Reported:

29-Jun-2017 14:29

### WUFF-IN 17F0273-01 (Water)

**Petroleum Hydrocarbons** 

Method: NWTPH-Dx

Seattle WA, 98121

Sampled: 06/15/2017 14:30 Analyzed: 23-Jun-2017 22:28

Instrument: FID4
Sample Preparation:

Preparation Method: EPA 3510C SepF

Preparation Batch: BFF0453

Sample Size: 500 mL

Prepared: 19-Jun-2017

Final Volume: 1 mL

		Reporting							
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes			
Diesel Range Organics (C12-C24)		1	0.100	1.61	mg/L				
HC ID: DRO									
Motor Oil Range Organics (C24-C38)		1	0.200	6.34	mg/L				
HC ID: MOTOR OIL		_							
Surrogate: o-Terphenyl			50-150 %	83.4	%				



### **Analytical Report**

Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

29-Jun-2017 14:29

**WUFF-OUT** 17F0273-02 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 06/15/2017 14:45 Analyzed: 23-Jun-2017 22:50

Instrument: FID4 Sample Preparation:

Seattle WA, 98121

Preparation Method: EPA 3510C SepF

Preparation Batch: BFF0453

Prepared: 19-Jun-2017

Sample Size: 470 mL Final Volume: 1 mL

			Reporting	· ·		
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.106	0.543	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)		1	0.213	0.886	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	76.2	%	





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

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

29-Jun-2017 14:29

### **Petroleum Hydrocarbons - Quality Control**

### Batch BFF0453 - EPA 3510C SepF

Instrument: FID4 Analyst: JR

Seattle WA, 98121

	11 11 11	Reporting		Spike	Source		%REC	E	RPD	
QC Sample/Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFF0453-BLK1)			Prepa	ared: 16-Jun	-2017 Ana	alyzed: 23	Jun-2017 15	:44		
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	1	0.311	mg/L	0.450		69.2	50-150	3 €		
LCS (BFF0453-BS1)			Prep	ared: 16-Jun	-2017 Ana	alyzed: 23	Jun-2017 16	:05		
Diesel Range Organics (C12-C24)	2.43	0.100	mg/L	3.00		81.0	56-120			
Surrogate: o-Terphenyl		0.394	mg/L	0.450		87.5	50-150			
LCS Dup (BFF0453-BSD1)	111 -		Prep	ared: 16-Jun	-2017 Ana	alyzed: 23	Jun-2017 16	:26		
Diesel Range Organics (C12-C24)	2.25	0.100	mg/L	3.00		75.0	56-120	7.61	30	
Surrogate: o-Terphenyl	Ĭ.	0.340	mg/L	0.450		75.6	50-150			
							N			

Analytical Resources, Inc.



Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

**Reported:** 29-Jun-2017 14:29

### **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	05/06/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	03/30/2017
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2017
WADOE	WA Dept of Ecology	C558	06/30/2017
WA-DW	Ecology - Drinking Water	C558	06/30/2017
NELAP WADOE	ORELAP - Oregon Laboratory Accreditation Program WA Dept of Ecology	WA100006 C558	05/11/2017 06/30/2017

Analytical Resources, Inc.





Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

29-Jun-2017 14:29

### **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

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\_17F0281

1FF0281-01   WUFF-NI	ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
1FF0281-01   WUFF-IN   3-36605-000   Stormwater   66/16/2017   06/16/2017   07/24/2017   07/24/2017   ASTM D.9977   S.C6.3   > 5.3 µm   18.00   mg/L   1FF0281-03   WUFF-IN   3-36605-000   Stormwater   66/16/2017   06/16/2017   07/24/2017   07/24/2017   ASTM D.9977   S.C6.3   < 5.3 µm   42.87   mg/L   1FF0281-03   WUFF-IN   3-36605-000   Stormwater   66/16/2017   06/16/2017   07/24/2017   07/24/2017   ASTM D.9977   S.C6.3   < 5.3 µm   42.87   mg/L   1FF0281-03   WUFF-IN   3-36605-000   Stormwater   66/16/2017   06/16/2017   07/24/2017   07/24/2017   ASTM D.9977   S.C6.13   < 5.3 µm   42.87   mg/L   1FF0281-03   WUFF-IN   3-36605-000   Stormwater   66/16/2017   06/16/2017   07/24/2017   07/24/2017   ASTM D.9977   S.C7.17 L Total SSC   0.9 7   mg/L   1FF0281-03   WUFF-IN   3-36605-000   Stormwater   66/16/2017   06/16/2017   07/24/2017   07/24/2017   ASTM D.9977   S.C7.17 L Total SSC   0.9 7   mg/L   1FF0281-03   WUFF-IN   3-36605-000   Stormwater   06/16/2017	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/19/2017	06/19/2017	SM 2340 B-97		Hardness	105		mg/L
17F0281-03   WUFF-OUT   13-05005-000   Stormwater   0616/2017   0616/2017   076/42017   0774/2017	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/19/2017	06/19/2017	SM 2340 B-97		Hardness	122		mg/L
1FF0281-91   WUFF-IN   13-05605-000   Stormwater   66/16/2017   66/16/2017   66/16/2017   67/24/2017   ASTM D3977   SC63   63 µm   42.87   mg/L	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	07/24/2017	07/24/2017	ASTM D3977	SC_>63	> 63 µm	18.00		mg/L
1FF0281-03   WUFF-NOT   13-05605-000   Stormwater   69/16/2017   06/16/2017   07/24/2017   07/	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	07/24/2017	07/24/2017	ASTM D3977	SC_>63	> 63 µm	0.85		mg/L
1FF0281-01   WUFF-NI   3-06605-000   Stormwater   06/16/2017   O6/16/2017   O7/24/2017   O7/24	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	07/24/2017	07/24/2017	ASTM D3977	SC_<63		42.87		mg/L
IFFO281-03	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	07/24/2017	07/24/2017	ASTM D3977	SC_<63	< 63 µm	1.06		mg/L
BFF0473-BLK1   Blank	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	07/24/2017	07/24/2017	ASTM D3977	SC_TOTAL	Total SSC	60.87		mg/L
BFF0473-BS1   CS	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	07/24/2017	07/24/2017	ASTM D3977	_	Total SSC	1.91		mg/L
BFF6473-DUP2	BFF0473-BLK1	Blank	13-05605-000	Water			06/16/2017	06/16/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFF0473-MS2   WUFF-IN   13-08605-000 Stormwater   06/16/2017   06/16	BFF0473-BS1	LCS	13-05605-000	Water			06/16/2017	06/16/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.146		mg-P/L
1FF0281-01   WUFF-IN   13-08605-000   Stormwater   06/16/2017   06/1	BFF0473-DUP2	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/16/2017	06/16/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0160		mg-P/L
1FF0281-03   WUFF-OUT   3-05605-000 Water   06/16/2017   06/20/2017	BFF0473-MS2	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/16/2017	06/16/2017	SM 4500-P E-99		Orthophosphorus	0.111		mg-P/L
BFF0485-BLK   Blank	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/16/2017	06/16/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0170		mg-P/L
BFF0485-BS1	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/16/2017	06/16/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0250		mg-P/L
17F0281-01   WUFF-IN   13-05605-000   Stormwater   06/16/2017   06/16/2017   06/19/2017   06/19/2017   EPA 6010C   7440-70-2   Calcium   27.3   mg/L   17F0281-03   WUFF-OUT   13-05605-000   Water   06/16/2017   06/16/2017   06/19/2017   EPA 6010C   7439-95-4   Magnesium   0.500   U mg/L   No. 17F0281-03   WUFF-IN   13-05605-000   Stormwater   06/16/2017   06/19/2017   06/19/2017   EPA 6010C   7439-95-4   Magnesium   0.500   U mg/L   No. 17F0281-03   WUFF-IN   13-05605-000   Stormwater   06/16/2017   06/16/2017   06/19/2017   EPA 6010C   7439-95-4   Magnesium   0.5   mg/L   No. 17F0281-03   WUFF-IN   13-05605-000   Water   06/16/2017   06/19/2017   06/19/2017   EPA 6010C   7439-95-4   Magnesium   0.5   mg/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Water   06/16/2017   06/19/2017   06/19/2017   EPA 6010C   7439-95-4   Magnesium   0.5   mg/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Water   06/16/2017   06/19/2017   06/19/2017   EPA 6010C   7439-95-4   Magnesium   0.8   mg/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Water   06/16/2017   06/16/2017   06/19/2017   EPA 200.8   7440-50-8   Copper   25.2   u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Stormwater   06/16/2017   06/16/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   25.2   u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Stormwater   06/16/2017   06/16/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   35.5   u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Stormwater   06/16/2017   06/20/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   35.5   u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Stormwater   06/16/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   35.5   u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Water   06/20/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   35.5   u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Water   06/20/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   24.9 u.g/L   No. 17F0281-03   WUFF-IN   No. 13-05605-000   Water   06/16/2017   06/16/201	BFF0485-BLK1	Blank	13-05605-000	Water			06/19/2017	06/19/2017	EPA 6010C	7440-70-2	Calcium	0.0500	U	mg/L
17F0281-03   WUFF-OUT   13-05605-000   Stormwater   06/16/2017   06/19/2017   06/19/2017   06/19/2017   EPA 6010C   7449-95-4   Magnesium   0.0500   mg/L	BFF0485-BS1	LCS	13-05605-000	Water			06/19/2017	06/23/2017	EPA 6010C	7440-70-2	Calcium	10.2		mg/L
BFF0485-BL1   Blank	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/19/2017	06/19/2017	EPA 6010C	7440-70-2	Calcium	27.3		mg/L
BFF0648-BS1   LCS	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/19/2017	06/19/2017	EPA 6010C	7440-70-2	Calcium	30.9		mg/L
17F0281-01   WUFF-IN   13-05605-000 Stormwater   06/16/2017   06/16/2017   06/19/	BFF0485-BLK1	Blank	13-05605-000	Water			06/19/2017	06/19/2017	EPA 6010C	7439-95-4	Magnesium	0.0500	U	mg/L
17F0281-01   WUFF-IN   13-05605-000   Stormwater   06/16/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   25.2   ug/L   06/20/2017   06/20/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   25.2   ug/L   06/20/2017   EPA 200.8   Copper   25.2   Ug/L   06/20/2017   COPPER 200.8   Copper   25.2   Ug/L   06/20/2017   COPPER 200.8   Copper   25.2   Ug/L   COPPER 200.8   Copper   COPPER 200.8	BFF0485-BS1	LCS	13-05605-000	Water			06/19/2017	06/23/2017	EPA 6010C	7439-95-4	Magnesium	10.7		mg/L
17F0281-03   WUFF-OUT   13-05605-000   Stormwater   06/16/2017   06/16/2017   06/20/2017   06/	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/19/2017	06/19/2017	EPA 6010C	7439-95-4	Magnesium	9.05		
EFF0623-BS1   LCS	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/19/2017	06/19/2017	EPA 6010C	7439-95-4		10.8		mg/L
BFF0623-BS1   LCS	BFF0523-BLK1	Blank	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFF0623-MS1   WUFF-IN   13-05605-000   Stormwater   06/16/2017   06/20/2017   06/20/2017   06/20/2017   EPA 20.8   7440-50-8   Copper   35.2   ug/L	BFF0523-BS1	LCS	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	25.2		
17F0281-01   WUFF-IN   3-05605-000   Stormwater   06/16/2017   06/16/2017   06/20/2017   06/20/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   10.9   ug/L	BFF0523-DUP1	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	35.2		ug/L
17F0281-03   WUFF-OUT   13-05605-000   Stormwater   06/16/2017   06/16/2017   06/20/2017   EPA 200.8   7440-50-8   Copper   0.500   U.g/L	BFF0523-MS1	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	58.8		ug/L
BFF0523-BLK1         Blank         13-05605-000         Water         06/20/2017         06/20/2017         EPA 200.8         7440-50-8         Copper         0.500         U ug/L           BFF0523-BLK1         LCS         13-05605-000         Water         06/20/2017         06/20/2017         EPA 200.8         7440-50-8         Copper         24.9         ug/L           BFF0523-BLK1         Blank         13-05605-000         Water         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         4.00         U ug/L           BFF0523-BLK1         Blank         13-05605-000         Water         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         4.00         U ug/L           BFF0523-BLK1         Blank         13-05605-000         Water         06/16/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         22.2         ug/L           BFF0523-BLX1         Blank         13-05605-000         Water         06/16/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         22.2         ug/L           BFF0523-BS1         LCS         13-05605-000         Water         06/16/2017         06/16/2017	17F0281-01	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	35.5		ug/L
BFF0523-BS1   LCS	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	10.9		ug/L
BFF0523-BS1   LCS	BFF0523-BLK1	Blank	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BFF0523-BLK1 Blank 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFF0523-BS1 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 81.9 ug/L Ug/L BFF0523-BLK1 Blank 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 22.2 ug/L BFF0523-BLK1 Blank 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFF0523-BLS1 LCS 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFF0523-BLS1 LCS 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 74.4 ug/L BFF0523-BLS1 UWFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 103 ug/L BFF0523-BLS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 103 ug/L BFF0523-BLS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK2 Blank 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 170 ug/L BFF0544-BLX3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 DFP 200.8 7440-66-6 Zinc 170 ug/L Ug/L DFP 200.8 7440-66-6 Zinc 170 ug/L Ug/L DFP 200.8 7440-66-6 Zinc 170 ug/L Ug/L DFP 200.8	BFF0523-BS1	LCS	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-50-8		24.9		
17F0281-03   WUFF-OUT   13-05605-000   Stormwater   06/16/2017   06/16/2017   06/20/2017   06/20/2017   EPA 200.8   7440-66-6   Zinc   22.2   ug/L	BFF0523-BLK1	Blank	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-66-6		4.00	U	
BFF0523-BLK1 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L 06/20/2018 BFF0523-BS1 LCS 13-05605-000 Water 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 74.4 ug/L 06/20/2018 BFF0523-MS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 103 ug/L 06/20/2018 EPA 200.8 T440-66-6 Zinc 103 ug/L 06/20/2019 EPA 200.8 T440-66-6 Zinc 103 ug/L 06/20/2019 EPA 200.8 T440-66-6 Zinc 107 ug/L 17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 T440-66-6 Zinc 107 ug/L 06/20/2018 EPA 200.8 T440-66-6 Zinc 107 ug/L 06/20/2018 EPA 200.8 T440-66-6 Zinc 107 ug/L 06/20/2019 Ug/L 06/20/2019 EPA 200.8 T440-66-6 Zinc 103 ug/L 06/20/2019 Ug/L 06/20/2019 EPA 200.8 Dissolved T440-66-6 Zinc 103 ug/L 06/20/2019 Ug/L 06/20/2019 EPA 200.8 Dissolved T440-50-8 Copper 0.500 U ug/L 06/20/2019 EPA 200.8 Dissolved T440-50-8 Copper 0.500 U ug/L 06/20/2019 EPA 200.8 Dissolved T440-50-8 Copper 0.500 U ug/L 06/20/2019 EPA 200.8 Dissolved T440-50-8 Copper 26.8 ug/L	BFF0523-BS1	LCS	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-66-6	Zinc	81.9		ug/L
BFF0523-BLK1 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 4.00 U ug/L BFF0523-BS1 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 74.4 ug/L BFF0523-BS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 103 ug/L BFF0523-MS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 107 ug/L 17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 107 ug/L BFF0544-BLK1 Blank 13-05605-000 Water 06/16/2017 06/16/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 107 ug/L BFF0544-BLK2 Blank 13-05605-000 Water 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 107 ug/L BFF0544-BLK2 Blank 13-05605-000 Water 06/20/2017 06/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L BFF0544-BS1 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L BFF0544-BS2 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.160 mg-P/L BFF0544-BS3 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.156 mg-P/L 17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.156 mg-P/L 17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L 17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L 17F0281-03 WUFF-OUT 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/20/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L BFF0563-BS1 LCS 13-05605-000 Water 06/21/2017 06/21/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper	17F0281-03	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8	7440-66-6	Zinc	22.2		ug/L
BFF0523-BS1         LCS         13-05605-000         Water         06/20/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         74.4         ug/L           BFF0523-DUP1         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         103         ug/L           BFF0523-MS1         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         177         ug/L           BFF0544-BLK1         Blank         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         177         ug/L           BFF0544-BLK1         Blank         13-05605-000         Water         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BLK2         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BLK3	BFF0523-BLK1	Blank	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
BFF0523-MS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L  17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 107 ug/L  BFF0544-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L  BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L  BFF0544-BS1 LCS 13-05605-000 Water 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.160 mg-P/L  BFF0544-BS3 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.157 mg-P/L  BFF0544-BS3 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.157 mg-P/L  17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.156 mg-P/L  17F0281-03 WUFF-OUT 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BS1 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BS1 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L	BFF0523-BS1	LCS	13-05605-000	Water			06/20/2017	06/20/2017	EPA 200.8	7440-66-6	Zinc	74.4		
BFF0523-MS1 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 177 ug/L  17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/20/2017 EPA 200.8 7440-66-6 Zinc 107 ug/L  BFF0544-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/20/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L  BFF0544-BLK3 Blank 13-05605-000 Water 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.00800 U mg-P/L  BFF0544-BS1 LCS 13-05605-000 Water 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.160 mg-P/L  BFF0544-BS3 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.157 mg-P/L  BFF0544-BS3 LCS 13-05605-000 Water 06/20/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.157 mg-P/L  17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.156 mg-P/L  17F0281-03 WUFF-OUT 13-05605-000 Stormwater 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BS1 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BLK1 Blank 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L  18FF0563-BS1 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L	BFF0523-DUP1	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8	7440-66-6	Zinc	103		ug/L
17F0281-01         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/20/2017         EPA 200.8         7440-66-6         Zinc         107         ug/L           BFF0544-BLK1         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BLK2         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BLK3         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BS1         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.160         mg-P/L           BFF0544-BS2         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.157         mg-P/L           BFF0544-BS3         LCS         13-05605-000 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>														
BFF0544-BLK1         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BLK2         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BLK3         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BS1         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         U mg-P/L           BFF0544-BS2         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.160         mg-P/L           BFF0544-BS3         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.156         mg-P/L           17F0281-01         WUFF-IN         13-05605-000         Stormwa	17F0281-01		13-05605-000	Stormwater	06/16/2017	06/16/2017	06/20/2017	06/20/2017	EPA 200.8					
BFF0544-BLK2         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         Umg-P/L           BFF0544-BLK3         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         Umg-P/L           BFF0544-BS1         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.160         mg-P/L           BFF0544-BS2         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.157         mg-P/L           BFF0544-BS3         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.156         mg-P/L           17F0281-01         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/20/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           17F0281-03         WUFF-OUT         13-05605-000												0.00800	U	
BFF0544-BLK3         Blank         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.00800         Umg-P/L           BFF0544-BS1         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.160         mg-P/L           BFF0544-BS2         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.157         mg-P/L           BFF0544-BS3         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.156         mg-P/L           17F0281-01         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           17F0281-03         WUFF-OUT         13-05605-000         Stormwater         06/16/2017         06/16/2017         06/20/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           BFF0563-BLK1         Blan											•			
BFF0544-BS1         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.160         mg-P/L           BFF0544-BS2         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.157         mg-P/L           BFF0544-BS3         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.156         mg-P/L           17F0281-01         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           17F0281-03         WUFF-OUT         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           BFF0563-BLK1         Blank         13-05605-000         Water         06/16/2017         06/20/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFF0563-BS1 <td></td> <td>·</td> <td></td> <td>Ū</td> <td></td>											·		Ū	
BFF0544-BS2 LCS 13-05605-000 Water 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.157 mg-P/L   BFF0544-BS3 LCS 13-05605-000 Water 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.156 mg-P/L   17F0281-01 WUFF-IN 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0540 mg-P/L   17F0281-03 WUFF-OUT 13-05605-000 Stormwater 06/16/2017 06/16/2017 06/20/2017 06/22/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0680 mg-P/L   BFF0563-BLK1 Blank 13-05605-000 Water 06/16/2017 06/21/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L   BFF0563-BS1 LCS 13-05605-000 Water 06/21/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper 26.8 ug/L														
BFF0544-BS3         LCS         13-05605-000         Water         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.156         mg-P/L           17F0281-01         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           17F0281-03         WUFF-OUT         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           BFF0563-BLK1         Blank         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFF0563-BS1         LCS         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         26.8         ug/L														
17F0281-01         WUFF-IN         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/20/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0540         mg-P/L           17F0281-03         WUFF-OUT         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0680         mg-P/L           BFF0563-BLK1         Blank         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFF0563-BS1         LCS         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         26.8         ug/L														
17F0281-03         WUFF-OUT         13-05605-000         Stormwater         06/16/2017         06/20/2017         06/22/2017         SM 4500-P E-99         7723-14-0         Total Phosphorus         0.0680         mg-P/L           BFF0563-BLK1         Blank         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFF0563-BS1         LCS         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         26.8         ug/L					06/16/2017	06/16/2017					-			
BFF0563-BLK1         Blank         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFF0563-BS1         LCS         13-05605-000         Water         06/21/2017         06/22/2017         EPA 200.8-Dissolved         7440-50-8         Copper         26.8         ug/L											-			
BFF0563-BS1 LCS 13-05605-000 Water 06/21/2017 06/22/2017 EPA 200.8-Dissolved 7440-50-8 Copper 26.8 ug/L													IJ	
											• • •			
	17F0281-02	WUFF-IN			06/16/2017	06/16/2017				7440-50-8	Copper	13.0		ug/L

