February 3, 2018

Data_18B0052

T8B0052-01 WUFF-IN 13-65605-000 Water 02/03/2018 02/05/2018 02/05/2018 02/05/2018 M2/05/2018 M2/05/2018	ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
1880692-03 WUFF-IN 13-05605-000 Water BGB0091-BS1 LS 13-05605-000 Water BGB0091-BS1 LS 13-05605-000 Water BGB0091-BS1 LS 13-05605-000 Water BGB0091-BS1 WUFF-IN 13-05605-000 Water C2/03/2018 C2/05/2018 C2/05/201	18B0052-01		•	Water			-		SM 2340 B-97		•	40.1		mg/L
BGB0091-BLK1 Blank									SM 2340 B-97					-
BGB0091-BS1 LCS		Blank								1426-54-42			U	mg-P/L
BGB0091-DUP1 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 SM 4500-P E-99 1426-6442 Orthophosphorus 0.0130 L mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 SM 4500-P E-99 1426-6442 Orthophosphorus 0.0130 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 SM 4500-P E-99 1426-6442 Orthophosphorus 0.0130 mg-IBB00052-03 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 0.0500 U mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 0.0500 U mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 11.9 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 11.9 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 11.9 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 11.6 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7440-70-2 Calcium 11.6 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7439-85-4 Magnesium 10.1 mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7439-85-4 Magnesium 246 Mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7439-85-4 Magnesium 246 Mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 EPA 6010C 7439-85-4 Magnesium 246 Mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 EPA 6010C 7439-85-4 Magnesium 246 Mg-IBB00052-01 WUFF-IN 13-05605-000 Water 20/20/2018 20/20/2018 20/20/2018 20/20/2018														mg-P/L
BGB0091-MS1 WUFF-IN 13-05605-000 Water 22/03/2018 20/05/20					02/03/2018	02/05/2018							L	mg-P/L
1880082-01 WUFF-IN 13-05605-000 Water 02/03/2018 02/05/2018 02/05/2018 SM 4500-P E-99 1426-54-42 Orthophosphorus 0.0100 mg-IB80062-01 MUFF-IN 13-05605-000 Water 02/05/2018 02/05/2018 CS 13-05005-000 Valer 02/05/2018 02/05/2018 DS M-500-P E-99 1426-54-42 Orthophosphorus 0.0130 mg-IBC 0.012-05/2018 03-05005-000 Valer 02/05/2018 02/05/2018 DS M-500-P E-99 1426-54-42 Orthophosphorus 0.0130 mg-IBC 0.012-05/2018 03-05005-000 Valer 02/05/2018 02/05/2018 02/05/2018 DS W-500-P E-99 1426-54-42 Orthophosphorus 0.0130 mg-IBC 0.012-05/2018 03-05005-000 Valer 02/05/2018 02/05/2018 02/05/2018 DS W-500-P E-99 1426-54-42 Orthophosphorus 0.0130 mg-IBC 0.012-05/2018 02/05/20														mg-P/L
BB0062-03 WUFF-OUT 13-05605-000 Water 02/03/2018 02/05/2018 02/05/2018 SM 4500-P =-99 1426-54-42 Orthophosphorus 0.0130 mg/L B606102-B811 LCS 13-05605-000 Water 02/06/2018 02/06/2018 EPA 6010C 7440-70-2 Calcium 9.98 mg/L B80062-03 WUFF-OUT 13-05605-000 Water 02/06/2018 02/06/2018 EPA 6010C 7440-70-2 Calcium 9.98 mg/L B80062-03 WUFF-OUT 13-05605-000 Water 02/06/2018 02/06/2018 EPA 6010C 7440-70-2 Calcium 11.9 mg/L B80062-03 WUFF-OUT 13-05605-000 Water 02/05/2018 02/06/2018 EPA 6010C 7440-70-2 Calcium 11.9 mg/L B80062-03 WUFF-OUT 13-05605-000 Water 02/05/2018 02/06/2018 EPA 6010C 7440-70-2 Calcium 11.6 mg/L B80062-00 WUFF-OUT 13-05605-000 Water 02/06/2018 02/06/2018 EPA 6010C 7439-95-4 Magnesium 0.0500 U mg/L B80062-01 WUFF-IN 13-05605-000 Water 02/06/2018 02/06/2018 02/06/2018 EPA 6010C 7439-95-4 Magnesium 0.0500 U mg/L B80062-01 WUFF-IN 13-05605-000 Water 02/03/2018 02/06/2018 02/06/2018 EPA 6010C 7439-95-4 Magnesium 0.0500 U mg/L B80062-01 WUFF-IN 13-05605-000 Water 02/03/2018 02/06/2018 02/0	18B0052-01	WUFF-IN	13-05605-000	Water	02/03/2018	02/05/2018	02/05/2018	02/05/2018	SM 4500-P E-99			0.0100		mg-P/L
BGB0122-BLK1 Blank 13-05605-000 Water 0.206/2018 0.206/2018 EPA 6010C 7440-70-2 Calcium 0.0500 U mg/L														mg-P/L
BGB0122-BST LCS 13-05605-000 Water 02/03/2018 02/06/2018													U	
BB0052-01 WUFF-IN 13-05605-000 Water 02/03/2018 02/05/2018														
B80652-03 WJFF-OUT 13-056605-000 Water 02/03/2018 02/05/20					02/03/2018	02/05/2018								
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B8B0052-03 WUFF-OUT 1-30-6605-000 Water 02/03/2018 02/05/2018 02/08/2018 EPA 200.8 7440-50-8 Copper 0.500 U ug/L					02/03/2018	02/05/2018								
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1880052-01 WUFF-IN 13-05605-000 Water 02/03/2018 02/05/2018 02/08/2018 02/08/2018 EPA 200.8 7440-50-8 Copper 22.7 Ug/L														
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18B0052-02 WUFF-IN 13-05605-000 Water 02/03/2018 02/05/2018 02/09/2018 02/12/2018 EPA 200.8-Dissolved 7440-50-8 Copper 10.7 ug/L											- ' '			
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18B0052-02 WUFF-IN 13-05605-000 Water 02/03/2018 02/05/2018 02/09/2018 02/12/2018 EPA 200.8-Dissolved 7440-66-6 Zinc 31.3 ug/L 18B0052-04 WUFF-OUT 13-05605-000 Water 02/03/2018 02/05/2018 02/09/2018 EPA 200.8-Dissolved 7440-66-6 Zinc 31.1 ug/L BGB0205-BLK1 Blank 13-05605-000 Water 02/09/2018 02/09/2018 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BGB0292-BLK1 Blank 13-05605-000 Water 02/09/2018 02/09/2018 EPA 200.8-Dissolved 7440-66-6 Zinc 4.00 U ug/L BGB0292-BLK1 Blank 13-05605-000 Water 02/13/2018 02/14/2018 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.0080 U mg-F BGB0292-BS1 LCS 13-05605-000 Water 02/13/2018 02/14/2018 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.144 mg-F BGB0292-BS2 LCS 13														
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BGB0292-BS2 LCS 13-05605-000 Water 02/13/2018 02/14/2018 SM 4500-P E-99 7723-14-0 Total Phosphorus 0.147 mg-F														mg-P/L
														mg-P/L
		WUFF-IN			02/03/2018	02/05/2018			SM 4500-P E-99	7723-14-0	Total Phosphorus	0.114	*	mg-P/L
											-		D	mg-P/L
											-			mg-P/L
														mg-P/L



20 February 2018

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)

18B0052



Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Client Services, email=amandav@arilabs.com Date: 2018.02.20 16:08:12 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.

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

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Seattle, Washington | 98121 Chain of Custody Record p 206 441 9080 | f 206 441 9108 80052

Project Name:	Proje	ct Number:	Client:	Client:			Analyses Requested											
Hydro International Up-flo Filter	13-0	5605-000	Herrera Environmental				5		776		7711							
Report To:			Copy To:	Сору То:		9	rratic		N 39		10		1 4					
Dylan Ahearn			1000				254	Concentration	solids -	ASTI	5.3	5.3	40B	ω.				
Sampled By: A. Suruss				opy To: elivery Method: 7 TOTE W ICE pletion Date: Total No. of Containers:		lids-SM	ent Cor	los papu	oution -	- EPA 36	EPA 36	Hardness as CaCO3-SM 2340B	Copper, dissolved - EPA 200.8	200.8	A 200.8	8.		
Laboratory:		Requested C	ompletion Date:	Total No.		ners:	d So	Ë	sper	istril	rus	rus	aCO	- pa	PA	EP	200	
Analytical Resources Inc.					2		apue	Se	e Su	ze D	ohds	ohds	as C	solv	al -	ved	EPA	
Lab Use:				Sample Type (see	Preser- vative?	Matrix (see	Total Suspended	Suspended Sediment - SMD3977	Total volatile Suspended SM2540-E	Particle size Distribution - ASTM 3977	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	ırdness	pper, dis	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	c, total - EPA 200.8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	To.	Sus	SM	ď	ř	0	Ĭ	ဝိ	ပိ	Zin	Zinc,	Lab
WUFF-IN		2/3/1	8 2308	С	N	SW	x	X	x	X	X	X	Х	X	Х	X	Х	
WUFF-OUT		2/3/18		С	N	SW	х	Х	Х	X	Х	X	Х	X	Х	X	Х	
						11-11			1 - 1			1-11						
				1					-	-								
																	7	
				+						-				-	-			
A .																		
Comments/Special Instructions:		<u>-</u>		1														
Send 1 liter to ETS, Inc 975 Tran	sport Way, Suite 2, Pe	taluma, CA	for PSD, TSS, a	nd TVSS.	PSD to	be run f	or >5	00, 50	0-125	, 125-	62.5,	52.5-4	, <4.					
Relinquished by (Name/CO/	Signature //		Date/Time	Rec	ceived By	Name/CO)		S	ignatur	e		-			Date/T	ime	=
ALEX SUENDSEN/HEC	Signature Signature		2/5/181	200 13	vando	n Fish	-/	ARI		0	K	/ I	F	1		2/5	1181	2000
Relinquished by (Name/CO/	Signature		Date/Time	Rei	ceived By	Name/CO)	1/	S	ignatur	е		-			Date/1	ime	
Cample Type: G-Grab. G-Composite	No. Will Code	A A:- C)A(-	Groundwater SE	Cadianak	50.5-11	SW S	-f \		10.10		×1.5. 8			2 011		· · · ·		





Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
20-Feb-2018 16:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18B0052-01	Water	03-Feb-2018 23:08	05-Feb-2018 12:00
WUFF-IN	18B0052-02	Water	03-Feb-2018 23:08	05-Feb-2018 12:00
WUFF-OUT	18B0052-03	Water	03-Feb-2018 23:08	05-Feb-2018 12:00
WUFF-OUT	18B0052-04	Water	03-Feb-2018 23:08	05-Feb-2018 12:00

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

Case Narrative

Sample receipt

Samples as listed on the preceding page were received February 5, 2018 under ARI workorder 18B0052. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis. The PSD and TSS analysis was subcontracted to ETS Labs. The SSC analysis was subcontracted to MTC.

Total Hardness - EPA Method 6010C

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

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total and Dissolved Metals - EPA Method 200.8

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A O-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery was within QC limits. The duplicate has a concentration <=5 times the reporting limit, and the replicate control limit defaults to +/- the reporting limit instead of 20% of the RPD. The duplicate has been flagged with a "L" qualifier. The results are advisory. No further corrective action was taken.

A T-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery was within QC limits. The duplicate has a high RPD. The duplicate was re-read to verify with results reported as is. The results are advisory. No further corrective action was taken.

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

Analytical Resources, Inc.

Printed: 2/5/2018 1:24:27PM

WORK ORDER

18B0052

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

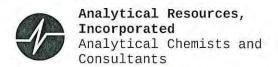
Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	рН
18B0052-01 A	HDPE NM, 1000 mL	
18B0052-01 B	HDPE NM, 1000 mL	
18B0052-01 C	HDPE NM, 1000 mL	
18B0052-01 D	Small OJ, 500 mL	
18B0052-01 E	Small OJ, 500 mL, 9N H2SO4	12 Dall
18B0052-01 F	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
18B0052-02 A	HDPE NM, 500 mL	>2 fail
18B0052-03 A	HDPE NM, 1000 mL	
18B0052-03 B	HDPE NM, 1000 mL	
18B0052-03 C	HDPE NM, 1000 mL	
18B0052-03 D	Small OJ, 500 mL	
18B0052-03 E	Small OJ, 500 mL, 9N H2SO4	LZ part
18B0052-03 F	HDPE NM, 500 mL, 1:1 HNO3	LZ park
18B0052-04 A	HDPE NM, 500 mL	72 fail

Preservation Confirmed By

2/5/18



Cooler Receipt Form

ARI Client: Hevver	4	Project Name: A Yd I	0 11-	ternas	Arone
COC No(s):	, NA	Delivered by: Fed-Ex UPS Cour	ier Hand Delive		
Assigned ARI Job No:	20057	Tracking No:		20	NA
Preliminary Examination Phase	:	Tracking No			INA
Were intact, properly signed and		to the outside of to cooler?	,	YES	NO
Were custody papers included w				YES?	NO
Were custody papers properly fi				120	NO
Temperature of Cooler(s) (°C) (r Time:				1231)	NO
If cooler temperature is out of co	impliance fill out form 00070F		Temp Gun ID#	1: 17002	2565
Cooler Accepted by:	BF	Date: 2/5/18 Time	1200	ク	
		s and attach all shipping documents			
Log-In Phase:					
Was a temperature blank include	ed in the cooler?			YES	NO
What kind of packing material		ap Wet Ice Gel Packs Baggies Foam	Block Paper O		
Was sufficient ice used (if appro			NA	(YES)	NO
Were all bottles sealed in individ	ual plastic bags?			YES	NO
				YES	NO
Were all bottle labels complete a	and legible?			(YES)	NO
Did the number of containers list	ed on COC match with the nur	mber of containers received?		(YES-)	NO
				YES	NO
				YES	NO
		preservation sheet, excluding VOCs)	NA	(ES)	NO
Were all VOC vials free of air bu		A CONTROL OF STATE OF	NA	YES	NO
			- IVI	YES	NO
			(NA)		140
	1	1 1.0		Calibban (FT
Was Sample Split by ARI : N Samples Logged by:		te: 7.18 / 18 Time:	318	Split by: <u>5</u>	CF
		ger of discrepancies or concerns **			
0 1 10 0 0		1 0 (ID D III			
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Samp	le ID on CO	C
11111 - 111 (B)	2.5				
Additional Notes, Discrepance	es, a resolutions.				
	ate:	Small → "sm" (<2 mm)			
Small Air Bubbles Peabubb	E 010E 110 E00000				
	0 000	Peabubbles \rightarrow "pb" (2 to < 4 mm)			
,		Large → "lg" (4 to < 6 mm)			
· · · · · · · · · · · · · · · · · · ·		Headspace → "hs" (>6 mm)			

Printed: 2/5/2018 1:24:27PM

WORK ORDER

18B0052	
I A ISUUD /	

Client: Herrera Environmental Consultants Project Manager: Amanda Volgardsen

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

Preservation Confirmation

Container ID	Container Type	рН
18B0052-01 A	HDPE NM, 1000 mL	
18B0052-01 B	HDPE NM, 1000 mL	
18B0052-01 C	HDPE NM, 1000 mL	
18B0052-01 D	Small OJ, 500 mL	
18B0052-01 E	Small OJ, 500 mL, 9N H2SO4	12 Dass
18B0052-01 F	HDPE NM, 500 mL, 1:1 HNO3	62 pall
18B0052-02 A	HDPE NM, 500 mL	>2 fail
18B0052-03 A	HDPE NM, 1000 mL	
18B0052-03 B	HDPE NM, 1000 mL	
18B0052-03 C	HDPE NM, 1000 mL	
18B0052-03 D	Small OJ, 500 mL	
18B0052-03 E	Small OJ, 500 mL, 9N H2SO4	LZ Gall
18B0052-03 F	HDPE NM, 500 mL, 1:1 HNO3	LZ Days
18B0052-04 A	HDPE NM, 500 mL	72 fail

Preservation Confirmed By

2/5/18
2/8/18 PP
filtered + preserved

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project:	Hydro International (18B0052)	Date Received:	February 6, 2018
Project #:	16T001-035	Sampled By:	Others
Client :	Analytical Resources, Inc.	Date Reported:	February 16, 2018
Source:	Multiple	Tested By:	B. Goble
MTC Sample#:	Multiple		

CASE NARRATIVE

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

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

Reviewed by:

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

 $\begin{tabular}{ll} \textbf{Regional Offices:} & Olympia \sim 360.534.9777 & Bellingham \sim 360.647.6111 & Silverdale \sim 360.698.6787 & Tukwila \sim 206.241.1974 \\ & & Visit our website: www.mtc-inc.net \\ \end{tabular}$

Page 10 of 28 18B0052 ARISample FINAL 20 Feb 2018 1605

Materials Testing & Consulting, Inc.



Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Project: Hydro International (18B0052) Project #: 16T001-035

Date Received: February 6, 2018 Sampled by: Others

Tested by: B. Goble Date Tested: February 9, 2018

> Suspended Sediment Concentration ASTM D3977 Method C

Client: Analytical Resources, Inc.

_						
	Client Sample ID	MTC Sample ID	Sampling Date	Coarse Fraction SSC (>63µm) (mg/L)	FineFraction SSC (<63µm) (mg/L)	Total Suspended Sediment Concentration (mg/L)
	WUFF-IN	S18-0147	2/3/2018	54.9	18.4	73.4
	WUFF-OUT	S18-0148	2/3/2018	2.7	13.8	16.4

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

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980 **Regional Offices:** Olympia ~ 360.534.9777

Bellingham ~ 360.647.6111

Silverdale ~ 360.698.6787

Tukwila ~ 206.241.1974

Visit our website: www.mtc-inc.net



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring

-Analytical Labs

-Technical Support

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

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

OMPANY:	Analytical Resources, Inc., 4611 S. 134th Place, Suite	100, Tukwila, W	/A 98168		ANALYST(S)	SUPERVISOR
ATTN:	Amanda Volgardsen	DATE	DATE	DATE	S. Santos	D. Jacobson
JOB:	Hydro International Up-Flo Filter	COLLECTED	RECEIVED	COMPLETED	L. Quijano	LAB DIRECTOR
SITE:	Oregon-Washington	2/3/2018	2/7/2018	2/19/2018		G.S. Conrad, PhD

SITE:	Oregon-Wa	shington			2/3/2018	2/7/2018	2/19/2018		G.S. Conrad,Phl
	PA	RTICLE SIZ	E DISTRIBUTI	ON (PSD), TS	S & TVSS AN	IALYSIS & R	EPORT – 5 P.	ART	1
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	SUSPENDED SOLIDS mg/l @ ≥500 µ	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SUSPENDED SEDIMENT CONC TSS mg/l
07657-1	HI-57HEC/RW 18B00		3.0 9.7%	3.0 9.7%	2.0 6.5%	Total SSC by	15.7 51.0% y Summation →	7.1 23.1% 30.8	27.5
07657-2	HI-58HEC/RW 18B00		0.2 1.2%	0.7 4.3%	0.7 4.3%	Total SSC by	9.5 59.0% y Summation →	5.0 31.1% 16.1	16.0
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
LAB SAMPLE NUMBER	SAMPLE	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE) SOLIDS (TVSS) mg/l
07657-1	HI-57HEC/RW 18B00								19.5
07657-2	HI-58HEC/RW 18B00							4	11.0
	-11			COMM					

COMMENTS

The matrix has a very low concentration of TSS particles amounting to about 30 ppm in the input sample; and the output sample is more than half that amount. The overall average reduction in TSS is just under 45% of the total TSS. The range is fairly wide in this case at 41.8%-47.7% (TSS by analytical method vs TSS by summation). The reductions in each fraction vary a great deal as follows: 93.3%, 76.7%, 65.0%, 39.5%, and 29.6%. Notice that for the input sample the mode is at the 4-63 μ fraction at just over half of the total TSS (51%); there is a minor mode at the finest fraction which is a little under one-quarter (~23%); all other fractions are much lower in proportion being more or less in the 7%-10% range. Thus, the size distribution is skewed low, but is not right at the bottom of the range. Based on the overall distribution, it seems most probable that the majority of the 4-63 μ fraction would be below 20 μ in size. The TVSS levels are actully very close this time. The range for the input sample is about 63%-71%; and for the output sample is practically nil at 68.3%-68.8%. The overall averages for the two are output at 67.1% TVSS; input @ 68.5% TVSS. The RPDs are very good to excellent as follows: $\pm 5.7\%$; & $\pm 0.3\%$.

