Operation & Maintenance Instruction

ecoSorp Adsorption Post-Treatment System

1 Installation

1.1 Location

The unit must be installed below grade, downstream to an ecoSep oil/water adsorption system or any other high efficiency oil water separation system. When choosing the location, make sure that the unit can easily be accessed (also for maintenance vehicles).
Avoid any pipes or hydraulic structures that might cause turbulence upstream to the adsorption system.
To ensure unimpeded flow to and from the system, inlet and outlet pipes of the separation system shall decline at least 2%.

1.2 Preparing the installation pit

Width of floor = outside diameter of the concrete manhole +3ft.
The pit must be deeper than the stated installation depth, so as to allow for the depth of a sand bed or of any concrete base that might be necessary.
Inlet-and outlet-pipes shall be below the frost line.

1.3 Preparing the floor

The adsorption system can be placed straight onto a sand bed (min. thickness 1.5") where the soil is sufficiently firm. Where the bearing capacity is insufficient, a base platform must first be constructed, in line with the static requirements. A sand bed at least 3 cm thick is then placed on top of this.

1.4 Installing the adsorption system

The adsorption system is lowered into the pit by using a 4 chain lift bar to prevent any damage of the precast tanks.

The adsorption system must be placed horizontally on sand or on the freshly poured concrete slab. If the concrete of the base has already hardened, a sand bed (1.5" thickness) must be provided first.
All precast tanks are equipped with a flanged bottom to avoid buoyancy. If the system is installed at a location with high groundwater level, calculate buoyancy of the empty tanks (safety factor > 1.1).
Make sure that all connections between concrete elements (tank-cover-slab-riser rings) are waterproof.

IMPORTANT: When placing the cover slab, make sure that the openings in the cover are in the correct position.

1.5 Pipe connections

Pipe connections are provided with the system. Do not use other connections than specified.

1.6 Cleaning

Clean all dirt and mortar splashes off the container.

1.7 Tightness test

A tightness test for the adsorption system itself has to be carried out in the factory. Check the tightness of pipe connections.

1.8 Backfilling

After the above operations have been completed, loose soil must be placed around the plant, compacted a layer at a time and - if necessary - sluiced.

2 Putting into service

Mount the filter cartridges to the inlet structure and make sure that the quick lock is closed.

Before the plant is put into service, the system MUST be filled with clean water (unless it has been filled during a tightness test). Any materials left behind from installation (e.g. mortar, soil,…) must be removed prior to filling the tanks with fresh water.
IMPORTANT: Fill the adsorption system via the upstream separation chain (grit chamber, separator) until the chamber is full and water leaves the adsorption system through the outlet pipe.

The adsorption system is now ready to work.

3 Technical description

3.1 General

ecoSorp is a hydrocarbon adsorbing system designed to remove small amounts of light liquids from the effluent. The purified water can directly be discharged, as residual hydrocarbon concentrations are below 0.1 ppm. ecoSorp is meant as the last element of a purification chain consisting of grit chamber and ecoSep oil/water separator. A physical adsorption process on the surface of a highly oleophilic material is mainly responsible for these high removal efficiencies.

The following kind of influent must NOT be treated with the adsorption system:

- More domestic sewage than the plant was designed to handle.
- Substances which could impede proper functioning (large quantities of suspended particles etc.)
- Detergents and cleaning agents that form stable emulsions.
- Wastewater inflows that are still influenced by pump, agitator or vibrator movements.
- Wastewater inflows not having pH-values of between 6.0 and 8.0.
- Wastewater containing chlorides.

Referring to the independent test results, the residual hydrocarbon content in the purified effluent does not exceed 0,1 mg/l (proper maintenance required!).

3.2 Purification Process

The ecoSorp requires any kind of mechanical pre-purification (grit chamber and oil/water separator). The hydrocarbon concentration of common oil/water separators is mostly too high for direct discharge of the effluent. Ecosorp removes small amounts of free, physically emulsified and dissolved oil by adsorption. During the adsorption process, oil particles that are too small to be separated by gravity, are physically bound to an oleophilic material. Due to the high specific surface of the filter elements, removal efficiencies below 0.1 ppm can be reached.

3.3 Adsorption Capacity of the ecoSorp system

The adsorbent used for the filter cartridges can adsorb 9 to 10 times its own weight of hydrocarbons and petroleum byproducts.

For a typical ecoSorp system 3 filter bags (0.9kg each) are filled into one cartridge.

0.9kg x 3 = 2.7kg adsorbent per cartridge
2.7kg x 2 cartridges = 5.4kg adsorbent per unit
5.4kg x 9kg hydrocarbon/kg adsorbent = 48.6kg of hydrocarbon can be adsorbed

4 Maintenance and Operation

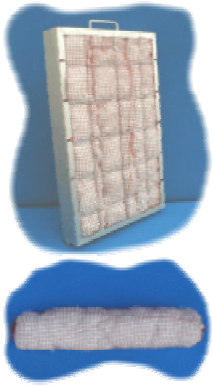
4.1 General

For an unimpeded functioning of the system, the adsorption system has to be maintained periodically. As every other adsorption system, the oil removal capacity of the ecoSorp fibers is limited (see 4.3.).
The adsorption system has to be inspected monthly, as well as after all non-routine events. Please report all damages to the system to the manufacturer.
To make sure that the adsorption system is maintained properly, a person must be designated to this task. Please use the enclosed maintenance sheet to report maintenance work and other events related to the operation of the system.
Due to the danger of explosions, it is strictly forbidden to smoke or light any flames anywhere near the plant, particularly after the cover has been opened.
Before entering the plant, remove the separated oil and make sure that the plant has been well ventilated. Each worker entering the plant must be attached to a safety rope held by another worker staying outside the plant. We recommend wearing breathing apparatus when entering the plant (confined space entry).
The access covers must fit correctly, and must be accessible at all times so that they can be lifted easily when necessary. They must not be covered with earth or any other material. The stated test loads of the cover slabs must not be exceeded.
An authorized specialist company must carry out the maintenance and emptying of the plants. The relevant maintenance and operating manual must be made available to this company.

4.2 Maintenance Intervals

The virgin filter media is bright white. Once it adsorbs oil and hydrocarbons it becomes yellowish and brown. Then the adsorption media needs to be exchanged.
Maintenance intervals will strongly depend on the filed of application and on inlet concentrations.
To meet 0.1 ppm effluent concentrations, the media needs to be exchanged monthly. Usually, maintenance intervals are in the range between 3 - 4 month.

4.3 Exchange of filter media



The filter cartridge has to be replaced periodically. Since the maintenance intervals strongly depend on the very application, check the condition of the filter element weekly during the first two month of operation.

To detach the filter cartridge from the outlet structure, release the quick lock on top of the cartridge and lift the filter on the handle. To replace the filter bags, remove one grating of the filter cartridge and insert three new filter bags parallel to each other and in longitudinal direction. Make sure that the filter media is distributed homogeneously over the total surface of the cartridge and the water cannot bypass the media.

Saturated adsorption media must be disposed properly!

All damage to the plant must be repaired immediately. It is forbidden to make constructional changes to the plant, to interfere with its mode of action or to increase the dimensions of the inlet or designed flow rates.

5 Maintenance log book

Working Site:		***ecoSorp Adsorption System/Model ____ gpm***	**Page No.:**
Date	Exchange of Adsorption Media	Remarks	Signature