Chapter 173-218 WAC
UNDERGROUND INJECTION CONTROL PROGRAM

Last Update: 6/19/08

WAC

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WAC 173-218-010 Purpose. The purpose of this chapter is to protect groundwater quality by:

(1) Preventing groundwater contamination by regulating the discharge of fluids into Underground Injection Control (UIC) wells; and

(2) Satisfying the intent and requirements of Part C of the Federal Safe Drinking Water Act (SDWA) and the Washington state Water Pollution Control Act, chapter 90.48 RCW.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-010, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-010, filed 2/29/84.]

WAC 173-218-020 Policy. (1) The policy of the department of ecology for this chapter is:

(a) To preserve and protect groundwaters by preventing the injection of fluids that will endanger groundwater;

(i) That contains fewer than 10,000 mg/L of total dissolved solids and is obtainable for beneficial uses as defined in WAC 173-218-030;

(ii) That contains greater than 10,000 mg/L of total dissolved solids and is obtainable for beneficial uses if the practices meet the requirements of this chapter;

(b) To require the use of all known, available, and reasonable methods of prevention, control and treatment (AKART) to the discharge of fluids and waste fluids into the waters of the state as authorized by RCW 90.48.010; and

(c) To prohibit the injection of fluids through wells except as authorized by this chapter.

(2) Consistent with this policy, the disposal of fluids from industrial, commercial, or municipal sources, or multifamily dwellings, into wells will be authorized by the department, providing these operations satisfy this chapter and are in compliance with local, state, and federal laws.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-020, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-020, filed 2/29/84.]

WAC 173-218-030 Definitions. "Abandoned well" means a well that is unused, unmaintained, or is in such disrepair as to be unusable.

"AKART" is an acronym that means all known, available and reasonable methods of prevention, control and treatment. AKART shall represent the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. The concept of AKART applies to both point and nonpoint sources of pollution. The term "best management practices" typically applies to nonpoint source pollution controls, and is considered a subset of the AKART requirement. The stormwater management manuals (see definition in this section) may be used as a guideline, to the extent appropriate, for developing best management practices to apply AKART for stormwater discharges.

"Aquifer" means a geologic formation, group of formations or part of a formation capable of yielding a significant amount of ground water to wells or springs.

"Beneficial uses" mean uses of the waters of the state which include, but are not limited to, use for domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state.

"Best management practices" mean approved physical, structural, and/or managerial practices that, when used singularly or in combination, prevent or reduce pollutant discharges.

"Caprock" means geologic confining formation(s) that has sufficiently low permeability and lateral continuity to prevent the migration of injected carbon dioxide and other fluids out of the geologic containment system.

"Cesspool" means a drywell that receives untreated sanitary waste containing human excreta, and that sometimes has an open bottom and/or perforated sides that discharge to the subsurface.

"Commercial business" means a type of business activity that may distribute goods or provide services, but does not involve the manufacturing, processing or production of goods.

"Contaminant" means any chemical, physical, biological, or radiological substance that does not occur naturally in ground water or that occurs at concentrations greater than those found naturally.

"Contamination" means introduction of a contaminant.

"Dangerous waste" means those solid wastes designated in WAC 173-303-070 through 173-303-100 as dangerous, or extremely hazardous or mixed waste. As used in chapter 173-303 WAC, Dangerous waste regulations, the words "dangerous waste" will refer to the full universe of wastes regulated by chapter 173-303 WAC.

"Decommission" means to fill or plug a UIC well so that it will not result in an environmental or public health or safety hazard, nor serve as a channel for movement of water or pollution to an aquifer.

"Department" means department of ecology.

"Dispersion" means the release of surface and stormwater runoff from a drainage facility system such that the flow spreads over a wide area and is located so as not to allow flow to concentrate anywhere upstream of a drainage channel with erodible underlying granular soils.

"Drywell" means a well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so

that its bottom and sides are typically dry except when receiving fluids.