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

Page 11 of 28 18B0052 ARISample FINAL 20 Feb 2018 1605



Herrera Environmental Consultants Project: Hydro International

Project Number: 13-05605-000 2200 6th Avenue, Suite 1100 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 20-Feb-2018 16:05

WUFF-IN 18B0052-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 02/03/2018 23:08

Instrument: ICPMS2 Analyzed: 08-Feb-2018 16:43

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

> Preparation Batch: BGB0162 Sample Size: 25 mL

Prepared: 08-Feb-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	33.0	ug/L	
Zinc	7440-66-6	1	4.00	99.9	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-IN 18B0052-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C Sampled: 02/03/2018 23:08

Instrument: ICP2 Analyzed: 09-Feb-2018 12:47

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BGB0122 Sample Size: 25 mL Prepared: 06-Feb-2018 Final Volume: 25 mL

Reporting Limit CAS Number Dilution Analyte Result Units Notes 7440-70-2 0.0500 Calcium 11.9 mg/L7439-95-4 0.0500 1 Magnesium 2.55 mg/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-IN 18B0052-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 02/03/2018 23:08

Instrument: UV1800-2 Analyzed: 05-Feb-2018 17:24

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGB0091 Sample Size: 50 mL Prepared: 05-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

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

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

Preparation Batch: BGB0292 Sample Size: 25 mL Prepared: 13-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0160 0.0840 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-IN 18B0052-01 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 02/03/2018 23:08

Instrument: [CALC] Analyzed: 09-Feb-2018 12:47

Sample Preparation: Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 06-Feb-2018 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	40.1	mg/L	-

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-IN 18B0052-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 02/03/2018 23:08

Instrument: ICPMS1 Analyzed: 12-Feb-2018 16:18

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

Preparation Batch: BGB0205 Sample Size: 25 mL

Prepared: 09-Feb-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.500	10.7	ug/L	
Zinc, Dissolved	7440-66-6	1	4.00	31.3	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-OUT 18B0052-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 02/03/2018 23:08

Instrument: ICPMS2 Analyzed: 08-Feb-2018 16:47

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

Preparation Batch: BGB0162 Prepared: 08-Feb-2018 Sample Size: 25 mL Final Volume: 25 mL

Reporting Limit CAS Number Dilution Analyte Result Units Notes 7440-50-8 0.500 Copper 22.7 ug/L 7440-66-6 1 4.00 Zinc 63.0 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-OUT 18B0052-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C Sampled: 02/03/2018 23:08

Instrument: ICP2 Analyzed: 09-Feb-2018 12:51

Sample Preparation: Preparation Method: TWC EPA 3010A

Preparation Batch: BGB0122 Sample Size: 25 mL Prepared: 06-Feb-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	11.6	mg/L	
Magnesium	7439-95-4	1	0.0500	2.46	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-OUT 18B0052-03 (Water)

**7 4			
Wet	Che	emis	trv

Method: SM 4500-P E-99 Sampled: 02/03/2018 23:08

Instrument: UV1800-2 Analyzed: 05-Feb-2018 17:26

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGB0091 Sample Size: 50 mL Prepared: 05-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

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

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

Preparation Batch: BGB0292 Sample Size: 25 mL Prepared: 13-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0160 0.0460 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-OUT 18B0052-03 (Water)

Calculation

Method: SM 2340 B-97 Sampled: 02/03/2018 23:08

Instrument: [CALC] Analyzed: 09-Feb-2018 12:51

Sample Preparation: Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 06-Feb-2018 Final Volume: 1

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Hardness		1	0.331	39.2	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

WUFF-OUT 18B0052-04 (Water)

Metals and Metallic Compounds (dissolved)

Zinc, Dissolved

Method: EPA 200.8 Sampled: 02/03/2018 23:08

Instrument: ICPMS1 Analyzed: 12-Feb-2018 16:22

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

Preparation Batch: BGB0205 Prepared: 09-Feb-2018 Sample Size: 25 mL Final Volume: 25 mL

1

4.00

31.1

ug/L

7440-66-6

Analytical Resources, Inc.

Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

Metals and Metallic Compounds - Quality Control

Batch BGB0122 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0122-BLK1)			Prepa	ared: 06-Feb	-2018 Ana	alyzed: 09-1	Feb-2018 11	:06		
Calcium	ND	0.0500	mg/L							U
Magnesium	ND	0.0500	mg/L							U
LCS (BGB0122-BS1)			Prepa	ared: 06-Feb	-2018 Ana	alyzed: 09-1	Feb-2018 11	:43		
Calcium	9.98	0.0500	mg/L	10.0		99.8	80-120			
Magnesium	10.1	0.0500	mg/L	10.0		101	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

Metals and Metallic Compounds - Quality Control

Batch BGB0162 - 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 (BGB0162-BLK1)				Prepa	ared: 08-Feb	-2018 Ana	ılyzed: 08-F	eb-2018 16	:25		
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 (BGB0162-BS1)				Prepa	ared: 08-Feb	-2018 Ana	ılyzed: 08-I	Feb-2018 17	:12		
Copper	63	24.9	0.500	ug/L	25.0		99.5	80-120			
Copper	65	26.2	0.500	ug/L	25.0		105	80-120			
Zinc	66	79.9	4.00	ug/L	80.0		99.8	80-120			
Zinc	67	75.3	4.00	ug/L	80.0		94.2	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Feb-2018 16:05

Project: Hydro International

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGB0205 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0205-BLK1)				Prepa	ared: 09-Feb	-2018 Ana	lyzed: 09-F	eb-2018 15	:12		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BGB0205-BS1)				Prepa	ared: 09-Feb	-2018 Ana	lyzed: 09-F	Feb-2018 15	:30		
Copper, Dissolved	63	27.3	0.500	ug/L	25.0		109	80-120			
Copper, Dissolved	65	27.4	0.500	ug/L	25.0		109	80-120			
Zinc, Dissolved	66	86.6	4.00	ug/L	80.0		108	80-120			
Zinc, Dissolved	67	84.3	4.00	ug/L	80.0		105	80-120			

Analytical Resources, Inc.

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

Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 20-Feb-2018 16:05

Wet Chemistry - Quality Control

Batch BGB0091 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0091-BLK1)			Prepa	red: 05-Feb	-2018 Ana	ılyzed: 05-l	Feb-2018 17	7:23		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BGB0091-BS1)			Prepa	red: 05-Feb	-2018 Ana	ılyzed: 05-l	Feb-2018 17	7:24		
Orthophosphorus	0.148	0.0040	mg-P/L	0.150		98.7	90-110			
Duplicate (BGB0091-DUP1)	Source:	18B0052-01	Prepa	red: 05-Feb	-2018 Ana	ılyzed: 05-l	Feb-2018 17	7:24		
Orthophosphorus	0.0130	0.0040	mg-P/L		0.0100			26.10	20	L
Matrix Spike (BGB0091-MS1)	Source:	18B0052-01	Prepa	red: 05-Feb	-2018 Ana	ılyzed: 05-l	Feb-2018 17	7:25		
Orthophosphorus	0.114	0.0040	mg-P/L	0.0999	0.0100	104	75-125			

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

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

Reported: 20-Feb-2018 16:05

Wet Chemistry - Quality Control

Batch BGB0292 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0292-BLK1)			Prepa	ared: 13-Feb	-2018 Ana	ılyzed: 14-	Feb-2018 11	:22		
Total Phosphorus	ND	0.0080	mg-P/L			•				U
Blank (BGB0292-BLK2)			Prepa	ared: 13-Feb	-2018 Ana	ılyzed: 14-	Feb-2018 11	:43		
Total Phosphorus	ND	0.0080	mg-P/L							U
LCS (BGB0292-BS1)			Prepa	ared: 13-Feb	o-2018 Ana	ılyzed: 14-	Feb-2018 11	:23		
Total Phosphorus	0.144	0.0080	mg-P/L	0.150		96.0	90-110			
LCS (BGB0292-BS2)			Prepa	ared: 13-Feb	o-2018 Ana	ılyzed: 14-	Feb-2018 11	:44		
Total Phosphorus	0.147	0.0080	mg-P/L	0.150		98.0	90-110			
Duplicate (BGB0292-DUP1)	Source:	18B0052-01	Prepa	ared: 13-Feb	o-2018 Ana	ılyzed: 14-	Feb-2018 11	:25		
Total Phosphorus	0.114	0.0080	mg-P/L		0.0840			30.30	20	*
Matrix Spike (BGB0292-MS1)	Source:	18B0052-01	Prepa	ared: 13-Feb	-2018 Ana	ılyzed: 14-	Feb-2018 11	:26		
Total Phosphorus	1.84	0.160	mg-P/L	2.00	0.0840	92.1	75-125			D

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

Analytical Resources, Inc.





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

Reported: 20-Feb-2018 16:05

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	

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

EPA 6010C in Water

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

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

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

Analytical Resources, Inc.



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

Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 20-Feb-2018 16:05

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
L	Analyte concentration is \leq =5 times the reporting limit and the replicate control limit defaults to \pm -RL instead of 20% RPD
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

Analyte NOT DETECTED at or above the reporting limit NR Not Reported

ND

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.

February 13, 2018

Data_18B0197

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BGB0371-BLK1	Blank	13-05605-000	Water			02/15/2018	02/15/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BGB0371-BS1	LCS	13-05605-000	Water			02/15/2018	02/15/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.155		mg-P/L
18B0197-01	WUFF-IN	13-05605-000	Surface Water	02/14/2018	02/14/2018	02/15/2018	02/15/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0170		mg-P/L
18B0197-02	WUFF-OUT	13-05605-000	Surface Water	02/14/2018	02/14/2018	02/15/2018	02/15/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0150		mg-P/L
BGB0613-BLK1	Blank	13-05605-000	Water			02/26/2018	02/27/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0160	U	mg-P/L
BGB0613-BLK2	Blank	13-05605-000	Water			02/26/2018	02/27/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0160	U	mg-P/L
BGB0613-BS1	LCS	13-05605-000	Water			02/26/2018	02/27/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.150		mg-P/L
BGB0613-BS2	LCS	13-05605-000	Water			02/26/2018	02/27/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.149		mg-P/L
18B0197-01	WUFF-IN	13-05605-000	Surface Water	02/14/2018	02/14/2018	02/26/2018	02/27/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0960		mg-P/L
18B0197-02	WUFF-OUT	13-05605-000	Surface Water	02/14/2018	02/14/2018	02/26/2018	02/27/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0860		mg-P/L



28 February 2018

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)

18B0197

Amanda

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Project Manager, Volgardsen, email=amanda.volgardsen@arilab s.com

Date: 2018.02.28 11:07:50 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.



Chain of Custody Record

Project Name:	Projec	ct Number:	Client:							-	Analyse	s Reque	sted			
Hydro International Up-flo Fil	ter 13-0	5605-000	Herrera Envi	onment	al				1	2						
Report To:			Copy To:		0		2									
Dylan Ahearn							SM 2540D		NE S	6.0	5.3					
Sampled By:			Delivery Metho	i:			SM			36	1 36					
A. SVENDSEN			IN TOTE 1	NICE	=		-spil		1	- EPA 365.3	EP/					
Laboratory:		Requested Co	mpletion Date:	The second of the second	of Contain	ners:	oS b		1	-sn	rus.					
Analytical Resources Inc.				3	2		apue		, C	oha	- oqa					
Lab Use:			Sample		Preser- vative?	Matrix (see	Total Suspended Solids-	Particle size Distribution - ASTM 3977		Total phosphorus	rthophos	Orthophosphorus - EPA 365.3				Lab ID No.
Sample	ID	Date	Time	codes)	(Y/N)	codes)	Į.		ď	ř	0					Lab
WUFF-IN		2/14/18	3 0132	С	N	SW	х		X	X	X					
WUFF-OUT		2/14/18	0138	С	N	SW	х		X	Х	Х					
	- E															
		-						-		7				-		
<u> </u>										-						
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				71												
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			-								-		-			
				11												
Comments/Special Instructions:																
Send 1 liter to ETS, Inc 975 Tr	ansport Way, Suite 2, Pe	taluma, CA f	for PSD, TSS, a	nd TVSS.	PSD to	be run f	for >50	00, 500	0-125, 12	5-62.5	, 62.5	-4, <4.				
Relinquished by (Name/CO/ Acax SvENDSEL/ (HEC	Signature Sh		Date/Time	05 G	ceived By	(Name/CO		AI	n Signat	ure	~	1		-	Date/Tin	ne 12
Relinquished by (Name/CO/	Signature		Date/Time	Re	ceived By	(Name/CO	0)	w	Signat		1				Date/Tin	e
The second secon	A - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3								10.50							

da. Hydro upflo COC Composite Samplereduced.docx

HERRERA



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Feb-2018 11:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18B0197-01	Water	14-Feb-2018 01:38	14-Feb-2018 12:05
WUFF-OUT	18B0197-02	Water	14-Feb-2018 01:38	14-Feb-2018 12:05

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Feb-2018 11:07

Case Narrative

Sample receipt

Samples as listed on the preceding page were received February 14, 2018 under ARI workorder 18B0197. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis. The PSD and TSS analysis was subcontracted to ETS Labs.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Printed: 2/14/2018 5:23:24PM

WORK ORDER

18B0197

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

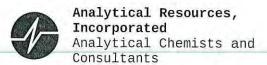
Project: Hydro International

Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	рН
18B0197-01 A	Large OJ, 1000 mL	
18B0197-01 B	Large OJ, 1000 mL	
18B0197-01 C	Small OJ, 500 mL	
18B0197-01 D	Small OJ, 500 mL, 9N H2SO4	LZ Dags
18B0197-02 A	Large OJ, 1000 mL	1 44
18B0197-02 B	Large OJ, 1000 mL	
18B0197-02 C	Small OJ, 500 mL	
18B0197-02 D	Small OJ, 500 mL, 9N H2SO4	Lz pag

Preservation Confirmed By



Cooler Receipt Form

ARI Client: Hevera		Project Name: Http://o	Inter	nata	100 A
	NA	Delivered by: Fed-Ex UPS Cou			100
Assigned ARI Job No: 1880197		Tracking No:		- Vereu Other.	- 10
Preliminary Examination Phase:		ridding No.			- NA
Were intact, properly signed and dated custody seals	attached to t	he outside of to cooler?		YES	NO
Were custody papers included with the cooler?				(FA	NO
Were custody papers properly filled out (ink, signed, e				VES)	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 Time:					110
If cooler temperature is out of compliance fill out form	00070F		Temp Gun ID	#: DOC	2565
Cooler Accepted by:		Date: 7/14/19 Time	e: 17 0 C		
Complete custo	dy forms ar	nd attach all shipping documents	1000		
Log-In Phase:					
Was a temperature blank included in the cooler?				VEC	.6)
What kind of packing material was used? Bu			Plack Paper (YES	ONO
Was sufficient ice used (if appropriate)?			NA	(YES)	NO
Were all bottles sealed in individual plastic bags?			N/A	YES	(NO)
Did all bottles arrive in good condition (unbroken)?					NO
Were all bottle labels complete and legible?				YES	NO
Did the number of containers listed on COC match with				YES	NO
Did all bottle labels and tags agree with custody papers				YES	
Were all bottles used correct for the requested analyse				VES VES	NO
Do any of the analyses (bottles) require preservation?			N/A		NO
Were all VOC vials free of air bubbles?			NA	YES	NO
		36.500.00.000.000.000.000.000.000	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle? .				YES	NO
Date VOC Trip Blank was made at ARI			(NA)		-
Was Sample Split by ARI: NA (YES) Date/7 Samples Logged by:	Date:	9 7 114 118 Times	SEF	Split by:	719
		of discrepancies or concerns **	A I	10	(, ,
Sample ID on Bottle Sample ID on	COC	Sample ID on Bottle	Samp	ole ID on CC	C
Arm to a second					
Additional Notes, Discrepancies, & Resolutions:					
					1.1
P					
By: Date:		small → "sm" (< 2 mm)			
Small Air Bubbles Peabubbles' LARGE Air Bu	000045	Peabubbles → "pb" (2 to < 4 mm)			
		$arge \Rightarrow "lg" (4 \text{ to } < 6 \text{ mm})$			
		leadspace → "hs" (> 6 mm)			
	1 17	icauspace 7 IIS (> 0 IIIII)			



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring -Analytical Labs

ANALYST(S) SUPERVISOR

-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 100, Tukwila, WA 98168

2/16/2018 IALYSIS & SUSPENDE SOLIDS mg/l @ 32 Total SSC	REPORT – 5 P D SUSPENDED SOLIDS μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	SUSPENDED SOLIDS mg/l @ 1 µ 6.8 22.5%	D. Jacobson LAB DIRECTOF G.S. Conrad,Phi SUSPENDED SEDIMENT CONC TSS mg/l 28.0
2/16/2018 IALYSIS & SUSPENDE SOLIDS mg/l @ 32 Total SSC	3 2/27/2018 REPORT – 5 P D SUSPENDED SOLIDS μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	SUSPENDED SOLIDS mg/l @ 1 µ 6.8 22.5% 30.2	G.S. Conrad,Phi SUSPENDED SEDIMENT CONG TSS mg/l
SUSPENDE SOLIDS mg/l @ 32 Total SSC	REPORT – 5 P D SUSPENDED SOLIDS μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	SUSPENDED SOLIDS mg/l @ 1 µ 6.8 22.5% 30.2	SUSPENDED SEDIMENT CON TSS mg/l
SUSPENDE SOLIDS mg/l @ 32 Total SSC	D SUSPENDED SOLIDS μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	SUSPENDED SOLIDS mg/l @ 1 µ 6.8 22.5% 30.2	SEDIMENT CON TSS mg/l
SUSPENDE SOLIDS mg/l @ 32 Total SSC	D SUSPENDED SOLIDS μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	SUSPENDED SOLIDS mg/l @ 1 µ 6.8 22.5% 30.2	SEDIMENT CON TSS mg/l
SOLIDS mg/l @ 32 Total SSC	SOLIDS µ mg/l @ 4 µ 12.5 41.4% by Summation → 8.9 54.9%	SOLIDS mg/l @ 1 µ 6.8 22.5% 30.2	SEDIMENT CON TSS mg/l
mg/l @ 32 Total SSC	μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	mg/l @ 1 μ 6.8 22.5% 30.2	TSS mg/l
mg/l @ 32 Total SSC	μ mg/l @ 4 μ 12.5 41.4% by Summation → 8.9 54.9%	mg/l @ 1 μ 6.8 22.5% 30.2	TSS mg/l
Total SSC	41.4% by Summation → 8.9 54.9%	22.5% 30.2	28.0
Total SSC	41.4% by Summation → 8.9 54.9%	22.5% 30.2	28.0
Total SSC	by Summation → 8.9 54.9%	30.2	
Total SSC	8.9 54.9%		
	54.9%	4.4	4
			16.2
		27.2%	
	by Summation →	16.2	
#DIV/0!	#DIV/0!	#DIV/0!	
	by Summation →		
10101 000	by Carmination -	0.0	
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Total SSC	by Summation \rightarrow	0.0	
COLOR	TOTAL IRON	TOTAL	. VOLATILE
			SOLIDS (TVSS
	The second second	Control of the Contro	mg/l
	· · · · · · · · · · · · · · · · · · ·		mg/i
	Total SSC COLOR PPAREN	Total SSC by Summation →	Total SSC by Summation → 0.0 COLOR TOTAL IRON TOTAL PPARENT Fe (diss.) SUSPENDED

COMMENTS

The matrix has a very low concentration of TSS particles amounting to just under 30 ppm in the input sample; and the output sample is more than half that amount. The overall average reduction in TSS is just over 44% of the total TSS. And the range is moderate in this case at 42.1%-46.4% (TSS by analytical method vs TSS by summation). The reductions in each fraction vary a great deal as follows: 88.3%, 68.8%, 29.4%, 28.8%, and 35.3%. Notice that for the input sample the mode is at the 4-63 μ fraction at just over two-fifths of the total TSS (~41%); there are minor modes at about one-fifth of the TSS each at the 1-4 μ fraction (22.5%) and the \geq 500 μ fraction (~20%); all other fractions are much lower in proportion being more or less (@ ~6%-11%). Thus, the size distribution is skewed low, but is not right at the bottom of the range. Based on the overall distribution, it may be that the majority of the 4-63 μ fraction could be below ~30 μ in size. The RPDs are excellent in both cases as follows: \pm 3.8%; & \pm 0.0%.

