THE HONORABLE THOMAS S. ZILLY

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

WASTE ACTION PROJECT,

Plaintiff,

v.

ESTES EXPRESS LINES, d/b/a ESTES WEST, G.I. TRUCKING CO., d/b/a ESTES WEST,

Defendants.

Case No. 2:18-cv-00559-TSZ

CONSENT DECREE

I. STIPULATIONS

Plaintiff Waste Action Project ("WAP") filed its lawsuit against Estes Express Lines, d/b/a Estes West, G.I. Trucking Co., d/b/a Estes West ("Estes") on April 16, 2018, alleging violations of the Clean Water Act, 33 U.S.C. § 1251 et seq., relating to discharges of stormwater from Estes' Facility in Auburn, Washington and seeking declaratory and injunctive relief, civil penalties, and attorney fees and costs. Estes denies the allegations contained in the sixty-day notice and complaint.

WAP and Estes agree that settlement of these matters is in the best interest of the parties and the public, and that entry of this Consent Decree is the most appropriate means of resolving this action.

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Seattle, Washington 98112
(206) 860-2883

WAP and Estes stipulate to the entry of this Consent Decree without trial, adjudication, or admission of any l issues of fact or law regarding WAP's claims or allegations set forth in its complaint and its sixty-day notice.

DATED this 12th of September, 2018

Estes Express Lines, d/b/a Estes West, G.I. Trucking Co., d/b/a Estes West	Waste Action Project
By Curtis E Carr	By Greg Wingard
Title: VP, Safety & Risk Management	Greg Wingard Title: Executive Director

II. ORDER AND DECREE

THIS MATTER came before the Court upon the Parties' Joint Motion for Entry of Consent Decree and the foregoing Stipulations of the parties. Having considered the Stipulations and the promises set forth below, the Court hereby ORDERS, ADJUDGES, and DECREES as follows:

1. This court has jurisdiction over the parties and subject matter of this action.

2. Each signatory for the parties certifies for that party that he or she is authorized to enter into the agreements set forth below.

3. This Consent Decree applies to and binds the parties and their successors and assigns.

4. This Consent Decree applies to the operation by Defendant Estes of its Facility at 2102 West Valley Highway, Auburn, Washington (the "**Facility**").

5. This Consent Decree is a full and complete settlement of the claims in the Complaint and all other claims known and unknown existing as of the date of entry of this Consent Decree that could be asserted under the Clean Water Act, 33 U.S.C. §§ 1251-1387. These claims are released and dismissed with prejudice. Enforcement of this decree is WAP's exclusive remedy for any

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(206) 860-2883

violation of its terms.

6. This Consent Decree is a settlement of disputed facts and law. It is not an admission or adjudication regarding any allegations by WAP in this case or of any fact or conclusion of law related to those allegations, nor evidence of any wrongdoing on the part of Estes.

7. Estes agrees to the following terms and conditions in full and complete satisfaction of the claims covered by this decree:

a. ESTES will comply fully with all conditions of its National Pollutant Discharge Elimination System Permit No. WAR008739 (the "**NPDES permit**") and any successor, modified, or replacement permit, and the stormwater pollution prevention plan ("**SWPPP**") adopted thereunder, for the duration of the consent decree;

b. Within thirty days of the entry of the consent decree, Estes will revise its SWPPP to include the below-described treatment, corrective actions, best management practices, and monitoring procedures.

c. Estes will install the L3 Corrective Action treatment system described in the Level 3 Corrective Action Engineering Report submitted to Ecology on May 15, 2018, attached as **EXHIBIT A**, and such system will be installed and in operation no later than September 30, 2018.

d. For the duration of the consent decree, Estes will maintain all corrective actions and best management practices ("**BMPs**"), including catch-basin inserts or other media designed to capture or treat oil in stormwater, in accordance with maintenance procedures specified by the treatment technology developer.

e. Estes will revise its SWPPP within thirty days of the entry of this consent

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decree to

i. add existing downspouts to the site map, as applicable;

ii. state that if raw materials are stored at the facility, they will be stored under cover;

iii. include the following description of truck flow at the facility: "Trucks, trailers, and vehicles enter from a single access point near the northwest corner of the property. Loading and unloading is completed on the north and south sides of the docks. Trucks and trailers then exit through the access point at the northwest corner. Unladen trailers and tractors not currently being used are moved and rotated between parking areas at the northwest, northeast, and southern portions of the property.";

iv. provide for trailers to be rotated and relocated as reasonably necessary and feasible to allow for cleaning of paving surrounding and under parked equipment using both hand sweeping and vacuum sweeping quarterly or more frequently as needed as required by NPDES Permit condition S3.B.4.b.i.2)a) and the 2012 Stormwater Management Manual for Western Washington as updated in 2014, IV-2.1 Applicable (Mandatory) operational Source Control BMPs;

v. prohibit washing except washing windshields with water only at the facility. If windshield washing with anything other than water is permitted, the facility must (a) implement best management practices

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for washing as required by the permit, (b) any and all chemicals in the windshield washing fluid that are used must be included as potential pollutants in the SWPPP; and (c) the SWPPP must include a statement that windshield washing will only occur under the canopy area where runoff is directed to the oil water separator located in the enclosed maintenance building that discharges to the sanitary sewer.

vi. include fecal coliform bacteria mandatory BMPs that are required by NPDES permit condition S6.C.1 Table 6, note i.

f. Estes' SWPPP will continue to include and implement mobile fueling BMPs. The SWPPP must be modified to ensure that anyone performing mobile fueling must comply with the BMPs;

g. Estes will continue to implement the spill logging procedure contained in its SWPPP as required by the permit;

h. Estes will continue to implement employee training as required by the Permit and the current or amended SWPPPPs;

i. If there is a stormwater discharge from its outfall, Estes will collect and analyze stormwater discharge samples in a method consistent with the NPDES permit requirements during the months of October 2018, November 2018, December 2018, January 2019, February 2019, and March, 2019;

j. For the duration of the consent decree, Estes will continue to contract with a qualified expert to perform stormwater sampling; and

k. For the duration of the consent decree, Estes will provide copies of all

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quarterly sample lab reports; discharge monitoring reports; written (including electronic) documents to and from Ecology pursuant to the NPDES permit; and updated SWPPPs. Documentation will be forwarded to WAP on a quarterly basis no later than the twentieth day following the end of each calendar quarter.

8. No later than thirty (30) days after the entry of this Consent Decree, Estes will pay an amount of ONE HUNDRED AND SEVENTY FOUR THOUSAND DOLLARS ($174,000) to the Green River College Foundation as described in **Exhibit B** to this Consent Decree, for environmental benefit projects benefiting water quality projects in the Green River basin. Payment will be made to the order of and delivered to Green River College Foundation, 12401 SE 320th Street, Auburn, WA 98092-3622, Attn: George Frasier. Payment shall include the following reference in a cover letter or on the check: "Consent Decree, Waste Action project / Estes Express Lines, Clean Water Act Settlement." A copy of each check and cover letter, if any, shall be sent simultaneously to WAP.

9. ESTES will pay WAP's reasonable attorney and expert fees and costs in the amount of TWENTY SIX THOUSAND DOLLARS ($26,000). Payment will be made within thirty (30) days of the entry of this decree by check payable and mailed to Smith & Lowney, PLLC, 2317 E. John Street, Seattle, Washington 98112, attn: Richard Smith. This payment is full and complete satisfaction of any claims WAP may have under the Clean Water Act for fees and costs.

10. A force majeure event is any event outside the reasonable control of Estes that causes a delay in performing tasks required by this decree that cannot be cured by due diligence. Delay in performance of a task required by this decree caused by a force majeure event is not a failure to comply with the terms of this decree, provided that Estes notifies WAP of the event; the steps that Estes will take to perform the task; the projected time that will be needed to complete the task; and

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2317 East John St.
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the measures that have been taken or will be taken to prevent or minimize any impacts to stormwater quality resulting from delay in completing the task.

Estes will notify WAP of the occurrence of a force majeure event as soon as reasonably possible but, in any case, no later than ten (10) days after the occurrence of the event. In such event, the time for performance of the task will be extended for a reasonable period of time following the force majeure event.

By way of example and not limitation, force majeure events include

a. Acts of God, war, insurrection, or civil disturbance;

b. Earthquakes, landslides, fire, floods;

c. Actions or inactions of third parties over which defendant has no control;

d. Restraint by court order or order of public authority;

e. Strikes; and

f. Litigation, arbitration, or mediation that causes delay.

11. This court retains jurisdiction over this matter. And, while this decree remains in force, this case may be reopened without filing fee so that the parties may apply to the Court for any further order that may be necessary to enforce compliance with this decree or to resolve any dispute regarding the terms or conditions of this decree. In the event of a dispute regarding implementation of, or compliance with, this decree, the parties must first attempt to resolve the dispute by meeting to discuss the dispute and any suggested measures for resolving the dispute. Such a meeting should be held as soon as practical but must be held within thirty (30) days after notice of a request for such a meeting to the other party and its counsel of record. If no resolution is reached at that meeting or within thirty (30) days of the notice, whichever occurs first, unless extended by mutual written agreement of the parties, either party may file a motion with this court to resolve the dispute. The provisions of section 505(d) of the Clean Water Act, 33 U.S.C. § 1365(d), regarding awards of costs of litigation (including reasonable attorney and expert witness fees) to any prevailing or substantially

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prevailing party, shall apply to any proceedings seeking to enforce the terms and conditions of this Consent Decree.

12. The parties recognize that, pursuant to 33 U.S.C. § 1365(c)(3), no consent judgment can be entered in a Clean Water Act suit in which the United States is not a party prior to forty-five (45) days following the receipt of a copy of the proposed consent judgment by the U.S. Attorney General and the Administrator of the U.S. EPA. Therefore, upon the signing of this Consent Decree by the parties, WAP shall serve copies of it upon the Administrator of the U.S. EPA and the Attorney General.

13. This Consent Decree takes effect upon entry by the court. It terminates three years after entry by the court.

14. All parties have participated in drafting this decree.

15. This Consent Decree may be modified only upon the approval of the court.

16. If for any reason the court should decline to approve this Consent Decree in the form presented, this Consent Decree is voidable at the discretion of either party. The parties agree to continue negotiations in good faith in an attempt to cure any objection raised by the court to entry of this Consent Decree.

17. Notifications required by this Consent Decree must be in writing. The sending party may use any of the following methods of delivery: (1) personal delivery; (2) registered or certified mail, in each case return receipt requested and postage prepaid; (3) a nationally recognized overnight courier, with all fees prepaid; or (4) e-mail. For a notice or other communication regarding this Consent Decree to be valid, it must be delivered to the receiving party at the addresses listed below or to any other address designated by the receiving party in a notice in accordance with this paragraph 16.

Smith & Lowney, p.l.l.c.
2317 East John St.
Seattle, Washington 98112
(206) 860-2883

if to WAP:

Waste Action Project
P.O. Box 9281
Covington, WA 98042
gwingard@earthlink.net

and to:

Smith & Lowney PLLC
2317 East John St.
Seattle, WA 98112
richard@smithandlowney.com

if to Estes:

Curtis Carr
Vice-President, Safety and Risk Management
Estes Express Lines
3901 West Broad Street
P.O. Box 25612
Richmond, Virginia 23260
Curtis.Carr@estes-express.com

A notice or other communication regarding this Consent Decree will be effective when received unless the notice or other communication is received after 5:00 p.m. on a business day, or on a day that is not a business day, then the notice will be deemed received at 9:00 a.m. on the next business day. A notice or other communication will be deemed to have been received: (a) if it is delivered in person or sent by registered or certified mail or by nationally recognized overnight courier, upon receipt as indicated by the date on the signed receipt; or (b) if the receiving party rejects or otherwise refuses to accept it, or if it cannot be delivered because of a change in address for which no notice was given, then upon that rejection, refusal, or inability to deliver; or (c) for notice provided via e-mail, upon receipt of a response by the party providing notice or other communication regarding this Consent Decree.

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II. ORDER

The parties' joint motion, docket no. 11, to which the United States has stated no objection, is GRANTED, and this Consent Decree is hereby APPROVED and ENTERED. The Clerk is DIRECTED to send a copy of this Consent Decree to all counsel of record and the United States c/o Thomas Swegle, and to CLOSE this case.

DATED this 8th day of November, 2018.

Thomas S. Zilly
United States District Judge

Smith & Lowney, p.l.l.c.
2317 East John St.
Seattle, Washington 98112
(206) 860-2883

EXHIBIT A

Estes Express Lines
Level 3 Corrective Action Engineering Report

Property:

Contact: Mr. Rick Nelson and Curtis Carr
Terminal Manager – Mr. Chris Harrelson
Estes Express Lines
2201 West Valley Hwy North
Auburn, WA 98001
(253) 939-5344 Ext.5021

Prepared By:

Contact: Calvin Noling, P.E.

StormwateRx LLC
122 SE 27th Ave
Portland, OR 97214
(503) 233-4660

Facility Permit Number: WAR008739

Submittal Date: May 15, 2018

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List of Appendices

i. Brief summary of the treatment alternatives considered and why the proposed option was selected. Include cost estimates of ongoing operation and maintenance, including disposal of any spent media

Estes Express Lines (Estes) considered a variety of treatment alternatives that would produce benchmark water quality in future site stormwater discharges. Advanced GeoEnvironmental, Inc. (AGE) has served as the environmental consultant for Estes and provided the basis for the treatment selection to StormwateRx for this report. The alternatives considered include onsite infiltration, above-grade and below-grade filtrations systems, electrocoagulation (EC) and chitosan enhanced sand filtration (CESF).

Infiltration was eliminated as a viable option because the space required would significantly disrupt primary operations, and because the facility is directly on the roadway.

Estes and AGE evaluated a below-grade flow-through StormFilter design by Contech. However, it was determined that the StormFilter treatment technology would not be suitable for the facility, as it would disrupt a large amount of site operational area, primarily due to the detention storage requirements. Because of the nature of operations at Estes, available space is a critically important consideration. The StormFilter system has recieved TAPE approval for basic treatment, but not for enhanced treatment, and investigative sampling has indicated that zinc in the facility's stormwater is 30%-50% dissolved. Therefore, a treatment system with enhanced approval was preferred. Additionally, the drainage system on the Estes facility cannot generate a sufficient drop in slope to have a dependable drain to the outfall, using a Contech flow-through StormFilter design.

EC and CESF systems were eliminated as options because they each require ongoing operating contracts with each vendor due to the complexity of these active systems that need to be managed. Such operating contracts present an additional ongoing cost of operation of these systems, and reduce the cost-effectiveness over the system's lifetime. The estimated capital and maintenance costs for EC and CESF systems were not provided to StormwateRx.

The selected treatment alternative is the StormwateRx Aquip enhanced stormwater filtration system. This system can be installed onsite and integrated with the existing site stormwater infrastructure without substantially affecting normal facility operations. The characteristic treatment performance of the Aquip filter technology for metals and turbidity at a variety of similar industrial applications indicates that treated discharge from the Aquip filter will satisfy benchmark water quality. The Aquip filter is described in greater detail in section **iii**.

Typical filter maintenance for the proposed Aquip enhanced stormwater filtration technology is described in three categories: routine maintenance, seasonal maintenance, or full maintenance. Routine maintenance refers to the regular cleaning of the filter media surface to remove accumulated sediment and occluded media in order to maintain flow capacity of the filter; a topper media supply is added after multiple instances of routine maintenance in order to return the filter media depth to original conditions. Seasonal maintenance refers to the removal and replacement of the upper inert layers of filter media

when sufficient sediment has accumulated within the bed and routine maintenance can no longer restore flow capacity of the filter. Full maintenance refers to the removal and replacement of the full media bed to restore the filter to original conditions when the flow capacity or treatment performance is suffering due to accumulated sediment load in the lower sorptive media layers. Spent media is not characterized as hazardous material and can be disposed of in a subtitle D landfill. An analysis of expected maintenance costs and frequencies for the proposed system is presented in Table 1.

Table 1. Estimated Operating Costs for the Proposed Stormwater Treatment System

Category	Cost	Frequency (1/yr)*
Aquip Topper Media Replacement: Replace top 3 inches of media after routine scraping of accumulated sediment	$1,950	1
Aquip Seasonal Media Replacement: Remove and replace top half of media	$5,830	0.5
Aquip Full Media Rebuild: Remove and replace full media bed	$37,330	0.2
Estimated Average Annual Cost of Filter Maintenance	$12,300	

*Average annual cost shown represents the average cost over a 5-year maintenance cycle. Actual maintenance intervals will be determined empirically and may be more or less frequent.

ii. The basic design data, including characterization of stormwater influent, and sizing calculations of the treatment units

The site operates under the NPDES Industrial Stormwater General Permit (permit number WAR008739), effective as of January 2, 2015. This permit sets water quality standards for stormwater discharges to surface waters or storm sewers that drain to surface waters. The water quality parameters of concern at Estes are turbidity, copper, and zinc. Estes will implement additional treatment BMPs onsite to address water quality exceedances.

Existing Conditions:

Estes is located at 2102 West Valley Highway North in Auburn, WA. The facility is approximately 5.9 acres, with 4.9 acres of paved surface, 0.81 acres of building rooftops, and 0.16 acres of vegetated area.

The Estes facility is a single drainage basin with an outfall to the City of Auburn municipal storm drain on West Valley Highway N. This outfall is called Outfall 1 in the facility's Stormwater Pollution Prevention Plan (SWPPP, see Appendix A). Stormwater runoff generated onsite flows to a series of catch basins and is conveyed through underground

storm drain lines to CB1, a catch basin vault that serves as the monitoring point for the facility and discharges to the outfall.

Estes uses a set of structural and treatment BMPs on site to control the quality of stormwater runoff. These BMPs are described in the facility's SWPPP and include catch basin inserts installed in 2016, and downspout filters installed in 2017. These structural BMPs were intended to reduce turbidity and metals in the site stormwater discharge.

Proposed Conditions

Estes will upgrade its existing stormwater treatment BMPs with the installation of a StormwateRx Aquip® 300SBE enhanced stormwater filtration system to address turbidity and zinc in stormwater discharges. The existing CB1 catch basin and vault will be modified to serve as a deeper structure to accommodate a treatment pump. The existing site drainage flow pattern will be maintained, and the treatment pump will receive flows from the entire site. The treatment pump will supply untreated stormwater to the Aquip filter at a rate of 235 gpm, corresponding to the water quality design flow rate for the site as determined using the Western Washington Hydrology Model (WWHM2012, v.4.2.12, see Appendix B). Treated Aquip discharge will return by gravity to the discharge point of CB1 and continue to the outfall. Runoff flows in excess of the water quality design flowrate will bypass the Aquip and be discharged to the outfall.

In addition to the proposed treatment BMP, Estes will also make improvements to pollutant source control. A new sweeping protocol scope is to be implemented with the relocation of the cargo trailers during cleaning, as much as possible. Utilizing brooms and pressure washers with vacuum recovery for cleanup under parked equipment, will collect recalcitrant sources of pollution. Focused cleaning on areas not maintained by standard Truck sweeping services will be conducted under trailers and near the dock area. The standard truck-based sweeping services will be conducted, on a minimum monthly basis.

Characterization of Stormwater Influent

The proposed stormwater treatment system will be incorporated into the existing site stormwater infrastructure at a point just prior to site discharge. The characteristic water quality of the influent to the proposed Aquip treatment system can therefore be represented by historic site discharges. Historic site discharge monitoring results for 2016 and 2017 are shown in Table 2 (quarterly averages shown).

Table 2. Historic Site Discharge Monitoring Results for Estes

Year	Quarter	Sample Date	**Turbidity (NTU)**	pH (s.u.)	**Copper (ug/L)**	**Zinc (ug/L)**	TPH (mg/L)
2016	1	1/12/2016	84	7.1	14	200	10
	2	6/17/2016	237	6.58	24	310	1
	3	9/17/2016	13	6.7	10	140	0.89
	4	10/13/2016	29	6.9	5.3	97	0.27
2017	1	3/15/2017	124	7.2	0.3	31.7	0.1
	2	4/6/2017	49	7.2	1.2	41.2	0.1
	3	9/18/2017	80	7.7	23.9	235	2.7
	4	10/12/2017	260	7.8	21.8	242	3.9
		Average	110	N/A	13	162	2.4
		Benchmark	25	5.0 to 9.0	14	117	10

Stormwater Treatment Sizing

The water quality (WQ) design flow rate varies depending on a treatment facility's design and if they are categorized as an online or offline system. The online WQ design flow rate is used when all stormwater flows through a treatment device. The offline flow rate is used when a high flow bypass (flow splitting device) is present, and flow rates which exceed the WQ design flow rate are bypassed. The stormwater treatment system proposed for this site is designed with a bypass system and is sized to handle the offline WQ design flow rate. Only water which exceeds the WQ design flow rate will bypass the stormwater treatment system.

Per Volume 5, Section 4.1.2 of the Stormwater Management Manual for Western Washington (SWMMWW), offline WQ design flow rate was calculated using an approved continuous runoff model, the Western Washington Hydrology Model (WWHM2012, v.4.2.12). The facility was modeled using 5.71 acres of impervious industrial area, classified as flat impervious land use. Additional model details can be found in the model output report in Appendix B. The WQ design flow rate generated by the model is 235 gpm for the facility, corresponding to the "off-line BMP, 15-minute" flow rate.

StormwateRx has established a set of operational and design criteria for the Aquip that has been applied to other facilities in Washington. The proposed treatment filters will use the Ecology CULD approved Aquip enhanced stormwater filtration system media configuration and a surface loading rate not to exceed 1 gpm/sf. The WWHM was used to establish the design flow rate as described, and the filter size was selected as the next largest Aquip size that can process the design flow rate. This sizing approach translates to a more conservative (environmentally protective) surface loading rate. Operating Aquip at a lower surface loading rate than the operational criterion also extends the maintenance interval of the system. The proposed Aquip 300SBE filter for Estes will be operating at a surface loading rate of 0.8 gpm/sf of media surface.

iii. A description of the treatment process and operation, including a flow diagram

Under the proposed conditions, site stormwater runoff will follow existing drainage infrastructure and conveyance, flowing to catch basin CB1 prior to discharge. Catch basin CB1 will be retrofitted to provide a deeper sump, in order to accommodate a 235-gpm treatment pump. Runoff flowrates that are less than or equal to 235 gpm will be pumped from the new CB1 to the new Aquip 300SBE stormwater filter. Flows in excess of 235 gpm will be discharged directly from the CB1 to the outfall, bypassing treatment. The existing CB1 outlet structure will be modified to receive both treated and untreated bypass flows, and provide an opportunity to sample the comingled discharge to the outfall. See Figure 1.

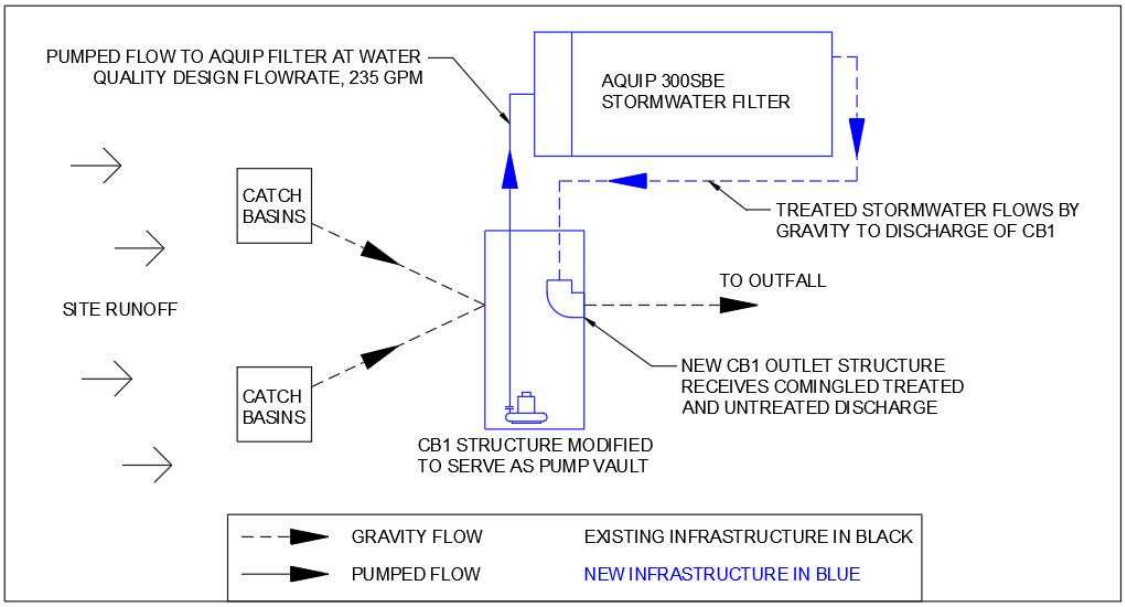

Figure 1. Estes Process Flow Diagram for the Proposed Site Improvements

A preferred location for the Aquip filter has been selected on-site to facilitate maintenance access to the filter, minimize the potential for equipment damage, and prevent disruption to industrial activities. A site layout drawing showing the proposed placement of the Aquip filter and connection to CB1 is provided in Appendix C.

The Aquip is a passive adsorptive depth-filtration technology that removes industrial stormwater pollutants such as suspended solids, turbidity, heavy metals, nutrients and organics. Aquip is a patented system that uses a pre-treatment chamber followed by a series of layered inert and adsorptive filtration media to effectively trap pollutants in an above-ground, pre-configured steel structure. The pollutant removal within the pre-treatment chamber occurs by gravity settling and adsorption; pollutant removal within the filtration chamber occurs through a combination of filtration, chemical complexing, co-precipitation, adsorption, absorption, micro-sedimentation and biological oxidation. Aquip has no moving parts and requires no chemicals, making operation inherently simple and safe.

The Aquip is a robust industrial stormwater treatment technology. Once polluted stormwater is pumped into the system, stormwater flows by gravity through the structure. A detail drawing of the model 300SBE is provided in Appendix D, and additional operational of the Aquip system are provided in the Aquip O&M manual in Appendix E.

Figure 2. Aquip Enhanced Stormwater Filtration System

iv. The amount and kind of chemicals used in the treatment process, if any

No chemicals are used in the proposed stormwater treatment process.

v. Results to be expected from the treatment process including the predicted wastewater characteristics, as shown in the waste discharge permit, where applicable

The Industrial Stormwater General Permit requires monitoring of turbidity, pH, oil sheen, copper, and zinc, as well as petroleum hydrocarbons for facilities operating under SIC code 4213. These parameters and benchmarks were considered in the design of the treatment system proposed for the site. A summary of the parameters and benchmarks are listed in Table 3.

Table 3. Standard and SIC-Specific Benchmarks

Benchmark Parameter	Unit	Benchmark Value
Turbidity	NTU	25
pH	Standard Units	Between 5.0 and 9.0
Oil Sheen	Yes/No	No Visible Oil Sheen
Copper, Total	µg/L	14
Zinc, Total	µg/L	117
Petroleum Hydrocarbons	mg/L	10

Historical stormwater monitoring from the facility has indicated turbidity, copper, and zinc to be parameters of concern.

The proposed Aquip 300SBE filter is expected to provide a level of performance that is in line with historic performance seen in similar full-scale units installed at other industrial facilities. StormwateRx has collected performance data in the form of inlet/outlet sample pairs for many of the Aquip filters that have been installed and operating at other sites. Table 4 provides a summary of all performance data used in the analysis. The median removal efficiency for each parameter is presented in the far-right column, along with the 25th and 75th percentile removal efficiencies in parentheses.

Table 4. Performance Summary of Aquip Enhanced Full-Scale Stormwater Filtration Systems

Parameter	Sample Location	Median (Range[3]) Number of Samples	% Removal Efficiency[4] Median (Range[3])
Turbidity (NTU)	Influent	89.4 (58.5 - 366) n = 10	94 (91 - 98)
	Effluent	6.745 (1.36 - 21.4) n = 10	
TCu (mg/L)	Influent	0.12 (0.0171 - 0.516) n = 81	84 (68 - 93)
	Effluent	0.0151 (0.00352 - 0.059) n = 81	
TZn (mg/L)	Influent	0.625 (0.241 - 2.1) n = 82	91 (80 - 96)
	Effluent	0.0558 (0.0279 - 0.222) n = 82	

1 - Sampling from inlet and outlet of Aquip SBE full-scale stormwater filtration systems. Results through April 2018. Data compiled by StormwateRx LLC.
2 - All chemical analysis by third party certified analytical testing laboratory.
3 - The inlet, outlet, and removal efficiency ranges provided are the 25th to the 75th percentile of all results.
4 - The removal efficiencies based on inlet and outlet pairs.
5 - Median values may include non-detections; for the purposes of these calculations, the non-detected values are presented at half the detection limit.