"Existing well" means a well that is in use at the adoption date of this chapter.

"Fluid" means any material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state.

"Geologic containment system" means the geologic formations that both receive the injected carbon dioxide (CO_2) and contains or sequesters it within the system's physical boundaries. The containment system is a three-dimensional area with defined boundaries that includes one or more geologic formations.

"Geologic sequestration of carbon dioxide" means the injection of carbon dioxide into subsurface geologic formations to permanently prevent its release into the atmosphere.

"Geologic sequestration project" means the surface and underground facilities used to inject carbon dioxide for sequestration and includes: Geologic containment system, monitoring zone(s) and surface facilities described in the permit application.

"Geologic sequestration project boundary" means a three-dimensional boundary defined in permit that encloses all surface and underground facilities of the geologic sequestration project and extends vertically to the overlying ground surface.

"Ground water" means water in a saturated zone or stratum beneath the surface of land or below a surface water body.

"Ground water protection area" means a geographic area that is by or close by a surrounding community and nontransient noncommunity water system, that uses ground water as a source of drinking water (40 C.F.R. 144.87) and other sensitive ground water areas critical to protecting underground sources of drinking water from contamination; such as sole source aquifers, highly productive aquifers supplying private wells, critical aquifer recharge areas and/or other state and local areas determined by state and local governments.

"Hazardous substances" mean any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6) or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous substance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director by rule to present a threat to human health or the environment if released into the environment.

"High threat to ground water" means, for this chapter, a UIC well is a high threat to ground water when it receives fluids that cannot meet the criteria in chapter 173-200 WAC Water quality standards for ground waters of Washington (GWQS) at the top of the aquifer, which include, but are not limited to, the following examples: A UIC well that receives drainage, that has not been pretreated and does not meet the GWQS; such as, from an area where stormwater comes into contact with a vehicle fueling area, airport deicing activities, storage of treated lumber or vehicle washing; or a UIC well that receives a discharge that is determined to be an imminent public health hazard by a legal authority or is prohibited in this chapter.

"Improved sinkhole" means a naturally occurring karst depression or other natural crevice found in volcanic terrain and other geologic settings that has been modified by man for the purpose of directing and emplacing fluids into the subsurface.

"Infiltration pond" means an earthen impoundment used for the collection, temporary storage and infiltration of incoming stormwater runoff.

"Infiltration trench" means a trench used to infiltrate fluid into the ground, is generally at least twenty-four inches wide and backfilled with a coarse aggregate. Perforated pipe or a product with similar use may also be installed.

"Industrial wastewater" means water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feedlots, poultry houses or dairies. The term includes contaminated stormwater and leachate from solid waste facilities.

"Monitoring zone(s)" means the geologic formations, identified in the application for a geologic sequestration project, where chemical, physical and other characteristics are measured to establish the location, behavior and effects of the injected carbon dioxide in the subsurface and to detect leakage from the geologic containment system. At a minimum, a monitoring zone must be established beneath the ground surface but outside of the geologic containment system to detect leakage of injected CO_2 except where other monitoring is approved by the director.

"Motor vehicle waste disposal well" means a Class V injection well that is typically a shallow disposal system that receives or has received fluids from vehicular repair or maintenance activities such as auto body repair shop, automotive repair shop, new and used car dealership, specialty repair shops or any facility that does any vehicular repair work (40 C.F.R. 144.81).

"New injection well" means an injection well that is put in use following the adoption date of this chapter.

"Nonendangerment standard" means to prevent the movement of fluid containing any contaminant into the ground water if the contaminant may cause a violation of the Water quality standards for ground waters of the state of Washington, chapter 173-200 WAC or may cause health concerns.

"Nonpollution-generating surface" means a surface considered to be an insignificant source of pollutants in stormwater runoff and/or a surface not defined as a pollution-generating surface.

