OREGON DEPARTMENT OF TRANSPORTATION TECHNICAL SERVICES

Geo-Environmental BULLETIN

SUBJECT	FINAL NUMBER	EFFECTIVE DATE	VALIDATION DATE	SUPERSEDES
Underground Injection Control (UIC) Systems	GE07-03(B)	02/10/2006	03/09/2012	Formerly numbered: GE68-B-002
	WEB LINK(S) http://www.oregon.gov/ODOT/HWY/TECHSERV/Pages/technicalguidance.aspx			
TOPIC/PROGRAM Hydraulics	APPROVED SIGNATURE Original signed by: Paul Wirfs, P.E. Geo-Environmental Manager			

PURPOSE

Underground Injection Control (UIC) Systems are regulated under the Federal Safe Drinking Water Act, which was enacted in 1974 to protect the Nation's drinking groundwater resources. In Oregon the Department of Environmental Quality (DEQ) administers UIC regulations. The State of Oregon considers all groundwater a drinking water resource.

Owners of UICs may be liable in the event their UIC causes groundwater contamination, costly groundwater remediation can be required. This is a major concern for Oregon Department of Transportation (ODOT) because it owns and operates various drainage systems that collect storm or wastewater generated from ODOT facilities and dispose of it by infiltrating the collected water into the ground such as highway stormwater sumps and dry wells, maintenance yard drain fields, etc. These drainage systems are defined by federal environmental regulations as Underground Injection Control systems (UICs).

It is critical that designers of ODOT projects carefully consider all other treatment options before considering UICs because the State of Oregon has rigorous permitting requirements and high liability is associated with these systems. The remaining sections of this bulletin outlines the recommended guidelines to follow when a UIC is the only reasonable drainage alternative available to the designer.

GUIDANCE

Registration, permitting, and management requirements of existing ODOT UICs: The ODOT Maintenance and Facilities Units prioritized the registration and management of ODOT UICs located at ODOT maintenance yards in 2000. ODOT maintenance yard UICs are the ODOT UICs most likely to pose threats to Oregon's drinking water. ODOT is in the process of locating, registering, sealing, removing, or decommissioning all ODOT maintenance yard UICs.

New ODOT UICs:
Because of liability risks, high management costs, and registration requirements, ODOT management has recommended that no new ODOT UICs be constructed. However***, if a UIC is the only reasonable drainage alternative available*** on an ODOT project and a UIC drainage solution poses no threat to ground (or surface) water, installation of a new ODOT UIC drainage system can be allowed.

All new ODOT UICs must be registered and approved by DEQ ***prior*** to construction. This includes all highway stormwater sumps or drywells. It can also include surface water containment facilities if they are constructed with water distribution systems intended to promote infiltration. DEQ should be consulted if there is a question as to whether or not an ODOT drainage system is considered a UIC.

Construction of new ODOT UICs:
If an ODOT Project Team chooses to design and install a UIC as a highway drainage solution, the Project Team must register and obtain DEQ approval for the UIC before the UIC is installed. UIC registration and approval is complicated and can be a lengthy process. More detailed information on how to obtain DEQ approval for the operation of ODOT UICs is outlined below.

DEQ's Process Summary for an injection system to qualify as "Rule Authorized":
Obtaining rule authorization requires a UIC having no impact to water quality and meeting all DEQ sitting requirements. It is best to discuss UIC design details directly with DEQ before assuming a new UIC will be able to operate as Rule Authorized. The Rule Authorization process is summarized below:

- Summary of the Rule Authorized stormwater injection "basic" requirements [OAR 340-044-0018(3)(a) and (b)] can be viewed and downloaded from: http://www.deq.state.or.us/wq/uic/uic.htm
- Inventory and registration information forms need to be completed and submitted. They can be viewed and downloaded from: http://www.deq.state.or.us/wq/uic/forms.htm
- Contact DEQ regarding Initial and annual UIC fees
- Public comment? No
- Processing time = up to 6 months.
- All water wells within 1000 feet of proposed injection well need to be identified.
- Well logs for all of these wells need to be obtained. They can be viewed at: http://apps2.wrd.state.or.us/apps/gw/well_log/Default.aspx
- The Oregon Department of Human Services in Eugene (541.726.2587 ext. 21 or 25) must be contacted to determine if Drinking Water Protection Areas (DWPAs) have been established for any public wells within a 10 mile radius of the proposed injection wells.
- It must be determined if the proposed injection wells are within any 2-year time-of-travel DWPA.
- All contaminated soils within 1000 feet of proposed injection well must be identified.