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



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Feb-2018 11:07

WUFF-IN 18B0197-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 02/14/2018 01:38

Instrument: UV1800-2 Analyzed: 15-Feb-2018 13:05

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGB0371 Sample Size: 50 mL Prepared: 15-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0170 mg-P/L

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

Preparation Batch: BGB0613 Sample Size: 25 mL Prepared: 26-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0160 0.0960 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Feb-2018 11:07

WUFF-OUT 18B0197-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 02/14/2018 01:38

Instrument: UV1800-2 Analyzed: 15-Feb-2018 13:06

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGB0371 Sample Size: 50 mL Prepared: 15-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Limit Result Units Notes

Orthophosphorus 1426-54-42 1 0.0040 0.0150 mg-P/L

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

Preparation Batch: BGB0613 Sample Size: 25 mL Prepared: 26-Feb-2018 Final Volume: 50 mL

Analyte CAS Number Dilution Result Units Notes

Total Phosphorus 7723-14-0 1 0.0160 0.0860 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Feb-2018 11:07

Wet Chemistry - Quality Control

Batch BGB0371 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: SK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0371-BLK1)			Prepa	ared: 15-Feb	-2018 Ana	alyzed: 15-I	Feb-2018 12	2:43		
Orthophosphorus	ND	0.0040	mg-P/L							U
LCS (BGB0371-BS1)			Prepa	ared: 15-Feb	-2018 Ana	alyzed: 15-I	Feb-2018 12	2:46		
Orthophosphorus	0.155	0.0040	mg-P/L	0.150		103	90-110			

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn28-Feb-2018 11:07

Wet Chemistry - Quality Control

Batch BGB0613 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0613-BLK1)			Prepa	red: 26-Feb	-2018 Ana	alyzed: 27-F	Feb-2018 16	5:18		
Total Phosphorus	ND	0.0160	mg-P/L							U
Blank (BGB0613-BLK2)			Prepa	red: 26-Feb	-2018 Ana	alyzed: 27-F	Feb-2018 16	5:25		
Total Phosphorus	ND	0.0160	mg-P/L							U
LCS (BGB0613-BS1)			Prepa	red: 26-Feb	-2018 Ana	alyzed: 27-F	Feb-2018 16	:19		
Total Phosphorus	0.150	0.0160	mg-P/L	0.150		100	90-110			
LCS (BGB0613-BS2)			Prepa	red: 26-Feb	-2018 Ana	alyzed: 27-F	Feb-2018 16	5:26		
Total Phosphorus	0.149	0.0160	mg-P/L	0.150		99.3	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Feb-2018 11:07

Certified Analyses included in this Report

Analyte Certifications

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

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

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

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

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 28-Feb-2018 11:07

Notes and Definitions

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

* 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.

February 28, 2018

Data_18C0025

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BGC0114-BLK1	Blank	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.100	U	mg/L
BGC0114-BS1	LCS	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.61		mg/L
BGC0114-BSD1	LCS Dup	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.27		mg/L
18C0025-01	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/06/2018	03/09/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	1.27		mg/L
18C0025-02	WUFF-OU	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/06/2018	03/09/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.646		mg/L
BGC0114-BLK1	Blank	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
BGC0114-BS1	LCS	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
BGC0114-BSD1	LCS Dup	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
18C0025-01	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/06/2018	03/09/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	4.10		mg/L
18C0025-02	WUFF-OU	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/06/2018	03/09/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	1.34		mg/L
BGC0114-BLK1	Blank	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx	84-15-1	o-Terphenyl	75.9		%
BGC0114-BS1	LCS	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx	84-15-1	o-Terphenyl	89.5		%
BGC0114-BSD1	LCS Dup	13-05605-000	Water			03/06/2018	03/09/2018	NWTPH-Dx	84-15-1	o-Terphenyl	76.7		%
18C0025-01	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/06/2018	03/09/2018	NWTPH-Dx	84-15-1	o-Terphenyl	84.8		%
18C0025-02	WUFF-OU	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/06/2018	03/09/2018	NWTPH-Dx	84-15-1	o-Terphenyl	80.1		%



12 March 2018

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)

18C0025

Amanda Volgardsen Inc., ou=Project Manager,

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, cn=Amanda Volgardsen, email=amanda.volgardsen@arilab s.com

Date: 2018.03.12 14:14:41 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.



Chain of Custody Record

Project Name:	Proje	ct Number:	Client:								Analyse	s Reque	sted			
Hydro International Up-flo Filter	13-0	5605-000	Herrera Envi	ronment	al											
Report To:			Copy To:	20000			1									
Dylan Ahearn																
Sampled By:			Delivery Metho	a trace	livered		2									
Laboratory: Analytical Resources Inc.		Requested C	Completion Date:	Total No.	of Contain	ners:	ontaine									
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)	Na	ž								Lab
WUFF-IN		2 20 1	2 16:25	G	N	SW	2	X							111	
WUFF-OUT		2 12.11	8 (6:30	G	N	SW	2	х								
									3.9							
															+	
			_								-			-	+	
			-							-		-		-	-	
										_		-				
												-				
Comments/Special Instructions:																
Relinquished by (Name/CO/ Mghan Muller/ Herrer	Signature M. Mll	in	Date/Time	12:30 Re	4	Name/CO	/	7KI		gnature	lita	10		Date O3	Political A	30
Relinquished by (Name/CO/	Signature		Date/Time			Name/CO			Sig	gnature					e/Time	

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

HERRERA Page 1 of 1



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Mar-2018 14:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0025-01	Water	28-Feb-2018 16:25	01-Mar-2018 12:30
WUFF-OUT	18C0025-02	Water	28-Feb-2018 16:30	01-Mar-2018 12:30

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Mar-2018 14:14

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 1, 2018 under ARI work order 18C0025. For details regarding sample receipt, please refer to the Cooler Receipt Form.

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

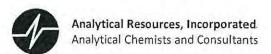
The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.



Cooler Receipt Form

ARI Client: Herrero	7	Project Name:	y Internation
COC No(s):	NA	Delivered by: Fed-Ex UPS Cour	ier Hand Delivered Other:
Assigned ARI Job No: (2)	COZC	Tracking No:	
Preliminary Examination Phase	:	rracking No.	NA
Were intact, properly signed and		to the outside of to cooler?	YES NO
Were custody papers included w			
Were custody papers properly fil			VES) NO
Temperature of Cooler(s) (°C) (r		A -	YES NO
If cooler temperature is out of co	mpliance fill out form 00070F		Temp Gun ID#: MOOS 20
Cooler Accepted by:	33W	Date:	100
		s and attach all shipping documents	
Log-In Phase:			
Was a temperature blank include	ed in the cooler?		YES (NO)
		ap Wet Ice) Gel Packs Baggies Foam I	(1.5)
Was sufficient ice used (if approp			
	and the second and second the second second of		YES NO
			YES NO
			NO NO
		mber of containers received?	
Did all bottle labels and tags agre	e with custody papers?	***************************************	YES NO
Were all bottles used correct for	the requested analyses?		YES NO
Do any of the analyses (bottles)	equire preservation? (attach p	preservation sheet, excluding VOCs)	NA YES NO
Were all VOC vials free of air but	obles?	Осторичения	NA YES NO
Was sufficient amount of sample	sent in each bottle?		YES) NO
Date VOC Trip Blank was made-	at ARI		NA
Was Sample Split by ARI : N		Equipment:	Split by:
Trab campio opin by ritti.	Date/Illie	Cdulphient.	Split by:
Samples Logged by:	SET Da	te: 2/1 (19) Time:	357
	** Notify Project Manag	ger of discrepancies or concerns **	
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
Additional Notes, Discrepancie	s, & Resolutions:		
By: Da	te:		
Small Air Bubbles Peabubb		Small → "sm" (<2 mm)	
-2mm 2-4 mn	I DAILOF AN DORNER	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



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Mar-2018 14:14

WUFF-IN 18C0025-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx Sampled: 02/28/2018 16:25

Instrument: FID4 Analyzed: 09-Mar-2018 17:11

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BGC0114 Sample Size: 500 mL Prepared: 06-Mar-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	1.27	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	4.10	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	84.8	%	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Mar-2018 14:14

WUFF-OUT 18C0025-02 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx Sampled: 02/28/2018 16:30

Instrument: FID4 Analyzed: 09-Mar-2018 17:32

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BGC0114 Sample Size: 500 mL Prepared: 06-Mar-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	0.646	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	1.34	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	80.1	%	



Herrera Environmental Consultants

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

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

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 12-Mar-2018 14:14

Petroleum Hydrocarbons - Quality Control

Batch BGC0114 - EPA 3510C SepF

Instrument: FID4 Analyst: JGR

		Reporting		Spike	Source		%REC		RPD	
QC Sample/Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Blank (BGC0114-BLK1)			Prepa	ared: 06-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	3:20		
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.342		mg/L	0.450		75.9	50-150			
LCS (BGC0114-BS1)			Prepa	ared: 06-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	3:42		
Diesel Range Organics (C12-C24)	2.61	0.100	mg/L	3.00		86.9	56-120			
Surrogate: o-Terphenyl	0.403		mg/L	0.450		89.5	50-150			
LCS Dup (BGC0114-BSD1)			Prepa	ared: 06-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	4:03		
Diesel Range Organics (C12-C24)	2.27	0.100	mg/L	3.00		75.5	56-120	14.00	30	
Surrogate: o-Terphenyl	0.345		mg/L	0.450		76.7	50-150			

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: 12-Mar-2018 14:14

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-C24)	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	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Mar-2018 14:14

Notes and Definitions

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

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_18C0031

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BGC0062-BLK1	Blank	13-05605-000	Water			03/02/2018	03/02/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BGC0062-BS1	LCS	13-05605-000	Water			03/02/2018	03/02/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.145		mg-P/L
BGC0062-DUP1	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/02/2018	03/02/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0200	L	mg-P/L
BGC0062-MS1	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/02/2018	03/02/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.115		mg-P/L
18C0031-01	WUFF-IN		Surface Water	02/28/2018	03/01/2018	03/02/2018	03/02/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0160		mg-P/L
18C0031-02	WUFF-OUT	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/02/2018	03/02/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0220		mg-P/L
BGC0086-BLK1	Blank	13-05605-000	Water			03/05/2018	03/05/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0086-BS1	LCS	13-05605-000	Water			03/05/2018	03/05/2018	EPA 200.8	7440-50-8	Copper	28.3		ug/L
18C0031-01	WUFF-IN		Surface Water	02/28/2018	03/01/2018	03/05/2018		EPA 200.8	7440-50-8	Copper	41.1		ug/L
18C0031-02	WUFF-OUT	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/05/2018	03/05/2018	EPA 200.8	7440-50-8	Copper	20.3		ug/L
BGC0086-BLK1	Blank	13-05605-000				03/05/2018		EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0086-BS1	LCS	13-05605-000				03/05/2018		EPA 200.8	7440-50-8	Copper	28.4		ug/L
BGC0086-BLK1	Blank	13-05605-000				03/05/2018		EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BGC0086-BS1	LCS	13-05605-000				03/05/2018		EPA 200.8	7440-66-6	Zinc	88.6		ug/L
18C0031-01	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/05/2018		EPA 200.8	7440-66-6	Zinc	138		ug/L
18C0031-02	WUFF-OUT		Surface Water	02/28/2018	03/01/2018	03/05/2018		EPA 200.8	7440-66-6	Zinc	65.7		ug/L
BGC0086-BLK1	Blank	13-05605-000				03/05/2018		EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BGC0086-BS1	LCS	13-05605-000				03/05/2018		EPA 200.8	7440-66-6	Zinc	83.4		ug/L
BGC0202-BLK1	Blank	13-05605-000				03/08/2018		SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BGC0202-BLK2	Blank	13-05605-000				03/08/2018		SM 4500-P E-99		Total Phosphorus	0.0080	U	mg-P/L
BGC0202-BS1	LCS	13-05605-000				03/08/2018			7723-14-0	Total Phosphorus	0.151		mg-P/L
BGC0202-BS2	LCS	13-05605-000				03/08/2018		SM 4500-P E-99		Total Phosphorus	0.150		mg-P/L
18C0031-02	WUFF-OUT		Surface Water	02/28/2018	03/01/2018	03/08/2018		SM 4500-P E-99		Total Phosphorus	0.0560		mg-P/L
BGC0203-BLK1	Blank	13-05605-000				03/08/2018		SM 4500-P E-99		Total Phosphorus	0.0160	U	mg-P/L
BGC0203-BLK2	Blank	13-05605-000				03/08/2018		SM 4500-P E-99		Total Phosphorus	0.0160	U	mg-P/L
BGC0203-BS1	LCS	13-05605-000				03/08/2018		SM 4500-P E-99		Total Phosphorus	0.145		mg-P/L
BGC0203-BS2	LCS	13-05605-000				03/08/2018		SM 4500-P E-99		Total Phosphorus	0.144		mg-P/L
18C0031-01	WUFF-IN	13-05605-000	Surface Water	02/28/2018	03/01/2018	03/08/2018	03/09/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.112		mg-P/L



20 March 2018

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)

18C0031

N/A

Amanda Volgardsen

Digitally signed by Amanda
Volgardsen
DN: c=US, st=Washington,
l=Tukwila, o=Analytical Resources,
lnc., ou=Project Manager,
cn=Amanda Volgardsen,
email=amanda.volgardsen@arilab
s.com

Date: 2018.03.20 17:32:44 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.

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

Cert# 100006

PJLA Testing Accreditation # 661

Analytical Resources, Incorporated Analytical Chemists and Consultants

WORK ORDER

18C0031

Client: Herrera Environmental Consultants Project Manager: Amanda Volgardsen Project: Hydro International Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	рН		
18C0031-01 A	Small OJ, 500 mL			
18C0031-01 A 01	Small OJ, 500 mL			
18C0031-01 B	Small OJ, 500 mL, 9N H2SO4	62	004	
18C0031-01 C	Large OJ, 1000 mL		T-u,	
18C0031-01 D	Large OJ, 1000 mL			
18C0031-01 E	HDPE NM, 500 mL, 1:1 HNO3	42	100,65	
18C0031-02 A	Small OJ, 500 mL		7	
18C0031-02 A 01	Small OJ, 500 mL			
18C0031-02 B	Small OJ, 500 mL, 9N H2SO4	(2	vage	
18C0031-02 C	Large OJ, 1000 mL			
18C0031-02 D	Large OJ, 1000 mL			
18C0031-02 E	HDPE NM, 500 mL, 1:1 HNO3	42	0099	

Preservation Confirmed By

Cooler Receipt Form

ARICHIENT HUMEN	A				
		Project Name:		2000	
COC No(s):	(nma) NA	Delivered by: Fed-Ex UPS Cou	irier Hand Deliv	Vered Other:	_
Assigned ARI Job No	10051	Tracking No:			NA
Preliminary Examination Phase					_
Were intact, properly signed and	dated custody seals attached to	the outside of to cooler?		YES	(NO)
Were custody papers included w	vith the cooler?	COLLEGE COLLEG		MEST	NO
Temperature of Cooler(s) (°C) (n	fled out (ink, signed, etc.) recommended 2.0-6.0 °C for cher	A-		YES?	NO
If cooler temperature is out of co	impliance fill out form 00070F	-0/1/2	Temp Gun ID	# Doc	5200
Cooler Accepted by:	513h		e: 1230	2	
	Complete custody forms a	and attach all shipping documents			
_og-In Phase:					
Was a temperature blank include	ed in the cooler?			YES	NO
What kind of packing material		Wer Toe Gel Packs Baggies Foam	Block Paper (CNO
	priate)?		NA	(YES)	NO
	ual plastic bags?			YES	(NO)
Did all bottles arrive in good con-		(YES)	NO		
Were all bottle labels complete a	and legible?			RES	NO
Did the number of containers list		MEST	NO		
Did all bottle labels and tags agre		YES	(NOT)		
Were all bottles used correct for		(ES)	NO		
Do any of the analyses (bottles)	NA	(ES)	NO		
Were all VOC yials free of air but	NA	YES	NO		
Was sufficient amount of sample	sent in each bottle?	***************************************		(ES)	NO
Date VOC Trip Blank was made	at ARI		(NA)		
Was Sample Split by ARI: N	A RES Date/Time:3/1/	18 1645 Equipment: Ch.		Split by:	BF
amples Logged by:	BTDate:	3/1/18 Time:		1645	
	"Notify Project Manager	r of discrepancies or concerns **			
					_
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Samp	ple ID on CO	C
Additional Notes, Discrepance WVFF-IN WVFF-OVT	25, & Resolutions: 20C - 2/25/18 2 20C - 2/28/18 2	2:11 label - 3/1/18 2:18 label - 3/1/18	11:15		
		(2)			
	ate: 3/1//8	C 11.3 11 11 11 11			
Small Air Bubbles Peabubb	LANGE AN DOMESTS	Small → "sm" (<2 mm)			
	>4 mm	Peabubbles > "pb" (2 to < 4 mm)			
		Large → "lg" (4 to < 6 mm)			

Headspace → "hs" (> 6 mm)

Page 3 of 16 18C0031 ARISample FINAL 20 Mar 2018 1731



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0031-01	Water	28-Feb-2018 22:11	01-Mar-2018 12:30
WUFF-OUT	18C0031-02	Water	28-Feb-2018 22:18	01-Mar-2018 12:30

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 1, 2018 under ARI work order 18C0031. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis. The PSD and TSS analyses were subcontracted to ETS Labs.

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 method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

An O-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery was within QC limits. The duplicate has a concentration <=5 times the reporting limit, and the replicate control limit defaults to +/- the reporting limit instead of 20% of the RPD. The duplicate has been flagged with an "L" qualifier. The results are advisory. No further corrective action was taken.



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring -Analytical Labs

-Technical Support

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

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

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

ATTN: Amanda Volgardsen

JOB: Hydro International Up-Flo Filter

SITE: Oregon-Washington

ANALYST(S)

SUPERVISOR

DATE

DATE

COLLECTED RECEIVED COMPLETED

L. Quijano

LAB DIRECTOR

2/28/2018 3/7/2018 3/15/2018

G. S. Conrad PhD

SITE:	Oregon-Wa	shington			2/28/2018	3/7/2018	3/15/2018		G.S. Conrad,Phl
	PA	RTICLE SIZI	DISTRIBUTI	ON (PSD), TS	S & TVSS AN	IALYSIS & R	REPORT – 5 PA	ART	1
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER		SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS		SUSPENDED SEDIMENT CONG TSS mg/l
07694-1	HI-61HEC/RW 18C00		0.2 0.4%	1.5 3.1%	2.0 4.2%	Total SSC by	7.9 16.5% y Summation →	36.2 75.7% 47.8	46.0
07694-2 HI-62HEC/RW WUFF-OUT 18C0031-02		0.0 0.0%	0.5 7.9%	0.7 11.1%	Total SSC by	3.1 49.2% y Summation →	2.0 31.7% 6.3	5.5	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDE	VOLATILE D SOLIDS (TVSS) mg/l

COMMENTS

The matrix has a very low concentration of TSS particles amounting to under 50 ppm in the input sample; and the output sample is extremly low at roughly 5-6 ppm. The overall average reduction in TSS is just over 87% of the total TSS. And the range is tight in this case at 86.8%-88.0% (TSS by summation vs TSS by analytical method). The reductions in each fraction varies somewhat as follows: 100%, 66.7%, 65.0%, 60.8%, and 94.5%. Notice that for the input sample the mode is definitely at the 1-4 μ fraction at just over three-quaters of the total TSS (>75%). The next largest fraction is the 4-63 μ fraction (@ 16.5%); the other three fractions are much lower in proportion being at about 4% or less. Thus, the size distribution is skewed low, and is right at the bottom of the size range in this case. The RPDs are very good to excellent as follows: $\pm 1.9\%$; & $\pm 6.8\%$.

