DEQ Guidance on Leachate Irrigation

Regulatory Reference: OAC 252:515-13-54

Applicability. MSWLFs where leachate is intended to be used for irrigation.[1]

Purpose. To provide guidance for plans to use landfill leachate for irrigation of vegetation over previously filled areas.

Technical Discussion. Leachate means liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste. This includes:

- fluid collected in a leachate collection system, including its sumps, surface impoundments, tanks, or other similar locations;
- fluid collected on top of the bottom liner of a disposal cell that has received solid waste; and
- leachate seeps from disposal cells that have received solid waste.

DEQ supports the beneficial reuse of landfill leachate to help establish or maintain vegetation provided it is conducted in a safe and controlled manner. As a minimum, a leachate irrigation plan must include the following components.

Location where leachate will be used for irrigation

Leachate may be used for irrigation only over previously-filled areas that have at least intermediate cover. The plan must include a map of the landfill showing locations where irrigation is proposed. DEQ may require that the owner/operator provide certification that intermediate cover meets the requirements of OAC 252:515-19-52.

Routine testing program

The irrigation plan must include a routine testing program to ensure leachate will not harm vegetation. The testing program must include a proposed leachate testing frequency for the parameters listed in Appendix 1, as well as a sampling protocol that addresses the method and number of samples necessary to ensure a representative sample of the leachate volume is collected.

Standards for application of leachate

The irrigation 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 irrigation area.
- Leachate application must not exceed vegetation agronomic rates, the field capacity of the soils, or result in ponding or runoff.[2]

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[1] For the purposes of this guidance document, "irrigation" means the application of leachate at a rate needed to sustain growth of vegetation.

[2] DEQ recommends owner/operators consult with local extension agents to assist with determining appropriate application rates.

- 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.[3]
- Procedures must be implemented to monitor vegetation and stop leachate application when vegetation is stressed until the cause of stress is positively determined.

Recordkeeping
Owner/operators must keep records of the amount of leachate applied, locations of application, and leachate testing results.

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

Appendix 1
Maximum Concentration Standards for Leachate Irrigation

Leachate exceeding any of these concentrations may cause harm to vegetation and is generally not suitable for land application.

Parameter	Concentration
Aluminum	6.0 mg/l
Arsenic	0.2 mg/l
Beryllium	0.1 mg/l
Boron	0.8 mg/l
Cadmium	0.1 mg/l
Calcium	N/A needed for SAR*
Chromium	0.1 mg/l
Cobolt	0.1 mg/l
Copper	0.2 mg/l
Fluoride	1.0 mg/l
Iron	5.0 mg/l
Lead	5.0 mg/l
Lithium	2.5 mg/l
Magnesium	N/A needed for SAR*
Manganese	1.5 mg/l
Mercury	0.01 mg/l
Nickel	1.5 mg/l
Nitrite-N	10.0 mg/l
Nitrate/Nitrite-N	100.0 mg/l
Selenium	0.2 mg/l
Sodium	N/A needed for SAR*
Vanadium	0.1 mg/l
Zinc	5.0 mg/l
pH	6.5 to 8.4
Sodium Absorption Ratio (SAR)*	< 9 meq/l
Bicarbonate-Residual Sodium Carbonate	2.5 meq/l
Salinity	< 2000 mg/l
Chloride	< 355 mg/l
TPH	15 ppm

$$^{*}SAR = \frac{Na}{\sqrt{\frac{Ca + Mg}{2}}}$$

meq/l × Equivalent weight = PPM