"Person" means any political subdivision, local, state, or federal government agency, municipality, industry, public or private corporation, partnership, association, firm, individual, or any other entity whatsoever.

"Point of compliance" means the location where the facility must be in compliance with chapter 173-200 WAC Water quality standards for ground waters of the state of Washington; the top of the aquifer, as near to the source as technically, hydrogeologically, and geographically feasible.

"Pollution" means contamination or other alteration of the physical, chemical, or biological properties of waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive

or other substance into any waters of the state as will, or is likely to, create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

"Pollution-generating surfaces" mean the surfaces are considered a significant source of pollutants in stormwater runoff. Pollution generating surfaces include pollution generating pervious surfaces and pollution generating impervious surfaces such as surfaces that are subject to: Regular vehicular use, industrial activities, or storage of erodible or leachable materials that receive direct rainfall, or the run-on or blow-in of rainfall, use of pesticides or fertilizers or loss of soil; or leaching such as from metal roofs not coated with an inert, nonleachable material, roofs that are subject to venting of manufacturing, commercial, or other indoor pollutants. Examples of commercial indoor pollutants are commercial facilities such as restaurants where oils and other solid particles are expected to be expelled. It does not include normal indoor air venting at commercial facilities where activities such as cooking, processing, etc., do not take place. Examples are: Roads, unvegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unfenced fire lanes, vehicular equipment storage yards, airport runways, lawns, and landscaped areas that apply pesticide applications; such as golf courses, parks, cemeteries, and sports fields except for landscaped areas that are approved infiltrative best management practices.

"Proper management of stormwater" means AKART has been provided or the well owner has demonstrated that the discharge will meet the nonendangerment standard.

"Radioactive waste" means any waste which contains radioactive material in concentrations that exceed those listed in 10 Code of Federal Regulations Part 20, Appendix B, Table II, and Column 2.

"Retrofit" means taking actions to reduce the pollutant load from a UIC well to meet the statutory requirements of 40 C.F.R. 144.12 and RCW 90.48.010. These actions may include, but are not limited to: Changes to the source control activities and/or structures around the well; an upgrade to the well such as adding a catch basin or spill control device; and/or addition of pretreatment facilities or decommissioning. The selection of actions is based on local priorities, required by the department or the local jurisdiction to address a documented water quality problem.

"Rule authorized" means a UIC well that is registered with the department and meets the nonendangerment standard. If a well is rule authorized, it does not require a state waste discharge permit from the department.

"Sanitary waste" means liquid or solid wastes originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned. Sources of these wastes may include single or multiple residences, hotels and motels, restaurants, bunkhouses, schools, ranger stations, crew quarters, guard stations, campgrounds, picnic grounds, day-use recreation areas, other commercial facilities, and industrial facilities provided the waste is not mixed with industrial waste.

"Septic system" means a well that is used to discharge sanitary waste below the surface and is typically comprised of a septic tank and subsurface fluid distribution system or disposal system. (Also called on-site sewage system.)

"Sequestration" means to set apart or remove.

"State waste discharge permit" means a permit issued in accordance with chapter 173-216 WAC, State waste discharge permit program.

"Stormwater" means the portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes and other features of a stormwater drainage system into a defined surface water body, or a constructed treatment, evaporation, or infiltration facility.

"Stormwater manuals" mean the *Stormwater Management Manual for Eastern or Western Washington* or other manuals approved by the department.

"Stormwater pollution prevention plan" means a documented plan to implement measures to identify, prevent, and control the contamination of stormwater and its discharge to UIC wells.

"Subsurface fluid distribution system" means an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground.

"Underground source of drinking water" means ground waters that contain fewer than 10,000 mg/L of total dissolved solids and/or supplies drinking water for human consumption.

"UIC well" or **"underground injection control well"** means a well that is used to discharge fluids into the subsurface. A UIC well is one of the following: (1) A bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension; (2) an improved sinkhole; or (3) a subsurface fluid distribution system.