Table 5 provides a comparison of historical site water quality with expected Aquip removal efficiencies for each parameter. Both the median and 25th percentile removal efficiencies are used in this analysis to demonstrate expected Aquip treated effluent concentrations under a variety of conditions.

Table 5. Evaluation of Estes Historic Data Using Full-Scale Aquip Performance to Predict Proposed Treated Effluent Concentrations

	Turbidity (NTU)		Copper (ug/L)		Zinc (ug/L)	
Historical Average Concentration	110		13		162	
25th Percentile and Median Aquip Removal Efficiency	91%	94%	68%	84%	80%	91%
Expected Effluent Concentration	9.9	6.6	4.2	2.1	32	14.6
ISGP Benchmark Value	25		14		117	
Effluent Satisfies Benchmark?	Yes	Yes	Yes	Yes	Yes	Yes

Historic Aquip sampling data and the analysis from Table 5 demonstrate that the Aquip performance will be sufficient to bring historic zinc concentrations to below benchmark levels.

vi. A statement, expressing sound engineering justification through the use of pilot plant data, results from other similar installations, and/or scientific evidence from the literature, or both, that the proposed treatment is reasonable expected to meet the permit benchmarks

The Aquip system is installed at numerous other facilities and has shown to provide a high level of pollutant reduction. Using this data, StormwateRx is able to size the system for Estes to provide optimal pollutant removal efficiencies. Based upon the findings in “Aquip Technology Assessment”, the Aquip system has been given the Conditional Use Level Designation in Washington by Department of Ecology for basic (TSS), enhanced (dissolved copper and zinc), and phosphorus treatment (see Appendix F). The Aquip has been designed to operate in conjunction with the site source control and operational BMPs.

The Aquip filter can also be retrofitted with additional treatment if stronger performance is required in the future. A polishing system that treats for particulate and dissolved metals can be added and would require less space than another Aquip 300SBE filter. At the time of this report, additional treatment is not expected to be required.

vii. Certification by a licensed professional engineer

This engineering report was prepared under the direct supervision of the engineering professional whose stamp appears below.

Calvin P. Noling
License #28722
Expires 02/24/2019

Appendix A

Estes Express Lines SWPPP

Stormwater Pollution Prevention Plan (SWPPP)

GI TRUCKING CO./DBA ESTES WEST
2102 West Valley Highway North Auburn, King County, WA 98001
Washington Industrial Stormwater General Permit Permit No. WAR008739

30 March 2018
AGE Project No. 18-4323

PREPARED FOR:

Mr. Chris Harrelson Terminal Manager Estes Express Lines Auburn, WA
Phone: (253) 939-5344 Ext.5021
Fax: (253) 939-5825
Email: Chris.Harrelson@estes-express.com

Updated January 2015
Update 07-2017, 08-2017, 09-2017, 01-2018

PREPARED BY:

AdvancedGeo Environmental
An Employee-Owned Company

Environmental • Compliance • Industrial Hygiene • Geotechnical
Phone: 800-511-9300
Fax: 888-445-8786
www.advgeoenv.com

"Working in Partnership with People, Business and the Environment"

Stormwater Pollution Prevention Plan (SWPPP)
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2102 West Valley Highway North Auburn, King County, WA 98001
Washington Industrial Stormwater General Permit Permit No. WAR008739

SWPPP Compliance Checklist

SWPPP Requirement	Permit Reference	SWPPP Reference
The Permittee shall sign and certify all SWPPPs in accordance with General Condition G2, each time it revises or modifies a SWPPP to comply with Conditions S3.A.4 (Update of the SWPPP), S7 (Inspections) or S8 (Corrective Actions).	S3.A.6.	Section 5
Site Map (see permit reference for specific requirements)	S3.B.1.	Section 1.4, Figure 2
Facility Assessment	S3.B.2.	Section 2
The SWPPP shall identify specific individuals by name or by title within the organization (pollution prevention team) whose responsibilities include: SWPPP development, implementation, maintenance, and modification.	S3.B.3.	Section 1.5
Detailed Description of the BMPs, including:	S3.B.4.b.	Section 3
Operational Source Control BMPs	S3.B.4.b.i.	Section 3.1
Structural Source Control BMPs	S3.B.4.b.ii	Section 3.2
Treatment BMPs	S3.B.4.b.iii.	Section 3.3
Erosion and Sediment Control BMPs	S3.B.4.b.v.	Section 3.4
Sampling Plan	S3.B.5.	Section 4

Stormwater Pollution Prevention Plan (SWPPP)
GI TRUCKING CO./DBA ESTES WEST
2102 West Valley Highway North Auburn, King County, WA 98001
Washington Industrial Stormwater General Permit Permit No. WAR008739

1.0. FACILITY DESCRIPTION AND CONTACT INFORMATION

1.1. FACILITY INFORMATION

Facility Name	GI Trucking Co./DBA Estes West
Address	2102 West Valley Highway North Auburn, WA 98001
Permit Number	WAR008739
Latitude/Longitude (decimal)	47.32694, -122.24941
Water Resources Inventory Area (WRIA)	10
Estimated area of industrial activity exposed to stormwater	6 Acres
Does this facility discharge stormwater into surface waters?	Yes
Does this facility discharge stormwater into a municipal storm water conveyance system?	Yes (Auburn)
SIC Code	4213 (Trucking, Except Local)

1.2. CONTACT INFORMATION/RESPONSIBLE PARTIES

Facility Owner/Operator	
Name	GI Trucking Co./DBA Estes West
Address	PO Box 25612
City, State, Zip Code	Richmond, VA. 23260-5612
Telephone Number	(804) 353-1900
Fax	(804) 359-9431
SWPPPP Contact	
Name	Chris Harrelson
Telephone Number	(253) 939-5344 Ext.5021
Email Address	chris.harrelson@estes-express.com

1.3. GENERAL LOCATION MAP

A General Location Map is provided in Figure 1.

1.4. SITE MAP

A Site Map is provided in Figure 2. In accordance with Section S3.B.1 of the Industrial Stormwater General Permit, the Site Map contains or identifies the following:

- The scale or relative distances between significant structures and drainage systems.
- Significant features.
- Location of stormwater drainage and discharge structures and identification, by name, of any party other than the Permittee that owns any stormwater drainage or discharge structures.
- The stormwater drainage areas for each stormwater discharge point off-site (including discharges to ground water) and unique identifying number for each discharge point.
- Each sampling location by unique identifying number.
- Paved areas and buildings.
- Areas of pollutant contact (actual or potential) associated with specific industrial activities.
- Conditionally approved non-stormwater discharges (Condition S5.D – NOT APPLICABLE)
- Surface water locations (including wetlands and drainage ditches).
- Areas of existing and potential soil erosion (in a significant amount).
- Vehicle maintenance areas.
- Lands and waters adjacent to the site that may be helpful in identifying discharge points or drainage routes.

1.5. STORMWATER POLLUTION PREVENTION TEAM

The pollution prevention and response team consists of the Terminal Manager and other designated individuals. Members of the Pollution Prevention Team are responsible for developing, implementing, maintaining, updating and revising the spill response plan and the SWPPP. Individual responsibilities are shown below in Table 3.

Terminal Manager	▪ Owner's representative: Responsible for operations that occur at the facility. ▪ Signatory authority: Signatory authority for the permit documents and other required certifications. ▪ Employee trainer: Responsible for employee training program or otherwise designates a person responsible for doing so. All yard employees will be trained in general spill response and stormwater control procedures. ▪ Team leader: Assigns facility personnel to the team and coordinates work related to spill control and stormwater compliance. ▪ Record keeper: Responsible for maintaining and retaining plans, documents, and records required to be maintained and retained by the Permit. ▪ Site Inspector: Conducts site inspections required by the Permit.
Environmental Consultants	▪ Assist, as requested, with inspections. Conducts stormwater sampling required by the Permit and prepares annual report and discharge monitoring reports (DMRs) required by the Permit.

2.0. FACILITY ASSESSMENT

2.1. FACILITY DESCRIPTION

GI Trucking Co./DBA Estes West (Estes) operates a cargo transportation and distribution facility on approximately 6 acres of property in Auburn, Washington. Nearly all of the site is paved or impervious, except for a landscaped area along the west side of the property. The surface area of the entire site is 250,000 square feet.

The facility includes a 23,800 square-foot warehouse and an approximately 4,300 square foot office. The topography of the site is generally flat with slopes of less than a degree sloping to catch basins. The facility is in operation from 6 p.m. Sunday to 4 p.m. Saturday.

2.2. INDUSTRIAL ACTIVITY, MATERIALS INVENTORY AND ASSOCIATED POLLUTANTS

Industrial activities at the site include cargo loading and unloading and minor maintenance activities. The facility receives a wide variety of containerized and bulk cargoes which include all freight except hazardous waste, dangerous explosives, commodities of exceptionally high value, commodities in bulk and those requiring specialized equipment.

With the exception of the office building and vegetated areas, the entire site may be associated with industrial activity including loading/unloading, cargo trailer storage and minor maintenance activities.

Small quantities of solid wastes, used oils and lubricants, and paints are generated inside the maintenance shop located in the north central portion of the site. These wastes are stored inside the maintenance shop, under canopy cover, in secondary containment and are routinely removed from the site by a licensed transporter and managed at an appropriately permitted disposal or recycling facility. Fueling activities occur within the loading yard, with implementation of appropriate best management practices (see section 3), by a third-party mobile fueling truck. No waste treatment occurs on-site.

Building materials include masonry, concrete and coated sheet metal. Roofing materials consist of coated sheet metal. There is galvanized and electrified security fencing on the north, south, east and west boundaries of the cargo yard.

Maintenance of forklifts and other yard equipment occurs inside the maintenance shop on the north side of the warehouse. On rare occasions, maintenance of equipment too tall to fit inside the shop is done on the yard with implementation of appropriate best management practices (see section 3).

There are no emissions from a manufacturing building or process area onto a roof or other exposed surface at the facility.

Table 4 below identifies potential pollutants and sources at the site.

Potential Pollutants	Potential Source	Associated Activities	Location(s)
Turbidity	Aerial deposition from off-site Soil/sediment track-in Deteriorating materials (packaging materials, wood, fugitive solid waste particles) Tire particles/dust	Cargo loading/unloading Material storage	Cargo Yard Maintenance Shop
Fugitive Dust	Aerial deposition from off-site Soil/sediment track-in	Cargo loading/unloading Material storage	Cargo Yard Maintenance Shop
Zinc	Aerial deposition from off-site Galvanized surfaces/roof Painted surfaces Motor oil and hydraulic fluid Tires	Cargo loading/unloading Material storage	Cargo Yard Maintenance Shop
Copper	Aerial deposition from off-site Brake pads Exposed piping and wiring	Cargo loading/unloading Material storage	Cargo Yard Maintenance Shop

Hydraulic Oils/ Motor Oils	Forklifts, machinery Drums and containers	Cargo loading/unloading Material storage Maintenance	Cargo Yard Maintenance Shop
Fuel	Vehicles, small engines Fueling Spills	Cargo loading/unloading Material storage Equipment Maintenance	Cargo Yard Maintenance Shop
Solvents	Drums and containers	Equipment maintenance	Maintenance Shop

2.3. SPILLS AND LEAKS

There has not been a spill at the site at any time over the past five years. However, spills and/or leaks potentially could occur from ruptured hydraulic lines, fuel lines or other equipment fluid in the Cargo Yard. Spills and leaks in this area could potentially impact the drainage conveyance and Outfall 1.

Spills in the Maintenance Shop likely would be contained with spill response equipment and prevented from exposure to stormwater. The Maintenance Shop is floor self-contained and drains to the sanitary sewer, though a treatment device. A form used to document significant/reportable spills and leaks is included as Appendix A. This form will be updated as necessary.

3.0. BEST MANAGEMENT PRACTICES (BMPs)

3.1. OPERATIONAL SOURCE CONTROL BEST MANAGEMENT PRACTICES

3.1.1. Mandatory BMPs[1],[2] – Good Housekeeping

- Vacuum paved surfaces with a vacuum sweeper (or a sweeper with a vacuum attachment) to remove accumulated pollutants a minimum of once per quarter. Surfaces with accumulated sediments are manually sweeped and cleaned using pressurized water with a vacuum recovery of generated water.
- Identify and control all on-site sources of dust to minimize stormwater contamination from the deposition of dust on areas exposed to precipitation.
- Keep all dumpsters under cover or fit with a lid that must remain closed when not in use.

[1]Mandatory BMPs are specifically listed in the Industrial Stormwater General Permit
[2]Condition S3 of the Industrial Stormwater General Permit requires that the SWPPP to include the "applicable" Good Housekeeping Operational and Source Control BMPs listed in the Washington Department of Ecology's SWMMs, or other guidance documents as mandatory.

- Assign one or more individuals to be responsible for stormwater pollution control. Hold regular meetings to review the overall operation of the BMPs. Establish responsibilities for inspections, operation, maintenance, and for emergencies. Train all team members in the operation, maintenance, and inspections of BMPs, and reporting procedures.
- Promptly contain and clean up spills or leaks of solid and liquid pollutants such as oils, solvents, fuels, and dust from manufacturing operations on any exposed soil, vegetation, or paved area.
- Do not hose down pollutants from any area to the ground, storm drains, conveyance ditches, or receiving water unless necessary for dust control purposes to meet air quality regulations. Convey pollutants before discharge, to a treatment system approved by the local jurisdiction.
- Regularly clean oils, debris, sludge, etc. from all stormwater facilities, including catch basins, settling/detention basins, oil/water separators, boomed areas, and conveyance systems to prevent the contamination of stormwater. Refer to Appendix IV-D R.3 of the Stormwater Management Manual for Western Washington for references to assist in handling potentially dangerous waste.
- Promptly repair or replace substantially cracked or otherwise damaged paved secondary containment, high-intensity parking, or any drainage areas that may be subjected to pollutant leaks or spills. Promptly repair or replace leaking connections, pipes, hoses, valves, etc., which can contaminate stormwater.
- Do not connect floor drains in potential pollutant source areas to storm drains, or other conveyances that release to surface water or to the ground.

3.1.2. Mandatory BMPs – Preventative Maintenance

- Clean catch basins when the depth of debris reaches 60% of the sump depth or when the debris surface reaches 6 inches below the outlet pipe, whichever occurs first.
- Inspect all equipment and vehicles during monthly site inspections for leaking fluids such as oil or antifreeze, etc. Take leaking equipment and vehicles out of service and prevent leaks from spilling on the ground until repaired.
- Immediately clean up spills and leaks (e.g., using absorbents, vacuuming, etc.) to prevent the discharge of pollutants.
- Maintain ponds, tanks/vaults, catch basins, swales, filters, oil/water separators, drains and other stormwater drainage/treatment facilities in accordance with the Maintenance Standards set forth in the applicable Stormwater Management Manual (SWMM), other guidance documents or manuals approved in accordance with S3.A.3.c., demonstrably equivalent BMPs per S3.A.3d., or an O&M Manual

submitted to the Washington Department of Ecology ("Ecology") in accordance with S8.D.

- Prevent the discharge of unpermitted liquid or solid wastes, process wastewater, or sewage to ground or surface water, or to storm drains that discharge to surface water, or to the ground. Conduct all oily parts cleaning, steam cleaning, or pressure washing of equipment or containers inside a building, or on an impervious contained area, such as a concrete pad. Direct contaminated stormwater from such an area to a sanitary sewer where allowed by local sewer authority, or to other approved treatment.
- Pressure wash impervious surfaces contaminated with oils, metals, sediment, etc., after plugging or otherwise preventing discharge from storm drains, if any. Collect the resulting washwater, by pumping or vactoring, for proper disposal by discharge to sanitary sewer or via vactor (vacuum) truck transport to a wastewater treatment plant.
- Do not pave over contaminated soil unless it has been determined that ground water has not been and will not be contaminated by the soil. Call Ecology for assistance.
- Construct impervious areas that are compatible with the materials to be handled there. Portland cement concrete, asphalt, or equivalent materials often are suitable materials for construction of impervious surfaces.
- Use drip pans to collect leaks and spills from industrial/ commercial equipment such as cranes at ship/boat building and repair facilities, log stackers, industrial parts, trucks and other vehicles stored outside.
- Drain oil and fuel filters before disposal. Discard empty oil and fuel filters, oily rags, and other oily solid waste into appropriately closed and properly labeled containers that comply with the Uniform Fire Code or International Building Code.
- To store liquids, use containers, such as steel or plastic drums, which are rigid and durable, corrosion resistant to weather and fluid content, non-absorbent, water tight, rodent-proof, and equipped with a close-fitting cover.
- For temporary storage of solid wastes contaminated with liquids or other potential polluted materials use dumpsters, garbage cans, drums, or comparable containers, that are durable, corrosion resistant, non-absorbent, non-leaking, and equipped with either a solid cover or screen cover to prevent littering. If covered with a screen, the container must be stored under a roof or other adequate form of cover.
- Where exposed to stormwater, use containers, piping, tubing, pumps, fittings, or valves that are appropriate for their intended use and for the contained liquid.

Appendix B contains the BMP Maintenance Logs.

3.1.3. Mandatory Applicable BMPs - Operational Source Control BMPs for Illicit Connections to Storm Drains

- Eliminate unpermitted wastewater discharges to storm drains, ground water, or surface water; and,
- Convey unpermitted discharges to a sanitary sewer if allowed by the local sewer authority, or to other approved treatment; and,
- Obtain appropriate permits for these discharges. Estes has not identified any illicit connections at the facility.

3.1.4. Mandatory Applicable BMPs - Operational Source Control BMPs for Landscaping and Lawn/Vegetation Management

- Install engineered soil/landscape systems to improve infiltration and regulation of stormwater in landscaped areas.
- Do not dispose of collected vegetation into waterways or storm sewer systems

3.1.5. Mandatory Applicable BMPs - Operational Source Control BMPs for Loading and Unloading Areas for Liquid or Solid Material

All Loading/Unloading Areas:

- Sweep debris at outdoor, uncovered loading/unloading areas to remove material that could otherwise be washed off by stormwater. Sweep outside areas that are covered for a period of time by containers, logs, or other material after the areas are cleared.
- Place drip pans or other appropriate temporary containment device at locations where leaks or spills may occur, such as hose connections, hose reels or filler nozzles. Drip pans must always be used when making and breaking connections. Regularly check loading/unloading equipment, such as valves, pumps, flanges, and connections for leaks and repair as needed.

3.1.6. Mandatory Applicable BMPs - Operational Source Control BMPs for Maintenance and Repair of Vehicles and Equipment

- Inspect for leaks all incoming vehicles, parts, and equipment stored temporarily outside.
- Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids, such as during dismantling of liquid containing parts or removal or transfer of liquids.

- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered non-leaking secondary containment system.
- Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.
- Do not pour/convey wash water, liquid waste, or other pollutant into storm drains or to surface water. Check with the local sanitary sewer authority for approval to convey to a sanitary sewer.
- Do not connect maintenance and repair shop floor drains to storm drains or to surface water.

3.1.7. Mandatory Applicable BMPs - Operational Source Control BMPs for Maintenance of Stormwater Drainage and Treatment Systems

- Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine whether improvements in O-&-M are needed.
- Promptly repair any deterioration threatening the structural integrity of the facilities and replace clean-out gates, catch basin lids, and rock in emergency spillways.
- Ensure that storm sewer capacities are not exceeded. Prevent heavy sediment discharges to the sewer system.
- Regularly remove debris and sludge from BMPs used for peak-rate control, treatment, etc. Discharge to sanitary sewer if approved by the sewer authority, or truck to a local or state government approved disposal site.
- Clean catch basins when (1) the depth of deposits reaches 60% of the sump depth when measured from the bottom of basin to the invert of the lowest pipe into or out of the basin, or
- (2) the debris surface reaches six inches from the invert of the lowest pipe. Some catch basins (for example, WSDOT Type 1L basins) may have as little as 12 inches for sediment storage below the invert. These catch basins will need more frequent inspection and cleaning to prevent scouring and to remain compliant. Where these catch basins are part of a stormwater collection and treatment system, the system owner/operator may choose to concentrate maintenance efforts on downstream control devices as part of a systems approach.
- Remove woody debris from catch basins as frequently as needed to ensure proper operation of the catch basin.
- Post warning signs; “Dump No Waste - Drains to “Streams,” “Lakes,” or emboss on or adjacent to storm drain inlets, where practical
- Disposal of catch basin sediments and liquids, must comply with the

"Recommendations for Management of Street Wastes" described in Appendix IV-G of the Stormwater Management Manual for Western Washington.

3.1.8 MANDATORY APPLICABLE BMPS - OPERATIONAL SOURCE CONTROL BMPS FOR MOBILE FUELING OF VEHICLES AND HEAVY EQUIPMENT

- Ensure that the local fire department approves all mobile fueling operations. Comply with state and local fire codes.
- At fueling locations that are in close proximity to sensitive aquifers, designated wetlands, wetland buffers, or other waters of the state, approval by local jurisdictions is necessary to ensure compliance with additional local requirements.
- Ensure compliance with all 49 CFR 178 requirements for DOT 406 cargo tanker. Documentation from a Department of Transportation (DOT) Registered Inspector constitutes proof of compliance.
- Ensure that the driver/operator is present at the fuel transfer location and is constantly observing/monitoring during fuel transfer, and ensure implementation of the following procedures at the fuel transfer locations:
    - Locate the point of fueling at least 25 feet from the nearest storm sewer or inside an impervious containment with a volumetric holding capacity equal to or greater than 110 percent of the fueling tank volume, or cover the storm sewer to ensure no inflow of spilled or leaked fuel. Covers are not required for storm sewers that convey in-flow to a spill control separator approved by the local jurisdiction and the fire department. Potential spill/leak conveyance surfaces must be impervious and in good repair.
    - Place a drip pan, or an absorbent pad under each fueling location prior to and during all dispensing operations. The pan must be liquid tight and the absorbent pad must have a capacity of at least five gallons. There is no need to report spills retained in the drip pan or the pad. Note that some local fire departments may have restrictions on mobile fueling practices.
    - Manage the handling and operation of fuel transfer hoses and nozzle, drip pan(s), and absorbent pads as needed to prevent spills/leaks of fuel from reaching the ground, storm sewer, or receiving waters.
    - Avoid extending the fueling hoses across a traffic lane without fluorescent traffic cones, or equivalent devices, conspicuously placed to block all traffic from crossing the fuel hose.
    - Remove the fill nozzle and cease filling the tank when the automatic shut-off valve engages. Do not lock automatic shutoff fueling nozzles in the open position.
    - Do not "top off" the fuel receiving equipment.

- Provide the driver/operator of the fueling vehicle with:
    - Adequate flashlights or other mobile lighting to view fuel fill openings with poor accessibility. Consult with local fire department for additional lighting requirements.
    - Two-way communication with his/her home base.
- Train the driver/operator annually in spill prevention and cleanup measures and emergency procedures. Ensure all employees are aware of the significant liability associated with fuel spills.
- The responsible manager shall properly sign and date the fueling operating procedures. Distribute procedures to the operators, retain them in the organization files, and make them available in the event an authorized government agency requests a review.
- Immediately notify the local fire department (911) and the appropriate Ecology Regional Office in the event of the spill entering surface or ground waters. Establish a "call down list" to ensure the rapid and proper notification of management and government officials should any significant amount of product be released. Keep the list in a protected but readily accessible location in the mobile fueling truck. The "call down list" should also pre-identify spill response contractors in the area to ensure the rapid removal of significant product spillage into the environment.
- Maintain a minimum of the following spill clean-up materials in all fueling vehicles, and ensure that they are readily available for use:
    - Oil absorbents capable of absorbing 15 gallons of fuel.
    - A storm drain plug or cover kit.
    - A non-water containment boom, a minimum of 10 feet in length, with a 12 gallon − absorbent capacity.
    - A non-metallic shovel.
    - Two 5-gallon buckets with lids.
- Use automatic shutoff nozzles for dispensing the fuel. Replace automatic shut-off nozzles as recommended by the manufacturer.
- Maintain and replace equipment on fueling vehicles, particularly hoses and nozzles, at established intervals to prevent failures.

3.1.9. Mandatory Applicable BMPs - Operational Source Control BMPs for Parking and Storage of Vehicles and Equipment

- If washing of a parking lot is conducted, discharge the wash water to a sanitary

sewer, if allowed by the local sewer authority, or to an approved wastewater treatment system, or collect it for off-site disposal.

- Do not hose down the area and allow it to drain to a storm drain or to a receiving water. Sweep parking lots, storage areas, and driveways, regularly to collect dirt, waste, and debris.

3.1.10. Mandatory Applicable BMPs - Operational Source Control BMPs for Roof/Building Drains at Manufacturing and Commercial Buildings

- Sample and analyze the stormwater draining from the building if leachates and/or emissions from buildings are suspected sources of stormwater pollutants.
- If a roof/building stormwater pollutant source is identified, implement appropriate source control measures such as installing air pollution control equipment, selecting varied materials, painting galvanized surfaces, making operational changes, recycling materials, and/or making process changes.

3.1.11. Mandatory Applicable BMPs - Operational Source Control BMPs for Soil Erosion and Sediment Control at Industrial Sites

- Cover Practice Options:
    - Vegetative cover such as grass, trees, shrubs, on erodible soil areas; or,
    - Covering with mats such as clear plastic, jute, synthetic fiber; and/or,
    - Preservation of natural vegetation including grass, trees, shrubs, and vines.
- Structural Practice Options:
    - Vegetated swale, dike, silt fence, check dam, gravel filter berm, sedimentation basin, and proper grading.

3.1.12. Mandatory Applicable BMPs - Operational Source Control BMPs for Spills of Oil and Hazardous Substances

- Prepare an Emergency Spill Control Plan (SCP), which includes:
    - A description of the facility including the owner's name and address
    - The nature of the activity at the facility
    - The general types of chemicals used or stored at the facility
    - A site plan showing the location of storage areas for chemicals, the locations of storm drains, the areas draining to them, and the location and description of any devices to stop spills from leaving the site such as positive control valves

- Cleanup procedures
- Notification procedures to be used in the event of a spill, such as notifying key personnel. Ecology, the local fire department, the Washington State Patrol, and the local sewer authority, must be notified
- The name of the person designated with overall spill cleanup and notification responsibility

- Train key personnel in the implementation of the Emergency SCP. Prepare a summary of the plan identifying the spill cleanup coordinators, location of cleanup kits, and phone numbers of regulatory agencies to be contacted in the event of a spill, and post it at appropriate points in the building.
- Update the SCP regularly.
- Immediately notify Ecology and the local sewer authority if a spill may reach sanitary or storm sewers, ground water, or surface water, in accordance with federal and Ecology spill reporting requirements.
- Immediately clean up spills. Do not use emulsifiers for cleanup unless an appropriate disposal method for the resulting oily wastewater is implemented. Absorbent material may not be washed down a floor drain or storm sewer.
- Locate emergency spill containment and cleanup kit(s) in areas with high potential for spills. The contents of the kit shall be appropriate for the types and quantities of chemical liquids stored at the facility. Spills kits are located in the Maintenance Shop and supplies are staged at the loading docks.

3.1.13. Mandatory Applicable BMPs - Operational Source Control BMPs for Outside Storage of Liquid, Food Waste, or Dangerous Waste Containers

- Place tight-fitting lids on all containers.
- Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
- Inspect container storage areas regularly for corrosion, structural failure, spills, leaks, overfills, and failure of piping systems. Check containers daily for leaks/spills. Replace containers, and replace and tighten bungs in drums as needed.
- Businesses accumulating Dangerous Wastes that do not contain free liquids need only to store these wastes in a sloped designated area with the containers elevated or otherwise protected from storm water run on.
- Secure drums when stored in an area where unauthorized persons may gain access in a manner that prevents accidental spillage, pilferage, or any unauthorized use.

- If the material is a Dangerous Waste, the business owner must comply with any additional Ecology requirements as specified in Appendix IV-D R.3 of the Stormwater Management Manual for Western Washington.
- Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code (Appendix IV-D R.2 of the Stormwater Management Manual for Western Washington).
- Cover dumpsters, or keep them under cover such as a lean-to, to prevent the entry of stormwater. Replace or repair leaking garbage dumpsters.
- Drain dumpsters and/or dumpster pads to sanitary sewer. Keep dumpster lids closed. Install waterproof liners.

3.1.14. Mandatory Applicable BMPs - Operational Source Control BMPs for Storage of Liquids in Permanent Aboveground Tanks

- Inspect the tank containment areas regularly for leaks/spills, cracks, corrosion, etc. to identify problem components such as fittings, pipe connections, and valves.
- Place adequately sized drip pans beneath all mounted taps and drip/spill locations during filling/unloading of tanks. Operators may need valve drain tubing in mounted drip pans.
- Vacuum sweep and clean the tank storage area regularly, if paved.
- Replace or repair tanks that are leaking, corroded, or otherwise deteriorating.
- All installations shall comply with the Uniform Fire Code Appendix IV-D R.2 of the Stormwater Management Manual for Western Washington and the National Electric Code.

