## **STORMWATER MAINTENANCE PLAN**

For:

### FIRST CHILDREN SCHOOL

BLOCK 509, LOT 1.02 CITY OF PLAINFIELD, UNION COUNTY NEW JERSEY

> April 1 2022 Revised April 26, 2022

> > Applicant/Owner:

J.G. Petrucci Company, Inc. 171 State Route 173, Suite 201 Asbury, NJ 08802

Prepared by:



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I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

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### **1.0 INTRODUCTION**

### 1.1 <u>Subject Property</u>

This report has been prepared to present the on-going maintenance requirements to maintain the stormwater management system proposed as part of the First Children School Project. The subject property is currently a 10.82-acre lot identified as Block 509, Lot 1 on the City of Plainfield Tax Maps. The development proposes to create a new lot via a minor subdivision. The newly created lot will be identified as Lot 1.02 and is 2.91-acres in size and fronts on Plainfield Avenue and Sherman Avenue to the east and north respectively in the City of Plainfield, Union County, New Jersey. See Figure 1- Site Location Map below:



Figure 1 – Site Location Map

### 1.2 <u>Project Description</u>

The proposed project consists of a two-story 44,417 gross square foot multi-purpose educational center. The educational center will cater to approximately 125 children from grades K through 9 with 20 classrooms. Other site improvements include a playground area, surface parking lot with 148 parking stalls, landscaping, lighting, utility improvements, and new sidewalks and curbing along the Plainfield Avenue and Sherman

Avenue property frontages. Construction of the First Children School Project is anticipated to disturb approximately 3.43 acres.

### 2.0 STORMWATER MAINTENACE PLAN

This Stormwater Maintenance Plan has been prepared in accordance with the City of Plainfield municipal Stormwater Management ordinance and applicable chapters of the NJDEP Stormwater BMP Manual. The site's stormwater management measures shall be maintained in accordance with the NJDEP Stormwater Management BMP Manual, the Standards for Soil Erosion and Sediment Control in New Jersey, and any manufacturer's specifications.

### 2.1 <u>Stormwater Management System</u>

The project proposes a stormwater management system to meet the requirements for stormwater quantity and quality as detailed in the City of Plainfield Stormwater Management Ordinance and N.J.A.C. 7:8. The stormwater management system consists of a subsurface detention basin and small-scale surface infiltration basin designed to meet stormwater management quantity requirements. The small-scale infiltration basin along with two (2) manufactured treatment water quality unit devices are designed to meet the stormwater quality requirements. A series of underground stormwater piping, catch basins, and inlets are also proposed to convey runoff to the basins and manufactured treatment devices and discharge runoff off site to the existing stormwater piping in the adjacent roadways. The following outlines the inspection, operation, and maintenance requirements for the stormwater management system.

### Inspection Notes

- During the first service year a visual inspection should be completed during and after each major rainfall event, in addition to semi-annually, to establish a pattern of sediment and debris build up.
- Second year plus: establish an annual inspection frequency based on the information collected during the first year. At a minimum an inspection should be performed semi-annually.
- Inspect inspection ports, inflow/outflow points, including inlet/manhole pipes and discharge area.
- Identify and report maintenance required, including sediment and debris accumulation, system backing up, and flow rate change.

### Maintenance Procedures

- Conform to all local, state and federal regulations.
- Determine if maintenance is required.
- Use a vacuum pump truck to evacuate debris from the inflow and outflow points.
- Flush the system with clean water forcing debris from the system. Take care to avoid extreme direct water pressure when flushing the system.
- Replace sand layer in small-scale infiltration basin if deemed clogged and not infiltrating properly.
- Clear trash racks on outlet control structures of large debris if present
- Remove large debris from grates of inlets

### Vegetation

- Maintain vegetation around the proposed small-scale infiltration basin and ensure proper plant growth of proposed landscaping plants around basin.
- Maintain grass side-slopes of basin and ensure side slopes are not eroding over time.
  - Reseed and maintain as required

### Structural Components

• All structural components (i.e. inlets, manholes, outlet control structures, water quality units, etc.) must be inspected for cracking, subsidence, spalling, erosion and deterioration at least annually and per manufacturer's specifications.

### State Plane Co-Ordinates

Site Centroid Location:	Northing:	644,761	Easting:	513,907
Subsurface Basin:	Northing:	644,635	Easting:	513,981
Infiltration Basin:	Northing:	644,862	Easting:	513,844

### Maintenance Cost Estimate

Task	Cost
Removal of accumulated sediment, trash and debris	\$100 per inlet/manhole
	\$1,000 for basins
Mowing, pruning and restoration of vegetation	\$250 - \$750 per workday
Restoration of eroded areas	\$250 - \$750 per workday
Elimination of mosquito breeding areas	\$250 - \$1,000 per workday
Control of aquatic vegetation	\$500 - \$1,000 per workday
Repair or replacement of damaged or deteriorated components	\$250 - \$4,000 per workday
Vacuum Truck	\$2,000 per workday

### Log Records for Annual Evaluation

Sample Record Keeping Form provided in Appendix B.

The responsible party shall maintain records documenting the condition of the stormwater management system, maintenance work performed and maintenance work necessary, and any safety hazards. The records shall include a schedule for performing needed maintenance, repairs or safety improvements.

Written maintenance and repair records for all components of the stormwater management system must be maintained for at least five (5) years by the responsible party. Copies of these documents must be submitted to the City Engineer by April 1st every five (5) years. This should include all receipts for materials and labor purchased. Manufacturers' documents, including warranty information, shall also be retained.

### 2.2 <u>Water Quality Units</u>

The project proposes two (2) manufactured treatment water quality devices to provide TSS removal to stormwater runoff in accordance with the City of Plainfield and NJDEP stormwater quality requirements. The first water quality unit is the Aqua-Swirl Xcelerator Model XC-5 which is designed to provide pretreatment to the small-scale infiltration basin by treating stormwater runoff for 50% TSS removal prior to discharging into the basin. The inspection and maintenance manual prepared by the manufacturer AquaShield is provided in Appendix C.

The second water quality unit proposed is the Hydro-International Up-Flo Filter Treatment System which is designed to treat stormwater runoff for 80% TSS removal prior to discharging into the subsurface detention basin. The inspection and maintenance manual prepared by the manufacturer Hydro-International is also provided in Appendix C.

## <u>APPENDIX A – STORMWATER DETENTION BASIN MAINTENANCE</u> <u>MANUAL</u>



This document is provided for informational purposes only and is meant only to be a guide. Individuals using this information should make their own decisions as to suitability of this guideline for their individual projects and adjust accordingly.

