

MTD Registration Form

Section A

Attachment 1

Manufactured Treatment Device (MTD) Registration

1. **Manufactured Treatment Device Name:** SciClone Hydrodynamic Separator

2. **Company Name:** Bio Clean Environmental Services, Inc. a Forterra Company

Mailing Address: 398 Via El Centro

City: Oceanside

State: CA Zip: 92058

3. **Contact Name** (to whom questions should be addressed): Zachariha Kent

Mailing Address: 398 Via El Centro

City: Oceanside

State: CA Zip: 92058

Phone number: 760-433-7640 Cell Phone 760-579-9752

Fax number: 760-433-3176

E-mail address: zach.kent@forterrabp.com

Web address: <http://www.biocleanenvironmental.com/>

4. **Technology**

Specific size/capacity of MTD assessed (include units):

The SciClone with internal bypass was tested under the new NJCAT protocol for separators with the model SC-4. The system has received approval by NJDEP. See Section A for detail. This model is capable to treat 0.70 cfs based on a verified loading rate of 25 gpm/sf surface loading scaling or 5 gpm/cu/ft total wet volume.

Range of drainage areas served by MTD (acres):

0.1 to 50 plus acres. Can be used in both flow and volume based designs.

Include sizing chart or describe sizing criteria:

Sizing is based on the verified loading rate of 25 gpm/sf (surface loading) and 5 gpm/cu/ft (wet volume). The standard sizing sheet is included in the brochure. See Section C for SciClone Brochure.

Model #	Diameter (ft)	Maximum Treatment Flow Rate ¹ (cfs)	Sediment Chamber Depth ² (ft)	Wet Volume (cu ft)	Storage Capacity (cu ft)
SC-4	4	0.702	5	62.80	19
SC-5	5	1.32	6	117.75	29
SC-6	6	2.21	7	197.82	42
SC-7	7	3.44	8	307.72	58
SC-8	8	5.05	9	452.16	75
SC-9	9	7.11	10	635.85	95
SC-10	10	9.65	11	863.50	118
SC-11	11	12.74	12	1139.82	142
SC-12	12	16.43	13	1469.52	170

Intended application: on-line or offline:

Online approved. Can also be used offline.

Media used (if applicable):

Not applicable

5. Warranty Information (describe, or provide web address):

1 year warranty free of manufacture's defects. See Section D for SciClone Warranty.

<http://www.biocleanenvironmental.com/>

6. Treatment Type

- Hydrodynamic Structure
- Filtering Structure
- Manufactured Bioretention System
- Provide Infiltration Rate (in/hr):
- Other (describe):

7. Water Quality Treatment Mechanisms (check all that apply)

- Sedimentation/settling
- Infiltration
- Filtration (specify filter media) Membrane Filtration
- Adsorption/cation exchange

- Chelating/precipitation
- Chemical treatment
- Biological uptake
- Other (describe):

8. Performance Testing and Certification (check all that apply):

Performance Claim (include removal efficiencies for treated pollutants, flow criteria, drainage area):

NJCAT 112 Micron PSD Teating – Average Weighted TSS Removal Rate of 80.6% with maximum removal rate of 97.5%. Based on loading rate of 25 gpm/sq ft surface area or 5 gpm/cu ft wet volume at 100% MTFR. NJCAT verified. See Section E for NJCAT Technology Verification for more information.

NJCAT – Average Weighted TSS Removal Rate of 50% with maximum removal rate of 59.6%. Based on loading rate of 25 gpm/sq ft surface area or 5 gpm/cu ft wet volume at 100% MTFR. NJCAT verified and NJDEP approved. See Section F for NJCAT Technology Verification and NJDEP approval for more information.

Specific size/Capacity of MTD assessed:

SC-4 which is a 4' diameter system / treatment flow of 0.702 cfs.

Has the MTD been "approved" by an established granting agency, e.g. New Jersey Department of Environmental Protection (NJDEP) , Washington State Department of Ecology, etc.