3.1.15. Spill Prevention and Emergency Cleanup Plan (SPECP)

In the event of a spill, employees must immediately, upon discovery, stop, contain, and clean up the spill. The locations of spill kits and emergency response equipment are shown in Figure 2: Site Map. In the event of a spill, immediately notify the terminal manager via personal contact, office phone and/or mobile phone.

Containment and cleanup is to be performed by terminal personnel who have been trained in spill containment and cleanup measures. Facilities must have spill containment and cleanup kits readily accessible in areas where potential pollutants are stored or handled. Spills kits are located in the Maintenance Shop.

If a spill reaches storm sewer, groundwater or surface water, report the spill immediately to the following agencies at the telephone numbers provided.

Spill Notifications:

National Response Center	(800) 424-8802
WA Emergency Management Division	(800) 258-5990
Ecology NW Regional Office	(425) 649-7000

The following spill prevention measures are required by the Industrial Stormwater General Permit:

- Store all chemical liquids, fluids, and petroleum products, on an impervious surface that is surrounded with a containment berm or dike that is capable of containing 10% of the total enclosed tank volume or 110% of the volume contained in the largest tank, whichever is greater.
- Prevent precipitation from accumulating in containment areas with a roof or equivalent structure or include a written plan on how accumulated water will be managed and disposed of if a containment area cover is not practical.
- Locate spill kits within 25 feet of used oil storage/transfer stations, fuel transfer stations, and mobile fueling units. At a minimum, spill kits shall include:
    - Oil absorbents capable of absorbing 15 gallons of fuel.
    - A storm drain plug or cover kit.
    - A non-water containment boom, a minimum of 10 feet in length with a 12-gallon absorbent capacity.
    - A non-metallic shovel.
    - Two five-gallon buckets with lids.
- Do not lock shut-off fill nozzles in the open position.
- Do not “top off” tanks being refueled.
- During fueling, block, plug or cover storm drains that receive runoff near areas where fueling is occurring.
- Use drip pans or equivalent containment measures during all petroleum transfer operations.
- Locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems, and confine leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas.
- Use drip pans and absorbents under or around leaky vehicles and equipment, or store indoors where feasible. Drain fluids from equipment and vehicles prior to on-site storage or disposal.
- Maintain a spill log that includes the following information for chemical and

petroleum spills: date, time, amount, location, and reason for spill; date/time clean-up completed, notifications made and staff involved. A form used to document significant spills and leaks is included as Appendix A.

3.1.16. Employee Training

Estes or their designated representative will train all operations personnel in identifying pollutant sources and in understanding the pollution control measures, spill response procedures, and material handling practices identified in this SWPPP. Training will occur at least once per year. Within 30 days of hiring, new operations employees will be trained in spill prevention and control and associated practices and procedures using this SWPPP. Estes will keep a record of training dates. Appendix C contains the employee training log. The content of the training will include:

- An overview of what is in the SWPPP.
- How employees make a difference in complying with the SWPPP and preventing stormwater contamination.
- Spill response procedures, good housekeeping, maintenance requirements, and material management practices.
- Safety procedures associated with implementing the SWPPP.

3.1.17. Inspections, Reporting and Recordkeeping

As shown in Table 3: Pollution Prevention Team, the Terminal Manager is responsible for the monthly inspections required by Section S.7 of the permit or a designated representative. In accordance with Section S.7., each inspection must include the observations outlined below, and must be documented on the Monthly Inspection Report Form, a copy of which can be found in Appendix D:

1. Observations must be made at stormwater sampling locations and areas where stormwater associated with industrial activity is discharged off-site; or discharged to waters of the state, or to a storm sewer system that drains to waters of the state.
2. Observations must be made for the presence of floating materials, visible oil sheen, discoloration, turbidity, odor, etc. in the stormwater discharge(s).
3. Observations must be made for the presence of illicit discharges such as domestic wastewater, noncontact cooling water, or process wastewater (including leachate). If an illicit discharge is discovered, the following must occur:
    a. The Permittee must notify Ecology within seven days, and
    b. The Permittee must eliminate the illicit discharge within 30 days.
4. The Monthly Inspection Report must contain a verification that the descriptions of potential pollutant sources required under this permit are accurate.

5. The Monthly Inspection Report must contain a verification that the site map in the SWPPP reflects current conditions.
6. The Monthly Inspection Report must contain an assessment of all BMPs that have been implemented, noting all of the following:
    a. Effectiveness of BMPs inspected.
    b. Locations of BMPs that need maintenance.
    c. Reason maintenance is needed and a schedule for maintenance.
    d. Locations where additional or different BMPs are needed and the rationale for the additional or different BMPs.

Reports regarding permit non-compliance identified during inspections must be prepared in accordance with the requirements of Condition S9.E. This includes an immediate notification to Ecology and submittal of a detailed written report within 5 days, unless Ecology requests an earlier submission. The report shall contain:

1. A description of the noncompliance, including exact dates and times.
2. Whether the noncompliance has been corrected and, if not, when the noncompliance will be corrected.
3. The steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

Inspection records and associated documentation and correspondence shall be retained for a minimum of five years in accordance with Section S.9.C. All inspection reports must be included in the SWPPP, as referenced in S7.C.

3.1.18. Illicit Discharge

Water from washing, steam cleaning, and/or pressure washing vehicles or equipment is considered process wastewater. This process wastewater must not be comingled with stormwater or enter storm drains. It must be collected in a tank for off-site disposal or discharged to sanitary sewer, with written approval from the local sewer authority.

During monthly site inspections, look for signs of illicit discharges, especially during dry weather when stormwater should not ordinarily be discharging from the site. Each monthly site inspection must include:

- Observations at stormwater sampling locations and areas where stormwater associated with industrial activity is discharged off-site; or discharged to waters of the state, or to a storm sewer system that drains to waters of the state.
- Observations for the presence of floating materials, visible oil sheen, discoloration, turbidity, odor, etc., in the stormwater discharge(s).

- Observations for the presence of illicit discharges such as domestic wastewater, noncontact cooling water, or process wastewater, including leachate.
- Reference Section 3.1.3: Operational Source Control BMPs for Illicit Connections to Storm Drains

If an illicit discharge is discovered, Ecology must be notified within seven days. The illicit discharge must be eliminated within 30 days.

3.2 STRUCTURAL SOURCE CONTROL BMPS

3.2.1. Mandatory BMPs

The following will be implemented as mandatory structural source control BMPs required by Condition S3 of the Industrial Stormwater General Permit.

- Use grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations).
- Perform all cleaning operations indoors, under cover, or in bermed areas that prevent stormwater runoff and run-on and capture overspray.
- Ensure that washwater drains to a collection system that directs the washwater to further treatment or storage and not to the stormwater drainage system.

3.2.2. Mandatory Applicable BMPs - Structural Source Control BMPs for Loading and Unloading Areas for Liquid or Solid Material

All Loading/ Unloading Areas:

- Consistent with Uniform Fire Code requirements (Appendix IV-D R.2 of the Stormwater Management Manual for Western Washington) and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building, under a roof, or lean-to, or other appropriate cover.
- Berm, dike, and/or slope the loading/unloading area to prevent run-on of stormwater and to prevent the runoff or loss of any spilled material from the area.
- Large loading areas typically are not curbed along the shoreline. As a result, stormwater passes directly from the paved surface into surface water. To prevent this run-off, install curbs along the edge, or slope the edge so that the stormwater can flow to a storm drain system that leads to an approved treatment BMP.
- Pave and slope loading/unloading areas to prevent the pooling of water. The use

of catch basins and drain lines within the interior of the paved area must be minimized, as they will frequently be covered by material. Alternatively, catch basins should be placed in designated “alleyways” that are not covered by material, containers or equipment.

Loading/Unloading Docks:

- Install/maintain overhangs or door skirts that enclose the end of the trailer to prevent contact with rainwater.
- Design the loading/unloading area with berms, sloping, etc. to prevent the run-on of stormwater.
- Retain on-site the necessary materials for rapid spill cleanup.

3.2.3. Mandatory Applicable BMPs - Structural Source Control BMPs for Maintenance and Repair of Vehicles and Equipment

- Conduct all maintenance and repair of vehicles and equipment in a building, or other covered impervious containment area that is sloped to prevent run-on of uncontaminated stormwater and runoff of contaminated stormwater.
- The maintenance of refrigeration engines in refrigerated trailers may be conducted in the parking area so long as caution is used to avoid the release of engine or refrigeration fluids to storm drains or surface water.
- Park large mobile equipment, such as forklifts, in a designated contained area.

3.2.4. Mandatory Applicable BMPs - Structural Source Control BMPs for Mobile Fueling of Vehicles and Heavy Equipment

- Automatic fuel transfer shut-off nozzles.
- An adequate lighting system at the filling point.

3.2.5. Mandatory Applicable BMPs - Structural Source Control BMPs for Outside Storage of Liquid, Food Waste, or Dangerous Waste Containers

- Keep containers with Dangerous Waste, food waste, or other potential pollutant liquids inside a building unless this is not feasible due to site constraints or Uniform/International Fire Code requirements.
- Store containers in a designated area, which is covered, bermed or diked, paved and impervious in order to contain leaks and spills. Slope the secondary containment to drain into a dead-end sump for the collection of leaks and small spills.

- For liquid wastes, surround the containers with a dike. The dike must be of sufficient height to provide a volume of either 10 percent of the total enclosed container volume or 110 percent of the volume contained in the largest container, whichever is greater.
- Where material is temporarily stored in drums, consider using a portable temporary secondary system in lieu of a permanent system as described above.
- Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area as described above. Use a drip pan during liquid transfer.

3.2.6. Mandatory Applicable BMPs - Structural Source Control BMPs for Storage of Liquids in Permanent Aboveground Tanks

- Locate permanent tanks in impervious (Portland cement concrete or equivalent) secondary containment surrounded by dikes, or use UL Approved double-walled tanks. The dike must be of sufficient height to provide a containment volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank, whichever is greater. The aboveground storage tank located at the facility is located within the maintenance shop and not exposed to stormwater.
- Slope the secondary containment to drain to a dead-end sump or equivalent, for the collection of small spills.
- Include a tank overfill protection system to minimize the risk of spillage during loading.

3.3 Treatment BMPs

3.3.1. Mandatory BMPs

The following will be implemented as mandatory structural source control BMPs required by Condition S3 of the Industrial Stormwater General Permit.

- Use Treatment BMPs consistent with the applicable documents referenced in Condition S3.A.3.
- Employ oil/water separators, booms, skimmers or other methods to eliminate or minimize oil and grease contamination of stormwater discharges.
- Obtain Ecology approval before beginning construction/installation of all treatment BMPs that include the addition of chemicals to provide treatment.

3.3.2. Mandatory Applicable BMPs - Treatment BMPs for Maintenance and Repair of Vehicles and Equipment

- Contaminated stormwater runoff from vehicle staging and maintenance areas must be conveyed to a sanitary sewer, if allowed by the local sewer authority, or to an API or CP oil/water separator followed by a basic treatment BMP, applicable filter, or other equivalent oil treatment system. All Estes maintenance and repair of vehicles and equipment is performed within the maintenance building and is not exposed to stormwater. Therefore, Estes is not required to have an oil water separator at the facility.

3.3.3. Mandatory Applicable BMPs - Treatment BMPs for Outside Storage of Liquid, Food Waste, or Dangerous Waste Containers

- For contaminated stormwater in the containment area, connect the sump outlet to a sanitary sewer, if approved by the local Sewer Authority, or to appropriate treatment such as an API or CP oil/water separator, catch basin filter or other appropriate system (see Volume V of the Stormwater Management Manual for Western Washington). Equip the sump outlet with a normally closed valve to prevent the release of spilled or leaked liquids, especially flammables (compliance with Fire Codes), and dangerous liquids. Open this valve only for the conveyance of contaminated stormwater to treatment.
- Another option for discharge of contaminated stormwater is to pump it from a dead-end sump or catchment to a tank truck or other appropriate vehicle for off-site treatment and/or disposal.

3.3.4. Structural Treatment BMPs

The following will be implemented as mandatory structural source control BMPs required by Condition S3 of the Industrial Stormwater General Permit.

- Sediment control BMPs such as detention ponds, vegetated filter strips, bio swales, or other permanent sediment control BMPs to minimize sediment loads in stormwater discharges were not practical. Estes does not have the required space on their facility for these BMPs. Therefore, Estes used drain inlet filters to perform this function.

The SWPPP listed the source of the zinc as the galvanized sheet metal roof on the terminal buildings. An investigation to the cause/sources of the pollutant was determined to be the east end of the warehouse roof of the terminal building. Additional pollution sources included forklift truck activity, truck tire debris, breaks dust debris for metals and sediments.

- In August 2016, Cleanway drain inlet filtration units (CleanWay Storm Clean) were installed inside drain inlet within the parking lot and trailer storage area. A total of

12 drain inlets have filtrations units installed. These treatment BMPs were intended to remove pollutants such as suspended solids, oil and metals from stormwater at catch basins, sumps or other stormwater collection and conveyance system components. Media have been installed to treat contamination associated with sediments and metals (total and dissolved). Cleanway filter designs and media information is attached in SWPPP.

- In September 2017, downspouts filters (Bio Clean) were installed for the metal component roof section of the warehouse building. The proposed treatment required installation on the downspouts because truck traffic has the potential to damage surface grade treatments. Bio Clean in-line filtration units were installed into new poly vinyl chloride (PVC) downspouts; equipped with industrial media for zinc and metals removal. Bio Clean downspout treatment information is attached in the SWPPP.
- Semi-annual replacement of filter media (catch basin or drain inlet and roof downspout) is planned and increased filter servicing (sediment removal) can be conducted, if necessary, based on the quarterly stormwater sampling data.
- An active stormwater treatment control system design is currently underway in accordance with Condition S8.D. A Level 3 Corrective Action Plan (CAP) will be prepared as required by the Permit, including a peak flow determination for the site in accordance with the Western Washington hydraulic model. The parameters will be to achieve 72-75% of the 2-year stormwater discharge event and/or the 15-minute maximum discharge rate.
- A set of operational parameters have been secured from treatment manufacturers for the evaluation and CAP finalization.

3.4. Erosion and Sediment Control BMPs

Although most of the site is paved or otherwise vegetated, the following erosion and sediment control BMPs will be implemented where appropriate as required by Condition S3.

4.0. SAMPLING PLAN

4.1 DISCHARGE LOCATIONS

One stormwater outfall discharge from the facility. Existing catch basins drain to a single catch basin (Catch Basin 1) located on the northwest side of the property prior to draining into the City of Auburn municipal storm drain at Outfall 1. Estes performs grab sampling at the discharge point of Catch Basin 1 which discharges all catch basins on the property. This sampling point is identified as “PT1” and is shown on the Site Map in Figure 2.

Because the entire site drains to Catch Basin 1 and discharges at Outfall 1, all of the industrial activities, potential pollutants and BMPs described in previous sections apply to discharge at this outfall.

4.2 STAFF RESPONSIBLE FOR SAMPLING

Sampling will be conducted by the Estes Terminal Manager or designated representative, who has been trained on proper procedures.

4.3 SAMPLE COLLECTION AND HANDLING

Discharge will be sampled at least once per quarter. The stormwater discharge storm event, that results in a discharge will be sampled, within the first 12 hours of discharge. The following checklist shall be used for sample collection and handling:

1. Call Nisqually Environmental or the designated analytical laboratory. Request a basic Stormwater Sampling Kit, including sample bottles, directions, ice and cooler.
2. Review kit directions and contents. Label and date jars.
3. Take sampling kit to sampling point (PT1). Bring sampling field book for recordkeeping.
4. During sampling:
    - Keep hands away from jar openings.
    - Sample from central portion of flow in the catch basin.
    - Measure pH and Turbidity (if appropriate).
    - AVOID touching or disturbing the bottom of the channel or stirring up particles.
    - Fill samples directly into jars, being careful not to spill any preservative.
    - DO NOT rinse or overfill bottles.
    - Fill jars to within one-half inch of top and cover tightly with lids.
    - Fill out the labels, put samples in the cooler on ice, and fill out the chain of custody form.
    - Request that laboratory report sampling results to terminal manager/environmental consultant.
5. Complete a Quarterly Stormwater Monitoring Sampling Log for recordkeeping. Appendix E contains a sample copy of the Quarterly Stormwater Monitoring Sampling Log.

6. Deliver samples to the lab.

Appendix F contains Ecology guidance for collection of stormwater samples at industrial facilities.

4.4 SAMPLING PARAMETERS

Consistent with the permit requirements, the samples will be analyzed once per quarter for the parameters shown below in Table 5

Parameter	Units	Benchmark Values	Analytical Method	Laboratory Quantitation Level [a]	Minimum Sampling Frequency [b]
Turbidity	NTU	25	EPA 180.1 Meter	0.5	1/quarter
pH	Standard Units	Between 5.0 and 9.0	Meter/Paper [c]	±0.5	1/quarter
Oil Sheen	Yes/No	No Visible Oil Sheen	N/A	N/A	1/quarter
Petroleum Hydrocarbons (Diesel Fractionation)	mg/L	10	NWTPD-Dx	0.1	1/quarter
Copper, Total	µg/L	Western WA: 14	EPA 200.8	2.0	1/quarter
Zinc, Total	µg/L	117	EPA 200.8	2.5	1/quarter
Fecal Coliform	colonies/ 100 ml	N/A	SM922D	20 col/ml	1/quarter

4.5. SAMPLE DOCUMENTATION

In accordance with Section S4.B, sample documentation shall contain the following for each sample:

- Sample date
- Sample time
- A notation stating whether the sample was collected within 12 hours of stormwater discharge, or whether it is unknown when in relation to the start of discharge the sample was collected (e.g., discharge was already occurring at the start of regular business hours)

- A statement explaining why a stormwater sample could not be collected within 12 hours of a stormwater discharge event
- Sample location
- Method of sampling and preservation, if applicable
- Individual who performed the sampling
- Weather conditions

A copy of the sample documentation form is located in Appendix E

4.6. REPORTING REQUIREMENTS

In accordance with Section S9, the following reporting procedures must be followed.

- Submit sampling data obtained during each reporting period on a Discharge Monitoring Report (DMR) form.
- Submit sampling results within 45 days of the end of each reporting period.
- The first reporting period begin on the effective date of permit coverage.
- Once permit coverage becomes effective, ensure that DMRs are submitted using Ecology's Water Quality Permitting Portal – Discharge Monitoring Report (DMR) application by the due dates listed below.

Reporting Period	Months	DMR Due Date
1st	January-March	May 15
2nd	April-June	August 14
3rd	July-Sept	November 14
4th	October-December	February 14

DMRs must be submitted electronically using Ecology's Water Quality Permitting Portal-DMR application.

- Once permit coverage becomes effective, submit a DMR each reporting period, whether or not the facility has discharged stormwater from the site.
- If discharge(s) occur during normal working hours and during safe conditions, but no sample was collected during an entire quarter, submit a DMR form indicating "no sample obtained." If no discharge(s) occur during an entire quarter, or if discharges occur outside of normal working hours or during unsafe conditions, submit a DMR indicating "no discharge."

- If sampling for a particular parameter has been suspended due to consistent attainment, submit a DMR and indicate that Consistent Attainment has been achieved for that parameter.

5.0. SWPPP Certification

Is this SWPPP certification in response to a Level 1, 2 or 3 Corrective Action If Yes:

☐ Yes ☐ No

Type of Corrective Action?: ☐ Level 1 ☐ Level 2 ☐ Level 3

- Date SWPPP update/revision completed: 03/30/2018 .

"I certify under penalty of law that this SWPPP and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate information to determine compliance with the Industrial Stormwater General Permit. Based on my inquiry of the person or persons who are responsible for stormwater management at my facility, this SWPPP is, to the best of my knowledge and belief, true, accurate, and complete, and in full compliance with Permit Conditions S3 and S8, including the correct Best Management Practices from the applicable Stormwater Management Manual. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Chris Harrelson	Terminal Manager
Operator's Printed Name	Title
Operator's Signature	Date

6.0. References

Guidance Manual for Preparing/Updating a Storm Water Pollution Prevention Plan for Industrial Facilities. Washington Department of Ecology. April 2004.

How to do Stormwater Sampling, A guide for industrial facilities. March 2010. Washington Department of Ecology. Publication 02-10-071. 2010.

Industrial Stormwater General Permit, Addendum to Fact Sheet: Appendix D, Response to Public Comments on the Draft Permit Washington Department of Ecology. December 3, 2014

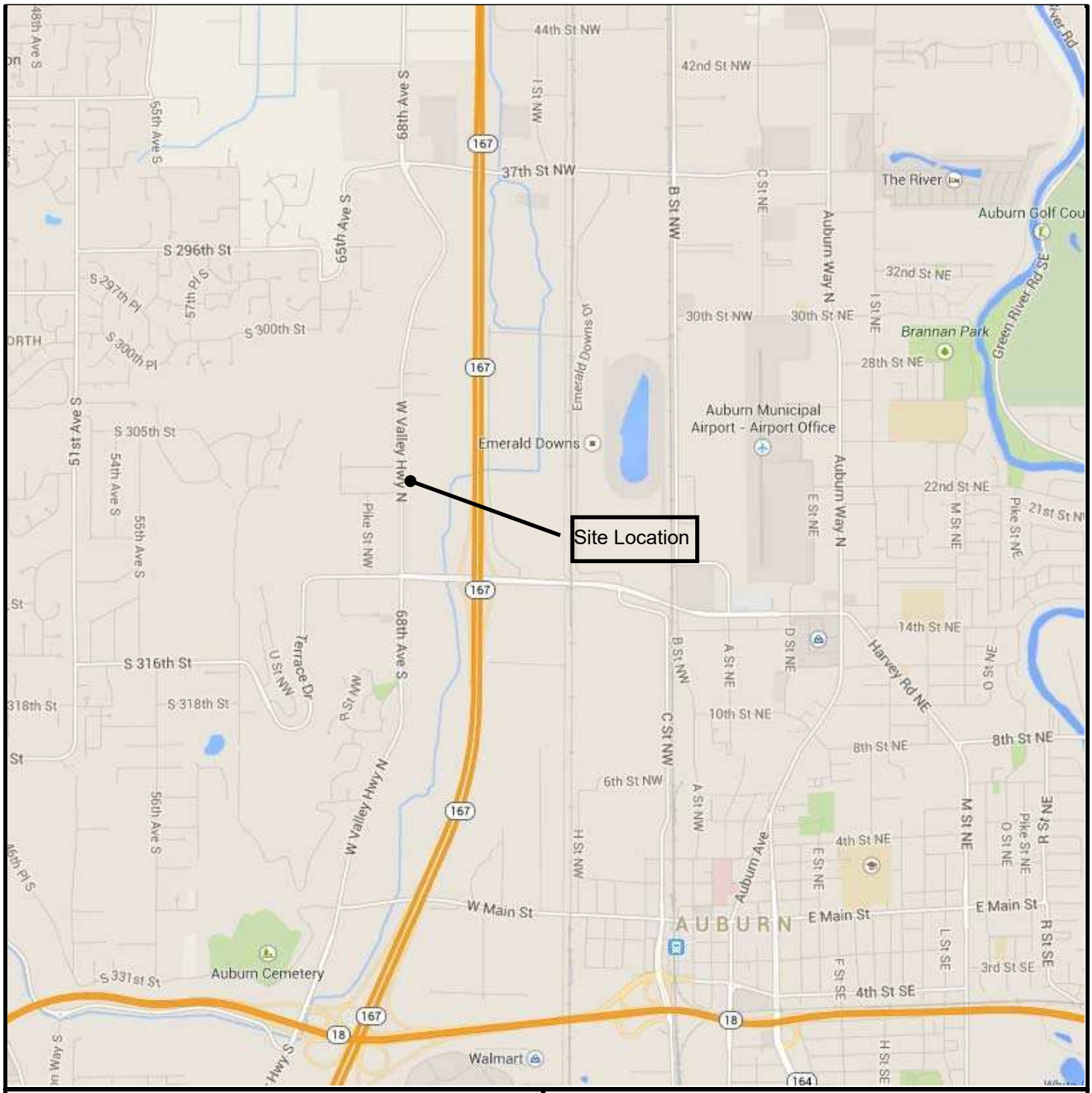
Industrial Stormwater General Permit. Effective 01/02/2015 – 12/31/2019. Washington Department of Ecology.

Industrial Stormwater General Permit Fact Sheet. June 3, 2009 Public Comment Draft. Washington Department of Ecology. 2009.

Stormwater Management Manual for Western Washington, Volume IV, Source Control BMPs. Washington Department of Ecology. 2012.

Guidance for the Preparation of Industrial Stormwater General Permit Engineering Reports. Washington Department of Ecology. February 2013.

FIGURES



N

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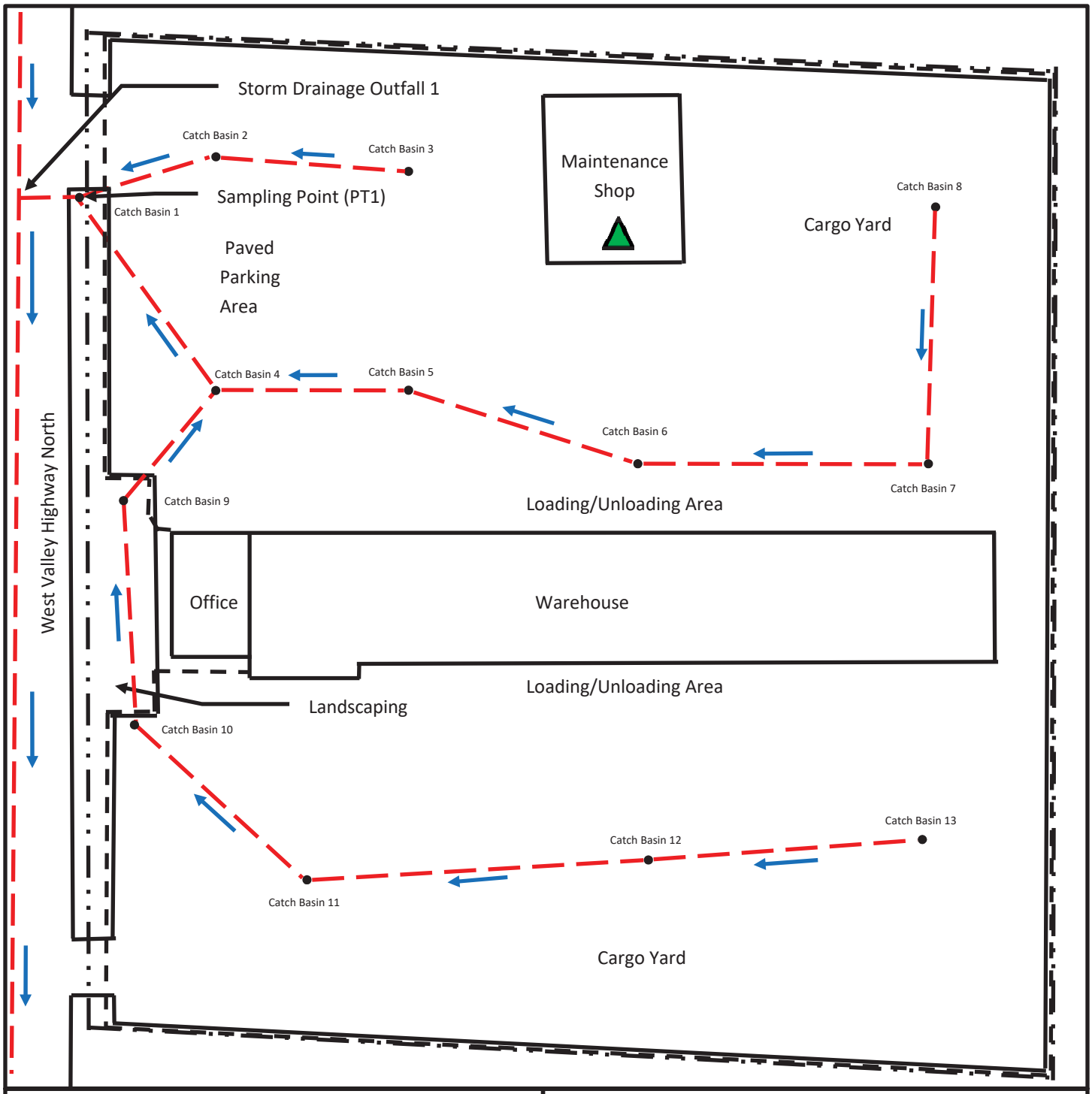
Data Source: Esri 2012.

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.