### Data\_17F0281

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17F0281-04	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-50-8	Copper	9.77		ug/L
BFF0563-BLK1	Blank	13-05605-000	Water			06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L
BFF0563-BS1	LCS	13-05605-000	Water			06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-50-8	Copper	26.6		ug/L
BFF0563-BLK1	Blank	13-05605-000	Water			06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFF0563-BS1	LCS	13-05605-000	Water			06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	84.2		ug/L
17F0281-02	WUFF-IN	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	30.3		ug/L
17F0281-04	WUFF-OUT	13-05605-000	Stormwater	06/16/2017	06/16/2017	06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	20.7		ug/L
BFF0563-BLK1	Blank	13-05605-000	Water			06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L
BFF0563-BS1	LCS	13-05605-000	Water			06/21/2017	06/22/2017	EPA 200.8-Dissolved	7440-66-6	Zinc	79.8		ug/L



25 July 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)

17F0281

N/A

# **Amanda** Volgardsen, Services, cn=Amanda Volgardsen, email=amandav@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: 2017.07.25 15:44:10 -07'00'

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?

Accreditation # 66169

2200 Sixth Avenue | Suite 1100

HERRERA

Seattle, Washington | 98121

Chain of Custody Record

Lab ID No. Sinc, total - EPA 200.8 × Zinc, dissolved - EPA 200.8 × Copper, total - EPA 200.8 ×  $\times$ Copper, dissolved - EPA 200.8  $\times$ Analyses Requested Hardness as CaCO3-SM 2340B × × Orthophosphorus - EPA 365.3 × × Total phosphorus - EPA 365.3  $\times$ × TRACIOLE SIZE DISTRIBUTION - ASTR 91717189 × × Total volatile Suspended solids -SM2540-E × SMD3977 × Suspended Sediment Concentration Total Suspended Solids- SM 2540D × × la codler, hand delivered Matrix codes) (see SW SW Total No. of Containers: Preservative? (<u>N</u> Z Z Herrera Environmental Sample Type (see codes) O  $\circ$ Delivery Method: Requested Completion Date: 10:30 10:30 Time Copy To: Client: 41.01.9 41.97.9 Date 13-05605-000 Project Number: からからろ Hydro International Up-flo Filter Sample ID Analytical Resources Inc. Sampled By: **Dylan Ahearn** WUFF-OUT Project Name: WUFF-IN Laboratory: Report To: Lab Use:

Send 1 liter to ETS, Inc 975 Transport Way, Suite 2, Petaluma, CA for PSD, TSS, and TVSS. PSD to be run for >500, 500-125, 125-62.5, 62.5-4, <4.

				i	Date /Times
Relinquished by (Name/CO/	Signature	Date/Time 11:08	Date/Time 11:08   Received By (Name/CO)	Signature	Cale/IIIIe
		7.0	10 11 11 11 11 11 11 11 11 11 11 11 11 1	00 1 1 9	ことこと
Ketio Wind to the	Lase Leger	4/20/02/4	はのとうでするようのようと言う	Dalling Volk	11:08
Relinquished by (Name/CO/	Signature	Date/Time	Received By (Name/CO)	Signature 🔾	Date/Time

Sample Type: G=Grab C=Composite

SW=Surface Water W=Water (blanks) M=Material O=Other (specify) SE=Sediment SO=Soil GW=Groundwater Matrix Codes: A=Air W HERRERA Page 1 of 1

~ 30

Project Name

Comments/Special Instructions:



# **Cooler Receipt Form**

ARI Client: Herrera	Project Name: Hydro	Intern	ational
COC No(s): NA	Delivered by: Fed-Ex UPS Cour	-	
Assigned ARI Job No: 17F0281	Tracking No:		•
Preliminary Examination Phase:			(NA)
Were intact, properly signed and dated custody seals attached t	to the outside of to cooler?	Y	ES (NO)
Were custody papers included with the cooler?		2	ES NO
Were custody papers properly filled out (ink, signed, etc.)		8	ES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for che Time: 1.0 %	emistry)	_	LS) NO
If cooler temperature is out of compliance fill out form 00070F	5.5		
			100520Le
Cooler Accepted by: B. H.	Date: <u></u>	11:0	8
Log-In Phase:	and attach all shipping documents		
Was a temperature blank included in the cooler?			YES NO
What kind of packing material was used? Bubble Wra	p Wet Ice Gel Packs Baggies Foam I	3lock Paper Ot	her: Nove
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?			YES NO
Did the number of containers listed on COC match with the num	ber of containers received?		YES NO
Did all bottle labels and tags agree with custody papers?			YES NO
Were all bottles used correct for the requested analyses?			YES NO
Do any of the analyses (bottles) require preservation? (attach pr Were all VOC vials free of air bubbles?	reservation sheet, excluding VOCs)	NA	(YES) NO
		NA	YES NO
Was sufficient amount of sample sent in each bottle?  Date VOC Trip Blank was made at ARI		$\sim$	YES NO
Was Sample Split by ARI : NA YES Date/Time:	Factorial	(NA)	
			Split by:
Samples Logged by:B_HDate	e: <u>le/1(e/1</u> Time:	15:1	9
	er of discrepancies or concerns **		
Sample ID on Bottle Sample ID on COC	Sample ID on Bottle	Sample	e ID on COC
1.			
Additional Notes, Discrepancies, & Resolutions:			
Number of containers not give	∕n ·		
0			
		proposition of the manifesta 977 V II Plant	
By: B.H. Date: Celloli	1-02-1-1		
Small Air Bubbles Peabubbles' LARGE Air Bubbles	Small → "sm" (<2 mm)		
= 2 mm > 4 mm	Peabubbles -> "pb" (2 to < 4 mm)		
	Large > "lg" (4 to < 6 mm)		
	Headspace → "hs" (>6 mm)		

0016F 3/2/10 Cooler Receipt Form

Revision 014

Printed: 6/16/2017 3:27:03PM

### **WORK ORDER**

· 17F0281

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

**Project: Hydro International** 

Project Number: 13-05605-000

### **Preservation Confirmation**

Container ID	Container Type	рН	
17F0281-01 A	Small OJ, 500 mL		
17F0281-01 B	Small OJ, 500 mL, 9N H2SO4	La Pass	
17F0281-01 C	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass	
17F0281-01 D	Large OJ, 1000 mL		
17F0281-01 E	Large OJ, 1000 mL		
17F0281-01 F	Large OJ, 1000 mL		
17F0281-01 G	Large OJ, 1000 mL		
17F0281-02 A	HDPE NM, 500 mL	>2 Fail	
17F0281-03 A	Small OJ, 500 mL		
17F0281-03 B	Small OJ, 500 mL, 9N H2SO4	L2 Pass	
17F0281-03 C	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass	
17F0281-03 D	Large OJ, 1000 mL		
17F0281-03 E	Large OJ, 1000 mL		
17F0281-03 F	Large OJ, 1000 mL		
17F0281-03 G	Large OJ, 1000 mL		
17F0281-04 A	HDPE NM, 500 mL	>2 Fail	

B.H.	
Preservation Confirmed By	_

Le/ILEIT)
Date



# SUBCONTRACT ORDER To: Environmental Technical Services ARI Work Order:17F0281

### **SENDING LABORATORY:**

Analytical Resources, Inc.

4611 S. 134th Place, Suite 100

Tukwila, WA 98168 Phone: (206) 695-6200 Fax: (206) 695-6201

Project Manager: Amanda Volgardsen

E-Mail: av@arilabs.com

Large OJ, 1000 mL

### **RECEIVING LABORATORY:**

Environmental Technical Services 975 Transport Way, Suite 2 Petaluma, CA 94954 Phone: (707) 778-9605

Fax:

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 17F0281-01 Sampled: 06/16/17 10:30 Mat	rix: Water			
Solids, Total Volatile Suspended S	M 2540 E-9: 06/30/17	06/23/17 10:30		2
Solids, Total Suspended SM 2540	D-97 06/30/17	06/23/17 10:30		
PSD (Particle Size Distribution by	Laser) (Subc 06/30/17	06/23/17 10:30		
Containers Supplied:				
17F0281-01 E Large OJ, 1000 mL	17F0281-01 F Large OJ, 1000 mL	- 11	<b>0281-01 G</b> ge OJ, 1000 mL	
Sample ID: 17F0281-03 Sampled: 06/16/17 10:30 Mate	ix: Water			
Solids, Total Volatile Suspended S	M 2540 E-91 06/30/17	06/23/17 10:30		•
Solids, Total Suspended SM 2540	D-97 06/30/17	06/23/17 10:30		
PSD (Particle Size Distribution by	Laser) (Subi 06/30/17	06/23/17 10:30		
Containers Supplied:				
17F0281-03 E	17F0281-03 F	17F	0281-03 G	

Large OJ, 1000 mL

Large OJ, 1000 mL

Released By	Date	Received By	Date
Released By	Date	Received By	Date

Printed: 6/16/2017 3:27:14PM



### **SUBCONTRACT ORDER**

To: Materials Testing & Consulting, Inc. (Tukwila)

### ARI Work Order:17F0281

### **SENDING LABORATORY:**

Analytical Resources, Inc.

4611 S. 134th Place, Suite 100

Tukwila, WA 98168

Phone: (206) 695-6200 Fax: (206) 695-6201

Project Manager: Amanda Volgardsen

E-Mail: av@arilabs.com

Containers Supplied: 17F0281-03 D Large OJ, 1000 mL

### **RECEIVING LABORATORY:**

Materials Testing & Consulting, Inc. (Tukwila)

4611 S 134th Place, Ste 200

Tukwila, WA 98296

Phone:-

Fax: -

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 17F0281-01 Sampled: 06/16/17 10:30 Matrix: Water				
Stormwater Sed Conc (SSC) ASTM D3977 (St	06/30/17	06/23/17 10:30		
Containers Supplied:				
<b>17F0281-01 D</b> Large OJ, 1000 mL				
Sample ID: 17F0281-03 Sampled: 06/16/17 10:30 Matrix: Water				
Stormwater Sed Conc (SSC) ASTM D3977 (St	06/30/17	06/23/17 10:30		

Released By	Date	Received By	Date	
	2			
Released By	Date	Received By	Date	

Printed: 6/16/2017 3:27:14PM



## 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

Serving people and the environment so that both benefit.

e-mail: entech@pacbell.net

OMPANY:	Analytical R	esources, Inc	., 4611 S. 134 <sup>th</sup>	Place, Suite 1	00, Tukwila, W	VA 98168		ANALYST(S)	SUPERVISOR
	Amanda Vo				DATE	DATE	DATE	S. Santos	D. Jacobson
JOB:	Hydro Interr	national Up-Fl	o Filter		COLLECTED	RECEIVED	COMPLETED	G.Hernandez	LAB DIRECTOR
SITE:	Oregon-Wa	shington			6/16/2017	6/20/2017	6/28/2017		G.S. Conrad,Phl
			E SIZE DISTR	RIBUTION (PS	D) ANALYSIS	S & REPORT	T – 5 PART		
LAB	SAMPLE	SOURCE	SUSPENDED	SUSPENDED	SUSPENDED	SUSPENDED	SUSPENDED	SUSPENDED	SUSPENDED
SAMPLE		of	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SOLIDS,	SEDIMENT CON
NUMBER	ID	WATER	mg/l @ ≥500 μ	mg/l @ 125 μ	mg/l @ 63 μ	mg/l @ 32 μ	mg/l @ 4 μ	mg/l @ 1 μ	TSS mg/l
07400-1	HI-29/RW	WUFF-IN	2.0	8.0	9.0		27.5	3.9	55.0
	17F028	1-01 E/F	4.0%	15.9%	17.9%		54.6%	7.7%	
						Total SSC b	y Summation →	50.4	
07400-2	HI-30/RW	WUFF-OUT	0.0	0.5	0.5		2.3	1.1	4.0
	17F028	1-03 E/F	0.0%	11.4%	11.4%		52.3%	25.0%	
						Total SSC b	y Summation →	4.4	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
							y Summation →	0.0	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
						Total SSC b	y Summation →	0.0	
LAB	SAMPLE	SOURCE	Water pH	ECw	COLOR,	COLOR	TOTAL IRON	TOTAL	VOLATILE
SAMPLE		of		[Spec Cond]	TRUE	APPARENT	Fe (diss.)	SUSPENDED	SOLIDS (TVSS
NUMBER	ID	WATER	-log[H+]	μS/cm	PtCo Units	PtCo Units	mg/l		mg/l
07400-1	HI-29/RW	WUFF-IN							16.0
	17F028	1-01 E/F							
07400-2	FII 30/D/W	WUFF-OUT							2.0
07400-2		1-03 E/F							2.0
	171 020	1-00 L/1							

### COMMENTS

The matrix has a very low concentration of TSS particles amounting to only about 50 ppm in the input sample; and the output sample is extremely low at 4-5 ppm. For the -IN & -OUT pair of samples, the overall reduction averaged right at 92% (i.e., TSS by summation vs tested TSS). The specific fraction reductions going from coarsest to finest sizes are as follows: 100%, 93.8%, 94.4%, 91.6%, and 71.8%. The TVSS values are proportionally somewhat different in this case. The proportion that is volatile suspended solids in the input sample is at just 29%, but for the output sample it is at 50%. Thus, in this case volatile suspended solids are a little less than a third up to one half of the suspended particulates, depending on which sample, the input or the output. So, it appears there is proportionally greater removal of non-organic particulates in this specific situation. The RPDs are excellent as follows: ±4.4%; and ±4.8%.