No

Yes; For each approval, indicate (1) the granting agency, (2) use level if awarded (3) the protocol version under which performance testing occurred (if applicable), and (4) the date of award, and attach award letter.

(1) NJCAT Verification September and December 2017

(2) NJDEP Approval December 2017

Was an established testing protocol followed?

No

Yes, (1) Provide name of testing protocol followed, (2) list any protocol deviations:
NJCAT / NJDEP

Provide the information below and provide a performance report (attached report):

For lab tests (See Section E & G for NJCAT Technology Verification Report):

- i. Summarize the specific settings for each test run (flow rates, run times, loading rates) and performance for each run:

Standard NJDEP protocol including runs ta 25%, 50%, 75%, 100% and 125% MTR. Each run including 6 sediment feed samples, 8 background samples and 15 effluent samples. Runs time being from 105 mints to 30 minutes respectively at the % of MTR. All influent loading rates at 200 mg/L. Performance for both test listed below:

112 Mean PSD Distribution

%MTR	Removal Efficiency (%)	Annual Weighting Fact	Weighted Removal Efficiency (%)
25	97.5	0.25	24.4
50	86.6	0.30	26.0
75	74.6	0.20	14.9
100	65.8	0.15	9.87
125	54.7	0.10	5.47
Annualized Weighted Removal Efficiency			80.6%

NJDEP PSD Distribution

%MTR	Removal Efficiency (%)	Annual Weighting Factor	Weighted Removal Efficiency (%)
25	59.6	0.25	14.90
50	53.0	0.30	15.90
75	47.4	0.20	9.48
100	40.2	0.15	6.03
125	37.2	0.10	3.72
Annualized Weighted Removal Efficiency			50.03

- ii. If a synthetic sediment product was used, include information about the particle size distribution of the test material:

See below PSDs for each:

112 Mean PSD Distribution

Particle Size (µm)	Test Sediment Particle size (%passing)			
	Sample 1	Sample 2	Sample 3	Average
1000	100	100.0	100.0	100.0
500	99.8	99.7	99.6	99.7
250	96.1	95.7	95.1	95.6
150	79.5	78.4	76.5	78.1
100	42.9	39.7	39.4	40.7
75	21.2	20.0	21.2	20.8
50	3.3	2.0	2.1	2.5
20	0	0	0	0
8	0	0	0	0
5	0	0	0	0
2	0	0	0	0
d ₅₀ (µm)	109	113	114	112

NJDEP PSD Distribution

Particle Size (Microns)	Test Sediment Particle Size (% Less Than) \diamond				NJDEP Minimum Specification	QA/QC
	Sample 1	Sample 2	Sample 3	Average		
1000	100	100	100	100	98	PASS
500	98	97	98	98	93	PASS
250	91	90	91	91	88	PASS
150	80	79	81	80	73	PASS
100	60	59	60	60	58	PASS
75	51	49	52	51	48	PASS
50	44	44	45	44	43	PASS
20	36	36	37	36	33	PASS
8	19	19	20	19	18	PASS
5	12	13	13	13	8	PASS
2	6	8	8	7	3	PASS
d ₅₀	71 µm	79 µm	70 µm	73 µm	≤ 75 µm	PASS

- iii. If less than full-scale setup was tested, describe the ratio of that tested to the full-scale MTD:

A full scale SC-4 was used which is a commercially available model.

For field tests:

- i. Provide the address, average annual rainfall and characterized rainfall pattern, and the average annual number of storms for the field-test location: **Not applicable**
- ii. Provide the total contributing drainage area for the test site, percent of impervious area in the drainage area, and percentages of land uses within the drainage area (acres): **Not applicable**
- iii. Describe pretreatment, bypass conditions, or other special circumstances at the test site: **Not applicable**
- iv. Provide the number of storms monitored and describe the monitored storm events (amount of precipitation, duration, etc.): **Not applicable**

Describe whether or not monitoring examined seasonal variation in MTD performance: **Not applicable**

- v. If particle size distribution was determined for monitored runoff and/or sediment collected by the MTD, provide this information: **Not applicable**

9. MTD History:

How long has this specific model/design been on the market?