Vicinity Map

GI Trucking Co./DBA Estes West
2102 West Valley Highway North
Auburn, Washington

Figure 1



Chain Link Fence
Paved/Drainage Area
Storm Drain Pipes
Stormwater Flow Direction
Spill Kit
Catch Basins
Property Boundary

N

0 40 80
Feet

Site Map

GI Trucking Co./DBA Estes West
2102 West Valley Highway North
Auburn, Washington

AdvancedGeo Environmental

Figure 2

Notes:

1. The locations of all features shown are approximate.

2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. DH Environmental Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by DH Environmental, Inc. and will serve as the official record of this communication.

APPENDIX A

Appendix A Spill Log	Facility: GI Trucking Co./DBA Estes West Completed by: Title: Date:

List all chemical and petroleum spills and leaks

Date and Time	Location	Description				Response Procedure		Comments
		Amount	Type of Material	Source, If Known	Reason for Spill/Leak	Notifications Made	Staff Involved	

APPENDIX B

Appendix B - Catch Basin/Storm Drain System Maintenance Log

Date	Description of Action(s)	Person Responsible for Action
May 2016	• Sediment filters installed at 12 drain inlets within the paved surfaces.	Estes Express – Terminal Manager
August 2016	• Cleanway Filters installed at 12 drain inlets within the paved surfaces.	Estes Express – Terminal Manager
September 2016	• Cleanway Filters media inspected - 12 drain inlets within the paved surfaces.	Advanced GeoEnvironmental
June 2017	• Cleanway Filters replaced at 12 drain inlets within the paved surfaces. Drain line cleaning.	Advanced GeoEnvironmental
September 2017	• BioClean downspout drainage media installed - 12 drain/downspouts within eastern terminal loading dock building drainage.	Advanced GeoEnvironmental
December 2017	• Cleanway Filters media cleaned - 12 drain inlets within the paved surfaces.	Advanced GeoEnvironmental
March 2018	• Drain line cleaning.	Advanced GeoEnvironmental
March 2018	• Cleanway Filters replaced at 12 drain inlets within the paved surfaces.	Advanced GeoEnvironmental

Appendix B - Sweeping Log

Date	Description of Action(s) (including location)	Person Responsible for Action
May 25, 2014 (Example)	3 hours sweeper vacuum truck at DBA Estes West located at 2102 West Valley Highway North, Auburn, WA - Phoenix Environmental (Example)	
	Site Sweeping monthly for traffic areas	

APPENDIX C

Employee Training	Appendix C Completed by: _____ Title: SWPP Procedures & practices_____ Date: _____

Describe the annual training of employees on the SWPPP, addressing spill response, good housekeeping, and material management practices.

Training Topics	Brief Description of Training Program/Materials (e.g., film, newsletter, course)	Schedule for Training (list dates)	Attendees
Spill Prevention and Response	Reviewed Stormwater Spill Prevention Plan procedures, duties and practices.		
Good Housekeeping	Reviewed Good Housekeeping procedures, as shown in our new SWPPP.		
Material Management Practices	Went over the potential Pollutants that affect our facility, including storage and secondary containment procedures.		
SWPPP Implementation	Reviewed SWPPP undated June 2014. Read and discussed "Industrial Stormwater General Permit Frequently Asked Questions" from Washington State DOE – Water Quality Program.		
Monitoring Procedures	Discussed monitoring of the drainage system & yard to ensure compliance with current Stormwater Permit.		

APPENDIX D

Site name _____

Facility Name		Inspection Date		Inspection Time	
Description of Weather					

Site Map Current (Yes / No) if no, describe changes	
SWPPP Inventory correct (Yes / No) if no, describe	
Any new potential pollutant sources (Yes / No) if no, describe	
Is equipment washed / cleaned in designated areas (Yes / No / NA)	
If washing, is wash water captured /disposed of correctly (Yes/ No/ NA)	
Fueling areas clean (Yes / No / NA)	
Chemicals/Liquids in secondary containment (Yes / No / NA)	
Containment areas covered ? (Yes / No / N/A)	
If No, is water present? (Yes / No / N/A/) Is management plan followed? (Yes / No/ N/A)	
Maintenance tools, equipment, materials stored properly? (Yes/ No, N/A)	
Drums / Containers stored properly? (Yes / No/ N/A)	
Drums / Containers dirty? (Yes / No/ N/A)	
Vehicles leaking fluids? (Yes/ No/ N/A)	
Evidence of leaks and spills since last inspection? (Yes/ No/ N/A)	
Leaky equipment, materials put out of service and out of stormwater? (Yes / No/ N/A)	
Paved surfaces free of dust / debris? (Yes/ No/ N/A)	
Quarterly vacuum sweeping occurring? (Yes/ No / N/A)	
Waste Receptacles in good condition (Yes/ No/ N/A)	
Waste Receptacles closed when not in use? (Yes/ No/ N/A)	
Waste Receptacles clean on outside? (Yes/ No/ N/A)	
Are the following areas clean of dust, sediment, debris, contaminants, spills, leaks?	

Dock Areas	(Yes/ No/ NA)		Storage Area	(Yes/ No/ NA)	
Shops	(Yes/ No/ NA)		Staging Area	(Yes/ No/ NA)	
Bag Houses	(Yes/ No/ NA)		Bone Yards	(Yes/ No/ NA)	
Other areas	(Yes/ No/ NA)				

Spill kit available at fueling stations/equipment maintenance areas (Yes/ No/ N/A)	
Spill Kit contains absorbents, drain plug, containment boom, non-metallic shovel, two 5 gal buckets (Yes/ No/ N/A)	
Are damaged materials stored inside a shelter (Yes/ No/ N/A/)	
Are outside materials covered (Yes / No/ N/A)	

Site name _____

Are scrap bins covered (Yes / No/ N/A)	
Are outdoor containers covered (Yes/ No/ N/A)	
BMP's in good repair (Yes/ No/ N/A)	
BMP's free of buildup? (Yes / No/ N/A)	
Catch basins need cleaning? (Yes/ No/ N/A)	
Treatment Systems in good shape (Yes/ N/ N/A)	
Discharge during dry observations? (Yes/ No)	

If inspection completed during sampling, complete the following (Yes/ No/ N/A)

Discharge free of floating materials, oil sheen, discoloration, turbidity, odor, foam, or any signs of contamination (Yes/No./ N/A)

Process water co-mingling with stormwater? (Yes/ No)	
Any other illicit discharges observed? (Yes/ No)	

Add comments for any of the above observations than need further clarification or follow-up:

(Yes/ No) This facility is in compliance with the terms and conditions of the SWPPP and the Industrial Stormwater General Permit
If "No" then list remedial actions above. "I certify that this report is true, accurate, and complete, to the best of my knowledge and belief"

Inspectors printed Name	Inspectors Signature	Date

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering formation, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations"

Printed Name	Signature	Date

INDUSTRIAL STORMWATER MONTHLY INSPECTION REPORT

Inspections must be conducted by a person with the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and evaluate the effectiveness of best management practices required by this permit. Retain a copy of the completed and signed form in accordance with Permit Condition S9.C.

FACILITY NAME: GI Trucking Co./DBA Estes West	**INSPECTION TIME:**	**DATE:**

WEATHER INFORMATION:

- Description of Weather Conditions (e.g., sunny, cloudy, raining, snowing, etc.):
  Raining_____
- Was stormwater (e.g., runoff from rain or snowmelt) flowing at outfalls and/or discharge areas shown on the Site Map during the inspection: **Yes** **No** **Comments:**

I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION

	Yes	No	Findings and Remedial Action Documentation: Describe any findings below and the schedule for remedial action completion including the date initiated and date completed or expected to be completed.
SWPPP and Site Map: Have a copy of the SWPPP and site map with you during the inspection so that you can ensure they are current and accurate. Use it as an aide in recording the location of any issues you identify during the inspection. • Is the Site Map current and accurate? • Is the SWPPP inventory of activities, materials and products current? Any new potential pollutant sources must be added to the map and reflected in the SWPPP Facility Assessment & Tables 2, 2A, 3 and 5.			

	Yes	No	NA	Findings and Remedial Action Documentation:

Vehicle/Equipment Areas:
Equipment cleaning: Check NA if not performed on-site. Skip section.
Is equipment washed and/or cleaned only in designated areas?
• Observe washing: Is all wash water captured and properly disposed of?
Equipment fueling: Check NA if not performed on-site. Skip section.
• Are all fueling areas free of contaminant buildup and evidence of chronic leaks/spills?
• Are all chemical liquids, fluids, and petroleum products, on an impervious surface that is surrounded with a containment berm or dike that is capable of containing 10% of the total enclosed tank volume or 110% of the volume contained in the largest tank, whichever is greater?
• Are structures in place to prevent precipitation from accumulating in containment areas?
  ○ If not, is there any water or other fluids accumulated within the containment area?
  ○ Note: If containment areas are not covered to prevent water from accumulating, the SWPPP must include a plan describing how accumulated water will be managed and disposed of.				

Equipment maintenance:	Yes	No	NA	Findings and Remedial Action Documentation:
• Are maintenance tools, equipment and materials stored under shelter, elevated and covered? • Are all drums and containers of fluids stored with proper cover and containment? • Are exteriors of containers kept outside free of deposits? • Are any vehicles and/or equipment leaking fluids? Identify leaking equipment. • Is there evidence of leaks or spills since last inspection? Identify and address. • Are materials, equipment, and activities located so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas)? Add any additional site-specific BMPs:				

I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION				
Good Housekeeping BMPs:	**Yes**	**No**	**NA**	**Findings and Remedial Action Documentation:**
1. Are paved surfaces free of accumulated dust/sediment and debris? • Date of last quarterly vacuum/sweep _____ • Are there areas of erosion or sediment/dust sources that discharge to storm drains? 2. Are all waste receptacles located outdoors: • In good condition? • Not leaking contaminants? • Closed when is not being accessed? • External surfaces and area free of excessive contaminant buildup? 3. Are the following areas free of accumulated dust/sediment, debris, contaminants, and/or spills/leaks of fluids? • External dock areas • Pallet, bin, and drum storage areas • Maintenance shop(s) • Equipment staging areas (loaders, tractors, trailers, forklifts, etc) • Around bag-house(s) • Around bone yards • Other areas of industrial activity:				

Spill Response and Equipment:	**Yes**	**No**	**N A**	**Findings and Remedial Action Documentation:**
Are spill kits available, in the following locations? • Fueling stations • Transfer and mobile fueling units • Vehicle and equipment maintenance areas Do the spill kits contain all the permit required items? • Oil absorbents capable of absorbing 15 gallons of fuel. • A storm drain plug or cover kit. • A non-water containment boom, a minimum of 10 feet in length with a 12 gallon absorbent capacity. • A non-metallic shovel. • Two five-gallon buckets with lids. Are contaminated absorbent materials properly disposed of?				
I. POTENTIAL POLLUTANT SOURCE AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION				
General Material Storage Areas: • Are damaged materials stored inside a building or another type of storm resistance shelter? • Are all uncontained material piles stored in a manner that does not allow discharge of impacted stormwater? • Are scrap metal bins covered? • Are outdoor containers covered?	**Yes**	**No**	**N A**	**Findings and Remedial Action Documentation:**
Stormwater BMPs and Treatment Structures: Visually inspect all stormwater BMPs and treatment structures devices, discharge areas infiltration and outfalls shown on the Site Map. • Are BMPs and treatment structures in good repair and operational? • Are BMPs and treatment structures free from debris buildup that may impair function? • The permit requires Permittees to clean catch basins when the depth of debris reaches 60% of the sump depth. In addition, the Permittee must keep the debris surface at least 6 inches below the outlet pipe. Based on this, do catch basins need to be cleaned? • Are berms, curbing or other methods used to divert and direct discharges adequate and in good condition?	**Yes**	**No**	**N A**	**Findings and Remedial Action Documentation:**
Observation of Stormwater Discharges: □ Is the discharge free of floating materials, visible oil sheen, discoloration, turbidity, odor, foam or any other signs of contamination? □ Water from washing vehicles or equipment, steam cleaning and/or pressure washing is considered process wastewater and is not allowed to comingle with stormwater or enter storm drains. Is process water comingling with stormwater or entering storm drains? □ Illicit discharges include domestic wastewater, noncontact cooling water, or process wastewater (including leachate). Were any illicit discharges observed during the inspection?	**Yes**	**No**	**N A**	**Findings and Remedial Action Documentation:**

II. CORRECTIVE ACTION AND SWPPP MODIFICATIONS DESCRIPTIONS: Additional space to describe inspection findings and corrective actions if needed. Provide brief explanation of the general location and the rationale for the additional or different BMPs.

III. CERTIFICATION STATEMENTS AND SIGNATURES:

Inspector - Certification: This section must be completed by the person who conducted the site inspection prior to submitting this form to the person with signature authority (see Permit Condition G2) or a duly authorized representative of that person.

☐ The facility is in compliance with the terms and conditions of the SWPPP and the Industrial Stormwater General Permit.

☐ The facility is out of compliance with the terms and conditions of the SWPPP and the Industrial Stormwater General Permit. This report includes the remedial actions that must be taken to meet the requirements of the SWPPP and permit, including a schedule of implementation of the remedial actions.

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

Inspector's Name – Printed	**Inspector's Signature**	**Inspector's Title**	**Date**

Permittee – Certification:

☐ The facility is in compliance with the terms and conditions of the SWPPP and the Industrial Stormwater General Permit.

☐ The facility is out of compliance with the terms and conditions of the SWPPP and the Industrial Stormwater General Permit. This report includes the remedial actions that must be taken to meet the requirements of the SWPPP and permit, including a schedule of implementation of the remedial actions.

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine *and imprisonment for knowing violations."*

PRINTED NAME of person with **Signature Authority** (permit condition G2.A) or a **Duly Authorized Representative**[1]	SIGNATURE of person with **Signature Authority** (permit condition G2.A) or a **Duly Authorized Representative**[1]	**DATE**

[1]A person is duly authorized representative only if 1) the authorization is made in writing by a person described in Permit Condition G2.A and submitted to Ecology, and 2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

APPENDIX E

QUARTELRY STORMWATER MONITORING
SAMPLING LOG GI TRUCKING CO./DBA ESTES WEST
2102 WEST VALLEY HIGHWAY NORTH, AUBURN,
WA 98001 PERMIT NUMBER: WAR 008739

Quarter: Q1 Q2 Q3 Q4 20____

Date of Sample Collection:

Sample Location:

STORMWATER SAMPLING: In accordance with the Industrial Stormwater General Permit condition S4.B, a permittee is required to collect a sample within the first 12 hours of stormwater discharge. Fourth quarter sampling must occur during the first storm event of that quarter. For the other three quarters, sampling does not need to be conducted during the first storm event. Permittees need not sample outside of regular business hours, during unsafe conditions, or during quarters where there is no discharge, but must still submit a Discharge Monitoring Report each reporting period.

1) Time of Sample Collection:

2) Did sampling occur within the first 12 hours of discharge? Yes ☐ No ☐

3) If the answer to question 2 is no, explain why a sample was not collected within the first 12 hours.

4) For fourth quarter sampling, did the sampling occur during the first storm event of that quarter? Yes ☐ No ☐

5) Sampling method (e.g., "from catch basin by hand"):

6) Sampling Parameters:
☐Turbidity ☐Copper
☐ pH ☐Zinc
☐ Petroleum Hydrocarbons ☐Other_____
☐ Oil Sheen

7) Results of Field Measurements:

Turbidity:_____

Oil Sheen:_____

pH*:_____ Calibration Date: _____

*Permittees shall use either a calibrated pH meter or narrow-range pH indicator paper with a resolution not greater than ± 0.5 SU.

8) Weather:

9) Comments (i.e., unusual circumstances, etc.):

SAMPLE ID NUMBER(s):_____

NAME OF SAMPLER:_____

SIGNATURE:_____

VISUAL MONITORING REMINDER [If monthly visual monitoring has not already been conducted, record the results of visual monitoring on the separate required Monthly Inspection form].

Record of SWPPP Revisions

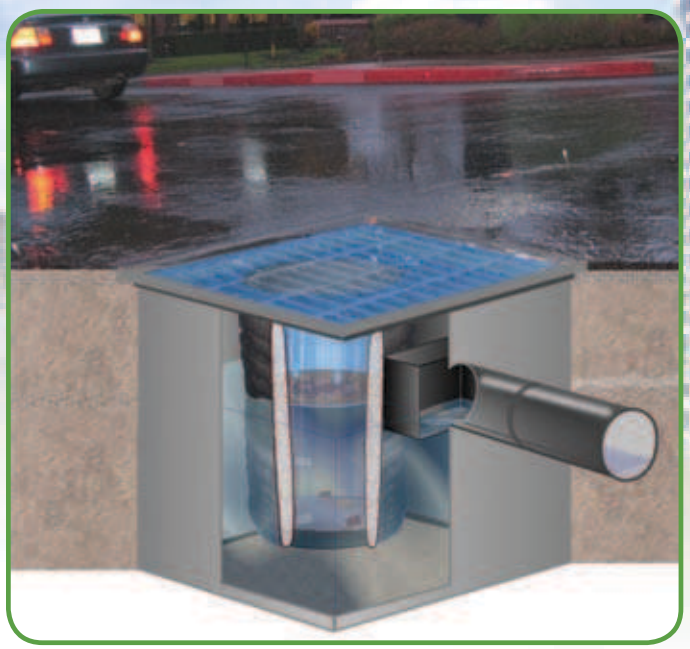
Date	Summary of Changes to SWPPP	Individual Making Changes
January 30, 2015	Updated SWPPP text to reflect 2015 Permit requirements	Andrew Johnson
08/30/2017	Updated SWPPP text to reflect Level 3 requirements	Tyler West William Little
10/15/2017	Updated SWPPP text to reflect Terminal Management	William Little
08/30/2017		

ATTACHMENTS

cleanwayusa.com

Call 1.800.723.1373

High Performance Catch Basin Filtration Inserts



In a world where stormwater agencies require compliance with ever tougher regulations, CleanWay® offers effective yet simple stormwater filtration solutions. CleanWay Storm Clean® catch basin filtration inserts are highly effective at capturing pollutants from stormwater runoff, and are easy to deploy in existing catch basins or on new sites.

Now you can meet NPDES Phase II stormwater regulations and comply with the Clean Water Act with a proven stormwater BMP from CleanWay.

Simple Installation

- No tools needed
- Completed in a few minutes
- Retrofits existing catch basins – available in any size

Easy Maintenance

- No tools needed
- Filters are quick and easy to remove and replace
- Prevents secondary spill

Storm Clean® II Benefits include:

- Proven stormwater BMP - thousands installed throughout the U.S.
- Retrofits existing sites in minutes
- Various configurations to capture target pollutants
- Standard and custom sizes available
- Highly durable materials
- Hi-flow bypass system prevents scouring during high volume storm events
- Great for post construction sediment and metals control
- Unique testing port

Simple Durable Effective Proven

CleanWay offers basic, advanced and maximum pollutant removal options to address the specific needs of your site. You can also add additional pollutant removal performance any time to enhance treatment, by adding 2nd and or 3rd stage filtration.

BASIC

- Inexpensive solution for construction sites
- Easy to access and clean for trash and debris removal
- Very high capture capacity for suspended solids

ADVANCED

- Helps meet benchmarks for stormwater discharge permit holders
- Prevents surface pollutants from entering the drinking water supply for UIC pretreatment
- Adsorbs and prevents leaching for oil and other hydrocarbons
- Measurably reduces levels of heavy metals

MAXIMUM

- Includes Basic and Advanced benefits
- Safely captures and contains various types of pollutants
- Captures site-specific pollutants
- Customized 3rd stage selective pollutant removal; can be altered in the field when conditions change

1st stage filtration

Rigid, removable strainer with non woven fabric filter

2nd stage filtration

Includes rigid strainer and adsorption filter

3rd stage filtration

Includes rigid strainer, adsorption filter and specially blended, site-specific media

METALS REMOVAL MEDIA

For highly effective removal of metals, CleanWay Metals Removal Media Blend efficiently removes heavy metals through ion adsorption and filtration processes. This special media blend can be applied in filtration devices to replace existing media or used in addition to conventional media to capture high levels of dissolved metals and reduce insoluble components.

General Specifications

Primary filtration	
Strainer solids total	1.0 cu ft
Strainer total surface areas	4.8 sq ft
Strainer sieve size	1/8 inch
Strainer flow rate	>100 gpm

Secondary filtration	
Adsorption media volume	1.5 cu ft
Filter surface areas	6.4 ft
Filtration design flow rate	40 gpm
Filtration maximum flow rate	80 gpm

Stormwater Filtration Products

CleanWay® provides a variety of stormwater filtration products that are highly effective at capturing and removing pollutants from stormwater runoff. They can be used in catch basins for direct capture at the source, as well as pretreatment for Underground Injection Controls (UIC), as secondary devices in treatment trains for protection of downstream devices such as swales, detention/retention ponds and infiltration trenches.

Catch Basin Filtration Inserts

CleanWay Storm Clean® catch basin filtration inserts are designed for retrofits or new installations. We offer several standard sizes and configurations to fit in a wide range of existing vaults and structures. We also design inserts for new sites customized to your specifications:

- Square Catch Basins
- Rectangular Catch Basins
- Round Catch Basins

Catch Basin Filtration Insert

Wall Mount Filtration

Storm Clean wall mount systems work best in large basins or manholes with 12” - 20” outlets deep in the vault. We also offer custom wall mount designs.

Downspout Filtration

Downspout filtration efficiently captures pollutants common to buildings with metal roofs or rooftop equipment. They offer a cost effective, unobtrusive solution in a small footprint.

Downspout Filtration

Request a Quote

CleanWay offers a cost effective solution for stormwater treatment. Contact us today for a quote on your project.

Call **800.723.1373** or email us at **technical@cleanwayusa.com**

Contact Us:
CleanWay
PO Box 30087
Portland, OR 97294

Tel 800.723.1373
503.280.5102
Fax 503.288.3658
www.cleanwayusa.com
technical@cleanwayusa.com

MetalZorb®

Dissolved Metals Removal Media

Remove dissolved metals from stormwater, industrial waste and process water with the Gold Standard in Metals Removal

For highly effective removal of metals from stormwater, industrial and wastewater discharge, CleanWay® offers MetalZorb, a proven filtration product that efficiently removes heavy metals including zinc, copper, lead, mercury, nickel, aluminum, silver and gold.

MetalZorb is a high capacity, non-toxic sponge product that rapidly absorbs metals from various water treatment applications. No backwash required and no leaching.

High and low flow

MetalZorb sponge is the ideal technology to reduce dissolved metallic ions from both high and low flow applications including industrial effluent, landfill leachates, stormwater runoff and any type of non-point source pollution where unattended gravity flow occurs.

This patented product is available exclusively from CleanWay Environmental Partners. Since 1989, CleanWay has worked with regulators and industry to provide innovative solutions to the complex challenge of removing dissolved heavy metals in water.

MetalZorb®

- Proven: in use for over 20 years
- Rapid absorption: as little as 20 seconds of contact time can achieve 90% reduction*
- NO backwash required
- Very low impedance of flow
- Disposable as solid waste
- Light weight, non-toxic, reduced disposal cost
- No special training or equipment
- Will not leach: unlike ion exchange, metal ion forms permanent ligand bond with the polymer
- High capacity: absorbs up to 10% of its dry weight in metal
- Available in loose form, absorption booms, catch basin inserts and other filtration systems

*dependent upon water pH, type of metal, total dissolved solids and other water chemistry factors.

MetalZorb is highly effective for recovery of dissolved precious metals, including gold. Once the sponge is metal-saturated, metals can be recovered economically and with low environmental impact.

Effectively remove dissolved metals from stormwater, industrial waste and process water with MetalZorb, the Gold Standard in Metals Removal.
Contact us for a quote today.

CleanWay Environmental Partners, Inc. | 800.723.1373
cleanwayusa.com | PO Box 30087 Portland OR 97294

Filtration Specifications

Filter Surface Area (Fabric elements)	6.4 sq ft	.6 sq m
Filter Design Flow Rate (Nominal)	40 gpm	151 liters/min
Filtration Design Flow Rate (Maximum)	80 gpm	303 liters/min
Adsorption Media Volume (Vermiculite/MetalZorb®)	1.0 cu ft	28 liters

Strainer solids total	1.0 cu ft	28 liters
Strainer total surface area	4.8 sq ft	.4 sq m
Strainer sieve size	1/8 in	3.2 mm
Strainer flow rate	> 100 gpm	> 379 liters/min

Downspout Filter

PROVEN STORMWATER TREATMENT TECHNOLOGY

BIO CLEAN ENVIRONMENTAL SERVICES, INC.

Overview

The Bio Clean Downspout Filter is the industry's leading solution for treatment of roof runoff. This technology is used to treat commercial and industrial roof tops along with highrise buildings, parking structures and residential buildings.

Available in 3 sizes, this filter can easily adapt to downspouts 2" to 12" in diameter. The filter comes standard with rubber boots that allow for easy installation to the downspout.

Proven since 2003, the Bio Clean Downspout Filter has been used on hundreds of installations throughout the United States. All internal components are constructed of stainless steel.

The sleek inline design allows the filter to be used in tight spaces. Approved by the IAPMO, this filter can meet all your needs.

Advantages

- 5 Year Warranty
- No Nets or Geofabrics
- Sleek Inline Design
- High Treatment Flow Rate
- High Bypass Flow Rate
- Low Cost

Performance

- 93% Removal of TSS
- 87% Removal of Hydrocarbons
- Effective at Removing Metals, Nutrients and Bacteria (Media Type)

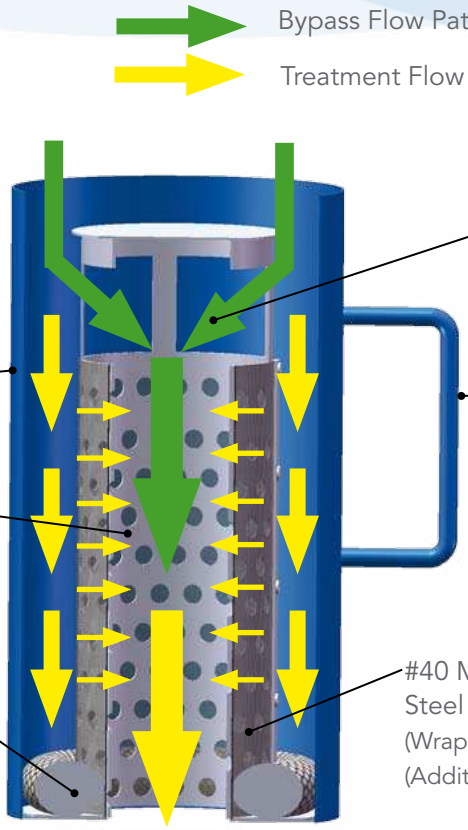
Specifications

Model #	Inlet ID (dia., in.)	Filter OD (dia., in.)	Storage Cap. (cu. ft.)	Filtered Flow (gpm)	Bypass Flow (gpm)
BC-DF4	4	6.625	0.09	249	566
BC-DF6	6	8.625	0.21	509	1006
BC-DF8	8	8.625	0.21	509	1006
BC-DF10	10	12.75	0.77	1145	2264
BC-DF12	12	12.75	0.77	1145	2264

Downspout Filter

PROVEN STORMWATER TREATMENT TECHNOLOGY

Operation



Application

Easily Adapts to Square or Rectangle Downspouts

- Commercial
- Residentail
- Parking Structures
- Mixed Use

Fits Inline with Iron, Steel or Plastic Pipe

Approvals

IAPMO Testing & Approval Listing

Installation & Maintenance

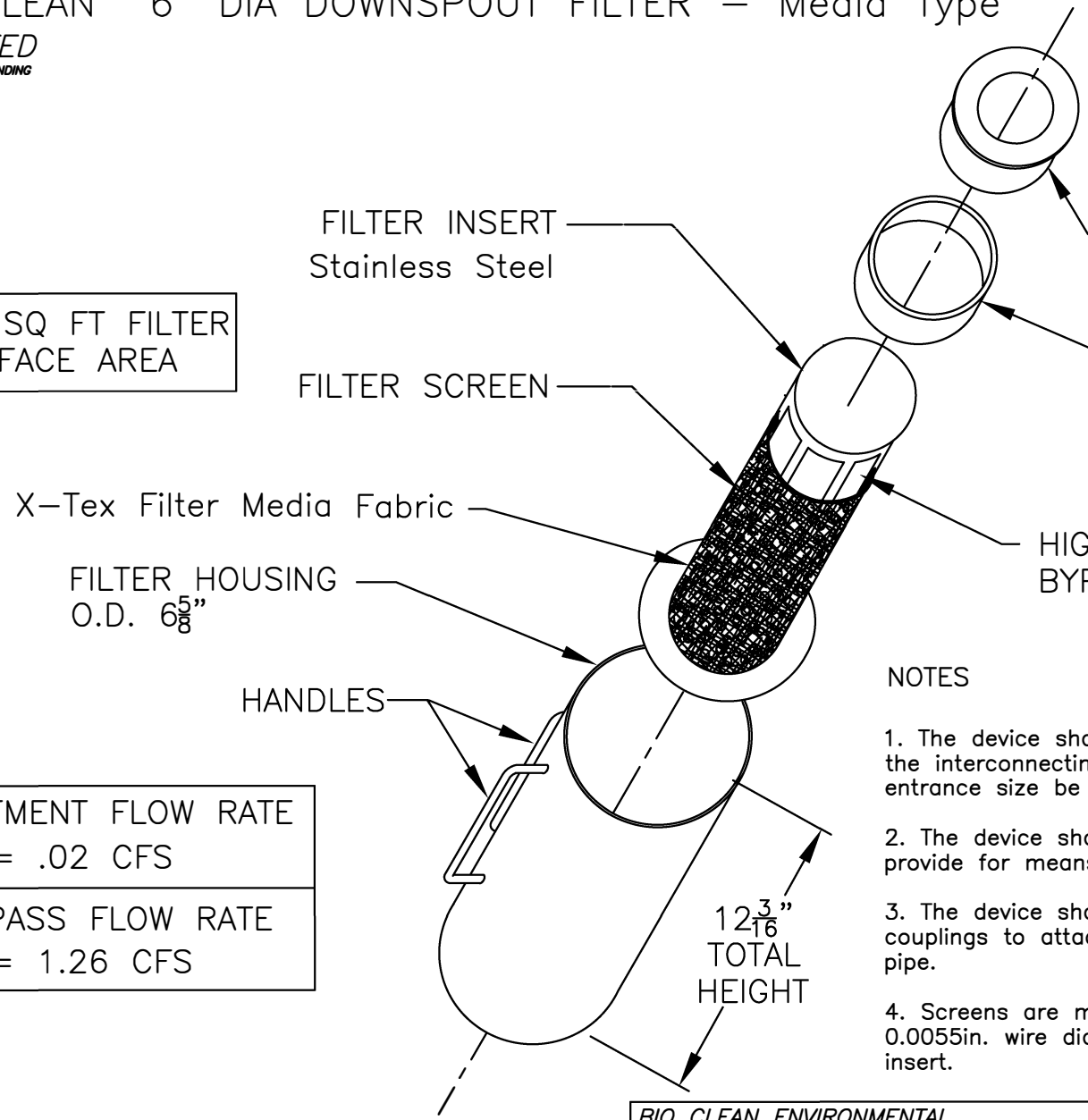
See our Website for Installation & Maintenance Manuals at www.BioCleanEnvironmental.com

2972 San Luis Rey Rd
Oceanside, CA 92058
p 760.433.7640 f 760.433.3176
www.BioCleanEnvironmental.com

BIO CLEAN

BIO CLEAN 6" DIA DOWNSPOUT FILTER – Media Type

PATENTED
AND PATENTS PENDING



NOTES

1. The device shall be sized according to the nominal size of the interconnecting drainage system. At no time shall the entrance size be larger than the exit size.