\\\\ 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.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

WUFF-IN 18C0031-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 02/28/2018 22:11

Instrument: ICPMS2 Analyzed: 05-Mar-2018 14:27

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

Preparation Batch: BGC0086 Prepared: 05-Mar-2018 Sample Size: 25 mL Final Volume: 25 mL

Reporting Limit CAS Number Dilution Analyte Result Units Notes 7440-50-8 0.500 Copper 41.1 ug/L 7440-66-6 1 4.00 Zinc 138 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

WUFF-IN 18C0031-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 02/28/2018 22:11

Instrument: UV1800-2 Analyzed: 02-Mar-2018 16:28

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0062 Sample Size: 50 mL Prepared: 02-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Limit Limit Analyte Dilution Result Units Notes Orthophosphorus 1426-54-42 1 0.0040 0.0040 0.0160 mg-P/L

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

Preparation Batch: BGC0203 Sample Size: 25 mL Prepared: 08-Mar-2018 Final Volume: 50 mL

Detection Reporting Analyte CAS Number Dilution Limit Limit Result Units Notes Total Phosphorus 7723-14-0 0.0080 0.0160 0.112 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

WUFF-OUT 18C0031-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 02/28/2018 22:18

Instrument: ICPMS2 Analyzed: 05-Mar-2018 14:32

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

Preparation Batch: BGC0086

Sample Size: 25 mL

Prepared: 05-Mar-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	20.3	ug/L	
Zinc	7440-66-6	1	4.00	65.7	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

WUFF-OUT 18C0031-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 02/28/2018 22:18

Instrument: UV1800-2 Analyzed: 02-Mar-2018 16:29

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0062 Sample Size: 50 mL Prepared: 02-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Limit Limit Analyte Dilution Result Units Notes Orthophosphorus 1426-54-42 1 0.0040 0.0040 0.0220 mg-P/L

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

Preparation Batch: BGC0202 Sample Size: 25 mL Prepared: 08-Mar-2018 Final Volume: 50 mL

Detection Reporting Analyte CAS Number Dilution Limit Limit Result Units Notes Total Phosphorus 7723-14-0 0.0080 0.0080 0.0560 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn20-Mar-2018 17:31

Metals and Metallic Compounds - Quality Control

Batch BGC0086 - 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 (BGC0086-BLK1)				Prepa	ared: 05-Mai	r-2018 Ana	alyzed: 05-1	Mar-2018 1	1:43		
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 (BGC0086-BS1)				Prepa	ared: 05-Mai	r-2018 Ana	alyzed: 05-1	Mar-2018 12	2:20		
Copper	63	28.3	0.500	ug/L	25.0		113	80-120			
Copper	65	28.4	0.500	ug/L	25.0		114	80-120			
Zinc	66	88.6	4.00	ug/L	80.0		111	80-120			
Zinc	67	83.4	4.00	ug/L	80.0		104	80-120			

Analytical Resources, Inc.

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

Reported: 20-Mar-2018 17:31

Wet Chemistry - Quality Control

Batch BGC0062 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: GM

Seattle WA, 98121

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0062-BLK1)				Prepa	ared: 02-Mai	r-2018 Ana	alyzed: 02-	Mar-2018 1	6:26		
Orthophosphorus	ND	0.0040	0.0040	mg-P/L							U
LCS (BGC0062-BS1)				Prepa	ared: 02-Mai	r-2018 Ana	alyzed: 02-	Mar-2018 1	6:27		
Orthophosphorus	0.145	0.0040	0.0040	mg-P/L	0.150		96.7	90-110			
Duplicate (BGC0062-DUP1)	Se	ource: 18C	0031-01	Prepa	ared: 02-Mai	r-2018 Ana	alyzed: 02-	Mar-2018 1	6:28		
Orthophosphorus	0.0200	0.0040	0.0040	mg-P/L		0.0160			22.20	20	L
Matrix Spike (BGC0062-MS1)	Se	ource: 18C	0031-01	Prepa	ared: 02-Mai	r-2018 Ana	alyzed: 02-	Mar-2018 1	6:29		
Orthophosphorus	0.115	0.0040	0.0040	mg-P/L	0.0999	0.0160	99.1	75-125			

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

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

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

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 20-Mar-2018 17:31

Wet Chemistry - Quality Control

Batch BGC0202 - SM 4500-P B-5 Persulfate

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0202-BLK1)				Prepa	ared: 08-Mai	r-2018 An	alyzed: 09-	-Mar-2018 1	3:37		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGC0202-BLK2)				Prepa	ared: 08-Mai	r-2018 An	alyzed: 09-	-Mar-2018 1	3:44		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGC0202-BS1)				Prepa	ared: 08-Mai	r-2018 An	alyzed: 09-	-Mar-2018 1	3:38		
Total Phosphorus	0.151	0.0080	0.0080	mg-P/L	0.150		101	90-110			
LCS (BGC0202-BS2)				Prepa	ared: 08-Mai	r-2018 An	alyzed: 09-	-Mar-2018 1	3:44		
Total Phosphorus	0.150	0.0080	0.0080	mg-P/L	0.150		100	90-110			

Analytical Resources, Inc.

Analytical Resources, Incorporated

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

Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 20-Mar-2018 17:31

Wet Chemistry - Quality Control

Batch BGC0203 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0203-BLK1)				Prepa	ared: 08-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	4:06		
Total Phosphorus	ND	0.0080	0.0160	mg-P/L							U
Blank (BGC0203-BLK2)				Prepa	ared: 08-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	4:11		
Total Phosphorus	ND	0.0080	0.0160	mg-P/L							U
LCS (BGC0203-BS1)				Prepa	ared: 08-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	4:06		
Total Phosphorus	0.145	0.0080	0.0160	mg-P/L	0.150		96.7	90-110			
LCS (BGC0203-BS2)				Prepa	ared: 08-Ma	r-2018 An	alyzed: 09-	Mar-2018 1	4:12		
Total Phosphorus	0.144	0.0080	0.0160	mg-P/L	0.150		96.0	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

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

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 20-Mar-2018 17:31

NELAP, WADOE, WA-DW, DoD-ELAP

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

SM 4500-P E-99 in Water

Zinc-67

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

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

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International

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

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 20-Mar-2018 17:31

Notes and Definitions

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

L Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

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.

March 8, 2018

Data_18C0179

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BGC0339-BLK1	Blank	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.100	U	mg/L
BGC0339-BS1	LCS	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.19		mg/L
BGC0339-BSD1	LCS Dup	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.33		mg/L
18C0179-01	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018 03/14/20	18 03/20/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.499		mg/L
18C0179-02	WUFF-OUT	13-05605-000	Water	03/08/2018	03/09/2018 03/14/20	18 03/20/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.325		mg/L
BGC0339-BLK1	Blank	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
BGC0339-BS1	LCS	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
BGC0339-BSD1	LCS Dup	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	C	mg/L
18C0179-01	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018 03/14/20	18 03/20/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	1.87		mg/L
18C0179-02	WUFF-OUT	13-05605-000	Water	03/08/2018	03/09/2018 03/14/20	18 03/20/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.832		mg/L
BGC0339-BLK1	Blank	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx	84-15-1	o-Terphenyl	81.7		%
BGC0339-BS1	LCS	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx	84-15-1	o-Terphenyl	79.8		%
BGC0339-BSD1	LCS Dup	13-05605-000	Water		03/14/20	18 03/20/2018	NWTPH-Dx	84-15-1	o-Terphenyl	85.8		%
18C0179-01	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018 03/14/20	18 03/20/2018	NWTPH-Dx	84-15-1	o-Terphenyl	75.7		%
18C0179-02	WUFF-OUT	13-05605-000	Water	03/08/2018	03/09/2018 03/14/20	18 03/20/2018	NWTPH-Dx	84-15-1	o-Terphenyl	79.2		%



21 March 2018

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)

18C0179

Amanda Volgardsen, cn=Amanda Volgardsen, email=amanda.volgardsen@arilabs

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Project Manager,

Date: 2018.03.21 14:52:10 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.





2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108 PORTLAND, OR | MISSOULA, MT | DLYMPIA, WA WINTHROP, WA | GUANGZHOU, CHINA

Chain of Custody Record

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	ompletion Date:	Total No.	of Contain	ers:	alue		1					
			4		out	45						
		Sample Type (see	Preserv- ative?	Matrix (see	Number of Containers	NWTPH-Dx						Lab ID No.
Date	Time	codes)	(Y/N)	codes)	2	ž					1,47, 494	Lab
3/8/18	1635	G	N	SW	2	X			7		1/1-11	
		G	N	SW	2	X						
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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)

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Project Name

HERRERA



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Mar-2018 14:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0179-01	Water	08-Mar-2018 16:35	09-Mar-2018 12:00
WUFF-OUT	18C0179-02	Water	08-Mar-2018 16:40	09-Mar-2018 12:00

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Mar-2018 14:51

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 9, 2018 under ARI work order 18C0179. For details regarding sample receipt, please refer to the Cooler Receipt Form.

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

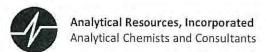
The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.



Cooler Receipt Form

ARI Client: Herre	10	Project Name: Hydr	alatem	Hona	1
COC No(s):	(NA	Delivered by: Fed-Ex UPS Cou	rior Hand Doli	Dorad Othor	
Assigned ARI Job No:		Tracking No:		vered Other:	(NA)
Preliminary Examination Phas					
Were intact, properly signed ar	nd dated custody seals attached	to the outside of to cooler?		YES	(NO)
Were custody papers included	with the cooler?			(YES)	NO
	filled out (ink, signed, etc.) (recommended 2.0-6.0 °C for ch				NO
	compliance fill out form 00070F	Date: 3/9/11/9 Tim	Temp Gun II	#: <u>Doo</u>	25105
Cooler Accepted by.		s and attach all shipping documents			
Log-In Phase:	Complete custody form	s and attach an shipping documents			
What kind of packing material Was sufficient ice used (if approvere all bottles sealed in individual bottles arrive in good convere all bottle labels completed Did the number of containers list Did all bottle labels and tags as were all bottles used correct for Do any of the analyses (bottles were all VOC vials free of air bottles).	opriate)? idual plastic bags? and legible? sted on COC match with the nur gree with custody papers? or the requested analyses? c) require preservation? (attach p	mber of containers received?	NA	YES Other: YES YES YES YES YES YES YES YES	20 20 20 20 20 20 20 20 20 20 20 20 20 2
			NA	YES	NO
7 2 4 7 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Equipment:	NA NA	Split by:	
Samples Logged by:	A Da	te: 3918 Time: _ ger of discrepancies or concerns **	1301		
	Notiny 1 Toject manag	ger or discrepancies or concerns			
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sam	ple ID on CC	OC .
Additional Notes, Discrepand	cies, & Resolutions:		. 1		
Small Air Bubbles Peabut - 2mm 2-4 m	CALLOT VIII DOUGHER	Small → "sm" (<2 mm)			
2-4	71m > 4 mm	Peabubbles → "pb" (2 to < 4 mm)			
		Large → "lg" (4 to < 6 mm)			
	- Income	Headspace → "hs" (>6 mm)			

0016F 3/2/10

Cooler Receipt Form

Revision 014



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Mar-2018 14:51

WUFF-IN 18C0179-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx Sampled: 03/08/2018 16:35

Instrument: FID3 Analyzed: 20-Mar-2018 21:00

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BGC0339 Sample Size: 500 mL Prepared: 14-Mar-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	0.499	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	1.87	mg/L	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	75.7	%	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Mar-2018 14:51

WUFF-OUT 18C0179-02 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx Sampled: 03/08/2018 16:40

Instrument: FID3 Analyzed: 20-Mar-2018 21:20

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BGC0339 Sample Size: 500 mL Prepared: 14-Mar-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	0.325	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	0.832	mg/L	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	79.2	%	



Herrera Environmental Consultants

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

Reported: 21-Mar-2018 14:51

Petroleum Hydrocarbons - Quality Control

Batch BGC0339 - EPA 3510C SepF

Instrument: FID3 Analyst: MDL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0339-BLK1)			Prepa	ared: 14-Mai	-2018 An	alyzed: 20-	Mar-2018 1	4:46		
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.368		mg/L	0.450		81.7	50-150			
LCS (BGC0339-BS1)			Prepa	ared: 14-Mai	:-2018 An	alyzed: 20-	Mar-2018 1:	5:05		
Diesel Range Organics (C12-C24)	2.19	0.100	mg/L	3.00		73.1	56-120			
Surrogate: o-Terphenyl	0.359		mg/L	0.450		79.8	50-150			
LCS Dup (BGC0339-BSD1)			Prepa	ared: 14-Mai	:-2018 An	alyzed: 20-	Mar-2018 1:	5:25		
Diesel Range Organics (C12-C24)	2.33	0.100	mg/L	3.00		77.8	56-120	6.20	30	
Surrogate: o-Terphenyl	0.386		mg/L	0.450		85.8	50-150			

Analytical Resources, Inc.





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

Project Number: 13-05605-000 Reported:
Project Manager: Dylan Ahearn 21-Mar-2018 14:51

Certified Analyses included in this Report

Seattle WA, 98121

Analyte	Certifications
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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-C24)	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	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn21-Mar-2018 14:51

Notes and Definitions

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

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_18C0180

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BGC0288-BLK1	Blank	13-05605-000	Water			03/10/2018	03/10/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BGC0288-BS1	LCS	13-05605-000	Water			03/10/2018	03/10/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.152		mg-P/L
BGC0288-DUP2	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018	03/10/2018	03/10/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0160	L	mg-P/L
BGC0288-MS1	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018	03/10/2018	03/10/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.115		mg-P/L
18C0180-01RE2	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018	03/10/2018	03/10/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0120		mg-P/L
18C0180-02RE1	WUFF-OUT	13-05605-000	Water	03/08/2018	03/09/2018	03/10/2018	03/10/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0140		mg-P/L
BGC0291-BLK1	Blank	13-05605-000	Water			03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0140		mg-P/L
BGC0291-BLK2	Blank	13-05605-000	Water			03/10/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0160	U	mg-P/L
BGC0291-BS1	LCS	13-05605-000	Water			03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.316		mg-P/L
BGC0291-BS2	LCS	13-05605-000	Water			03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.312		mg-P/L
18C0180-01	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018	03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.138		mg-P/L
18C0180-02	WUFF-OUT	13-05605-000	Water	03/08/2018	03/09/2018	03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0580		mg-P/L
BGC0293-BLK1	Blank	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0293-BS1	LCS	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-50-8	Copper	29.2		ug/L
18C0180-01	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018	03/12/2018	03/13/2018	EPA 200.8	7440-50-8	Copper	45.9		ug/L
18C0180-02	WUFF-OUT	13-05605-000	Water	03/08/2018	03/09/2018	03/12/2018	03/13/2018	EPA 200.8	7440-50-8	Copper	26.6		ug/L
BGC0293-BLK1	Blank	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0293-BS1	LCS	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-50-8	Copper	28.5		ug/L
BGC0293-BLK1	Blank	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BGC0293-BS1	LCS	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-66-6	Zinc	88.1		ug/L
18C0180-01	WUFF-IN	13-05605-000	Water	03/08/2018	03/09/2018	03/12/2018	03/13/2018	EPA 200.8	7440-66-6	Zinc	142		ug/L
18C0180-02	WUFF-OUT	13-05605-000		03/08/2018	03/09/2018	03/12/2018	03/13/2018	EPA 200.8	7440-66-6	Zinc	77.4		ug/L
BGC0293-BLK1	Blank	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BGC0293-BS1	LCS	13-05605-000	Water			03/12/2018	03/12/2018	EPA 200.8	7440-66-6	Zinc	86.9		ug/L



28 March 2018

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)

18C0180

Amanda Volgardsen, email=amanda.volgardsen@arilab

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Project Manager,

Date: 2018.03.28 10:50:08 -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 requirements 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.

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2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121

Seattle, Washington | 98121 p 206 441 9080 | 1 206 441 9108 | 18 Col 8 O Chain of Custody Record

Project Name:	Proje	ct Number:	Client:							An	equested	ested				
Hydro International Up-flo Filter	13-0	5605-000	Herrera Env	Herrera Environmental					12					7 7		
Report To:		Copy To:					8		M 35	1						
Dylan Ahearn							2540D		ASTM 3977	5.3	5.3		1			
Sampled By: ALEX SVENDSEN			Delivery Metho		E		Suspended Solids- SM		100	. EPA 36	- EPA 36		200.8		8,	
Laboratory:		Requested C	ompletion Date:	Total No.	of Contain	ners:	d So		Stri	rus.	Z S		PA		200	
Analytical Resources Inc.					2		nde		9	ofd	phq		-		EP.	
Lab Use:				Sample Type (see	Preser- vative?	Matrix (see	Total Suspe		Particle size Distribution	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3		Copper, total - EPA 200.8		Zinc, total - EPA 200,8	Lab ID No.
Sample ID		Date	Time	codes)	(Y/N)	codes)	10		Δ.	12	0		ి		Zin	La La
WUFF-IN		3/8/18	1231	C	N	SW	x		X	X	X		X		X	
WUFF-OUT		3/8/18	1821	С	N	SW	x		X	Х	X		X		X	1
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Comments/Special Instructions:																
Send 1 liter to ETS, Inc 975 Transp	port Way, Suite 2, Pe	taluma, CA	for PSD, TSS,	and TVSS	PSD to	be run f	or >50	00, 500-	125, 125-	62.5,	62.5-4	, <4.				
Relinquished by (Name/CO/	Signature C		Date/Time		ceived By			Anu	Signatu	re	+	-		Date/		O.
ALG SVENDSEN/HEC	alles	~	3/9/18	1200 3	tennou	nu Fre	Low	14-01	7 80NO	wie	YE.	M	3	191	(0)	120
Relinquished by (Name/CO/	Signature		Date/Time		ceived By				Signatu	re				Date/	Time	
Hemisquired by (Hamle) CO/			Grandwater 5											200		



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0180-01	Water	08-Mar-2018 18:21	09-Mar-2018 12:00
WUFF-OUT	18C0180-02	Water	08-Mar-2018 18:21	09-Mar-2018 12:00

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 9, 2018 under ARI work order 18C0180. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis. The PSD and TSS analyses were subcontracted to ETS Labs.

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 method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

An O-Phos matrix spike and duplicate were prepared in conjunction with sample WUFF-IN. The matrix spike percent recovery was within QC limits. The duplicate has a concentration <=5 times the reporting limit, and the replicate control limit defaults to +/- the reporting limit instead of 20% of the RPD. The duplicate has been flagged with an "L" qualifier. The results are advisory. No further corrective action was taken.

