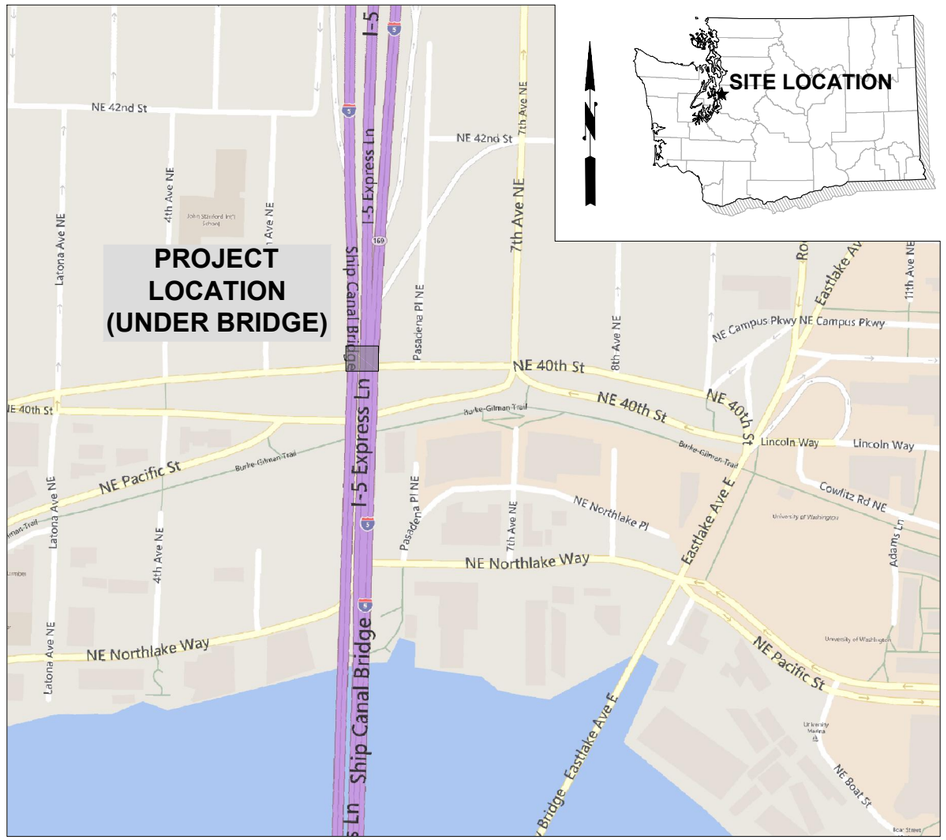
APPENDIX A

Design Drawings of the Test System

HYDRO-INTERNATIONAL, INC.
SHIP CANAL FACILITY
SEATTLE, WASHINGTON



VICINITY MAP
SCALE: 1"= 500'

SHEET INDEX		
SHEET NO.	DRAWING NO.	DESCRIPTION
1	G-1	VICINITY MAP, SHEET INDEX, AND NOTES
2	C-1	PLAN VIEW AND ELEVATION
3	C-2	DETAILS

GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, AND ALL OTHER APPLICABLE CODES AND STANDARDS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THESE PLANS.
2. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL PREVAIL.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING WORK AND REVIEW CONFLICTS WITH ENGINEER BEFORE PROCEEDING.
4. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS AND PRODUCT DATA SHEETS FOR REVIEW PRIOR TO PROCURING MATERIAL. REVIEW OF SHOP DRAWINGS IS FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT AND REQUIREMENTS AND DOES NOT INDICATE ACCEPTANCE OF THE WORK BY THE ENGINEER.
5. A COPY OF THE APPROVED PLANS SHALL BE ONSITE DURING CONSTRUCTION.
6. THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN (SPCC PLAN) FOR ALL FUELS, PETROLEUM PRODUCTS AND HAZARDOUS MATERIALS, AS DEFINED IN CHAPTER 477 OF THE WSDOT ENVIRONMENTAL PROCEDURES MANUAL. PLAN SHALL INCLUDE IDENTIFICATION OF RESPONSIBLE PERSONNEL, SPILL REPORTING CONTACTS, POTENTIAL SPILL SOURCES, AND SPILL PREVENTION AND SPILL RESPONSES MEASURES.
7. CONTRACTOR SHALL NOT COMMENCE WORK UNTIL WRITTEN AUTHORIZATION TO PROCEED HAS BEEN PROVIDED BY WSDOT AND HYDRO-INTERNATIONAL.
8. PUBLIC AND PRIVATE DRAINAGE WAYS SHALL BE PROTECTED FROM POLLUTION. NO MATERIAL IS TO BE DISCHARGED OR DEPOSITED IN STORMWATER SYSTEMS THAT MAY RESUILT IN A VIOLATION OF STATE OR FEDERAL WATER QUALITY STANDARDS. ALL STORM DRAIN INLETS SHALL BE PROTECTED SO THAT STORMWATER SHALL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
9. **A PRE CONSTRUCTION MEETING AND A 24-HOUR NOTICE SHALL BE REQUIRED PRIOR TO STARTING NEW CONSTRUCTION**. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE THE PRE CONSTRUCTION MEETING WITH ALL CONCERNED PARTIES (HYDRO INTERNATIONAL, WSDOT, HERRERA) AND TO OBTAIN ANY AND ALL REQUIRED PERMITS PRIOR TO STARTING CONSTRUCTION.
10. TRAFFIC CONTROL MEASURES SHALL BE EMPLOYED IN ACCORDANCE WITH WSDOT TEMPORARY TRAFFIC CONTROL REQUIREMENTS.
11. ALL DAMAGES INCURRED TO PUBLIC AND/OR PRIVATE PROPERTY BY THE CONTRACTOR DURING THE COURSE OF CONSTRUCTION SHALL BE PROMPTLY REPAIRED TO ORIGINAL CONDITION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERIFICATION OF EXISTING UTILITY LOCATIONS WHETHER OR NOT THESE UTILITIES ARE SHOWN ON THE PLANS. THE CONTRACTOR SHALL EXERCISE ALL CARE TO AVOID DAMAGE TO ANY UTILITY. IF CONFLICTS WITH EXISTING UTILITIES ARISE DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EROSION CONTROL INCLUDING PROTECTION OF ALL ADJACENT PROPERTIES FROM SEDIMENT DEPOSITION.
14. WHEREVER CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED ROADS, PROVISIONS MUST BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT AND MUD ONTO THE PAVED ROADS. IF SEDIMENT IS TRANSPORTED ONTO A ROAD SURFACE, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR SWEEPING AND BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY INCLUDING PROTECTION OF WORK AND SITE AGAINST VANDALISM, THEFT, AND UNAUTHORIZED ACCESS.
17. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE.
18. THE CONTRACTOR SHALL PERFORM FINAL CLEANUP INCLUDING REMOVAL OF ALL EQUIPMENT, MATERIALS, AND DEBRIS, BEFORE THE PROJECT IS CONSIDERED COMPLETE.
19. **A FINAL INSPECTION AND A 24-HOUR NOTICE SHALL BE REQUIRED AFTER COMPLETION OF WORK AND FINAL CLEANUP**. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE THE FINAL INSPECTION WITH ALL CONCERNED PARTIES (HYDRO INTERNATIONAL, WSDOT, HERRERA).

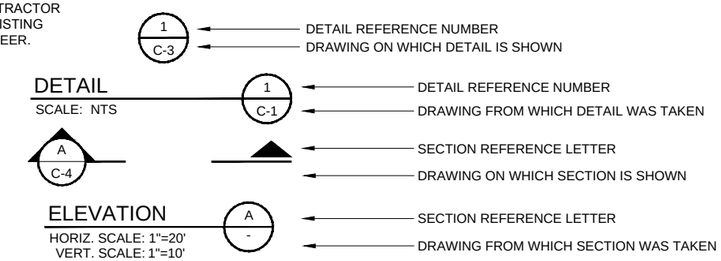
SURVEYOR NOTES (TRUE NORTH LAND SURVEYING, INC.)

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE, NAD 83/91
2. VERTICAL DATUM: NAVD 88
3. BENCHMARK: CITY OF SEATTLE BRASS CAP STAMPED "0001" IN CONCRETE WALK 1 FOOT WEST OF TRAFFIC SIGNAL CONTROL BOX AT THE SOUTH END OF TRAFFIC ISLAND, AT THE INTERSECTION OF ROOSEVELT WAY NORTHEAST AND EASTLAKE AVENUE NORTHEAST. ELEV.=107.253
4. DATE OF SURVEY: AUGUST 18 & 21, 2015
5. EQUIPMENT USED: LEICA TS12, LEICA VIVA GPS, & LEICA DNA 3 DIGITAL LEVEL.
6. UTILITIES SHOWN HEREON WERE FROM CITY UTILITY INFORMATION, PHYSICAL STRUCTURES, OR FROM SURFACE PAINT MARKINGS BY A LOCATOR SERVICE.

CIVIL ABBREVIATIONS:

CB	CATCH BASIN
DIA	DIAMETER
ELEV	ELEVATION
FT	FEET
HORIZ	HORIZONTAL
IE	INVERT ELEVATION
LBF	POUNDS FORCE
MH	MANHOLE
MIN	MINIMUM
TYP	TYPICAL
VERT	VERTICAL
N	NORTH
S	SOUTH
E	EAST
W	WEST

NOTE AND DETAIL/SECTION REFERENCING



"-" INDICATES THAT THE DETAIL/SECTION IS SHOWN ON THE SAME SHEET

"TYP" INDICATES THAT THE DETAIL/SECTION IS UNIFORMLY TYPICAL THROUGHOUT PROJECT EXCEPT WHERE OTHERWISE NOTED

Know what's **below.** **Call** before you dig.

No.	REVISION	BY	APP'D	DATE

ONE INCH AT FULL SIZE. IF NOT ONE INCH SCALE ACCORDINGLY

HERRERA

MEGHAN M. FELLER STATE OF WASHINGTON 51554 REGISTERED PROFESSIONAL ENGINEER

DESIGNED: M. FELLER	DRAWN: E. MARSHALL
DESIGNED: -	DRAWN: -
DESIGNED: -	CHECKED: C. WEBB
SCALE: AS NOTED	APPROVED: -

HYDRO-INTERNATIONAL, INC.
SHIP CANAL FACILITY

VICINITY MAP, SHEET INDEX, AND NOTES

DATE: DECEMBER 2015
PROJECT NO: 13-05605-000
DRAWING NO: G-1
SHEET NO: 1 OF 3

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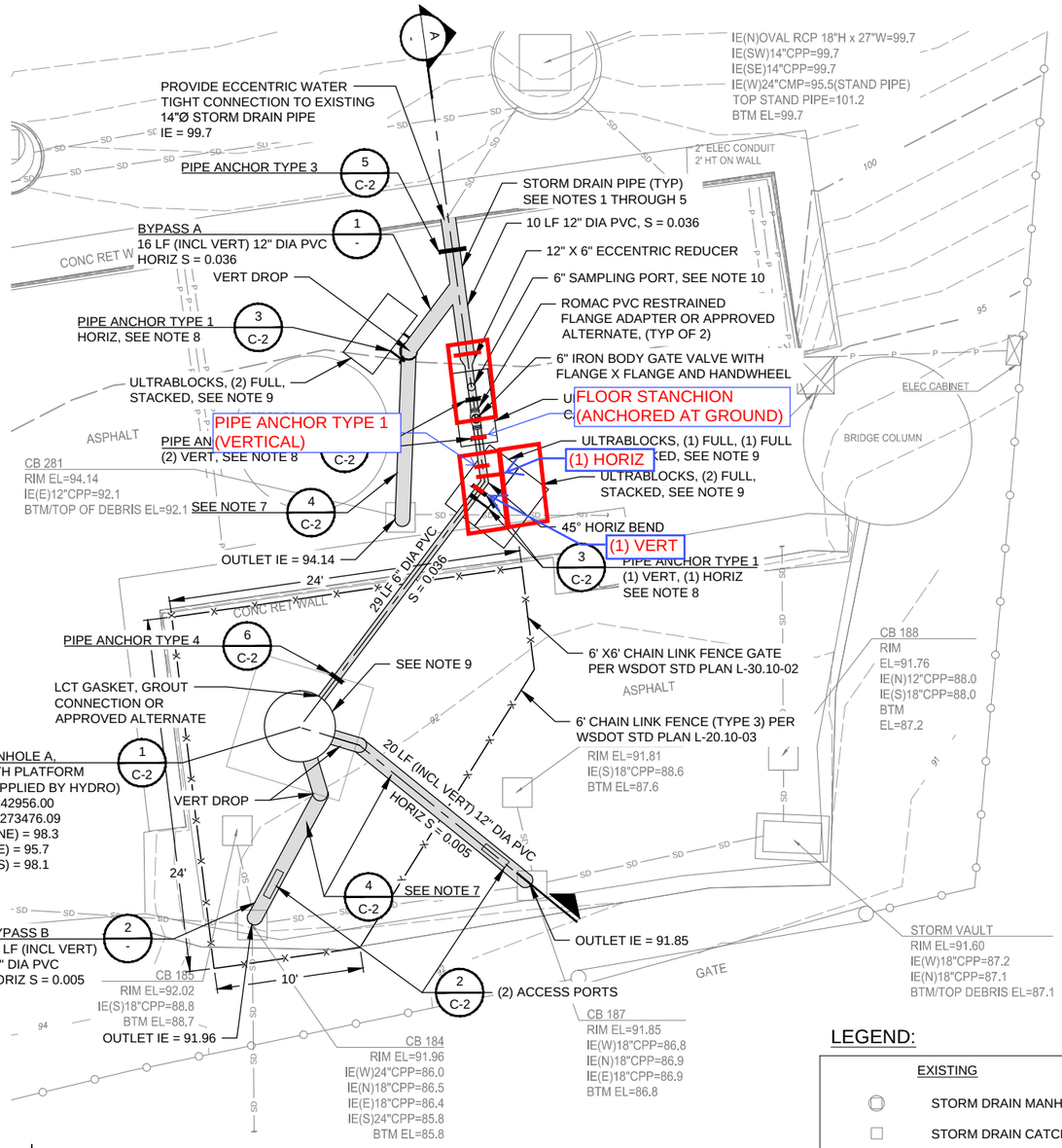
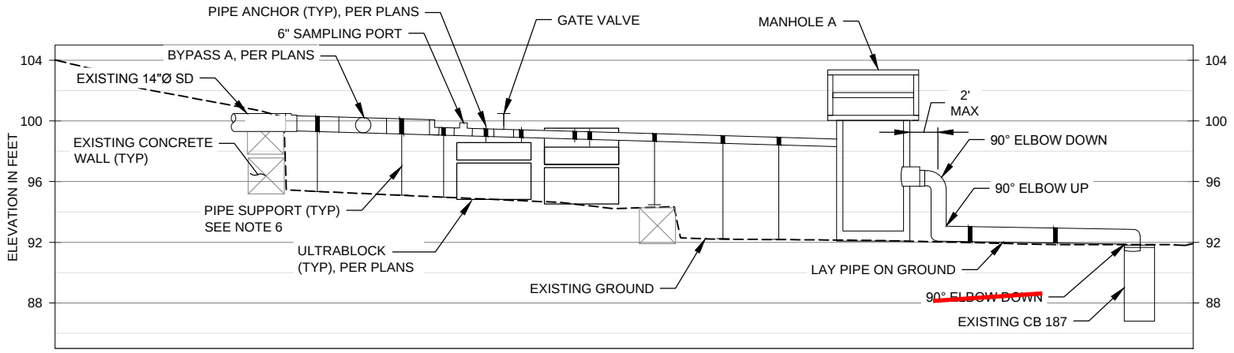
Cad User: Meghan Feller
Plotter: DWG To PDF.pc3