\\\ 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 Up-flo Filter (17F0281)	Date Received: June 19, 2017
Project #: 16T001-035	Sampled By: Others
Client: Analytical Resources, Inc.	Date Reported: July 25, 2017
Source: Multiple	Tested By: B. Goble
ATC Sample# Multiple	

### **CASE NARRATIVE**

<ol> <li>Tl</li> <li>Tl</li> <li>Tl</li> </ol>	wo samples were submitted the coarse material was screen he suspended solids are reposite data is provided in a summer were were no other noted and	ned over a No. 230 s rted in mg/L. nary table.	sieve.	77, Method C.
			-715	

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

Regional Offices: Olympia ~ 360.534.9777 Visit our website: www.mtc-inc.net

Silverdale ~ 360.698.6787 Bellingham ~ 360.647.6111

Tukwila ~ 206.241.1974

# Materials Testing & Consulting, Inc

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Hydro International Up-flo Filter

**Project:** (17F0281)

Date Received: June 19, 2017 Date Tested: July 24, 2017 Project #: 16T001-035

Sampled by: Others Tested by: B. Goble

Client: Analytical Resources, Inc.

Suspended Sediment Concentration ASTM D3977 Method C

Total Suspended Sediment Concentration (mg/L)	6.09	1.9
FineFraction SSC (<63µm) (mg/L)	42.9	1.1
Coarse Fraction SSC (>63µm) (mg/L)	18.0	6.0
Sampling Date	6/16/2017	6/16/2017
MTC Sample ID	T17-1074	T17-1075
Client Sample ID	WUFF-IN	WUFF-OUT

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: Sah Hobble

Tukwila  $\sim 206.241.1974$ Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980 Silverdale  $\sim 360.698.6787$ Bellingham ~ 360.647.6111 Regional Offices: Olympia ~ 360.534.9777

Visit our website: www.mtc-inc.net



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

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

**Reported:** 25-Jul-2017 15:42

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	17F0281-01	Water	16-Jun-2017 10:30	16-Jun-2017 11:08
WUFF-IN	17F0281-02	Water	16-Jun-2017 10:30	16-Jun-2017 11:08
WUFF-OUT	17F0281-03	Water	16-Jun-2017 10:30	16-Jun-2017 11:08
WUFF-OUT	17F0281-04	Water	16-Jun-2017 10:30	16-Jun-2017 11:08

Analytical Resources, Inc.



Project: Hydro International

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 25-Jul-2017 15:42

Seattle WA, 98121

### **Case Narrative**

### Sample receipt

Samples as listed on the preceding page were received June 16, 2017 under ARI workorder 17F0281. For details regarding sample receipt, please refer to the Cooler Receipt Form. The TSS, PSD and TVS were subcontracted to ETS Labs. The SSC was subcontracted to MTC Labs.

### Total and Dissolved Metals - EPA Method 200.8

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

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.

A totals 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 Metals - EPA Method 6010C

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

There were no target compounds detected in the method blank.

The LCS percent recoveries were within control limits.

### Wet Chemistry (O-Phos and T-Phos)

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

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.

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

### **Analytical Report**

Herrera Environmental Consultants

Project: Hydro International

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

25-Jul-2017 15:42

### WUFF-IN 17F0281-01 (Water)

**Metals and Metallic Compounds** 

Method: EPA 200.8 Sampled: 06/16/2017 10:30

Instrument: ICPMS2 Analyzed: 20-Jun-2017 20:33

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

Preparation Batch: BFF0523 Sample Size: 25 mL Prepared: 20-Jun-2017 Final Volume: 25 mL

Reporting Limit CAS Number Dilution Units Notes Analyte Result 7440-50-8 0.500 35.5 ug/L Copper Zinc 7440-66-6 4.00 107 ug/L

Analytical Resources, Inc.



### **Analytical Report**

Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

Reported: 25-Jul-2017 15:42

Seattle WA, 98121

Project Manager: Dylan Ahearn

**WUFF-IN** 

17F0281-01 (Water)

**Metals and Metallic Compounds** 

Method: EPA 6010C

Sampled: 06/16/2017 10:30

Instrument: ICP2 Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0485

Analyzed: 19-Jun-2017 18:57

Prepared: 19-Jun-2017

Sample Size: 50 mL

Final Volume: 50 mL

	<u>u</u>			F	Reporting			
Analyte		CAS Number	Dilution		Limit	Result	Units	Notes
Calcium		7440-70-2	1		0.0500	27.3	mg/L	
Magnesium		7439-95-4	1		0.0500	9.05	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

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

Project Manager: Dylan Ahearn

Reported:

25-Jul-2017 15:42

### **WUFF-IN** 17F0281-01 (Water)

Wet Chemistry

Seattle WA, 98121

Method: SM 4500-P E-99 Instrument: UV1800-2

Sampled: 06/16/2017 10:30

Analyzed: 16-Jun-2017 17:33

Notes

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0473

Prepared: 16-Jun-2017

Sample Size: 10 mL

Final Volume: 10 mL

CAS Number

1426-54-42

7723-14-0

Orthophosphorus Sample Preparation:

Analyte

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

Preparation Batch: BFF0544

Sample Size: 25 mL

Prepared: 20-Jun-2017

Final Volume: 50 mL

Analyte Total Phosphorus CAS Number Dilution

Dilution

Reporting Limit

Reporting Limit

0.0040

Units

mg-P/L

Units Notes

0.00800 0.0540 mg-P/L

Result

0.0170

Result

Analytical Resources, Inc.



### **Analytical Report**

Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

25-Jul-2017 15:42

WUFF-IN 17F0281-01 (Water)

Calculation

Method: SM 2340 B-97

Sampled: 06/16/2017 10:30 Analyzed: 19-Jun-2017 18:57

Instrument: [CALC]
Sample Preparation:

Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 19-Jun-2017

Final Volume: 1

Analyte CAS Number Dilution Reporting
Limit Result Units Notes

Hardness 1 0.331 105 mg/L

Analytical Resources, Inc.





Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

25-Jul-2017 15:42

# Analysis by: Materials Testing & Consulting, Inc. (Tukwila) WUFF-IN 17F0281-01 (Water)

\*\*\* DEFAULT GENERAL METHOD \*\*\*

 Method: ASTM D3977
 Sampled: 06/16/2017 10:30

 Instrument: MT&C
 Analyzed: 24-Jul-2017 00:00

trument: MT&C

Analyzed: 24-Jul-2017 00:00

mple Preparation: Preparation Method: No Prep Geo

Sample Preparation: Preparation Method: No Prep Geo Preparation Batch: B072417

Prepared: 24-Jul-2017 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	18.00	mg/L	
<63 μm	SC_<63	1	0.1	42.87	mg/L	
Total SSC	SC_TOTAL	1	0.1	60.87	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000

Reported:

Project Manager: Dylan Ahearn

25-Jul-2017 15:42

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

**WUFF-IN** 

17F0281-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/16/2017 10:30 Analyzed: 22-Jun-2017 21:15

Instrument: ICPMS2
Sample Preparation:

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

Preparation Batch: BFF0563

Sample Size: 25 mL

Prepared: 21-Jun-2017

Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	13.0	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	30.3	ug/L	

Analytical Resources, Inc.



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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn Reported: 25-Jul-2017 15:42

WUFF-OUT 17F0281-03 (Water)

**Metals and Metallic Compounds** 

Method: EPA 200.8 Sampled: 06/16/2017 10:30

Instrument: ICPMS2 Analyzed: 20-Jun-2017 20:04

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

Preparation Batch: BFF0523 Sample Size: 25 mL Prepared: 20-Jun-2017 Final Volume: 25 mL

		Reporting			
Analyte	CAS Number Dilution	Limit	Result	Units	Notes
Copper	7440-50-8 1	0.500	10.9	ug/L	
Zinc	7440-66-6 1	4.00	22.2	ug/L	

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: 25-Jul-2017 15:42

Sampled: 06/16/2017 10:30

**WUFF-OUT** 17F0281-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Instrument: ICP2 Analyzed: 19-Jun-2017 19:01

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0485

Sample Size: 50 mL Prepared: 19-Jun-2017 Final Volume: 50 mL

Reporting Analyte CAS Number Dilution Limit Result Units Notes Calcium 7440-70-2 0.0500 30.9 mg/L Magnesium 7439-95-4 0.0500 1 10.8 mg/L

Analytical Resources, Inc.



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

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

Reported: 25-Jul-2017 15:42

WUFF-OUT 17F0281-03 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 06/16/2017 10:30

Instrument: UV1800-2 Analyzed: 16-Jun-2017 17:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0473 Sample Size: 10 mL

Prepared: 16-Jun-2017 Final Volume: 10 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: BFF0544 Sample Size: 25 mL

Prepared: 20-Jun-2017 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.00800 0.0680 mg-P/L

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:** 25-Jul-2017 15:42

WUFF-OUT 17F0281-03 (Water)

Calculation

Method: SM 2340 B-97

Sampled: 06/16/2017 10:30 Analyzed: 19-Jun-2017 19:01

Instrument: [CALC]
Sample Preparation:

Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 19-Jun-2017

Final Volume: 1

Trepar	Ca. 19 Buil 2017	i mai voiame.	•				
		-		Reporting			
Analyte		CAS Number	Dilution	Limit	Result	Units	Notes
Hardness			1	0.331	122	ma/I	

Analytical Resources, Inc.





Project: Hydro International

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

Reported: 25-Jul-2017 15:42

Project Manager: Dylan Ahearn

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

**WUFF-OUT** 

17F0281-03 (Water)

\*\*\* DEFAULT GENERAL METHOD \*\*\*

 Method: ASTM D3977
 Sampled: 06/16/2017 10:30

 Instrument: MT&C
 Analyzed: 24-Jul-2017 00:00

Sample Preparation:

Seattle WA, 98121

Preparation Method: No Prep Geo

Preparation Batch: B072417

Prepared: 24-Jul-2017 Final Volume:

			Reporting		,	
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
> 63 μm	SC_>63	1	0.1	0.85	mg/L	
< 63 μm	SC_<63	1	0.1	1.06	mg/L	
Total SSC	SC_TOTAL	1	0.1	1.91	mg/L	

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:** 25-Jul-2017 15:42

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

**WUFF-OUT** 

17F0281-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/16/2017 10:30 Analyzed: 22-Jun-2017 21:20

Instrument: ICPMS2
Sample Preparation:

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

Preparation Batch: BFF0563

Sample Size: 25 mL

Prepared: 21-Jun-2017

Final Volume: 25 mL

	*		Reporting			
Analyte	CAS Number Di	ilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	9.77	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	20.7	ug/L	

Analytical Resources, Inc.





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

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

25-Jul-2017 15:42

#### Metals and Metallic Compounds - Quality Control

#### Batch BFF0485 - TWC EPA 3010A

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0485-BLK1)			Prepa	ared: 19-Jun	-2017 Ana	lyzed: 19-J	Jun-2017 17:3	8		
Calcium	ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L		<b>-</b> - <b>1</b>			=		U
LCS (BFF0485-BS1)	2		Prepa	ared: 19-Jun	-2017 Ana	ılyzed: 23-J	Jun-2017 14:3	35		
Calcium	10.2	0.0500	mg/L	10.0		102	80-120			
Magnesium	10.7	0.0500	mg/L	10.0		107	80-120			

Analytical Resources, Inc.



Project: Hydro International

2200 6th Avenue, Suite 1100

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

Seattle WA, 98121

Reported: 25-Jul-2017 15:42

#### Metals and Metallic Compounds - Quality Control

#### Batch BFF0523 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

			Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFF0523-BLK1)				Prep	ared: 20-Jun	-2017 Ana	lyzed: 20	Jun-2017 20	: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 (BFF0523-BS1)				Dran	ared: 20-Jun	2017 Ano	luzadi 20	Iun 2017 20	.44	(4)	
Copper	63	25.2	0.500	ug/L	25.0	-2017 Alla	101	80-120	.77		
Copper	65	24.9	0.500	ug/L ug/L	25.0		99.5	80-120			
Zinc	66	81.9	4.00	ug/L ug/L	80.0		102	80-120			
Zinc	67	74.4	4.00	ug/L	80.0		93.0	80-120			
Duplicate (BFF0523-DUP1)		So	urce: 17F0281-01	Prepa	ared: 20-Jun	-2017 Ana	lyzed: 20	Jun-2017 20	:28		
Copper	63	35.2	0.500	ug/L		35.5			1.07	20	
Zinc	67	103	4.00	ug/L		107			3.47	20	
Matrix Spike (BFF0523-MS1	)	So	urce: 17F0281-01	Prepa	ared: 20-Jun	-2017 Ana	lyzed: 20	Jun-2017 20	:38		
Copper	63	58.8	0.500	ug/L	25.0	35.5	93.0	75-125			
Zinc	67	177	4.00	ug/L	80.0	107	87.4	75-125			

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

Analytical Resources, Inc.





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

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

25-Jul-2017 15:42

#### Metals and Metallic Compounds (dissolved) - Quality Control

#### Batch BFF0563 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

			Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFF0563-BLK1)			- 1   1	Prep	ared: 21-Jun	-2017 Ana	lyzed: 22-J	un-2017 14:	17		
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	1 11					1 = 1	U
LCS (BFF0563-BS1)	7			Prep	ared: 21-Jun	-2017 Ana	lyzed: 22-J	un-2017 15:	:02		
Copper, Dissolved	63	26.8	0.500	ug/L	25.0		107	80-120			
Copper, Dissolved	65	26.6	0.500	ug/L	25.0		107	80-120			
Zinc, Dissolved	66	84.2	4.00	ug/L	80.0		105	80-120			
Zinc, Dissolved	67	79.8	4.00	ug/L	80.0		99.8	80-120			

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Seattle WA, 98121

Project: Hydro International

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

**Reported:** 25-Jul-2017 15:42

#### Wet Chemistry - Quality Control

#### Batch BFF0473 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: RMH2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0473-BLK1)			Prepa	red: 16-Jun	-2017 Ana	lyzed: 16-J	Jun-2017 17:	36		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFF0473-BS1)			Prepa	red: 16-Jun	-2017 Ana	lyzed: 16-J	un-2017 17:	37		
Orthophosphorus	0.146	0.0040	mg-P/L	0.150		97.3	90-110			
Duplicate (BFF0473-DUP2)	Source:	17F0281-01	Prepa	red: 16-Jun-	-2017 Ana	lyzed: 16-J	un-2017 17:	33		
Orthophosphorus	0.0160	0.0040	mg-P/L		0.0170			6.06	20	
Matrix Spike (BFF0473-MS2)	Source:	17F0281-01	Prepa	red: 16-Jun-	-2017 Ana	lyzed: 16-J	un-2017 17:	34		
Ortho phosphorus	0.111	0.0040	mg-P/L	0.0999	0.0170	94.1	75-125			

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





Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 25-Jul-2017 15:42

#### **Wet Chemistry - Quality Control**

#### Batch BFF0544 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: KK

1 21	1 1 1	Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFF0544-BLK1)			Prepa	red: 20-Jun-	-2017 An	alyzed: 22-J	Jun-2017 14	:24		
Total Phosphorus	ND	0.00800	mg-P/L							U
Blank (BFF0544-BLK2)			Prepa	ared: 20-Jun-	-2017 An	alyzed: 22-	Jun-2017 14	:28		
Total Phosphorus	ND	0.00800	mg-P/L							U
DL (BFF0544-BLK3)			Prepa	ared: 20-Jun-	-2017 An	alyzed: 22-	Jun-2017 14	:32		
Total Phosphorus	ND	0.00800	mg-P/L						50 1	U
LCS (BFF0544-BS1)			Prepa	ared: 20-Jun-	-2017 An	alyzed: 22	Jun-2017 14	:24		
Total Phosphorus	0.160	0.00800	mg-P/L	0.150		107	90-110			
DL (BFF0544-BS2)			Prepa	ared: 20-Jun-	-2017 An	alyzed: 22	Jun-2017 14	:30		
Total Phosphorus	0.157	0.00800	mg-P/L	0.150		105	90-110			
DL (BFF0544-BS3)			Prepa	ared: 20-Jun	-2017 An	alyzed: 22	Jun-2017 14	:32		
Total Phosphorus	0.156	0.00800	mg-P/L	0.150		104	90-110	-	1 -	

Analytical Resources, Inc.



Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

**Reported:** 25-Jul-2017 15:42

## **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	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.





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Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 25-Jul-2017 15:42

#### **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
В	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.

# October 18, 2017

# Data\_17J0342

BEJOSPA-BLK1   Blank	ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17.10342-02   WUFF-OUT HF   3-05669-000 Water   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   4.00   U ug/L   17.10342-01   WUFF-IN HF   13-05669-000 Water   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   31.6 ug/L   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   31.6 ug/L   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   31.6 ug/L   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   4.00   U ug/L   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   4.00   U ug/L   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   4.00   U ug/L   10.702017   10.702017   10.702017   10.702017   10.702018   7440-666   2 lnc   4.00   U ug/L   10.702018	BFJ0573-BLK1	Blank	13-05605-000	Water			10/20/2017	10/27/2017	EPA 200.8	7440-50-8	Copper	0.687		ug/L
170942-02   WUFF-OUT HF   31-05605-000   Water   10/18/2017   10/18/2017   10/20/	17J0342-01	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/27/2017	EPA 200.8	7440-50-8	Copper	62.5	D, B	ug/L
BFJ0578-BLK1   Blank   13-05695-000 Water   10/20/2017	17J0342-02	WUFF-OUT HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/27/2017	EPA 200.8	7440-50-8	Copper	20.5	В	ug/L
BFJ0573-BS1   CS	BFJ0573-BLK1	Blank	13-05605-000	Water			10/20/2017	10/27/2017	EPA 200.8	7440-50-8	Copper	0.673		ug/L
BF.J0578-BST   CS	BFJ0573-BLK1	Blank	13-05605-000	Water			10/20/2017	10/27/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
17.0342-02   WUFF-NPT   13-0560-0-00 Water   1018/2017   1019/2017   1027/2017   EPA 20.08   7440-66-6   Zinc   54.4   Ug/L   10.5   13-0560-0-00 Water   1027/2017   1027/2	BFJ0573-BS1	LCS	13-05605-000	Water			10/20/2017	10/27/2017	EPA 200.8	7440-66-6	Zinc	91.6		
17.0342-02   WIFF-OUT HF   13-05600-000 Water   Wate	17J0342-01	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/27/2017	EPA 200.8	7440-66-6	Zinc	234	D	
BFJ0573-BLK1   Blank	17J0342-02	WUFF-OUT HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/27/2017	EPA 200.8	7440-66-6	Zinc	54.4		
BFJ0573-BS1   LCS	BFJ0573-BLK1	Blank	13-05605-000	Water			10/20/2017	10/27/2017	EPA 200.8	7440-66-6	Zinc	4.00	U	
B-J0585-BS1   LCS	BFJ0573-BS1	LCS	13-05605-000	Water			10/20/2017	10/27/2017	EPA 200.8	7440-66-6	Zinc	86.0		
BFJ0585-BS1   LCS	BFJ0585-BLK2	Blank	13-05605-000	Water			10/20/2017	10/20/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BFJ0686-DUP  WUFF-IN HF	BFJ0585-BS1	LCS	13-05605-000	Water			10/20/2017	10/20/2017	SM 4500-P E-99	1426-54-42		0.151		
BFJ0682-MS1   WUFF-IN HF   13-05605-000   Water   10/18/2017   10/19/2017   10/20/2017   20/20	BFJ0585-DUP1	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/20/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0170		
17.0342-01   WUFF-IN HF   13-05605-000   Water   10/18/2017   10/19/2017   10/20/	BFJ0585-MS1	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/20/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.117		
17.0342-02   WUFF-OUT HF   13-05605-000   Water   10/18/2017   10/19/2017   10/20	17J0342-01	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/20/2017	SM 4500-P E-99	1426-54-42		0.0190		
BFJ0624-BLK    Blank   13-05605-000   Water     10/21/2017   10/21/2017   10/21/2017   SM 2540 D-97   Suspended Solids   1.0   U mg/L	17J0342-02	WUFF-OUT HF	13-05605-000	Water	10/18/2017	10/19/2017	10/20/2017	10/20/2017	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0220		
BFJ0624-BST   LCS   13-05605-000   Water   10/18/2017   10/19/2017   10/21/2017   SM 2540 D-97   Suspended Solids   49.2   mg/L	BFJ0624-BLK1	Blank					10/21/2017	10/21/2017	SM 2540 D-97			1.0	U	
BFJ0073-BLK1   Blank   13-05605-000   Water   March	BFJ0624-BS1	LCS	13-05605-000	Water			10/21/2017	10/21/2017	SM 2540 D-97			49.2		
17.0342-01   WUFF-IN HF   3-05605-000   Water   10/18/2017   10/19/2017   10/21/2017   SM 2540 D-97   Suspended Solids   87.3   mg/L   17.0342-02   WUFF-OUT HF   3-05605-000   Water   10/18/2017   10/19/2017   10/21/2017   SM 2540 D-97   SM 2540 D-97   Suspended Solids   87.3   mg/L   17.0342-01   SM 2540 D-97   SM 25	BFJ0624-DUP1	WUFF-IN HF			10/18/2017	10/19/2017	10/21/2017	10/21/2017	SM 2540 D-97			103		
17/3042-02   WUFF-OUT HF   13-05605-000   Water   10/18/2017   10/21	17J0342-01		13-05605-000	Water	10/18/2017	10/19/2017	10/21/2017	10/21/2017	SM 2540 D-97			87.3		
BFJ0773-BLK1   Blank   13-05605-000   Water   11/03/2017   11/04/2017   SM 4500-P E-99   7723-14-0   Total Phosphorus   0.0080   U mg-P/L		WUFF-OUT HF	13-05605-000	Water	10/18/2017	10/19/2017	10/21/2017	10/21/2017	SM 2540 D-97					
BFJ0773-BLK2   Blank   13-05605-000   Water   11/03/2017   11/04/2017   SM 4500-P E-99   7723-14-0   Total Phosphorus   0.0080   U mg-P/L		Blank								7723-14-0	-		U	
BFJ0773-BLX3   Blank   13-05605-000   Water     11/03/2017   11/04/2017   SM 4500-P E-99   7723-14-0   Total Phosphorus   0.080   U mg-P/L	BFJ0773-BLK2	Blank					11/03/2017	11/04/2017	SM 4500-P E-99	7723-14-0	•		U	
BFJ0773-BS1   LCS		Blank									•		U	
BFJ0773-BS2 LCS 13-05605-000 Water 13-05605-000 Wat										7723-14-0	•			
BFJ0773-BS3 LCS 13-05605-000 Water 10/18/2017 11/03/2017 11/04/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.152 mg-P/L 17J0342-01 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/03/2017 11/04/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.204 mg-P/L 17J0342-02 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/03/2017 11/04/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.204 mg-P/L 17J0342-02 WUFF-IN HF 13-05605-000 Water 11/01/2017 11/01/2017 11/01/2017 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.204 mg-P/L 17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.7 ug/L 17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 39.3 ug/L 17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 12.3 ug/L 17J0342-04 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 12.3 ug/L 17J0342-04 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 12.3 ug/L 17J0342-04 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 13.9 ug/L 17J0342-04 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.6 ug/L 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.6 ug/L 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 39.3 ug/L 11/01/2017 EPA 200.8-Diss	BFJ0773-BS2	LCS	13-05605-000	Water			11/03/2017	11/04/2017	SM 4500-P E-99	7723-14-0	-			
17.0342-01   WUFF-IN HF   13-05605-000   Water   10/18/2017   10/19/2017   11/03/2017   11/04/2017   SM 4500-P E-99   7723-14-0   Total Phosphorus   0.204   mg-P/L   17.0342-02   WUFF-OUT HF   13-05605-000   Water   10/18/2017   10/19/2017   11/03/2017   11/04/2017   SM 4500-P E-99   7723-14-0   Total Phosphorus   0.0680   mg-P/L														
17.0342-02   WUFF-OUT HF   13-05605-000   Water   10/18/2017   10/19/2017   11/03/2017   11/04/2017   SM 4500-P E-99   7723-14-0   Total Phosphorus   0.0680   mg-P/L	17J0342-01	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	11/03/2017	11/04/2017	SM 4500-P E-99	7723-14-0				
BFK0003-BLK1         Blank         13-05605-000         Water         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U         ug/L           BFK0003-BS1         LCS         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         28.7         ug/L           BFK0003-DP1         WUFF-IN HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         11.8         ug/L           BFK0003-MS1         WUFF-IN HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         39.3         ug/L           17/J0342-04         WUFF-OUT HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         13.9         ug/L           BFK0003-BLK1         Blank         13-05605-000         Water         11/01/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-	17J0342-02	WUFF-OUT HF	13-05605-000	Water	10/18/2017	10/19/2017	11/03/2017	11/04/2017	SM 4500-P E-99	7723-14-0		0.0680		
BFK0003-BS1         LCS         13-05605-000         Water         11/01/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         28.7         ug/L           BFK0003-DUP1         WUFF-IN HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         11.8         ug/L           BFK0003-MS1         WUFF-IN HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         39.3         ug/L           17J0342-03         WUFF-IN HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         13.9         ug/L           BFK0003-BLK1         Blank         13-05605-000         Water         10/18/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         13.9         ug/L           BFK0003-BS1         LCS         13-05605-000         Water         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         28.6         ug/L <td< td=""><td>BFK0003-BLK1</td><td>Blank</td><td></td><td></td><td></td><td></td><td>11/01/2017</td><td>11/01/2017</td><td>EPA 200.8-Dissolved</td><td>7440-50-8</td><td></td><td></td><td>U</td><td></td></td<>	BFK0003-BLK1	Blank					11/01/2017	11/01/2017	EPA 200.8-Dissolved	7440-50-8			U	
BFK0003-DUP1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 39.3 ug/L 17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 39.3 ug/L 17J0342-04 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 12.3 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 13.9 ug/L BFK0003-BS1 LCS 13-05605-000 Water 10/18/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 13.9 ug/L BFK0003-BS1 LCS 13-05605-000 Water 10/18/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.6 ug/L BFK0003-BS1 LCS 13-05605-000 Water 10/18/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0003-BS1 LCS 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 42.8 ug/L BFK0003-BS1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 42.8 ug/L BFK0003-MS1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 42.8 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L	BFK0003-BS1	LCS												
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17J0342-03         WUFF-IN HF         13-05605-000         Water         10/18/2017         11/01/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         12.3         ug/L           17J0342-04         WUFF-OUT HF         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         13.9         ug/L           BFK0003-BLK1         Blank         13-05605-000         Water         11/01/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFK0003-BLK1         Blank         13-05605-000         Water         11/01/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         28.6         ug/L           BFK0003-BS1         LCS         13-05605-000         Water         11/01/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-66-6         Zinc         4.00         U ug/L           BFK0003-BS1         LCS         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         744	BFK0003-MS1	WUFF-IN HF	13-05605-000	Water	10/18/2017	10/19/2017	11/01/2017	11/01/2017	EPA 200.8-Dissolved	7440-50-8				
17J0342-04         WUFF-OUT HF         13-05605-000         Water         10/18/2017         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         13.9         ug/L           BFK0003-BLK1         Blank         13-05605-000         Water         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         0.500         U ug/L           BFK0003-BS1         LCS         13-05605-000         Water         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-50-8         Copper         28.6         ug/L           BFK0003-BLK1         Blank         13-05605-000         Water         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-66-6         Zinc         4.00         U ug/L           BFK0003-BS1         LCS         13-05605-000         Water         11/01/2017         11/01/2017         EPA 200.8-Dissolved         7440-66-6         Zinc         83.8         ug/L           BFK0003-BS1         LCS         13-05605-000         Water         10/18/2017         10/19/2017         11/01/2017         EPA 200.8-Dissolved         7440-66-6         Zinc         83.8         ug/L           BFK0003-BS1         WUFF-IN HF         13-05605-000         Water <td></td> <td></td> <td></td> <td></td> <td>10/18/2017</td> <td>10/19/2017</td> <td>11/01/2017</td> <td>11/01/2017</td> <td>EPA 200.8-Dissolved</td> <td></td> <td></td> <td></td> <td></td> <td></td>					10/18/2017	10/19/2017	11/01/2017	11/01/2017	EPA 200.8-Dissolved					
BFK0003-BLK1 Blank 13-05605-000 Water 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 0.500 U ug/L BFK0003-BS1 LCS 13-05605-000 Water 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.6 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0003-BS1 LCS 13-05605-000 Water 10/18/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 83.8 ug/L BFK0003-DUP1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 42.8 ug/L BFK0003-MS1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 123 ug/L 17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 36.2 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 36.2 ug/L	17J0342-04	WUFF-OUT HF	13-05605-000	Water	10/18/2017	10/19/2017	11/01/2017	11/01/2017	EPA 200.8-Dissolved	7440-50-8	- ' '	13.9		
BFK0003-BS1 LCS 13-05605-000 Water 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-50-8 Copper 28.6 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BFK0003-DUP1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 83.8 ug/L BFK0003-MS1 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 42.8 ug/L 17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 123 ug/L 17J0342-04 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 36.2 ug/L		Blank											U	
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17J0342-03 WUFF-IN HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 45.7 ug/L 17J0342-04 WUFF-OUT HF 13-05605-000 Water 10/18/2017 10/19/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 36.2 ug/L BFK0003-BLK1 Blank 13-05605-000 Water 10/18/2017 11/01/2017 11/01/2017 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L														
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													U	
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06 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)

17J0342

# **Amanda** Volgardsen Resources, Inc., ou=Client

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, Services, cn=Amanda Volgardsen, email=amandav@arilabs.com Date: 2017.11.06 12:38:48 -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-



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



# Chain of Custody Record

Project Name:	Project Number	r: (	Client:								Ar	alyses	Reques	ted			
Hydro International Up-flo Filter	13-05605-00		Herrera Envi	ronment	al												
Report To:	13 03003 00		Сору То:											9			
Dylan Ahearn								رب ا	eg.	9.00		_		254			
Sampled By:  MOLLEN		1	Delivery Metho	er			2	EPA 365	EPA 365	- EPA 2(	200.8	PA 200.8	8.00	lids-SN			
Laboratory:	Request	ted Com	npletion Date:		. of Contain	ners:	aju	50	5	ved	EPA	7 - E	- EPA 200.8	o P			
Analytical Resources Inc.					2		Cont	rod	hor	ssol	tal -	olvec	ᄪ	ande			
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 -	Total Suspended Solids- SM 2540D			Lab ID No.
Sample ID	Da	ate	Time	codes)	(Y/N)	codes)	Z	P.	o F								- at
WUFF-IN HF	10.18	6.17	18:45	CStor	N	SW		大	×	×	×	7	人	×			
WUFF-OUT HE		6.17		CSTAT	N	SM		×	×	×	X	×	$ \mathbf{x} $	×			
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Comments/Special Instructions:																	
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Relinquished by (Name/CO/ Signature	Mul		Date/Time	' I	eceived By	ly H	ale.	1 n	RI	ignatu S Io 6	11.	1=:2	she	/	j d	1	2102
11-10-11-11-11-11-11-11-11-11-11-11-11-1				0:40	Jul	W/ P	wire	IH	_			113	ME	1		/ <u>/ 9/ / 7</u> e/Time	7 103
Relinquished by (Name/CO) Signature	e		Date/Time	Re	eceived By	(Name/CC	))		13	ignatu	re				Date	gime	
										. 41.	1.3			2 011 - 1	16.3		

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: 10/19/2017 4:51:41PM

## WORK ORDER

17J0342

Client: Herrera Environmental Consultants	Project Manager: Amanda Volgardsen
Project: Hydro International	Project Number: [none]

Analysis	Due	TAT	Expires	Comments
17J0342-03 WUFF-IN HF Pacific Time (US & Canad		ct-2017 1	18:45 (GMT-08:00)	
Filter 0.45 micron	02-Nov-2017 15:00	10	20-Oct-2017 10:37	
Met Diss 200.8 - Cu	02-Nov-2017 15:00	10	16-Apr-2018 18:45	
Met Diss 200.8 - Zn	02-Nov-2017 15:00	10	16-Apr-2018 18:45	
17J0342-04 WUFF-OUT I Pacific Time (US & Canad		Oct-201	7 18:45 (GMT-08:00)	
Met Diss 200.8 - Zn	02-Nov-2017 15:00	10	16-Apr-2018 18:45	
Filter 0.45 micron	02-Nov-2017 15:00	10	20-Oct-2017 10:37	
Met Diss 200.8 - Cu	02-Nov-2017 15:00	10	16-Apr-2018 18:45	

# **Preservation Confirmation**

17J0342-01 A Glass NM, Amber, 500 mL 17J0342-01 B Small OJ, 500 mL, 9N H2SO4	Container ID	Container Type	рН	
17J0342-01 C Large OJ, 1000 mL  17J0342-01 D HDPE NM, 500 mL, 1:1 HNO3	17J0342-01 A	Glass NM, Amber, 500 mL		
17J0342-01 D HDPE NM, 500 mL, 1:1 HNO3	17J0342-01 B	Small OJ, 500 mL, 9N H2SO4	(2 pag)	
17J0342-02 A Glass NM, Amber, 500 mL  17J0342-02 B Small OJ, 500 mL, 9N H2SO4  17J0342-02 C Large OJ, 1000 mL  17J0342-02 D HDPE NM, 500 mL, 1:1 HNO3  17J0342-03 A HDPE NM, 500 mL	17J0342-01 C	Large OJ, 1000 mL		
17J0342-02 A Glass NM, Amber, 500 mL  17J0342-02 B Small OJ, 500 mL, 9N H2SO4	17J0342-01 D	HDPE NM, 500 mL, 1:1 HNO3	< 2 ears	
17J0342-02 C Large OJ, 1000 mL 17J0342-02 D HDPE NM, 500 mL, 1:1 HNO3	17J0342-02 A	Glass NM, Amber, 500 mL		
17J0342-02 C Large OJ, 1000 mL 17J0342-02 D HDPE NM, 500 mL, 1:1 HNO3 ∠ 2 ροδ 17J0342-03 A HDPE NM, 500 mL	17J0342-02 B	Small OJ, 500 mL, 9N H2SO4	62 PAPA	
17J0342-03 A HDPE NM, 500 mL	17J0342-02 C	Large OJ, 1000 mL		
17J0342-03 A HDPE NM, 500 mL	17J0342-02 D	HDPE NM, 500 mL, 1:1 HNO3	<7-8180	
17J0342-04 A HDPE NM, 500 mL	17J0342-03 A	HDPE NM, 500 mL	To Foot	
	17J0342-04 A	HDPE NM, 500 mL		