Printed: 3/9/2018 12:59:52PM

WORK ORDER

1000100	
18C0180	

Client: Herrera Environmental Consultants Project Manager: Amanda Volgardsen

Project: Hydro International Project Number: [none]

Preservation Confirmation

Container ID	Container Type	рН	
18C0180-01 A	Large OJ, 1000 mL		
18C0180-01 B	Large OJ, 1000 mL		
18C0180-01 C	Small OJ, 500 mL, 9N H2SO4	(2	Rass
18C0180-01 D	Small OJ, 500 mL		
18C0180-01 E	HDPE NM, 500 mL, 1:1 HNO3	62	Pass
18C0180-02 A	Large OJ, 1000 mL		
18C0180-02 B	Large OJ, 1000 mL		
18C0180-02 C	Small OJ, 500 mL, 9N H2SO4	62	Pass
18C0180-02 D	Small OJ, 500 mL		
18C0180-02 E	HDPE NM, 500 mL, 1:1 HNO3	4	Rass
		. /	

Preservation Confirmed By



Cooler Receipt Form

ARI Client: Herre	ra	Project Name:		
COC No(s):	NA	Delivered by: Fed-Ex UPS Cou		
Assigned ARI Job No: 18	C0180	Tracking No:		(NA)
Preliminary Examination Phase:		20 2000 000		
Were intact, properly signed and	dated custody seals attached	to the outside of to cooler?	YES	(NO)
Were custody papers included w	ith the cooler?		(FES)	NO
Were custody papers properly fill			VES	NO
Temperature of Cooler(s) (°C) (re		- 12		
If cooler temperature is out of cor	mpliance fill out form 00070F	2/01/14	Temp Gun ID#: DO	25/05
Cooler Accepted by:	307	Date: // (COTime	e: <i>LDOO</i>	
Log-In Phase:	Complete custody form	s and attach all shipping documents		
Log-in Fhase.				_
Was a temperature blank include	ed in the cooler?		YES	(O)
What kind of packing material v	was used? Bubble Wr	ap Wet Ice Gel Packs Baggies Foam	Block Paper Other: 100	UE
Was sufficient ice used (if approp	oriate)?		NA YES	NO
Were all bottles sealed in individu	ual plastic bags?		YES	(O)
Did all bottles arrive in good cond	dition (unbroken)?		YES	NO
Were all bottle labels complete ar	nd legible?		YES	NO
Did the number of containers lists	ed on COC match with the nur	mber of containers received?	YES	NO
Did all bottle labels and tags agre	ee with custody papers?		(YES)	NO
			CYES	NO
		preservation sheet, excluding VOCs)	NA (YES)	NO
Were all VOC vials free of air but			NA YES	NO
			YES	NO
Date VOC Trip Blank was made a		Activities and the state of the	(NA)	NO
Was Sample Split by ARI: NA	6	3/C/N 100-5		Bin
was cample opin by Arri .	Date/Illie	Edulpment. Cron	Spill by. =	317
Samples Logged by:	USA Da	ite: 03/04/18 Time:	1258	
	** Notify Project Manag	ger of discrepancies or concerns **		
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on CC	OC.
Additional Notes, Discrepancie	es, & Resolutions:		<u> </u>	
By: Da	te:			
Small Air Bubbles Peabubb		Small → "sm" (<2 mm)		
- 2mm 2-4 mm	THE TANK THE PROPERTY OF	Peabubbles → "pb" (2 to < 4 mm)		
	. 000	Large → "lg" (4 to < 6 mm)		
		Headspace → "hs" (>6 mm)		

0016F 3/2/10 Cooler Receipt Form

Revision 014



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring

-Analytical Labs

-Technical Support

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

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

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

ATTN: Amanda Volgardsen

JOB: Hydro International Up-Flo Filter

SITE: Oregon-Washington

ANALYST(S) SUPERVISOR

DATE DATE DATE

COLLECTED RECEIVED COMPLETED

L. Quijano

LAB DIRECTOR

3/8/2018 3/13/2018 3/13/2018

PA	RTICLE SIZI	E DISTRIBUTI	ON (PSD), TS	S & TVSS AN	IALYSIS & R	EPORT - 5 P	ART	
SAMPLE ID	SOURCE of WATER	SUSPENDED SOLIDS mg/l @ ≥500 µ	SOLIDS	SOLIDS	SOLIDS	SOLIDS	SUSPENDED SOLIDS mg/l @ 1 µ	SUSPENDED SEDIMENT CONC TSS mg/l
		1.2 2.0%	2.0 3.4%	1.5 2.6%	Total SSC by	17.6 30.0% y Summation →	36.4 62.0% 58.7	60.0
		0.0 0.0%	0.2 1.7%	0.5 4.1%	Total SSC by	2.7 22.3% y Summation →	8.7 71.9% 12.1	12.0
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
SAMPLE	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE) SOLIDS (TVSS) mg/l
	WALL	109[111]	ролон	T too offits	r to Comits	mgn		mgn
	ID HI-63HEC/RW 18C018 HI-64HEC/RW 18C018	SAMPLE SOURCE of ID WATER HI-63HEC/RW WUFF-IN 18C0180-01A HI-64HEC/RW WUFF-OUT 18C0180-02A SAMPLE SOURCE of	SAMPLE SOURCE SUSPENDED of SOLIDS ID WATER mg/l @ ≥500 µ HI-63HEC/RW WUFF-IN 18C0180-01A 2.0% HI-64HEC/RW WUFF-OUT 18C0180-02A 0.0% #DIV/0! SAMPLE SOURCE of Water pH	SAMPLE SOURCE of SOLIDS SUSPENDED SOLIDS SOLIDS SOLIDS ID WATER mg/l @ ≥500 μ mg/l @ 125 μ HI-63HEC/RW WUFF-IN 18C0180-01A 1.2 2.0 3.4% HI-64HEC/RW WUFF-OUT 18C0180-02A 0.0 0.2 0.2 1.7% #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! SAMPLE SOURCE of [Spec Cond] Water pH ECw [Spec Cond]	SAMPLE SOURCE of SOLIDS SUSPENDED SUSPENDED SUSPENDED SOLIDS SOLIDS SOLIDS SOLIDS mg/l @ 2500 μ mg/l @ 125 μ mg/l @ 63 μ HI-63HEC/RW WUFF-IN 18C0180-01A 1.2 2.0 1.5 18C0180-01A 2.0% 3.4% 2.6% HI-64HEC/RW WUFF-OUT 18C0180-02A 0.0 0.2 0.5 18C0180-02A #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! SAMPLE SOURCE of Water pH ECw ECOLOR, [Spec Cond] TRUE	SAMPLE SOURCE of of SOLIDS SUSPENDED SUSPENDED SUSPENDED SUSPENDED SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS SOLIDS Mg/I @ 32 μ Mg/I @ 2500 μ mg/I @ 125 μ mg/I @ 63 μ mg/I @ 32 μ Mg/I @ 32 μ </td <td> SAMPLE SOURCE SUSPENDED SUSPENDED SUSPENDED SUSPENDED SOLIDS SOLID</td> <td> Of WATER MATER MATER</td>	SAMPLE SOURCE SUSPENDED SUSPENDED SUSPENDED SUSPENDED SOLIDS SOLID	Of WATER MATER MATER

COMMENTS

The matrix has a very low concentration of TSS particles amounting to about 60 ppm in the input sample; and the output sample is extremely low at not much over 10 ppm. The overall average reduction in TSS is just under 80% of total TSS. And the range is very tight in this case at 79.4%-80.0% (TSS by summation vs TSS by analytical method). The reductions in each fraction vary some as follows: 100%, 90.0%, 66.7%, 84.7%, and 76.1%. Notice that for the input sample the mode is definitely at the 1-4 μ fraction at just over three-fifths of the total TSS (62%). The next largest size class is the 4-63 μ fraction (@ 30%); the other three fractions are much lower in proportion being at about 3%+ or less. Thus, the size distribution is skewed toward the smallest particle size, and thus is right at the bottom of the size range in this case. The RPDs are both excellent in this case as follows: $\pm 1.1\%$; & $\pm 0.4\%$.

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



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 28-Mar-2018 10:48

WUFF-IN 18C0180-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/08/2018 18:21

Instrument: ICPMS2 Analyzed: 13-Mar-2018 18:06

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

> Preparation Batch: BGC0293 Sample Size: 25 mL

Prepared: 12-Mar-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	45.9	ug/L	
Zinc	7440-66-6	1	4.00	142	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

WUFF-IN 18C0180-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/08/2018 18:21

Instrument: UV1800-2 Analyzed: 16-Mar-2018 14:17

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

Preparation Batch: BGC0291 Sample Size: 25 mL Prepared: 15-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Analyte Result Units Notes Total Phosphorus 7723-14-0 1 0.0080 0.0160 0.138 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

WUFF-IN 18C0180-01RE2 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/08/2018 18:21

Instrument: UV1800-2 Analyzed: 10-Mar-2018 17:18

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0288 Sample Size: 50 mL
Prepared: 10-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Analyte Result Units Notes Orthophosphorus 1426-54-42 1 0.0040 0.0040 0.0120 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

WUFF-OUT 18C0180-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/08/2018 18:21

Instrument: ICPMS2 Analyzed: 13-Mar-2018 18:02

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

Preparation Batch: BGC0293 Sample Size: 25 mL

Prepared: 12-Mar-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	26.6	ug/L	
Zinc	7440-66-6	1	4.00	77.4	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

WUFF-OUT 18C0180-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/08/2018 18:21

Instrument: UV1800-2 Analyzed: 16-Mar-2018 14:17

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

Preparation Batch: BGC0291 Sample Size: 25 mL Prepared: 15-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Analyte Result Units Notes Total Phosphorus 7723-14-0 1 0.0080 0.0160 0.0580 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

WUFF-OUT 18C0180-02RE1 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/08/2018 18:21

Instrument: UV1800-2 Analyzed: 10-Mar-2018 17:05

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0288 Sample Size: 50 mL Prepared: 10-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Analyte Result Units Notes Orthophosphorus 1426-54-42 1 0.0040 0.0040 0.0140 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

Metals and Metallic Compounds - Quality Control

Batch BGC0293 - 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 (BGC0293-BLK1)				Prepa	ared: 12-Mai	r-2018 Ana	alyzed: 12-1	Mar-2018 1	3:43		
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 (BGC0293-BS1)				Prepa	ared: 12-Mai	r-2018 Ana	alyzed: 12-1	Mar-2018 1	4:25		
Copper	63	29.2	0.500	ug/L	25.0		117	80-120			
Copper	65	28.5	0.500	ug/L	25.0		114	80-120			
Zinc	66	88.1	4.00	ug/L	80.0		110	80-120			
Zinc	67	86.9	4.00	ug/L	80.0		109	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn28-Mar-2018 10:48

Wet Chemistry - Quality Control

Batch BGC0288 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0288-BLK1)				Prepa	ared: 10-Mai	r-2018 Ana	alyzed: 10-	Mar-2018 1	7:03		
Orthophosphorus	ND	0.0040	0.0040	mg-P/L							U
LCS (BGC0288-BS1)				Prepa	ared: 10-Mai	r-2018 Ana	alyzed: 10-	Mar-2018 1	7:03		
Orthophosphorus	0.152	0.0040	0.0040	mg-P/L	0.150		101	90-110			
Duplicate (BGC0288-DUP2)	Se	ource: 18C	0180-01RE	2 Prepa	ared: 10-Mai	r-2018 Ana	alyzed: 10-	Mar-2018 1	7:18		
Orthophosphorus	0.0160	0.0040	0.0040	mg-P/L		0.0120			28.60	20	L
Matrix Spike (BGC0288-MS1)	Se	ource: 18C	0180-01RE	2 Prepa	ared: 10-Mai	r-2018 Ana	alyzed: 10-	Mar-2018 1	7:04		
Orthophosphorus	0.115	0.0040	0.0040	mg-P/L	0.0999	0.0120	103	75-125			

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

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International

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

 Seattle WA, 98121
 Project Manager: Dylan Ahearn
 28-Mar-2018 10:48

Wet Chemistry - Quality Control

Batch BGC0291 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0291-BLK1)				Prepa	ared: 15-Ma	r-2018 An	alyzed: 16-1	Mar-2018 1	4:13		
Total Phosphorus	0.0140	0.0080	0.0160	mg-P/L							
Blank (BGC0291-BLK2)				Prepa	ared: 10-Ma	r-2018 An	alyzed: 16-1	Mar-2018 1	4:19		
Total Phosphorus	ND	0.0080	0.0160	mg-P/L							U
LCS (BGC0291-BS1)				Prepa	ared: 15-Ma	r-2018 An	alyzed: 16-1	Mar-2018 1	4:13		
Total Phosphorus	0.316	0.0080	0.0160	mg-P/L	0.300		105	90-110			
LCS (BGC0291-BS2)				Prepa	ared: 15-Ma	r-2018 An	alyzed: 16-1	Mar-2018 1	4:19		
Total Phosphorus	0.312	0.0080	0.0160	mg-P/L	0.300		104	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants

2200 6th Avenue, Suite 1100

Seattle WA, 98121

Project Number: 13-05605-000

Project Manager: Dylan Ahearn

Project Number: 13-05605-000 Reported:
Project Manager: Dylan Ahearn 28-Mar-2018 10:48

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

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

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

Analytical Resources, Inc.



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

2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn28-Mar-2018 10:48

Notes and Definitions

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

L Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

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.

March 13, 2018

Data_18C0251

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_>500	>500 µm	1.20		mg/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_>500	>500 µm	0.00		mg/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_500-125	500-125 μm	4.00		mg/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_500-125	500-125 μm	1.00		mg/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_125-62.5	125-62.5 μm	2.50		mg/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_125-62.5	125-62.5 μm	0.50		mg/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_62.5-4	62.5-4 μm	22.00		mg/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_62.5-4	62.5-4 μm	7.00		mg/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_4-1	4-1 μm	24.30		mg/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977	SC_4-1	4-1 μm	2.70		mg/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977		Suspended Sediment Concentration	58.00		mg/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/29/2018	03/29/2018	ASTM D3977		Suspended Sediment Concentration	11.50		mg/L
BGC0291-BLK1	Blank	13-05605-000	Water			03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0140		mg-P/L
BGC0291-BLK2	Blank	13-05605-000	Water			03/10/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0160	U	mg-P/L
BGC0291-BS1	LCS	13-05605-000	Water			03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.316		mg-P/L
BGC0291-BS2	LCS	13-05605-000						SM 4500-P E-99		Total Phosphorus	0.312		mg-P/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.140		mg-P/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/15/2018	03/16/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0640		mg-P/L
BGC0416-BLK2	Blank	13-05605-000	Water			03/15/2018	03/15/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0416-BS2	LCS	13-05605-000	Water			03/15/2018	03/15/2018	EPA 200.8	7440-50-8	Copper	25.6		ug/L
18C0251-01	WUFF-IN	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/15/2018	03/15/2018	EPA 200.8	7440-50-8	Copper	47.5	D	ug/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/15/2018	03/16/2018	EPA 200.8	7440-50-8	Copper	23.8		ug/L
BGC0416-BLK2	Blank	13-05605-000				03/15/2018		1	7440-50-8	Copper	0.500	U	ug/L
BGC0416-BS2	LCS	13-05605-000	Water			03/15/2018	03/15/2018	EPA 200.8	7440-50-8	Copper	25.9		ug/L
BGC0416-BLK2	Blank	13-05605-000				03/15/2018		1	7440-66-6	Zinc	4.00	U	ug/L
BGC0416-BS2	LCS	13-05605-000				03/15/2018			7440-66-6	Zinc	87.0		ug/L
18C0251-01	WUFF-IN			03/13/2018					7440-66-6	Zinc	182	D	ug/L
18C0251-02	WUFF-OUT			03/13/2018	03/14/2018			1	7440-66-6	Zinc	77.8		ug/L
BGC0416-BLK2	Blank	13-05605-000	Water			03/15/2018	03/15/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L
BGC0416-BS2	LCS	13-05605-000	Water			03/15/2018	03/15/2018	EPA 200.8	7440-66-6	Zinc	79.3		ug/L
	Blank	13-05605-000								Orthophosphorus	0.0040	U	mg-P/L
BGC0438-BS1	LCS	13-05605-000						1		Orthophosphorus	0.148		mg-P/L
	WUFF-IN							SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0150		mg-P/L
	WUFF-IN							SM 4500-P E-99	1426-54-42	Orthophosphorus	0.101		mg-P/L
18C0251-01								1		Orthophosphorus	0.0130		mg-P/L
18C0251-02	WUFF-OUT	13-05605-000	Surface Water	03/13/2018	03/14/2018	03/15/2018	03/15/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0110		mg-P/L



30 March 2018

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)

18C0251

Amanda Volgardsen l=Tukwila, o=Analytical Relation lnc., ou=Project Manager,

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, cn=Amanda Volgardsen, email=amanda.volgardsen@arilab s.com

Date: 2018.03.30 14:39:37 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.

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

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



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

Chain of Custody Record

Project Name:	Proje	ct Number:	per: Client:						Analyses Requested								
Hydro International Up-flo Filter	13-6	05605-000	Herre	ra Envir	onmenta	al				1						-	
Report To:			Copy T	Copy To:			9		38								
Dylan Ahearn						524			5.3	60							
Sampled By: A. SVENDSEW				y Method	ICE			Suspended Solids- SM 2540D			- EPA 36	- EPA 365.3		200.8		1.8	
Laboratory: Analytical Resources Inc.		Requested (Completio	n Date:	Total No.	of Contain	iers:	S papu			phorus	phorus		al - EPA		EPA 200	
Lab Use:	-1-	*			Sample Type (see	Preser- vative?	Matrix (see				Total phosphorus - EPA 365.3	Orthophosphorus		Copper, total - EPA 200.8		Zinc, total - EPA 200.8	Lab ID No.
Sample ID		Date		Time	codes)	(Y/N)	codes)	Total			-	1		_			E
WUFF-IN		3/13/1	8 2	018	Ç	N	SW	X		Х	X	X		X		X	
WUFF-OUT		3/13/1	€ 2	310	C	N	SW	x		X	X	X		X		X	
Comments/Special Instructions:		1									-	_			-		
Send 1 liter to ETS, Inc 975 Trans	sport Way, Suite 2, Pe	taluma, CA	for PSD	, TSS, a	nd TVSS.	PSD to	be run f	or >50	00, 500	-125, 12	5-62.5,	62.5-	4, <4.				
Relinquished by (Name/CO/ ALSX SVENDSEN / HEC	Signature Signature	<i>></i>	100	/Time	405 Kg	eived By	Name/CO	Al	27	Signa	ture /	ha	1/6		3/14	1	1405
Relinquished by (Name/CO/	Signature		Date	/Time	Rec	eived By	Name/CO)		Signa	ture				Date/	Time	

Sample Type: G=Grab C=Composite

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

HERRERA



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0251-01	Water	13-Mar-2018 20:18	14-Mar-2018 14:05
WUFF-OUT	18C0251-02	Water	13-Mar-2018 20:18	14-Mar-2018 14:05

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 14, 2018 under ARI work order 18C0251. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis. The PSD and TSS analyses were subcontracted to ETS Labs.