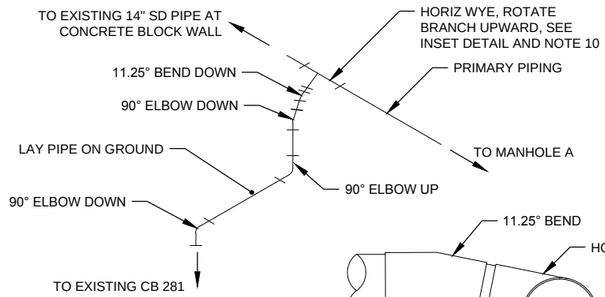


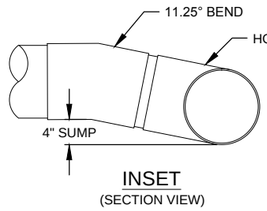


PROFILE THROUGH PRIMARY PIPING

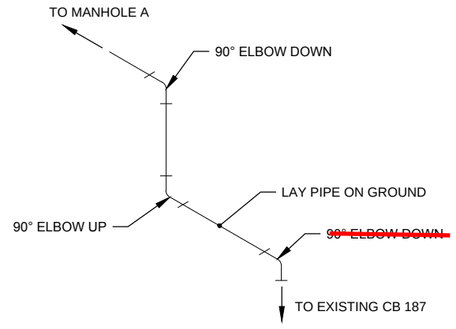
A -

HORIZ. SCALE: NTS
VERT. SCALE: NTS





INSET
(SECTION VIEW)



ISOMETRIC DETAIL - BYPASS A

1 -

SCALE: NTS

ISOMETRIC DETAIL - BYPASS B

2 -

SCALE: NTS

LEGEND:

EXISTING	PROPOSED
STORM DRAIN MANHOLE	STORM DRAIN PIPE
STORM DRAIN CATCH BASIN	MANHOLE
ELECTRICAL HAND HOLE	GATE VALVE
ELECTRICAL CABINET	ULTRABLOCKS
CHAIN LINK FENCE	CHAIN LINK FENCE
POWER LINE	
STORM DRAIN LINE	

NOTES:

1. ALL STORM DRAIN PIPE SHALL BE PVC, SCHEDULE 40, UNLESS OTHERWISE NOTED.
2. ALL PIPE JOINTS SHALL BE SOLVENT WELDED UNLESS OTHERWISE NOTED.
3. MINIMUM PIPE SLOPE SHALL BE 1 PERCENT, UNLESS OTHERWISE NOTED.
4. PIPES WILL BE SUBJECT TO FREEZING CONDITIONS. ALL PIPES MUST HAVE POSITIVE DRAINAGE TO DOWNSTREAM STRUCTURE.
5. FITTINGS SHOWN ARE MINIMUM REQUIRED FOR PIPE ALIGNMENT. CONTRACTOR RESPONSIBLE FOR ALL FITTINGS REQUIRED TO LAY OUT PIPE PER PLANS.
6. WHEN PIPE ALIGNMENT IS ABOVE EXISTING GRADE, STEEL PIPE SUPPORTS WITH SADDLE, STRAP, AND FLOOR STANCHION, CAPABLE OF SUPPORTING THE WEIGHT OF PIPE UP TO 1,000 LBS, SHALL BE EVENLY SPACED AT 5' ON CENTER, MINIMUM.
7. WHEN PIPE ALIGNMENT IS AT EXISTING GRADE, SECURE PIPE TO GROUND WITH ANCHOR TYPE 2 AT 5' ON CENTER MINIMUM AND ALL JOINTS TO PREVENT MOVEMENT OF PIPE DURING OPERATION.
8. LOCATE ALL PIPE ANCHORS WITHIN 1 FOOT OF VALVE OR JOINT, UNLESS OTHERWISE NOTED.
9. APPLY ASPHALT COLD PATCH TO LEVEL ULTRABLOCKS AND MANHOLE TO WITHIN 1° OF PLUMB.
10. SAMPLING PORT SHALL BE AN UPTURNED 6" PVC TEE WITH TEMPORARY (DRY FIT) PLUG. LOCATE SAMPLING PORT UPSTREAM OF GATE VALVE AND WITHIN 15 FEET OF CONNECTION TO EXISTING 14" STORM DRAIN AT RETAINING WALL.

Know what's **below.** **Call** before you dig.

No.	REVISION	BY	APP'D	DATE

ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

HERRERA

MEGHAN M. FELLER STATE OF WASHINGTON 51554 REGISTERED PROFESSIONAL ENGINEER

DESIGNED: M. FELLER	DRAWN: E. MARSHALL
DESIGNED: -	DRAWN: -
DESIGNED: -	CHECKED: C. WEBB
SCALE: AS NOTED	APPROVED: -

HYDRO-INTERNATIONAL, INC.

SHIP CANAL FACILITY

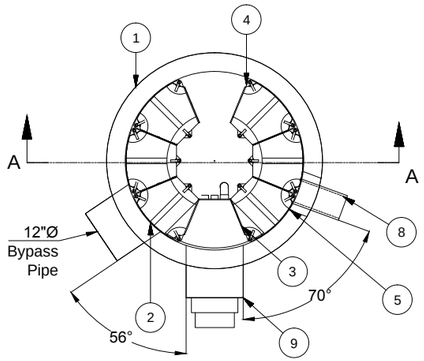
PLAN VIEW

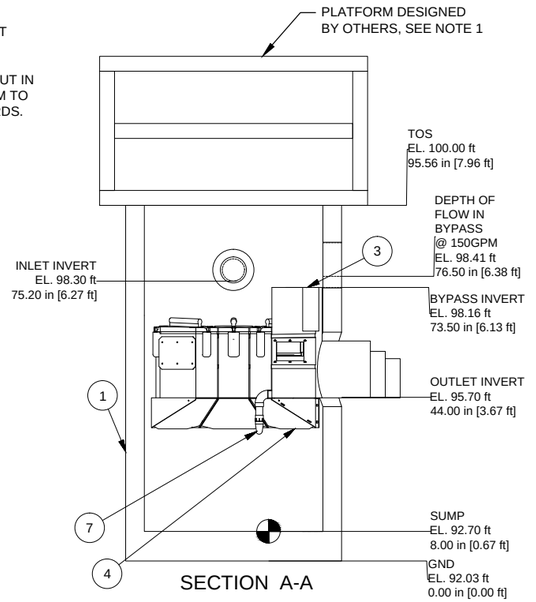
DATE: DECEMBER 2015
PROJECT NO: 13-05605-000
DRAWING NO: C-1
SHEET NO: 2 OF 3

Path: O:\proj\Y2013\13-05605-000\CAD\Dwg\C-1.dwg
Plot Date: 12/30/2015 1:06 PM
Plot Style Table: Herrera.ctb
Cad User: Meghan Feller
Plotter: DWG To PDF.pc3

NOTES:

1. CONTRACTOR TO SUBMIT DESIGN DRAWINGS FOR AN 8 FT BY 8 FT WOOD FRAMED PLATFORM OR SCAFFOLDING TO PROVIDE MAINTENANCE ACCESS TO MANHOLE. PLATFORM SHALL BE CENTERED ON PRECAST MANHOLE WITH 32 IN DIAMETER HOLE CUT IN CENTER. CONTRACTOR RESPONSIBLE FOR DESIGN OF PLATFORM TO MEET INTENDED USE AND ALL APPLICABLE CODES AND STANDARDS.





SECTION A-A

Parts List			
ITEM	QTY	DESCRIPTION	SIZE
1	1	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)	48 in
2	6	FILTER MODULE	
3	1	OUTLET MODULE AND BYPASS HOOD	
4	6	SINGLE SUPPORT BRACKET W/ ANGLED SCREEN	
5	6	BACKER PLATE FOR SINGLE SUPPORT	
6	1	OUTLET SUPPORT BRACKET	
7	1	DRAIN DOWN FILTER	
8	1	INLET PIPE (BY OTHERS)	6 in
9	1	OUTLET STUB (BY HYDRO)	12 in

CAPACITIES:

1. Minimum performance: 80% removal of Sil-Co-Sil 106 (d50 = 22 microns) at the peak treatment flow.
2. NJDEP peak treatment flow: 0.056 cfs/module * OR 0.66 acres of imperviousness/module, whichever results in the greater number of modules.
3. Maximum number of modules: 7 **

ADDITIONAL DESIGN INFORMATION:

1. * Normal operating W.S.E. is 2.46' above the outlet invert at the peak treatment flow of 0.056 cfs/module. For a given flow the head requirement can be reduced by adding additional filters.
2. ** Treatment flows that require more modules will require a larger vault design.

Notes

REVISION HISTORY			
REV	BY	DATE	DESCRIPTION
A	RC	9/9/15	INVERTS
B	RC	10/12/15	INVERTS
C	RC	10/28/15	BYPASS
D	RC	11/2/15	BYPASS

Date 08/10/15	Scale 3/8" = 1'0"

Drawn RC	Checked	Approved

Title

4-FT DIAMETER
UP-FLO FILTER®

I5 TEST SITE
WASHINGTON

Hydro International

Stormwater Solutions
94 Hutchins Drive
Portland, Maine 04102
Tel: (207) 756-6200
Fax: (207) 756-6212
stormwaterinquiry@hydro-int.com

CAD Ref: 6M ROUND

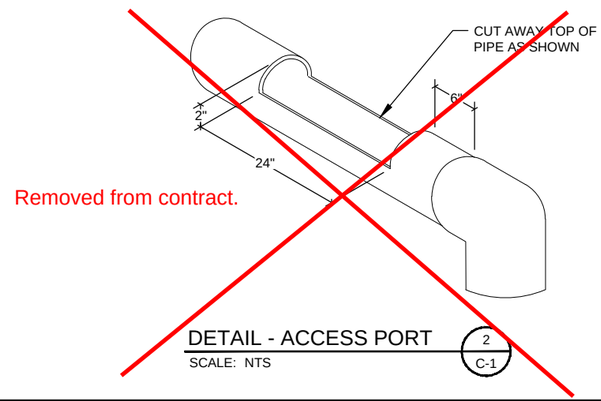
Project No. 15-11979

Drawing No. 6M ROUND Rev. D

DETAIL - MANHOLE B 6-MODULE UP-FLO FILTER

SCALE: NTS

1 C-1



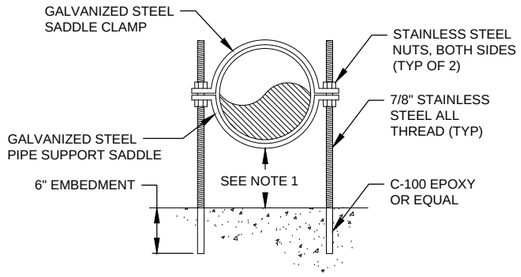
DETAIL - ACCESS PORT

SCALE: NTS

2 C-1

NOTES:

1. PIPE SADDLE SHALL BE WITHIN 12 INCHES OF CONCRETE SURFACE FOR 12 INCH DIAMETER PIPES AND WITHIN 18 INCHES OF CONCRETE SURFACE FOR 6 INCH DIAMETER PIPES.

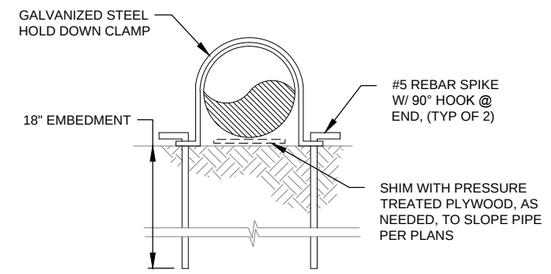


DETAIL - PIPE ANCHOR TYPE 1

SCALE: NTS

3 C-1

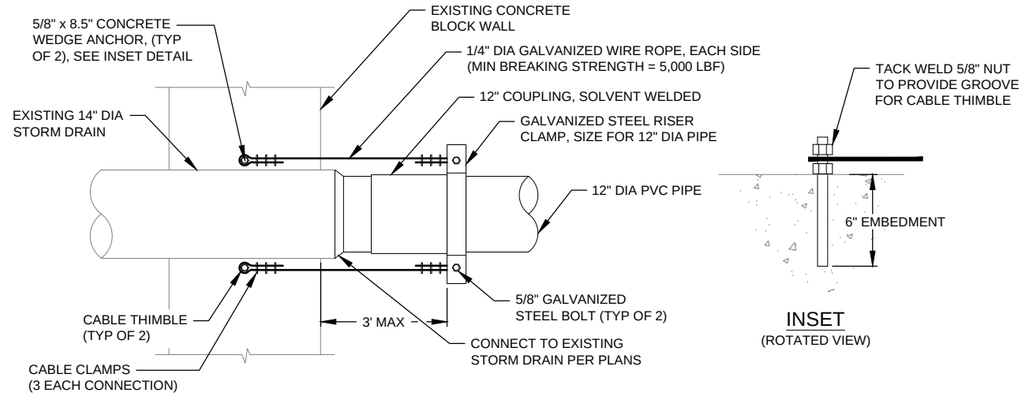
u-bolt and splice plate



DETAIL - PIPE ANCHOR TYPE 2

SCALE: NTS

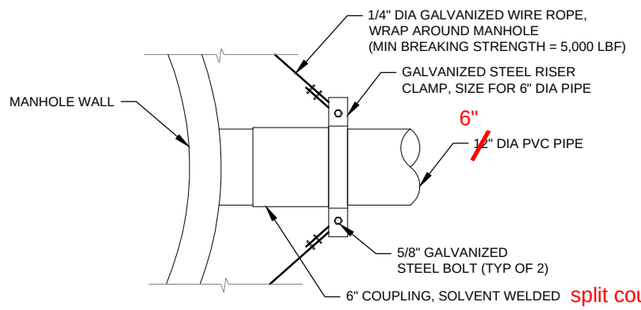
4 C-1



DETAIL - PIPE ANCHOR TYPE 3

SCALE: NTS

5 C-1



DETAIL - PIPE ANCHOR TYPE 4

SCALE: NTS

6 C-1

Know what's **below.**
Call before you dig.

No.	REVISION	BY	APP'D	DATE

ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

HERRERA

MEGHAN M. FELLER
STATE OF WASHINGTON
51554
REGISTERED
PROFESSIONAL ENGINEER

DESIGNED: M. FELLER	DRAWN: E. MARSHALL
DESIGNED: -	DRAWN: -
DESIGNED: -	CHECKED: C. WEBB
SCALE: AS NOTED	APPROVED: -

HYDRO-INTERNATIONAL, INC.
SHIP CANAL FACILITY

DETAILS

DATE:	DECEMBER 2015
PROJECT NO:	13-05605-000
DRAWING NO:	C-2
SHEET NO:	3 OF 3

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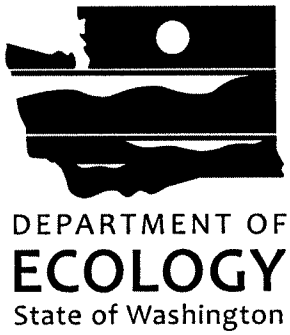
Cad User: Meghan Feller
Plotter: DWG To PDF.pc3

APPENDIX B

Property Use Agreement



PROPERTY USE AGREEMENT

RE: LAKE UNION SHIP CANAL RESEARCH FACILITY STORMWATER TREATMENT DEVICE

This Property Use Agreement is made and entered into between the WASHINGTON STATE DEPARTMENT OF ECOLOGY (hereinafter ECOLOGY) and HIL TECHNOLOGY, INC., a Maine corporation dba HYDRO INTERNATIONAL, (hereinafter "HYDRO") collectively referred to as "Parties," and individually, the "Party."