"Waste fluid" means any fluid that cannot meet the nonendangerment standard at the point of compliance, which is the top of the aquifer.

"Well assessment" means an evaluation of the potential risks to ground water from the use of UIC wells. A well assessment includes information such as the land use around the well which may affect the quality of the discharge and whether the UIC well is located in a ground water protection area. It may include the local geology and depth of the ground water in relation to the UIC well if the well is considered a high threat to ground water.

"Well injection" means the subsurface emplacement of fluids through a well.

"You" means the owner or operator of the UIC well.

[Statutory Authority: Chapter 80.80 RCW. WSR 08-14-011 (Order 07-11), § 173-218-030, filed 6/19/08, effective 7/20/08. Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-030, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-030, filed 2/29/84.]

WAC 173-218-040 UIC well classification including allowed and prohibited wells. The most common type of UIC well in Washington is a Class V well. A Class V well is usually a shallow disposal well such as a drywell, drainfield or French drain (see subsection (5) of this section).

(1) "Class I injection well" means a well used to inject dangerous and/or radioactive waste, beneath the lowermost formation containing an underground source of drinking water within one-quarter mile of the well bore. All Class I wells are prohibited in Washington and must be decommissioned.

(2) "Class II injection well" means a well used to inject fluids:

(a) Brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production. It may be mixed with wastewaters from gas plants that are an integral part of production operations, unless those waters are classified as hazardous wastes at the time of injection;

(b) For enhanced recovery of oil or natural gas; or

(c) For storage of hydrocarbons that are liquid at standard temperature and pressure.

(3) "Class III injection well" means a well used for extraction of minerals. All Class III wells are prohibited in Washington and must be decommissioned. Examples of Class III injection wells include, but are not limited to, the injection of fluids for:

(a) In situ production of uranium or other metals that have not been conventionally mined;

(b) Mining of sulfur by Frasch process; or

(c) Solution mining of salts or potash.

(4) "Class IV injection well" means a well used to inject dangerous or radioactive waste into or above an underground source of drinking water. Class IV wells are prohibited and must be decommissioned except for Class IV wells reinjecting treated groundwater into the same formation from where it was drawn as part of a removal or remedial action if such injection is approved by EPA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act or the Resource Conservation and Recovery Act, 40 C.F.R. 144.13(c). Other examples of Class IV wells include:

(a) Dangerous or radioactive waste into or above a formation that contains an underground source of drinking water within one quarter mile of the well. This includes disposal of dangerous waste into a septic system or cesspool regardless of the size; or

(b) Dangerous or radioactive waste that cannot be classified as a Class I well type or (a) of this subsection.

(5) "Class V injection well" means all injection wells not included in Classes I, II, III, or IV. Class V wells are usually shallow injection wells that inject fluids above the uppermost groundwater aquifer. Some examples are dry wells, French drains used to manage stormwater and drain fields.

(a) The following are examples of Class V injection wells that are allowed in Washington:

(i) Drainage wells used to drain surface fluids, primarily stormwater runoff, into or below the ground surface, such as, but not limited to, a drywell or infiltration trench containing perforated pipe;

(ii) Heat pump or cooling water return flow wells used to inject water previously used for heating or cooling;

(iii) Aquifer recharge wells used to replenish the water in an aquifer;

(iv) Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water;

(v) Septic systems serving multiple residences or nonresidential establishments that receive only sanitary waste and serve twenty or

more people per day or an equivalent design capacity of 3,500 gallons or larger per day;

(vi) Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a nonoil or gas producing zone to reduce or eliminate subsidence associated with the removal of fresh water;

(vii) Injection wells associated with the recovery of geothermal energy for heating, aquaculture and production of electric power;

(viii) Injection wells used in experimental technologies;

(ix) Injection wells used for in situ recovery of lignite, coal, tar sands, and oil shale;

(x) Injection wells used for remediation wells receiving fluids intended to clean up, treat or prevent subsurface contamination;

(xi) Injection wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts;

(xii) Injection wells used to control flooding of residential basements;

(xiii) Injection wells used for testing geologic reservoir properties for potential underground storage of natural gas or oil in geologic formations; if the injected water used is of equivalent or better quality than the groundwater in the targeted geologic formation and the groundwater in the targeted geologic formation is nonpotable and/or toxic because of naturally occurring groundwater chemistry;

(xiv) Injection wells used as part of a reclaimed water project as allowed under a permit; and

(xv) Injection wells used to inject carbon dioxide for geologic sequestration.