Preservation Confirmed By	Date



# **Cooler Receipt Form**

ARI Client: Herrera		Project Name:	Hydro Int	· Upflo Fil	tov
COC No(s):	NA NA	-	JPS Courier Hand Deliv		,
Assigned ARI Job No: 17J0347			- Courier Hand Deliv	•	
Preliminary Examination Phase:					•
Were intact, properly signed and dated custoo	ly seals attached to	the outside of to cooler?		YES (NO)	
Were custody papers included with the cooler	?	***************************************	(	YES NO	
Were custody papers properly filled out (ink, s	igned, etc.)	***************************************		YES NO	
Time:(°C) (recommended	2.0-6.0 °C for chem	nistry) 2.7		TES NO	
If cooler temperature is out of compliance fill of	out <b>fo</b> rm 00070F		Temp Gun ID	#: DOU 2565	
Cooler Accepted by:	N	Date: 10/19/17	Time:1037		
	te custody forms a	nd attach all shipping docu			
Log-In Phase:		na attaon an ompping bott	ments		
Was a temperature blank included in the coole				YES NO	
What kind of packing material was used?	Bubble Wrap	Wet Ice Gel Packs Baggies	s Foam Block Paper (	Other:	
Was sufficient ice used (if appropriate)?				(YES) NO	
Were all bottles sealed in individual plastic bag				YES NO	
Did all bottles arrive in good condition (unbroke				ES NO	
Were all bottle labels complete and legible?				YES NO	
Did the number of containers listed on COC m				YES NO	
Did all bottle labels and tags agree with custoo	ly papers?		******	YES NO	
Were all bottles used correct for the requested	analyses?	***************************************	••••	YES NO	
Do any of the analyses (bottles) require presen	vation? (attach pres	servation sheet, excluding V(	OCs) NA	YES NO	
Were all VOC vials free of air bubbles?			NA	YES NO	
Was sufficient amount of sample sent in each	bottle?	•••••		YES NO	
Date VOC Trip Blank was made at ARI		(1)		1120	
Was Sample Split by ARI: NA YES	Date/Time: 10/	Q 17 H Equipment:	churnaplifer	Split by:	
Samples Logged by:	Date:		Time:		
** Notif	y Project Manager	of discrepancies or conce		- (DSH	11
				100010	191
Sample ID on Bottle Samp	le ID on COC	Sample ID on Bottl			
j.		Cample 15 on Bottl	e Samp	ole ID on COC	-
A .					-
					-
				*	_
Additional Notes, Discrepancies, & Resolut	ions:				_
1 1 4			*		
V **			Million and the Control of the Contr		
By: Date:					
Coult Air Duck Unit	GE Air Butioles	Small → "sm" (<2 mm)			-
-2mm 2-4 mm	- 140 Philips	Peabubbles > "pb" (2 to <4	1 mm )		4
		Large → "lg" (4 to < 6 mm)			-
		Headspace → "hs" (>6 mm			-
	•.	mm 0 < ) Its. (>0 mm	)		1

0016F 3/2/10 Cooler Receipt Form

Revision 014



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-Nov-2017 12:37

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN HF	17J0342-01	Water	18-Oct-2017 18:45	19-Oct-2017 10:37
WUFF-OUT HF	17J0342-02	Water	18-Oct-2017 18:45	19-Oct-2017 10:37
WUFF-IN HF	17J0342-03	Water	18-Oct-2017 18:45	19-Oct-2017 10:37
WUFF-OUT HF	17J0342-04	Water	18-Oct-2017 18:45	19-Oct-2017 10:37

Analytical Resources, Inc.



2200 6th Avenue, Suite 1100

Project: Hydro International

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 06-Nov-2017 12:37

#### Case Narrative

#### Sample receipt

Seattle WA, 98121

Samples as listed on the preceding page were received October 19, 2017 under ARI workorder 17J0342. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were churn split by sample receiving prior to analysis.

#### **Total 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 total method blank BFJ0573 has Copper detected above the reporting limit. Associated detected results and QC have been flagged with a "B" qualifier. No further corrective action was taken.

The LCS percent recoveries were within control limits.

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

#### Wet Chemistry (TSS, Ortho-Phos, Total-Phos)

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

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.

A TSS duplicate was prepared in conjunction with sample WUFF-IN HF. The duplicate RPD was within QC limits.

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



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-Nov-2017 12:37

WUFF-IN HF 17J0342-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Instrument: ICPMS2

Sampled: 10/18/2017 18:45

Analyzed: 27-Oct-2017 15:22

Sample Preparation:

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

Preparation Batch: BFJ0573

Sample Size: 25 mL

Prepared: 20-Oct-2017

Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	5	2.50	62.5	ug/L	D, B
Zinc	7440-66-6	5	20.0	234	ug/L	D



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

**Reported:** 06-Nov-2017 12:37

Seattle WA, 98121

Project Manager: Dylan Ahearn

WUFF-IN HF 17J0342-01 (Water)

Wet Chemistry

Method: SM 2540 D-97

Sampled: 10/18/2017 18:45

Instrument: N/A

Analyzed: 21-Oct-2017 11:56

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFJ0624 Prepared: 21-Oct-2017 Sample Size: 300 mL

Final Volume: 1000 mL

Analyte CAS Number Dilution Result Units Notes
Suspended Solids 1 3.3 87.3 mg/L

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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-Nov-2017 12:37

WUFF-IN HF 17J0342-01 (Water)

**Wet Chemistry** 

Method: SM 4500-P E-99 Instrument: UV1800-2 Sampled: 10/18/2017 18:45

Analyzed: 20-Oct-2017 12:00

Sample Preparation:

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

Preparation Batch: BFJ0585

Sample Size: 50 mL

Prepared: 20-Oct-2017

Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0190 mg-P/L

Sample Preparation:

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

Preparation Batch: BFJ0773

Sample Size: 25 mL

Prepared: 03-Nov-2017

Final Volume: 50 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	: 1	0.0080	0.204	mg-P/L	



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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 06-Nov-2017 12:37

WUFF-OUT HF 17J0342-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Instrument: ICPMS2

Seattle WA, 98121

Sampled: 10/18/2017 18:45

Analyzed: 27-Oct-2017 14:50

Sample Preparation:

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

Preparation Batch: BFJ0573

Sample Size: 25 mL

Prepared: 20-Oct-2017

Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	20.5	ug/L	В
Zinc	7440-66-6	1	4.00	54.4	ug/L	



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-Nov-2017 12:37

WUFF-OUT HF 17J0342-02 (Water)

Wet Chemistry

Method: SM 2540 D-97 Instrument: N/A

Sampled: 10/18/2017 18:45

Analyzed: 21-Oct-2017 11:56

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFJ0624

Prepared: 21-Oct-2017

Sample Size: 550 mL

Final Volume: 1000 mL

Analyte CAS Number Dilution Result Units Notes

Suspended Solids 1 1.8 15.6 mg/L

Analytical Resources, Inc.

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

**Reported:** 06-Nov-2017 12:37

WUFF-OUT HF 17J0342-02 (Water)

**Wet Chemistry** 

Seattle WA, 98121

Method: SM 4500-P E-99 Instrument: UV1800-2 Sampled: 10/18/2017 18:45 Analyzed: 20-Oct-2017 12:16

Sample Preparation:

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

Preparation Batch: BFJ0585

Sample Size: 50 mL

Prepared: 20-Oct-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: BFJ0773

Sample Size: 25 mL

Prepared: 03-Nov-2017

Final Volume: 50 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	1	0.0080	0.0680	mg-P/L	

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Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

06-Nov-2017 12:37

WUFF-IN HF 17J0342-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Instrument: ICPMS2

Sampled: 10/18/2017 18:45

Analyzed: 01-Nov-2017 17:28

Sample Preparation:

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

Preparation Batch: BFK0003

Sample Size: 25 mL

Prepared: 01-Nov-2017

Final Volume: 25 mL

		Reporting			
Analyte	CAS Number Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8 1	0.500	12.3	ug/L	
Zinc, Dissolved	7440-66-6 1	4.00	45.7	ug/L	

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Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

06-Nov-2017 12:37

WUFF-OUT HF 17J0342-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Instrument: ICPMS2

Sampled: 10/18/2017 18:45

Analyzed: 01-Nov-2017 18:30

Sample Preparation:

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

Preparation Batch: BFK0003

Sample Size: 25 mL

Prepared: 01-Nov-2017

Final Volume: 25 mL

		Reporting			
Analyte	CAS Number Diluti	on Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	0.500	13.9	ug/L	
Zinc, Dissolved	7440-66-6	4.00	36.2	ug/L	

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2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

06-Nov-2017 12:37

#### Metals and Metallic Compounds - Quality Control

#### Batch BFJ0573 - 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 (BFJ0573-BLK1)				Prepa	ared: 20-Oct-2	017 Ana	lyzed: 27-0	Oct-2017 12:	:54		
Copper	63	0.687	0.500	ug/L							
Copper	65	0.673	0.500	ug/L							
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFJ0573-BS1)				Prepa	ared: 20-Oct-2	017 Ana	lyzed: 27-0	Oct-2017 13:	:34		<del></del>
Zinc	66	91.6	4.00	ug/L	80.0		114	80-120			
Zinc	67	86.0	4.00	ug/L	80.0		108	80-120			

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Herrera Environmental Consultants 2,200 6th Avenue, Suite 1100 Seattle WA, 98121 Project: Hydro International

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

06-Nov-2017 12:37

#### Metals and Metallic Compounds (dissolved) - Quality Control

#### Batch BFK0003 - 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 (BFK0003-BLK1)	8			Prepa	ared: 01-Nov	v-2017 An	alyzed: 01-	Nov-2017 1	7:51		
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
				Prep	ared: 01-No	v-2017 An	alyzed: 01-	Nov-2017 1	8:35		
Copper, Dissolved	63	28.7	0.500	ug/L	25.0		115	80-120			
Copper, Dissolved	65	28.6	0.500	ug/L	25.0		114	80-120			
Zinc, Dissolved	66	83.8	4.00	ug/L	80.0		105	80-120			
Zinc, Dissolved	67	77.2	4.00	ug/L	80.0		96.5	80-120			
 Dug licate (BFK0003-DUP	21)	Source	e: 17J0342-03	Prep	ared: 01-No	v-2017 An	alyzed: 01-	Nov-2017	7:23	174	
Copper, Dissolved	63	11.8	0.500	ug/L		12.3			4.49	20	
Zinc, Dissolved	66	42.8	4.00	ug/L		45.7		1 = 1	6.50	20	
Matrix Spike (BFK0003-M	MS1)	Source	e: 17J0342-03	Prep	ared: 01-No	v-2017 An	alyzed: 01-	Nov-2017	17:33		
Copper, Dissolved	63	39.3	0.500	ug/L	25.0	12.3	108	75-125			
Zinc, Dissolved	66	123	4.00	ug/L	80.0	45.7	97.3	75-125			

 $\ensuremath{\mathsf{Rec}} \ensuremath{\mathsf{a}} \ensuremath{\mathsf{very}}$  limits for target analytes in MS/MSD QC samples are advisory only.

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

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

06-Nov-2017 12:37

#### Wet Chemistry - Quality Control

#### Batch BFJ0585 - 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 (BFJ0585-BLK2)			Prepa	red: 20-Oct	-2017 Ana	ılyzed: 20-	Oct-2017 11	:59		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BFJ0585-BS1)	*		Prepa	red: 20-Oct	-2017 Ana	ılyzed: 20-	Oct-2017 12	2:00		
Orthophosphorus	0.151	0.0040	mg-P/L	0.150		101	90-110			
Duplicate (BFJ0585-DUP1)	Source:	17J0342-01	Prepa	red: 20-Oct	-2017 Ana	lyzed: 20-	Oct-2017 12	2:01		
Orthophosphorus	0.0170	0.0040	mg-P/L		0.0190			11.10	20	
Matrix Spike (BFJ0585-MS1)	Source:	17J0342-01	Prepa	red: 20-Oct	-2017 Ana	lyzed: 20-	Oct-2017 12	2:16		
Orthophosphorus	0.117	0.0040	mg-P/L	0.0999	0.0190	98.1	75-125			

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

Analytical Resources, Inc.





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

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

06-Nov-2017 12:37

#### **Wet Chemistry - Quality Control**

#### Batch BFJ0624 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFJ0624-BLK1)			Prepa	ared: 21-Oct	-2017 Ana	ılyzed: 21-0	Oct-2017 11	:56		
Suspended Solids	ND	1.0	mg/L							U
LCS (BFJ0624-BS1)			Prepa	ared: 21-Oct	-2017 Ana	alyzed: 21-0	Oct-2017 11	:56		
Suspended Solids	49.2	1.0	mg/L	50.0		98.4	90-110	-		
Duplicate (BFJ0624-DUP1)	Source	: 17J0342-01	Prepa	ared: 21-Oct	-2017 Ana	alyzed: 21-0	Oct-2017 11	:56		
Suspended Solids	103	4.0	mg/L		87.3			16.30	20	



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

nental Consultants Project: Hydro International
Suite 1100 Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

06-Nov-2017 12:37

### Wet Chemistry - Quality Control

### Batch BFJ0773 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFJ0773-BLK1)			Prepa	ared: 03-Nov	/-2017 An	alyzed: 04-	Nov-2017 1	1:54		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFJ0773-BLK2)			Prepa	ared: 03-Nov	/-2017 An	alyzed: 04-	Nov-2017 1	2:22		
Total Phosphorus	ND	0.0080	mg-P/L							U
Blank (BFJ0773-BLK3)			Prepa	ared: 03-Nov	/-2017 An	alyzed: 04-	Nov-2017 1	2:32		*
Total Phosphorus	ND	0.0080	mg-P/L							U
LCS (BFJ0773-BS1)			Prepa	ared: 03-Nov	-2017 An	alyzed: 04-	Nov-2017 1	1:55		
Total Phosphorus	0.152	0.0080	mg-P/L	0.150		101	90-110			
DL (BFJ0773-BS2)			Prepa	ared: 03-Nov	/-2017 An	alyzed: 04-	Nov-2017 1	2:23		
Total Phosphorus	0.153	0.0080	mg-P/L	0.150		102	90-110			
LCS (BFJ0773-BS3)			Prepa	ared: 03-Nov	/-2017 An	alyzed: 04-	Nov-2017 1	2:32		
Total Phosphorus	0.152	0.0080	mg-P/L	0.150		101	90-110			

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.



Herrera Environmental ConsultantsProject: Hydro International2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn06-Nov-2017 12:37

### **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	
SM 2540 D-97 in Water		
Suspended Solids	DoD-ELAP,WADOE,NELAP	
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	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.

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.



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-Nov-2017 12:37

### **Notes and Definitions**

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

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.

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.

# **October 27, 2017**

## Data\_17J0549

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17J0549-01	WUFF-Sump	13-05605-000			10/27/2017			PSEP 1986	GS_GRAVEL	Phi Size <-1	0.2		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_VCS	Phi Size -1 to 0	2.2		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_CS	Phi Size 0 to 1	3.8		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_MS	Phi Size 1 to 2	3.9		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_FS	Phi Size 2 to 3	5.7		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_VFS	Phi Size 3 to 4	4.6		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_CSILT	Phi Size 4 to 5	18.5		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_MSILT	Phi Size 5 to 6	33.5		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_FSILT	Phi Size 6 to 7	15.1		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_VFSILT	Phi Size 7 to 8	7.1		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_CCLAY	Phi Size 8 to 9	1.9		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_MCLAY	Phi Size 9 to 10	1.4		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_FCLAY	Phi Size >10	2.0		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_TOTFINES	Total Fines	79.6		%
BFJ0843-BLK1	Blank	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	0.50	U	mg/kg wet
BFJ0843-BS1	LCS	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	26.1		mg/kg wet
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	456		mg/kg dry
BFJ0843-BLK1	Blank	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	0.50	U	mg/kg wet
BFJ0843-BS1	LCS	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	26.6		mg/kg wet
BFJ0843-BLK2	Blank	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	1.5	J	mg/kg wet
BFJ0843-BS2	LCS	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	82.7		mg/kg wet
BFJ0843-BLK2	Blank	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	1.3	J	mg/kg wet
BFJ0843-BS2	LCS	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	78.8		mg/kg wet
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	1700	D	mg/kg dry
BFK0061-BLK1	Blank	13-05605-000	Solid			11/02/2017	11/02/2017	PSEP 1986		Volatile Solids	0.010	J	%
BFK0061-DUP1	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	PSEP 1986		Volatile Solids	30.6		%
17J0549-01		13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	PSEP 1986		Volatile Solids	30.2		%
	Blank	13-05605-000	Solid					SM 2540 G-97		Total Solids	0.04	J	%
		13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	SM 2540 G-97		Total Solids	40.37		%
17J0549-01	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	SM 2540 G-97		Total Solids	40.66		%
BFK0307-BLK1	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	C	mg-P/kg wet
BFK0307-BLK2	Blank	13-05605-000	Solid			1/10/2017	1/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	J	mg-P/kg wet
BFK0307-BLK3	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	J	mg-P/kg wet
BFK0307-BLK4	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	J	mg-P/kg wet
BFK0307-BS1	LCS	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	25.8		mg-P/kg wet
BFK0307-BS2	LCS	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	25.8		mg-P/kg wet
BFK0307-DUP1	WUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	2210	D	mg-P/kg dry
BFK0307-MS1	WUFF-Sump	13-05605-000		10/27/2017				SM 4500-P E-99	7723-14-0	Total Phosphorus	2530	D	mg-P/kg dry
17J0549-01	<u> </u>	13-05605-000	-					SM 4500-P E-99	7723-14-0	Total Phosphorus	2010	D	mg-P/kg dry



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)

17J0549

# Amanda Volgardsen Resources, Inc., ou=Client

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, Services, cn=Amanda Volgardsen, email=amandav@arilabs.com Date: 2017.11.30 16:22:48 -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 entiretv.