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 method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

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

Printed: 3/14/2018 3:17:13PM

WORK ORDER

18C0251	
1000221	

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	рН
18C0251-01 A	Large OJ, 1000 mL	
18C0251-01 B	Large OJ, 1000 mL	
18C0251-01 C	Small OJ, 500 mL	
18C0251-01 D	Small OJ, 500 mL, 9N H2SO4	LZ DOM
18C0251-01 E	HDPE NM, 500 mL, 1:1 HNO3	LZ DOM
18C0251-02 A	Large OJ, 1000 mL	
18C0251-02 B	Large OJ, 1000 mL	
18C0251-02 C	Small OJ, 500 mL	
18C0251-02 D	Small OJ, 500 mL, 9N H2SO4	L-098
18C0251-02 E	HDPE NM, 500 mL, 1:1 HNO3	LZ POH

Preservation Confirmed By

3(14(18



Cooler Receipt Form

Locceca		L	1000 10	i .	
ARI Client:		Project Name:	Dio II	tenan	ieral
COC No(s):	NA	Delivered by: Fed-E	VUPS Courier Hand	Delivered Other	<u> </u>
Assigned ARI Job No:	<u> </u>	Tracking No:			NA
reliminary Examination Phase:					
Were intact, properly signed and dated custod	y seals attached to t	the outside of to cooler?		YES	(NO)
Were custody papers included with the cooler?	?			YES.	NO
Were custody papers properly filled out (ink, si Temperature of Cooler(s) (°C) (recommended Time:		The state of the s	0.86	YES	NO
If cooler temperature is out of compliance fill or	ut form 00070F	JIN	OC Temp Gu		5306
Cooler Accepted by:	/	_Date:	Time:	5	
Complet	te custody forms a	nd attach all shipping d	ocuments		
.og-In Phase:					
Was a temperature blank included in the coole What kind of packing material was used? Was sufficient ice used (if appropriate)? Were all bottles sealed in individual plastic bag Did all bottles arrive in good condition (unbroke	Bubble Wrap	Wet Ice Gel Packs Bag	NA	YES	NO NO
				(YES)	NO
Were all bottle labels complete and legible?				YES	NO
Did the number of containers listed on COC ma				(ES)	NO
Did all bottle labels and tags agree with custod				YES	NO
Were all bottles used correct for the requested				(ES)	NO
Do any of the analyses (bottles) require preser	The second section of the second		VOCs) NA		NO
Were all VOC vials free of air bubbles? Was sufficient amount of sample sent in each b			(NA	YES	NO
Date VOC Trip Blank was made at ARI		1-		YES	NO
Was Sample Split by ARI: NA (YES)	2/		1	Split by:	ETI
Was sample opin by ATT.	Date/fille.	Cquipmen	COUNTY Spiri	_ Split by,_	A. L.
amples Logged by:	Date:	3/14/18	Time: (S)		
Application of the second of t	y Project Manager	of discrepancies or con	cerns **		
			You will be a second		
Sample ID on Bottle Sample	le ID on COC	Sample ID on Bo	ottle S	ample ID on C	OC.
		3000,000,000		ampie is on o	-
					*
Additional Notes, Discrepancies, & Resoluti	ions:	1			
limited you've for v	metars -	Tpnos €	o phos		
737 11165					
By:SEF Date: 31 (4	4118				
Seed Air Bubbles II Bushing		Small → "sm" (<2 mm)			
-2mm 2-4 mm	GE AN DUBLISES	Peabubbles → "pb" (2 to			
•	00	Large → "lg" (4 to < 6 mr	n)		
		Headspace → "hs" (>6 m	*		

0016F 3/2/10

Cooler Receipt Form

Revision 014



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring -Analytical Labs

-Technical Support

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

e-mail: entech@pacbell.net

Serving people and the environment so that both benefit.

			., 4611 S. 134 ^{tt}	Place, Suite 1	The second second			ANALYST(S)	
JOB:	Amanda Vol Hydro Intern Oregon-Was	ational Up-Fl	o Filter		DATE COLLECTED 3/13/2018	DATE RECEIVED 3/16/2018	DATE COMPLETED 3/29/2018	S. Santos L. Quijano	D. Jacobson LAB DIRECTOR G.S. Conrad,PhI
	PAI	RTICLE SIZI	E DISTRIBUTI	ON (PSD), TS	S & TVSS AN	IALYSIS & F	EPORT – 5 P.	ART	
LAB SAMPLE NUMBER	SAMPLE	SOURCE of WATER	SUSPENDED SOLIDS mg/l @ ≥500 µ	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS	SUSPENDED SOLIDS		SUSPENDED SEDIMENT CONC TSS mg/l
07713-1	HI-65HEC/RW 18C02		1.2 2.2%	4.0 7.4%	2.5 4.6%	Total SSC b	22.0 40.7% y Summation →	24.3 45.0% 54.0	58.0
07713-2	HI-66HEC/RW 18C02		0.0 0.0%	1.0 8.9%	0.5 4.5%	Total SSC b	7.0 62.5% y Summation →	2.7 24.1% 11.2	11.5
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC b	#DIV/0! y Summation →	#DIV/0! 0.0	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC b	#DIV/0! y Summation →	#DIV/0! 0.0	
LAB SAMPLE NUMBER	SAMPLE ID	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE SOLIDS (TVSS) mg/l

COMMENTS

The matrix has a very low concentration of TSS particles amounting to 55-60 ppm in the input sample; and the output sample is extremely low at not much over 10 ppm. The overall average reduction in TSS is just under 80% of total TSS. And the range is very tight in this case at 79.3%-80.2% (TSS by summation vs TSS by analytical method). The reductions in each fraction vary some as follows: 100%, 75.0%, 80.0%, 68.2%, and 88.9%. Notice that for the input sample the mode is at the 1-4 μ fraction being right at 45%; but close to that is the next size class, 4-63 μ , comprising just over two-fifths of the total TSS. The other size classes are at much lower proportions being more or less in the 5%-7% range. Thus, in this case the size distribution is very strongly skewed toward the fines end of the TSS size range. It seems quite likely that a majority of particles in the 4-63 μ size class would be closer to 4 μ than 60+ μ . The RPDs are both excellent as follows: $\pm 3.6\%$; & $\pm 1.3\%$.

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



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

WUFF-IN 18C0251-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/13/2018 20:18

Instrument: ICPMS2 Analyzed: 15-Mar-2018 23:31

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

Preparation Batch: BGC0416 Prepared: 15-Mar-2018 Sample Size: 25 mL Final Volume: 25 mL

Reporting Limit CAS Number Dilution Analyte Result Units Notes 7440-50-8 5 2.50 D Copper 47.5 ug/L 7440-66-6 5 20.0 D Zinc 182 ug/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

WUFF-IN 18C0251-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/13/2018 20:18

Instrument: UV1800-2 Analyzed: 16-Mar-2018 14:18

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

Preparation Batch: BGC0291 Sample Size: 25 mL Prepared: 15-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Limit Limit Analyte Dilution Result Units Notes Total Phosphorus 7723-14-0 1 0.0080 0.0160 0.140 mg-P/L

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0438 Sample Size: 50 mL Prepared: 15-Mar-2018 Final Volume: 50 mL

Detection Reporting Analyte CAS Number Dilution Limit Limit Result Units Notes Orthophosphorus 1426-54-42 0.0040 0.0040 0.0130 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 30-Mar-2018 14:38

WUFF-OUT 18C0251-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/13/2018 20:18

Instrument: ICPMS2 Analyzed: 16-Mar-2018 00:08

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

> Preparation Batch: BGC0416 Sample Size: 25 mL

Prepared: 15-Mar-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	23.8	ug/L	
Zinc	7440-66-6	1	4.00	77.8	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

WUFF-OUT 18C0251-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/13/2018 20:18

Instrument: UV1800-2 Analyzed: 16-Mar-2018 14:18

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

Preparation Batch: BGC0291 Sample Size: 25 mL Prepared: 15-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Limit Limit Analyte Dilution Result Units Notes Total Phosphorus 7723-14-0 1 0.0080 0.0160 0.0640 mg-P/L

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0438 Sample Size: 50 mL Prepared: 15-Mar-2018 Final Volume: 50 mL

Detection Reporting Analyte CAS Number Dilution Limit Limit Result Units Notes Orthophosphorus 1426-54-42 0.0040 0.0040 0.0110 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

Metals and Metallic Compounds - Quality Control

Batch BGC0416 - 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 (BGC0416-BLK2)				Prepa	ared: 15-Mai	r-2018 Ana	alyzed: 15-1	Mar-2018 1	6:28		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BGC0416-BS2)				Prepa	ared: 15-Mai	r-2018 Ana	alyzed: 15-1	Mar-2018 1	7:12		
Copper	63	25.6	0.500	ug/L	25.0		103	80-120			
Copper	65	25.9	0.500	ug/L	25.0		104	80-120			
Zinc	66	87.0	4.00	ug/L	80.0		109	80-120			
Zinc	67	79.3	4.00	ug/L	80.0		99.2	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

Wet Chemistry - Quality Control

Batch BGC0291 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0291-BLK1)				Prepa	ared: 15-Ma	r-2018 An	alyzed: 16-l	Mar-2018 1	4:13		
Total Phosphorus	0.0140	0.0080	0.0160	mg-P/L							
Blank (BGC0291-BLK2)				Prepa	ared: 10-Ma	r-2018 An	alyzed: 16-	Mar-2018 1	4:19		
Total Phosphorus	ND	0.0080	0.0160	mg-P/L							U
LCS (BGC0291-BS1)				Prepa	ared: 15-Mai	r-2018 An	alyzed: 16-	Mar-2018 1	4:13		
Total Phosphorus	0.316	0.0080	0.0160	mg-P/L	0.300		105	90-110			
LCS (BGC0291-BS2)				Prepa	ared: 15-Ma	r-2018 An	alyzed: 16-	Mar-2018 1	4:19		
Total Phosphorus	0.312	0.0080	0.0160	mg-P/L	0.300		104	90-110			

Analytical Resources, Inc.

Reported:

Herrera Environmental Consultants

2200 6th Avenue, Suite 1100 Project Number: 13-05605-000 Seattle WA, 98121 Project Manager: Dylan Ahearn 30-Mar-2018 14:38

Wet Chemistry - Quality Control

Project: Hydro International

Batch BGC0438 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0438-BLK1)				Prepa	ared: 15-Mai	r-2018 Ana	alyzed: 15-	Mar-2018 1	2:02		
Orthophosphorus	ND	0.0040	0.0040	mg-P/L							U
LCS (BGC0438-BS1)				Prepa	ared: 15-Mai	r-2018 Ana	alyzed: 15-	Mar-2018 1	2:02		
Orthophosphorus	0.148	0.0040	0.0040	mg-P/L	0.150		98.7	90-110			
Duplicate (BGC0438-DUP1)	Se	ource: 18C	0251-01	Prepa	ared: 15-Mai	r-2018 Ana	alyzed: 15-	Mar-2018 1	2:03		
Orthophosphorus	0.0150	0.0040	0.0040	mg-P/L		0.0130			14.30	20	
Matrix Spike (BGC0438-MS1)	Se	ource: 18C	0251-01	Prepa	ared: 15-Mai	r-2018 Ana	alyzed: 15-	Mar-2018 1	2:03		
Orthophosphorus	0.101	0.0040	0.0040	mg-P/L	0.0999	0.0130	88.1	75-125			

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

Analytical Resources, Inc.



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

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

Certified Analyses included in this Report

Analyte	Certifications

EPA 200.8	in Water
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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 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

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

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 14:38

Notes and Definitions

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

J Estimated concentration value detected below the reporting limit.

D The reported value is from a dilution

* Flagged value is not within established control limits.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

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

March 22, 2018

Data_18C0396

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method		Compound	Value	Q	Units
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_>500	>500 µm	5.00		mg/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_>500	>500 µm	1.00		mg/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_500-125	500-125 μm	6.80		mg/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_500-125	500-125 μm	2.70		mg/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_125-62.5	125-62.5 μm	5.70		mg/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_125-62.5	125-62.5 μm	4.80		mg/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_62.5-4	62.5-4 μm	39.50		mg/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977		62.5-4 μm	11.80		mg/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_4-1	4-1 μm	11.70		mg/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977	SC_4-1	4-1 μm	6.80		mg/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977		Suspended Sediment Concentration	74.50		mg/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	04/06/2018	04/06/2018	ASTM D3977		Suspended Sediment Concentration	28.00		mg/L
BGC0663-BLK1	Blank	13-05605-000	Water			03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BGC0663-BLK2	Blank	13-05605-000	Water			03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BGC0663-BLK3	Blank	13-05605-000	Water			03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L
BGC0663-BS1	LCS	13-05605-000	Water			03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.154		mg-P/L
BGC0663-BS2	LCS	13-05605-000	Water			03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.155		mg-P/L
BGC0663-BS3	LCS	13-05605-000	Water			03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.153		mg-P/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.140		mg-P/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/24/2018	03/26/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.100		mg-P/L
BGC0664-BLK1	Blank	13-05605-000	Water			03/24/2018	03/24/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg-P/L
BGC0664-BS1	LCS	13-05605-000	Water			03/24/2018	03/24/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.145		mg-P/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/24/2018	03/24/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0120		mg-P/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/24/2018	03/24/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0110		mg-P/L
BGC0666-BLK1	Blank	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0666-BS1	LCS	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8	7440-50-8	Copper	26.5		ug/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/27/2018	EPA 200.8	7440-50-8	Copper	36.3		ug/L
BGC0666-BLK1	Blank	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L
BGC0666-BS1	LCS	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8	7440-50-8	Copper	26.7		ug/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/27/2018	EPA 200.8	7440-50-8	Copper	51.4		ug/L
BGC0666-BLK1	Blank	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8		Zinc	4.00	U	ug/L
BGC0666-BS1	LCS	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8		Zinc	86.2		ug/L
18C0396-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/27/2018	EPA 200.8		Zinc	151		ug/L
18C0396-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/27/2018	EPA 200.8	7440-66-6	Zinc	106		ug/L
BGC0666-BLK1	Blank	13-05605-000	Water				03/26/2018		7440-66-6	Zinc	4.00	U	ug/L
BGC0666-BS1	LCS	13-05605-000	Water			03/26/2018	03/26/2018	EPA 200.8	7440-66-6	Zinc	73.6		ug/L



09 April 2018

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)

18C0396

Amanda Volgardsen l=Tukwila, o=Analytical Relation lnc., ou=Project Manager, cn=Amanda Volgardsen

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, cn=Amanda Volgardsen, email=amanda.volgardsen@arilab s.com

Date: 2018.04.09 12:08:16 -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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.

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

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





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

Chain of Custody Record

Project Name:	Project Number:	Client:			Analyses Requested										
Hydro International Up-flo Filter	13-05605-000	Herrera Environmental					11					7 - 1			
Report To:		Copy To:				8		M 39							
Dylan Ahearn					254		ASTI	5.3	60						
Sampled By: ALEX SVENDSEN	Sampled By: Delivery N					Suspended Solids- SM 2540D		oution -)	EPA 36	- EPA 36		- EPA 200.8		100	
Laboratory:	Requested C	Completion Date:	Total No.	of Contain	ners:	S P		strit	SD.	S		PA	PA	200	
Analytical Resources Inc.						ndec		G e	pho	bho		<u></u>		EPA	
Lab Use:			Sample Type (see	Preser- vative?	Matrix (see	al Suspe		Particle size Distribution - ASTM 3977	Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3		Copper, total		Zinc, total - EPA 200.8	Lab ID No.
Sample ID	Date	Time	codes)	(Y/N)	codes)	Total		ă.	F	ō		S		Zin	Lab
WUFF-IN	3/22/1	2 1641	C	N	sw	×		X	X	X		X		X	
WUFF-OUT	3/22/1		С	N	SW	x		X	X	X		X		X	
															1
		1111													
									15-1						1-1
Comments/Special Instructions:								-		-			1		
Send 1 liter to ETS, Inc 975 Transport Way,	, Suite 2, Petaluma, CA	for PSD, TSS, a	and TVSS.	PSD to	be run f	or >500,	500-12	25, 125-	62.5,	52.5-4,	<4.				
Relinquished by (Name/CO/ Signature	MA	Date/Time		and the same of	(Name/CO		e 11	Signatur	re	-			Date/Ti	me	
ALEX SVENOSEN/HEC COL	401	3/23/18/	455 B	rondo	in Fis	K/AL	31	1/3	7	6	XE	t	- 5/2	5/13	1455
Relinquished by (Name/CO/ Signature/		Date/Time			Name/CO			Signatur	e		V		Date/Ti		

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)

HERRERA



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0396-01	Water	22-Mar-2018 16:41	23-Mar-2018 14:55
WUFF-OUT	18C0396-02	Water	22-Mar-2018 16:41	23-Mar-2018 14:55

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 23, 2018 under ARI work order 18C0396. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis. The TSS and PSD analysis were subcontracted to ETS Labs.

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 method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.



WORK ORDER

18C0396

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

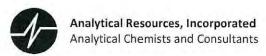
Project Number: 13-05605-000

Preservation Confirmation

Container ID	Container Type	рН
18C0396-01 A	Large OJ, 1000 mL	
18C0396-01 B	Large OJ, 1000 mL	
18C0396-01 C	Small OJ, 500 mL	
18C0396-01 D	Small OJ, 500 mL, 9N H2SO4	<2 na45
18C0396-01 E	HDPE NM, 500 mL, 1:1 HNO3	<2 poiss
18C0396-02 A	Large OJ, 1000 mL	, ,
18C0396-02 B	Large OJ, 1000 mL	
18C0396-02 C	Small OJ, 500 mL	
18C0396-02 D	Small OJ, 500 mL, 9N H2SO4	LZ 1055
18C0396-02 E	HDPE NM, 500 mL, 1:1 HNO3	< 2 pass

Preservation Confirmed By

3/23/18 Date



Cooler Receipt Form

ARI Client: Hervero	4	Project Name:						
COC No(s):	NA	Delivered by: Fed-Ex UPS Co	ourier Hand Delivered Oth	er:				
Assigned ARI Job No:	0396	Tracking No:						
Preliminary Examination Phase		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		NA				
Were intact, properly signed and	d dated custody seals attached	to the outside of to cooler?	YES	NO				
Were custody papers included v			YES	NO				
Were custody papers properly f			VES	NO				
Temperature of Cooler(s) (°C) (Time: 1455								
If cooler temperature is out of co	ompliance fill out form 00070F		Temp Gun ID#: DOC	72565				
Cooler Accepted by:	BF	Date: 3/23/18 Tin	ne: 1455	8				
		s and attach all shipping documents		_				
Log-In Phase:								
Was a temperature blank includ			YES	NO				
		ap Wet Ice Gel Packs Baggies Foar	n Block Paper Other:					
Was sufficient ice used (if appro			NA YES	NO				
			YES	NO				
Did all bottles arrive in good cor	ndition (unbroken)?	na yezer mezarra manazi menindeka mela	YES	NO				
Were all bottle labels complete a	and legible?		YES	NO				
Did the number of containers lis	ted on COC match with the nur	mber of containers received?	YES	NO NO				
Did all bottle labels and tags agr	ree with custody papers?		YES	3 NO				
Were all bottles used correct for	the requested analyses?		YES	NO				
Do any of the analyses (bottles)	require preservation? (attach p	preservation sheet, excluding VOCs)	NA YES	NO				
Were all VOC vials free of air but	ubbles?		NA YES	NO				
Was sufficient amount of sample	e sent in each bottle?		(ES)	NO				
Date VOC Trip Blank was made	The same of the sa		(NA)					
Was Sample Split by ARI:	NA YES Date/Time: 3/	23/18 1558 Equipment: Chi	ing spliter Split by	13F+SE				
Samples Logged by:	25	ite: 3/23/18 Time:	16.06					
	** Notify Project Manag	ger of discrepancies or concerns **						
Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on	coc				
Additional Notes, Discrepance	ies, & Resolutions:							
all of								
	ate:	C 11 N 11 11 11 11 11 11 11 11 11 11 11 1						
Small Air Bubbles Peabub	CALLOS VIII DODONES	Small → "sm" (<2 mm)						
	1m > 4 mm	Peabubbles → "pb" (2 to < 4 mm)						
	• • •	Large → "lg" (4 to < 6 mm)						
1	2.1	Headspace → "hs" (>6 mm)						

0016F 3/2/10 Cooler Receipt Form

Revision 014



ETS

Environmental Technical Services

-Soil, Water & Air Testing & Monitoring -Analytical Labs

-Technical Support

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

Serving people and the environment so that both benefit.

e-mail: entech@pacbell.net

OMPANY:	Analytical Resources, Inc., 4611 S. 134th Place, Su	ite 100, Tukwila, W	/A 98168		ANALYST(S)	SUPERVISOR
ATTN:	Amanda Volgardsen	DATE	DATE	DATE	S. Santos	D. Jacobson
JOB:	Hydro International Up-Flo Filter	COLLECTED	RECEIVED	COMPLETED	L. Quijano	LAB DIRECTOR
SITE:	Oregon-Washington	3/22/2018	3/29/2018	4/6/2018		G.S. Conrad,PhD

18C0396-	WUFF-IN -01 A/B WUFF-OUT	SUSPENDED SOLIDS mg/I @ ≥500 µ 5.0 7.3% 1.0 3.7%	SUSPENDED SOLIDS mg/l @ 125 µ 6.8 9.9% 2.7	SOLIDS mg/l @ 63 μ 5.7 8.3%	SOLIDS	SOLIDS mg/l @ 4 μ 39.5 57.5%	SUSPENDED SOLIDS mg/l @ 1 µ 11.7 17.0%	SUSPENDED SEDIMENT CONG TSS mg/l 74.5
18C0396- BHEC/RW \	-01 A/B WUFF-OUT	7.3% 1.0	9.9%	8.3%	Total SSC by	57.5%		74.5
	A THE STREET STREET	300	2.7	20.00		/ Summation →	68.7	
			10.0%	4.8 17.7%	Total SSC by	11.8 43.5% / Summation →	6.8 25.1% 27.1	28.0
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0! Total SSC by	#DIV/0! y Summation →	#DIV/0! 0.0	
MPLE ID	SOURCE of WATER	Water pH -log[H+]	ECw [Spec Cond] µS/cm	COLOR, TRUE PtCo Units	COLOR APPARENT PtCo Units	TOTAL IRON Fe (diss.) mg/l	SUSPENDED	VOLATILE SOLIDS (TVSS mg/I
		of	MPLE SOURCE Water pH	MPLE SOURCE Water pH ECw of [Spec Cond]	MPLE SOURCE Water pH ECw COLOR, of [Spec Cond] TRUE	MPLE SOURCE Water pH ECw COLOR, COLOR of [Spec Cond] TRUE APPARENT	Total SSC by Summation → MPLE SOURCE Water pH ECw COLOR, COLOR TOTAL IRON of [Spec Cond] TRUE APPARENT Fe (diss.)	Total SSC by Summation → 0.0 MPLE SOURCE Water pH ECW COLOR, COLOR TOTAL IRON TOTAL of [Spec Cond] TRUE APPARENT Fe (diss.) SUSPENDED

COMMENTS

The matrix has a very low concentration of TSS particles amounting to about 70 ppm in the input sample; and the output sample is even lower at <30 ppm. The overall average reduction in TSS is at about 61.5% of total TSS. Also, the range is very tight in this case at 60.6%-62.4% (TSS by summation vs TSS by analytical method). The reductions in each fraction vary a good deal as follows: 80.0%, 60.3%, 15.8%, 70.1%, and 41.9%. Notice that for the input sample the mode is at the 4- $63~\mu$ fraction being right at 57.5%, and this is the only size class that is over 20% of the total TSS. The other size fractions are at much lower proportions being more or less in the 7%-17% range in the input sample. Thus, in this case the size distribution is strongly skewed toward the fines end of the TSS size range, but is not at the finest size fraction. The output sample has a roughly equivalent distribution in this case. The RPDs are both excellent as follows: $\pm 4.1\%$; $\&\pm 1.6\%$.