(b) The following are examples of Class V wells that are prohibited in Washington:

(i) New and existing cesspools including multiple dwelling, community or regional cesspools, or other devices that receive sanitary wastes that have an open bottom and may have perforated sides that serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day. The UIC requirements do not apply to single family residential cesspools or to nonresidential cesspools which receive solely sanitary waste and have the capacity to serve fewer than twenty persons a day or an equivalent design capacity of less than 3,500 gallons per day;

(ii) Motor vehicle waste disposal wells that receive or have received fluids from vehicular repair or maintenance activities (see definition of motor vehicle waste disposal wells in WAC 173-218-030). UIC wells receiving stormwater located at vehicular repair, maintenance or dismantling facilities shall not be considered waste disposal wells if the wells are protected from receiving vehicle waste;

(iii) Wells used for solution mining of conventional mines such as stopes leaching;

(iv) Backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not;

(v) UIC wells receiving fluids containing hazardous substances (see definition for hazardous substances in WAC 173-218-030) except for wells:

(A) Allowed under (a)(x) of this subsection; or

(B) Receiving stormwater that meets the nonendangerment standard by applying the best management practices and requirements in WAC 173-218-090 or stormwater authorized under a permit; and

(vi) UIC wells receiving industrial wastewater except for industrial wastewater authorized under a permit.

[Statutory Authority: Chapter 80.80 RCW. WSR 08-14-011 (Order 07-11), § 173-218-040, filed 6/19/08, effective 7/20/08. Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-040, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-040, filed 2/29/84.]

WAC 173-218-050 Exemptions from UIC well status. The following are not considered UIC wells and are not regulated under this chapter.

(1) Single-family residential septic systems, handling only sanitary wastes and have the capacity to serve less than twenty people per day or an equivalent design capacity of less than 3,500 gallons per day;

(2) Nonresidential septic systems and cesspools handling only sanitary wastes and have the capacity to serve less than twenty people per day or an equivalent design capacity of less than 3,500 gallons per day;

(3) Any dug, blasted or drilled hole, bored shaft that is not used for the subsurface placement of fluids in accordance with 40 C.F.R. 144.1 (g)(1)(ii);

(4) Infiltration ponds, dispersion systems, or infiltration trenches that do not contain perforated pipe; or

(5) Storm drain components that contain perforated pipes, drain tiles or other similar mechanisms designed and intended to convey water directly or indirectly to a surface water body.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-050, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-050, filed 2/29/84.]

WAC 173-218-060 Requirements to operate a UIC well. To operate an existing or new UIC well in Washington, the UIC well must be registered and either rule authorized or receive a state waste discharge permit from the department to operate, except as noted below, and the following must be met:

(1) Class I UIC wells are prohibited and must be decommissioned.

(2) Class II UIC wells must be registered and have a state waste discharge permit issued by the department to operate, and the following must occur:

(a) The well must be reported to the department of natural resources in accordance with the provisions of chapter 344-12 WAC General rules by any person who proposes to conduct or is conducting a Class II injection well operation, as defined in chapter 173-218 WAC;

(b) The department of natural resources will perform review, evaluation, and approval in accordance with the provisions of chapter 344-12 WAC General rules; and

(c) The department of ecology will process a Class II injection well application, in accordance with applicable requirements as contained in 40 Code of Federal Regulations Parts 124 and 144 as published in Federal Register Volume 48, #64 (April 1, 1983) and Part 146 as

published in Federal Register Volume 45, #123 (June 24, 1980), Volume 46, #166 (August 27, 1981) and Volume 47, #23 (February 3, 1982).