2. The device shall be installed in an accessible location to provide for means of repair and maintenance.

3. The device shall be installed using approved adapters or couplings to attach the device to the downspout or drainage pipe.

4. Screens are made out of 46 mesh stainless steel. 0.0055in. wire diameters. 55% open around exterior of filter insert.

Bio Clean
A Forterra Company

BIO CLEAN ENVIRONMENTAL
PO BOX 869, OCEANSIDE, CA
P 760.433.7640 F 760.433.3179

6" DOWNSPOUT FILTER MEDIA TYPE
MODEL NO. BC–DF2, BC–DF4

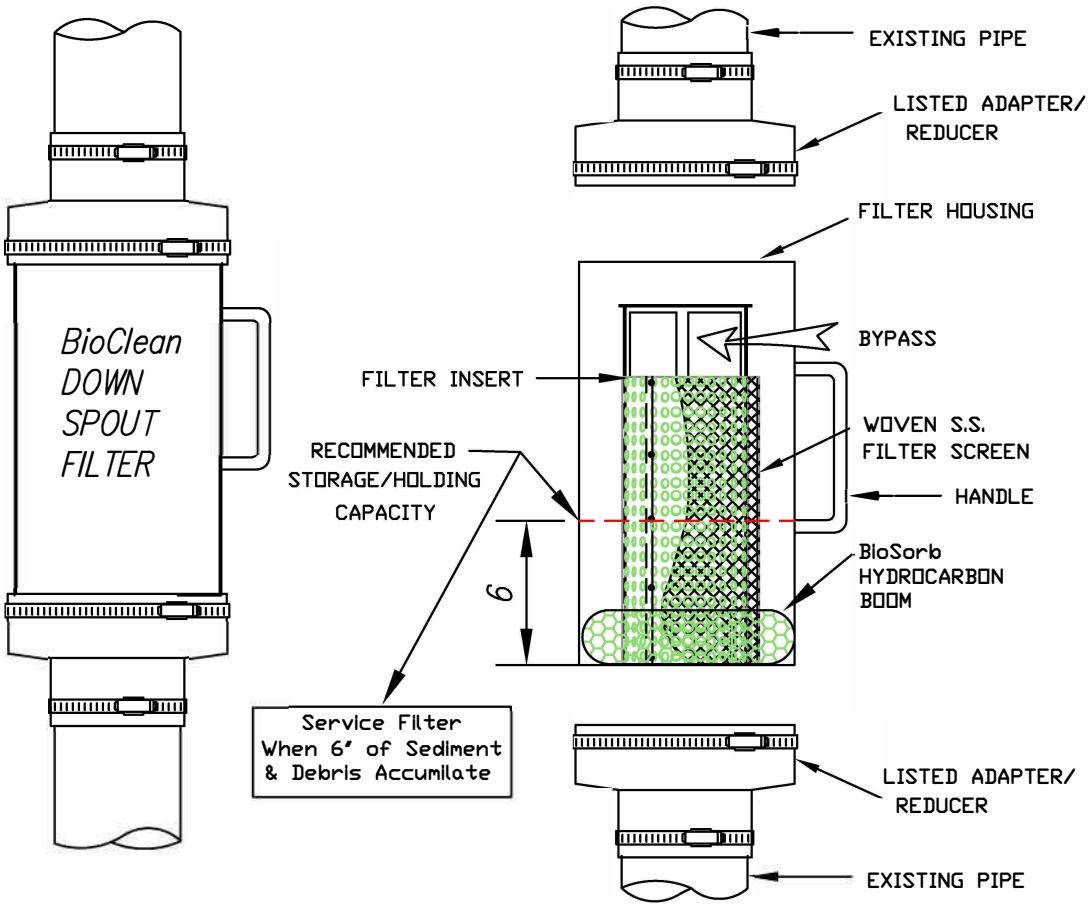
DATE: 12/4/2012	SCALE: NTS	REVISIONS: LM	DATE: 12/4/2012
DRAFTER: T.H.H.	UNITS =INCHES	REVISIONS:	DATE:

PROJECT:
DRAWING #:
FILE NAME:

SERVICE MANUAL

(Cleaning Procedures)

Bio Clean DOWNSPOUT FILTER
Screen Type With Hydrocarbon Boom



DETAIL OF PARTS

TOOLS AND EQUIPMENT NEEDED:

1. Medium size flat scred driver
2. BioSorb hydrocarbon boom. 25-1/2" X 2" dia.
   (Call Bio Clean to order)
3. Trash container or bag
4. Wooden dowel approx. 3' x 1/2' dia.

Bio Clean
A Forterra Company

P.O. BOX 869, Oceanside, Ca. 92049
(760) 433-7640 Fax (760) 433-3176
www.biocleanenvironmental.net

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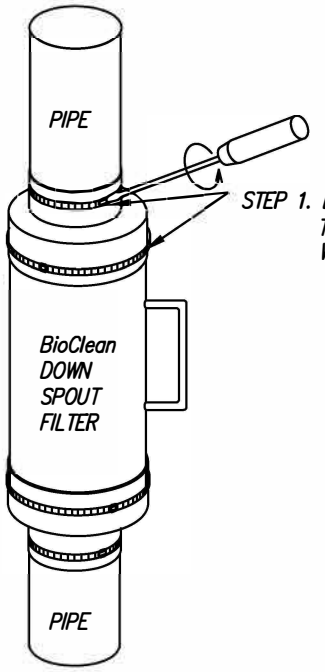
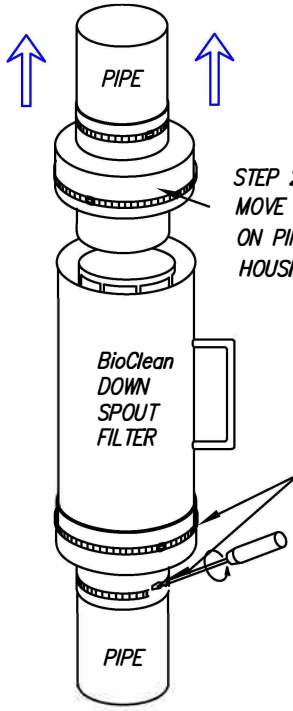
REMOVING FILTER



STEP 1. LOOSEN BOTH TOP CLAMPS WITH SCREW DRIVER.

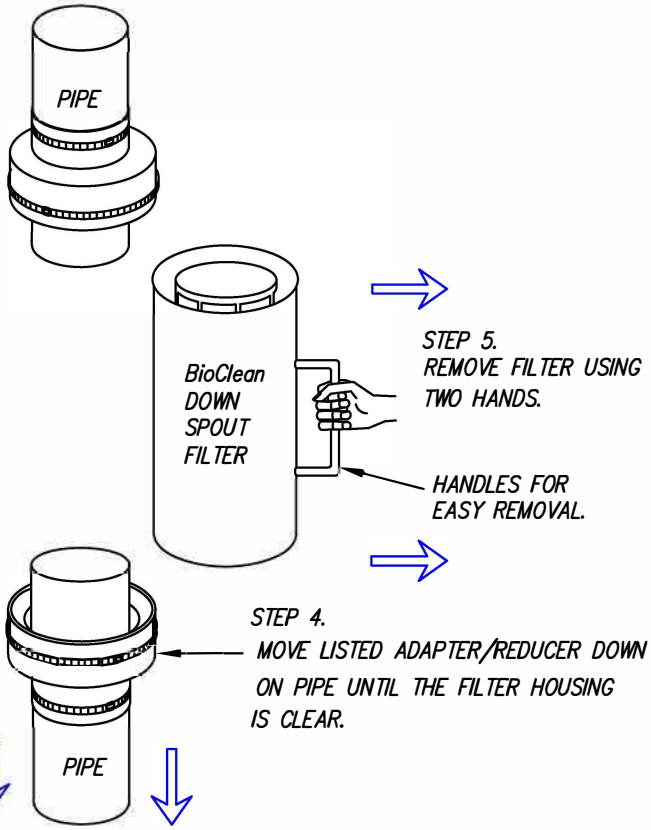


STEP 2.
MOVE LISTED ADAPTER/REDUCER UP ON PIPE UNTIL THE FILTER HOUSING IS CLEAR TO REMOVE.

STEP 3.
LOOSEN BOTH BOTTOM CLAMPS WITH SCREW DRIVER.

(STEP 4. AT BOTTOM LEFT OF PAGE)

CLEANING FILTER

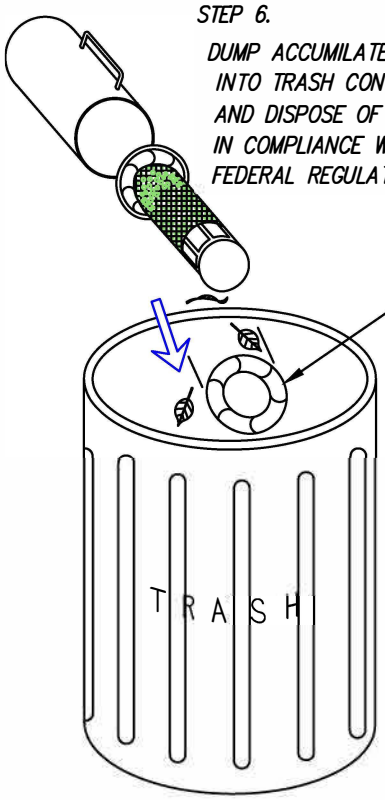


STEP 5.
REMOVE FILTER USING TWO HANDS.

HANDLES FOR EASY REMOVAL.

STEP 4.
MOVE LISTED ADAPTER/REDUCER DOWN ON PIPE UNTIL THE FILTER HOUSING IS CLEAR.

STEP 6.
DUMP ACCUMILATED DEBRIS OUT OF FILTER INTO TRASH CONTAINER. REMOVE FILTER INSERT AND DISPOSE OF HYDROCARBON BOOM IN COMPLIANCE WITH LOCAL STATE & FEDERAL REGULATIONS.



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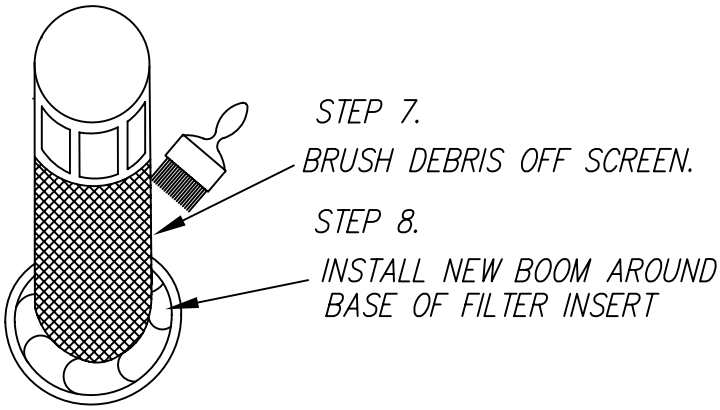
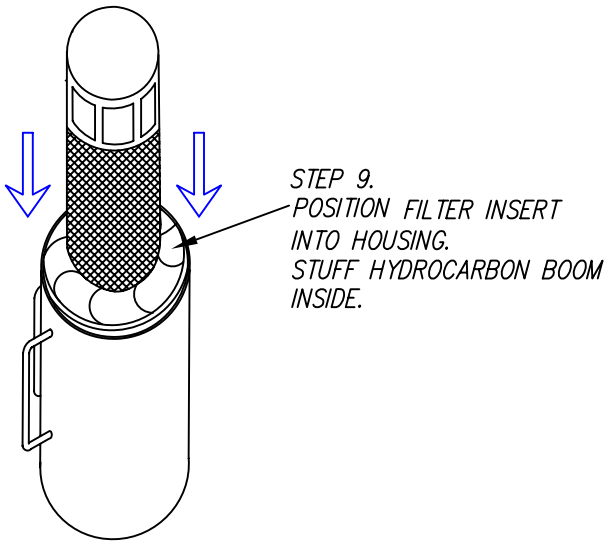
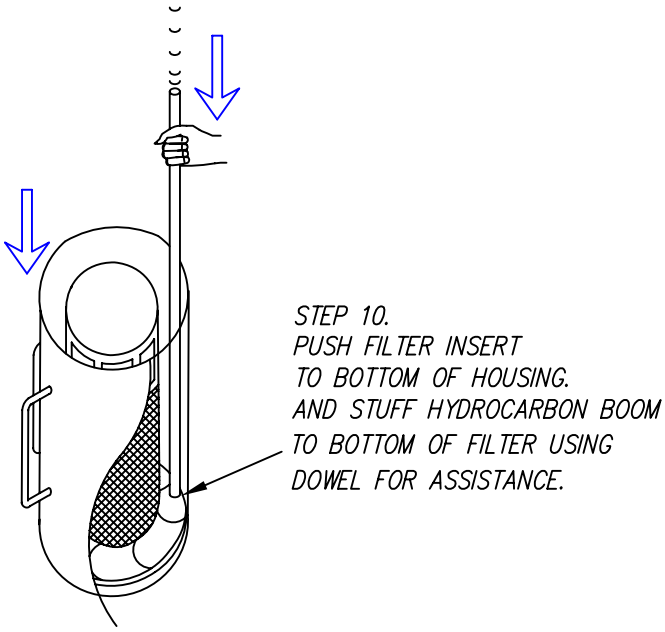
(760) 433-7640 Fax (760) 433-3176
www.biocleanenvironmental.net



REPLACING FILTER INSERT





REPLACING FILTER

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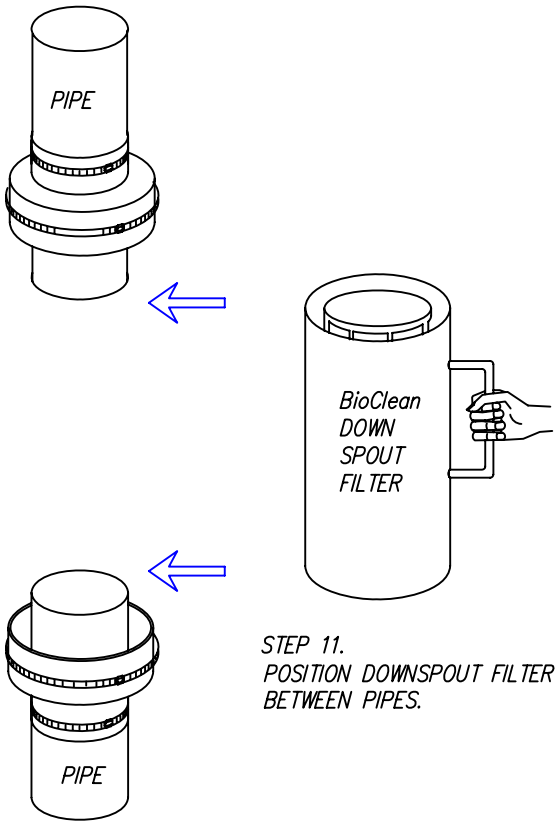
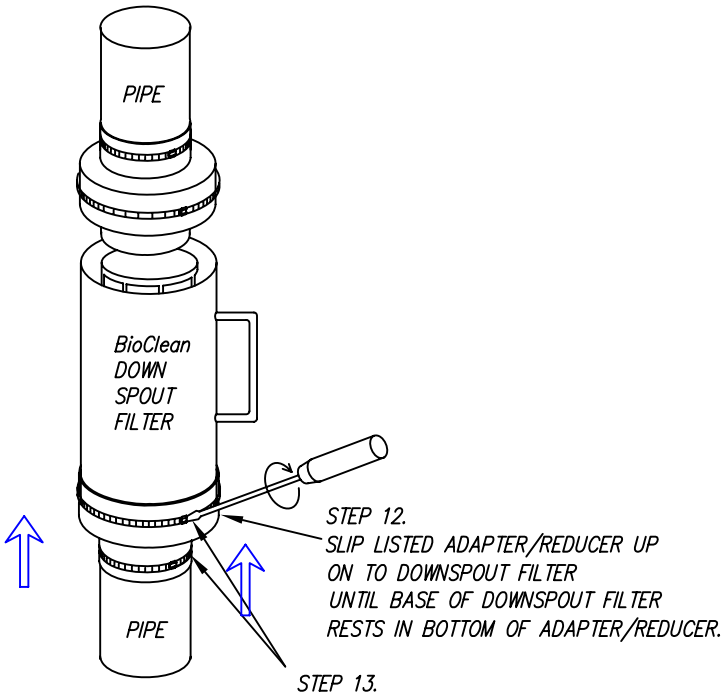
www.biocleanenvironmental.net

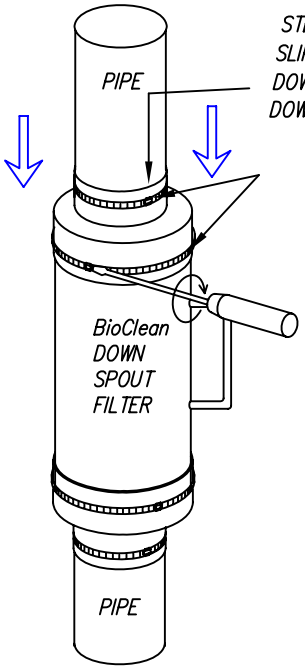


STEP 11.
POSITION DOWNSPOUT FILTER
BETWEEN PIPES.



STEP 12.
SLIP LISTED ADAPTER/REDUCER UP
ON TO DOWNSPOUT FILTER
UNTIL BASE OF DOWNSPOUT FILTER
RESTS IN BOTTOM OF ADAPTER/REDUCER.

STEP 13.
SECURE BY TIGHTENING
BOTH CLAMPS.



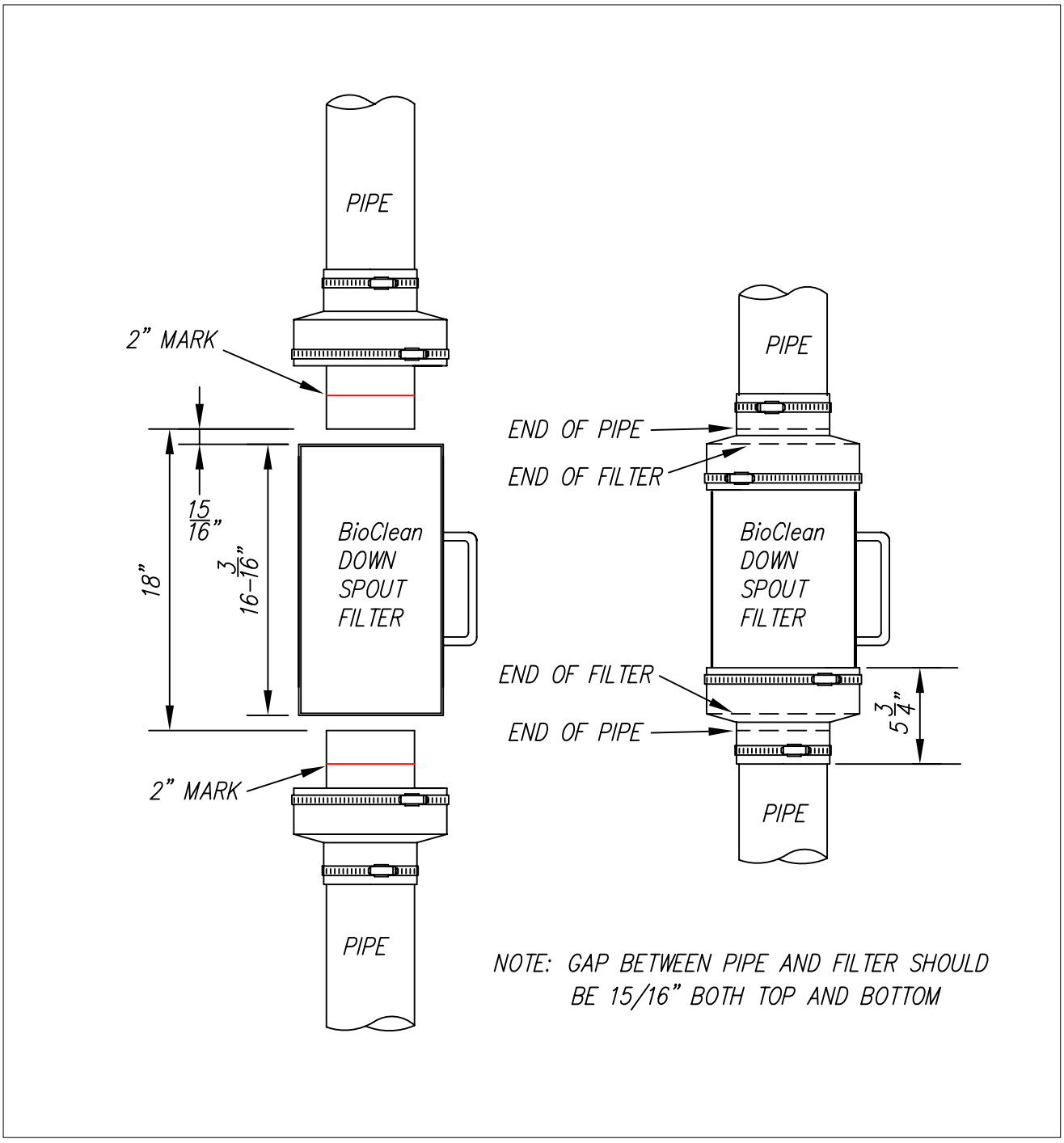
STEP 14.
SLIP LISTED ADAPTER/REDUCER
DOWNWARD ON TO
DOWNSPOUT FILTER.

STEP 15.
SECURE BY TIGHTENING
BOTH CLAMPS
WITH SCREWDRIVER.

ENSURE CLAMPS
ARE PROPERLY TIGHTENED.
SERVICE COMLPLETE.

APPROPRIATE INSTALLATION

FILTER CENTERED BETWEEN PIPES WITH EVEN GAPS ON TOP AND BOTTOM



BioClean
A Forterra Company

P.O. BOX 869, Oceanside, Ca. 92049
(760) 433-7640 Fax (760) 433-3176
www.biocleanenvironmental.net

Bio Clean
A Forterra Company

Section [_____]
Stormwater Quality In-Line Downspout Filtration Device

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for in-line devices used for filtration of stormwater runoff in structure downspouts. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Stormwater In-Line Downspout Filter (SWIDF) units are used for filtration of stormwater runoff in structure downspouts. The SWIDF is a cylindrical filter system composed of an external housing and internal cylindrical filter insert which is wrapped with various filter screens. The SWIDF is to be used for vertical flowing runoff only. Runoff enters the SWIDF from the top and flows into the area between the housing and internal cylinder. It then flows horizontally through the filter screen to the center bypass area and flow vertically down out of the housing. The SWIDF also utilizes a hydrocarbon boom wrapped around the bottom of the filter insert which absorbs hydrocarbons during low flows. The SWIDF has an internal bypass feature located in the center of the internal cylinder; when water flow exceeds the capacity of the filter screen or filter media it rises to a level where it enters large orifices at the top of the inner cylinder and bypasses directly out the bottom of the housing .

01.03.00 Manufacturer
The manufacturer of the SWIDF device shall be one that is regularly engaged in the engineering, design and production of systems developed for the treatment of stormwater runoff for at least (5) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the SWIDF(s) shall be a filter device manufactured by Bio Clean Environmental Services, Inc., or assigned distributors or licensees. Bio Clean Environmental Services Inc. can be reached at:

Corporate Headquarters:
2972 San Luis Rey Road
Oceanside, CA 92058
Phone: (760) 433-7640
Fax: (760) 433-3176
www.biocleanenvironmental.net

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and consulting engineer.

01.04.02 Shop drawings are to detail the SWIDF and all components required and the sequence for installation, including:
- Filter configuration with primary dimensions
- Interior components
- Any accessory equipment called out on shop drawings

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of SWIDF.

01.05.02 Manufacturer to supply completely assembled SWIDF(s):

- Exterior filter housing
- Interior filter cylinder insert
- Filter screen
- Hydrocarbon filter boom

01.05.03 Standard flexible adapters with clamps will be supplied with each filter unit, but it is the responsibility of the contractor to install the correct type of gaskets and couplings per local regulations. Note: standard adapters provided not acceptable in all jurisdictions. Please reference local regulations.

01.06.00 Reference Standards

ASTM A 240	Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM D 3789	Hydraulic Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method
ASTM D 4491	Water Permeability Geotextiles by Permittivity
ASTM D 4632	Grab Breaking Load and Elongation of Geotextiles
ASTM D 4833	Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 5919	Determination of Adsorptive Capacity of Activated Carbon by Micor-Isotherm Technique for Absorbents at ppb Concentrations
ASTM F 716	Testing Sorbent Performance of Absorbents
ASTM F 726	Sorbent Performance of Absorbents

PART 2 – COMPONENTS

02.01.00 Internal Filter Components

02.01.01 Filter Cylinder shall be manufactured using only Stainless Steel components with a minimum type 304 complying with the requirements of ASTM A 240, with a top and bottom thickness of 14 gauge (0.078") and a wall thickness of 20 gauge (0.038").

02.01.02 Mesh Screen shall be manufactured using only Stainless Steel wire mesh with a minimum type 304 complying with the requirements of ASTM A 240, with a wire diameter of 0.01mm and with a number 40 sieve size (420µm).

02.01.03 Hydrocarbon Filter Boom

- Filter media shall be made up of granulated oil absorbing polymers that have been tested in accordance with section 11.2 of ASTM F 716.07. Filter media must be proven to absorb 180% of its weight within a 300 second contact time, and at this absorption percentage the physical increase in the size of the granules is not more that 50%.
- Filter netting shall be 100% Polyester with a number 16 sieve size, and strength tested per ASTM D 3787.

02.01.04 Stainless Steel - All metal components shall be Stainless Steel. No galvanized or other zinc or copper containing treatments or alloys should be used.