WHEREAS, HYDRO has a stormwater treatment system (System) that has been tested, approved, and is in use elsewhere in the country but would like it to be approved for use in Washington State; and

WHEREAS, ECOLOGY has an agreement with the Washington State Department of Transportation dated September 14, 2015, for research on storm water treatment technologies, a copy of which is attached as an exhibit to this Agreement, at the WSDOT Lake Union Ship Canal Research Facility (Facility) located at 650 NE 40th St in Seattle, WA; and

WHEREAS, ECOLOGY agrees to sublet the use of the Facility to HYDRO; and

WHEREAS, HYDRO desires to use a test bay at the Facility for the purpose of installing up to two storm water treatment devices for filtering, testing, and monitoring of stormwater runoff to support approval of its System; and

WHEREAS, the installation of the storm water treatment devices will reduce the amount of untreated storm water discharging from the Facility during the test period, and permit HYDRO the opportunity to test and apply for approval of their System for use in Washington State; and

WHEREAS, ECOLOGY agrees to permit the use of the System, subject to the terms and conditions herein;

NOW, THEREFORE, pursuant to the above recitals that are incorporated herein as if fully set forth below, and in consideration of the terms, conditions, covenants and performances contained herein, the Parties hereto agree as follows:

1. PROJECT USE

1.1 In consideration of ECOLOGY's desire to sublet the Facility and HYDRO's desire to perform further research on and obtain ECOLOGY approval of its System, ECOLOGY authorizes HYDRO to use BAY #3 of the Facility to install the System, for the period of the testing program, namely, HYDRO to screen particulates from stormwater prior to discharge into the drainage system, together with monitoring and data storage equipment to facilitate such research. HYDRO shall test the effectiveness of such devices and monitor the type, quantity, and volume of such particulates. ECOLOGY's authorization is subject to the terms and conditions of this Agreement.

1.2 HYDRO shall monitor the stormwater treatment System on a schedule pre-approved in writing by ECOLOGY. HYDRO shall report to ECOLOGY the results of the testing and monitoring activities ("Data"), the report format will be agreed upon in advance. At the conclusion of the monitoring period, HYDRO agrees to uninstall its Systems from Bay #3 at HYDRO's sole cost within thirty (30) days, unless otherwise agreed upon. Upon completion of such action, this Agreement shall terminate, unless amended.

1.3 HYDRO shall be solely responsible for the maintenance and repair of the System during the term of this Agreement. If, for any reason, ECOLOGY decides, in its sole discretion, that the System should be removed, HYDRO agrees to remove the System at HYDRO's sole cost and expense, within thirty (30) days, unless otherwise agreed upon. Upon completion of such action, this Agreement shall terminate, unless amended.

1.5 HYDRO shall be fully responsible for the actions of its employees, the contractor who will physically install the System, and the consultant who will be monitoring the testing process while at the Facility pursuant to this Agreement.

1.6 ECOLOGY'S authorization under the Agreement does not constitute an endorsement of HYDRO's stormwater treatment device(s) or System(s), before, during, or after the performance of this Agreement. However, HYDRO may use the monitoring data and project information in satisfying the submittal requirements for product acceptance by ECOLOGY and to support other regulatory agency performance documentation requirements.

1.7 HYDRO may secure Bay #3, and its equipment installed in Bay #3 in such a manner as it may determine, including by installing fencing around Bay #3, and/or secure containers for its monitoring equipment, for which only HYDRO and Ecology shall have access. HYDRO agrees that no such installation securing Bay #3 shall preclude ECOLOGY or its authorized persons and licensees from accessing any of the other bays at the Facility.

1.8 ECOLOGY agrees that should it authorize any person to use another bay at the Facility, it shall cause any such person to not alter the flow-rate to Bay #3, as ECOLOGY understands and acknowledges that HYDRO's testing and monitoring in Bay #3, downstream, may be adversely affected by any such alterations.

2. TERM

2.1 This Agreement shall become effective on the date of the Party's last signature executed below, and shall expire on June 30, 2017, unless terminated earlier pursuant to Section 6 herein.

3. FACILITY USE

3.1 HYDRO shall not disrupt or adversely affect in any way the use, operation, and maintenance of the Facility. ECOLOGY shall continue to use, operate, maintain, and sublet the other Bays of the Facility during HYDRO's activities. ECOLOGY will coordinate with HYDRO to ensure that ECOLOGY's activities at the Facility are not disrupted or delayed and that any other authorized parties have reasonable access to these other ECOLOGY approved locations at the Facility to complete its installation, testing, and monitoring activities.

3.2 ECOLOGY shall not be responsible for providing equipment of any kind.

3.3 HYDRO shall pay all charges for electricity and other services and utilities used by HYDRO at the Facility during the term of this Agreement unless otherwise expressly agreed in writing by ECOLOGY.

3.4 HYDRO may, after receiving ECOLOGY's written authorization, authorize its employees, contractor, and consultant to access the Facility for the installation, testing, and monitoring of their System.

3.5 HYDRO shall require its employees, contractor, and consultant to comply with all applicable federal, state, and municipal laws, rules, and regulations while conducting its installation, operation, testing, monitoring, and repairing its System. Failure of HYDRO to comply with any such laws, rules, and regulations shall be cause for immediate termination of the Agreement.

3.6 HYDRO agrees and shall be fully responsible for all clean-up costs and/or Facility damage arising from its activities authorized pursuant to the Agreement. ECOLOGY shall notify HYDRO in writing of the need to clean-up the Facility or correct Facility damages, and HYDRO agrees to perform the work as ECOLOGY directs in its notification. If, for any reason, ECOLOGY determines it is in ECOLOGY's best interest to perform the necessary clean-up and/or corrective damage work itself, ECOLOGY shall provide a detailed invoice to HYDRO for such work, and HYDRO agrees to and shall pay the invoiced costs within thirty (30) calendar days following the invoice date.

3.7 Upon completion or termination of the Agreement, HYDRO shall have no further access to the Facility for any testing purposes.

4. INDEMNITY

4.1 HYDRO shall protect, defend, indemnify, and hold harmless ECOLOGY and WSDOT, their officers, officials, employees, and agents while acting within the scope of their employment as such, from any and all costs, claims, judgments, and/or awards of damages (both to persons and/or

property), arising out of, or in any way resulting from, the HYDRO's authorized or unauthorized use of the Facility pursuant to the provisions of the Agreement. HYDRO will not be required to indemnify defend, or save harmless ECOLOGY and WSDOT if the claim, suit, or action for injuries, death, or damages (both to persons and/or property) is caused by the sole negligence or intentional misconduct of ECOLOGY or WSDOT. Where such claims, suits, or actions result from the concurrent negligence of both parties, or involve those actions covered by RCW 4.24.115, the indemnity provisions provided herein shall be valid and enforceable only to the extent of each Party's own negligence.

4.2 HYDRO agrees that its obligations under this section extend to any claim, demand and/or action brought by, or on behalf of, any HYDRO employees or agents while performing all actions while located on state of Washington property. For this purpose, HYDRO, by MUTUAL NEGOTIATION, HEREBY WAIVES with respect to ECOLOGY and WSDOT only, any immunity that would otherwise be available to it against such claims under the Industrial Insurance provisions of chapter 51.12 RCW.

4.3 This indemnification and waiver shall survive the termination of this Agreement.

5. INSURANCE

5.1 At its sole expense, HYDRO shall keep its activities and equipment, covered by the Agreement, continuously insured throughout the term of this Agreement against claims for personal injury or property damage, by an insurer licensed or authorized to conduct business in the State of Washington. The insurance shall be Commercial General Liability Insurance in an amount not less than a combined single limit of One Million Dollars ($1,000,000) per occurrence. Coverage in the minimum amount set forth herein shall not be construed to relieve HYDRO from liability in excess of such coverage.

5.2 The insurance policy or policies shall: (i) name ECOLOGY and WSDOT as an "additional insured" during the Agreement period; (ii) include a waiver of subrogation for ECOLOGY and WSDOT, and (iii) not be changed or canceled without prior notice to ECOLOGY. HYDRO shall furnish ECOLOGY with proper evidence of such insurance prior to commencement of activities under the Agreement.

5.3 At its sole expense, HYDRO shall provide an executed contract Bond in the amount of $5,000. This contract bond shall:

1. Be signed by an approved Surety that is registered with the Washington State Insurance Commissioner.
2. Be conditioned on the faithful performance of the Contract by HYDRO.
3. Guarantee that HYDRO shall remove all equipment from the site and return the site to its condition when HYDRO began use of the site.

6. TERMINATION

6.1 Termination for Convenience:
Either Party may terminate this Agreement for convenience at any time. In such event, the terminating Party: (i) shall provide the other Party as much advance notice as reasonably possible, with no less than 30 days prior written notification; and (ii) shall not be liable to the other Party for any direct, indirect or consequential damages arising solely from the decision to terminate the Agreement.

6.2 Termination for Default:
Upon prior written notice, ECOLOGY may terminate this Agreement for HYDRO's failure to perform or abide by any provision of this Agreement.

6.3 If this Agreement is terminated for any reason, HYDRO agrees to be liable to ECOLOGY for: (i) all reasonable expenses, if any, incurred by ECOLOGY to enforce the terms of and terminate this Agreement prior to the termination; and (ii) any damages to the Facility.

6.4 Termination of this Agreement shall not modify, waive or cancel any rights of the Parties accrued prior to the termination of this Agreement, including, but not limited to ECOLOGY's rights under Sections 1.2 and 1.6.

7. ENTIRE AGREEMENT

7.1 This Agreement constitutes the full agreement between the Parties. There are no terms, obligations, covenants or conditions other than those contained herein, either written or oral, that would obligate or bind either Party. This Agreement may not be modified except by a written amendment signed by both Parties.

8. VENUE

8.1 In the event that either Party deems it necessary to institute legal action or proceedings to enforce any right of obligation under this Agreement, the Parties hereto agree that any such action or proceedings shall be brought in a court of competent jurisdiction situated in Thurston County, Washington. Each Party agrees to be responsible for its own attorney fees and costs.

[Signatures on following page]

IN WITNESS WHEREOF, the parties hereto, having read this Contract in its entirety, including all attachments, do agree in each and every particular and have thus set their hands hereunto.

WASHINGTON STATE
DEPARTMENT OF ECOLOGY

BY: Heather R Bartlett Date: 10/23/15
Heather Bartlett
Water Quality Program Manager

HYDRO

BY: L Lemont Date: 9/27/2015
Lisa Lemont
Business Development Manager

Federal I.D. No. : 01-0414292

Address: 94 Hutchins Drive
Portland, ME 04102

Phone: (207)756-6200
Fax: (207)756-6212
E-mail: llemont@hydro-int.com

Approved as to form only: Attorney General Office

TRAVELERS

Bond

Bond No. 106332637

KNOW ALL MEN BY THESE PRESENTS, that we, HIL Technology, Inc dba: Hydro International, as principal, and TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA, a corporation organized under the laws of the state of Connecticut, and duly authorized to transact business in the State of Washington, as Surety, are held and firmly bound unto Washington State Department of Ecology, in the penal sum of Five Thousand ($5) Dollars, lawful money of the United States, to the payment of which well and truly be made we bind ourselves and our heirs, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS the above bounden Principal has entered into a certain written Contract with the above named Obligee, effective the 8th day of September 8, 2015, for Property Use Agreement for Lake Union Ship Canal Research Facility Stormwater Treatment Device, which Contract is hereby referred to and made part hereof as fully and to the same extent as if copies at length were attached herein.

NOW THEREFORE, if the Principal shall comply with and faithfully perform the terms of section 5.3 of the Contract, then this bond shall be null and void, otherwise to be in full force and effect.

PROVIDED HOWEVER, that this bond is subject to the following expressed conditions:

1. This bond is for the term beginning September 8, 2015 and ending June 30, 2017.

2. If any conflict or inconsistency exists between the Surety's obligation or undertakings as described in this bond and those described in any related underlying documents, then the terms of this bond shall prevail.

3. Surety's liability under this bond and all continuation certificates issued in connection therewith shall not be cumulative and shall in no event exceed the amount as set forth in this bond or in any additions, riders, or endorsements properly issued by the Surety as supplements thereto.

4. No claim, action, suit or proceeding, except as herein set forth, shall be had or maintained against the Surety on this bond unless same be brought or instituted and process served upon the Surety within three months following the expiration of the original term of this bond, or extended term as provided herein.

5. It shall be a condition precedent to any right of recovery hereunder, that in event of any default on part of the Principal, a written statement of the particular facts of such default shall be forwarded to the Surety within sixty (60) days of the occurrence of such default, delivered by registered mail to the Surety at its Home Office in Hartford, Connecticut.

6. No right of action shall accrue under this bond to or for the use of any person or entity other than the Obligee and it successors and assigns.

Signed, sealed and dated this 9th day of September, 2015.

HIL Technology, Inc dba: Hydro International

ATTEST Andrea Rocle

BY Kristy Greco
Principal

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA

ATTEST

BY
Jenifer McCormick, Attorney-In-Fact

SEAL

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

TRAVELERS

POWER OF ATTORNEY

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company
St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company

Attorney-In Fact No. 224045 **Certificate No.** 006102139

KNOW ALL MEN BY THESE PRESENTS: That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Kathy Cerkoney, Wolter Van Doorninck, Coralee Aho, James S. Ewald, Jenifer McCormick, and Dave Van Gordon

of the City of Portland, State of Oregon, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 18th day of September, 2014.

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company
St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company

State of Connecticut
City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the 18th day of September, 2014, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.
My Commission expires the 30th day of June, 2016.

MARIE C. TETREAULT NOTARY PUBLIC CONNECTICUT

Marie C. Tetreault
Marie C. Tetreault, Notary Public

58440-8-12 Printed in U.S.A.

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of September, 20 17

Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at www.travelersbond.com. Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.

APPENDIX C

E-Mail Correspondence with Ecology

From:	Carla B. Milesi
To:	Dylan Ahearn; Douglas Howie
Subject:	RE: Thoughts on Up-Flo Maintenance Interval
Date:	Monday, July 16, 2018 9:43:37 AM
Attachments:	image002.jpg image003.gif

Dylan,

Yes, we will likely require testing at another site as we have required with other devices that have had the clogging issues at the Ship Canal site. However, at this point we can't say whether the BER will want to see additional testing regarding the breakthrough concern. With the short maintenance cycle it's possible that they will still have some concerns about breakthrough of the media if it were to be exposed to more than 25% of a water year.

Let me know if you have further questions about this.

Carla

Carla Milesi
Emerging Stormwater Technologies Coordinator
University of Washington Tacoma
Washington Stormwater Center
Technology Assessment Protocol – Ecology (TAPE)

CENTER FOR URBAN WATERS
326 East D Street | Tacoma, WA 98421 | (253) 254-7030 x8004

http://www.tacoma.uw.edu/urbanwaters

From: Dylan Ahearn [mailto:dahearn@herrerainc.com]
Sent: Friday, July 13, 2018 12:31 PM
To: Douglas Howie <douglas.howie@ecy.wa.gov>; Carla B. Milesi <milesi@uw.edu>
Subject: Thoughts on Up-Flo Maintenance Interval

Hi Doug and Carla,

As I am finishing up the Hydro-International Up-Flo TER I am trying to anticipate comments from the BER based on past submissions from testing at the SCTF. The Up-Flo, like all the filters at the SCTF tested over the past 3 years, required more maintenance than is considered typical. We were able to get 25 percent of a water year through the filter over a one year monitoring period with 4 ribbon swaps. This system is a bit different than a Treebox Filter because when you maintain it you are essentially starting fresh (new ribbon media, clean sump). Given this, I am assuming the BER will not

require additional samples to prove that media breakthrough will not be a long term issue. I know you cannot speak for the BER, but do you think this is this a safe assumption?

Second, I am also assuming that post-GULD monitoring will be required (similar to what was required of the Oldcastle BioPod with their GULD) in order to prove that the rapid clogging we observed at the SCTF does not happen at a site deemed more typical (commercial parking lot, surface street ROW, etc). Can you confirm that a GULD can indeed be obtained from the SCTF, if the GULD contains stipulations regarding this follow-up monitoring?

Thanks in advance,
Dylan

DYLAN AHEARN, PH.D.
Associate Scientist
direct 206.787.8244 | cell 206.407.9538| main 206.441.9080
2200 Sixth Avenue Suite 1100 Seattle, WA 98121
Find Herrera online at: www.herrerainc.com

APPENDIX D

Hydrologic Data Quality Assurance Review of Hydro-International Up-Flo Filter Monitoring Project

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: December 19, 2018

To: Project File 13-05605-000

From: Dylan Ahearn, Herrera Environmental Consultants, Inc.