(3) Class III UIC wells are prohibited and must be decommissioned.

(4) Class IV UIC wells that are not prohibited (see WAC 173-218-040) must be registered and approved under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA), 40 C.F.R. 144.13 (a)(4)(c). Approved Class IV UIC wells are wells used at:

(a) CERCLA sites conducting a cleanup under an EPA order, consent order or consent decree or where the cleanup is being conducted by EPA; or

(b) RCRA sites conducting a cleanup under an order, agreed order or consent decree.

(5) Class V UIC wells, except as noted below, must be registered and either rule authorized (see WAC 173-218-070) or receive a state waste discharge permit issued by the department to operate including wells used in independent remedial actions under MTCA. The following Class V wells do not need a permit but do have to register with the UIC program if they are authorized in accordance with:

(a) CERCLA conducting a cleanup under an EPA order, consent order or consent decree or where the cleanup is being conducted by EPA; and

(b) RCRA or MTCA conducting a cleanup under a MTCA order, agreed order or consent decree or where the cleanup is being conducted by the department.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-060, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-060, filed 2/29/84.]

WAC 173-218-070 Rule authorization and registration. In order to receive rule authorization, your well must meet the nonendangerment standard (see WAC 173-218-080 and 173-218-090) and must be registered with the department unless otherwise noted below. If your UIC well is rule authorized, it does not need a state waste discharge permit to operate. Rule authorization can be rescinded if a UIC well no longer meets the nonendangerment standard of this chapter.

(1) Registering your UIC well:

(a) The UIC well owner or operator must register the UIC well with the department and the wells only need to be registered once. Registration forms are available for single and multiple sites and can be found on the department's website at http://www.ecy.wa.gov/programs/wq/grndwtr/uic. When completing the form, the following information must be included:

(i) Operator/owner information;

(ii) Site location;

(iii) Best management practices used to protect groundwater quality;

(iv) UIC well description;

(v) Other information the department determines is necessary to meet the nonendangerment standard.

(b) Owners of UIC wells used to manage stormwater must:

(i) Complete a well assessment for existing wells (see WAC 173-218-090) except for UIC wells authorized for use at CERCLA facilities; and

(ii) Provide to the department an annual update on any well status changes, such as a change in the legal owner or if the well has been closed, after the initial well registration is sent to the department.

(c) Owners of existing UIC wells that are not used for stormwater management must complete a survey provided by the department except for wells in WAC 173-218-100 and UIC wells authorized for use at CERCLA facilities.

(d) UIC wells on tribal land must be registered with the Environmental Protection Agency, Region 10. Tribal land means the land within Indian reservations and federal land located off-reservation which is held in trust for Indians, unless specifically delegated by EPA.

(e) UIC wells at single-family homes that only receive residential roof runoff, or are used to control basement flooding, do not have to register with the department.

(f) Septic systems that serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day that receive operating permits, meet the requirements and are permitted in accordance with chapter 246-272B WAC Large on-site sewage system regulations will be registered after the Washington state department of health provides to the department:

(i) Registration information for all systems with valid operating permits as of the effective date of this chapter; and

(ii) Annual updates on newly permitted systems and closed systems.

(g) The following types of Class V UIC wells that require an associated permit still need to register with the department:

(i) Aquifer recharge wells that meet the requirements and are permitted in accordance with chapter 173-157 WAC Underground artificial storage and recovery;

(ii) Septic systems that serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day that meet the requirements and are permitted in accordance with chapter 246-272A WAC On-site sewage systems;

(iii) UIC wells used for geothermal fluid return flow into the same aquifer and that meet chapter 173-200 WAC Water quality standards for groundwaters of the state of Washington and chapter 173-216 WAC State waste discharge permit program requirements; and

(iv) UIC wells that are used as part of a reclaimed water project that meet the requirements of the water reclamation and reuse standards as authorized by RCW 90.46.042.