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

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



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

WUFF-IN 18C0396-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/22/2018 16:41

Instrument: ICPMS1 Analyzed: 27-Mar-2018 22:46

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

Preparation Batch: BGC0666 Sample Size: 25 mL Prepared: 26-Mar-2018 Final Volume: 25 mL

Reporting Limit CAS Number Dilution Analyte Result Units Notes 7440-50-8 0.500 Copper 51.4 ug/L 7440-66-6 1 4.00 ug/L Zinc 151

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

WUFF-IN 18C0396-01 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/22/2018 16:41

Instrument: UV1800-1 Analyzed: 26-Mar-2018 17:59

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

Preparation Batch: BGC0663 Sample Size: 25 mL Prepared: 24-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Analyte Result Units Notes Total Phosphorus 7723-14-0 1 0.0080 0.00800.140 mg-P/L

Instrument: UV1800-2 Analyzed: 24-Mar-2018 15:54

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0664 Sample Size: 50 mL Prepared: 24-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Result Units Notes Analyte 1426-54-42 0.0040 0.0040 0.0120 Orthophosphorus mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

WUFF-IN 18C0396-01 (Water)

*** DEFAULT GENERAL METHOD ***

Method: ASTM D3977 Sampled: 03/22/2018 16:41

Instrument: ETSE Analyzed: 06-Apr-2018 00:00

Analysis by: Environmental Technical Services

Sample Preparation: Preparation Method: *** DEFAULT PREP ***

Preparation Batch: B040618

Prepared: 06-Apr-2018 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
>500 μm	SC_>500	1	0.1	5.00	mg/L	
500-125 μm	SC_500-125	1	0.1	6.80	mg/L	
125-62.5 μm	SC_125-62.5	1	0.1	5.70	mg/L	
62.5-4 μm	SC_62.5-4	1	0.1	39.50	mg/L	
4-1 μm	SC_4-1	1	0.1	11.70	mg/L	
Suspended Sediment Concentration		1	0.1	74.50	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

Project Number: 13-05605-000 2200 6th Avenue, Suite 1100 Reported: Seattle WA, 98121 Project Manager: Dylan Ahearn 09-Apr-2018 12:05

WUFF-OUT 18C0396-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 Sampled: 03/22/2018 16:41

Instrument: ICPMS1 Analyzed: 27-Mar-2018 22:50

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

> Preparation Batch: BGC0666 Sample Size: 25 mL

Prepared: 26-Mar-2018 Final Volume: 25 mL

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
Copper	7440-50-8	1	0.500	36.3	ug/L	
Zinc	7440-66-6	1	4.00	106	ug/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

WUFF-OUT 18C0396-02 (Water)

Wet Chemistry

Method: SM 4500-P E-99 Sampled: 03/22/2018 16:41

Instrument: UV1800-1 Analyzed: 26-Mar-2018 18:00

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

Preparation Batch: BGC0663 Sample Size: 25 mL Prepared: 24-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Analyte Result Units Notes Total Phosphorus 7723-14-0 1 0.0080 0.00800.100 mg-P/L

Instrument: UV1800-2 Analyzed: 24-Mar-2018 15:55

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGC0664 Sample Size: 50 mL Prepared: 24-Mar-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Result Units Notes Analyte 1426-54-42 0.0040 0.0040 0.0110 Orthophosphorus mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

WUFF-OUT 18C0396-02 (Water)

*** DEFAULT GENERAL METHOD ***

Method: ASTM D3977 Sampled: 03/22/2018 16:41

Instrument: ETSE Analyzed: 06-Apr-2018 00:00

Analysis by: Environmental Technical Services

Sample Preparation: Preparation Method: *** DEFAULT PREP ***

Preparation Batch: B040618

Prepared: 06-Apr-2018 Final Volume:

			Reporting			
Analyte	CAS Number	Dilution	Limit	Result	Units	Notes
>500 μm	SC_>500	1	0.1	1.00	mg/L	
500-125 μm	SC_500-125	1	0.1	2.70	mg/L	
125-62.5 μm	SC_125-62.5	1	0.1	4.80	mg/L	
62.5-4 μm	SC_62.5-4	1	0.1	11.80	mg/L	
4-1 μm	SC_4-1	1	0.1	6.80	mg/L	
Suspended Sediment Concentration		1	0.1	28.00	mg/L	

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

Metals and Metallic Compounds - Quality Control

Batch BGC0666 - 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 (BGC0666-BLK1)				Prepa	ared: 26-Mai	r-2018 Ana	alyzed: 26-l	Mar-2018 1:	5:38		
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BGC0666-BS1)				Prepa	ared: 26-Mai	r-2018 Ana	alyzed: 26-l	Mar-2018 1	6:20		
Copper	63	26.5	0.500	ug/L	25.0		106	80-120		·	·
Copper	65	26.7	0.500	ug/L	25.0		107	80-120			
Zinc	66	86.2	4.00	ug/L	80.0		108	80-120			
Zinc	67	73.6	4.00	ug/L	80.0		92.0	80-120			

Analytical Resources, Inc.



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

Seattle WA, 98121 Project Manager: Dylan Ahearn

Reported: 09-Apr-2018 12:05

Wet Chemistry - Quality Control

Batch BGC0663 - SM 4500-P B-4 Strong Acid

Instrument: UV1800-1 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0663-BLK1)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 26-	Mar-2018 1	7:48		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L			•				U
Blank (BGC0663-BLK2)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 26-	Mar-2018 1	7:58		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGC0663-BLK3)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 26-	Mar-2018 1	8:00		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGC0663-BS1)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 26-	Mar-2018 1	7:49		
Total Phosphorus	0.154	0.0080	0.0080	mg-P/L	0.150		103	90-110			
LCS (BGC0663-BS2)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 26-	Mar-2018 1	7:58		
Total Phosphorus	0.155	0.0080	0.0080	mg-P/L	0.150		103	90-110			
LCS (BGC0663-BS3)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 26-	Mar-2018 1	8:01		
Total Phosphorus	0.153	0.0080	0.0080	mg-P/L	0.150		102	90-110			

Analytical Resources, Inc.

Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

Wet Chemistry - Quality Control

Batch BGC0664 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0664-BLK1)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 24-	Mar-2018 1	5:52		
Orthophosphorus	ND	0.0040	0.0040	mg-P/L							U
LCS (BGC0664-BS1)				Prepa	ared: 24-Ma	r-2018 An	alyzed: 24-	Mar-2018 1	5:52		
Orthophosphorus	0.145	0.0040	0.0040	mg-P/L	0.150		96.7	90-110			

Analytical Resources, Inc.



Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number:13-05605-000Reported:Seattle WA, 98121Project Manager:Dylan Ahearn09-Apr-2018 12:05

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

SM 4500-P E-99 in Water

Orthophosphorus WADOE,NELAP
Total Phosphorus WADOE,NELAP

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

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn09-Apr-2018 12:05

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.

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_18C0399

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units
BGC0680-BLK1	Blank	13-05605-000	Water			03/26/2018	03/28/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.100	U	mg/L
BGC0680-BS1	LCS	13-05605-000	Water			03/26/2018	03/28/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	2.33		mg/L
18C0399-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/28/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.571		mg/L
18C0399-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/28/2018	NWTPH-Dx		Diesel Range Organics (C12-C24)	0.200		mg/L
BGC0680-BLK1	Blank	13-05605-000	Water			03/26/2018	03/28/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
BGC0680-BS1	LCS	13-05605-000	Water			03/26/2018	03/28/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.200	U	mg/L
18C0399-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/28/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	1.79		mg/L
18C0399-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/28/2018	NWTPH-Dx		Motor Oil Range Organics (C24-C38)	0.325		mg/L
BGC0680-BLK1	Blank	13-05605-000	Water			03/26/2018	03/28/2018	NWTPH-Dx	84-15-1	o-Terphenyl	76.2		%
BGC0680-BS1	LCS	13-05605-000	Water			03/26/2018	03/28/2018	NWTPH-Dx	84-15-1	o-Terphenyl	77.7		%
18C0399-01	WUFF-IN	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/28/2018	NWTPH-Dx	84-15-1	o-Terphenyl	78.5		%
18C0399-02	WUFF-OUT	13-05605-000	Water	03/22/2018	03/23/2018	03/26/2018	03/28/2018	NWTPH-Dx	84-15-1	o-Terphenyl	82.9		%



30 March 2018

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)

18C0399

Amanda Volgardsen, email=amanda.volgardsen@arilab

Digitally signed by Amanda Volgardsen DN: c=US, st=Washington, I=Tukwila, o=Analytical Resources, Inc., ou=Project Manager,

Date: 2018.03.30 15:55:02 -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 requirements 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.

1800399



2200 Sixth Avenue | Suite 1100 Seattle, Washington | 98121 p 206 441 9080 | f 206 441 9108 PORTLAND, OR | MISSOULA, MT | OLYMPIA, WA WINTHROP, WA | GUANGZHOU, CHINA

Chain of Custody Record

Project Name:	Project Num	ber:	Client:							Ana	alyses Re	quested			
Hydro International Up-flo Filter	13-05605-	000	Herrera Environmental											1	
Report To:			Сору То:		1								1		
Dylan Ahearn												1 1	1		
Sampled By: ALEK SVENDSEN			Delivery Method		CE		5				91				
Laboratory: Analytical Resources Inc.	Requ				mpletion Date: Total No. of Containers:		Containers								
Lab Use:				Sample	Preserv- ative?	Matrix (see	0	NWTPH-Dx							Lab ID No.
Sample ID		Date	Time	Type (see codes)	(Y/N)	codes)	Number	3	11 Hz = 0						de.
WUFF-IN	3	22/18	3 1222	G	N	SW	2	X						10-1	
WUFF-OUT		22/18		G	N	SW	2	х	_		_			-	
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Comments/Special Instructions:														1	100
comments/special instructions.															
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Project Name

HERRERA



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 15:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN	18C0399-01	Water	22-Mar-2018 12:22	23-Mar-2018 14:55
WUFF-OUT	18C0399-02	Water	22-Mar-2018 12:25	23-Mar-2018 14:55

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 15:54

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 23, 2018 under ARI work order 18C0399. 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.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.



Cooler Receipt Form

ARI Client: Herrera	_	Project Name:			
COC No(s):	NA	Delivered by: Fed-Ex UPS Cour	ier Hand Deli	vered Other	
Assigned ARI Job No: 1900399		Tracking No:			10.5
Preliminary Examination Phase:		Tracking No.			NA
Were intact, properly signed and dated custody sea	als attached	to the outside of to cooler?		YES	(NO
Were custody papers included with the cooler?				VEC	74-20-
Were custody papers properly filled out (ink, signed				1	NO
Temperature of Cooler(s) (°C) (recommended 2.0- Time: 1474 1454	6.0 °C for che			NES/	NO
If cooler temperature is out of compliance fill out for	rm 00070F		Temp Gun II	D#: 2003	565
Cooler Accepted by:		Date:5/23/i \$ Time:	14.		
		and attach all shipping documents			
Log-In Phase:					
Was a temperature blank included in the cooler?	Manual Manual			YES	(NO)
What kind of packing material was used?			Block Paner ((NO)
Was sufficient ice used (if appropriate)?			NA NA	YES.	NO
Were all bottles sealed in individual plastic bags?			IXO	YES	
Did all bottles arrive in good condition (unbroken)?					NO
Were all bottle labels complete and legible?				YES	NO
Did the number of containers listed on COC match				KES	NO
Did all bottle labels and tags agree with custody par				(YES)	NO
Were all bottles used correct for the requested anal				(ES)	NO
			6	YES	NO
Do any of the analyses (bottles) require preservation		[16] - 보이 시티스 보다 보고 있는 그런 그들은 그리고 있는 그리고 있는 사람들이 되는 그리고 있다면 보이 없는 것이다.	NA	YES	NO
Were all VOC vials free of air bubbles?			NA	YES	NO
Was sufficient amount of sample sent in each bottle			1	YES	NO
Date VOC Trip Blank was made at ARI			(NA	-	
Was Sample Split by ARI: (NA YES Dat	te/Time:	Equipment:		Split by:	
Samples Logged by:	Date	e:3/23/18 Time:	1705	_	
		er of discrepancies or concerns **	110)		
Sample ID on Bottle Sample ID			•		
Sample ID on Bottle Sample ID	on COC	Sample ID on Bottle	Samp	le ID on CO	C
	_				
Additional Notes, Discrepancies, & Resolutions:					
Additional Notes, Discrepancies, & Resolutions:					
By: Date:					
Small Air Bubbles Peabubbles' LARGE Air	Charles Comments	Small \rightarrow "sm" (<2 mm)			
2-4 mm >4 m	nm	Peabubbles → "pb" (2 to < 4 mm)			
	•	Large → "lg" (4 to < 6 mm)			

0016F 3/2/10

Cooler Receipt Form

Revision 014



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 15:54

WUFF-IN 18C0399-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx Sampled: 03/22/2018 12:22

Instrument: FID4 Analyzed: 28-Mar-2018 18:42

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BGC0680 Sample Size: 500 mL Prepared: 26-Mar-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	0.571	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	1.79	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	78.5	%	



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 15:54

WUFF-OUT 18C0399-02 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx Sampled: 03/22/2018 12:25

Instrument: FID4 Analyzed: 28-Mar-2018 19:03

Sample Preparation: Preparation Method: EPA 3510C SepF

Preparation Batch: BGC0680 Sample Size: 500 mL Prepared: 26-Mar-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	0.200	mg/L	
HC ID: DRO Motor Oil Range Organics (C24-C38)		1	0.200	0.325	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	82.9	%	



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-Mar-2018 15:54

Petroleum Hydrocarbons - Quality Control

Batch BGC0680 - EPA 3510C SepF

Instrument: FID4 Analyst: MDL

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0680-BLK1)			Prepa	red: 26-Mar	-2018 An	alyzed: 28-	Mar-2018 1	6:39		
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.343		mg/L	0.450		76.2	50-150			
LCS (BGC0680-BS1)			Prepa	red: 26-Mar	-2018 An	alyzed: 28-	Mar-2018 1	6:59		
Diesel Range Organics (C12-C24)	2.33	0.100	mg/L	3.00		77.7	56-120			
Surrogate: o-Terphenyl	0.350		mg/L	0.450		77.7	50-150			

Analytical Resources, Inc.





Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
30-Mar-2018 15:54

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-C24)	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	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn30-Mar-2018 15:54

Notes and Definitions

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

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.

December 12, 2018 - Rinsate Blank 3

Data_18L0049

ARI ID	Client ID	Proj ID	Matrix	Sampled	Rec	Prep	Analyzed	Method	CAS	Compound	Value	Q	Units	Batch
BGL0098-BLK1	Blank	13-05605-000	Water			12/05/2018	12/05/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg/L	BGL0098
BGL0098-BS1	LCS	13-05605-000	Water			12/05/2018	12/05/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.155		mg/L	BGL0098
BGL0098-DUP1	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/05/2018	12/05/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg/L	BGL0098
BGL0098-MS1	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/05/2018	12/05/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.101		mg/L	BGL0098
18L0049-01	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/05/2018	12/05/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg/L	BGL0098
18L0049-03	WUFF-OUT-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/05/2018	12/05/2018	SM 4500-P E-99	1426-54-42	Orthophosphorus	0.0040	U	mg/L	BGL0098
BGL0137-BLK1	Blank	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L	BGL0137
BGL0137-BS1	LCS	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-50-8	Copper	27.2		ug/L	BGL0137
18L0049-01	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/06/2018	12/06/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L	BGL0137
18L0049-03	WUFF-OUT-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/06/2018	12/06/2018	EPA 200.8	7440-50-8	Copper	0.625		ug/L	BGL0137
BGL0137-BLK1	Blank	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-50-8	Copper	0.500	U	ug/L	BGL0137
BGL0137-BS1	LCS	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-50-8	Copper	27.1		ug/L	BGL0137
BGL0137-BLK1	Blank	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L	BGL0137
BGL0137-BS1	LCS	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-66-6	Zinc	88.3		ug/L	BGL0137
18L0049-01	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/06/2018	12/06/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L	BGL0137
18L0049-03	WUFF-OUT-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/06/2018	12/06/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L	BGL0137
BGL0137-BLK1	Blank	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-66-6	Zinc	4.00	U	ug/L	BGL0137
BGL0137-BS1	LCS	13-05605-000	Water			12/06/2018	12/06/2018	EPA 200.8	7440-66-6	Zinc	83.1		ug/L	BGL0137
BGL0205-BLK1	Blank	13-05605-000	Water			12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L	BGL0205
BGL0205-BLK2	Blank	13-05605-000	Water			12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L	BGL0205
BGL0205-BS1	LCS	13-05605-000	Water			12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.300		mg-P/L	BGL0205
BGL0205-BS2	LCS	13-05605-000	Water			12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.296		mg-P/L	BGL0205
BGL0205-DUP1	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L	BGL0205
BGL0205-MS1	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.202		mg-P/L	BGL0205
18L0049-01	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0140		mg-P/L	BGL0205
18L0049-03	WUFF-OUT-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	SM 4500-P E-99	7723-14-0	Total Phosphorus	0.0080	U	mg-P/L	BGL0205
BGL0206-BLK1	Blank	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L	BGL0206
BGL0206-BS1	LCS	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-50-8	Copper	26.8		ug/L	BGL0206
18L0049-02	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L	BGL0206
18L0049-04	WUFF-OUT-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L	BGL0206
BGL0206-BLK1	Blank	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-50-8	Copper	0.500	U	ug/L	BGL0206
BGL0206-BS1	LCS	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-50-8	Copper	26.8		ug/L	BGL0206
BGL0206-BLK1	Blank	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L	BGL0206
BGL0206-BS1	LCS	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-66-6	Zinc	81.5		ug/L	BGL0206
18L0049-02	WUFF-IN-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L	BGL0206
18L0049-04	WUFF-OUT-QA	13-05605-000	Water	12/04/2018	12/04/2018	12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L	BGL0206
BGL0206-BLK1	Blank	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-66-6	Zinc	4.00	U	ug/L	BGL0206
BGL0206-BS1	LCS	13-05605-000	Water			12/10/2018	12/11/2018	EPA 200.8-Dissolved	7440-66-6	Zinc	75.0		ug/L	BGL0206



12 December 2018

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)

18L0049

Associated SDG ID(s)

N/A

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 requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

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

Analytical Resources, Inc.