Subject: Hydrologic Data Quality Assurance Review of Hydro-International Up-Flo® Filter TAPE Monitoring Project

INTRODUCTION

This memorandum reviews hydrologic data that were collected from April 12, 2017, through March 22, 2018, and compares the results to data quality indicators that were identified in the quality assurance project plan (QAPP) for the Up-Flo® Filter TAPE Monitoring Project (Herrera 2018). It then provides results that indicate whether or not specific measurement quality objectives (MQOs) for each data quality indicator were met and establishes the overall usability of the data.

Hydrologic monitoring consisted of measurements of water level (for estimating discharge) and precipitation depth. MQOs for these measurements are expressed in terms of precision, bias, representativeness, completeness, and comparability. Data quality for each of these categories is described in the sections that follow. Table 1 presents a list of the equipment that was used to collect the measurements and subsequently tested as part of this evaluation.

Table 1. Project Hydrological Measurement Instrument Characteristics.

Instrument	Make/Model	Serial Number	Station	Deployment
Pressure transducer	Instrumentation Northwest PS-9805 (0-2.5 psi)	21138011	WUFF-OUT	April 12, 2017, to present
Pressure transducer	Instrumentation Northwest PS-9805 (0-2.5 psi)	21138012	WUFF-BP	April 12, 2017, to present
Rain Gauge	Texas Electronics TR525USW	10-568	WUFF-RG	April 12, 2017, to present

Precision

Pursuant to the QAPP for the project, the MQO for water level and precipitation depth precision is 5 percent. On September 9, 2016, and prior to initiating monitoring, the precision of the precipitation depth measurements was evaluated by repeatedly releasing a known volume of water (between 400 and 450 milliliters) into the rain gauge's tipping bucket mechanism with a burette and recording the number of tips associated with the volume. The percent error in rain gauge measurements was then computed based on the theoretical number of tips that should have been recorded for each known volume and the actual number of tips (Table 2). The standard deviation of the percent error across the repeated tests was then computed and compared with the MQO. The resultant value (2.25 percent) was less than the MQO for precipitation depth precision identified above; hence, no qualification of the data was necessary based on this measure of quality.

Table 2. Pre-Monitoring Precipitation Precision and Bias Testing.

Water Volume Applied (mL)	Theoretical Number of Tips	Actual Number of Tips	Percent Error	Absolute Percent Error
450	54.6	55	-0.71	0.71
400	48.5	47	3.2	3.2
400	48.5	47	3.2	3.2
Total Bias				**2.37**
Total Precision			**2.25**	

ml = milliliter

To evaluate the precision of water level measurements, both the WUFF-OUT and WUFF-BP pressure transducers were placed in a graduated cylinder filled with water for approximately 92 hours. Water level data from each pressure transducer were then recorded on a 5-minute time step over this period. Figure 1 provides a graphical presentation of these results. The coefficient of variation of these repeated measurements at 20 degrees Celsius for the WUFF-OUT transducer was 0.32 percent, while the coefficient of variation for the WUFF-BP transducer was 0.39 percent. These values were less than the MQO for water level measurement precision identified above; hence, no qualification of the data was necessary based on this measure of quality.

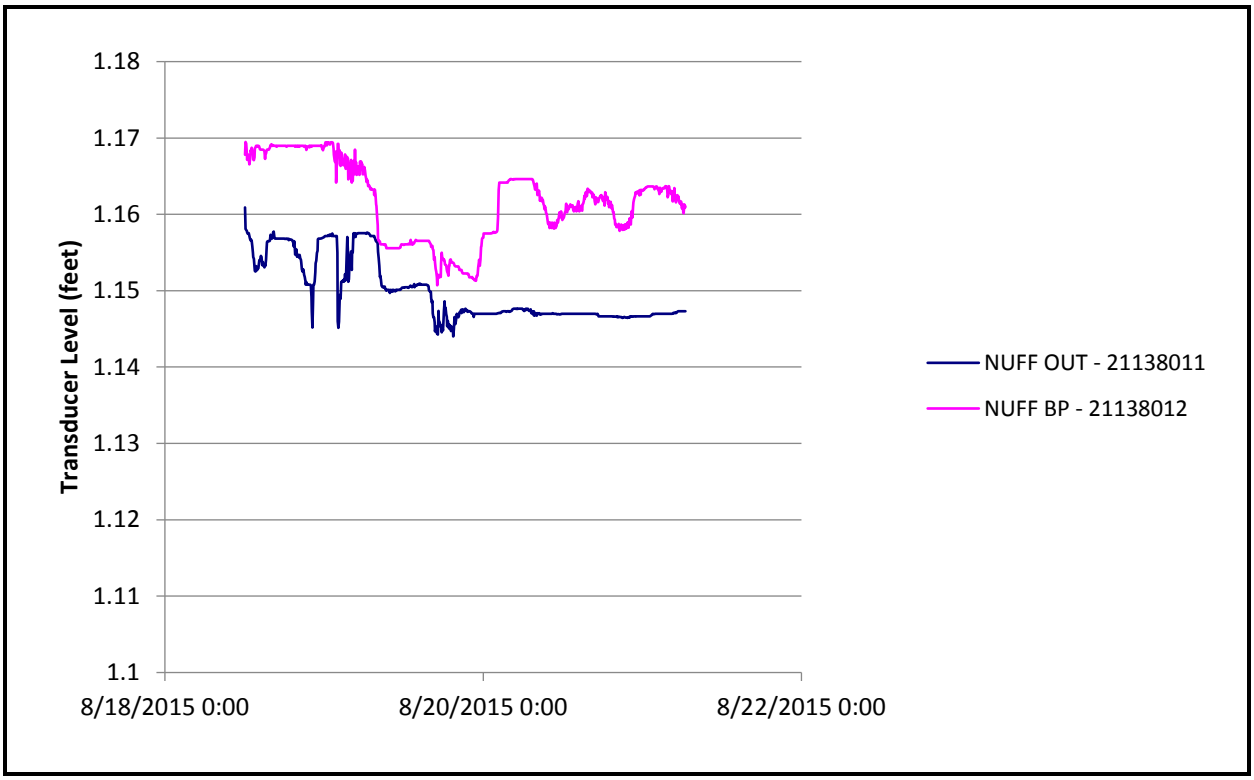


Figure 1. Pressure Transducer Precision Testing Results.

Bias

The MQO for bias in precipitation depth and water level measurements as defined in the QAPP (Herrera 2018) was a difference of no more than 5 percent between recorded measurements and the true value. Bias was assessed by comparing monitoring equipment readings to an independently measured "true" value. For example, bias in precipitation depth data collected through this study was assessed by comparing the rain gauge's actual tip volume to its theoretical tip volume, as specified by the manufacturer. Prior to monitoring, bias was estimated by pouring a known volume of water through the rain gauge in order to generate approximately 50 tips of the gauge. The theoretical number of tips that should have been recorded for each known volume was then compared with the actual number of tips to estimate the percent error in the precipitation depth measurements (Table 2). This process was repeated three times, and the average of the absolute percent error was computed. The resultant value (2.37 percent) was less than the MQO for precipitation depth bias identified above; hence, no qualification of the data was necessary based on this measure of quality.

Bias in the continuous water level measurement data is introduced from two primary sources: instrument design limitations and calibration or operation errors. To assess if instrument design limitation were contributing to level gauge bias, the pressure transducers were placed in a graduated cylinder filled with water. One inch of water at a time was then added to the graduated cylinder, and the pressure transducer responses were recorded. Pressure transducer

depths were then compared to the measured depths to compute the corresponding percent error. This test was conducted before the monitoring period on both of the pressure transducers used during the project. Results from the pressure transducer bias tests are presented in Table 3. This table indicates the average of the percent error for the WUFF-OUT transducer was 1.2 percent while the average for the WUFF-BP was -0.7 percent. These values were less than the MQO for water level measurement bias identified above; hence, no qualification of the data was necessary based on this measure of quality.

Table 3. Results from Pressure Transducer Bias Testing at WUFF-OUT and WUFF-BP.

Date	Depth (inches)	WUFF-OUT Transducer Depth (inches)	WUFF-Out Percent Error	WUFF-BP Transducer Depth (inches)	WUFF-BP Percent Error
11/15/16	1.0	1.009	0.91	0.967	-3.39
11/15/16	1.0	1.009	0.91	1.048	4.54
11/15/16	1.0	1.009	0.91	0.967	-3.39
11/15/16	3.0	3.066	2.15	2.984	-0.52
Total Bias			**1.2**		**-0.7**

Despite this result, bias can still be introduced into the water level measurements when the pressure transducers are deployed and operated in the field. This bias is usually due to calibration, operation, or configuration errors. Routine field calibrations of the pressure transducers were conducted before each targeted sampling event. Occasionally, these calibrations could not be conducted because water flows were too high to accurately calibrate the pressure transducers. During the 12-month monitoring period, the WUFF-OUT and WUFF-BP pressure transducers were both calibrated 10 times. The Aquarius software package for managing continuous time series data (Version 3.1) was used to assess transducer measurement drift between each calibration; however, in all cases the drift was sufficiently small that no calibration correction was required.

The Aquarius software package was also used to delete anomalous spikes and fill small data gaps. All edits to the continuous record from the WUFF-OUT pressure transducer are presented in Table 4; edits to the record for the WUFF-BP pressure transducer are presented in Table 5. Finally, edits to the continuous record for the WUFF-RG rain gauge are presented in Table 6.

Table 4. Hydrologic Data Correction History for Station WUFF-OUT.					
Date of Correction	**User**	**From**	**To**		**Comment**
2/20/2018 15:58	dahearn	4/27/2016 11:45	4/27/2016 12:45	13	Delete Region
2/20/2018 15:59	dahearn	7/21/2016 6:50	7/28/2016 16:15	2,130	Offset Correction with value of -0.01000 ft
6/25/2018 18:54	dahearn	3/6/2018 13:50	3/6/2018 13:55	2	Multi-Point Drift Correction of (Date/Time, Diff) (2018-03-06 13:50:00 0.12227 ft) (2018-03-06 13:55:00 0.00000 ft)
6/26/2018 13:09	dahearn	2/28/2018 21:05	3/1/2018 16:30	234	Amplification Correction – Inline (end point) with start factor of 2.00000 and end factor of 1.50000

Table 5. Hydrologic Data Correction History for Station WUFF-BP.					
Date of Correction	**User**	**From**	**To**		**Comment**
2/20/2018 15:47	dahearn	7/21/2016 6:30	7/25/2016 10:15	1,198	Multi-Point Drift Correction of (Date/Time, Diff) (2016-07-21 06:30:00 0.00000 ft) (2016-07-25 10:15:00 -0.01000 ft)
2/20/2018 15:51	dahearn	10/4/2016 10:10	10/4/2016 10:15	2	Multi-Point Drift Correction of (Date/Time, Diff)(2016-10-04 10:10:00 0.17767 ft) (2016-10-04 10:15:00 0.00000 ft)
2/20/2018 15:52	dahearn	1/17/2017 3:55	2/2/2017 14:20	4,734	Offset Correction with value of -0.02000 ft
2/20/2018 15:53	dahearn	2/2/2017 13:05	2/2/2017 13:15	3	Offset Correction with value of -0.02000 ft

Table 6. Hydrologic Data Correction History for Station WUFF-RG.				
Date of Correction	**User**	**From**	**To**	**Comment**
6/19/2017 15:58	dahearn	10/8/2016 12:15	10/8/2016 12:25	Fill Data Gap – short gap
6/19/2017 15:59	dahearn	10/10/2016 8:55	10/10/2016 9:05	Fill Data Gap – short gap
6/19/2017 15:59	dahearn	10/18/2016 16:00	10/18/2016 23:40	Fill Data Gaps (Linear) with gap resample rate of 5.00 min
6/19/2017 15:59	dahearn	12/21/2016 0:15	12/21/2016 0:25	Fill Data Gaps (Linear) with gap resample rate of 5.00 min
6/19/2017 15:59	dahearn	12/22/2016 0:35	12/22/2016 1:40	Fill Data Gap – short gap
6/19/2017 15:59	dahearn	3/28/2017 22:55	3/28/2017 23:05	Fill Data Gap – short gap
6/19/2017 15:59	dahearn	4/4/2017 22:55	4/4/2017 23:30	Fill Data Gap – short gap
6/19/2017 15:59	dahearn	4/22/2017 7:35	4/22/2017 7:45	Fill Data Gaps (Linear) with gap resample rate of 5.00 min
6/19/2017 16:00	dahearn	5/22/2017 20:35	5/25/2017 16:05	Fill Data Gap – short gap

Bias can also result when primary measurement devices (i.e., weirs) are incorrectly designed or installed in non-ideal conditions. The dimensions of the WUFF-OUT and WUFF-BP weirs (both Thel-Mar volumetric pipe weirs [Thel-Mar weirs]) were measured by hand to ensure that the weir equations were appropriate; results from these measurements indicated the weirs appeared to be built to specifications.

However, because past experience has shown Thel-Mar weirs can still produce biased measurements despite being built to specifications (due to elevated approach velocities in sloped pipes), an additional field test was performed to independently check for potential bias in the discharge estimates made at each station. Specifically, field technicians conducted a dynamic flow tests at WUFF-OUT and WUFF-BP on March 3, 2016. For this test, a fire hose was attached to a nearby fire hydrant, and flows from the hydrant were assessed using a graduated bucket and timer and a closed channel flow meter (Master Meter 3" FHM). These "known" flows were then used as the standard for adjusting the weir rating curves. First, the closed channel flow meter was used to discharge a flow rate of 5 gpm. The flow was held at this rate for 5 minutes until a constant and stable water level reading was recorded at the weir's pressure transducer. These values (known flow rate and water level behind the weir) were recorded and then the process was repeated at 10 gpm, 50 gpm, and 100 gpm. This process was completed for both the WUFF-OUT and WUFF-BP weirs. As shown in Figure 2, results from these tests show the WUFF-OUT and WUFF-BP weirs were underestimating flows by 30 and 42 percent, respectively. This error was higher than is typical for Thel-Mar weirs so the dynamic flow testing process was repeated on July 25, 2016.

The second dynamic flow test was conducted at 10, 25, 100, 150, and 200 gpm. The new rating curves based on this test for each weir are presented in Figure 3. Results from this test indicated an upward adjustment of 30 and 26 percent for the WUFF-Out and WUFF-BP weirs, respectively. This error was addressed by adjusting the rating curves so that they more closely fit the dynamic flow test calibration points (Figure 3). All flow data presented in this study are based on these adjusted rating curves from the second flow test on July 25, 2016. The results from the March 3, 2016 flow test were discarded.