(2) The department will determine if the UIC well is rule authorized based on the information provided in the registration packet and will take one of the following actions within sixty days:

(a) Provide written notification that your UIC well is registered and rule authorized;

(b) Contact you or conduct a site visit if additional information is needed;

(c) Provide written notification if rule authorization of your UIC well is denied. The denial letter will include one of the following:

(i) Written notification that improvements to your on-site practices are needed to meet the nonendangerment standards for rule authorization;

(ii) Written notification indicating that you must decommission the UIC well (see WAC 173-218-120); or

(iii) Written notification indicating that you will have to apply for a state waste discharge permit to operate your UIC well under chapter 173-216 WAC State waste discharge permit program.

(d) If you do not hear from the department within sixty days, the well will be automatically registered.

(3) Class IV wells that are not prohibited (see WAC 173-218-040) are rule authorized, after the UIC well is registered, for the life of the well if such subsurface emplacement of fluids is authorized under the Comprehensive Environmental Response, Compensation, and Liability Act or the Resource Conservation Recovery Act, 40 C.F.R. 144.23(c).

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-070, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-070, filed 2/29/84.]

WAC 173-218-080 The nonendangerment standard for UIC wells. To meet the nonendangerment standard you must prevent the movement of fluid containing any contaminant into the groundwater if the contaminant may cause a violation of chapter 173-200 WAC Water quality standards for the groundwaters of the state of Washington. In order to meet the nonendangerment standard, you must meet the following:

(1) Be in compliance with the following sections in RCW 90.48.010, 90.48.080, 90.48.160, 90.48.162, and 90.48.455;

(2) Be in compliance with chapter 173-200 WAC Water quality standards for groundwaters of the state of Washington; such as, but not limited to, providing best management practices at the site that will fulfill the AKART requirement; and

(3) Be constructed, operated, maintained and decommissioned in a manner that protects groundwater quality as described in 40 C.F.R. 144.12(a).

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-080, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-080, filed 2/29/84.]

WAC 173-218-090 Specific requirements for Class V wells to meet the nonendangerment standard. Specific requirements for Class V wells are organized by wells that are used for stormwater management and wells that are used for other purposes. This section does not apply to the Class V wells in WAC 173-218-100.

(1) **New** Class V UIC wells used for **stormwater management** must:

(a) Meet additional groundwater protection area requirements as determined by other state laws or by local ordinances;

(b) Not directly discharge into groundwater. A separation between the bottom of the well and the top of the groundwater is required. The treatment capacity of the unsaturated zone or the zone where the fluid is discharged, and the pollutant loading of the discharge must be considered when determining the vertical separation; and

(c) The owner or operator of a new Class V well used to manage stormwater must meet the nonendangerment standard as defined under WAC 173-218-080. The owner or operator of a new Class V well must show compliance with the nonendangerment standard prior to placing a new

well into service. Compliance with the nonendangerment standard may be met through one or a combination of the following two approaches:

(i) Presumptive approach: The presumptive approach means compliance with the nonendangerment standard is presumed, unless discharge monitoring data or other site specific information shows that a discharge causes or contributes to a violation of chapter 173-200 WAC Water quality standards for groundwaters of the state of Washington, when:

(A) The well activity is in compliance with this chapter; and either

(B) The well is designed and installed to the stormwater manual current at the time of construction and is operated in conformance with stormwater best management practices including the proper selection, implementation, and maintenance of all on-site pollution control using the current stormwater manual published by the department for your region or an equivalent department approved local manual.