The SciClone along with all available models has been on the market since 2017

List no more than three locations where the assessed model size(s) has/have been installed in Virginia. If applicable, provide permitting authority. If known, provide latitude & longitude:

Currently, there are no SciClone installed in Virginia, thus approval is being sought. We have installations in CO, TX, GA, IA, MN, OH, SC, MN, TN, SD, KY, CA.

List no more than three locations where the assessed model size(s) has/have been installed outside of Virginia. If applicable, provide permitting authority. If known, provide latitude & longitude:

1. City of Grand Junction. 2000 West 3rd Ave. Grand Junction, CO 80223
2. City of Kilgore. 815 N. Kilgore St, Kilgore, TX 75662
3. City of Summerville. Boone Hill Rd and Greenwave Blvd, Summerville, SC 29063

The SciClone has been installed in CO, TX, GA, IA, MN, OH, SC, MN, TN, SD, KY, CA.

10. Maintenance:

What is the generic inspection and maintenance plan/procedure? (attach necessary documents):

Maintenance requirements will vary depending on pollutant loading and individual site conditions. It is recommended that the system be inspected at least twice a year the first year to determine loading conditions. These findings should be used to establish inspection and maintenance frequency. Chamber maintenance is achieved by opening the access hatch/manhole and, using an extension on a vacuum truck, lower the hose into the sedimentation chamber to remove all floating debris, standing water, and sediment. This concludes maintenance and the vault can be closed up. See Section G for Operation and Maintenance Manual for more information.

Is there a maintenance track record/history that can be documented?

- No, no track record.
- Yes, track record exists; (provide maintenance track record, location, and sizing of three to five MTDs installed in Virginia [preferred] or elsewhere): Maintenance records currently being collected and compiled and will be submitted at a later time.

Recognizing that maintenance is an integral function of the MTD, provide the following: amount of runoff treated, the water quality of the runoff, and what is the expected maintenance frequency for this MTD in Virginia, per year?

The SciClone was tested under the latest NJCAT protocol. Loading is part the protocol and a maintenance duration is applied to the BMP. The SciClone exceeded the NJ CAT protocol for being able to treat in excess of 600 of pounds of sediment per acre per year. The sediment removal interval is 96 months.

Total life expectancy of MTD when properly operated in Virginia and, if relevant, life expectancy of media:

The SciClone, its structure and components is designed to have a user life of 50 plus years.

For media or amendments functioning based on cation exchange or adsorption, how long will the media last before breakthrough (indicator capacity is nearly reached) occurs?

Not applicable.

For media or amendments functioning based on cation exchange or adsorption, how has the longevity of the media or amendments been quantified prior to breakthrough (attach necessary performance data or documents)?

N/A

Is the maintenance procedure and/or are materials/components proprietary?

- Yes, proprietary
 No, not proprietary

Maintenance complexity (check all that apply):

- Confined space training required for maintenance (if cartridge maintenance is needed)
 Liquid pumping and transportation

Specify method: Vacuum Truck

- Solids removal and disposal

Specify method:

Vacuum truck

Other noteworthy maintenance parameter (describe):

Access to the sump chamber is completely unrestricted unlike other separators that have only small access ports and visual observation and sediment removal is restricted.

11. Comments

Include any additional explanations or comments:

The SciClone is a simple and effective separator with a focus on being able to full maintain and remove sediments. Other systems on the market make removal of all the sediments, especially around the perimeter very difficult and in some cases impossible since the sediment will compact and become solid like in consistency.

12. Certification

Signed by the company president or responsible officer of the organization:

“I certify that all information submitted is to the best of my knowledge and belief true, accurate, and complete.”

Signature: Zachariha J Kent

Name: Zachariha J Kent

Title: VP of Product Development and Regulatory Compliance

Date: 1/17/2018

NOTE: All information submitted to the department will be made publically accessible to all interested parties. This MTD registration form will be posted on the Virginia Stormwater BMP Clearinghouse website.