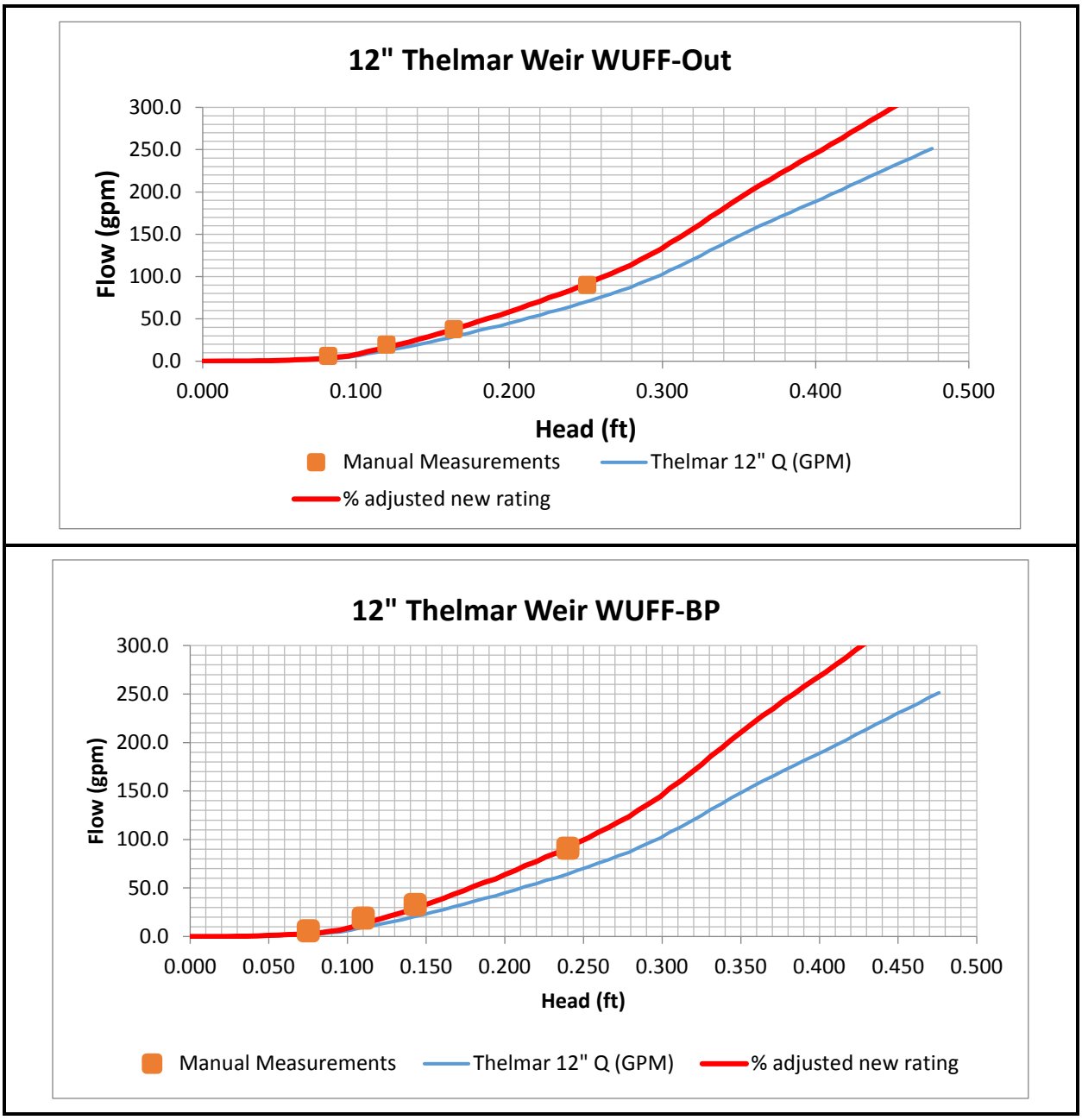


Figure 2. Rating Curve and Thel-Mar Weir Equation for Stations WUFF-OUT and WUFF-BP – March 3, 2016.

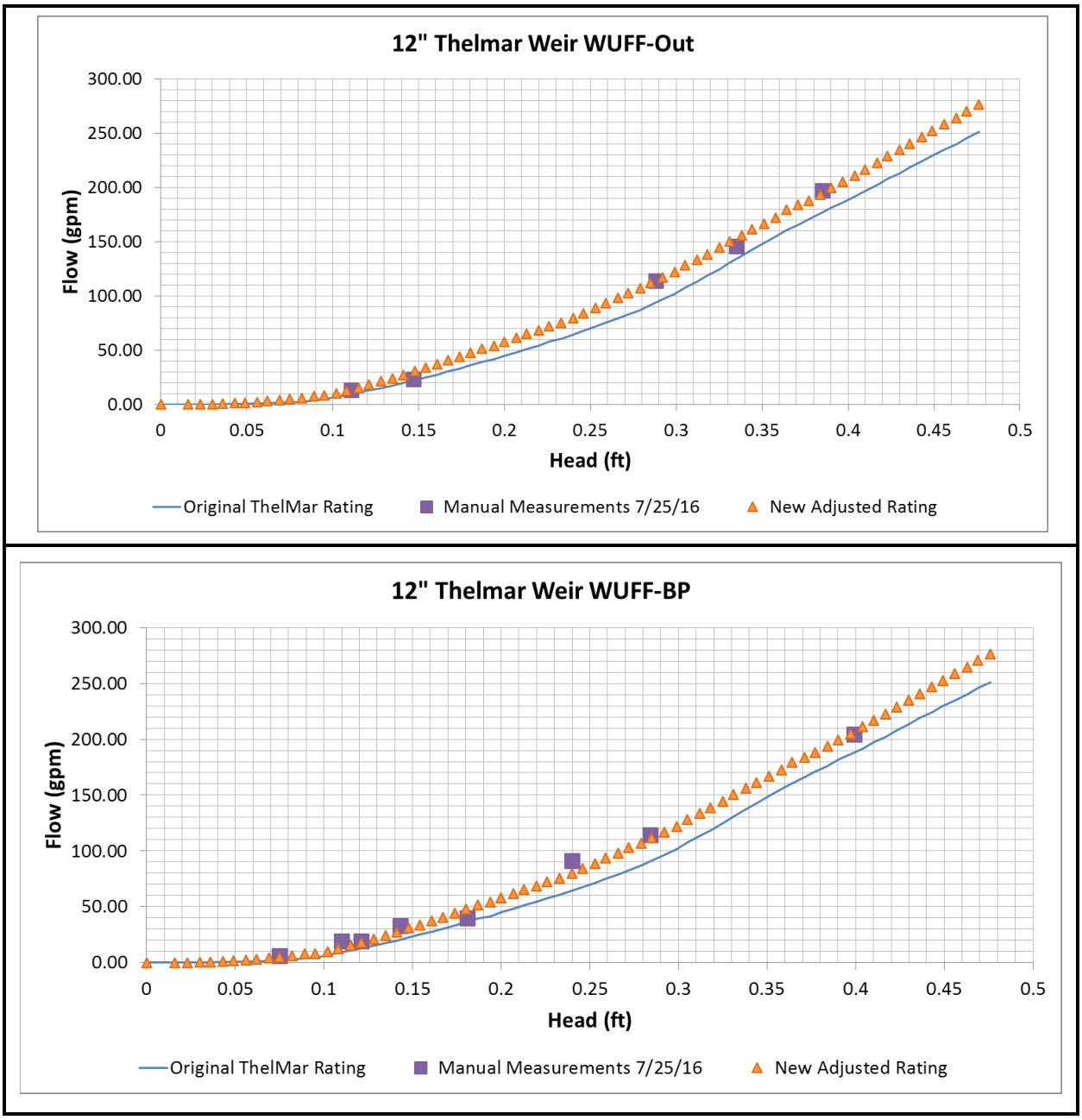


Figure 3. Rating Curve and Thel-Mar Weir Equation for Stations WUFF-OUT and WUFF-BP– July 25, 2016.

Representativeness

The representativeness of the hydrologic data was ensured by properly selecting and installing all associated monitoring equipment. Rainfall patterns, stormwater conveyance features, and surrounding land uses were also considered when identifying monitoring locations and sampling frequencies, to ensure that representative data were obtained.

Due to progressive clogging of the 6-inch valve leading to the WUFF test system, the hydrograph form was not always correlated with the hyetograph form (see the individual storm report—Appendix H—for the November 21, 2017, event as an example). This resulted in a sample distribution across the hydrograph which is more skewed toward the beginning of the storm when the valve was not clogged. Because both the inlet and outlet samplers were pacing off the same flow data they were equally affected by this bias. Though the event hydrographs were not always representative of what a "free-flowing" hydrograph would be from the same basin, the comparison of the chemistry in the inlet and outlet hydrographs was the focus of this study, so this issue with the data representativeness was deemed acceptable.

Completeness

Completeness was assessed based on the occurrence of gaps in the data record for all hydrologic monitoring locations. The associated MQO requires that less than 10 percent of the total data record be missing due to equipment malfunction or other operational problems. During the monitoring period, there were minimal data gaps (Tables 4, 5, and 6), and the majority of those gaps that did occur were sufficiently short in duration that they could be filled by interpolation. Approximately 0.4, 3.1, and 1.8 percent of the record was missing at WUFF-OUT, WUFF-BP, and WUFF-RG, respectively. These gaps were all filled by linear interpolation from measured values before and after the gap. The MQO of less than 10 percent was met at all stations.

Comparability

Although there is no numeric MQO for this data quality indicator, standard monitoring procedures, units of measurement, and reporting conventions were used in this study to meet the quality indicator of data comparability.

REFERENCES

Herrera. 2018. Quality Assurance Project Plan: Hydro International Up-Flo® Filter Stormwater Treatment System Performance Verification Project. Prepared for Hydro International, Inc., by Herrera Environmental Consultants, Inc., Seattle, Washington. January 30.

APPENDIX E

Data Quality Assurance Review of the Up-Flo Filter Biofilter System Performance Verification Project Water Quality Monitoring Data

Herrera Environmental Consultants, Inc.

Internal Memorandum

Date: June 21, 2018 (updated December 17,2018)

To: Project File 13-05605-000

From: Gina Catarra

Subject: Data Quality Assurance Review of the Hydro International Up-Flo® Filter Water Quality Monitoring Data

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This memorandum presents a review of data quality for 13 grab water samples (including one field duplicate), 51 composite water samples (including 3 field duplicates), and five equipment rinsate blank water samples collected for the Hydro International Up-Flo® Filter Stormwater Treatment System Performance Verification Project between February 4, 2016, and March 22, 2018. Analytical Resources, Inc. (ARI), of Tukwila, Washington, analyzed the samples for:

- Total phosphorus (TP) and orthophosphorus (OP) by Standard Method 4500P-F
- Hardness by Standard Method 2340B
- Total and dissolved copper and zinc (metals) by EPA Method 200.8
- Diesel-range total petroleum hydrocarbons (TPH) by Ecology's NWTPH-Dx method.

Environmental Technical Services (ETS), of Petaluma, California, analyzed the samples for:

- Total suspended solids (TSS) by Standard Method 2540D
- Particle size distribution (PSD) by ASTM D3977 C
- Total volatile suspended solids (TVSS) by Standard Method 2540E.

Materials Testing and Consulting, Inc. (MTC), of Tukwila, Washington, analyzed the samples for:

- Suspended sediment concentration (SSC) by ASTM D3977 C.

Results for the following samples were validated.

Sample ID	Lab SDG	Date Collected	Analyses
WUFF-In[b]	AVL7	2/4/16	TSS, TP, OP, metals
WUFF-Out[b]	AVL7	2/4/16	TSS, TP, OP, metals
WUFF-In	17D0216	4/13/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17D0216	4/13/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17D0317	4/20/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17D0317	4/20/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17E0196	5/12/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17E0196	5/12/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17E0232	5/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17E0232	5/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17F0161	5/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17F0161	5/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In (QA)[a]	17F0161	5/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17F0273	6/15/17	TPH
WUFF-Out	17F0273	6/15/17	TPH
WUFF-In	17F0281	6/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17F0281	6/16/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In HF	17J0342	10/18/17	TSS, TP, OP, metals
WUFF-Out HF	17F0281	6/16/17	TSS, TP, OP, metals
WUFF-In	17K0043	11/2/17	TPH
WUFF-Out	17K0043	11/2/17	TPH
WUFF-In	17K0068	11/3/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17K0068	11/3/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17K0089	11/6/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In DUP[a]	17K0089	11/6/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17K0089	11/6/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In Blank[b]	17K0092	11/6/17	TP, OP, metals
WUFF-Out Blank[b]	17K0092	11/6/17	TP, OP, metals
WUFF-Churn Blank[b]	17K0092	11/6/17	TP, OP, metals
WUFF-In	17K0170	11/10/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In DUP[a]	17K0170	11/10/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17K0170	11/10/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17K0197	11/13/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17K0197	11/13/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17L0224	11/14/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17L0224	11/14/17	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17K0382	11/20/17	TSS, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	17K0382	11/20/17	TSS, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	17K0457	11/21/17	TPH
WUFF-In DUP[a]	17K0457	11/21/17	TPH
WUFF-Out	17K0457	11/21/17	TPH
WUFF-In	17L0472	12/19/17	TSS, PSD, TVSS, SSC, TP, OP
WUFF-Out	17K0068	11/13/17	TSS, PSD, TVSS, SSC, TP, OP

Sample ID	Lab SDG	Date Collected	Analyses
WUFF-In	18A0070	1/5/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	18A0070	1/5/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	18A0093	1/8/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	18A0093	1/8/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	18A0109	1/9/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	18A0109	1/9/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	18A0436	1/27/18	TSS, TVSS, SSC, TP, OP
WUFF-Out	18A0436	1/27/18	TSS, TVSS, SSC, TP, OP
WUFF-In	18B0052	2/4/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-Out	18B0052	2/4/18	TSS, PSD, TVSS, SSC, TP, OP, hardness, metals
WUFF-In	18B0197	2/14/18	TSS, PSD, TP, OP
WUFF-Out	18B0197	2/14/18	TSS, PSD, TP, OP
WUFF-In	18C0025	2/28/18	TPH
WUFF-Out	18C0025	2/28/18	TPH
WUFF-In	18C0031	2/28/18	TSS, PSD, TP, OP, metals (total)
WUFF-Out	18C0031	2/28/18	TSS, PSD, TP, OP, metals (total)
WUFF-In	18C0179	3/8/18	TPH
WUFF-Out	18C0179	3/8/18	TPH
WUFF-In	18C0180	3/8/18	TSS, PSD, TP, OP, metals (total)
WUFF-Out	18C0180	3/8/18	TSS, PSD, TP, OP, metals (total)
WUFF-In	18C0251	3/13/18	TSS, PSD, TP, OP, metals (total)
WUFF-Out	18C0251	3/13/18	TSS, PSD, TP, OP, metals (total)
WUFF-In	18C0399	3/22/18	TPH
WUFF-Out	18C0399	3/22/18	TPH
WUFF-In	18C0396	3/22/18	TSS, PSD, TP, OP, metals (total)
WUFF-Out	18C0396	3/22/18	TSS, PSD, TP, OP, metals (total)

[a] Field duplicate sample.

[b] Equipment rinsate blank sample.

The laboratory's performance was reviewed in accordance with quality control (QC) criteria established in the *Hydro International Up-Flo® Filter Stormwater Treatment System Performance Verification Project Quality Assurance Project Plan* (QAPP) (Herrera 2018), by the laboratory, and in the specified methods.

Quality control data summaries submitted by the laboratories were reviewed; raw data were not submitted by the laboratories. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by definitions of data qualifiers.

Custody, Preservation, Holding Times, and Completeness—Acceptable with Qualification

With the exceptions noted below, the samples were properly preserved; and sample custody was maintained from sample collection to receipt at the laboratories. With the exceptions noted below, samples were analyzed within the required method holding times. With the exceptions noted below, the laboratory reports were complete and contained results for all samples and tests requested on the chain-of-custody (COC) forms.

Due to laboratory error, several samples (collected 11/3/17, 11/6/17, 11/10/17, 11/13/17, and 11/14/17) were not analyzed for TVSS, as requested on the COC forms. No data were qualified due to this oversight.

The temperature of the samples at the time of laboratory receipt exceeded the less than 6 degrees Celsius criterion for the composite sample collected on 4/13/17 and the grab sample collected on 11/2/17. Samples were qualified as estimated (flagged J) due to sample temperature exceedance, as shown in the table below.

Date Collected	Parameter	Sample ID	Reason for Qualification	Data Flag
4/13/17	All parameters	WUFF-IN and WUFF-Out	Sample Temperature Exceedance	J
11/2/17	TPH	WUFF-IN and WUFF-Out	Sample Temperature Exceedance	J

The holding time (7 days) was exceeded for several samples for TSS, PSD, TVSS, and SSC analyses. The pre-preservation holding time (12 hours) was exceeded for several samples for OP and dissolved metals analyses. Samples were qualified as estimated (flagged J) due to the holding time exceedances, as shown in the table below.