02.02.00 External Filter Components

02.02.01 Filter Housing shall be manufactured using only Stainless Steel components with a minimum type 304 complying with the requirements of ASTM A 240, with a wall thickness of 1/8" (0.125") and a bottom ring of housing thickness of 10 gauge (0.134")

02.02.02 Handles shall be manufactured using 1/2" round Stainless Steel components with a minimum type 304 complying with the requirements of ASTM A 240.

02.02.03 Adapters

- Flexible Adapters/Couplings shall be made of an elastomeric compound that meets the requirements of ASTM D5926, C1173 and applicable portions of ASTM C443, C425, C564, CSA B602 and D1869, and must be leak-proof, root-proof and resistant to chemicals, ultraviolet rays and fungus growth. Specific jurisdictions may require a shielded or alternate type of adapter.
- Stainless Steel clamps must be corrosion-resistant and rust-proof.

02.02.04 Finishes shall consist of thermoplastic coating powder that meets standards in Table 1;

Table 1

Recommended Coating Thickness		300-750 µ
Appearance		Smooth/Glossy
Gloss	ISO 2813	70
Impact Strength	Gardner (drop weight) ISO 6272 Direct 23°C (3mm plate) Indirect 0°C (3mm plate) Gardner (drop weight) ISO 6272 Direct 23°C (0.7mm plate) Indirect 0°C (0.7mm plate)	 2.7 Joules 18.0 Joules > 27 Joules > 27 Joules
Abrasion	Taber ASTM D4060/84 H18, 500g load, 1000 cycles	60 mg weight loss
Salt Spray	ISO 7253 Steel - Scribed - Unscribed Aluminium - Scribed - Unscribed	Results after 1000 hours Loss of adhesion less than 10mm from scribe. Under film corrosion 2-3mm No loss of adhesion No loss of adhesion No loss of adhesion
Chemical Resistance*	- Dilute Acids 60°C - Dilute Alkali 60°C - Salts (except peroxides) 60°C - Solvents 23°C	Good Good Good Poor
Adhesion	PSL, TM 19	A-1
Weathering	QUV ASTM G53-77 Florida 45° facing South	2000 hrs - No significant change in color or loss of gloss. 3 years - No significant change in color or loss of gloss.
Burning Characteristics		
Ignitability	BS476: Pt5: 1979 500 micron coating	P - not easily ignitable
Surface spread of flame	BS476: Pt7: 1979 500 micron coating	Class 1
Fire Propagation	BS476: Pt6: 1989 500 micron coating	I = 0.2
Flammability	UL94	V_0 (see also Properties of Material)
Safe Working Temperature	(Continuous in air)	60°C max

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The SWIDF has no moving internal components and functions based on gravity flow, unless otherwise specified. The SWIDF is composed of an inner and outer cylinder. The outer cylinder is housing for the inner cylinder, which is perforated and wrapped with a filter screen. The bottom of the cylinder is wrapped with a hydrocarbon media boom to remove oils during low flows. The top of the inner cylinder is capped, which forces inflowing water towards the area between the inner and outer cylinders. Water entering this space is forced through the filer screens and /or hydrocarbon filter boom material. As water passes through the filter screens and/or hydrocarbon filter boom, particulate matter is captured and stored within the treatment area between the inner and outer cylinders. The upper part of the inner cylinder contains a plurality of multiple, larger openings which are not wrapped to allow water flows greater than the peak treatment flow rate to flow through the apparatus unimpeded, as a high flow bypass. Coverage of the SWIDF is to provide full treatment of influent stormwater, at rated flows.

03.01.02 Pollutants - The SWIDF will remove and retain debris, sediments, metals and hydrocarbons entering the filter during frequent storm events and specified flow rates.

03.01.03 Treatment Flow Rate and Bypass - The SWIDF operates in-line. The device has an internal bypass that is capable of directing flows in excess of the treatment flow rate. The SWIDF will treat 100% of the required water quality treatment flow based on Minimum Filtration Capacities listed in Table 2. The SWIDF will bypass any flow rate greater than the Filtration Capacity Requirements. The minimum bypass capacities are listed in Table 2.

03.01.04 Pollutant Load – The SWIDF must be designed to have minimum storage capacity of 0.23 cubic feet of solids and 1.62 pounds of hydrocarbons.

03.01.05 Performance Protocol and Results - The test setup and procedure shall be in accordance with IAMPO standards, except the bypass shall remain open and unplugged. A quantity of 20 mesh sand, equivalent in volume to the unit housing capacity, and randomly containing four halved 12 ounce paper cups shall be prepared. The mixture shall be gradually added to the system upstream of the filter at a rate resulting in the feed sand concentration approximately 150mg/L at a flow rate equivalent to 25% of the maximum Filtered Flow Capacity listed for the appropriate downspout model number in Table 2. The system shall be run at this flow rate for 20 minutes following the addition of the solids without having the water level backup as noted in the view port. The filter shall be capable of capturing a minimum of 60% of the sand.

03.02.00 Lab Test Performance

At a minimum, the SWIDF shall meet the performance standards in Table 2.

Table 2

MODEL NUMBER	INLET INSIDE DIAMETER		FILTER OUTSIDE DIAMETER		STORAGE CAPACITY		FILTERED FLOW		BYPASS FLOW	
	in.	cm.	in.	cm.	cf	L	gpm	lps	gpm	lps
BC-DF4	4	10.16	6.625	16.828	0.09	2.55	249	15.709	566	35.709
BC-DF6	6	15.24	8.625	21.908	0.21	5.95	509	32.113	1006	63.469
BC-DF8	8	20.32	8.625	21.908	0.21	5.95	509	32.113	1006	63.469
BC-DF10	10	25.40	12.750	32.385	0.77	21.80	1145	72.238	2264	142.84
BC-DF12	12	30.48	12.750	32.385	0.77	21.80	1145	72.238	2264	142.84

PART 4 - EXECUTION

04.01.00 General

The installation of the SWIDF shall conform to all applicable national, state, state highway, municipal and local specifications.

04.02.00 Installation

The Contractor or Plumber shall furnish all labor, equipment, materials and incidentals required to install the (SWIDF) device(s) and appurtenances in accordance with the drawings and these specifications.

04.02.01 The SWIDF will be securely installed inline with existing piping, with contact surfaces sufficiently joined together. The filter is connected to downspout piping with the use of 4", 6", or 8" approved couplers or adapters, secured with metal bands. The SWIDF shall be installed in a vertical position, pursuant to the manufacturer's recommendations and the details, shop drawings, and these specifications.

A. Remove couplers or adapters from both ends of the SWIDF.
B. Measure the exact height of the SWIDF, approximately 18"
C. Cut the existing piping ¼" longer than the exact height of the SWIDF.
D. Place the couplers or adapters on the top and bottom of the existing pipe, sliding them all the way up and down, even with the pipe.
E. Using the handles, place the filter in line with the existing pipe. Slide the couplers or adapters back in place over the filter and tighten the clamps securely.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – SWIDF shall be shipped to the contractor's address and is the responsibility of the contractor to transport the unit(s) to the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the SWIDF components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be born by the contractor. The SWIDF(s) shall always be stored indoors and transported inside the original shipping container until the unit(s) are ready to be installed. The SWIDF shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor or plumber shall demonstrate that the SWIDF has been properly installed at the correct location(s), elevations, and with appropriate seals and gaskets. All components associated with the SWIDF and its installation shall be subject to inspection by the engineer at the place of installation. In addition, the contractor shall demonstrate that the SWIDF has been installed per the manufacturer's specifications and recommendations.

04.04.02 Maintenance – The manufacturer recommends cleaning and debris removal maintenance of twice a year and replacement of the Hydrocarbon Filter Media. The maintenance shall be preformed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the SWIDF. A Maintenance/Inspection record shall be kept by the maintenance operator. The record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured by the SWQIDF shall be transported and disposed of at an approved facility for disposal in accordance with local and state requirements. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURANCE

05.01.00 Warranty

The Manufacturer shall guarantee the SWIDF against all manufacturing defects in materials and workmanship for a period of (5) years from the date of delivery to the contractor or plumber. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The SWQIDF is limited to recommended application for which it was designed.

05.02.00 Performance Certification

The SWIDF manufacturer shall submit to the Engineer of Record a "Manufacturer's Performance Certificate" certifying the SWIDF is capable of achieving the specified removal efficiency for suspended solids as set by the International Association of Plumbing and Mechanical Official (IAMPO) guide criteria for in-line devices for downspout filtration – IAMPO IGC 214-2008 as revised October, 2008. Devices without suspended solids testing done by an IAMPO approved company and/or approved by the IAMPO will not be accepted.

Appendix B

Western Washington Hydrology Model Report for Estes Express Lines

WWHM2012
PROJECT REPORT

Project Name: wwhm estes
Site Name:
Site Address:
City :
Report Date: 4/30/2018
Gage : Seatac
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.00
Version Date: 2017/04/14
Version : 4.2.13

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
Pervious Total	0

Impervious Land Use	acre
PARKING FLAT	5.71
Impervious Total	5.71
Basin Total	5.71

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
Pervious Total	0

Impervious Land Use	acre
PARKING FLAT	5.71
Impervious Total	5.71
Basin Total	5.71

Element Flows To:
Surface Interflow Groundwater

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:0
Total Impervious Area:5.71

Mitigated Landuse Totals for POC #1
Total Pervious Area:0
Total Impervious Area:5.71

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	2.177021
5 year	2.749831
10 year	3.139016
25 year	3.643845
50 year	4.030227
100 year	4.425993

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	2.177021
5 year	2.749831
10 year	3.139016
25 year	3.643845
50 year	4.030227
100 year	4.425993

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	2.820	2.820
1950	3.047	3.047
1951	1.761	1.761
1952	1.567	1.567
1953	1.692	1.692
1954	1.770	1.770
1955	2.007	2.007
1956	1.975	1.975
1957	2.241	2.241
1958	1.808	1.808
1959	1.844	1.844
1960	1.810	1.810
1961	1.914	1.914
1962	1.668	1.668
1963	1.853	1.853
1964	1.817	1.817
1965	2.308	2.308
1966	1.543	1.543
1967	2.659	2.659
1968	3.024	3.024
1969	2.102	2.102
1970	2.028	2.028
1971	2.419	2.419
1972	2.497	2.497
1973	1.512	1.512
1974	2.207	2.207
1975	2.542	2.542
1976	1.709	1.709
1977	1.851	1.851
1978	2.265	2.265
1979	3.100	3.100
1980	2.781	2.781
1981	2.275	2.275
1982	3.208	3.208
1983	2.611	2.611
1984	1.647	1.647
1985	2.270	2.270
1986	1.967	1.967
1987	3.035	3.035
1988	1.842	1.842
1989	2.303	2.303
1990	3.879	3.879
1991	3.099	3.099
1992	1.631	1.631
1993	1.413	1.413
1994	1.537	1.537
1995	2.017	2.017
1996	2.147	2.147
1997	2.085	2.085
1998	2.113	2.113
1999	4.323	4.323
2000	2.152	2.152
2001	2.364	2.364
2002	2.758	2.758

2003	2.143	2.143
2004	4.045	4.045
2005	1.848	1.848
2006	1.633	1.633
2007	3.780	3.780
2008	3.045	3.045
2009	2.814	2.814

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.3230	4.3230
2	4.0447	4.0447
3	3.8795	3.8795
4	3.7804	3.7804
5	3.2080	3.2080
6	3.0999	3.0999
7	3.0992	3.0992
8	3.0469	3.0469
9	3.0451	3.0451
10	3.0354	3.0354
11	3.0238	3.0238
12	2.8196	2.8196
13	2.8139	2.8139
14	2.7811	2.7811
15	2.7581	2.7581
16	2.6594	2.6594
17	2.6110	2.6110
18	2.5421	2.5421
19	2.4971	2.4971
20	2.4189	2.4189
21	2.3643	2.3643
22	2.3081	2.3081
23	2.3030	2.3030
24	2.2750	2.2750
25	2.2698	2.2698
26	2.2645	2.2645
27	2.2406	2.2406
28	2.2066	2.2066
29	2.1517	2.1517
30	2.1467	2.1467
31	2.1429	2.1429
32	2.1130	2.1130
33	2.1020	2.1020
34	2.0847	2.0847
35	2.0280	2.0280
36	2.0174	2.0174
37	2.0073	2.0073
38	1.9751	1.9751
39	1.9673	1.9673
40	1.9142	1.9142
41	1.8528	1.8528
42	1.8513	1.8513
43	1.8484	1.8484
44	1.8442	1.8442
45	1.8415	1.8415

46	1.8169	1.8169
47	1.8097	1.8097
48	1.8080	1.8080
49	1.7703	1.7703
50	1.7613	1.7613
51	1.7094	1.7094
52	1.6919	1.6919
53	1.6678	1.6678
54	1.6470	1.6470
55	1.6328	1.6328
56	1.6311	1.6311
57	1.5668	1.5668
58	1.5433	1.5433
59	1.5368	1.5368
60	1.5122	1.5122
61	1.4127	1.4127

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.0885	1805	1805	100	Pass
1.1182	1637	1637	100	Pass
1.1479	1476	1476	100	Pass
1.1777	1345	1345	100	Pass
1.2074	1228	1228	100	Pass
1.2371	1101	1101	100	Pass
1.2668	1005	1005	100	Pass
1.2965	920	920	100	Pass
1.3262	853	853	100	Pass
1.3559	794	794	100	Pass
1.3857	726	726	100	Pass
1.4154	665	665	100	Pass
1.4451	610	610	100	Pass
1.4748	572	572	100	Pass
1.5045	533	533	100	Pass
1.5342	488	488	100	Pass
1.5639	451	451	100	Pass
1.5937	420	420	100	Pass
1.6234	389	389	100	Pass
1.6531	364	364	100	Pass
1.6828	339	339	100	Pass
1.7125	316	316	100	Pass
1.7422	295	295	100	Pass
1.7719	272	272	100	Pass
1.8017	256	256	100	Pass
1.8314	238	238	100	Pass
1.8611	221	221	100	Pass
1.8908	208	208	100	Pass
1.9205	193	193	100	Pass
1.9502	181	181	100	Pass
1.9799	171	171	100	Pass
2.0097	161	161	100	Pass

2.0394	148	148	100	Pass
2.0691	139	139	100	Pass
2.0988	135	135	100	Pass
2.1285	122	122	100	Pass
2.1582	113	113	100	Pass
2.1879	108	108	100	Pass
2.2177	105	105	100	Pass
2.2474	100	100	100	Pass
2.2771	92	92	100	Pass
2.3068	87	87	100	Pass
2.3365	84	84	100	Pass
2.3662	73	73	100	Pass
2.3959	71	71	100	Pass
2.4257	66	66	100	Pass
2.4554	63	63	100	Pass
2.4851	62	62	100	Pass
2.5148	58	58	100	Pass
2.5445	54	54	100	Pass
2.5742	54	54	100	Pass
2.6039	52	52	100	Pass
2.6337	50	50	100	Pass
2.6634	46	46	100	Pass
2.6931	45	45	100	Pass
2.7228	40	40	100	Pass
2.7525	39	39	100	Pass
2.7822	33	33	100	Pass
2.8119	32	32	100	Pass
2.8417	29	29	100	Pass
2.8714	28	28	100	Pass
2.9011	25	25	100	Pass
2.9308	22	22	100	Pass
2.9605	21	21	100	Pass
2.9902	20	20	100	Pass
3.0199	17	17	100	Pass
3.0497	13	13	100	Pass
3.0794	12	12	100	Pass
3.1091	9	9	100	Pass
3.1388	9	9	100	Pass
3.1685	9	9	100	Pass
3.1982	9	9	100	Pass
3.2279	8	8	100	Pass
3.2577	8	8	100	Pass
3.2874	8	8	100	Pass
3.3171	8	8	100	Pass
3.3468	8	8	100	Pass
3.3765	8	8	100	Pass
3.4062	8	8	100	Pass
3.4359	7	7	100	Pass
3.4657	7	7	100	Pass
3.4954	7	7	100	Pass
3.5251	7	7	100	Pass
3.5548	7	7	100	Pass
3.5845	7	7	100	Pass
3.6142	6	6	100	Pass
3.6439	6	6	100	Pass
3.6737	6	6	100	Pass
3.7034	6	6	100	Pass

3.7331	6	6	100	Pass
3.7628	6	6	100	Pass
3.7925	5	5	100	Pass
3.8222	5	5	100	Pass
3.8519	4	4	100	Pass
3.8817	3	3	100	Pass
3.9114	3	3	100	Pass
3.9411	2	2	100	Pass
3.9708	2	2	100	Pass
4.0005	2	2	100	Pass
4.0302	2	2	100	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0.7023 **acre-feet**
On-line facility target flow: 0.9277 **cfs.**
Adjusted for 15 min: 0.9277 **cfs.**
Off-line facility target flow: 0.5242 **cfs.**
Adjusted for 15 min: 0.5242 **cfs.**

LID Report

LID Technique	Used for Water Quality?	Total Volumn Percent Treatment Needs (ac-ft)	Volumn Through Facility (ac-ft)	Infiltration Volumn (ac-ft.)	Cumulative Volumn Infiltration Credit	Percent Volumn Infiltrated	Comment Water Quality Treated
Total Volume Infiltrated		0.00	0.00	0.00	0.00	0.00	No Treat. Credit

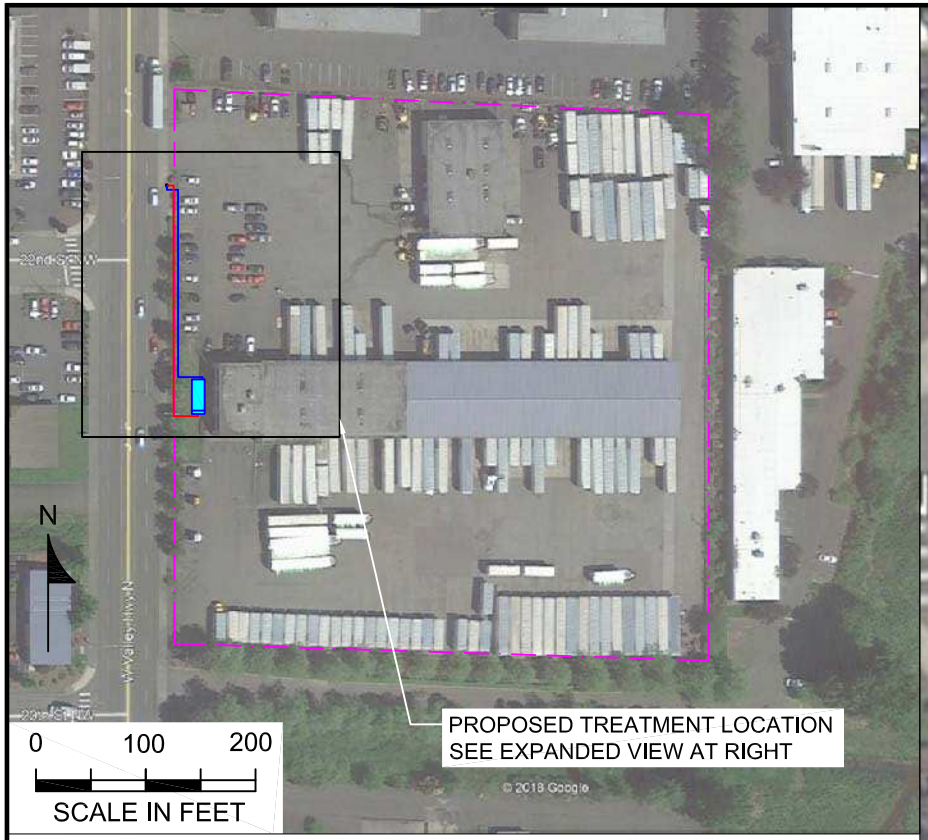
Compliance with LID Standard 8
Duration Analysis Result = Passed

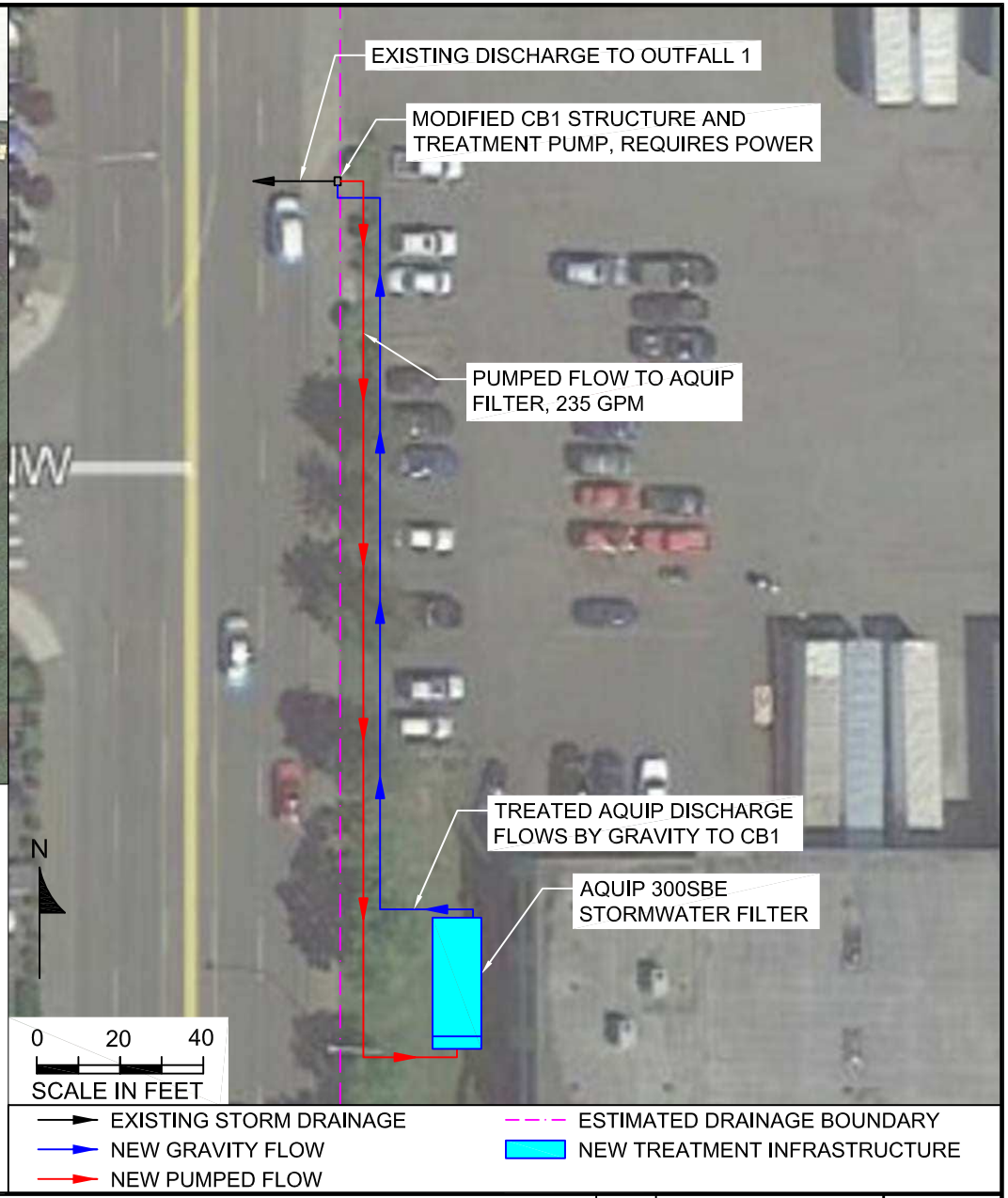
Perlnd and Implnd Changes

No changes have been made.

Appendix C

Proposed Stormwater Treatment Site Layout





NOTES:

1. STORMWATER RUNOFF GENERATED ONSITE IS COLLECTED IN EXISTING CATCH BASINS AND CONVEYED TO CB1 PRIOR TO DISCHARGE.
2. CB1 VAULT STRUCTURE MODIFIED TO PROVIDE DEEPER SUMP IN ORDER TO ACCOMMODATE A NEW 235-GPM SUBMERSIBLE TREATMENT PUMP. REQUIRES POWER.
3. TREATMENT PUMP PROVIDES FLOW TO NEW AQUIP 300SBE STORMWATER FILTER. AQUIP FILTER TREATS AT 235 GPM AND DISCHARGES TREATED STORMWATER BY GRAVITY TO MODIFIED CB1 STRUCTURE.
4. TREATED STORMWATER JOINS CB1 DISCHARGE AT A POINT IMMEDIATELY DOWNSTREAM OF THE CB1 OUTLET.

stormwateRx
www.stormwaterx.com

PROPOSED STORMWATER TREATMENT LAYOUT
ESTES EXPRESS LINES
AUBURN, WA

DATE	REVISIONS

SHEET 1

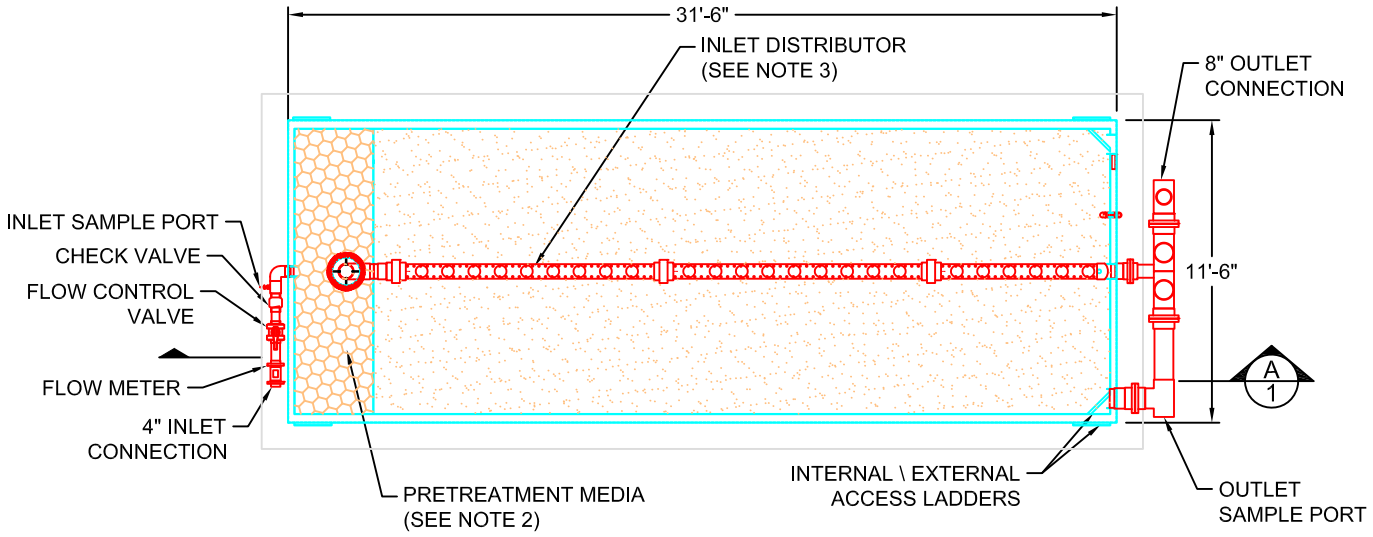
DATE: 5/1/2018	SCALE: NONE	FILE NAME: Estes Express Proposed	DRAWN: RC	CHECKED:	1 OF 1

Appendix D

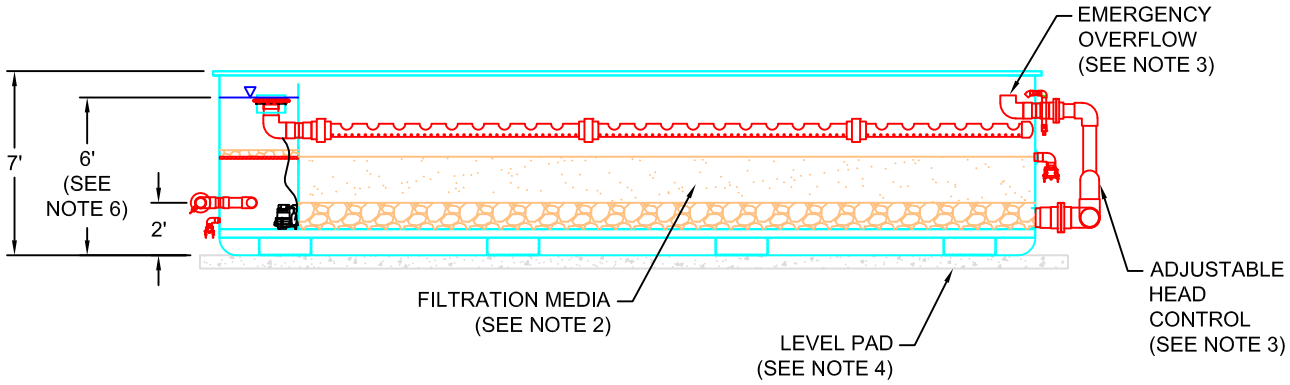
Aquip 300SBE Standard Detail Drawing

GENERAL NOTES

1. AQUIP® FILTRATION SYSTEM BY STORMWATERX LLC - PORTLAND, OREGON - 800.680.3543 (U.S. PATENT NO. 8,002,974).
2. PRETREATMENT AND FILTER MEDIA COMBINATION DEPENDENT ON POLLUTANT REMOVAL REQUIREMENTS. MODELS: SBE: OMNIPLEX & INERT/SORPTIVE MEDIA, SXI:SETTLING PRETREATMENT & INERT MEDIA.
3. INTERNAL APPURTENANCES BY STORMWATERX INCLUDING INLET AND OUTLET SAMPLE PORTS, INLET FLOW CONTROL & CHECK VALVES, INLET DISTRIBUTOR, UNDERDRAIN SYSTEM, EMERGENCY OVERFLOW AND ADJUSTABLE HEAD CONTROL.
4. SYSTEM REQUIRES LEVEL SURFACE FOR 35.5' x 11.5' FOOTPRINT AND LOAD BEARING CAPACITY OF 175,000 LBS. SYSTEM INSTALLATION REQUIRES A CRANE TO OFFLOAD AND SET TANK IN PLACE.
5. INLET AND OUTLET PIPING CONNECTION SIZE AS NOTED. CONNECTION PIPING PROVIDED BY OTHERS. CENTER INLET STANDARD, INLET CONNECTION LEFT OR RIGHT (RIGHT SHOWN). OPTIONAL LEFT OR RIGHT OUTLET (LEFT OUTLET SHOWN).
6. THE OPERATING WATER SURFACE HEIGHT IS 6' ABOVE BOTTOM OF STRUCTURE.