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

# Page 2 of 22 17J0549 ARISample FINAL 30 Nov 2017 1618



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

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

Project Name:	Projec	t Number:	Client:				Analyses Requested										
Hydro International Up-flo Filter	13-05	605-000	Herrera Envi	ronment	al												
Report To:			Copy To:				1	B 으									
Dylan Ahearn								254									
Sampled By: Ahean			Delivery Metho	coole-			S.	Percent Total Solids – SM 2540	1986		5,3						
Laboratory:		Requested C	ompletion Date:	Total No.	of Contair	ners:	aine	l š	EP	) E	136	3020	020				
Analytical Resources Inc.					3		Cont	fal	PS -	254(	EP/	PA6	A 6				
Lab Use:				Sample Type (see	Preserv- ative?	Matrix (see	Number of Containers	cent To	Grain size – PSEP 1986	TVS - SM 2540 E	Tot Phos – EPA 365.3	Tot Cu – EPA 6020	Tot Zn - EPA 6020				Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	ž	Per	G.	Ž	Į.	To To	Þ				Lab
WUFF-Sump		10/27/17	9:00	G	N	SE	2	Х	Х	Х	Х	Х	X				
																	-
					na n								-	<u> </u>	 <b></b> _		
								-						-	 		
													-				
Comments/Special Instructions:																	
Relinquished by (Name/CO/ Maynan Mulan Herrara	Signature Medyna N	Aull	Date/Time	Re S	ceived By (	Name/CO	Fish	اعا		ignatu	re		h		Date/T	ime 7/1	7
Relinquished by (Name/CO/	Signature/		Date/Time	Red	ceived By (	Name/CO	)			ignatu		/			Date/T	ime	

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)



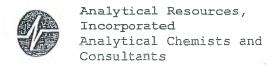


## **Cooler Receipt Form**

ARI Client: HET PET 6_	Project Name: Higher Ir	Ternate	1	20 Fin For
COC No(s):NA	Delivered by: Fed-Ex UPS Cou	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN		4
Assigned ARI Job No: 17 J 0549		-	age of the same of	
Preliminary Examination Phase:	Tracking No:			NA
Were intact, properly signed and dated custody seals attached	to the outside of to cooler?		YES	(NO.
Were custody papers included with the cooler?			VEC	NO
Were custody papers properly filled out (ink, signed, etc.)			120	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for children:			YES	NO
If cooler temperature is out of compliance fill out form 00070F		Temp Gun ID	#: Dage	565
Cooler Accepted by: SF	Date: 10/27/19 Time	e:_ <u>  100</u>	-	
Complete custody forms	and attach all shipping documents			
Log-In Phase:				
Was a temperature blank included in the cooler?			YES	GO
	Wet Ice Gel Packs Baggies Foam	Block Paner (		NU
Was sufficient ice used (if appropriate)?		NA NA	YES	NG>
Were all bottles sealed in individual plastic bags?		ואר	YES	
Did all bottles arrive in good condition (unbroken)?			(ES)	NO NO
Were all bottle labels complete and legible?			( <u>15</u> )	NO
Did the number of containers listed on COC match with the num			(ES)	NO
Did all bottle labels and tags agree with custody papers?			(ES)	NO
Were all bottles used correct for the requested analyses?			YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation)			YES	NO
Were all VOC vials free of air bubbles?	eservation sneet, excluding VOCs)	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		CNA-	YES	NO
			ES	NO
Date VOC Trip Blank was made at ARI		NA 3	·	
Vas Cample Spill by Art . TES Date/Time:	Equipment:		Split by:	The second second
Samples Logged by:Date	: 10/30/17 Time	17.57		
** Notify Project Manag	er of discrepancies or concerns **			
Sample ID on Bottle Sample ID on COC	Sample ID on Bottle	Samr	ole ID on CO	
		Oam	ole ID oll CO	
		,		-
Additional Notes, Discrepancies, & Resolutions:	20 A.A.			
1				
# T				
By: Date:				
Small Air Bubbles Peabubbles LARGE Air Bubbles	Small → "sm" (<2 mm)			
=2mm 2-4 mm > 4 mm	Peabubbles > "pb" (2 to < 4 mm)			•
	Large > "lg" (4 to < 6 mm)			
	Headspace → "hs" (>6 mm)			

0016F 3/2/10 Cooler Receipt Form

Revision 014



## Cooler Temperature Compliance Form

Cooler#: Te	mperature(°C):	2.2:
Sample ID	Bottle Count	Bottle Type
and but in was		,
Samples received		
		·
		· ·
Controlle	(%0)	
Cooler#: .Ter	nperature(°C):	In.u. T
Sample ID	Bottle Count	Bottle Type
	-	
Cooler#: Ter	nperature(°C):	
Sample ID	Bottle Count	Bottle Type
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	T.	
		V V
"		
Cooler#: Ter	(90)	1
Sample ID	nperature(°C):	Detti T.
Sample ID	Bottle Count	Bottle Type
	i	
4		
C-		
Completed by:	Dat	e: 0/27 / 15 Time: 1100

# Materials Testing & Consulting, Inc. Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting





Project: <u>Hydro Intern</u> Project #: <u>16T001-035</u> Client : <u>Analytical R</u> Source: <u>WUFF-Sum</u> C Sample#: <u>T17-1587</u>	Resources, Inc.	Date Received: November 1, 2017 Sampled By: Others Date Reported: November 29, 2017 Tested By: B. Goble
	CASE N	NARRATIVE
(PSEP) methodolo 2. The sample was analysis. The tripl 3. The data is prov	gy.	l plots.

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

# Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting



Client: Analytical Resources, Inc.
Sampled by: Others
Tested by: B. Goble

### **Apparent Grain Size Distribution Summary**

Percent Finer Than Indicated Size

			·											
Sample No.		Gravel		Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand		Si	ilt		Cl	ay
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8**	#4 (4750)	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)	31.0	15.6	7.8	3.9	2.0	1.0
_	100.0	100.0	100.0	99.1	97.5	93.0	68.1	40.4	24.4	14.8	9.2	5.4	3.5	1.8
T17-1596	100.0	99.6	99.1	98.3	96.8	92.3	67.3	39.9	23.9	14.4	9.0	5.0	3.2	1.7
	100.0	100.0	99.9	99.1	97.4	92.6	66.9	38.8	23.9	14.2	9.5	5.4	3.4	1.8
WUFF-SUMP	100.0	99.9	99.8	97.6	93.7	89.8	84.2	79.6	61.1	27.6	12.5	5.4	3.4	2.0

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

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# Page 7 of 22 17J0549 ARISample FINAL 30 Nov 2017 1618

# Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting



Project: Hyd	ro International (17J0549)	Client: Analytical Resources, Inc.	
Project #: 16T0	001-035		
Date Received: Nov	ember 1, 2017	Sampled by: Others	
Date Tested: Nov	ember 15, 2017	Tested by: B. Goble	

### **Apparent Grain Size Distribution Summary**

Percent Retained in Each Size Fraction

							II Euch Dize I							
Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt		Clay		Total Fines
Phi Size	< -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	> 10	> 4
Sieve Size (microns)	>#10 (2000)	10-18 (2000- 1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250- 125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0	<230 (<62)
	0.0	0.8	1.6	4.6	24.8	27.8	16.0	9.6	5.5	3.9	1.9	1.6	1.8	40.4
T17-1596	0.9	0.8	1.5	4.5	24.9	27.5	15.9	9.5	5.4	4.0	1.8	1.6	1.7	39.9
	0.1	0.8	1.7	4.9	25.7	28.0	15.0	9.7	4.8	4.1	2.0	1.5	1.8	38.8
WUFF-SUMP	0.2	2.2	3.8	3.9	5.7	4.6	18.5	33.5	15.1	7.1	1.9	1.4	2.0	79.6

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:

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# Page 8 of 22 17J0549 ARISample FINAL 30 Nov 2017 1618

# Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting



Project: Hydro International (17J0549) Project #: 16T001-035

Date Received: November 1, 2017 Date Tested: November 15, 2017 Client: Analytical Resources, Inc.

Sampled by: Others Tested by: B. Goble

Relative Standard Deviation, By Phi Size

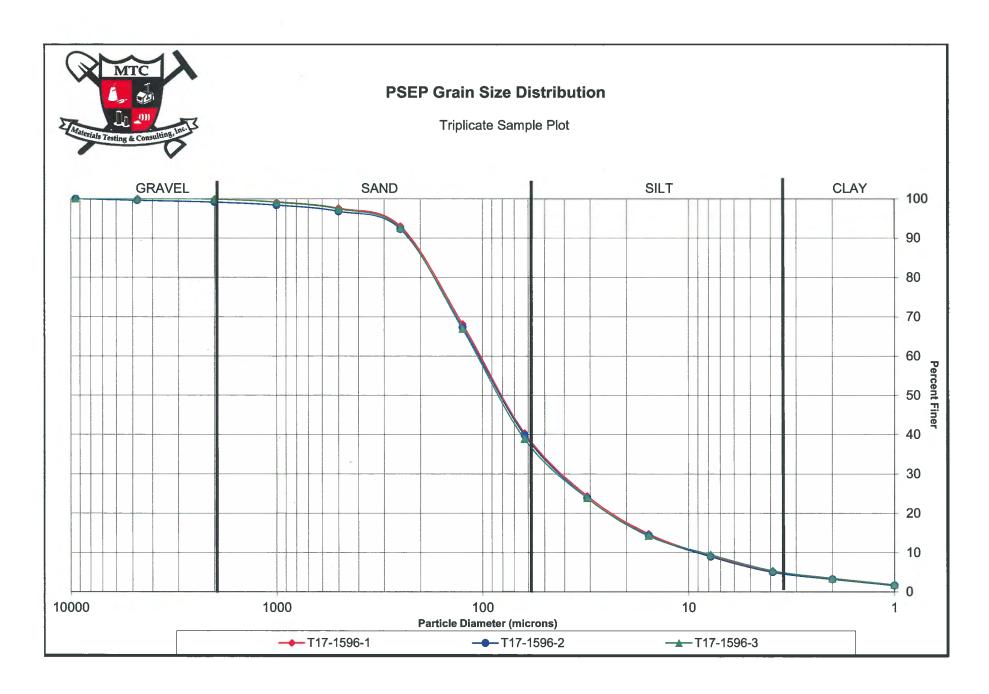
					Clative Stan	idald Deviation	m, by I m or							
Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
	100.0	100.0	100.0	99.1	97.5	93.0	68.1	40.4	24.4	14.8	9.2	5.4	3.5	1.8
T17-1596	100.0	99.6	99.1	98.3	96.8	92.3	67.3	39.9	23.9	14.4	9.0	5.0	3.2	1.7
	100.0	100.0	99.9	99.1	97.4	92.6	66.9	38.8	23.9	14.2	9.5	5.4	3.4	1.8
AVE	100.0	99.9	99.6	98.8	97.2	92.6	67.4	39.7	24.1	14.5	9.2	5.3	3.3	1.8
STDEV	0.0	0.2	0.4	0.4	0.3	0.3	0.5	0.6	0.2	0.2	0.2	0.2	0.1	0.1
%RSD	0.0	0.2	0.4	0.4	0.3	0.3	0.8	1.6	1.0	1.5	2.1	3.3	2.9	4.9

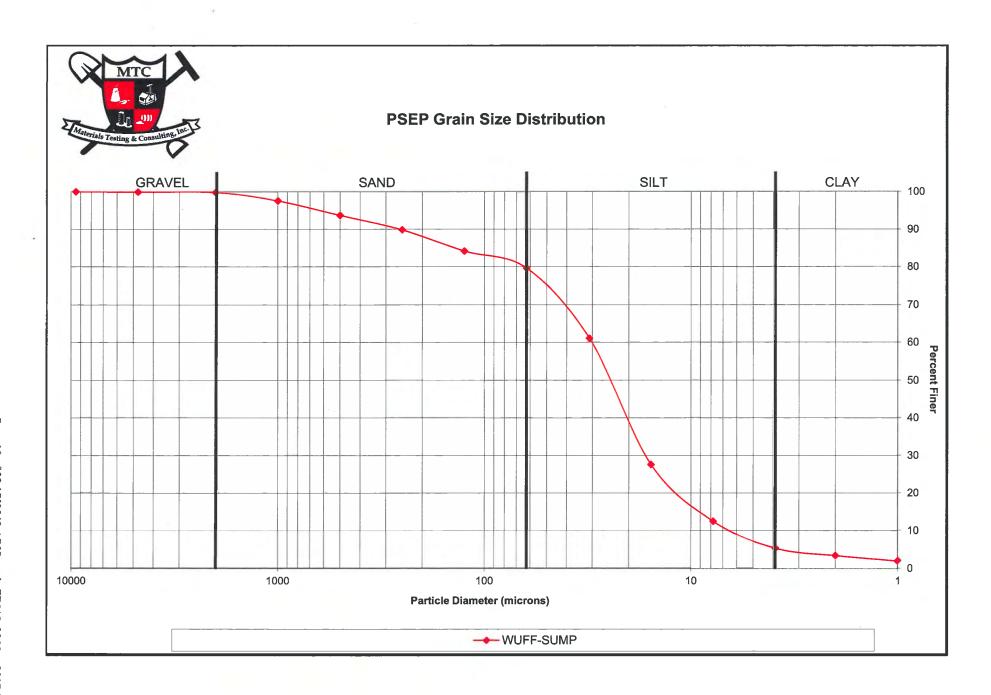
The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0- 25.0g) 17.3
	10/24/2017	11/8/2017	11/15/2017	100.0		17.3
T17-1596	10/24/2017	11/8/2017	11/15/2017	101.1		17.1
	10/24/2017	11/8/2017	11/15/2017	100.7		16.5
WUFF-SUMP	10/22/2017	11/8/2017	11/15/2017	97.4		10.6

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:







Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-Sump	17J0549-01	Solid	27-Oct-2017 09:00	27-Oct-2017 11:00

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.



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

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

**Reported:** 30-Nov-2017 16:18

### **Case Narrative**

### Sample receipt

One sample as listed on the preceding page was received October 27, 2017 under ARI workorder 17J0549. For details regarding sample receipt, please refer to the Cooler Receipt Form. The grainsize analysis was subcontracted to MTC Labs.

### Total Metals - EPA Method 200.8

The sample was digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank has Zinc detected below the reporting limit, but above the method detection limit. The Zinc has been flagged with a "J" qualifier on the method blank. No further corrective action was taken.

The LCS percent recoveries were within control limits.

### Total Phosphorus and %TS - Method SM4500

The sample was prepared and analyzed within the recommended holding times.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

The matrix spike percent recovery and duplicate RPD were within QC limits.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

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

Reported:

30-Nov-2017 16:18

**WUFF-Sump** 17J0549-01 (Solid)

Metals and Metallic Compounds

Method: EPA 6020A UCT-KED

Sampled: 10/27/2017 09:00

Analyzed: 02-Nov-2017 14:44

Sample Preparation:

Instrument: ICPMS1

Preparation Method: SWN EPA 3050B

Preparation Batch: BFJ0843

Sample Size: 1.003 g (wet)

Dry Weight:0.41 g

% Solids: 40.66

Prepared: 31-Oct-2017

Final Volume: 50 mL

Analyte

Reporting Result

456

CAS Number Dilution

20

7440-50-8

Limit Limit 0.09 1.23

Detection

Units Notes

Copper

Instrument: ICPMS2

mg/kg Analyzed: 09-Nov-2017 04:50

Sample Preparation:

Preparation Method: SWN EPA 3050B

Preparation Batch: BFJ0843

Sample Size: 1.003 g (wet)

Dry Weight:0.41 g

Prepared: 31-Oct-2017

Final Volume: 50 mL

% Solids: 40.66

			Detection	Reporting			
Analyte	CAS Number	Dilution	Limit	Limit	Result	Units	Notes
Zinc	7440-66-6	100	2.8	49.0	1700	mg/kg	D



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100 Seattle WA, 98121

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

Reported: 30-Nov-2017 16:18

**WUFF-Sump** 17J0549-01 (Solid)

Wet Chemistry

Method: PSEP 1986 Instrument: N/A

Sampled: 10/27/2017 09:00

Notes

Analyzed: 02-Nov-2017 14:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0061 Prepared: 02-Nov-2017

Sample Size: 10 g (wet)

Dry Weight:4.07 g

Final Volume: 10 g

% Solids: 40.66

Reporting Analyte CAS Number Dilution Limit Result Units

Volatile Solids 0.010 % 1 30.2



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Project: Hydro International

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

Reported:

30-Nov-2017 16:18

**WUFF-Sump** 17J0549-01 (Solid)

**Wet Chemistry** 

Instrument: N/A

Seattle WA, 98121

Method: SM 2540 G-97

Sampled: 10/27/2017 09:00

Analyzed: 02-Nov-2017 14:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0061

Prepared: 02-Nov-2017

Sample Size: 10 g (wet)

Final Volume: 10 g

Dry Weight:4.07 g

% Solids: 40.66

Reporting Limit Analyte CAS Number Dilution Result Units Notes 0.04 % 40.66 Total Solids 1

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.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100 Seattle WA, 98121

Project: Hydro International

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

Reported:

30-Nov-2017 16:18

**WUFF-Sump** 17J0549-01 (Solid)

**Wet Chemistry** 

Method: SM 4500-P E-99 Instrument: UV1800-2

Sampled: 10/27/2017 09:00

Analyzed: 17-Nov-2017 17:31

Sample Preparation:

