DEQ Guidance on Leachate Recirculation

Regulatory Reference: OAC 252:515-13-53

Applicability. MSWLFs where leachate is intended to be recirculated.

Purpose. To identify the minimum requirements for plans to recirculate landfill leachate over areas with a composite liner and leachate collection system.

Technical Discussion. As a minimum, a leachate recirculation plans must include the following components.

Location where leachate will be recirculated
Leachate may be recirculated only over areas of the landfill with a composite liner and leachate collection system. If recirculation will take place near the interface between a composite-lined cell and a clay-lined cell, a barrier must be constructed at the interface to prevent leachate from filtering into the clay-lined area.

The plan must include a map of the landfill showing locations where recirculation is proposed and design criteria for the interface, if one is required.

Leachate collection system design
The plan must include supporting assumptions, drawings, and calculations to demonstrate the leachate collection system will be able to handle the additional volume of liquid and still maintain no more than one-foot of head above the liner.[1]

In developing recirculation plans, DEQ believes the following, at a minimum, should be thoroughly considered and discussed:

- specific design of the drainage layer;[2]
- the potential for plugging of the drainage layer;
- the potential for chemical reaction of the leachate with the drainage layer material;
- long-term permeability of the drainage layer; and
- a method to verify excessive head is not collecting above the liner.

Routine testing program
The recirculation plan must include a routine testing program to monitor changes to leachate composition. A testing program must be established prior to beginning recirculation and submitted as part of the recirculation plan. As a minimum, leachate must be tested for the constituents identified in OAC 252:515-9-31(d)(1)(A) and (B). The plan must also include a sampling protocol that addresses the method and number of samples necessary to ensure a representative sample of the leachate volume is collected.

[1] Considerations may include HELP model output, pipe slopes and diameter, drainage layer permeability, etc.
[2] For instance, some materials, such as geotextile, may be incompatible with recirculation due to plugging problems.

Sampling must initially be performed quarterly and sample results submitted to the DEQ. After four quarterly samples have been collected, the DEQ may consider requests to reduce sampling frequency.

Standards for leachate recirculation

Application rates must take into consideration the hydraulic conductivity of the waste and any cover present, waste compaction, surface grade, time of year, and weather conditions. Using these considerations, the recirculation plan must include a comprehensive discussion of how the following will be met.

- During leachate application, exposure to landfill employees and customers must be minimized.
- Leachate must be prevented from discharging from the landfill.
- Leachate application must be at a low flow rate with uniform distribution over the proposed recirculation area.[3]
- Leachate application must not exceed holding capacity of the soils so as to cause ponding or runoff.[4]
- Leachate application must not occur during periods of high winds, freezing temperatures, or during or immediately after rainfall events.
- Adequate leachate storage must be available to store leachate when it is not being applied.[5]
- Procedures must be implemented to annually assess the performance of the leachate collection system to determine if any adverse effects from the added volume of leachate have occurred.

Recordkeeping

Owner/operators must keep records of the amount of leachate recirculated, locations of recirculation, and leachate testing results.

[3] Acceptable application methods may include surface spraying, drip irrigation tubing, pipes within the waste mass, etc.

[4] DEQ recommends owner/operators consult with their local extension agent to assist with determining appropriate application rates.

[5] Leachate storage is subject to the requirements of OAC 252:515-13-52.