## Introduction

A retention/detention system is comprised of a series of pipes and fittings that form an underground storage area, which retains or detains storm water runoff from a given area. As sediment and debris settle out of the detained stormwater, build up occurs that requires the system to be regularly inspected and cleaned in order for the system to perform as originally designed. The following provides the available fittings and guidelines for inspection and maintenance of an HDPE underground storage system.

## **System Accessories and Fittings**

### **Concentric Reducers**

Concentric Reducers are fittings that transition between two pipes, either in line with one another or at perpendicular angles. The centerlines of the two pipes are at the same elevation. When a concentric reducer is used to connect the manifold pipe to the lateral pipes, most debris will be trapped in the manifold pipe.



### **Eccentric Reducers**

Eccentric Reducers are fittings that transition between two pipes, either in line with one another or at perpendicular angles. The inverts of the two pipes are at the same elevations. When an eccentric reducer is used to connect the manifold pipe to the lateral pipes, most debris will follow the flow of the storm water into the lateral pipes.









### Riser

Each retention/detention system typically has risers strategically placed for maintenance and inspection of the system. These risers are typically 24" in diameter or larger and are placed on the manifold fittings.

### Cleanouts

Cleanout ports are usually 4-, 6-, or 8-in diameter pipe and are placed on the manifold fittings. They are used for entrance of a pipe from a vacuum truck or a water-jetting device.



For a complete listing of available fittings and components please refer to the *ADS Fittings Manual*.

## **Maintenance Overview of a Retention/Detention System**

Maintaining a clean and obstruction-free retention/detention system helps to ensure the system performs the intended function of the primary design. Build up of debris may obstruct flow through the laterals in a retention system or block the entranceway of the outlet pipe in a detention system. This may result in ineffective operation or complete failure of the system . Additionally, surrounding areas may potentially run the risk of damage due to flooding or other similar issues.

### Inspection/Maintenance Frequency

All retention/detention systems must be cleaned and maintained. Underground systems may be maintained more cost effectively if these simple guidelines are followed. Inspection should be performed at a minimum of once per year. Cleaning should be done at the discretion of individuals responsible to maintain proper storage and flow. While maintenance can generally be performed year round, it should be scheduled during a relatively dry season.

### **Pre-Inspection**

A post-installation inspection should be performed to allow the owner to measure the invert prior to accumulation of sediment. This survey will allow the monitoring of sediment build-up without requiring access to the retention/detention system.

The following is the recommended procedure for pre-inspections:

- 1) Locate the riser section or cleanouts of the retention/detention system. The riser will typically be 24" in diameter or larger and the cleanouts are usually 4", 6" or 8" in diameter.
- 2) Remove the lid of the riser or clean outs.
- Insert a measuring device into the opening and make note to a point of reference on the stick or string. (This is done so that sediment build up can be determined in the future without having to enter the system.)



### Inspection/Maintenance

A retention/detention system should be inspected at a minimum of one time a year or after major rain events if necessary.

The following is the recommended procedure to inspect system in service:

- 1) Locate the riser section of the retention/detention system. The riser will typically be 24" in diameter or larger.
- 2) Remove the lid from the riser.
- 3) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be permitted to enter the retention/detention System.
- 4) Inspect each manifold, all laterals, and outlet pipes for sediment build up, obstructions, or other problems. Obstructions should be removed at this time.
- 5) If measured sediment build up is between 5% 20% of the pipe diameter, cleaning should be considered; if sediment build up exceeds 20%, cleaning should be performed at the earliest opportunity. A thorough cleaning of the system (manifolds and laterals) shall be performed by either manual methods or by a vacuum truck.

## **APPENDIX B – MAINTENANCE LOGS**

### Sample Record Keeping Form

for

### **Stormwater Management Facilities**

#### Block 509, Lot 1.02

### **<u>First Children School</u>** <u>1108 Plainfield Avenue, City of Plainfield, Union County, New Jersey</u>

This form is intended for maintaining a record of inspections and maintenance activities for the stormwater management facilities located on Block 509, Lot 1.02 in accordance with the approved Stormwater Management Facilities Operation and Maintenance Plan.

Date Completed:

Completed By:

Date of Last Rainfall and Rainfall Amount:

Stormwater Component	Type of Inspection	Overall Condition	Routine Maintenance Performed	Maintenance /Repair Work Needed*
Underground Detention Basin				
Surface Infiltration Basin				
Outlet Control Structure-1				
Outlet Control Structure-2				
Inlets & Manholes				

\* Provide a schedule for the completion of the action

**General Comments** 

## **APPENDIX C – WATER QUALITY UNIT MAINTENANCE MANUAL**



## Aqua-Swirl<sup>®</sup> XCelerator Stormwater Treatment System

## Inspection and Maintenance Manual for New Jersey Department of Environmental Protection (NJDEP)



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## Aqua-Swirl<sup>®</sup> XCelerator Stormwater Treatment System

The Aqua-Swirl<sup>®</sup> XCelerator Stormwater Treatment System (Aqua-Swirl<sup>®</sup> XCelerator) is a vortex-type hydrodynamic separator designed and supplied by AquaShield<sup>TM</sup>, Inc. (AquaShield<sup>TM</sup>). Aqua-Swirl<sup>®</sup> XCelerator technology removes pollutants including suspended solids, debris, and floatables from stormwater runoff. Both treatment and storage are accomplished in the single swirl chamber without the use of multiple or hidden, blind access chambers.



Floatable trash & debris in the Aqua-Swirl<sup>®</sup>

## **System Operation**

The treatment operation begins when stormwater enters the Aqua-Swirl<sup>®</sup> XCelerator through a tangential inlet pipe that produces a circular (or vortex) flow pattern that causes contaminates to settle to the base of the unit. Since stormwater flow is intermittent by nature, the Aqua-Swirl<sup>®</sup> XCelerator retains water between storm events providing both dynamic and quiescent settling of solids. The dynamic settling occurs during each storm event while the quiescent settling takes place between successive storms. A combination of gravitational and hydrodynamic drag forces encourages the solids to drop out of the flow and migrate to the center of the chamber where velocities are the lowest.

## **Aqua-Swirl<sup>®</sup> XCelerator System Maintenance**

The long term performance of any stormwater treatment structure, including manufactured or land based systems, depends on a consistent maintenance plan. Inspection and maintenance functions are simple and easy for the Aqua-Swirl<sup>®</sup> XCelerator allowing all inspections to be performed from the surface. It is important that a routine inspection and maintenance program be established for each unit based on: (a) the volume or load of the contaminants of concern, (b) the frequency of releases of contaminants at the facility or location, and (c) the nature of the area being drained. In order to ensure that our systems are being maintained properly, AquaShield<sup>TM</sup> offers a maintenance solution to all of our customers. We will arrange to have maintenance performed.