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

Preparation Batch: BFK0307

Sample Size: 0.328 g (wet)

Dry Weight:0.13 g

% Solids: 40.66

Prepared: 10-Nov-2017 Final Volume: 50 mL Reporting Analyte CAS Number Dilution Limit Result Units Notes Total Phosphorus 7723-14-0 20 60.0 mg-P/kg 2010 D

Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

Reported:

30-Nov-2017 16:18

### Analysis by: Materials Testing & Consulting, Inc. (Tukwila) **WUFF-Sump** 17J0549-01 (Solid)

**Geochemical Methods** 

Method: PSEP 1986 Instrument: MT&C

Sampled: 10/27/2017 09:00

Analyzed: 15-Nov-2017 00:00

Sample Preparation:

Preparation Method: No Prep Geo

Preparation Batch: B111517

Prepared: 15-Nov-2017

Final Volume:

	F						
				Reporting			
Analyte		CAS Number	Dilution	Limit	Result	Units	Notes
Phi Size <-1		GS_GRAVEL	-1	0.1	0.2	%	
Phi Size -1 to 0		GS_VCS	1	0.1	2.2	%	
Phi Size 0 to 1		GS_CS	1	0.1	3.8	%	
Phi Size 1 to 2		GS_MS	1	0.1	3.9	%	
Phi Size 2 to 3		GS_FS	1	0.1	5.7	%	
Phi Size 3 to 4		GS_VFS	1	0.1	4.6	%	
Phi Size 4 to 5		GS_CSILT	1	0.1	18.5	%	
Phi Size 5 to 6		GS_MSILT	1	0.1	33.5	%	
Phi Size 6 to 7		GS_FSILT	1	0.1	15.1	%	
Phi Size 7 to 8		GS_VFSILT	1	0.1	7.1	%	
Phi Size 8 to 9		GS_CCLAY	1	0.1	1.9	%	
Phi Size 9 to 10		GS_MCLAY	1	0.1	1.4	%	
Phi Size >10		GS_FCLAY	1	0.1	2.0	%	
Total Fines		GS_TOTFINES	1	0.1	79.6	%	





Herrera Environmental Consultants

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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

### Metals and Metallic Compounds - Quality Control

### Batch BFJ0843 - SWN EPA 3050B

Instrument: ICPMS1 Analyst: TCH

			Detection	Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFJ0843-BLK1)			-		Prepa	red: 31-Oct	-2017 Ana	lyzed: 02-1	Nov-2017 1	4:31		
Copper	63	ND	0.04	0.50	mg/kg							U
Copper	65	ND	0.03	0.50	mg/kg							U
LCS (BFJ0843-BS1)					Prepa	red: 31-Oct	-2017 Ana	ılyzed: 02-1	Nov-2017 1	5:04		
Copper	63	26.1	0.04	0.50	mg/kg	25.0		104	80-120			
Copper	65	26.6	0.03	0.50	mg/kg	25.0		106	80-120			
Instrument: ICPMS2 Analys	t: CC		-		_							
			Detection	Reporting		Spike	Source		%REC		RPD	_
QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
QC Sample/Analyte Blank (BFJ0843-BLK2)	Isotope	Result				-	Result		Limits			Notes
	Isotope 66	Result				Level	Result		Limits			Notes
Blank (BFJ0843-BLK2)	_		Limit	Limit	Prepa	Level	Result		Limits			Notes J J
Blank (BFJ0843-BLK2) Zinc	66	1.5	Limit	Limit	Prepa mg/kg mg/kg	Level	Result -2017 Ana	ılyzed: 09-1	Limits	0:42		Notes  J  J
Blank (BFJ0843-BLK2) Zinc Zinc	66	1.5	Limit	Limit	Prepa mg/kg mg/kg	Level	Result -2017 Ana	ılyzed: 09-1	Limits	0:42		Notes J J



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

30-Nov-2017 16:18

### **Wet Chemistry - Quality Control**

### Batch BFK0061 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0061-BLK1)			Prepa	ared: 02-Nov	-2017 An	alyzed: 02-	Nov-2017 1	4:38		
Volatile Solids	ND	0.010	%							U
Total Solids	ND	0.04	%						-	U
Duplicate (BFK0061-DUP1)	Source:	17J0549-01	Prepa	ared: 02-Nov	-2017 An	alyzed: 02-	Nov-2017 1	4:38		
Volatile Solids	30.6	0.010	%		30.2			1.20	20	
Total Solids	40.37	0.04	%		40.66			0.73	20	





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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

### Wet Chemistry - Quality Control

### Batch BFK0307 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: CDE

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
	TOSGIE	Ellint							Linin	rvotes
Blank (BFK0307-BLK1)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	-Nov-2017	17:28		
Total Phosphorus	ND	1.33	mg-P/kg							U
Blank (BFK0307-BLK2)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:30		1 1 1
Total Phosphorus	ND	1.33	mg-P/kg				-			U
Blank (BFK0307-BLK3)		· · · · · · · · · · · · · · · · · · ·	Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:34		l a l
Total Phosphorus	ND	1.33	mg-P/kg							U
Blank (BFK0307-BLK4)			Prepa	red: 10-No	v-2017 Ana	alyzed: 17-	-Nov-2017	17:35		
Total Phosphorus	ND	1.33	mg-P/kg							U
LCS (BFK0307-BS1)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	-Nov-2017	17:30		
Total Phosphorus	25.8	1.33	mg-P/kg	25.0		103	90-110		1 1 1 1	
DL (BFK0307-BS2)			Prepa	red: 10-No	v-2017 Ana	alyzed: 17-	-Nov-2017	17:38	*	
Total Phosphorus	25.8	1.33	mg-P/kg	25.0		103	90-110			
Duplicate (BFK0307-DUP1)	Source:	17J0549-01	Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:32		
Total Phosphorus	2210	63.9	mg-P/kg		2010			9.59	20	D
Matrix Spike (BFK0307-MS1)	Source:	17J0549-01	Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:32		
Total Phosphorus	2530	62.2	mg-P/kg	389	2010	134	75-125			D

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



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 16:18

### **Certified Analyses included in this Report**

Analyte	Certifications

### EPA 6020A UCT-KED in Solid

Copper-63 NELAP,DoD-ELAP,WADOE
Copper-65 NELAP,DoD-ELAP,WADOE
Zinc-66 NELAP,DoD-ELAP,WADOE
Zinc-67 NELAP,DoD-ELAP,WADOE

### SM 4500-P E-99 in Solid

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



Herrera Environmental ConsultantsProject:Hydro International2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn30-Nov-2017 16:18

### **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
В	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.

# October 27, 2017 – Sediment Sample

## Data\_17J0549

ARI ID CI	lient ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_GRAVEL	Phi Size <-1	0.2		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_VCS	Phi Size -1 to 0	2.2		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_CS	Phi Size 0 to 1	3.8		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_MS	Phi Size 1 to 2	3.9		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_FS	Phi Size 2 to 3	5.7		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_VFS	Phi Size 3 to 4	4.6		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_CSILT	Phi Size 4 to 5	18.5		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_MSILT	Phi Size 5 to 6	33.5		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_FSILT	Phi Size 6 to 7	15.1		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_VFSILT	Phi Size 7 to 8	7.1		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_CCLAY	Phi Size 8 to 9	1.9		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_MCLAY	Phi Size 9 to 10	1.4		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_FCLAY	Phi Size >10	2.0		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/15/2017	11/15/2017	PSEP 1986	GS_TOTFINES	Total Fines	79.6		%
BFJ0843-BLK1 BI	Blank	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	0.50	U	mg/kg wet
BFJ0843-BS1 LC	.CS	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	26.1		mg/kg wet
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	456		mg/kg dry
BFJ0843-BLK1 BI	Blank	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	0.50	U	mg/kg wet
BFJ0843-BS1 LC	.CS	13-05605-000	Solid			10/31/2017	11/02/2017	EPA 6020A UCT-KED	7440-50-8	Copper	26.6		mg/kg wet
BFJ0843-BLK2 BI	Blank	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	1.5	J	mg/kg wet
BFJ0843-BS2 LC	.CS	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	82.7		mg/kg wet
BFJ0843-BLK2 BI	Blank	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	1.3	J	mg/kg wet
BFJ0843-BS2 LC	.CS	13-05605-000	Solid			10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	78.8		mg/kg wet
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	10/31/2017	11/09/2017	EPA 6020A UCT-KED	7440-66-6	Zinc	1700		mg/kg dry
BFK0061-BLK1 BI	Blank	13-05605-000	Solid			11/02/2017	11/02/2017	PSEP 1986		Volatile Solids	0.010	U	%
BFK0061-DUP1 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	PSEP 1986		Volatile Solids	30.6		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	PSEP 1986		Volatile Solids	30.2		%
BFK0061-BLK1 BI	Blank	13-05605-000	Solid			11/02/2017	11/02/2017	SM 2540 G-97		Total Solids	0.04	U	%
BFK0061-DUP1 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	SM 2540 G-97		Total Solids	40.37		%
17J0549-01 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/02/2017	11/02/2017	SM 2540 G-97		Total Solids	40.66		%
BFK0307-BLK1 BI	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	U	mg-P/kg wet
BFK0307-BLK2 BI	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	U	mg-P/kg wet
BFK0307-BLK3 BI	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	U	mg-P/kg wet
BFK0307-BLK4 BI	Blank	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	1.33	U	mg-P/kg wet
BFK0307-BS1 LC	.CS	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	25.8		mg-P/kg wet
BFK0307-BS2 LC	.CS	13-05605-000	Solid			11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	25.8		mg-P/kg wet
BFK0307-DUP1 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	2210		mg-P/kg dry
BFK0307-MS1 W	VUFF-Sump	13-05605-000	Sediment	10/27/2017	10/27/2017	11/10/2017	11/17/2017	SM 4500-P E-99	7723-14-0	Total Phosphorus	2530		mg-P/kg dry
		13-05605-000						SM 4500-P E-99	7723-14-0	Total Phosphorus	2010		mg-P/kg dry



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)

17J0549

# Amanda Volgardsen Resources, Inc., ou=Client

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington,

l=Tukwila, o=Analytical Services, cn=Amanda Volgardsen,

email=amandav@arilabs.com Date: 2017.11.30 16:22:48 -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 entiretv.

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

# Page 2 of 22 17J0549 ARISample FINAL 30 Nov 2017 1618



2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121

Chain of Custody Record

p 206 441 9080 | f 206 441 9108

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

Project Name:	Projec	oject Number: Client:									, AI	nalyse	Reque	sted			_	
Hydro International Up-flo Filte	r 13-0	5605-000	Herrera Environmental				-											
Report To:			Сору То:				1	SM 2540 B										
Dylan Ahearn															- 1			
Sampled By: Ahean				Delivery Method:					1986		5,3							
Laboratory:		Requested (	ompletion Date: Total No. of Containers:					Solii Solii	EP 1	E E	136	020	020					
Analytical Resources Inc.				3		Cont	tal (	- PSEP	2540	EP/	PA 6	EPA 6020						
Lab Use:				Sample Type (see	Preserv- ative?	Matrix (see	Number of Containers	Percent Total Solids	Grain size	TVS - SM 2540 E	Tot Phos – EPA 365,	Tot Cu – EPA 6020	Tot Zn - EP				Lab ID No.	
Sample ID		Date	Time	codes)	~	codes)	Ž	Pe				_					<u></u>	Lak
WUFF-Sump		10/27/1	7 9:00	G	N	SE	2	Х	Х	Х	Х	Х	X					ļ
					Paragraphic and Paragraphic an													
Comments/Special Instructions:																		
Relinquished by (Name/CO/ Maynan Muilan Herrera Mayna Mull Relinquished by (Name/CO/ Signature)			Date/Time	Date/Time Received By (Name/Co			Fish	Signature			ure The			Date/Time 10/27/17				
Relinquished by (Name/CO/ Signature/			Date/Time	Re	ceived By	Name/CO	)		S	Signature			/			Date/Time		
Sample Type: G=Grab C=Composite	Bántaiu Coden	A_A:- C\6(-	Groundwater SS	-Fadimont		CM-S	eface W	lator	10/-10/-	tor (bl-	nks)	NA-NA-	torial	O=Othr	or lenge	ifu)		



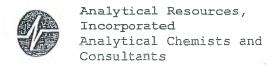


# **Cooler Receipt Form**

ARI Client: HET PET 6_	Project Name: Higher Ir	Ternate	1	20 Fin For
COC No(s):NA	Delivered by: Fed-Ex UPS Cou	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN 1		4
Assigned ARI Job No: 17 J 0549		-	age of the same of	
Preliminary Examination Phase:	Tracking No:			NA
Were intact, properly signed and dated custody seals attached	to the outside of to cooler?		YES	(NO.
Were custody papers included with the cooler?			VEC	NO
Were custody papers properly filled out (ink, signed, etc.)			120	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for children:			YES	NO
If cooler temperature is out of compliance fill out form 00070F		Temp Gun ID	#: Dage	565
Cooler Accepted by: SF	Date: 10/27/19 Time	e:_ <u>  100</u>	-	
Complete custody forms	and attach all shipping documents			
Log-In Phase:				
Was a temperature blank included in the cooler?			YES	GO
	Wet Ice Gel Packs Baggies Foam	Block Paner (		NU
Was sufficient ice used (if appropriate)?		NA NA	YES	NG>
Were all bottles sealed in individual plastic bags?		ואר	YES	
Did all bottles arrive in good condition (unbroken)?			(ES)	NO NO
Were all bottle labels complete and legible?			( <u>15</u> )	NO
Did the number of containers listed on COC match with the num			(ES)	NO
Did all bottle labels and tags agree with custody papers?			(ES)	NO
Were all bottles used correct for the requested analyses?			YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation)			YES	NO
Were all VOC vials free of air bubbles?	eservation sneet, excluding VOCs)	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		CNA-	YES	NO
			ES	NO
Date VOC Trip Blank was made at ARI		NA 3	·	
Vas Cample Spill by Art . TES Date/Time:	Equipment:		Split by:	The second second
Samples Logged by:Date	: 10/30/17 Time	17.57		
** Notify Project Manag	er of discrepancies or concerns **			
Sample ID on Bottle Sample ID on COC	Sample ID on Bottle	Samr	ole ID on CO	
		Oam	ole ID oll CO	
		,		-
Additional Notes, Discrepancies, & Resolutions:	20 A A			
1				
# T				
By: Date:				
Small Air Bubbles Peabubbles LARGE Air Bubbles	Small → "sm" (<2 mm)			
=2mm 2-4 mm > 4 mm	Peabubbles > "pb" (2 to < 4 mm)			•
	Large > "lg" (4 to < 6 mm)			
	Headspace → "hs" (>6 mm)			

0016F 3/2/10 Cooler Receipt Form

Revision 014



# Cooler Temperature Compliance Form

Cooler#: Te	mperature(°C):	2.2:
Sample ID	Bottle Count	Bottle Type
and but in was		,
Samples received		
		·
		· ·
Controlle	(%0)	
Cooler#: .Ter	nperature(°C):	In.u. T
Sample ID	Bottle Count	Bottle Type
	-	
Cooler#: Ter	nperature(°C):	
Sample ID	Bottle Count	Bottle Type
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	T.	
		V V
"		
Cooler#: Ter	(90)	1
Sample ID	nperature(°C):	Detti T.
Sample ID	Bottle Count	Bottle Type
	i	
4		
C-		
Completed by:	Dat	e: 0/27 / 15 Time: 1100

# Materials Testing & Consulting, Inc.





Project: Hydro International (17J0549)  Project #: 16T001-035  Client: Analytical Resources, Inc.  Source: WUFF-Sump  TC Sample#: T17-1587	Date Received: November 1, 2017 Sampled By: Others Date Reported: November 29, 2017 Tested By: B. Goble
CASE NA	ARRATIVE
<ol> <li>One sample was submitted for grain size analy (PSEP) methodology.</li> <li>The sample was run in a single batch and one analysis. The triplicate data is reported on the Q.</li> <li>The data is provided in summary tables and p.</li> <li>There were no other noted anomalies in this p.</li> </ol>	sample from another job was chosen for triplicate A summary. lots.

publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

# Materials Testing & Consulting, Inc.





Client: Analytical Resources, Inc.
Sampled by: Others
Tested by: B. Goble

### **Apparent Grain Size Distribution Summary**

Percent Finer Than Indicated Size

			·											
Sample No.		Gravel		Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt			Clay		
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8**	#4 (4750)	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)	31.0	15.6	7.8	3.9	2.0	1.0
_	100.0	100.0	100.0	99.1	97.5	93.0	68.1	40.4	24.4	14.8	9.2	5.4	3.5	1.8
T17-1596	100.0	99.6	99.1	98.3	96.8	92.3	67.3	39.9	23.9	14.4	9.0	5.0	3.2	1.7
	100.0	100.0	99.9	99.1	97.4	92.6	66.9	38.8	23.9	14.2	9.5	5.4	3.4	1.8
WUFF-SUMP	100.0	99.9	99.8	97.6	93.7	89.8	84.2	79.6	61.1	27.6	12.5	5.4	3.4	2.0

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

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# Page 7 of 22 17J0549 ARISample FINAL 30 Nov 2017 1618

# Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting



Project: Hydro International (17J05	49) Client: Analytical Resources, Inc.
<b>Project #:</b> 16T001-035	
Date Received: November 1, 2017	Sampled by: Others
Date Tested: November 15, 2017	Tested by: B. Goble

### **Apparent Grain Size Distribution Summary**

Percent Retained in Each Size Fraction

							II Lucii bize i	1001011						
Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt		Clay		Total Fines
Phi Size	< -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	> 10	> 4
Sieve Size (microns)	>#10 (2000)	10-18 (2000- 1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250- 125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0	<230 (<62)
	0.0	0.8	1.6	4.6	24.8	27.8	16.0	9.6	5.5	3.9	1.9	1.6	1.8	40.4
T17-1596	0.9	0.8	1.5	4.5	24.9	27.5	15.9	9.5	5.4	4.0	1.8	1.6	1.7	39.9
	0.1	0.8	1.7	4.9	25.7	28.0	15.0	9.7	4.8	4.1	2.0	1.5	1.8	38.8
WUFF-SUMP	0.2	2.2	3.8	3.9	5.7	4.6	18.5	33.5	15.1	7.1	1.9	1.4	2.0	79.6

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:

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**Regional Offices:** Olympia ~ 360.534.9777

Bellingham ~ 360.647.6111 Visit our website: www.mtc-inc.net

Silverdale ~ 360.698.6787

Tukwila ~ 206.241.1974

# Page 8 of 22 17J0549 ARISample FINAL 30 Nov 2017 1618

# Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting



Project: Hydro International (17J0549)

Project #: 16T001-035 Date Received: November 1, 2017 Date Tested: November 15, 2017 Client: Analytical Resources, Inc.