- It must be determined if any contamination is known or suspected to exist at the site and what cleanup action, if any, has been taken. This information can be researched at the following website: http://www.deq.state.or.us/wq/uic/database.htm
- Ground water protection must be assured.
- Pre-treatment system must be provided.
- A storm water management plan (SWMP) must be prepared and implemented. See SWMP requirements below.

DEQ's Process summary for an injection system to qualify for a "Water Pollution Control Facilities" (WPCF) Permit:

A WPCF is required if the injection well is within 500 feet of public or domestic water well, within a 2-year time-of-travel Drinking Water Protection Area (DWPA) for public drinking water wells, or if the injection well cannot otherwise be rule-authorized. The permit process is summarized below:

- Inventory and registration information forms need to be completed and submitted. http://www.deq.state.or.us/wq/uic/forms.htm
- Permit application must be submitted.
- Contact DEQ regarding Initial and annual UIC fees
- Public comment? Yes
- Processing time = 12 months or more. ODOT may have to pay consultant to prepare permit on behalf of DEQ.
- Permit duration? 10 years maximum, 5 years likely.
- All contaminated soils within 1000 feet of proposed injection well must be identified.
- It must be determined if any contamination is known or suspected to exist at the site and what cleanup action, if any, has been taken. This information can be researched at the following website: http://www.deq.state.or.us/wq/uic/database.htm
- Ground water protection must be assured.
- Pre-treatment system must be provided.
- A storm water management plan (SWMP) must be prepared and implemented. See SWMP requirements below.
- A monitoring plan must be prepared and implemented.
- Comply with all other permit requirements.

DEQ's Process summary for "decommissioning" injections systems [OAR 340-044-0018 (3) (b) (A) (ii)]:

The decommissioning process is outlined below:

- A Class V Pre-Closure Notification form must be completed and submitted. This information can be viewed and downloaded from: http://www.deq.state.or.us/wq/uic/forms.htm
- DEQ approval for decommissioning process must be obtained.
- Contact DEQ regarding Initial and annual UIC Fees
- Closure plan may be required if location is high risk or potentially contaminated.

- DEQ must be notified 30 days prior to closure or conversion.
- Proper decommissioning of an injection system shall be certified by a professional geologist, engineering geologist, or professional engineer registered in the State of Oregon.

DEQ's Stormwater Management Plan (SWMP) requirements:

- SWMP requirements can be viewed and downloaded from:
- http://www.deq.state.or.us/wq/uic/guidance.htm
- Site assessment must include: well location, construction details, evaluation of use and activities, evaluation of risk for accidental or illicit waste disposal.
- Site controls must be prepared and implemented – BMPs to consider for source controls and treatment are:
    - Prevent drainage from areas with high risk for accidental or illicit disposal.
    - Outline Spill prevention and prepare response plan
    - Maintenance plan and schedule must be prepared – minimum monthly visual inspection and semi-annual physical maintenance.
    - Employee and public education should be provided.
    - Responsible personnel must be identified.
- Monitoring Plan must be prepared and implemented:
    - Locations for monitoring must be identified
    - Minimum sampling requirements – 2 times in first year, then annually at on-set of wet weather conditions in first 30 minutes of discharge from storm > 0.1 inches after 72 hours dry weather.
    - Stormwater samples should be obtained prior to injection
    - Sample analysis must be prepared – Use analytical methods with detection limits below MCLs. Analyze for contaminants identified in site assessment plus BTEX, benzo(a)pyrene, Pb, Cr, Cd, total nitrogen, fecal coliform bacteria.
    - MCLs as reference levels should be used
    - BMPs must be reviewed and implement corrective measures if reference levels are exceeded
- Record keeping and reporting plan must be prepared – report results that exceed reference levels

DEFINITIONS

UIC - An underground injection control is any system, structure, or activity that is created to place fluid below the ground or sub-surface. Common stormwater underground injection systems or activities in Oregon include but are not limited to sumps, infiltration galleries, drywells, trench drains, and drill holes.