## Inspection



The Aqua-Swirl<sup>®</sup> XCelerator can be inspected from the surface, eliminating the need to enter the system to determine when cleanout should be performed. In most cases, AquaShield<sup>TM</sup> recommends a quarterly inspection during construction and for the first year of operation to develop an appropriate schedule of maintenance. The Aqua-Swirl<sup>®</sup> XCelerator should be inspected and cleaned at the end of construction regardless of whether it has reached its sediment storage capacity and/or other captured materials. Based on experience of the system's first year in operation, we recommend that the inspection

schedule be revised to reflect the site-specific conditions encountered. Typically, the inspection schedule for subsequent years is once per year.

## Maintenance

The Aqua-Swirl<sup>®</sup> XCelerator has been designed to minimize and simplify the inspection and maintenance process. The single chamber system can be inspected and maintained entirely from the surface thereby eliminating the need for confined space entry. Furthermore, the entire structure (specifically, the floor) is accessible for visual inspection from the surface. There are no areas of the structure that are blocked from visual inspection or periodic cleaning. Inspection of any floatable debris can be directly observed and maintained through the manhole access provided directly over the swirl chamber.

### **Inspection Procedure**

To inspect the Aqua-Swirl<sup>®</sup> XCelerator, a hook is typically needed to remove the manhole cover. AquaShield<sup>TM</sup> provides a customized manhole cover with our distinctive logo to make it easy for maintenance crews to locate the system in the field. We also provide a permanent metal

information plate affixed inside the access riser which provides our contact information, the Aqua-Swirl<sup>®</sup> XCelerator model size, and serial number.

The only tools needed to inspect the Aqua-Swirl<sup>®</sup> XCelerator system are a flashlight and a measuring device such as a stadia rod or pole. Given the easy and direct accessibility provided, floating trash and debris can be observed directly from the surface. Sediment depths can easily be determined by lowering a measuring device to the top of the sediment pile and to the surface of the water. AquaShield<sup>TM</sup> recommends that the units be cleaned when sediment depth reaches 6 inches, representing 50% sediment storage capacity. The full sediment storage depth in the Aqua-Swirl<sup>®</sup> XCelerator is 12 inches.

It should be noted that in order to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the *top* of the sediment pile. Keep in mind that the finer sediment at the top of the pile may offer less resistance to the measuring device than the larger particles which typically occur deeper within the sediment pile.

### **Aqua-Swirl<sup>®</sup> XCelerator Cleanout Procedure**

Cleaning the Aqua-Swirl<sup>®</sup> XCelerator is simple and quick. Floatable trash debris can be observed and removed directly through the 30-inch service access riser provided. A vacuum truck is typically used to remove the accumulated sediment and debris. An advantage of the Aqua-Swirl<sup>®</sup> XCelerator design is that the entire sediment storage area can be reached with a vacuum hose from the surface reaching all the sides. Since there are no multiple or limited (blind) access chambers in the Aqua-Swirl<sup>®</sup> XCelerator there are no restrictions to impede on-site maintenance tasks.



Sediment inspection using a stadia rod

### **Disposal of Recovered Materials**

AquaShield<sup>TM</sup> recommends that all maintenance activities be performed in accordance with appropriate health and safety practices for the tasks and equipment being used. AquaShield<sup>TM</sup> also recommends that all materials removed from the Aqua-Swirl<sup>®</sup> XCelerator and any external structures (e.g, bypass features) be handled and disposed in full accordance with any applicable local and state requirements.



Vacuum (vactor) truck quickly cleans the single open access swirl chamber

## Aqua-Swirl<sup>®</sup> XCelerator Inspection and Maintenance Work Sheets on following pages

### Aqua-Swirl<sup>®</sup> XCelerator Inspection and Maintenance Manual Work Sheets

### SITE and OWNER INFORMATION

Site Name:	
Site Location:	
Date:	Time:
Inspector Name:	
Inspector Company:	Phone #:
Owner Name:	
Owner Address:	
Owner Phone #:	Emergency Phone #:

### INSPECTIONS

### I. Floatable Trash and Debris

- 1. Remove manhole lid to expose liquid surface of the Aqua-Swirl<sup>®</sup> XCelerator.
- 2. Remove floatable debris with basket or net if any present.

### II. Sediment Accumulation

- 1. Lower measuring device (e.g. stadia rod) into swirl chamber through service access provided until top of sediment pile is reached.
- 2. Record distance to top of sediment pile from top of standing water: \_\_\_\_\_\_ inches.
- 3. Maximum recommended sediment depth prior to cleanout is 12 inches for all models. Consult system shop drawing for treatment chamber depth as measured from the inlet pipe invert to base of the unit.

### III. Diversion Structures (External Bypass Features)

If a diversion (external bypass) configuration is present, it should be inspected as follows:

- 1. Inspect weir or other bypass feature for structural decay or damage. Weirs are more susceptible to damage than off-set piping and should be checked to confirm that they are not crumbling (concrete or brick) or decaying (steel).
- 2. Inspect diversion structure and bypass piping for signs of structural damage or blockage from debris or sediment accumulation.
- 3. When feasible, measure elevations on diversion weir or piping to ensure it is consistent with site plan designs.

4. Inspect downstream (convergence) structure(s) for sign of blockage or structural failure as noted above.

### CLEANING

Schedule cleaning with local vactor company or AquaShield<sup>TM</sup> to remove sediment, trash, and other floatable pollutants. The captured material generally does not require special treatment or handling for disposal. Site-specific conditions or the presence of known contaminants may necessitate that appropriate actions be taken to clean and dispose of materials captured and retained by the Aqua-Swirl<sup>®</sup> XCelerator. All cleaning activities should be performed in accordance with property health and safety procedures.

AquaShield<sup>TM</sup> always recommends that all materials removed from the Aqua-Swirl<sup>®</sup> XCelerator during the maintenance process be handled and disposed in accordance with local and state environmental or other regulatory requirements.

### MAINTENANCE SCHEDULE

### I. During Construction

Inspect the Aqua-Swirl<sup>®</sup> XCelerator every three (3) months and clean the system as needed. The Aqua-Swirl<sup>®</sup> XCelerator should be inspected and cleaned at the end of construction regardless of whether it has reached its maintenance trigger.

### II. First Year Post-Construction

Inspect the unit(s) every three (3) months and clean the system as needed.

Inspect and clean the system once annually regardless of whether it has reached its sediment or floatable pollutant storage capacity.