Sampled by: Others Tested by: B. Goble

Relative Standard Deviation, By Phi Size

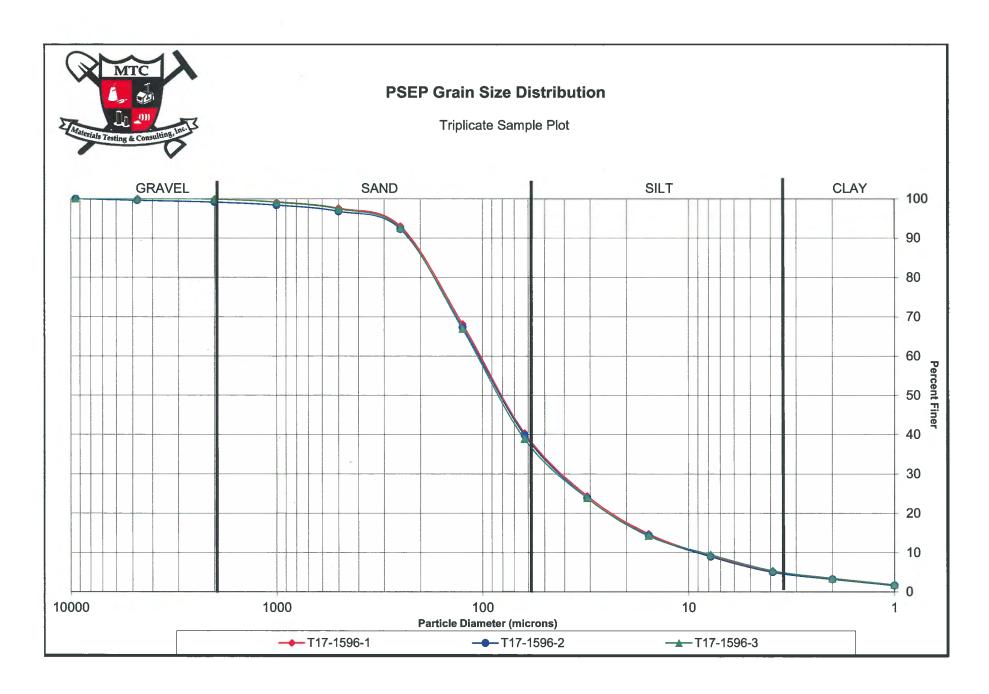
					Clative Stan	dard Deviant	m, by t in or	2.0						
Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	_9	10
T17-1596	100.0	100.0	100.0	99.1	97.5	93.0	68.1	40.4	24.4	14.8	9.2	5.4	3.5	1.8
	100.0	99.6	99.1	98.3	96.8	92.3	67.3	39.9	23.9	14.4	9.0	5.0	3.2	1.7
	100.0	100.0	99.9	99.1	97.4	92.6	66.9	38.8	23.9	14.2	9.5	5.4	3.4	1.8
AVE	100.0	99.9	99.6	98.8	97.2	92.6	67.4	39.7	24.1	14.5	9.2	5.3	3.3	1.8
STDEV	0.0	0.2	0.4	0.4	0.3	0.3	0.5	0.6	0.2	0.2	0.2	0.2	0.1	0.1
%RSD	0.0	0.2	0.4	0.4	0.3	0.3	0.8	1.6	1.0	1.5	2.1	3.3	2.9	4.9

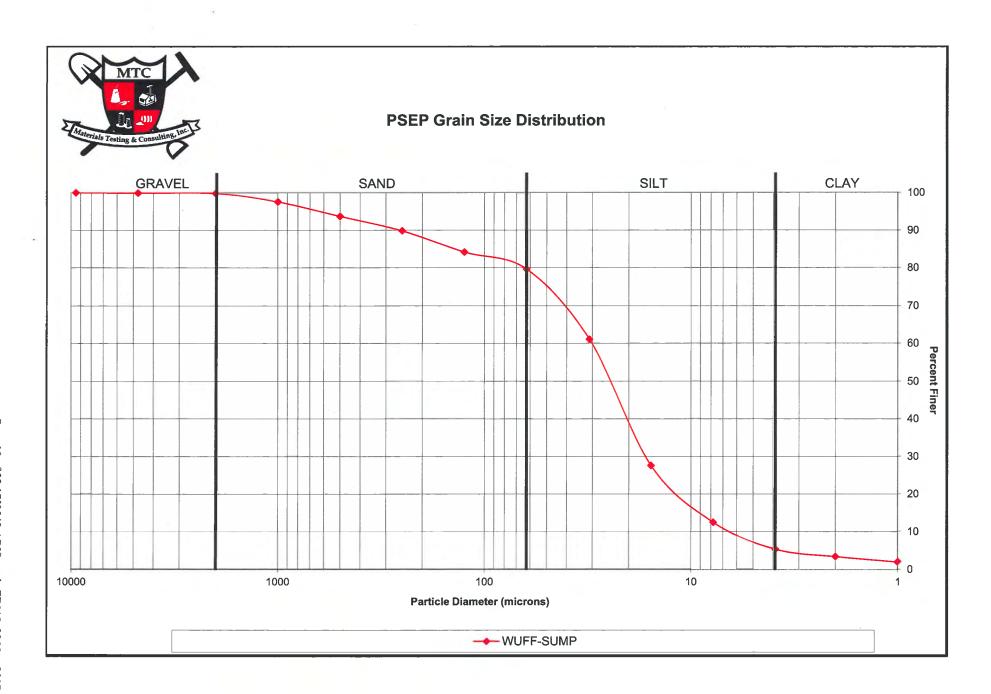
The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0- 25.0g) 17.3
	10/24/2017	11/8/2017	11/15/2017	100.0		17.3
T17-1596	10/24/2017	11/8/2017	11/15/2017	101.1		17.1
	10/24/2017	11/8/2017	11/15/2017	100.7		16.5
WUFF-SUMP	10/22/2017	11/8/2017	11/15/2017	97.4		10.6

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:







Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

# ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-Sump	17J0549-01	Solid	27-Oct-2017 09:00	27-Oct-2017 11:00

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.



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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

### **Case Narrative**

### Sample receipt

One sample as listed on the preceding page was received October 27, 2017 under ARI workorder 17J0549. For details regarding sample receipt, please refer to the Cooler Receipt Form. The grainsize analysis was subcontracted to MTC Labs.

### Total Metals - EPA Method 200.8

The sample was digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank has Zinc detected below the reporting limit, but above the method detection limit. The Zinc has been flagged with a "J" qualifier on the method blank. No further corrective action was taken.

The LCS percent recoveries were within control limits.

### Total Phosphorus and %TS - Method SM4500

The sample was prepared and analyzed within the recommended holding times.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

The matrix spike percent recovery and duplicate RPD were within QC limits.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

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

Reported:

30-Nov-2017 16:18

**WUFF-Sump** 17J0549-01 (Solid)

Metals and Metallic Compounds

Method: EPA 6020A UCT-KED

Sampled: 10/27/2017 09:00

Analyzed: 02-Nov-2017 14:44

Sample Preparation:

Instrument: ICPMS1

Preparation Method: SWN EPA 3050B

Preparation Batch: BFJ0843 Prepared: 31-Oct-2017

Final Volume: 50 mL

7440-50-8

Sample Size: 1.003 g (wet)

Dilution

20

Dry Weight:0.41 g

Result

456

% Solids: 40.66

Analyte

CAS Number

Detection Reporting Limit Limit

1.23

0.09

Units Notes

Copper

Instrument: ICPMS2

Analyzed: 09-Nov-2017 04:50

mg/kg

Sample Preparation:

Preparation Method: SWN EPA 3050B

Preparation Batch: BFJ0843

Sample Size: 1.003 g (wet)

Dry Weight:0.41 g

Prepared: 31-Oct-2017

Final Volume: 50 mL

% Solids: 40.66

			Detection	Reporting			
Analyte	CAS Number	Dilution	Limit	Limit	Result	Units	Notes
Zinc	7440-66-6	100	2.8	49.0	1700	mg/kg	D



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100 Seattle WA, 98121 Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

WUFF-Sump 17J0549-01 (Solid)

Wet Chemistry

Method: PSEP 1986 Instrument: N/A Sampled: 10/27/2017 09:00

Analyzed: 02-Nov-2017 14:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0061 Prepared: 02-Nov-2017 Sample Size: 10 g (wet)

Dry Weight:4.07 g

Final Volume: 10 g

% Solids: 40.66

			Reporting			<b></b>
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Volatile Solids		1	0.010	30.2	%	



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

30-Nov-2017 16:18

WUFF-Sump 17J0549-01 (Solid)

Wet Chemistry

Instrument: N/A

Seattle WA, 98121

Method: SM 2540 G-97

Sampled: 10/27/2017 09:00

Analyzed: 02-Nov-2017 14:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFK0061

Prepared: 02-Nov-2017

Sample Size: 10 g (wet) Final Volume: 10 g Dry Weight:4.07 g % Solids: 40.66

70 5011us. 40

Analyte CAS Number Dilution Result Units Notes

Total Solids 1 0.04 40.66 %

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.



Herrera Environmental Consultants

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

Project Number: 13-05605-000 Reported:
Project Manager: Dylan Ahearn 30-Nov-2017 16:18

WUFF-Sump 17J0549-01 (Solid)

**Wet Chemistry** 

Method: SM 4500-P E-99 Instrument: UV1800-2 Sampled: 10/27/2017 09:00

Analyzed: 17-Nov-2017 17:31

Sample Preparation:

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

Preparation Batch: BFK0307

Prepared: 10-Nov-2017

Sample Size: 0.328 g (wet)

Dry Weight:0.13 g

Final Volume: 50 mL

% Solids: 40.66

112 112 1			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Total Phosphorus	7723-14-0	20	60.0	2010	mg-P/kg	D

Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

30-Nov-2017 16:18

Analysis by: Materials Testing & Consulting, Inc. (Tukwila)

WUFF-Sump

17J0549-01 (Solid)

**Geochemical Methods** 

Method: PSEP 1986

Sampled: 10/27/2017 09:00

Instrument: MT&C

Analyzed: 15-Nov-2017 00:00

Sample Preparation:

Preparation Method: No Prep Geo

Preparation Batch: B111517

Prepared: 15-Nov-2017

Final Volume:

	11cpared. 13 1101 2017	i mai voiame.					
				Reporting			
Analyte		CAS Number	Dilution	Limit	Result	Units	Notes
Phi Size <-1		GS_GRAVEL	-1	0.1	0.2	%	
Phi Size -1 to 0		GS_VCS	1	0.1	2.2	%	
Phi Size 0 to 1		GS_CS	1	0.1	3.8	%	
Phi Size 1 to 2		GS_MS	1	0.1	3.9	%	
Phi Size 2 to 3		GS_FS	1	0.1	5.7	%	
Phi Size 3 to 4		GS_VFS	1	0.1	4.6	%	
Phi Size 4 to 5		GS_CSILT	1	0.1	18.5	%	
Phi Size 5 to 6		GS_MSILT	1	0.1	33.5	%	
Phi Size 6 to 7		GS_FSILT	1	0.1	15.1	%	
Phi Size 7 to 8		GS_VFSILT	1	0.1	7.1	%	
Phi Size 8 to 9		GS_CCLAY	1	0.1	1.9	%	
Phi Size 9 to 10		GS_MCLAY	1	0.1	1.4	%	
Phi Size >10		GS_FCLAY	1	0.1	2.0	%	
Total Fines		<b>GS_TOTFINES</b>	1	0.1	79.6	%	





Herrera Environmental Consultants

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

Project Number: 13-05605-000 Project Manager: Dylan Ahearn **Reported:** 30-Nov-2017 16:18

# Metals and Metallic Compounds - Quality Control

### Batch BFJ0843 - SWN EPA 3050B

Instrument: ICPMS1 Analyst: TCH

. 11			Detection	Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Isotope	Result	Limit	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BFJ0843-BLK1)			-		Prepa	red: 31-Oct	:-2017 Ana	ılyzed: 02-1	Nov-2017 1	4:31		
Copper	63	ND	0.04	0.50	mg/kg							U
Copper	65	ND	0.03	0.50	mg/kg							U
LCS (BFJ0843-BS1)					Prepa	red: 31-Oct	-2017 Ana	ılyzed: 02-1	Nov-2017 1	5:04		
Copper	63	26.1	0.04	0.50	mg/kg	25.0		104	80-120			
Copper	65	26.6	0.03	0.50	mg/kg	25.0		106	80-120			
Instrument: ICPMS2 Analys	t: CC		_		_							
		-	Detection	Reporting		Spike	Source		%REC		RPD	_
QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
	Isotope	Result				-	Result		Limits			Notes
Blank (BFJ0843-BLK2)	Isotope 66	Result				Level	Result		Limits			Notes
QC Sample/Analyte  Blank (BFJ0843-BLK2)  Zinc  Zinc			Limit	Limit	Prepa	Level	Result		Limits			Notes J J
Blank (BFJ0843-BLK2) Zinc	66	1.5	Limit	Limit	Prepa mg/kg mg/kg	Level	Result	ılyzed: 09-1	Limits	0:42		Notes J J
Blank (BFJ0843-BLK2) Zinc Zinc	66	1.5	Limit	Limit	Prepa mg/kg mg/kg	Level	Result	ılyzed: 09-1	Limits	0:42		Notes J J



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project: Hydro International

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Reported:

30-Nov-2017 16:18

# **Wet Chemistry - Quality Control**

# Batch BFK0061 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0061-BLK1)			Prepa	ared: 02-Nov	-2017 An	alyzed: 02-	Nov-2017 1	4:38		
Volatile Solids	ND	0.010	%							U
Total Solids	ND	0.04	%						-	U
Duplicate (BFK0061-DUP1)	Source:	17J0549-01	Prepa	ared: 02-Nov	-2017 An	alyzed: 02-	Nov-2017 1	4:38		
Volatile Solids	30.6	0.010	%		30.2			1.20	20	
Total Solids	40.37	0.04	%		40.66			0.73	20	





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

Project Manager: Dylan Ahearn

**Reported:** 30-Nov-2017 16:18

# Wet Chemistry - Quality Control

# Batch BFK0307 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: CDE

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
	TOSGIE	Ellint							Linne	rvotes
Blank (BFK0307-BLK1)			Prepa	red: 10-No	v-2017 Ana	alyzed: 17-	Nov-2017	17:28		
Total Phosphorus	ND	1.33	mg-P/kg							U
Blank (BFK0307-BLK2)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	7:30		1 1 1
Total Phosphorus	ND	1.33	mg-P/kg							U
Blank (BFK0307-BLK3)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:34		l a l
Total Phosphorus	ND	1.33	mg-P/kg							U
Blank (BFK0307-BLK4)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:35		
Total Phosphorus	ND	1.33	mg-P/kg					_		U
LCS (BFK0307-BS1)			Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	7:30		
Total Phosphorus	25.8	1.33	mg-P/kg	25.0		103	90-110			
DL (BFK0307-BS2)			Prepa	red: 10-No	v-2017 Ana	alyzed: 17-	Nov-2017	17:38		
Total Phosphorus	25.8	1.33	mg-P/kg	25.0		103	90-110			
Duplicate (BFK0307-DUP1)	Source:	17J0549-01	Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	17:32		
Total Phosphorus	2210	63.9	mg-P/kg		2010			9.59	20	D
Matrix Spike (BFK0307-MS1)	Source:	17J0549-01	Prepa	red: 10-No	v-2017 An	alyzed: 17-	Nov-2017	7:32		
Total Phosphorus	2530	62.2	mg-P/kg	389	2010	134	75-125			D

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

Analytical Resources, Inc.

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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 16:18

# **Certified Analyses included in this Report**

Analyte	Certifications

### EPA 6020A UCT-KED in Solid

Copper-63 NELAP,DoD-ELAP,WADOE
Copper-65 NELAP,DoD-ELAP,WADOE
Zinc-66 NELAP,DoD-ELAP,WADOE
Zinc-67 NELAP,DoD-ELAP,WADOE

### SM 4500-P E-99 in Solid

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



Herrera Environmental ConsultantsProject: Hydro International2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Nov-2017 16:18

# **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	
В	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.	