ACTIVE TREATMENT SYSTEMS

Active treatment systems incorporate weir tanks, flocculants and filters in order to achieve a high contaminant removal rate while occupying a relatively small footprint (Figure B2-26).

They differ from a passive flocculant-based treatment train in that they are more sophisticated, offering more precise control of the treatment processes, such as flocculant dose metering and filter backwashing capabilities. They may also incorporate hydrodynamic processes for physical separation of floatables and suspended particles from the water. Flocculants are often incorporated in the treatment process to promote sediment particle binding and settling, and filters (e.g. sand) are included as a final 'polishing' step before water leaves the system.

Figure B2-26: Active water treatment system for construction site runoff

Active treatment systems are highly customizable and can range from simple to complex, depending on the components included, the types of contaminants being removed and the removal rate required. Product suppliers typically rent out the system components for the desired duration and often provide installation and other operations support to ensure the system performs effectively.

Application

Active treatment systems should be considered for removing contaminants during pumping of construction site stormwater when:

- Treatment is required for short-term pumping activities, such that taking the time to construct a BMP with similar sediment removal capacity (e.g. sediment control pond) would be impractical;
- A high sediment removal rate is required but the area available for treatment is too small to accommodate a sediment control pond;
- Water being treated contains certain contaminants of concern that require removal through specific chemical and/or physical processes;
- Site specific policy requirements define more stringent effluent water quality standards than are typical and/or achievable when applying other conventional BMPs; or
- Other conventional sediment control measures have failed to achieve the necessary removal rates.

Design and installation

- Selection of system and sizing should be done in consultation with the system supplier. Consider what treatment level is needed and what contaminants should be removed in order to find the right system to achieve those goals.

- Typical system components may include:
  - Flocculant and associated dosing system (e.g. injection into water stream, passive dosing by allowing water to flow over and around water soluble flocculant blocks);
  - Detention tank with weirs or baffles to allow mixing and sediment settling; and
  - Filters with or without backwashing capability.
- Determine the location where the system will be placed based on consideration of the following:
  - Placement at least 30 m from any natural water feature in order to minimize risk of a spill into the feature. Where siting 30 m away is not possible, consult with the local CA for guidance on siting and monitoring efforts that can be applied to mitigate risk.
  - Placement on a stabilized ground surface.
  - The location must be accessible to the vehicles transporting the system components. Consider whether the largest component that will be brought on site can be transported and placed in the intended area.
- Where flocculants are used, refer to flocculant guidance. The proposed use of any cationic flocculant is subject to approval by the local municipality and CA, as well as any other agencies involved in regulating discharges for the site.
- Selection of a flocculant should be based on demonstrated sediment settling performance during bench scale testing using soil and water samples from the site.
- For any flocculants to be used, toxicity data must be available to demonstrate that the product is non-toxic to aquatic organisms at the intended dosing/application rate.
- Ensure pumping rates do not shift substantially from the rates estimated during flocculant and system selection and sizing, as the flocculant and filters may be less effective at different flow rates.
- Ensure the system discharges to a well stabilized area, with flow dispersion and interruption devices placed as needed. Consider the entire flow path to the receiver and apply stabilization measures along the path as needed.
- For a multi-barrier approach, add a sediment control barrier around the area where the active treatment system is placed. This will provide added protection in the event of any pipe leaks.
- Keep a spill response kit near the active treatment system and ensure staff are aware of spills response and reporting protocols.

Inspections and monitoring

- Inspect daily during active use of the system and keep a record of the inspection. Inspection of specific system components may be the responsibility of the supplier, depending on the terms of the contract. As a minimum the onsite inspector should look monitor sediment accumulation in the tank and effluent quality.
- Carry out routine effluent monitoring to verify performance and ensure that effluent quality meets any applicable standards.

Figure B2-27: Treated water from an active treatment system

- Ensure system is monitored daily during active pumping and that staff overseeing the use of the system have a thorough knowledge of proper operation.
- Where there is evidence of erosion at the discharge point or along the flow path downstream of the discharge locations, re-consider whether stabilization is adequate to protect against erosion based on the flows.
- Keep MSDS sheets and toxicity reports related to the flocculant used in an easily accessible location on the site.
- Any repair or maintenance needs identified should be repaired within 48 hours or sooner if natural receptors are at imminent and foreseeable risk of adverse impact.