TOP VIEW 1/1



SECTION VIEW A/1

aquip®

stormwateRx®
www.stormwaterx.com

AQUIP MODEL 300S
STORMWATER FILTRATION SYSTEM
STANDARD DETAIL

DATE:	SCALE:	FILE NAME:	DRAWN:	CHECKED:
2/22/2018	NONE	SRX-AQUIP-300S-DTL	MJW	ARG

SHEET 1

Appendix E

Aquip O&M Manual

Stormwater Filtration System

Operation & Maintenance Manual

122 Southeast 27th Avenue
Portland, OR 97214

www.stormwaterx.com | 800.680.3543

stormwateRx®
Reclaiming the world's water.®

v017

Table of Contents

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Important!

Do not neglect upstream source control and stormwater management once Aquip is installed. This may result in the premature fouling of the Aquip filtration and pollutant reduction capacity, shortening bed life.

Do not flush spills or otherwise use Aquip to capture pollutants from stormwater drain line jetting or pavement washing.

Lifting Aquip once the media has been installed may result in damage to the tank. All the media except the underdrain gravel should be removed before attempting to move Aquip.

Regular maintenance of the media surface will ensure optimal performance results as well as increase the lifespan of the media bed. The removed media needs replacement after removing more than 2". Media replacement should not be done in the place of seasonal maintenance.

Do not pressure-wash or rinse the inside of the Aquip prior to removing the filtration media.

Stormwater sampling should be done with care. Use new sampling bottles and avoid contaminating samples with dirt from the Aquip sample port or your hands.

Freezing conditions can cause damage to the external plumbing on Aquip. Please refer to this manual to take the necessary precautions.

1 Introduction and System Description

The Aquip (Figure 1, below) is a passive adsorptive depth filtration technology designed specifically for reduction of stormwater pollutants such as suspended solids, turbidity, heavy metals, nutrients and organics from industrial sites. The Aquip is a patented system that uses a pretreatment chamber followed by a series of inert and adsorptive (depending on the configuration) filtration media to effectively trap pollutants in a pre-configured package. The Aquip structure is typically concrete (C), steel (S) or pre-cast concrete blocks for high flow applications (HF). Pollutant removal within the pretreatment chamber occurs by gravity settling; pollutant removal within the filtration chamber occurs through a combination of chemical complexing, co-precipitation, adsorption, absorption, micro-sedimentation, filtration and biological degradation.

Figure 1: Aquip Stormwater Filtration System

1.1 Aquip Features

(1) **Inlet:** Polluted stormwater flows into the Aquip via the inlet pipe which controls and monitors the flow into the system.

a. **Inline Flow Meter:** An electromagnetic flow meter displays the operating flow rate and the total volume of water treated by the Aquip. The volume of water treated should be recorded at regular intervals to help in planning maintenance intervals.
b. **Flow Control Valve:** The valve used to calibrate the proper flow rate into the Aquip.
c. **Inlet Check Valve:** This check valve keeps the standing water level in the pretreatment chamber at the correct level.
d. **Inlet Sample Port:** Allows for the convenient sampling of the inlet stormwater.

(2) **Pretreatment:** This chamber is customized to improve the quality of the stormwater prior to treatment in the filtration chamber. The pretreatment chamber can be configured for settling coarse solids, skimming free floating oil, conditioning the stormwater for dissolved metals removal, or optimizing organics removal, or any combination thereof.

The **conditioning** option is the most common configuration. The Aquip uses a passive pretreatment process which accelerates the output of alkalinity, an important constituent in natural waters. This pretreatment works synchronously with several of the adsorptive filtration media layers within the filtration chamber. The pretreated water helps positively charged metallic ions find negatively charged alkalinity compounds. Some of these positive and negative ions form insoluble complexes that are removed in the filtration chamber. Within the Aquip filtration treatment chamber some of the metals are removed as precipitates by micro-sedimentation. Because of the low alkalinity common to most stormwater, particularly those from facilities where most of the surface is paved, there is not lingering effect of the pretreatment process.

Other options are the basic solid settling configuration or the oil water separator design. All configurations come standard with a precautionary **oil skimmer** that helps to trap and absorb free oil inside of the pretreatment chamber.

(3) **Inlet Distributor:** Water from the pretreatment chamber flows into the inlet distributor and is dispersed along the full length of the filter media bed optimizing the contact area of stormwater with filtration media. The **energy dissipation fabric** lies beneath the distributor to prevent scouring of the media bed.

(4) **Filtration Treatment:** Layers of inert and adsorptive media make up the **media bed** which filters out stormwater pollutants such as metals, particulates, oil, organics and nutrients. Once filtered through the media bed, clean stormwater flows into the **underdrain** located along the bottom of the media bed.

(5) **Outlet Manifold:**
   a. **Outlet Sample Port:** Allows for the convenient sampling of treated stormwater.
   b. **Adjustable Head Control:** Clean stormwater leaving the filter bed passes through the adjustable head control. This device can be adjusted in the field and assures optimal water-filter media contact under a range of operating conditions.

(6) **Emergency Overflow:** The upturned elbow provides a means of bypass for stormwater if the media bed is no longer draining at a rate that keeps pace with the influent design flow rate. A passive **overflow indicator** on the outside of the Aquip tank visually indicates when an emergency overflow has occurred. After each overflow event, this feature needs to be reset by releasing the water stored inside the overflow indicator by turning the petcock valve at the bottom of the device.

(7) **Outlet:** Clean stormwater is discharged from the Aquip through the outlet pipe to an existing conveyance line or to an infiltration gallery or other means of disposal or reuse.

(8) **Sample Port:** Effluent stormwater samples are collected from the sample tap installed on the outlet manifold.

The “Installed Aquip Project Specifications” sheet at the beginning of this manual will provide the details of the system installed at your site. Refer to this document for details on your site-specific Aquip system. A description of the Aquip model numbers are provided in Table 1, below.

Table 1. Aquip Model Descriptions

System Size	Tank Material	Pretreatment Media	Filtration Chamber Media
10	P: Plastic	B: Conditioning	E: Enhanced Metals
25	S: Steel	O: Oil Coalescing	I: Inert
50	C: Concrete	X: Settling (no media)	Z: Special
80	U: User Supplied		G: Enhanced Organics
110	H: High Flow		
160	G: Green - Infiltrating		
210			
300			
400			
800			
Example: Model 210SBE			

Typical Installation Configuration

In most applications, the Aquip system is installed as a retrofit and installation is above ground. In this case, stormwater needs to be pumped from a below-ground vault or catch basin to the Aquip. In some cases, stormwater is first pumped to an above-ground storage tank and stormwater is drained by gravity through the Aquip. A configuration with a storage tank is referred to as “Storage Discharge” (Figure 2, left). Configurations without a storage tank are called “Direct Discharge” (Figure 2, right).

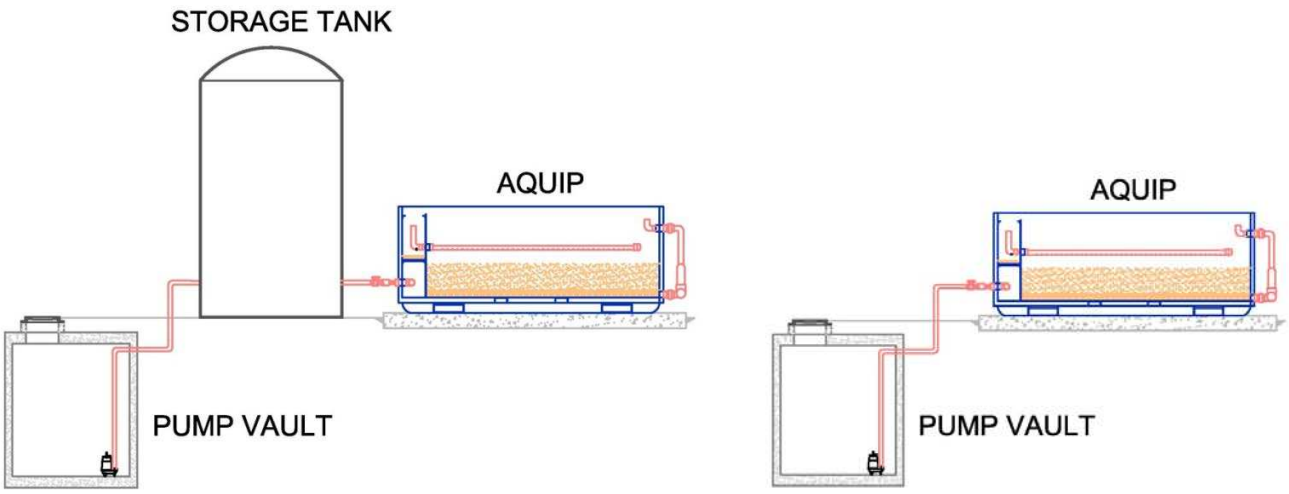

Figure 2. Storage discharge configuration (left) and direct discharge configuration (right).

2 Aquip Operations

Regular inspection and maintenance is required for the proper operation of the Aquip. Site conditions vary such that the maintenance requirements cannot be prescribed without regular inspections. Inspections determine the type and frequency of maintenance required and regular maintenance keeps the Aquip operating at optimal conditions to improve the performance and media longevity.

2.1 Wet Start-up Procedures

The Aquip is typically installed during dry weather when there is not sufficient stormwater available to complete the final steps to put the Aquip online. StormwateRx LLC personnel will leave the Inlet Flow Control Valve set to half open until the flow rate to the system can be calibrated. During the first storm event, it is imperative that the owner calibrate the flow rate through the system to that designated in the Installed Aquip Project Specification sheet at the front of this manual.

Step 1. **Fill above ground storage tanks:** For Storage Discharge configurations only. For Direct Discharge, proceed to Step 2. Close the outlet valve from the storage tank (or the Inlet Flow Control Valve to the Aquip) and fill the above ground storage tank(s) until the water level is near the top of the tank(s).

Step 2. **Flow calibration:** Adjust the Inlet Flow Control Valve until the Inline Flow Meter indicates the design/nameplate flow rate as noted on the flow meter (Figure 3, page 5). The design flow rate is listed in the Installed Aquip Project Specification sheet at the front of this manual.

Step 3. **Inlet Distributor adjustment:** Adjust the height of the Inlet Distributor until each arc of water is roughly uniform across the entire length of the Aquip filtration chamber (Figure 4, page 6). This is done by tightening or loosening the plastic washers on the threaded rod suspending the Inlet Distributor.

Step 4. **System operation:** Monitor system throughout the first storm event to confirm stormwater is passing through the Aquip. Inspect outfall point of stormwater conveyance line to confirm there is free discharge. Note that the Aquip filter performance improves (outlet water clarity should improve) after the first or second storm event. This occurs because the stormwater particulates that are captured by the Aquip filtration bed in early storm events actually assist the particle filtration process, thereby producing better water clarity with time. This process is known as “bed seasoning.”

Step 5. **After storm inspection:** Inspect the Aquip after the storm event. Normally, owners observe an accumulation of fine solids over the top of the filtration chamber. If the thickness is greater than 1/4-inch, additional upstream source control may be beneficial to reduce sediment loading to the system (see Section 7).

Figure 3. Inlet piping with flow meter (right); Uniform flow out the inlet distributor (left)

2.2 Inspections

During the first rainy season, inspections should be conducted weekly or every two to three storms to establish site-specific inspection and maintenance intervals. Regular inspections will verify that the system is in good operating condition and should be recorded as part of the monthly inspection program and the facility Stormwater Pollution Prevention (or Control) Plan (SWPPP or SWPCP). Inspections are also recommended after every major storm event. An inspection report template is included at the end of this manual to assist with record keeping.

AN INSPECTION DURING A RAIN EVENT IS THE BEST METHOD OF ASSESSING HOW WELL THE AQUIP SYSTEM IS OPERATING

Flow meter

- Verify that the flow rate to the Aquip matches the design flow rate. Operating the Aquip at a rate other than the designated design flow rate will affect the system performance and may not be allowable under the stormwater permitting rules. Adjust the flow rate as necessary. Opening the flow control valve such that the flow rate is increased will decrease system performance. The flow rate should only be adjusted when the storage tank(s) are full for the Storage Discharge system configuration.

Pretreatment Chamber

For Aquip SBE with pretreatment media

- Inspect the amount and distribution of the pretreatment media. There should be at least 3 inches of pretreatment media evenly distributed across the media grates.
- Inspect for the accumulation of solids and debris on top of the pretreatment media. Before removing accumulated debris, drain down the pretreatment chamber through the inlet sample port.

- Inspect for solidification of the pretreatment media. If present, clumps of media should be broken up with a shovel.

For Aquip SOI or SOE with oil coalescing packs

- Inspect the water surface for heavy oil sheen. If a heavy sheen is present, remove the accumulated oil from the surface.
- Inspect the side walls of the Pretreatment Chamber for heavy oil and debris accumulation. If heavy oil and debris are present, follow the maintenance steps described in the Section 3.3.

Inlet Distributor

- Inspect the perforations for the accumulation of debris. The accumulation of any debris should be removed by hand.
- During a storm event, verify that the flow of water out of the perforations is uniform the entire length of pipe. For storage Discharge configurations, the Inlet Distributor should only be adjusted when the storage tank(s) are full.

Media Bed

- During a storm event, observe the water level above the media bed relative to the Inlet Distributor. Note that the water level may increase during the first 15 minutes of operation.
- Inspect the accumulation of solids on the surface of the media (Figure 4, below). Observe the appearance of the solids and its distribution across the media surface. If more solids than sand are visible on top of the media, refer to Routine Surface Maintenance Section 3.1.1.
- Check for a hardened or brittle media surface in the absence of solids accumulation. If the media surface is hardened, break up the media surface to help restore hydraulic capacity.
- Verify that the Energy Dissipation Fabric is clean and laying flat beneath the Inlet Distributor. The Energy Dissipation Fabric may be re-anchored by pushing small amounts of filter sand over the fabric at various intervals.

Outlet Sample Port

- Collect the effluent from the Aquip to observe changes in water clarity. The clarity of the water is best observed using a clear glass/plastic container. As mentioned earlier, water clarity should improve after the first few storms.

Figure 4. Accumulation of solids on the media bed surface

2.3 Optimal Operating Conditions

The Aquip should be maintained regularly for optimal performance and media longevity. Observe the water level within the Filtration Chamber to determine optimal operation. Both of the following conditions need to be met for the Aquip to be operating at optimal conditions:

- Water has been draining through the Inlet Distributor continuously for 15 minutes or more.
- The water level within the filter is above the surface of the media and below the Inlet Distributor (Figure 5, below).

However, for LIGHT RAIN or INTERMITTENT RAIN conditions, neither of the two conditions may be established.

Should the water level within the Filtration Chamber reach the Inlet Distributor, maintenance should be performed to re-establish the proper flow through the Aquip (see Section 3).

Figure 5. Best operating water level in filtration chamber for optimal pollutant removal conditions

2.4 Weatherizing the System for Freezing Weather

In areas that are prone to continuous freezing weather, StormwateRx LLC recommends weatherizing certain components of the Aquip filtration system and/or purchasing the pre-installed freeze protection package

Online Application – Keeping Filter In Service

This procedure applies to Aquip systems that must stay online through periods of freezing weather.

Freeze Protection Package

For systems with a StormwateRx Freeze Protection package, turn the system on. The freeze protection system is thermostatically controlled with radiant heaters to keep the filter body above freezing. The freeze protection package can only be obtained at time of the Aquip purchase.

If your system does not have factory-installed freeze protection package, owners may apply heating elements to the bottom of the Aquip tank to help keep the filter media from freezing. These heating elements can include, but are not limited to, heat panels, blankets, and/or coils.

Freeze Protect Inlet Piping

Heat tracing and insulation of all above ground inlet plumbing is recommended (Figure 6, below). For many Aquip inlet plumbing designs, the pump discharge includes a check valve. This causes the inlet plumbing to stay full of water and may be subject to freezing. Above-ground inlet plumbing for the Aquip system is typically 5 – 10 linear feet.

Figure 6. Aquip inlet line heat tracing (left) and Aquip inlet line insulation (right).

Freeze Protect the Pretreatment Chamber

The pretreatment chamber will either have standing water in it, up to the bottom of the riser pipe connecting the pretreatment chamber to the filtration chamber (Figure 7, left, page 9), or will be pumped down below the pretreatment rack with the pretreatment pump (Figure 7, right, page 9, shown with pretreatment rack removed). In either case, the standing water in the pretreatment chamber may freeze or develop a surface ice skim layer, depending on the extent of freezing weather. This thin layer of ice will not impair operations and should break up as the water rises with pumped flow.

Figure 7. Aquip pretreatment chamber without pump (left) and with pretreatment pump (right).

In anticipation of a freezing event that is predicted to have sustained temperatures below 25 degrees F for two or more days:

- Drain the pretreatment chamber using the pretreatment chamber drain-down valve* (Figure 8, below). Close the valve after water has stopped flowing.

Figure 8. Pretreatment chamber drain-down valve

Freeze Protecting the Filtration Chamber

The filtration chamber contains loose filter media and accumulated sediment for Aquip systems that have been in operation. The wetted filter media may become clumpy as the pore water within the filtration media granules freezes. In anticipation of a freezing event, the following steps are recommended for the filtration chamber of treatment systems without freeze protection:

1. Drain down any standing water in the filtration chamber through the filtration chamber drain-down valve (Figure 9, below).
2. Perform a routine maintenance to remove accumulated sediment and media containing sediment.
3. Add at least one inch of topper media to insulate the remaining used filter media in anticipation of the freezing event.

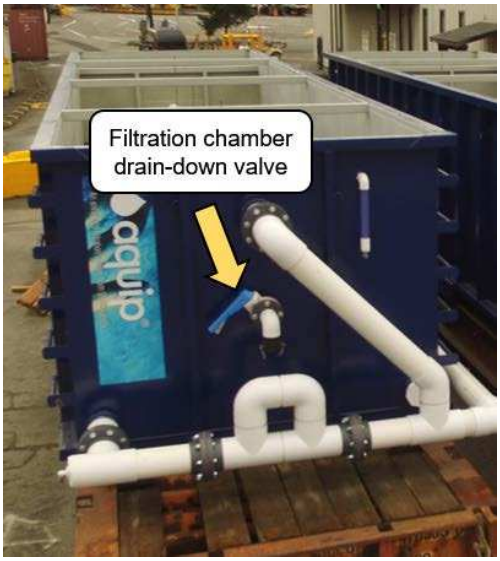

Figure 9. Filtration chamber drain-down valve.

Freeze Protecting Outlet Piping

Outlet piping from the Aquip should be empty between storm events and as such, freezing of the outlet manifold should not occur.

Offline Application – Taking the Filter Out of Service for the Winter

This procedure applies to Aquip systems that:

- operate in areas where a hard, long winter freeze is typical;
- do not have a freeze protection package; and,
- are taken offline for the winter season.

Seasonally Decomissioning Inlet Piping

Inlet piping between the check valve and the Aquip filter will be full of water and could freeze during cold weather. To prevent damage:

1. Turn off the pump to the system.
2. Drain the pretreatment chamber through the pretreatment drain-down valve* (Figure 10, page 11).
3. Drain the inlet piping using the inlet sample port (Figure 10, page 11).

Seasonally Decommissioning the Pretreatment Chamber

- Drain the pretreatment chamber using the pretreatment chamber drain-down valve* (Figure 10, page 11). Close the valve after water has stopped flowing.

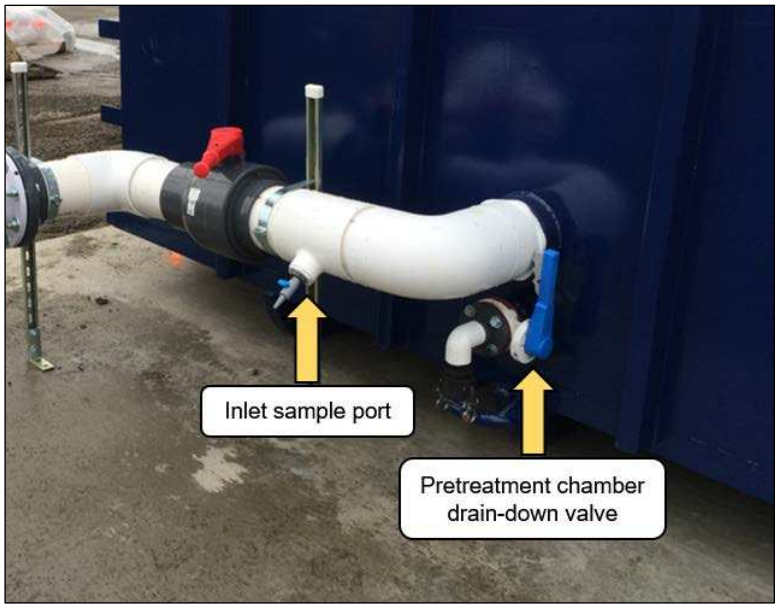

Figure 10. Aquip pretreatment chamber and inlet piping drains.

Filtration Chamber

The Filtration Chamber contains loose filter media and accumulated sediment for Aquip systems that have been in operation. The wetted filter media may become clumpy as the pore water within the filtration media granules freezes. The following steps are recommended for the Filtration Chamber in anticipation of taking the unit offline for the season:

1. Drain down any standing water in the Filtration Chamber through the filtration chamber drain-down valve* (Figure 11, below).
2. Perform a routine or seasonal maintenance to remove accumulated sediment and media containing sediment.
3. Add new filter media to insulate the remaining used filter media for the season. Snow may accumulate in the filter. This is normal and acceptable.
4. Remove the filtration chamber drain plug on the underside of the Filtration Chamber. This will drain any standing water in the bottom of the Filtration Chamber.

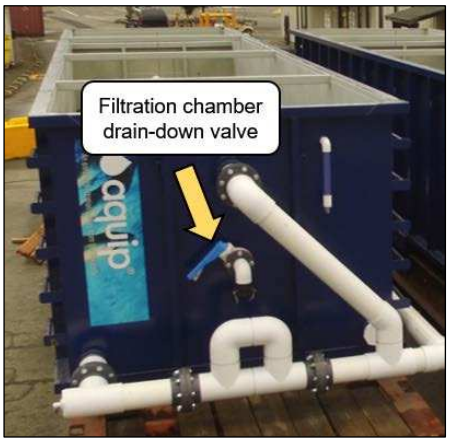

Figure 11. Filtration chamber drain-down valve.

Seasonally Decomissioning Outlet Piping

Outlet piping from the Aquip should be empty between storm events and as such, freezing of the outlet manifold should not occur.

> ***Warning:** Draining water onto the ground may freeze and create a slip hazard. Consider draining the water back to the sump or another location using hose or tubing.

2.5 Sampling Protocol and Methodology

Water quality samples should be taken only when the system has been maintained and is operating effectively (see Section 2.3). The inlet and outlet sample ports on the Aquip provide a convenient and reliable method of taking samples.

AFTER INSTALLING NEW FILTRATION MEDIA, OPERATE THE AQUIP FOR TWO HOURS BEFORE COLLECTING AN EFFLUENT SAMPLE

Use caution when collecting water quality samples to prevent contamination of the sample bottles. A small amount of dirt goes a long way to contaminating a stormwater sample. Make sure the sample port and your hands or gloves are clean BEFORE collecting your compliance sample. The following precautions should be taken immediately before sampling:

1. Using a CLEAN cloth, wipe off any visible dirt from the sample port valve spigot.
2. Open sample valve and allow water to flush through the port for a minimum of 10 seconds.
3. Use the proper unused sample bottle – do not reuse sample bottles.
4. Do not touch the sample bottle to the sample port.
5. Do not put fingers inside or around the sample port or the mouth of the sample bottle.
6. For sample bottles with liquid preservative inside, do not allow the bottle to overflow.
7. Cap the sample bottle as quickly as possible. Store on ice. Ice helps reduce the amount of metals that move from particulate to dissolved phase and reduces the rate of growth of biological organisms within the sample bottles.

StormwateRx recommends sampling the inlet to the Aquip each time that the outlet is sampled. Without the inlet sample data, StormwateRx LLC cannot diagnose or provide recommendations on tuning system performance. The inlet should be sampled approximately 15 minutes before sampling the outlet to get the most representative inlet/outlet sample pair.

3 Maintenance Guidelines

The Aquip, like all filtration systems, requires periodic maintenance to restore the system to its original effectiveness. The type and frequency of maintenance required for the Aquip varies significantly from site to site due to differences in facility operations, upstream stormwater management, and rainfall frequency. Routine inspections conducted on the Aquip will help to determine how frequently to maintain your Aquip stormwater filter (see Section 2.2).

LOADING TO AND MAINTENANCE OF THE AQUIP CAN BE REDUCED BY IMPROVING UPSTREAM SOURCE CONTROL BMPS.

3.1 Filter Media Maintenance

Maintaining the filter media is the most important step for achieving the optimal results from your Aquip filtration system. The media can be maintained either by cleaning and leveling the surface or replacing specific layers of media. The type of maintenance required is based upon the flow rate through the Aquip and/or the type of pollutants entering the system. Media maintenance is done to provide uniform flow downward through the media, preventing preferential flow and utilizing the entire surface area of the media bed. By providing uniform flow, treatment is maximized.

The layers of media have been configured in a specific arrangement to provide treatment for the identified pollutants in your stormwater. Refer to Figure 12, below, for media layer nomenclature.

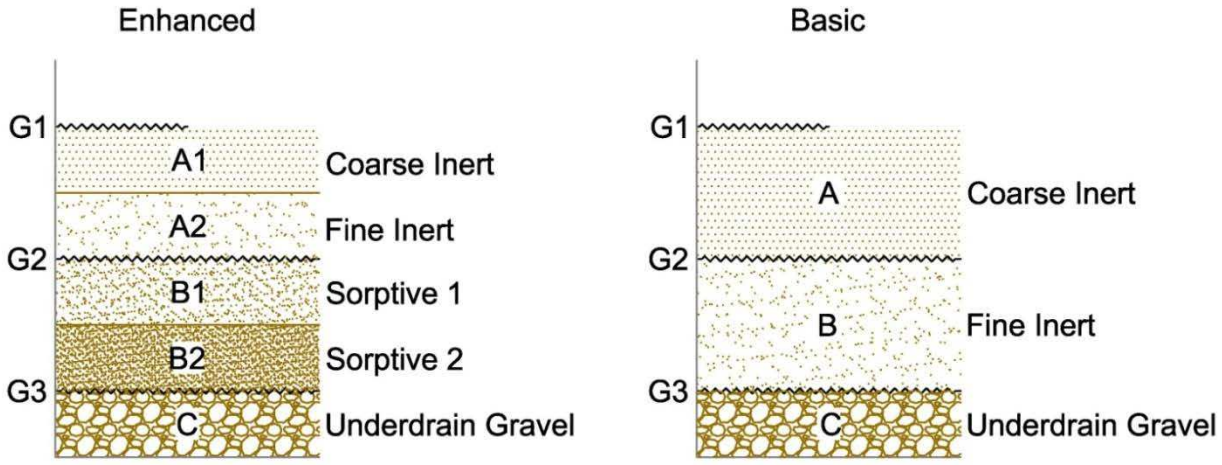

Figure 12. Enhanced and basic media bed configurations

3.1.1 Maintenance Type I – Routine Surface Maintenance

Refer to Figure 12 to identify the media and fabric layers described in this section.