### III. Second and Subsequent Years Post-Construction

If the system did not reach full sediment or floatable pollutant capacity in the First Year Post-Construction period, the system can be inspected and cleaned once annually.

If the Aqua-Swirl<sup>®</sup> XCelerator reached full sediment or floatable pollutant capacity in less than 12 months in the First Year Post-Construction period, the system should be inspected once every six (6) months and cleaned as needed. The unit should be cleaned annually regardless of whether it reaches its sediment or floatable pollutant capacity.

### **IV.** Bypass Structures

Bypass structures should be inspected whenever the Aqua-Swirl<sup>®</sup> XCelerator is inspected. Maintenance should be performed on bypass structures as needed.

### MAINTENANCE COMPANY INFORMATION

Company Name:					
Street Address:					
City:			Star	te/Prov.:	Zip/Postal Code:
Contact:					Title:
Office Phone:				Cell Phon	e:
			ACTIVI	<b>FY LOG</b>	
Date of Cleaning:				(Next ins this data	pection should be 3 months from for first year).
Time of Cleaning:	Start:			Er	nd:
Date of Next Inspect	ion:				
Floatable debris pres	ent:	Yes	No		
Notes:					
S	<b>FRUC</b>	ΓURAI	CONDITIC	ONS and OBS	SERVATIONS
Structural damage:	Yes	No	Where:		
Structural wear:	Yes	No	Where:		
Odors present:	Yes	No	Describe:		
Clogging: Yes	No	Desci	ribe:		
Other Observations:					

### NOTES

Additional Comments and/or Actions To Be Taken	Time Frame

### ATTACHMENTS

- Attach site plan showing Aqua-Swirl<sup>®</sup> XCelerator location.
- Attach detail drawing showing Aqua-Swirl<sup>®</sup> XCelerator dimensions and model number.
- If a diversion configuration is used, attach details showing basic design and elevations (where feasible).

## Aqua-Swirl<sup>®</sup> XCelerator

### **TABULAR MAINTENANCE SCHEDULE**

Date Construction Started:

Date Construction Ended:

### **During Construction**

		Month										
Activity	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as needed			Х			Х			Х			Х
Inspect Bypass and maintain as needed			Х			Х			Х			Х
Clean System*												X*

\* The Aqua-Swirl<sup>®</sup> XCelerator should be cleaned <u>once a year</u> regardless of whether it has reached full pollutant storage capacity. In addition, the system should be cleaned at the <u>end of construction</u> regardless of whether it has reach full pollutant storage capacity.

### **First Year Post-Construction**

		Month										
Activity	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as needed			Х			Х			Х			Х
Inspect Bypass and maintain as needed			Х			Х			Х			Х
Clean System*												X*

\* The Aqua-Swirl<sup>®</sup> XCelerator should be cleaned <u>once a year</u> regardless of whether it has reached full pollutant storage capacity.

### Second and Subsequent Years Post-Construction

		Month										
Activity	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as needed												X*
Inspect Bypass, maintain as needed												X*
Clean System*												X*

\* If the Aqua-Swirl<sup>®</sup> XCelerator did <u>not</u> reach full sediment or floatable pollutant capacity in the First Year Post-Construction period, the system can be inspected and cleaned once annually.

If the Aqua-Swirl<sup>®</sup> XCelerator <u>reached</u> full sediment or floatable pollutant capacity in less than 12 months in the First Year Post-Construction period, the system should be inspected once every six (6) months or more frequently if past history warrants, and cleaned as needed. The system should be cleaned annually regardless of whether it reaches its full sediment or floatable pollutant capacity.





## **Operation and Maintenance Manual**

## **Stormwater Solutions**

94 Hutchins Drive Portland, ME 04102

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www.hydro-int.com

## Up-Flo<sup>®</sup> Filter

Filtration System for Stormwater Treatment

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### **IMPORTANT** - ORDER REPLACEMENT PARTS FOR MAINTENANCE - **IMPORTANT**

Annual maintenance requires replacement of the Media Packs and the Drain Down Filter. Contact Hydro International to order replacements. Allow 2-4 weeks for delivery.

Office hours Monday thru Friday 8:00 A.M. to 5:00 P.M. EST Toll free: 1-888-382-7808 Phone: 207-756-6200 Fax: 207-756-6212 Email: services@hydro-int.com

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**DISCLAIMER:** Information and data contained in this manual is exclusively for the purpose of assisting in the operation and maintenance of Hydro International plc's Up-Flo®Filter. No warranty is given nor can liability be accepted for use of this information for any other purpose. Hydro International plc have a policy of continuous product development and reserve the right to amend specifications without notice.

## **OVERVIEW & PRODUCT DESCRIPTION**

The Up-Flo® Filter is a modular high-rate stormwater filtration device designed to capture trash, oil, sediment and remove fine pollutants such as dissolved and particulate metals and nutrients from stormwater runoff. Designed with efficiency, longevity and upkeep in mind, this high performance, low maintenance filter option that offers higher loading rates and longer media life for higher quality stormwater for longer periods between servicings.

In general, a minimum of two inspections are required per year to monitor sediment and gross pollutant accumulations. In order to achieve an annual TSS removal rate of 80% for the Up-Flo<sup>®</sup> Filter, the minimum maintenance frequency specified in the maintenance section for replacement of the Media Pack and removal of accumulated sediment from the sump is mandatory.



## **PRODUCT CONFIGURATIONS**



a. Manhole

**Fig.2** The Up-Flo<sup>®</sup> Filter is installed in a) 4-ft (1.2m) round manholes or b) in rectangular precast vaults. Both configurations have a wide central opening in the Up-Flo<sup>®</sup> Filter.

## HYDRO MAINTENANCE SERVICES

Hydro International has been engineering stormwater treatment systems for over 30 years. We understand the mechanics of removing pollutants from stormwater and how to keep systems running at an optimal level.

## NOBODY KNOWS OUR SYSTEMS BETTER THAN WE DO



## AVOID SERVICE NEGLIGENCE

Sanitation services providers not intimately familiar with stormwater treatment systems are at risk of the following:

- Inadvertently breaking parts or failing to clean/replace system components appropriately.
- Charging you for more frequent maintenance because they lacked the tools to service your system properly in the first place.
- Billing you for replacement parts that might have been covered under your Hydro warranty plan
- · Charging for maintenance that may not yet have been required.

## LEAVE THE DIRTY WORK TO US

Trash, sediment and polluted water is stored inside treatment systems until they are removed by our team with a vactor truck. Sometimes teams must physically enter the system chambers in order to prepare the system for maintenance and install any replacement parts. Services include are are not limited to:

- · Solids removal
- Removal of liquid pollutants
- · Replacement media installation (when applicable)



## **BETTER TOOLS, BETTER RESULTS**

Not all vactor trucks are created equal. Appropriate tools and suction power are needed to service stormwater systems appropriately. Companies who don't specialize in stormwater treatment won't have the tools to properly clean systems or install new parts.