Stormwater runoff – That part of precipitation which runs off the surface of a drainage area after accounting for all abstractions. The portion of precipitation that appears as flow in streams; total volume of flow of a stream during a specified time.

Best Management Practice (BMP) - BMPs are physical, structural, and or operational practices employed to reduce or eliminate the pollutant load carried by highway runoff.

Within ODOT, BMP refers to a non-engineered feature or activity that is known to have a water quality benefit, but for which pollutant removal efficiency cannot be confidently estimated. These BMPs include, but are not limited to, filter strips, vegetated roadside ditches, street sweeping, and vegetation preservation or enhancement. Additional information on highway maintenance BMPs is available in the most current version of "The ODOT Routine Roadside Maintenance Water Quality and Habitat Protection Best Management Practices".

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/docs/research-roadside_maintenance_manual.pdf

Mitigation - The act of reducing, offsetting, or compensating for an impact. For water quality, this usually consists of limiting the amount of pollutants entering highway runoff and removing pollutants from highway runoff before discharge into surface or ground water.

Engineered Treatment Facilities - A treatment facility that requires engineering analysis to determine the hydrology, hydraulics and design of the structure. Engineered treatment facilities include features such as dry and wet detention basins, engineered water quality swales (bioswales), treatment wetlands, and proprietary systems. Pollutant removal efficiencies can be reasonably estimated for engineered treatment facilities. Such facilities are often well suited for urbanized settings with highly polluted runoff, locations where there are physical constraints, including right-of-way, on the placement of treatment facilities, and where there are specific targets for pollutant loads.

BACKGROUND/REFERENCE

OAR 340-044:
http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_044.html

Oregon Department of Environmental Quality Website,
http://www.deq.state.or.us/wq/uic/uic.htm

EXPLANATION

DEQ UIC Rules

All new and existing ODOT UIC must be registered with DEQ. UIC registration requires detailed information on UIC ownership, location, well design, local geology and hydrology, as well as chemical analysis of water injected into the UIC. Following registration, DEQ allows UICs to operate as Excluded, Rule Authorized, or by Permit. Brief explanations of these operation levels are included below:

Excluded:

Excluded UICs include septic systems that inject only human waste and serve less than 20 people a day or operate with a flow of less than 2,500 gallons per day.

Rule Authorized:
Rule Authorized UICs must operate under design, sitting, and management parameters defined in DEQ UIC rules. Groundwater contamination is prohibited. Long term pollutant monitoring of injected water and UIC management plans are required.

Permitted:
UICs that cannot be Rule Authorized may be allowed through the issuance of a Water Pollution Control Facilities (WPCF) permit provided that groundwater is protected. WPCF permits are UIC and site specific and usually include design, management, monitoring, fees, and renewal requirements.

No UIC activities are allowed that cause direct or indirect movement of contaminants into groundwater. No UICs are allowed to operate within 500 feet (or a 2-year groundwater time-of-travel) of public and domestic water wells or within designated Drinking Water Protection Areas (DWPAs). UICs that DEQ does not allow to operate as Exempt, Rule Authorized or by Permit must be closed and decommissioned.

CONTACT INFORMATION

Water quality mitigation guidance questions should be directed to:

Title:	Water Quality/Resources Program Coordinator
Branch:	Geo-Environmental Section
Phone Number:	503-986-3509

DEQ regulation interpretation and/or general questions should be directed to:

Title:	Cleanwater Program Technician
Branch:	Office of Maintenance – Clean Water Program
Phone Number:	503-731-8289

Design of engineered UIC and stormwater treatment facility questions should be directed to:

Title:	Senior Hydraulics Engineer
Section:	Geo-Environmental Section
Phone Number:	503-986-3365