Date Collected	Parameter	Sample ID	Reason for Qualification	Data Flag
4/20/2017	TSS, PSD, TVSS	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
5/12/2017	TSS, PSD, TVSS, SSC, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
5/16/2017	TSS, PSD, TVSS, SSC	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
6/9/2017	TSS, PSD, TVSS, SSC	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
6/15/2017	TSS, PSD, TVSS, SSC	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
11/3/2017	TSS, PSD, OP, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
11/6/2017	TSS, PSD, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
11/10/2017	TSS, PSD, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
11/13/2017	TSS, PSD, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
11/14/2017	TSS, PSD, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
11/14/2017	TSS, TVSS, SSC, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J

Date Collected	Parameter	Sample ID	Reason for Qualification	Data Flag
12/29/2017	TSS, PSD, TVSS, SSC	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
1/5/2018	TSS, PSD, TVSS, SSC, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
1/8/2018	TSS, PSD, TVSS, SSC, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
1/9/2018	TSS, PSD, TVSS, SSC, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
1/27/2018	TSS, PSD, SSC, OP	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
2/04/2018	TSS, PSD, TVSS, diss metals	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
2/14/2018	TSS, PSD	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
2/28/2018	TSS, PSD, OP	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
3/8/2018	TSS, PSD, OP	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
3/13/2018	TSS, PSD, OP	WUFF-IN, WUFF-Out	Holding Time Exceedance	J
3/22/2018	TSS, PSD, OP	WUFF-IN, WUFF-Out	Holding Time Exceedance	J

Laboratory Reporting Limits—Acceptable

The laboratory reporting limits met those established in the SAP. No data were qualified based on laboratory reporting limits.

Method Blank Analysis—Acceptable with Discussion

Method blanks were analyzed at the required frequency. Method blanks did not contain levels of target analytes above the laboratory reporting limits, with the following exception.

The method blank analyzed with samples collected on 10/18/17, had a reported level of total copper (0.69 µg/L) that was greater than the reporting limit (0.5 µg/L). However, no data were qualified because all associated results for total copper were greater than 5 times the method blank result.

Rinsate Blank Analysis—Acceptable

Rinsate blanks were analyzed were analyzed in February 2016, November 2017, and December 2018. Rinsate blanks did not contain levels of target analytes above the criterion (greater than 2 times above the laboratory reporting limits) established in the QAPP.

Laboratory Control Sample Analysis—Acceptable with Qualification

Blank spike (BS) or blank spike/blank spike duplicate (BS/BSD) samples were analyzed for TP, OP, hardness, total and dissolved metals, and TPH. The percent recovery values met the criteria established by the methods, with the following exception.

The BSD percent recovery (129 percent) for total zinc analyzed with the samples collected on 11/14/17 exceeded the 80 to 120 percent criteria established by the method. The total zinc results for the associated samples were qualified as estimated (flagged J), as shown in the table below.

Date Collected	Parameter	Sample ID	Reason for Qualification	Data Flag
11/14/17	Total zinc	WUFF-In	BS Percent Recovery Exceedance	J
11/14/17	Total zinc	WUFF-Out	BS Percent Recovery Exceedance	J

Matrix Spike Analysis—Acceptable with Qualification

Matrix spike (MS) samples were analyzed for TP, OP, harness, and total and dissolved metals. The percent recovery values met the control limits (75 to 125 percent) established in the QAPP, with the following exception.

The percent recovery value (130 percent) for the MS analysis of sample WUFF-In collected on 11/10/17 exceeded the 75 to 125 percent criteria for hardness. The result for hardness for sample WUFF-In collected on 11/10/17 was qualified as estimated (flagged J), as shown in the table below.

Date Collected	Parameter	Sample ID	Reason for Qualification	Data Flag
11/10/17	Hardness	WUFF-In	MS Percent Recovery Exceedance	J

Laboratory Duplicate Analysis—Acceptable

Laboratory duplicate samples were analyzed for TSS, TP, OP, hardness, and total and dissolved metals. The relative percent difference (RPD) values met the less than 20 percent control limit (less than 25 percent for TSS) established in the QAPP.

Field Duplicate Analysis—Acceptable with Qualification

Field duplicates were analyzed for all parameters at a frequency of 6 percent (8 percent for TPH), which did not meet the 10 percent frequency specified in the QAPP. With the exceptions noted below, the RPD values met the control limits of less than 20 percent (less than 25 percent for TSS) established in the QAPP.

The RPD values for TSS (28 percent) and TP (39 percent) exceeded the criterion established in the QAPP for sample WUFF-In and field duplicate WUFF-In (QA) collected on 6/9/2017. The results for TSS and TP were qualified as estimated (flagged J), as shown in the table below.

The RPD value for OP (22 percent) exceeded the less than 20 percent criterion for the sample WUFF-IN and the field duplicate collected on 11/6/17. No data were qualified because the failure was marginal (2 percent) and all other criteria were met.

Date Collected	Parameter	Sample ID	Reason for Qualification	Data Flag
6/9/17	TSS	WUFF-In	Field Duplicate RPD Exceedance	J
6/9/17	TP	WUFF-In	Field Duplicate RPD Exceedance	J

Definition of Data Qualifiers

The following data qualifier definitions are taken from the QAPP (Herrera 2018).

Data Qualifier	Definition
J	Value is an estimate based on analytical results
R	Value is rejected based on analytical results
U	Value is below the reporting limit
UJ	Value is below the reporting limit and is an estimate based on analytical results

References

Herrera. 2018. Hydro International Up-Flo® Filter Stormwater Treatment System Performance Verification Project Quality Assurance Project Plan. Prepared for Hydro International Inc., Portland, Maine by Herrera Environmental Consultants, Seattle, Washington. January 30.

APPENDIX F

Water Quantity and Quality Database

		Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet
Rain Start	Rain Stop	Flow Start	Flow Stop	Flow Stop	Flow Stop	Flow Duration	Flow Duration	Flow Duration	Flow Average	Flow Average	Flow Average	Flow Maximum	Flow Maximum	Flow Maximum	Flow Volume	Flow Volume
datetime	datetime	datetime	datetime	datetime	datetime	hour	hour	hour	gal/min	gal/min	gal/min	gal/min	gal/min	gal/min	gal	gal
10/8/2016 13:30	10/9/2016 2:35	10/9/2016 0:40	10/9/2016 8:35	10/9/2016 8:35	10/9/2016 8:35	19.3	19.3	8.0	3.73	3.72	0.02	13.35	13.35	0.03	4,312.8	4,301.9
10/9/2016 18:30	10/9/2016 22:05	10/9/2016 18:30	10/10/2016 4:05	10/10/2016 4:05	10/10/2016 4:05	9.7	9.7	9.7	1.46	1.44	0.02	5.22	5.21	0.03	844.7	832.7
10/13/2016 1:25	10/14/2016 14:30		10/14/2016 20:30	10/14/2016 20:30		42.2	42.2	0.0	1.08	1.08	0.00	1.92	1.92	0.00	2,743.3	2,743.3
10/14/2016 23:45	10/16/2016 12:10		10/16/2016 17:45	10/16/2016 17:45		42.1	42.1	0.0	0.48	0.48	0.00	0.76	0.76	0.00	1,212.0	1,212.0
10/16/2016 17:45	10/16/2016 23:55		10/17/2016 5:55	10/17/2016 5:55		12.3	12.3	0.0	0.24	0.24	0.00	0.37	0.37	0.00	178.4	178.4
10/18/2016 1:30	10/18/2016 7:00		10/18/2016 12:55	10/18/2016 12:55		11.6	11.6	0.0	0.12	0.12	0.00	0.17	0.17	0.00	81.2	81.2
10/19/2016 20:25	10/20/2016 11:00		10/20/2016 17:00	10/20/2016 17:00		20.7	20.7	0.0	0.06	0.06	0.00	0.08	0.08	0.00	68.5	68.5
10/22/2016 23:10	10/23/2016 8:45		10/23/2016 14:45	10/23/2016 14:45		15.7	15.7	0.0	0.05	0.05	0.00	0.10	0.10	0.00	47.3	47.3
10/24/2016 17:00	10/24/2016 18:55		10/25/2016 0:55	10/25/2016 0:55		8.0	8.0	0.0	0.07	0.07	0.00	0.08	0.08	0.00	32.9	32.9
10/26/2016 6:05	10/26/2016 23:35		10/27/2016 5:35	10/27/2016 5:35		23.7	23.7	0.0	0.14	0.14	0.00	0.19	0.19	0.00	191.7	191.7
10/27/2016 18:50	10/28/2016 0:45		10/28/2016 6:40	10/28/2016 6:40		12.0	12.0	0.0	0.13	0.13	0.00	0.16	0.16	0.00	92.9	92.9
10/29/2016 8:10	10/29/2016 13:00		10/29/2016 18:55	10/29/2016 18:55		10.8	10.8	0.0	0.10	0.10	0.00	0.14	0.14	0.00	66.9	66.9
10/30/2016 13:55	10/31/2016 10:25		10/31/2016 16:25	10/31/2016 16:25		26.7	26.7	0.0	0.08	0.08	0.00	0.12	0.12	0.00	135.4	135.4
10/31/2016 19:05	11/1/2016 12:50		11/1/2016 18:45	11/1/2016 18:45		23.8	23.8	0.0	0.09	0.09	0.00	0.13	0.13	0.00	126.5	126.5
11/2/2016 4:45	11/2/2016 13:10		11/2/2016 19:05	11/2/2016 19:05		14.5	14.5	0.0	0.07	0.07	0.00	0.09	0.09	0.00	63.2	63.2
11/2/2016 20:20	11/3/2016 3:50		11/3/2016 9:45	11/3/2016 9:45		13.6	13.6	0.0	0.08	0.08	0.00	0.09	0.09	0.00	65.5	65.5
11/5/2016 5:05	11/6/2016 5:35		11/6/2016 11:35	11/6/2016 11:35		31.6	31.6	0.0	0.17	0.17	0.00	0.30	0.30	0.00	317.9	317.9
11/7/2016 4:55	11/7/2016 5:50		11/7/2016 6:45	11/7/2016 6:45		2.0	2.0	0.0	0.12	0.12	0.00	0.16	0.16	0.00	13.8	13.8
12/19/2016 3:15	12/19/2016 15:50		12/19/2016 20:30	12/19/2016 20:30		17.3	17.3	0.0	0.59	0.59	0.00	0.94	0.94	0.00	617.0	617.0
12/19/2016 20:30	12/20/2016 1:35		12/20/2016 7:30	12/20/2016 7:30		11.1	11.1	0.0	0.63	0.63	0.00	0.82	0.82	0.00	416.9	416.9
12/22/2016 18:20	12/23/2016 17:30		12/23/2016 23:25	12/23/2016 23:25		29.2	29.2	0.0	0.39	0.39	0.00	0.51	0.51	0.00	676.2	676.2
12/26/2016 15:50	12/26/2016 22:40		12/27/2016 4:40	12/27/2016 4:40		13.0	13.0	0.0	0.12	0.12	0.00	0.14	0.14	0.00	95.8	95.8
12/29/2016 16:45	12/30/2016 6:15		12/30/2016 12:10	12/30/2016 12:10		19.6	19.6	0.0	0.08	0.08	0.00	0.09	0.09	0.00	93.6	93.6
12/31/2016 17:55	1/1/2017 0:15		1/1/2017 6:10	1/1/2017 6:10		12.3	12.3	0.0	0.07	0.07	0.00	0.10	0.10	0.00	51.6	51.6
1/8/2017 11:00	1/8/2017 21:20		1/9/2017 3:20	1/9/2017 3:20		16.4	16.4	0.0	0.90	0.90	0.00	1.50	1.50	0.00	887.6	887.6
1/9/2017 16:15	1/9/2017 18:10		1/10/2017 0:10	1/10/2017 0:10		8.0	8.0	0.0	0.11	0.11	0.00	0.33	0.33	0.00	53.3	53.3
1/10/2017 1:55	1/10/2017 8:20		1/10/2017 14:15	1/10/2017 14:15		12.5	12.5	0.0	0.54	0.54	0.00	0.77	0.77	0.00	401.7	401.7
1/17/2017 4:00	1/17/2017 9:05		1/17/2017 11:45	1/17/2017 11:45		7.9	7.9	0.0	0.40	0.40	0.00	1.75	1.75	0.00	189.0	189.0
1/17/2017 11:50	1/19/2017 0:25	1/17/2017 12:55	1/19/2017 5:55	1/19/2017 5:55	1/19/2017 5:55	42.3	42.3	39.2	11.80	9.07	2.95	46.38	35.08	16.85	29,922.8	23,000.9
1/19/2017 6:00	1/19/2017 10:20	1/19/2017 5:55	1/19/2017 14:15	1/19/2017 14:15	1/19/2017 12:55	8.4	8.4	6.9	0.04	0.03	0.01	0.04	0.04	0.01	17.7	15.1
1/19/2017 14:20	1/19/2017 16:55	1/19/2017 14:30	1/19/2017 22:50	1/19/2017 22:50	1/19/2017 22:50	8.7	8.7	7.3	0.04	0.03	0.01	0.05	0.04	0.01	20.8	18.2
1/21/2017 20:45	1/21/2017 23:00		1/22/2017 5:00	1/22/2017 5:00		8.3	8.3	0.0	0.03	0.03	0.00	0.03	0.03	0.00	15.2	15.2
1/22/2017 8:25	1/22/2017 12:10	1/22/2017 8:40	1/22/2017 18:10	1/22/2017 18:10	1/22/2017 8:40	9.8	9.8	0.1	0.03	0.03	0.00	0.03	0.03	0.00	17.4	17.4
2/3/2017 1:55	2/5/2017 0:25	2/3/2017 13:35	2/5/2017 6:20	2/5/2017 6:20	2/3/2017 17:30	52.6	52.6	4.0	3.97	3.81	2.04	28.53	20.86	8.32	12,523.7	12,034.5
2/5/2017 12:20	2/6/2017 1:45	2/6/2017 2:20	2/6/2017 7:40	2/6/2017 7:40	2/6/2017 7:45	19.4	19.4	5.3	0.11	0.11	0.01	0.12	0.12	0.01	125.5	123.3
2/6/2017 11:45	2/6/2017 20:35	2/6/2017 11:45	2/7/2017 2:35	2/7/2017 2:35	2/6/2017 15:05	14.9	14.9	3.3	0.08	0.08	0.01	0.10	0.09	0.01	74.5	73.4
2/8/2017 8:45	2/10/2017 7:55		2/10/2017 13:55	2/10/2017 13:55		53.3	53.3	0.0	5.83	5.83	0.00	14.36	14.36	0.00	18,616.6	18,616.6
4/6/2017 5:25	4/6/2017 10:10		4/6/2017 16:05	4/6/2017 16:05		10.8	10.8	0.0	0.08	0.08	0.00	0.10	0.10	0.00	54.5	54.5
4/7/2017 2:05	4/7/2017 9:35		4/7/2017 15:30	4/7/2017 15:30		13.6	13.6	0.0	0.07	0.07	0.00	0.07	0.07	0.00	53.6	53.6
4/7/2017 15:35	4/8/2017 1:00		4/8/2017 6:55	4/8/2017 6:55		15.5	15.5	0.0	0.06	0.06	0.00	0.07	0.07	0.00	57.7	57.7
4/10/2017 11:25	4/10/2017 17:15	4/10/2017 13:55	4/10/2017 23:10	4/10/2017 23:10	4/10/2017 20:50	11.4	11.1	6.3	2.03	2.03	0.12	134.57	134.52	4.48	1,393.7	1,348.2

		Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet
Rain Start	Rain Stop	Flow Start	Flow Stop	Flow Stop	Flow Stop	Flow Duration	Flow Duration	Flow Duration	Flow Average	Flow Average	Flow Average	Flow Maximum	Flow Maximum	Flow Maximum	Flow Volume	Flow Volume
datetime	datetime	datetime	datetime	datetime	datetime	hour	hour	hour	gal/min	gal/min	gal/min	gal/min	gal/min	gal/min	gal	gal
4/12/2017 1:10	4/12/2017 12:15	4/12/2017 3:35	4/12/2017 16:35	4/12/2017 16:35	4/12/2017 13:35	15.4	15.4	10.1	39.91	15.77	36.92	90.99	90.99	65.93	36,919.0	14,583.1
4/12/2017 20:00	4/13/2017 2:20		4/13/2017 8:15	4/13/2017 8:15		12.1	12.1	0.0	28.38	28.38	0.00	92.10	92.10	0.00	20,575.7	20,575.7
4/13/2017 14:40	4/13/2017 15:50		4/13/2017 21:45	4/13/2017 21:45		7.3	7.3	0.0	1.60	1.60	0.00	6.06	6.06	0.00	695.0	695.0
4/17/2017 16:55	4/17/2017 20:35		4/18/2017 2:35	4/18/2017 2:35		9.2	9.2	0.0	1.32	1.32	0.00	13.09	13.09	0.00	723.4	723.4
4/18/2017 18:25	4/19/2017 0:00		4/19/2017 5:55	4/19/2017 5:55		10.9	10.9	0.0	3.98	3.98	0.00	70.43	70.43	0.00	2,606.3	2,606.3
4/19/2017 8:45	4/19/2017 23:45	4/19/2017 12:25	4/20/2017 6:10	4/20/2017 6:10	4/20/2017 6:10	21.6	21.6	11.8	16.98	4.93	22.14	68.76	55.73	60.71	21,991.4	6,386.0
4/22/2017 12:30	4/22/2017 14:45		4/22/2017 20:45	4/22/2017 20:45		8.3	8.3	0.0	1.62	1.62	0.00	1.96	1.96	0.00	807.5	807.5
4/23/2017 11:00	4/23/2017 20:50		4/24/2017 2:45	4/24/2017 2:45		15.8	15.8	0.0	1.44	1.44	0.00	1.79	1.79	0.00	1,363.5	1,363.5
4/26/2017 13:25	4/26/2017 18:25		4/26/2017 23:00	4/26/2017 23:00		9.7	9.7	0.0	0.84	0.84	0.00	0.92	0.92	0.00	487.3	487.3
4/26/2017 23:05	4/27/2017 2:05		4/27/2017 8:00	4/27/2017 8:00		9.1	9.1	0.0	0.66	0.66	0.00	0.76	0.76	0.00	361.5	361.5
4/28/2017 2:50	4/28/2017 7:00		4/28/2017 12:55	4/28/2017 12:55		10.3	10.3	0.0	0.34	0.34	0.00	0.42	0.42	0.00	206.6	206.6
4/29/2017 19:35	4/29/2017 20:15		4/30/2017 2:10	4/30/2017 2:10		6.0	6.0	0.0	0.28	0.28	0.00	0.31	0.31	0.00	99.3	99.3
4/30/2017 8:35	4/30/2017 9:15		4/30/2017 15:10	4/30/2017 15:10		4.3	4.3	0.0	0.02	0.02	0.00	0.05	0.05	0.00	6.1	6.1
5/1/2017 10:30	5/1/2017 12:00		5/1/2017 17:55	5/1/2017 17:55		7.6	7.6	0.0	0.19	0.19	0.00	0.21	0.21	0.00	85.6	85.6
5/2/2017 19:15	5/3/2017 8:00		5/3/2017 14:00	5/3/2017 14:00		18.8	18.8	0.0	0.14	0.14	0.00	0.19	0.19	0.00	152.8	152.8
5/4/2017 16:15	5/5/2017 9:10		5/5/2017 15:10	5/5/2017 15:10		23.0	23.0	0.0	0.18	0.18	0.00	0.39	0.39	0.00	245.5	245.5
5/6/2017 0:50	5/6/2017 2:50		5/6/2017 8:45	5/6/2017 8:45		8.1	8.1	0.0	0.68	0.68	0.00	0.76	0.76	0.00	331.4	331.4
5/11/2017 3:30	5/11/2017 19:00		5/12/2017 0:55	5/12/2017 0:55		21.5	21.5	0.0	7.68	7.68	0.00	30.61	30.61	0.00	9,913.2	9,913.2
5/12/2017 12:05	5/12/2017 12:55	5/12/2017 14:55	5/12/2017 18:55	5/12/2017 18:55	5/12/2017 18:55	7.0	7.0	4.1	2.37	2.37	0.00	5.98	5.97	0.01	995.8	994.6
5/12/2017 20:30	5/13/2017 6:55	5/12/2017 20:25	5/13/2017 12:55	5/13/2017 12:55	5/13/2017 10:50	16.6	16.6	14.5	8.41	8.39	0.02	29.79	29.77	0.03	8,364.8	8,349.3
5/13/2017 19:20	5/13/2017 22:35		5/14/2017 4:30	5/14/2017 4:30		9.3	9.3	0.0	19.85	19.85	0.00	60.46	60.46	0.00	11,114.7	11,114.7
5/15/2017 14:00	5/16/2017 10:45	5/15/2017 21:45	5/16/2017 16:45	5/16/2017 16:45	5/16/2017 16:40	26.8	26.8	19.0	18.01	16.71	1.84	30.31	30.31	8.83	28,993.9	26,898.7
6/8/2017 1:05	6/8/2017 10:35		6/8/2017 16:30	6/8/2017 16:30		14.6	14.6	0.0	14.97	14.97	0.00	39.54	39.54	0.00	13,096.5	13,096.5
6/13/2017 5:10	6/13/2017 5:50		6/13/2017 11:45	6/13/2017 11:45		6.1	6.1	0.0	2.80	2.80	0.00	4.40	4.40	0.00	1,023.7	1,023.7
6/15/2017 6:30	6/15/2017 21:45		6/16/2017 3:40	6/16/2017 3:40		21.3	21.3	0.0	3.79	3.79	0.00	9.26	9.26	0.00	4,831.3	4,831.3
9/17/2017 14:45	9/17/2017 19:20		9/18/2017 1:15	9/18/2017 1:15		5.6	5.6	0.0	1.48	1.48	0.00	3.53	3.53	0.00	496.7	496.7
9/18/2017 16:00	9/19/2017 2:55		9/19/2017 8:55	9/19/2017 8:55		16.5	16.5	0.0	1.82	1.82	0.00	2.58	2.58	0.00	1,805.2	1,805.2
9/19/2017 13:25	9/19/2017 23:40		9/20/2017 5:35	9/20/2017 5:35		16.3	16.3	0.0	1.16	1.16	0.00	1.78	1.78	0.00	1,134.0	1,134.0
9/30/2017 15:50	9/30/2017 17:50		9/30/2017 23:45	9/30/2017 23:45		6.7	6.7	0.0	3.04	3.04	0.00	23.51	23.51	0.00	1,217.2	1,217.2
10/7/2017 5:05	10/7/2017 5:50		10/7/2017 11:45	10/7/2017 11:45		6.3	6.3	0.0	1.29	1.29	0.00	2.63	2.63	0.00	491.6	491.6
10/7/2017 18:15	10/7/2017 20:40		10/8/2017 2:35	10/8/2017 2:35		8.5	8.5	0.0	0.62	0.62	0.00	1.07	1.07	0.00	317.4	317.4
10/12/2017 11:35	10/12/2017 17:45		10/12/2017 21:40	10/12/2017 21:40		8.5	8.5	0.0	0.11	0.11	0.00	0.17	0.17	0.00	56.8	56.8
10/12/2017 21:40	10/13/2017 2:15		10/13/2017 8:10	10/13/2017 8:10		10.6	10.6	0.0	0.13	0.13	0.00	0.23	0.23	0.00	83.6	83.6
10/17/2017 7:45	10/17/2017 11:40		10/17/2017 17:35	10/17/2017 17:35		9.9	9.9	0.0	3.73	3.73	0.00	7.11	7.11	0.00	2,220.3	2,220.3
10/18/2017 9:55	10/19/2017 23:25	10/18/2017 19:00	10/20/2017 5:25	10/20/2017 5:25	10/20/2017 5:25	39.8	39.8	9.9	4.93	4.93	0.02	89.13	89.13	0.72	11,761.6	11,752.3
10/20/2017 9:05	10/20/2017 14:15	10/20/2017 9:00	10/20/2017 20:10	10/20/2017 20:10	10/20/2017 14:55	11.2	11.2	6.0	3.52	3.52	0.00	9.69	9.69	0.01	2,361.3	2,360.0
10/21/2017 4:25	10/22/2017 3:50	10/21/2017 5:50	10/22/2017 5:25	10/22/2017 5:25	10/22/2017 2:40	24.0	19.3	20.9	32.95	13.02	25.77	79.43	25.83	67.94	47,442.3	15,106.5
11/2/2017 11:40	11/3/2017 14:15		11/3/2017 14:15	11/3/2017 14:15		25.9	25.9	0.0	6.46	6.46	0.00	33.02	33.02	0.00	10,043.0	10,043.0
11/4/2017 13:55	11/5/2017 13:45		11/5/2017 19:40	11/5/2017 19:40		23.8	23.8	0.0	6.21	6.21	0.00	7.68	7.68	0.00	8,850.7	8,850.7
11/8/2017 16:00	11/9/2017 20:25		11/10/2017 2:20	11/10/2017 2:20		34.1	34.1	0.0	7.56	7.56	0.00	13.60	13.60	0.00	15,460.3	15,460.3
11/11/2017 9:20	11/11/2017 12:55	11/11/2017 9:20	11/11/2017 15:45	11/11/2017 15:45	11/11/2017 13:30	6.5	4.9	4.0	9.93	13.13	0.00	39.42	39.42	0.01	3,872.7	3,872.2

		Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet	Bypass	Inlet	Outlet
Rain Start	Rain Stop	Flow Start	Flow Stop	Flow Stop	Flow Stop	Flow Duration	Flow Duration	Flow Duration	Flow Average	Flow Average	Flow Average	Flow Maximum	Flow Maximum	Flow Maximum	Flow Volume	Flow Volume
datetime	datetime	datetime	datetime	datetime	datetime	hour	hour	hour	gal/min	gal/min	gal/min	gal/min	gal/min	gal/min	gal	gal
11/12/2017 3:45	11/12/2017 8:55		11/12/2017 13:05	11/12/2017 13:05		8.3	8.3	0.0	10.51	10.51	0.00	35.42	35.42	0.00	5,254.9	5,254.9
11/12/2017 14:05	11/13/2017 5:35		11/13/2017 11:35	11/13/2017 11:35		21.2	21.2	0.0	16.64	16.64	0.00	31.06	31.06	0.00	21,127.2	21,127.2
11/13/2017 15:05	11/13/2017 18:05		11/13/2017 20:00	11/13/2017 20:00		4.4	4.4	0.0	6.01	6.01	0.00	18.51	18.51	0.00	1,592.9	1,592.9
11/14/2017 21:55	11/15/2017 10:45		11/15/2017 11:45	11/15/2017 11:45		13.9	13.9	0.0	5.64	5.64	0.00	11.49	11.49	0.00	4,711.6	4,711.6
11/19/2017 15:55	11/20/2017 5:10		11/20/2017 1:40	11/20/2017 1:40		6.5	6.5	0.0	9.65	9.65	0.00	39.18	39.18	0.00	3,764.3	3,764.3
11/20/2017 14:30	11/20/2017 16:20		11/20/2017 22:15	11/20/2017 22:15		7.9	7.9	0.0	11.11	11.11	0.00	39.31	39.31	0.00	5,278.2	5,278.2
11/21/2017 5:15	11/22/2017 15:55		11/22/2017 20:55	11/22/2017 20:55		39.8	39.8	0.0	8.64	8.64	0.00	21.35	21.35	0.00	20,646.0	20,646.0
11/22/2017 21:00	11/23/2017 0:30		11/23/2017 6:30	11/23/2017 6:30		9.7	9.7	0.0	0.24	0.24	0.00	0.36	0.36	0.00	136.9	136.9
11/23/2017 8:05	11/23/2017 12:45		11/23/2017 18:40	11/23/2017 18:40		10.8	10.8	0.0	0.23	0.23	0.00	0.26	0.26	0.00	151.4	151.4
11/25/2017 16:50	11/26/2017 2:30		11/26/2017 4:15	11/26/2017 4:15		11.5	11.5	0.0	0.26	0.26	0.00	0.29	0.29	0.00	176.6	176.6
11/26/2017 4:20	11/26/2017 16:35		11/26/2017 22:30	11/26/2017 22:30		18.3	18.3	0.0	0.18	0.18	0.00	0.36	0.36	0.00	202.3	202.3
11/28/2017 6:15	11/28/2017 15:20		11/28/2017 21:20	11/28/2017 21:20		15.3	15.3	0.0	0.11	0.11	0.00	0.12	0.12	0.00	97.7	97.7
11/30/2017 6:25	11/30/2017 11:40	11/30/2017 8:55	11/30/2017 17:35	11/30/2017 17:35	11/30/2017 17:35	11.3	11.3	8.8	8.08	7.55	0.69	119.11	100.48	22.01	5,495.9	5,133.2
12/1/2017 13:35	12/1/2017 18:40	12/1/2017 13:30	12/2/2017 0:40	12/1/2017 23:10	12/2/2017 0:40	11.3	9.8	9.9	0.21	0.24	0.00	0.44	0.43	0.01	144.1	141.6
12/2/2017 9:00	12/3/2017 3:45	12/2/2017 8:55	12/3/2017 9:40	12/3/2017 9:40	12/3/2017 9:40	24.8	23.4	20.5	0.04	0.04	0.01	0.07	0.07	0.02	66.7	60.5
12/19/2017 23:20	12/20/2017 4:45		12/20/2017 9:40	12/20/2017 9:40		4.8	4.8	0.0	0.00	0.00	0.00	0.01	0.01	0.00	0.9	0.9
12/28/2017 19:45	12/29/2017 20:15	12/28/2017 22:55	12/30/2017 2:10	12/30/2017 2:10	12/30/2017 2:10	26.2	15.9	14.1	4.11	6.75	0.00	94.20	94.20	0.01	6,451.0	6,447.2
1/4/2018 22:20	1/5/2018 5:30		1/5/2018 8:15	1/5/2018 8:15		9.1	9.1	0.0	15.63	15.63	0.00	39.74	39.74	0.00	8,517.9	8,517.9
1/6/2018 0:00	1/6/2018 15:00		1/7/2018 3:00	1/7/2018 3:00		27.2	27.2	0.0	5.53	5.53	0.00	10.11	10.11	0.00	9,010.1	9,010.1
1/7/2018 6:25	1/8/2018 1:35		1/8/2018 10:45	1/8/2018 10:45		29.2	29.2	0.0	6.87	6.87	0.00	9.31	9.31	0.00	12,024.2	12,024.2
1/8/2018 22:20	1/9/2018 3:55	1/9/2018 0:15	1/9/2018 7:25	1/9/2018 4:35	1/9/2018 7:25	7.8	5.0	7.3	9.86	15.39	0.04	35.42	33.98	1.44	4,633.0	4,616.0
1/26/2018 18:30	1/27/2018 12:10	1/27/2018 1:15	1/27/2018 13:40	1/27/2018 12:15	1/27/2018 13:40	14.2	13.6	11.4	18.48	19.08	0.24	44.22	38.86	5.42	15,709.9	15,546.5
1/27/2018 23:35	1/28/2018 6:25	1/28/2018 1:00	1/28/2018 4:15	1/28/2018 4:15	1/28/2018 1:00	3.8	3.8	0.1	3.26	3.26	0.00	20.46	20.46	0.00	749.3	749.3
1/29/2018 6:20	1/29/2018 16:50		1/29/2018 20:30	1/29/2018 20:30		13.4	13.4	0.0	6.58	6.58	0.00	11.86	11.86	0.00	5,295.8	5,295.8
2/1/2018 11:30	2/1/2018 22:25		2/2/2018 0:10	2/2/2018 0:10		7.8	7.8	0.0	3.58	3.58	0.00	5.97	5.97	0.00	1,684.5	1,684.5
2/3/2018 10:55	2/3/2018 22:15		2/4/2018 0:45	2/4/2018 0:45		9.8	9.8	0.0	12.69	12.69	0.00	19.98	19.98	0.00	7,422.1	7,422.1
2/13/2018 21:05	2/14/2018 0:30		2/14/2018 2:50	2/14/2018 2:50		4.7	4.7	0.0	18.08	18.08	0.00	31.19	31.19	0.00	5,061.2	5,061.2
2/14/2018 6:25	2/14/2018 11:20		2/14/2018 9:05	2/14/2018 9:05		2.1	2.1	0.0	3.60	3.60	0.00	9.11	9.11	0.00	449.9	449.9
2/27/2018 15:05	2/27/2018 23:30		2/28/2018 11:10	2/28/2018 11:10		18.8	18.8	0.0	6.00	6.00	0.00	29.44	29.44	0.00	6,779.0	6,779.0
3/2/2018 1:20	3/2/2018 5:50		3/2/2018 17:45	3/2/2018 17:45		16.5	16.5	0.0	6.87	6.87	0.00	10.81	10.81	0.00	6,797.4	6,797.4
3/8/2018 6:05	3/8/2018 19:30		3/8/2018 19:30	3/8/2018 19:30		10.3	10.3	0.0	15.35	15.35	0.00	35.27	35.27	0.00	9,440.6	9,440.6
3/13/2018 14:55	3/13/2018 19:55		3/14/2018 3:05	3/14/2018 3:05		9.1	9.1	0.0	3.45	3.45	0.00	10.51	10.51	0.00	1,880.8	1,880.8
3/22/2018 6:50	3/22/2018 20:05		3/23/2018 0:55	3/23/2018 0:55		18.3	18.3	0.0	15.12	15.12	0.00	53.22	53.22	0.00	16,627.5	16,627.5
3/23/2018 8:00	3/23/2018 11:20		3/23/2018 23:20	3/23/2018 23:20		15.4	15.4	0.0	8.89	8.89	0.00	15.80	15.80	0.00	8,227.0	8,227.0
3/24/2018 1:25	3/24/2018 6:45		3/24/2018 18:40	3/24/2018 18:40		17.3	17.3	0.0	8.91	8.91	0.00	13.94	13.94	0.00	9,263.7	9,263.7
2/28/2018 12:05	3/1/2018 0:30		3/1/2018 4:05	3/1/2018 4:05		17.0	17.0	0.0	17.15	17.15	0.00	61.59	61.59	0.00	17,488.3	17,488.3