### SERVICE WARRANTY

Make sure you're not paying for service that is covered under your warranty plan. Only Hydro International's service teams can identify tune-ups that should be on us, not you.

## TREATMENT SYSTEMS SERVICED BY HYDRO:

- Stormwwater filters
- Stormwater separators
- Baffle boxes
- Biofilters/biorention systems
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## OPERATION

### INTRODUCTION

The Up-Flo<sup>®</sup> Filter operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirements and is fabricated with durable non-corrosive components. Personnel are not required to operate the unit and maintenance is limited to periodic inspections, sediment and floatables removal, Media Pack replacement and Drain Down Filter replacement.

### POLLUTANT CAPTURE

The Up-Flo<sup>®</sup> Filter is designed to operate as a "treatment train" by incorporating multiple treatment technologies into a single device. Trash and gross debris are removed by sedimentation and screening before they are introduced to the filtration media, preventing surface blinding of the filter media. The Up-Flo<sup>®</sup> Filter is a wet-sump device. Between storm events, oil and floatables are stored on the water surface separate from the sediment storage volume in the sump (see **Fig.1**). The high-capacity bypass siphon acts as a floatables baffle to prevent washout of captured floatable pollutants during high intensity events.

### **REDUCED CLOGGING**

The Up-Flo<sup>®</sup> Filter has been designed to minimize the occurrence of clogging and blinding and employs a unique Drain Down Filter that allows the water level in the chamber to drop below the filter media between events. The Drain Down Filter mechanism creates a reverse flow that flushes captured pollutants off the surface of the Media Bag, helping to prevent blinding. By allowing the water to drain out, the Drain Down Filter also reduces the weight of the Media Bags. This makes the bags easier and safer to remove during maintenance operations.

### **OVERFLOW PROTECTION**

The Angled Screens are designed to prevent ragging and blinding and are situated below the Filter Modules, sheltering them from the direct path of the influent. Coarse debris settles in the sump before the runoff flows up through the screens, protecting them from blinding. In the unlikely event of a blockage, the high capacity siphonic Bypass Hood is designed to convey high enough flow to minimize the risk of large storm creating upstream flooding.

### **BEST PRACTICES**

Good housekeeping upstream of the Up-Flo<sup>®</sup> Filter can significantly extend Media Bag life. For example, sweeping paved surfaces, collecting leaves and grass trimmings, and protecting bare ground from erosion will reduce loading to the system. Media Packs should not be installed in the Filter Modules until construction activities are complete and site stabilization is effective.

### DAMAGE DUE TO LACK OF MAINTENANCE

Delayed maintenance would result in clogged Media Bags and/or blinded Angled Screens. In that situation, the Up-Flo<sup>®</sup> Filter would go into bypass and there would be no treatment of the incoming stormwater. Because the Bypass Weir can easily convey all of the flow to the Outlet Module, there would be no lasting damage to the system. Replacement of the Media Bags and removal of sediment from the sump would restore the Up-Flo<sup>®</sup> Filter to its original treatment efficiency. Establishing and adhering to a regular maintenance schedule ensures optimal performance of the system.



Fig.3 a) The water level in a properly functioning Up-Flo® Filter will drain down to the base of the Filter Modules. b) When the Drain Down Filter becomes clogged, the base of the Filter Modules will be submerged in standing water. Note, above right, that the Drain Down Filter is submerged in standing water.

### **INSPECTION & MAINTENANCE**

### OVERVIEW

The Up-Flo<sup>®</sup> Filter protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the proper functioning of the Up-Flo<sup>®</sup> Filter.

Maintenance activities can be categorized as those that may be performed from outside the Up-Flo® vessel and those that are performed inside the vessel. Maintenance performed from outside the modules includes removal of floatables and oils that have accumulated on the water surface and removal of sediment from the sump. Maintenance performed inside the vessel includes removal and replacement of Media Bags, Flow Distribution Media and the Drain Down Filter. A vactor truck is required for removal of oils, water, sediment, and to completely pump out the vessel to allow for maintenance inside. If you are not using Hydro Internatioanl or a trained servcie provider you must follow OSHA Confined Space Entry procedures when entering the Up-Flo® vessel.

The Up-Flo<sup>®</sup> Filter design has a wide central opening between the Filter Modules for easy access to all of the components (see **Fig.3**). In the case of inspection and floatables removal, a vactor truck is not required. Otherwise, a vactor truck is normally required for oil removal, removal of sediment from the sump, and replacement of the Media Packs and Drain Down Filter. In most cases, entry into the Up-Flo<sup>®</sup> Filter vessel is required for replacement of the Media Packs and Drain Down Filter.

The minimum required frequency for replacement of the Media Pack is annually, whereas the minimum required frequency for removal of accumulated sediment from the sump is dependent on the Up-Flo® Filter configuration. Configurations with a larger sediment storage volume per module will require less frequent removal of accumulated sediment. Regardless, whenever sediment depth in the sump is found to be greater than 16 inches, sediment removal is required.



AT A MINIMUM, MEDIA BAGS MUST BE REPLACED AT LEAST ONCE A YEAR.

Fig.4 a) A new Media Bag of Hydro Filter Sand. b) A spent media bag of Hydro Filter Sand.

## MAKE SURE YOUR SYSTEM WAS INSTALLED CORRECTLY

### First Year Inspection and Maintenance

The frequency of inspection and maintenance can be determined in the field after installation. The frequency of ongoing maintenance needs is based on site characteristics such as contributing area, types of surfaces (e.g., paved and/or landscaped), site activities (e.g., short-term or long-term parking), and other site maintenance (e.g., sanding and sweeping). At a minimum, inspection and maintenance should be conducted at intervals of no more than six months during the first year of operation. Maintenance personnel should observe and record pollutant accumulations during the first year of service in order to benchmark the maintenance intervals that will later be established for the site. Pollutant accumulations should be measured or monitored using the following procedures:

- Measurement of sediment depth in the sump: A minimum of 8 inches (20 cm) should separate the Drain Down Filter inlet from stored sediment in the sump in order to minimize sediment migration into the Drain Down Filter. A simple probe, such as the Sludge-Judge<sup>®</sup>, can be used to determine the depth of the solids in the sump. In a typical 4-ft (1.2m) diameter manhole installation, the sediment depth should be no more than 16 inches (41 cm).
- Maintenance personnel should then enter the structure, remove the Media Pack from one of the Filter Modules, and weigh the Media Bags. Media Bags with a wet weight of approximately 40 lbs (18 kg) or more are an indication that the filter media has become full and that the Media Packs in all of the Filter Modules will require replacement (Fig.4). Minimum filtration rate is generally reached when the Media Bags have accumulated approximately 20 lbs (9 kg) of sediment. Determining the amount of accumulated sediment will be accomplished by removing both of the Media Bags from one of the Media Packs and weighing the bags separately. Since a new Media Bag weighs approximately 30 lbs (14 kg) wet, the difference in weight will approximately equal the weight of solids that have accumulated in the bag. A spent Media Bag weighs approximately 50 lbs (23 kg) wet.
- Measurement of oil layer on water surface: Since water in the Up-Flo<sup>®</sup> vessel drains down to an elevation below the bottom of the
  Filter Modules when the system is idle, the amount of accumulated oil must be minimized so that oil is not entrained in the Media
  Pack when stormwater begins to fill the vessel at the start of a storm event. Oil accumulation should be limited to 1.5 inches (4 cm)
  or less. Probes can be used to measure oil thickness.
- Monitoring for Drain Down Filter clogging: The water level in the Up-Flo® Filter should be monitored to ensure that the Drain Down Filter is operating properly. The Drain Down Filter is designed to lower the water level in the Up-Flo® vessel to an elevation below the bottom of the Filter Modules between storm events. Periodically conduct an inspection one to two days after a storm event during the first year of operation. Approximately 36 hours after a 1-in (2.5-cm) rainfall, the water level inside the vessel should have dropped to a point where it is equal with the base of the Filter Modules. If the water level has not reached that point, then the Drain Down Filter has either become clogged or blinded by trash or debris (Fig.5 a and b). If there is no evidence of trash or debris around the Drain Down Filter inlet, then it has likely become clogged with particles.
- Monitoring for slime and debris covering the Flow Distribution Media or Angled Screens: After removal of the Media Bags, the bottom Flow Distribution Media should be removed and inspected to determine if it is coated with slime or debris. Similarly, the Angled Screen should be inspected for blockages and ragging.

### FIND OUT HOW FREQUENTLY YOUR SYSTEM NEEDS MAINTENANCE

Monitoring for floatables on the water surface: Similar to oil, the amount of accumulated floatables must be minimized to prevent trash and loose debris from becoming trapped on the Angled Screens when stormwater begins to fill the Up-Flo<sup>®</sup> vessel at the start of a storm event. Visual inspection is adequate to determine the amount of floatables. Floatables should be removed before they form a mat on the surface of the water.

The solids loading rate in the sump will be calculated by measuring the sediment depth in the sump and dividing the depth by the correlating interval of time since the sump was last cleaned. Similarly, starting with fresh Media Bags, the solids loading rate in the Media Packs will be calculated by weighing the Media Bags and dividing the weights by the correlating interval of time since they were installed. The wet weight of the heaviest bag will be used to determine the loading rate. As previously mentioned, a spent Media Bag weighs approximately 50 lbs (23 kg) wet. The spent Media Bag weight estimate was based on calculations of sediment loading in an Up-Flo<sup>®</sup> Filter that was run to exhaustion during laboratory testing.

The rate of oil accumulation will be calculated by measuring the thickness of the oil layer and dividing the thickness by the correlating interval of time since the sump was last cleaned. Ordinarily, oil thickness will not be measurable unless a spill has occurred. Consequently, any oil will typically be removed along with water when cleaning the sump.

Monitoring the Drain Down Filter for clogging, monitoring the Flow Distribution Media and Angled Screens for slime and debris, and monitoring the accumulation of floatables will provide an estimate of how long the Up-Flo® Filter can operate before its performance can become impaired by one of these factors.

### **Routine Inspection and Maintenance**

After completion of the first year of operation, determining and then following the established inspection and maintenance intervals will keep pollutant loadings within their respective limits. Removal of oils and floatables, replacement of the Drain Down Filter, replacement of Flow Distribution Media (see Fig.9, pg 11), and cleaning of Angled Screens will occur at the same frequency as cleaning of the sump and replacement of Media Bags unless the first year of operation indicates otherwise. Keeping to the established maintenance intervals will keep treatment flow rates at, or above, the design flow rate. Typically, annual maintenance is adequate.

In addition to scheduled maintenance, occasional checks for Up-Flo<sup>®</sup> Filter clogging can be performed by removing the manhole cover during a storm, monitoring the water level in the manhole or vault, and determining whether the filter is in bypass. A properly-sized filter (on-line or off-line) that is in bypass during a storm that is producing runoff at, or below, the filter's design filtration rate needs maintenance.

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## **INSPECTION & MAINTENANCE**

### **ROUTINE INSPECTION**

Inspection is a simple process that requires monitoring pollutant accumulations. Maintenance crews should be familiar with the Up-Flo<sup>®</sup> Filter and its components prior to inspection.

THE FOLLOWING INSTRUCTIONS ARE INTENDED FOR NON-HYDRO MAINTENANCE SERVICE PROVIDERS AND/OR THOSE INTENDING TO MAINTAIN THIER OWN UP-FLO<sup>®</sup> FILTER:

### Scheduling

• Inspection may be conducted during any season of the year but should occur shortly after a predicted rainfall to ensure components are operating properly.

### NECESSARY EQUIPMENT

- Safety Equipment and Personal Protective Equipment (traffic cones, work gloves, etc.)
- · Scale to measure the weight of the Media Bags
- · Crow bar to remove grate or lid
- · Pole with skimmer or net
- Sediment probe (such as a Sludge-Judge<sup>®</sup>)
- Hydro International Up-Flo® Filter Maintenance Log
- Trash bags for removed floatables

### **ROUTINE INSPECTION PROCEDURES**

- Set up any necessary safety equipment (such as traffic cones) to provide access to the Up-Flo<sup>®</sup> Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
- 2. Remove the grate or lid to the manhole or vault.
- Without entering the vessel, look down into the chamber to inspect the inside and to determine whether the high-water level indicator has been activated. Make note of any irregularities. See Fig.6 for a typical Inspection View.
- **4.** Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the chamber.
- Using a sediment probe such as a Sludge-Judge<sup>®</sup>, measure the depth of sediment that has collected in the sump of the vessel.
   Maximum sediment depth is 16 inches (41 cm).
- 6. If the high-water level indicator has been activated after two consecutive storms, remove the Filter Module lid by turning the cam latch and remove the Filter Media Pack (*refer to page 11 Replacement Procedures*). Weigh the Media Bags from one or two modules. Media Bags should be replaced if the wet weight exceeds 40 lbs (18 kg).
- 7. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or a high standing water level (see Fig.6 for the standard standing water level).
- 8. Securely replace the grate or lid.
- 9. Remove safety equipment.
- **10.** Contact Hydro International at (800) 848-2706 to discuss any irregularities noted during inspection.

