

Subsurface Discharge of Treated Wastewater Effluent

Oregon Permitting Options and Standards

Regulation Summary Chart

Type of Discharge System	Description	Controlling Regulations	Needed Permit Information	Other Agencies
For all Systems listed below		-40 CFR 144 – 146 -40 CFR 122 -OAR Div. 40 -OAR Div. 41 -OAR Div. 45	Hydrologic and hydrogeologic assessment (% to groundwater; % to Surface water) -Background water quality for groundwater and surface water. -Effluent quality and quantity -Historic WWTP performance (inc. pretreatment program and spill/emergency response capacity) -Design discharge details -Operational parameters -Proposed monitoring for the system and ambient monitoring -Beneficial use identification for drinking water and stream -Baseline biological assessment (specific for applicable water quality standards)	-Water Resources Department -Department of Human Services - Health Services Division -Department of State Lands -Department of Land Conservation and Development -Habitat agencies inc. ODFW, US F & W, NOAA Fisheries -Tribal nations -Department of Agriculture
Surface Discharge <i>Not Likely Regulated as a UIC</i>				
Unlined Ponds or Lagoons	A shallow - typically less than 12-feet deep - natural or artificial depression in the ground surface filled with wastewater.	In addition to listed in the first row: -OAR Div. 55 -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row: -Possible dam safety issues -Wetland permitting issues -Mercury pollution prevention plan for the wastewater treatment plant	In addition to those listed in the first row: -Federal Aviation Administration (if airport nearby)

Land Application Over Agronomic Rates	Treated effluent is applied to the land at a rate that exceeds the ability of the crops, vegetation, or trees to uptake the nutrients or water.	In addition to those listed in the first row: -OAR Div. 55 -SB 212 land use citing issues and the need for DEQ to approve that site productivity will not be impacted by activities.	In addition to those listed in the first row: -Crop management plan	In addition to those listed in the first row:
Rapid Infiltration	Also called soil aquifer treatment; uses the soil to treat wastewater. Treatment including filtration, adsorption, metals removal, precipitation and microbial action occurs as the wastewater moves through soil matrix. Phosphorus and metals can be retained in the soil; toxic organics are degraded or adsorbed.	In addition to those listed in the first row: -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:
Constructed Trenches	A long, narrow, steep-sided [typically V-shaped] excavation in the ground, the earth from which is placed on the sides to increase the apparent depth. A deep, narrow furrow, ditch, or cut in the ground.	In addition to those listed in the first row: -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:
Flood Channels	Treated effluent would be either surface discharged or injected through a piped system as a UIC into or immediately above highly permeable gravels that represent the location of former or active flood channels in a major river system. These channels can be part of the hyporheic zone of the river if they are still hydraulically active during moderate floods (e.g., Q10-Q25), or they may be features that are no longer hydraulically active due to natural or engineered shifts in the river channel location. These sites are characterized by coarse-grained sediment (i.e., gravels/cobbles with sand) that is highly permeable. Injected water would be expected to reach surface water with a relatively short subsurface residence time.	In addition to those listed in the first row: -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:

Wetlands and Bogs	Natural or constructed wetlands, bogs and marshes are characterized by a combination of saturated soils and having wetland-type flora (e.g. cattails, bulrushes, etc.), bog-type flora (e.g. mosses, grasses, etc.) or marsh-type flora (e.g. trees, woody plants, etc.). These plants provide treatment as the water moves through the wetland or bog providing reliable treatment BOD, suspended solids, temperature and nutrients.	In addition to those listed in the first row: -OAR Div. 55 -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row: -Possible dam safety issues -Wetland permitting issues -Mercury pollution prevention plan for the wastewater treatment plant	In addition to those listed in the first row: -Federal Aviation Administration (if airport nearby)
Subsurface Discharge <i>Likely Regulated As a UIC</i>				
Exfiltration Gallery	An Exfiltration Gallery is a series of perforated pipes buried about 2-4 feet deep to distribute the effluent evenly across an area. This allows the water to percolate and receive treatment through the soil. The surface can still be used to grow vegetation, which assists in the treatment of the effluent.	In addition to those listed in the first row: -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:
Hyporheic injection (direct/indirect)	Treated effluent would be injected into the subsurface through a piped system (UIC) into or immediately above the hyporheic zone of a river channel. In this case, the mode of emplacement can vary, but the location of emplacement (i.e., into the hyporheic zone) is fixed. The hyporheic zone is the area of saturated materials in the bed or banks of a river channel that exhibits biological interaction with the river. The hyporheic zone varies in depth below ground surface during the year as river stage varies. To maintain the required biological activity within the hyporheic zone, dissolved oxygen in the hyporheic zone must be sufficient to meet the Inter Gravel Dissolved Oxygen standard, if applicable	In addition to those listed in the first row: -OAR Div. 55 -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row: -Channel migration evaluation	In addition to those listed in the first row:

Vertical Downflow (slow sand filter)	A vertical down flow reclamation system consists of constructed sand and gravel-filled bed that is intermittently dosed on the surface with treated effluent. The treated wastewater percolates vertically through the bed. Wetland plants are grown on the surface to enhance treatment and help maintain infiltration rates.	In addition to those listed in the first row: -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:
Dry Wells	Well that is used to inject or receive water runoff from industrial, commercial, and residential areas such as parking lots, residential subdivisions, building roofs and highways; dry wells are constructed so the bottom and sides are typically dry except when receiving fluids. The majority of dry wells in Oregon are used to collect and discharge stormwater runoff.	In addition to those listed in the first row: -OAR Div. 44	In addition to those listed in the first row:	In addition to those listed in the first row:
Mounds	Mounds are similar to an exfiltration gallery except the system is constructed on a mound of soil about 2 to 4 foot high which allows for treatment in the mound prior to the effluent reaching the native soil. They can be used in areas where the soil is not very deep or if there is a high groundwater table.	In addition to those listed in the first row: -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:

Aquifer Discharge
Likely Regulated as a UIC

Groundwater Recharge	Groundwater recharge typically refers to a project that uses treated effluent designed, constructed, or operated for the purpose of recharging by infiltration or injection of effluent a groundwater basin designed for use as an underground source of drinking water. There are numerous types of engineered facilities that may qualify as being mechanisms used for groundwater recharge such as exfiltration galleries, unlined lagoons, and trenches.	In addition to those listed in the first row: -OAR Div. 55 -OAR Div. 44 if it is designed to discharge as a UIC	In addition to those listed in the first row:	In addition to those listed in the first row:
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