		Bypass	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
Rain Start	Rain Stop	Flow Volume	Sample Count	Sample Count	First Sample Time	First Sample Time	Last Sample Time	Last Sample Time	Sample Duration	Sample Duration	Sampled Volume	Sampled Volume	Sample Coverage	Sample Coverage	Average Sampled Flow	Average Sampled Flow
datetime	datetime	gal	count	count	datetime	datetime	datetime	datetime	hour	hour	gal	gal	%	%	gal/min	gal/min
10/8/2016 13:30	10/9/2016 2:35	10.9	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/9/2016 18:30	10/9/2016 22:05	12.0	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/13/2016 1:25	10/14/2016 14:30	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/14/2016 23:45	10/16/2016 12:10	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/16/2016 17:45	10/16/2016 23:55	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/18/2016 1:30	10/18/2016 7:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/19/2016 20:25	10/20/2016 11:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/22/2016 23:10	10/23/2016 8:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/24/2016 17:00	10/24/2016 18:55	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/26/2016 6:05	10/26/2016 23:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/27/2016 18:50	10/28/2016 0:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/29/2016 8:10	10/29/2016 13:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/30/2016 13:55	10/31/2016 10:25	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/31/2016 19:05	11/1/2016 12:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/2/2016 4:45	11/2/2016 13:10	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/2/2016 20:20	11/3/2016 3:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/5/2016 5:05	11/6/2016 5:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/7/2016 4:55	11/7/2016 5:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/19/2016 3:15	12/19/2016 15:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/19/2016 20:30	12/20/2016 1:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/22/2016 18:20	12/23/2016 17:30	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/26/2016 15:50	12/26/2016 22:40	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/29/2016 16:45	12/30/2016 6:15	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/31/2016 17:55	1/1/2017 0:15	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/8/2017 11:00	1/8/2017 21:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/9/2017 16:15	1/9/2017 18:10	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/10/2017 1:55	1/10/2017 8:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/17/2017 4:00	1/17/2017 9:05	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/17/2017 11:50	1/19/2017 0:25	6,921.9	65	72	1/17/2017 12:50	1/17/2017 12:52	1/18/2017 11:52	1/18/2017 12:52	23.0	24.0	27,285	20,834	91.2	90.6	23.6	15.4
1/19/2017 6:00	1/19/2017 10:20	2.6	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/19/2017 14:20	1/19/2017 16:55	2.7	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/21/2017 20:45	1/21/2017 23:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/22/2017 8:25	1/22/2017 12:10	0.0	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
2/3/2017 1:55	2/5/2017 0:25	489.3	30	58	2/3/2017 7:40	2/3/2017 7:52	2/4/2017 5:27	2/4/2017 5:47	21.8	21.9	11,842	11,316	94.6	94.0	13.3	12.0
2/5/2017 12:20	2/6/2017 1:45	2.2	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
2/6/2017 11:45	2/6/2017 20:35	1.1	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
2/8/2017 8:45	2/10/2017 7:55	-	39	38	2/8/2017 11:45	2/8/2017 12:22	2/9/2017 11:12	2/9/2017 11:12	23.5	22.8	14,702	14,373	79.0	77.2	10.6	10.6
4/6/2017 5:25	4/6/2017 10:10	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/7/2017 2:05	4/7/2017 9:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/7/2017 15:35	4/8/2017 1:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/10/2017 11:25	4/10/2017 17:15	45.5	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0

		Bypass	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
Rain Start	Rain Stop	Flow Volume	Sample Count	Sample Count	First Sample Time	First Sample Time	Last Sample Time	Last Sample Time	Sample Duration	Sample Duration	Sampled Volume	Sampled Volume	Sample Coverage	Sample Coverage	Average Sampled Flow	Average Sampled Flow
datetime	datetime	gal	count	count	datetime	datetime	datetime	datetime	hour	hour	gal	gal	%	%	gal/min	gal/min
4/12/2017 1:10	4/12/2017 12:15	22,335.9	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/12/2017 20:00	4/13/2017 2:20	-	100	100	4/12/2017 20:17	4/12/2017 20:17	4/13/2017 3:12	4/13/2017 3:12	6.9	6.9	18,343	18,343	89.1	89.1	56.8	56.8
4/13/2017 14:40	4/13/2017 15:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/17/2017 16:55	4/17/2017 20:35	-	0	4		4/17/2017 17:42		4/17/2017 18:27	0.0	0.8	-	446	0.0	61.6	0.0	10.1
4/18/2017 18:25	4/19/2017 0:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/19/2017 8:45	4/19/2017 23:45	15,605.4	100	47	4/19/2017 12:07	4/19/2017 12:07	4/19/2017 23:15	4/20/2017 5:17	11.1	17.2	14,004	5,984	70.1	93.7	56.4	14.0
4/22/2017 12:30	4/22/2017 14:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/23/2017 11:00	4/23/2017 20:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/26/2017 13:25	4/26/2017 18:25	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/26/2017 23:05	4/27/2017 2:05	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/28/2017 2:50	4/28/2017 7:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/29/2017 19:35	4/29/2017 20:15	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
4/30/2017 8:35	4/30/2017 9:15	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/1/2017 10:30	5/1/2017 12:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/2/2017 19:15	5/3/2017 8:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/4/2017 16:15	5/5/2017 9:10	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/6/2017 0:50	5/6/2017 2:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/11/2017 3:30	5/11/2017 19:00	-	56	71	5/11/2017 3:55	5/11/2017 4:02	5/11/2017 22:52	5/11/2017 22:42	19.0	18.7	9,233	9,048	93.1	91.3	11.8	11.6
5/12/2017 12:05	5/12/2017 12:55	1.2	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/12/2017 20:30	5/13/2017 6:55	15.5	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/13/2017 19:20	5/13/2017 22:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
5/15/2017 14:00	5/16/2017 10:45	2,095.1	90	90	5/15/2017 15:07	5/15/2017 15:07	5/16/2017 13:27	5/16/2017 13:37	22.3	22.5	27,391	25,408	94.5	94.5	22.5	20.6
6/8/2017 1:05	6/8/2017 10:35	-	33	42	6/8/2017 2:05	6/8/2017 2:07	6/8/2017 9:57	6/8/2017 13:32	7.9	11.4	10,850	12,159	82.8	92.8	28.3	25.4
6/13/2017 5:10	6/13/2017 5:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
6/15/2017 6:30	6/15/2017 21:45	-	19	19	6/15/2017 6:52	6/15/2017 6:52	6/16/2017 1:37	6/16/2017 1:37	18.8	18.8	4,499	4,499	93.1	93.1	4.7	4.7
9/17/2017 14:45	9/17/2017 19:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
9/18/2017 16:00	9/19/2017 2:55	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
9/19/2017 13:25	9/19/2017 23:40	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
9/30/2017 15:50	9/30/2017 17:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/7/2017 5:05	10/7/2017 5:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/7/2017 18:15	10/7/2017 20:40	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/12/2017 11:35	10/12/2017 17:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/12/2017 21:40	10/13/2017 2:15	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/17/2017 7:45	10/17/2017 11:40	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/18/2017 9:55	10/19/2017 23:25	9.3	35	31	10/18/2017 18:25	10/18/2017 18:25	10/18/2017 18:45	10/18/2017 18:45	0.3	0.3	1,690	1,676	14.4	14.3	86.6	86.6
10/20/2017 9:05	10/20/2017 14:15	1.3	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
10/21/2017 4:25	10/22/2017 3:50	32,335.8	100	75	10/21/2017 5:35	10/21/2017 5:52	10/21/2017 19:57	10/22/2017 3:32	14.4	21.7	31,118	14,775	65.6	97.8	67.7	17.2
11/2/2017 11:40	11/3/2017 14:15	-	35	60	11/2/2017 12:27	11/2/2017 12:30	11/3/2017 12:02	11/3/2017 12:02	23.6	23.5	8,871	8,788	88.3	87.5	10.8	10.1
11/4/2017 13:55	11/5/2017 13:45	-	34	56	11/4/2017 21:00	11/4/2017 21:17	11/5/2017 18:02	11/5/2017 18:27	21.0	21.2	8,270	8,298	93.4	93.8	6.3	6.3
11/8/2017 16:00	11/9/2017 20:25	-	69	100	11/8/2017 17:02	11/8/2017 17:02	11/10/2017 1:12	11/10/2017 1:12	32.2	32.2	14,805	14,805	95.8	95.8	8.4	7.9
11/11/2017 9:20	11/11/2017 12:55	0.5	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0

		Bypass	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
Rain Start	Rain Stop	Flow Volume	Sample Count	Sample Count	First Sample Time	First Sample Time	Last Sample Time	Last Sample Time	Sample Duration	Sample Duration	Sampled Volume	Sampled Volume	Sample Coverage	Sample Coverage	Average Sampled Flow	Average Sampled Flow
datetime	datetime	gal	count	count	datetime	datetime	datetime	datetime	hour	hour	gal	gal	%	%	gal/min	gal/min
11/12/2017 3:45	11/12/2017 8:55	-	11	14	11/12/2017 5:12	11/12/2017 5:12	11/12/2017 7:52	11/12/2017 9:42	2.7	4.5	3,546	4,733	90.1	90.1	24.4	21.4
11/12/2017 14:05	11/13/2017 5:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/13/2017 15:05	11/13/2017 18:05	-	8	9	11/13/2017 15:52	11/13/2017 15:52	11/13/2017 18:07	11/13/2017 18:27	2.3	2.6	1,209	1,362	75.9	85.5	9.9	9.6
11/14/2017 21:55	11/15/2017 10:45	-	16	15	11/15/2017 3:05	11/15/2017 3:22	11/15/2017 10:12	11/15/2017 10:12	7.1	6.8	2,612	2,475	55.4	52.5	6.3	6.2
11/19/2017 15:55	11/20/2017 5:10	-	24	38	11/19/2017 18:57	11/19/2017 18:52	11/20/2017 0:22	11/20/2017 0:37	5.4	5.8	3,362	3,626	89.3	96.3	27.1	25.4
11/20/2017 14:30	11/20/2017 16:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/21/2017 5:15	11/22/2017 15:55	-	100	100	11/21/2017 6:02	11/21/2017 6:02	11/22/2017 3:52	11/22/2017 5:42	21.8	23.7	14,214	15,107	68.8	73.2	11.6	11.4
11/22/2017 21:00	11/23/2017 0:30	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/23/2017 8:05	11/23/2017 12:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/25/2017 16:50	11/26/2017 2:30	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/26/2017 4:20	11/26/2017 16:35	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/28/2017 6:15	11/28/2017 15:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
11/30/2017 6:25	11/30/2017 11:40	362.8	22	20	11/30/2017 9:01	11/30/2017 9:01	11/30/2017 9:40	11/30/2017 9:37	0.6	0.6	3,897	3,495	70.9	68.1	102.3	97.7
12/1/2017 13:35	12/1/2017 18:40	2.5	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/2/2017 9:00	12/3/2017 3:45	6.2	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/19/2017 23:20	12/20/2017 4:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
12/28/2017 19:45	12/29/2017 20:15	3.8	22	23	12/29/2017 11:10	12/29/2017 11:10	12/29/2017 11:20	12/29/2017 11:20	0.2	0.2	904	901	14.0	14.0	91.4	91.6
1/4/2018 22:20	1/5/2018 5:30	-	72	100	1/4/2018 23:37	1/4/2018 23:22	1/5/2018 5:42	1/5/2018 5:52	6.1	6.5	7,343	7,891	86.2	92.6	30.2	26.9
1/6/2018 0:00	1/6/2018 15:00	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/7/2018 6:25	1/8/2018 1:35	-	96	100	1/7/2018 7:25	1/7/2018 7:32	1/8/2018 4:37	1/8/2018 4:22	21.2	20.8	9,068	8,890	75.4	73.9	8.2	8.0
1/8/2018 22:20	1/9/2018 3:55	17.0	43	51	1/8/2018 23:57	1/8/2018 23:52	1/9/2018 2:00	1/9/2018 2:57	2.0	3.1	3,799	4,481	82.0	97.1	31.0	28.0
1/26/2018 18:30	1/27/2018 12:10	163.4	100	100	1/27/2018 0:22	1/26/2018 22:57	1/27/2018 9:37	1/27/2018 6:02	9.3	7.1	13,728	12,338	87.4	79.4	34.2	32.3
1/27/2018 23:35	1/28/2018 6:25	0.0	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
1/29/2018 6:20	1/29/2018 16:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
2/1/2018 11:30	2/1/2018 22:25	-	1	13	2/1/2018 17:12	2/1/2018 16:47		2/1/2018 22:42	0.0	5.9	-	1,495	0.0	88.8	0.0	4.3
2/3/2018 10:55	2/3/2018 22:15	-	49	49	2/3/2018 15:27	2/3/2018 15:27	2/3/2018 23:07	2/3/2018 23:07	7.7	7.7	7,260	7,260	97.8	97.8	16.8	16.7
2/13/2018 21:05	2/14/2018 0:30	-	72	72	2/13/2018 22:20	2/13/2018 22:22	2/14/2018 1:27	2/14/2018 1:37	3.1	3.3	4,895	4,898	96.7	96.8	26.5	26.4
2/14/2018 6:25	2/14/2018 11:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
2/27/2018 15:05	2/27/2018 23:30	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
3/2/2018 1:20	3/2/2018 5:50	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
3/8/2018 6:05	3/8/2018 19:30	-	54	54	3/8/2018 9:25	3/8/2018 9:27	3/8/2018 18:02	3/8/2018 18:22	8.6	8.9	9,102	9,229	96.4	97.8	21.6	21.4
3/13/2018 14:55	3/13/2018 19:55	-	11	15	3/13/2018 16:27	3/13/2018 16:27	3/13/2018 20:47	3/13/2018 21:17	4.3	4.8	1,595	1,727	84.8	91.8	8.5	7.2
3/22/2018 6:50	3/22/2018 20:05	-	81	93	3/22/2018 8:05	3/22/2018 8:17	3/22/2018 17:27	3/22/2018 17:42	9.4	9.4	12,524	12,611	75.3	75.8	37.3	33.6
3/23/2018 8:00	3/23/2018 11:20	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
3/24/2018 1:25	3/24/2018 6:45	-	0	0					0.0	0.0	-	-	0.0	0.0	0.0	0.0
2/28/2018 12:05	3/1/2018 0:30	-	100	100	2/28/2018 13:25	2/28/2018 13:27	2/28/2018 22:12	2/28/2018 22:17	8.8	8.8	13,164	13,259	75.3	75.8	30.3	30.5