Bypass siphon sits evenly on Outlet Module.

Standing water level is no higher than the base of the Filter Module. The Drain Down Filter will be visible if the water level is correct.

Filter Module Lids are closed.

Fig.6 Inspection view of the Up-Flo® Filter.

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### **ROUTINE MAINTENANCE**

Maintenance activities are grouped into two categories:

- Activities Not Requiring Man Entry Into the Up-Flo<sup>®</sup> Filter These activities include floatables removal, oil removal and removal of sediment from the sump.
- Activities Requiring Man Entry Into the Up-Flo<sup>®</sup> Filter Media Pack replacement and Drain Down Filter replacement.

Maintenance intervals are determined from monitoring the Up-Flo<sup>®</sup> Filter during its first year of operation. Depending on the site, some maintenance activities may have to be performed on a more frequent basis than others. In the case of floatables removal, a vactor truck is not required. Floatables and loose debris can be netted with a skimmer and pole.

A vactor truck is normally required for oil removal, removal of sediment from the sump, and to dewater the vessel for replacement of the Media Packs and Drain Down Filter (Fig.7). All inspection and maintenance activities would be recorded in an Inspection and Maintenance Log.

Completion of all the maintenance activities for a typical 4-ft (1.2m) diameter manhole installation takes less than one hour. Approximately 360 gallons of water and up to 0.6 yd<sup>3</sup> (0.5 m<sup>3</sup>) of sediment may be removed in the process. In an installation equipped with six Filter Modules, 12 Media Bags (2 bags per module) would be removed and replaced. Assuming a spent Media Bag weight of 50 lbs (23 kg), up to 600 lbs (272 kg) of spent Media Bags would be removed. All consumables, including Media Bags, Flow Distribution Media, and replacement Drain Down Filters are supplied by Hydro International.

The access port located at the top of the manhole provides unobstructed access for a vactor hose and/or skimmer pole to be lowered to the base of the sump.

## MAINTENANCE ACTIVITIES NOT REQUIRING MAN ENTRY

These activities include floatables removal, oil removal and removal of sediment from the sump.

### SCHEDULING

• Floatables and sump cleanout may typically be done during any season of the year - before and after rainy season

• Floatables and sump cleanout should occur as soon as possible following a contaminated spill in the contributing drainage area

### RECOMMENDED EQUIPMENT

- Safety Equipment (traffic cones, etc)
- · Crow bar to remove grate or lid
- · Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge-Judge<sup>®</sup>)
- · Vactor truck (flexible hose preferred)
- · Pressure nozzle attachment or other screen-cleaning device





Fig.7 Sediment is removed from the sump with a vactor hose. Man entry is not required for this step.

#### Page | 10

### Up-Flo® Filter Operation and Maintenance Manual

### NO MAN ENTRY REQUIRED: FLOATABLES, OIL AND SEDIMENT:

- Set up any necessary safety equipment (such as traffic cones) around the access of the Up-Flo<sup>®</sup> Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
- 2. Remove the grate or lid to the manhole or vault.
- 3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
- 4. If the standing water level in the sump is above the base of the Filter Modules (see Fig.8), tug the Pull Chain(s) to release the Drain Down Filter plug(s). Allow the excess water to drain out of the chamber.
- 5. Use the skimmer pole to fit the Drain Down Filter plug back into the open port.
- Once all floatables and oil have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris from the sump floor. Up to 0.3 yd<sup>3</sup> (0.2 m<sup>3</sup>) of sediment and 360 gallons (1,363 L) of water will be removed from a typical manhole Up-Flo<sup>®</sup> Filter during this process.
- 7. Retract the vactor hose from the vessel.
- 8. Inspect the Angled Screens for blockages and ragging. If present, remove the obstruction or ragging materials from the surface using a hose or other screen-cleaning device.
- On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables, oils, and gross debris removed, and the depth of sediment measured. Note any apparent irregularities such as damaged components or blockages.
- 10. Securely replace the grate or lid. Remove safety equipment.
- 11. Dispose of sediment and gross debris following local regulations.
- 12. Dispose of oil and sump water at a licensed water treatment facility or following local regulations.
- 13. Contact Hydro International at (800) 848-2706 to discuss any irregularities noted during cleanout.

### MAINTENANCE ACTIVITIES REQUIRING MAN ENTRY

These activities include replacement of the Media Packs and Drain Down Filter.

Unless the Up-Flo<sup>®</sup> Filter has been installed as a very shallow unit, it is necessary to have an OSHA-confined space entry trained person enter the vessel to replace Media Packs.

The access port located at the top of the manhole or vault provides access to the Up-Flo<sup>®</sup> vessel for maintenance personnel to enter the vessel and remove and replace Media Packs. The same access would be used for maintenance personnel working from the surface to net or skim debris and floatables or to vactor out sediment, oil, and water. Unless the Up-Flo<sup>®</sup> Filter has been installed in a very shallow configuration, it is necessary to have personnel with OSHA Confined Space Entry training performing the maintenance that occurs inside the vessel.

### Scheduling

- Call Hydro International to order replacement Media Packs
   and Drain Down Filter prior to scheduling maintenance.
- Because Media Pack replacement requires entry into the Up-Flo<sup>®</sup> chamber, maintenance events should be scheduled during dry weather.
- Media Pack replacement should occur immediately after a contaminated spill in the contributing drainage area.



Fig.8 Cutaway view of the Filter Module

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### Recommended Equipment

- Safety Equipment (traffic cones, etc.)
- Crow bar to remove grate or lid
- Pole with skimmer or net (if floatables removal is not to be done with vactor hose)
- Sediment probe (such as a Sludge-Judge®)
- Vactor truck (flexible hose preferred)
- OSHA Confined Space Entry Equipment
- Up-Flo<sup>®</sup> Filter Replacement Media Packs (available from Hydro International)
- Hydro International Up-Flo® Filter Maintenance Log
- Screwdriver (flat head)
- Replacement Drain Down Filter components supplied by Hydro International

### Man Entry Required: Media Pack and Drain Down Filter

- 1. Follow Floatables and Sump Cleanout Procedures, 1 13.
- 2. Following OSHA Confined Space Entry procedures, enter the

Up-Flo<sup>®</sup> Filter Chamber.