Maintenance Description

A Maintenance Type 1 - Routine Surface Maintenance consists of cleaning the entire media surface by shoveling off and removing the top ¼ - ½ inches of media with a square point shovel. The media below the Energy Dissipation Fabric should also be clean at this time. The surface of the media should then be leveled using the filter shovel provided.

The Inlet Distributor and Energy Dissipation Fabric should also be inspected and cleaned if necessary at the time of Routine Surface Maintenance (see Section 2.2).

The removed media should be replaced after 2” of the top inert layer is removed as a result of routine surface maintenances. Replenish the removed media with new media if less than 7” of inert media remains on top of the media bed.

SURFACE MAINTENANCE AND MEDIA REPLENTISHMENT DO NOT SERVE AS A REPLACEMENT TO SEASONAL MAINTENANCE BUT DO EXTEND SYSTEM RUN-TIMES

Maintenance Timing/Frequency

A Routine Surface Maintenance should be conducted when the water level within the Aquip begins to stack up. Optimal operating conditions for the Aquip occur when the following conditions exist:

1. The Aquip has been operating for more than more than 15 minutes.
2. The water level within the Filtration Chamber reaches a point within 3 inches of the lowest point on the Inlet Distributor (Figure 5, page 7).

A Routine Surface Maintenance may need to be done as frequently as every 3 – 4 weeks depending on the amount of loading on the Aquip.

Maintenance Steps

The steps in conducting a Routine Surface Maintenance are:

1. Remove and set aside the Energy Dissipation Fabric (Fabric Layer G1, see Figure 12, page 13).
2. Clean the Energy Dissipation Fabric if necessary.
3. Clean the entire surface of the media by shoveling off the accumulated solids and the top ¼ - ½ inches of media (approximate) (Figure 12). The newly exposed media should look cleaner than the removed media. Remove more depth if necessary.
4. Dispose of the removed media and accumulated debris.
5. Level the surface of the media.
6. Measure the depth of the remaining inert media layer by inserting a shovel directly down into the media until it reaches the lower-lying fabric layer (Figure 13, below). This will indicate the depth of the inert media layer.
7. Replenish the removed media with new media if less than 7” of the inert layer remains (more than 2” of the inert layer has been removed over the course of several surface maintenances).
8. Re-install the Energy Dissipation Fabric beneath the Inlet Distributor using scoops of sand to hold down the edges.

ROUTINE SURFACE MAINTENANCE HELPS TO AVOID MORE COSTLY FULL MAINTENANCES AND IMPROVES TREATMENT PERFORMANCE

Figure 13. Surface cleaning (left) and measuring remaining inert media layer with a shovel (right).

3.1.2 Maintenance Type II – Seasonal Maintenance

Refer to Figure 12 (page 13) to identify the media and fabric layers described in this section.

Maintenance Description

During a Seasonal Maintenance, the inert media on top (Media Layer A) is replaced to restore the proper flow rate through the Aquip. Typically, dirt and debris are trapped within the top layer of media which eventually causes the media to plug.

Maintenance Timing/Frequency

Media replacement is necessary when the proper flow rate through the Aquip cannot be established by a Routine Surface Maintenance or lowering the Adjustable Head Control (see Section 3.2). Seasonal Maintenance is recommended when stormwater sampling shows consistent pollutant reductions and solids loading in the lower-lying media (Media Layer B) is not appreciable.

Maintenance Steps

StormwateRx can provide a quotation for Seasonal Maintenance which includes the new media, filter fabric, and optional technical supervision at the time of the maintenance. The steps to conduct a Seasonal Maintenance are:

1. Set up safety equipment if the system is near vehicle and pedestrian traffic.
2. Sparingly pressure-wash or hand-wipe the side walls of the Aquip prior to removing any media. Cleaning the inside walls of the Aquip will allow the operator to observe the system's most recent operating water level based upon the scum line left behind inside of the Aquip. No detergent or hot water should be used when cleaning the insides of the Aquip.
3. Remove and dispose of the Energy Dissipation Fabric (Fabric Layer G1, see Figure 12, page 13).
4. Excavate the spent filter media (Media Layer A) down to the first layer of geotextile fabric (Fabric Layer G2). A shovel or vactor truck may be used to remove the filter media (Figure 14, page 16). See Section 5 for media disposal.
5. Remove Fabric Layer G2 and inspect the underlying filter media (Media Layer B).
6. Break up the top three to six inches of media to rejuvenate Media Layer B. Level and smooth the filter media.
7. Re-install Fabric Layer G2 over the top of Media Layer B.
8. Install the new inert filter media (Media Layer A). Media should be added in uniform, level layers using the level indicators on the side walls of the Aquip as a guide. Each media layer should be leveled before adding the next media layer.
9. Install the new Energy Dissipation Fabric (Fabric Layer G1) on top Media Layer A using scoops of sand to hold down the edges.

When conducting a Seasonal Maintenance, the Pretreatment Chamber should also be maintained (see Section 3.3).

NO DETERGENT OR HOT WATER SHOULD BE USED WHEN CLEANING THE INSIDES OF THE AQUIP

Figure 14. Vactor service removing the top layers of sand during a Seasonal Maintenance

3.1.3 Maintenance Type III – Full Maintenance

Refer to Figure 12 (page 13) to identify the media and fabric layers described in this section.

Maintenance Description

A Full Maintenance replaces all the filtration media (Media Layers A and B) not including the underdrain gravel (Media Layer C). The filtering capacity of the media can be exhausted due to a combination of heavy loading, inadequate maintenance of the Aquip, and extended Aquip run-times.

Maintenance Timing/Frequency

Full Maintenance is recommended when a decline in treatment is observed in the water quality sampling and Routine Surface Maintenance is no longer capable of restoring the proper flow. Significant loading in the lower-lying media layers (Media Layer B) will often accompany a decline in treatment.

Maintenance Steps

StormwateRx can provide a quotation for a Full Maintenance which includes the new media, filter fabric, and optional technical supervision at the time of the maintenance. The steps to conduct a Full Maintenance are:

1. Set up safety equipment if the system is near vehicle and pedestrian traffic.
2. Sparingly pressure-wash or hand-wipe the side walls of the Aquip prior to removing any media as shown in Figure 15, page 17. Do not use any detergents. Cleaning the inside walls of the Aquip will allow the operator to observe the system's most recent operating water level based upon the scum line left behind inside of the Aquip. No detergent or hot water should be used when cleaning the insides of the Aquip.

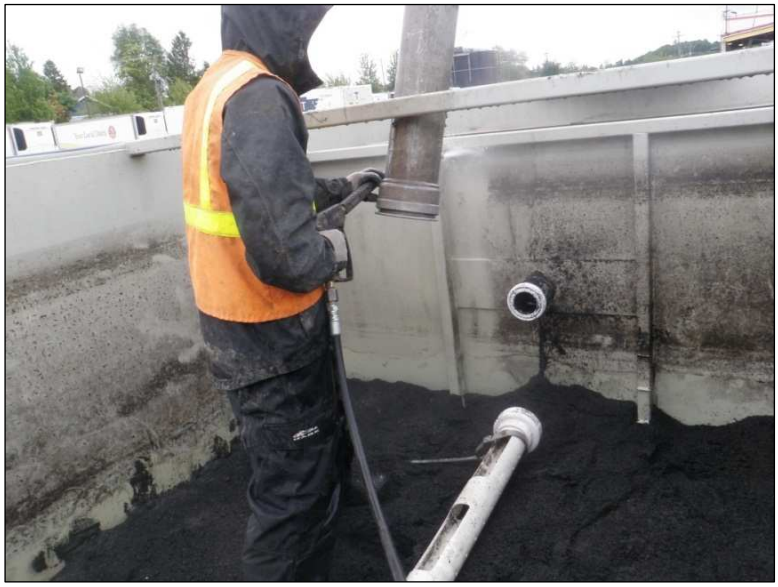

Figure 15. Pressure wash the sidewalls of the Aquip before removing filter media during a full maintenance.

3. Remove and dispose of the Energy Dissipation Fabric (Fabric Layer G1, see Figure 12, page13). Use a vacuum truck or shovel to remove all spent media (Media Layers A and B). Stop at the geotextile fabric above the underdrain gravel (Fabric Layer G3). The underdrain gravel (Media Layer C) should ***not*** be removed.

DO NOT PRESSURE WASH OR RINSE THE SIDE WALLS OF THE AQUIP ONCE THE FILTRATION MEDIA HAS BEEN REMOVED.

4. Remove the PVC plugs located at each of the ends of the underdrain. Also remove the Adjustable Head Control located on the outlet end of the Aquip by loosening the flanges located on both sides of this PVC loop (see Figure 1, page 1).
5. Pressure-wash the insides of the underdrain to flush its insides.
6. Reinstall all the PVC plugs on the underdrain and the Adjustable Head Control.
7. Install new geotextile fabric (Fabric Layer G3) on top of Media Layer C.
8. Install the new media layers and filter fabric layers as shown in Figure 12, page 13. Media should be added in uniform, level layers using the level indicators on the side walls of the Aquip as a guide. Each media layer should be leveled before adding the next media layer.
9. Install a new Energy Dissipation Layer (Fabric Layer G1) on top layer of the media using scoops of sand to hold down the edges.

When conducting a full maintenance, the Pretreatment Chamber should also be maintained (see Section 3.3).

3.2 Adjustable Head Control

The flow rate through the Aquip may be increased using the Adjustable Head Control. This should be done only when the proper flow rate cannot be established with Routine Surface Maintenance. By lowering the Adjustable Head Control, the back pressure within the media bed is reduced allowing the water to flow more freely through the system. The steps to lowering the Adjustable Head Control are:

1. Loosen all of the bolts on the two flanges located on both sides of the Adjustable Head Control. Some bolts may need to be loosened further after the flange assembles change their positioning.
2. Rotate the Adjustable Head Control downward away from the Aquip so that it is positioned parallel to level ground.
3. Evenly tighten the bolts on both flanges. Do not over tighten the bolts. The rubber gasket between the flange assembles will create a seal with even pressure around the flange.

3.3 Pretreatment Chamber Maintenance

The pretreatment chamber should be maintained when performing a Seasonal or Full Maintenance. Inspections of the pretreatment chamber should be performed as part of your routine inspections. The maintenance procedure for each type of pretreatment configuration is described below.

For Aquip SBE with loose pretreatment media

1. Remove and dispose of the solids that have accumulated on the surface of the pretreatment media.
2. Shovel the loose media to one side of the pretreatment chamber.
3. If the walls of the pretreatment chamber are coated in mud or debris, hose down the walls.
4. Lift up and remove the grate exposed by shoveling aside the media.
5. Suspend a pump off of the floor of the pretreatment chamber and pump down the water beneath the pretreatment media grates.
6. Shovel or vactor out the accumulated solids on the floor of the pretreatment chamber.
7. Replace grates and level the pretreatment media across the surface of the grates.

For Aquip SOI or SOE with oil coalescing packs

1. Remove the accumulation of any heavy oil sheen on the water's surface using an oil adsorbent pad(s) or vactor service.
2. Drain down the pretreatment chamber using the inlet sample port.
3. Remove the coalescing packs from pretreatment chamber.
4. Remove the plastic media blocks from stainless steel frame.
5. Clean the plastic media blocks and stainless steel frame using a low pressure hose.
6. Collect and dispose the removed oil and debris.
7. Reassemble coalescing packs and reinstall in pretreatment chamber.

For Aquip SXI with pretreatment settling

1. Drain down the pretreatment chamber using the inlet sample port.
2. If necessary, hose down the walls of the pretreatment chamber.
3. Suspend a pump off of the floor of the pretreatment chamber and pump down the water beneath the pretreatment media grates.
4. Shovel or vactor out the accumulated solids on the floor of the pretreatment chamber.

3.4 Oil Skimmer Maintenance

The oil sorbent pad on the oil skimmer should be routinely checked (Figure 16, below). The sorptive media within the pad will expand when reacting with oil causing the pad to swell in size. The oil sorbent pad should be replaced once the pad has swollen to its maximum size.

Figure 16. Pretreatment chamber oil skimmer sorbent pad.

3.5 Flow Meter Maintenance

The inside of the flow meter should be cleaned at a minimum of once a year to remove accumulating oil and dirt. Any accumulation on the surfaces of the electrodes will impede the proper operation of the flow meter. Remove the flow meter from the influent line on the Aquip and clean the small metal surfaces (electrodes) and all other surfaces inside of the flow meter using a soft cloth and a 50/50 solution of denatured alcohol and water. For reference, Table 2 lists the battery types utilized in Aquip flow meters.

Table 2. Replacement batteries for Aquip flow meters

Type of Flow Meter	Batteries Required
Seametrics 2” Flow Meter	6 AA batteries
Seametrics 3” Flow Meter	Battery pack of 2 Lithium XL-205F batteries
Seametrics 4” Flow Meter	Battery pack of 2 Lithium XL-205F batteries

The user manual for the installed flow meter is attached at the end of this O&M manual.

4 Troubleshooting

The Table 3 below provides a quick reference to address specific issues confronted with the operation of the Aquip. Sections 2 and 3 should be reviewed to reduce the onset of these issues.

Table 3. Aquip troubleshooting

Symptom	Probable Cause	Recommended Action
Water is spilling over the baffle wall between the Pretreatment Chamber and the Filtration Chamber.	The flow rate into the system is not correct. The Inlet Distributor needs to be cleaned of accumulated debris.	Adjust the flow control valve (see Section 2.2). Remove the accumulated solids within the Inlet Distributor (see Section 2.2).
There is an uneven distribution of water across the media surface or from the Inlet Distributor.	The media surface is not level. Water is channeling unevenly across the media surface. The Inlet Distributor is not properly adjusted. More water is flowing out of one end of the Inlet Distributor more than the other.	Clean the media surface by removing accumulated debris and then level the top of the media to reduce uneven channeling. When the system is operating at the design flow rate, adjust the height of the Inlet Distributor so that the flow out of the pipe is even on both ends (see Section 2.1, Step 3).
The water level within the Aquip is significantly higher than the inlet distributor (up to the emergency overflow) during Aquip operation.	The flow rate into the system is not correct. Too much solids have accumulated on the media surface. This can be observed as a thin brittle crust or as heavy solids accumulation. Solids have migrated deep within the media bed.	Adjust the Flow Control Valve (see Section 2.2). In either of these cases, use a square point shovel to remove the top 1/4” of sand (approximate, see Section 3.1.1). The Adjustable Head Control should be lowered (see Section 3.2). A Maintenance Type II - Seasonal or Full Maintenance may also be necessary (see Section 3.1.2).
The Aquip is not draining water through the media bed.	Solids accumulation on the media surface is preventing flow through the media.	From the outside edge of the tank, use a shovel to disturb the media surface in several locations. Conduct a Maintenance Type I - Routine Surface Maintenance once the water drains down completely (see Section 3.1.1). A Maintenance Type II - Seasonal Maintenance may be necessary (see Section 3.1.2).
The pretreatment media racks within the Pretreatment Chamber have been moved out of place.	Heavy oil and/or solids accumulation has accumulated on the bottom side of the pretreatment media racks allowing the water to push them out of place.	Conduct Pretreatment Chamber Maintenance (see Section 3.3). Clean both sides of the racks by spraying them down with water.
The metals removal efficiency from the Aquip is beginning to decrease.	Loading on the media surface is preventing uniform flow downward through the media. The sorptive media within the media bed is beginning to reach its capacity.	For a brittle or hardened media surface, break up and remove the hardened media to regain the hydraulic capacity. For heavy solids loading (i.e. more solids than sand visible on top), remove the top (approximate) 1/4” of inert media (see Section 3.1.1). A Maintenance Type III - Full Maintenance will be necessary (see Section 3.1.3).

5 Material Disposal

Water and sediment removed from the Aquip filter must be disposed of in accordance with all applicable waste disposal regulations. The removed accumulated sediment in the Aquip can typically be sent to the local landfill. Follow local regulations for standard guidelines for solid waste disposal.

6 Maintenance Support

If you have any questions about maintenance procedures, contact StormwateRx LLC at (800) 680-3543.

7 Best Management Practice Requirements

Consistently achieving the benchmarks requires rigorous implementation of best management practices (BMPs) including source control, structural and treatment BMPs. Treatment BMPs (i.e. the Aquip filtration system) are not designed to operate in the absence of other BMPs. Employing source control practices on a regular basis is essential to extending the life of the Aquip system, as heavy pollutant loading can result in a shorter maintenance cycle than expected. The Aquip system is not designed as an all-in-one treatment device for all types and quantities of stormwater pollution.

Your Stormwater Pollution Prevention (or Control) Plan (SWPPP or SWPCP) should address the BMPs appropriate for your facility. During normal business operation, make sure that all best management practices are deployed and maintained. When engaging in operations that are atypical of standard business practices, please utilize source control measures to prevent heavy pollutant loading into the Aquip. The following are a few examples of typically employed practices.

- **Sweeping:** Sweep site on a regular basis, such as daily, weekly or bi-monthly, especially in areas of heavy industrial activities.
- **Covering activities:** When practical, cover significant materials or industrial operations that are outdoors, to prevent stormwater contact with potential pollutants.
- **Spill control:** When a spill occurs, contain and use onsite spill kits to dispose of material.

DO NOT FLUSH SPILLS OF ANY KIND INTO THE AQUIP FILTRATION SYSTEM

- **Catch basin and stormwater conveyance clean out:** When cleaning out catch basins and jetting stormwater conveyance lines, turn off the pump that diverts water to the Aquip system. This water should not enter the Aquip system.

JETTING YOUR STORMWATER LINES INTO THE AQUIP FILTRATION SYSTEM IS NOT ADVISED.

Trademarks and Disclaimers

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This document is subject to change without notice.

StormwateRx LLC
122 Southeast 27th Avenue
Portland, Oregon, 97214
(800) 680 - 3543

Appendix F

Washington Department of Ecology Conditional Use Level Designation Approval for Aquip

WASHINGTON STATE DEPARTMENT OF ECOLOGY

June 2017

CONDITIONAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, & PHOSPHORUS TREATMENT

For

StormwateRx, LLC, Aquip® Enhanced Stormwater Filtration System

Ecology's Decision:

Based on StormwateRx's application submissions, Ecology hereby issues the following use level designations for the Aquip® Enhanced Stormwater Filtration System:

1. A Conditional Use Level Designation (CULD) for Basic (TSS) Treatment.

   - Sized at a hydraulic loading rate of no greater than 1 gallon per minute (gpm) per square foot (sq ft) of media surface area.
   - Using the enhanced (sorptive) media.
   - Influent by pump station or gravity flow.

2. A Conditional Use Level Designation (CULD) Enhanced (dissolved Cu and Zn).

   - Sized at a hydraulic loading rate of no greater than 1 gallon per minute (gpm) per square foot (sq ft) of media surface area.
   - Using the enhanced (sorptive) media.
   - Influent by pump station or gravity flow.

3. A Conditional Use Level Designation (CULD) for Phosphorus Treatment.

   - Sized at a hydraulic loading rate of no greater than 1 gallon per minute (gpm) per square foot (sq ft) of media surface area.
   - Using the enhanced (sorptive) media.
   - Influent by pump station or gravity flow.

4. Ecology approves the Aquip® Enhanced Stormwater Filtration System for treatment at the above flow rates. The designer shall calculate the water quality design flow rates using the following procedures:

   - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.

   - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.

   - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. The Use Level Designation expires on January 1, 2021 unless extended by Ecology, and is subject to the conditions specified below.

Ecology's Conditions of Use:

The Aquip® Enhanced Stormwater Filtration Systems shall comply with these conditions:

1. Design, assemble, install, operate, and maintain the Aquip® systems in accordance with StormwateRx's applicable manuals and documents and the Ecology Decision.

2. If you pump influent to the system, pump station and bypass design shall follow local guidelines and codes.

3. StormwateRx, LLC commits to submitting a QAPP for BER review and Ecology approval by March 1, 2018 that meets the TAPE requirements for attaining a GULD for Basic, Enhanced, and Phosphorus Treatment. Ecology must review and approve any QAPPs for each additional field site in Washington State. The sites chosen should reflect the product's treatment intent.

4. StormwateRx, LLC shall complete all required testing and submit a TER for Ecology review by March 1, 2020.

5. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.

- StormwateRx Aquip system maintenance includes routine media maintenance, inert media replacement and sorptive media replacement. Maintenance frequency is site specific and for preventative maintenance purposes is estimated based on elapsed time and/or cumulative flow through the system. Maintenance includes the following:
  - Surface Media Maintenance – remove visible surface accumulation of sediment and discolored inert media from pretreatment and filtration chambers. Top off with new media to original media height when approximately 3-inches of filter media has been removed. Surface media maintenance interval averages 1 month.
  - Inert Media Replacement– replace inert media in filtration chamber when surface media maintenance program results in a continuous operating filtration chamber water level of more than two feet. Replacing the inert media protects the underlying sorptive media and extends sorptive media life. Inert media replacement interval averages 12 months.
  - Sorptive Media Replacement – replace sorptive media in concert with an inert media replacement when the operating filtration chamber water level is greater than two feet despite proper routine and inert media maintenance, or when dissolved pollutant concentrations exceed regulatory standards. Remove accumulated pretreatment chamber sediment and media at time of sorptive media replacement. Pollutant removal capacity of the sorptive media can exhaust due to high loading, inadequate routine and inert media maintenance, and extended Aquip throughput. Sorptive media replacement interval averages 24 months.

- Owners/operators must inspect Aquip systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. Conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.

- When inspections are performed, the following findings typically serve as maintenance triggers:
  - Effluent flow decreasing to below the design flow rate.
  - Accumulated sediment discoloration on the media surface is visually more predominant than filtration media, or
  - Evidence of bypass or operating water levels more than one foot above the inlet distributor, or
  - Standing water remains inside the filtration chamber between rain events, or
  - Treatment system performance has declined for two or more samples, or
  - Jar testing indicates that media samples have accumulated more than 20% solids by volume.

6. StormwateRx, LLC may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.

7. Discharges from Aquip® Enhanced Stormwater Filtration Systems shall not cause or contribute to water quality standards violations in receiving waters.

Applicant: StormwateRx, LLC

Applicant's Address: 122 SE 27th Avenue
Portland, OR, 97214

Application Documents:

- Aquip® Enhanced Stormwater Filtration System, Technology Assessment Protocol – Ecology Application for Certification (January 26, 2011; revised May 20, 2011). Prepared by StormwateRx, LLC. Received May 27, 2011.

Applicant's Use Level Request:

- Conditional Use Level Designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's 2005 Stormwater Management Manual for Western Washington.

Applicant's Performance Claims:

- The Aquip® Enhanced Stormwater Filtration System provides statistically significant removal of TSS, dissolved copper, dissolved zinc, and total phosphorus from stormwater, and can meet or exceed Ecology's Basic, Enhanced, and Phosphorus treatment standards.

Ecology's Recommendations:

- Ecology should provide StormwateRx, LLC with the opportunity to demonstrate, through field testing that follows an approved QAPP, whether the Aquip® Enhanced Stormwater Filtration System can attain Ecology's Basic, Enhanced, and Phosphorus treatment performance levels.

Findings of Fact:

- Based on paired grab sample data for TSS, from 14 installation sites, the Aquip® Enhanced Stormwater Filtration System achieved the following treatment levels:
  - Median effluent was 5 mg/L TSS, influent concentration in the range of 20-100 mg/L (n=32).
  - Median percent removal was 98 percent, influent concentration in the range of 100-200 mg/L (n=8).

- Median percent removal was 98 percent, influent concentration greater than 200 mg/L (n=8).

- Based on paired grab sample data for dissolved copper, from 7 installation sites, the Aquip® Enhanced Stormwater Filtration System achieved the following treatment levels:
  - Median percent removal was 73 percent, influent concentration in the range of 0.003-0.02 mg/L (n=5).
  - Median percent removal was 93 percent, influent concentration greater than 0.02 mg/L (n=32).

- Based on paired grab sample data for dissolved zinc, from eight installation sites, the Aquip® Enhanced Stormwater Filtration System achieved the following treatment levels:
  - Median percent removal was 59 percent, influent concentration in the range of 0.02-0.3 mg/L (n=30).
  - Median percent removal was 94 percent, influent concentration greater than 0.3 mg/L (n=21).

- Based on paired grab sample data for total phosphorus, from six installation sites, the Aquip® Enhanced Stormwater Filtration System achieved the following treatment levels:
  - Median percent removal was 60 percent, influent concentration in the range of 0.1-0.5 mg/L (n=14).
  - Median percent removal was 89 percent, influent concentration greater than 0.5 mg/L (n=5).

Issues to be Addressed By the Company:

1. The Aquip® Enhanced Stormwater Filtration System must show that it can reliably attain the minimum percent removal criteria for Basic, Enhanced, and Phosphorus treatment for runoff found from local highways, parking lots, and other high-use areas at the design-operating rate in accordance with the Ecology TAPE protocols. StormwateRx, LLC should test a variety of operating rates to establish conservative design rates.

2. Test the system under normal operating conditions, such that pollutants partially fill the system. Results obtained for "clean" systems may not be representative of typical performance.

3. StormwateRx, LLC submitted extensive grab sample data from several sites operating in industrial treatment settings. Pollutant concentrations are both within and above the ranges required by TAPE. Testing to achieve a GULD under the TAPE program will need to focus on pollutant concentrations within the specified TAPE ranges, as well as using flow-weighted composite sampling (or other method approved in the QAPP) as opposed to grab sampling.

4. Calculation of treatment efficiency shall be in accordance with the 2011 Revision of the Guidance for Evaluating Emerging Stormwater Treatment Technologies: Technology Assessment Protocol – Ecology (TAPE).

5. StormwateRx shall include a discussion of treatment efficiency (percent removed) as flow rates change in the Technical Evaluation Report.

6. Conduct field-testing at sites that are indicative of the treatment goals.

7. Conduct testing to obtain information about maintenance requirements in order to come up with a maintenance cycle.

8. Conduct loading tests on the filter media to determine maximum treatment life of the system.

Technology Description: Download at: www.stormwaterx.com/Products/Aquip.aspx

Contact Information:

Applicant: Calvin Noling
StormwateRx, LLC
122 SE 27th Avenue
Portland, OR, 97214
800-680-3543
caln@stormwaterx.com

Applicant website: www.stormwaterx.com

Ecology web link: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

Ecology: Douglas C. Howie
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	Revision
July 2011	Original use-level-designation document
September 2012	Revised dates for QAPP, TER, and Expiration
January 2013	Updated document format to match Ecology standard, added maintenance criteria
April 2014	Revised Due dates for QAPP and TER and changed Expiration date
June 2017	Revised Due dates for QAPP and TER and changed Expiration date

EXHIBIT B

Green River
COLLEGE FOUNDATION
12401 SE 320th Street, Auburn, WA 98092-3622
Phone:(253) 288-3330 • Fax:(253) 288-3420
E-mail:foundation@greenriver.edu

September 6, 2018

Re: Waste Action Project & Estes Express Lines d/b/a Estes West, G.I. Trucking, d/b/a Estes West

Consent Decree Case No. 2.18-cv-00559-TSZ

To Whom It May Concern:

Green River College Foundation is an institutionally related Foundation and is a stand-alone 501(c)(3) nonprofit, EIN 51-0168649. Within the mission of the Foundation, providing resources to assist Green River College in achieving educational excellence, are the strategic priorities: to remove financial barriers for students, create pathways to good living wage careers, and provide resource capacity for college programs. The Green River College Natural Resources Program is a CTE program of Green River, and students are engaged in a variety of experiential learning projects that have value to the natural resources and ecological welfare in our community.

We have reviewed the consent decree that provides payment in the amount of $174,000 from Estes Express Lines d/b/a Estes West, G.I. Trucking, d/b/a Estes West to the Green River College Foundation. The funding provided will be used to pay for projects focused on improved water quality in the Green River watershed. Work may include invasive plant control, native planting, and other stewardship activities conducted by or through the Green River College Natural Resources Department. This work is in partnership with existing conservation organizations and local governments engaged in water quality related conservation projects in the Green River, and its tributaries.

No money received under the proposed consent judgment will be used for political lobbying activities; and following the expenditure of funds provided by the settlement instrument Green River College Foundation will submit to the Court, the United States, and the parties a letter describing how the SEP funds were spent.

Please do not hesitate to contact us with questions or for additional information.

Sincerely,

George P. Frasier,
Executive Director
Green River College Foundation