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

Cert# 10000

PJLA Testing
Accreditation # 66169



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

Chain of Custody Record

Project Name:	Project Number:	Client:								Ar	alyses	Reque	sted				
Hydro International Up-flo Filter	Herrera Environmental																
Report To:		Copy To:															
Dylan Ahearn							t.i	ι.	8.00		128					- 1	
Sampled By: K. Bliss		Delivery Metho	d: Coole	-lice			Total phosphorus - EPA 365.3	Orthophosphorus - EPA 365.3	Copper, dissolved - EPA 200.8	Copper, total - EPA 200.8	Zinc, dissolved - EPA 200.8	8.					
Laboratory:	Requested C	 ompletion Date:		of Contain		iner	П	П	eq.	ΡA	- EP	200	9			- 1	
Analytical Resources Inc.						onta	noru	noru	solv	a - E	ved	EPA				1	
Lab Use:						of C	ospł	ospł	, dis	, tot	ssol	tal -					
			Sample	Preser- vative?	Matrix (see	Number of Containers	l ph	hdoi	pper	pper	c, di	Zinc, total - EPA 200.8					Lab ID No.
Sample ID	Date	Time	Type (see codes)	(Y/N)	codes)	Nun	Num Tota		ပိ	ပိ	Zin	Zin					ab l
WUFF-IN-QA			6	N	W	L	X	X	X	X	У	X					
WUFF-OUT-QA			6	N	W	1	X	X	1	X	V	X					
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Comments/Special Instructions:																	
1-Week TOT	Pleas	0															
Relinquished by (Name/CO/ Signature Signature	E	Date/Time 1 74/18	6'00 Rec	ceived By (Name/CO	-IS	kor!	Si	gnatur	e	, E	-10	Non	-	Date/Ti	me i(200
Relinquished by (Name/CO/ Signature	Date/Time 16'00 Received By (Name/CO) 124/18 Date/Time Received By (Name/CO)						Signature			- 1	Date/Time 16 Ut Date/Time Date/Time						
Sample Type: G=Grab C=Composite Matrix C	Codes: A=Air GW=G	Groundwater SE	=Sediment,	SO=Soil	SW=Sur	face W	ater '	W=Wat	er (bla	nks) N	Л=Mate	erial ()=Other	r (speci	fy)		

da Hydro upflo COC rinsate blank docx

Project Name

HERRERA



Herrera Environmental Consultants
Project: Hydro International

2200 6th Avenue, Suite 1100
Project Number: 13-05605-000
Reported:
Seattle WA, 98121
Project Manager: Dylan Ahearn
12-Dec-2018 17:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WUFF-IN-QA	18L0049-01	Water	04-Dec-2018 00:00	04-Dec-2018 16:00
WUFF-IN-QA	18L0049-02	Water	04-Dec-2018 00:00	04-Dec-2018 16:00
WUFF-OUT-QA	18L0049-03	Water	04-Dec-2018 00:00	04-Dec-2018 16:00
WUFF-OUT-QA	18L0049-04	Water	04-Dec-2018 00:00	04-Dec-2018 16:00

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

Work Order Case Narrative

Sample receipt

Samples as listed on the preceding page were received December 4, 2018 under ARI work order 18L0049. For details regarding sample receipt, please refer to the Cooler Receipt Form. The samples were split by sample receiving prior to analysis.

Total and Dissolved Metals - EPA Method 200.8

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry (O-Phos, T-Phos)

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

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

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

Printed: 12/4/2018 5:34:48PM

WORK ORDER

La companya companya manana ma	
18L0049	
1010049	

Client: Herrera Environmental Consultants

Project Manager: Amanda Volgardsen

Project: Hydro International

Project Number: [none]

Preservation Confirmation

Container ID	Container Type	рН
18L0049-01 A	Small OJ, 500 mL, 9N H2SO4	£20001
18L0049-01 B	Small OJ, 500 mL	- 10 1973
18L0049-01 C	HDPE NM, 500 mL, 1:1 HNO3	12000
18L0049-02 A	HDPE NM, 500 mL	37- Fail
18L0049-03 A	Small OJ, 500 mL, 9N H2SO4	Linan
18L0049-03 B	Small OJ, 500 mL	110 x 00
18L0049-03 C	HDPE NM, 500 mL, 1:1 HNO3	LZnan
18L0049-04 A	HDPE NM, 500 mL	72-Fail

Set

164-1

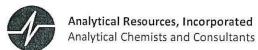
Preservation Confirmed By



WORK ORDER

18L0049

Client: Herrera Environmental Con	sultants		Project Manager: Amanda Volgardsen
Project: Hydro International			Project Number: [none]
Report To:			Invoice To:
Herrera Environmental Consultants			Herrera Environmental Consultants
Dylan Ahearn			Dylan Ahearn
2200 6th Avenue, Suite 1100			2200 6th Avenue, Suite 1100
Seattle, WA 98121			Seattle, WA 98121
Phone: 206-441-9080			Phone :206-441-9080
Fax: -			Fax: -
Date Due: 12-Dec-2018 18:00	(5 day TAT)		
Received By: Stephanie Fishel			Date Received: 04-Dec-2018 16:00
Logged In By: Stephanie Fishel			Date Logged In: 04-Dec-2018 17:31
Samples Received at:18.8°C	2 420 Mar 10 10 10 10 10 10 10 10 10 10 10 10 10	525 ps 30000	Von
Intact, properly signed and dated custody seal Custody papers properly filled out (in, signed	s attached to outside o	f cooler(s).	No Custody papers included with the cooler
Was sufficient ice used (if appropriate)			No All bottles sealed in individual plastic bags
All bottles arrived in good condition (unbroke	n)		Yes All bottle labels complete and legible
Number of containers listed on COC match in Correct bottles used for the requested analyses	imber received		Yes All VOC vials free of air bubbles
Analyses/bottles require preservation (attach p	reservation sheet excl	uding VOC	2). Yes Sufficient amount of sample sent in each bottle
Sample split at ARI			Yes
18L0049-01 WUFF-IN-QA [Water]	Sampled 04-Dec-	2018 00:	00
Filter 0.45 micron (O-Phos)	12/12/2018	5	12/5/2018
Met 200.8 - Cu	12/12/2018	5	6/2/2019
Met 200.8 - Zn	12/12/2018	5	6/2/2019
Phosphorus, Ortho-P, SM 4500-P E-1999 (SI	12/12/2018	5	12/6/2018
Phosphorus, Total, SM 4500-P E-99	12/12/2018	5	1/1/2019
18L0049-02 WUFF-IN-QA [Water]	Sampled 04-Dec-		
Filter 0.45 micron	12/12/2018	5	12/5/2018
Met Diss 200.8 - Zn	12/12/2018	5	6/2/2019
Met Diss 200.8 - Cu	12/12/2018	5	6/2/2019
18L0049-03 WUFF-OUT-QA [Water			
Met 200.8 - Cu	12/12/2018	5	6/2/2019
Filter 0.45 micron (O-Phos)	12/12/2018	5	12/5/2018
Met 200.8 - Zn	12/12/2018	5	6/2/2019
Phosphorus, Ortho-P, SM 4500-P E-1999 (SI	12/12/2018	5	12/6/2018
Phosphorus, Total, SM 4500-P E-99	12/12/2018	5	1/1/2019
18L0049-04 WUFF-OUT-QA [Wate		ec-2018	
Filter 0.45 micron	12/12/2018	- 5	12/5/2018
Met Diss 200.8 - Cu	12/12/2018	5	6/2/2019
Met Diss 200.8 - Zn	12/12/2018	5	6/2/2019



Cooler Receipt Form

1.1					
ARI Client: Herrera		Project Name: HUMCO	Interr	nationa	4
COC No(s):		Delivered by: Fed-EXUPS Co	-		
Assigned ARI Job No: 18L0049			THE PERSON NAMED IN COLUMN TWO	rered Offier	0
Preliminary Examination Phase:		Tracking No:			-(NA)
SELECTION CONTRACTOR IN CONTRACTOR IN SECURITION CONTRACTOR IN CONTRACTO					\sim
Were intact, properly signed and dated custody seals atta				YES	NO
Were custody papers included with the cooler?				YES	NO
Were custody papers properly filled out (ink, signed, etc.)				YES	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C Time:(()()()	for chemis	istry) 18.8			
If cooler temperature is out of compliance fill out form 000	170F		Temp Gun ID	#: Dan	565
Cooler Accepted by:		Date: 12-4-18 Tim	e 1000)	3 02 4
	forms an	d attach all shipping documents			
Log-In Phase:	ATTENNED SELECTION OF THE PARTY.				
Was a temperature blank included in the seeder?					
Was a temperature blank included in the cooler? What kind of packing material was used? Bubbl				YES	MO
		Vet Ice Gel Packs Baggies Foam	9.75 19999	19013870000	
Was sufficient ice used (if appropriate)?			NA	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? .				YES	NO
Were all bottles used correct for the requested analyses?				YES	NO
Do any of the analyses (bottles) require preservation? (atta			NA	YES	NO
Were all VOC vials free of air bubbles?			NA NA	YES	NO
Was sufficient amount of sample sent in each bottle?			CIVA	YES	NO
Date VOC Trip Blank was made at ARI			SNA	(IES)	NO
Was Sample Split by ARI: NA (YES) Date/Time			MEC	Split by:	06
(- (- quipinonii 1 vett		opiit by.	
Samples Logged by:	Date: 🚶	2-4-18 Time:	1731		
** Notify Project M	anager of	f discrepancies or concerns **			
Sample ID on Bottle Sample ID on CO	C	Sample ID on Bottle	Samp	le ID on COC	2
				MISK ION - WATER	
Additional Nature Discourse in C. D. J. C.					
Additional Notes, Discrepancies, & Resolutions:					
By: Date:					
Small Air Rubbles	Sn	nall → "sm" (<2 mm)			
-2mm 2-4 mm > 4 mm	=5	abubbles → "pb" (2 to < 4 mm)			
	- I	rge → "lg" (4 to < 6 mm)			
		eadspace > "hs" (> 6 mm)			
	100000	TARLO AND SOCIETATION			

0016F 3/2/10

Cooler Receipt Form

Revision 014



Cooler Temperature Compliance Form

ARI Work Order: 1000	49	
Cooler#:	1 (3.6
Sample ID	Bottle Count	Bottle Type
8		
(00,0101,00000		
Samples recreved		
above 6		
Cooler#:	Temperature(°C):	
Sample ID	Bottle Count	Bottle Type
Liver Control of the		
Cooler#:	Temperature(°C):	
Sample ID	Bottle Count	Bottle Type
		•
www.alexandra.al		
Cooler#:	Temperature(°C):	
Sample ID	Bottle Count	Bottle Type
		1,10
Was the first terms of the first		
Completed by:	Date	12-4-16 Time:
00070F	Cooler Temperature	

3/3/09



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

WUFF-IN-QA 18L0049-01 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 12/04/2018 00:00

 Instrument: ICPMS2
 Analyst: MCB

 Analyzed: 12/06/2018 17:41

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

Preparation Batch: BGL0137

Prepared: 06-Dec-2018

Sample Size: 25 mL Final Volume: 25 mL

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

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

WUFF-IN-QA 18L0049-01 (Water)

Wet Chemistry

 Method: SM 4500-P E-99
 Sampled: 12/04/2018 00:00

 Instrument: UV1800-2 Analyst: YK
 Analyzed: 12/05/2018 11:23

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0098 Sample Size: 50 mL Prepared: 05-Dec-2018 Final Volume: 50 mL

Reporting Detection CAS Number Limit Limit Analyte Dilution Result Units Notes 1426-54-42 0.0040 0.0040 ND U Orthophosphorus mg/L

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0205 Sample Size: 25 mL Prepared: 10-Dec-2018 Final Volume: 50 mL

Detection Reporting CAS Number Dilution Limit Limit Result Units Notes Analyte Total Phosphorus 7723-14-0 0.0080 0.0080 0.0140 mg-P/L

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

WUFF-IN-QA 18L0049-02 (Water)

Metals and Metallic Compounds (dissolved)

 Method: EPA 200.8
 Sampled: 12/04/2018 00:00

 Instrument: ICPMS2
 Analyst: MCB

 Analyzed: 12/11/2018 19:57

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

Preparation Batch: BGL0206

Sample Size: 25 mL Final Volume: 25 mL

Prepared: 10-Dec-2018 Reporting Limit CAS Number Dilution Result Units Notes 0.500 ND Copper, Dissolved 7440-50-8 1 ug/L U Zinc, Dissolved 7440-66-6 4.00 ug/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

WUFF-OUT-QA 18L0049-03 (Water)

Metals and Metallic Compounds

 Method: EPA 200.8
 Sampled: 12/04/2018 00:00

 Instrument: ICPMS2
 Analyst: MCB

 Analyzed: 12/06/2018 17:45

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

Preparation Batch: BGL0137

Prepared: 06-Dec-2018

Sample Size: 25 mL Final Volume: 25 mL

Reporting Limit Analyte CAS Number Dilution Result Units Notes 0.500 Copper 7440-50-8 1 0.625 ug/L Zinc 7440-66-6 4.00 ug/L U

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

WUFF-OUT-QA 18L0049-03 (Water)

Wet Chemistry

 Method: SM 4500-P E-99
 Sampled: 12/04/2018 00:00

 Instrument: UV1800-2
 Analyst: YK

 Analyzed: 12/05/2018 11:24

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0098 Sample Size: 50 mL Prepared: 05-Dec-2018 Final Volume: 50 mL

Reporting Detection CAS Number Dilution Limit Limit Analyte Result Units Notes 1426-54-42 0.0040 0.0040 ND U Orthophosphorus mg/L

Sample Preparation: Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0205 Sample Size: 25 mL Prepared: 10-Dec-2018 Final Volume: 50 mL

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

Analytical Resources, Inc.



ug/L

U

Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

WUFF-OUT-QA 18L0049-04 (Water)

Metals and Metallic Compounds (dissolved)

Zinc, Dissolved

 Method: EPA 200.8
 Sampled: 12/04/2018 00:00

 Instrument: ICPMS2
 Analyst: MCB

 Analyzed: 12/11/2018 20:02

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

Preparation Batch: BGL0206 Sample Size: 25 mL Prepared: 10-Dec-2018 Final Volume: 25 mL

7440-66-6

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.

4.00



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

Metals and Metallic Compounds - Quality Control

Batch BGL0137 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0137-BLK1)				Prepa	ared: 06-Dec	:-2018 Ana	alyzed: 06-l	Dec-2018 14	4:59		
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 (BGL0137-BS1)				Prepa	ared: 06-Dec	:-2018 Ana	alyzed: 06-l	Dec-2018 1:	5:03		
Copper	63	27.2	0.500	ug/L	25.0		109	80-120			
Copper	65	27.1	0.500	ug/L	25.0		108	80-120			
Zinc	66	88.3	4.00	ug/L	80.0		110	80-120			
Zinc	67	83.1	4.00	ug/L	80.0		104	80-120			

Analytical Resources, Inc.



Herrera Environmental Consultants Project: Hydro International

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGL0206 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0206-BLK1)				Prepa	ared: 10-Dec	:-2018 Ana	alyzed: 11-	Dec-2018 1'	7:29		
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BGL0206-BS1)				Prepa	ared: 10-Dec	:-2018 Ana	alyzed: 11-	Dec-2018 1'	7:34		
Copper, Dissolved	63	26.8	0.500	ug/L	25.0		107	80-120			
Copper, Dissolved	65	26.8	0.500	ug/L	25.0		107	80-120			
Zinc, Dissolved	66	81.5	4.00	ug/L	80.0		102	80-120			
Zinc, Dissolved	67	75.0	4.00	ug/L	80.0		93.7	80-120			

Analytical Resources, Inc.

Herrera Environmental Consultants

Project: Hydro International
2200 6th Avenue, Suite 1100

Project Number: 13-05605-000

2200 6th Avenue, Suite 1100Project Number: 13-05605-000Reported:Seattle WA, 98121Project Manager: Dylan Ahearn12-Dec-2018 17:36

Wet Chemistry - Quality Control

Batch BGL0098 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0098-BLK1)				Prepa	ared: 05-Dec	-2018 An	alyzed: 05-	Dec-2018 1	1:22		
Orthophosphorus	ND	0.0040	0.0040	mg/L							U
LCS (BGL0098-BS1)				Prepa	ared: 05-Dec	:-2018 An	alyzed: 05-	Dec-2018 1	1:23		
Orthophosphorus	0.155	0.0040	0.0040	mg/L	0.150		103	90-110			
Duplicate (BGL0098-DUP1)	Se	ource: 18L	.0049-01	Prepa	ared: 05-Dec	:-2018 An	alyzed: 05-	Dec-2018 1	1:24		
Orthophosphorus	ND	0.0040	0.0040	mg/L		ND					U
Matrix Spike (BGL0098-MS1)	Se	ource: 18L	.0049-01	Prepa	ared: 05-Dec	:-2018 An	alyzed: 05-	Dec-2018 1	1:24		
Orthophosphorus	0.101	0.0040	0.0040	mg/L	0.0999	ND	101	75-125			

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

Analytical Resources, Inc.



Herrera Environmental Consultants 2200 6th Avenue, Suite 1100

Seattle WA, 98121

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

Reported: 12-Dec-2018 17:36

Wet Chemistry - Quality Control

Batch BGL0205 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

		D-44'	Dti		C - 11	Source		%REC		RPD	
QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Result	%REC	%REC Limits	RPD	Limit	Notes
					1 10 5	2010		D 2010.1			
Blank (BGL0205-BLK1)				Prepa	ared: 10-Dec	c-2018 An	alyzed: 11-	Dec-2018 1:	5:42		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
Blank (BGL0205-BLK2)				Prepa	ared: 10-Dec	c-2018 An	alyzed: 11-	Dec-2018 1:	5:45		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L							U
LCS (BGL0205-BS1)				Prepa	ared: 10-Dec	e-2018 An	alyzed: 11-	Dec-2018 1:	5:43		
Total Phosphorus	0.300	0.0080	0.0080	mg-P/L	0.300		100	90-110			
LCS (BGL0205-BS2)				Prepa	ared: 10-Dec	c-2018 An	alyzed: 11-	Dec-2018 1:	5:45		
Total Phosphorus	0.296	0.0080	0.0080	mg-P/L	0.300		98.7	90-110			
Duplicate (BGL0205-DUP1)		Source: 18I	.0049-01	Prepa	ared: 10-Dec	c-2018 An	alyzed: 11-	Dec-2018 1:	5:44		
Total Phosphorus	ND	0.0080	0.0080	mg-P/L		0.0140					U
Matrix Spike (BGL0205-MS1)	,	Source: 18I	.0049-01	Prepa	ared: 10-Dec	c-2018 An	alyzed: 11-	Dec-2018 1	5:44		
Total Phosphorus	0.202	0.0080	0.0080	mg-P/L	0.200	0.0140	94.1	75-125			

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

Analytical Resources, Inc.





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

Project Number: 13-05605-000 Reported:
Project Manager: Dylan Ahearn 12-Dec-2018 17:36

Certified Analyses included in this Report

Analyte Cert	tifications
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EPA 200.8 in Water	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
7inc-67	NELAP WADOE WA-DW 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	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
DoD-ELAP D	W DoD-Environmental Laboratory Accreditation - Drinking Water	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Notes and Definitions

D The reported value is from a dilution

Estimated concentration value detected below the reporting limit.

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

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.