- Open the Filter Module by turning the three cam latches on the front and sides of the module. Remove the lid 1 to gain access to the Media Pack (Fig.9).
- 4. Remove and discard the spent Media Pack. The Media Pack contents include:
  - A top layer of A Flow Distributing Sheets
  - Two (2) Media Bags B equipped with nylon handles.
  - A bottom layer of **A** Flow Distributing Media.
- 5. Insert a new Media Pack, supplied by Hydro International.
  - First, insert a bottom layer of green Flow Distributing Media. Be sure that the media sits snugly and level at the bottom of the Filter Module.
  - Next, insert the first of two (2) replacement Media Bags. Smooth the bag out with your hands to make sure that the bag extends snugly to the walls and corners of the Filter Module.
  - Insert the second Media Bag, following the same procedure.
  - Insert the top layer of green Flow Distributing Media.



Be sure that the piece fits snugly against the walls and corners of the Filter Module.

- Put the lid on and secure the three latches. Check to make sure that the latches are closed properly.
- 6. Use a screwdriver to unscrew the Drain Down Filter from the face of the Outlet Module (see Fig.10). DO NOT DISCARD THIS PIECE.
- 7. Install new Drain Down Filter supplied by Hydro International.
- 8. Exit the Up-Flo<sup>®</sup> Filter chamber and securely replace the grate \_\_\_\_or lid.
- 9. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables, oil and gross debris removed, and the depth of sediment measured. Note the number of Media Packs replaced. Note any irregularities such as damaged components or blockages.

#### Fig.10 The Drain Down Filter.



- 10. Remove safety equipment.
- 11. Dispose of spent media packs at your local landfill, following local regulations.
- 12. Return the spent Drain Down Filter to Hydro International.
- 13. Contact Hydro International to discuss any irregularities noted during annual maintenance.

### Solids Disposal

Sediment, floatables, gross debris, and spent Media Bags can generally be disposed of at the local landfill in accordance with local regulations. The toxicity of the residues captured will depend on the activities in the contributing drainage area, and testing of the residues may be required if they are considered potentially hazardous.

Sump water can generally be disposed of at a licensed water treatment facility but the local sewer authority should be contacted for permission prior to discharging the liquid. Significant accumulations of oil removed separately from sump water should be transported to a licensed hazardous waste treatment facility for treatment or disposal. In all cases, local regulators should be contacted about disposal requirements.

### MAINTENANCE AT A GLANCE

Activity	Frequency
Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Floatables/Oils Removal	- Twice per year or as needed - Following a contaminated spill in the drainage area
Sediment Removal	<ul> <li>Every six to 12 months, depending on the Up-Flo<sup>®</sup> Filter Configuration</li> <li>The maximum allowable sediment depth in any Up-Flo Filter configuration is 16 inches (41 cm)</li> <li>Following a contaminated spill in the drainage area</li> </ul>
Media Pack Replacement	<ul> <li>Once per year</li> <li>Replacement is required anytime inspection reveals that the high-water level indicator has been activated after two consecutive storms and the subsequent weighing of the Media Bags shows a wet weight greater than 40 lbs</li> <li>Following a contaminated spill in the drainage area</li> </ul>
Drain Down Filter Replacement	<ul> <li>Once per year with Media Pack replacement</li> <li>Replacement is required anytime inspection reveals that the water level inside the vessel has not reached a level equal with the base of the Filter Modules approximately 36 hours after a 1-inch (2.5 cm) rainfall</li> <li>As needed, in the event of continuous base flow conditions</li> </ul>

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## **UP-FLO®** FILTER INSTALLATION LOG



SITE REFERENCE NAME OR NUMBER FOR THIS UP-FLO® FILTER LOCATION:						
SITE NAME:						
SITE LOCATION:						
OWNER:	SITE CONTRACTOR:					
CONTACT NAME:	CONTACT NAME:					
COMPANY NAME:	COMPANY NAME:					
ADDRESS:	ADDRESS:					
TELEPHONE:	TELEPHONE:					
FAX:	FAX:					

INSTALLATION DATE: / /

CONFIGURATION (CIRCLE ONE): MANHOLE VA

VAULT SYSTEM

TOTAL NUMBER OF UP-FLO® FILTER MODULES:

## **UP-FLO®** FILTER INSPECTION LOG

Site Name:	Owner Change since last inspection? Y			
Location:				
Owner Name:				
Address:				Phone Number:
Site Status:				
Date: Time:	Site	conditions	*. 	
	*(St	able, Unde	er Construction,	Needing Maintenance, etc.)
Inspection Frequency Key: A=annual; M=mor	nthly; S=aft	er major s	torms	
Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Debris Removal				
Adjacent area free of debris?	M			
Inlets and Outlets free of debris?	М			
Facility (internally) free of debris?	M			
Vegetation				
Surrounding area fully stabilized? (no evidence of eroding material into Up-Flo <sup>®</sup> Filter)	A			
Grass mowed?	M			
Water retention where required	0			
Water holding chamber(s) at normal pool?	A			
Evidence of erosion?	A			
Sediment Deposition	0			
Filtration Chamber free of sediments?	A			
Sedimentation sump not more than 50% full?	A			
Structural Components				
Any evidence of structural deterioration?	A			
Grates in good condition?	A			
Spalling or cracking of structural parts?	A			
Outlet/Overflow Spillway	A			
Other				
Noticeable odors?	A			
Any evidence of filter(s) clogging?	М			
Evidence of flow bypassing facility?	A			



Inspector Comments:							
Overall Condition of Up-Flo <sup>®</sup> Filter**:							
**"Acceptable" would mean properly fu	inctioning; "unacceptable"	would mean damaged or required further ma	aintenance.				

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed", list Maintenance actions and their completion dates below or on the Maintenance Log provided on page 15 of the Up-Flo® Filter Operation & Maintenance Manual:

Maintenance Action Needed	Due Date

The next routine inspection is schedule for approximately: (date)

Inspected by: (signature)

Inspected by: (printed)

# Hydro Solutional Solution

## **UP-FLO® FILTER MAINTENANCE LOG**

Site Name:		Owner Change since	last inspection? Y N
Location:			
Owner Name: _			
Address:		Phone Number:	
Site Status:			
Date:	Time:	Site conditions:*(Stable, Under Construction, Needing Maintenance, etc.)	
Estimated volun	ne of oil/floatable trash rei	moved:	
Sediment depth	measured in sump prior t	o removal:	
Number of Filter	r Modules fitted with new	media packs:	
Inspector Comr	ments:		
Overall Condition	on of Up-Flo <sup>®</sup> Filter: would mean properly func	Acceptable Unacceptable tioning; "unacceptable" would mean damaged or required further mai	intenance.
Maintained by:	(signature)		
Maintained by:	(printed)		

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