(C) Owners or operators of municipal separate storm sewer systems regulated under section 1342(p) of the Federal Water Pollution Control Act which also own or operate Class V UIC wells may satisfy the presumptive approach by applying the stormwater management programs developed to comply with the Federal Water Pollution Control Act to their new UIC wells. For new UIC wells, construction phase and post-construction stormwater controls must be applied in accordance with applicable stormwater manuals.

(D) The presumptive approach may not be used when best management practices do not exist to remove or reduce a contaminant, the vadose zone has no treatment capacity and/or the stormwater quality is such that a best management practice does not exist to reduce or eliminate the concentration.

(ii) Demonstrative approach: The demonstrative approach means that the technical bases for the selection of stormwater best management practices are documented. The documentation must include:

(A) The method and reasons for choosing the stormwater best management practices selected;

(B) The pollutant removal performance expected from the practices selected;

(C) The technical basis supporting the performance claims for the practices selected, including any available existing data concerning field performance of the practices selected;

(D) An assessment of how the selected practices will satisfy the requirements of WAC 173-218-080 and chapter 173-200 WAC; and

(E) An assessment of how the selected practices will satisfy state requirements to use all known, available, and reasonable methods of prevention, control and treatment.

(2) **Existing** Class V UIC wells used for **stormwater management** do not have to meet the new well requirements. If the UIC wells are not already registered, the owner or operator must register the wells with the department and complete a well assessment. The following timelines must be met unless otherwise approved from the department:

(a) If you own or operate less than or equal to fifty wells:

(i) You have three years after the adoption date of this rule to register your UIC wells unless an extension has been approved by the department;

(ii) You have five years after the adoption date of this rule to complete a well assessment. The approach to conducting the well assessment will be determined by the owner. The well assessment evaluates the potential risks to groundwater from the use of UIC wells and

includes information such as the land use around the well which may affect the quality of the discharge and whether the UIC well is located in a groundwater protection area. It may include the local geology, and depth of the groundwater in relation to the UIC well if the well is considered a high threat to groundwater. The well assessment requirements will be met if an owner or operator applies the stormwater best management practices contained in a guidance document approved by the department to their UIC wells and determines if the UIC well is located in a groundwater protection area;

(iii) Any well assessment that identifies a well as a high threat to groundwater must include a retrofit schedule; and

(iv) You must immediately take action to correct the use of a well that is determined to be an imminent public health hazard, for example when a drinking water supply is contaminated and causes a public health emergency. The department must be notified within thirty days from the determination and may determine a retrofit schedule. The department's enforcement procedure (see WAC 173-218-130) will be followed when a retrofit schedule is needed.

(b) If you own or operate more than fifty wells:

(i) You have five years after the adoption date of this rule to register your UIC wells unless an extension has been approved from the department;

(ii) You have seven years after the adoption date of this rule to complete a well assessment. The approach to conducting the well assessment will be determined by the owner. The well assessment evaluates the potential risks to groundwater from the use of UIC wells and includes information such as the land use around the well which may affect the quality of the discharge, and whether the UIC well is located in a groundwater protection area. It may include the local geology, and depth of the groundwater in relation to the UIC well if the well is considered a high threat to groundwater. The well assessment requirements will be met if an owner or operator applies the stormwater best management practices contained in a guidance document approved by the department to their UIC wells and determines if the UIC well is located in a groundwater protection area;

(iii) Any well assessment that identifies a well as a high threat to groundwater must include a retrofit schedule; and

(iv) You must immediately take action to correct the use of a well that is determined to be an imminent public health hazard, for example when a drinking water supply is contaminated and causes a public health emergency. The department must be notified within thirty days from the determination and may establish a retrofit schedule. The department's enforcement procedure will be followed when a retrofit schedule is needed.

(c) If you own or operate a site that uses, stores, loads, or treats hazardous substances or is an industrial facility that has a Standard Industrial Classification as regulated by Federal Regulations, 40 C.F.R. Subpart 122.26 (b)(14) (excluding construction sites), you may use the following to satisfy the documentation requirements for meeting the nonendangerment standard:

(i) If the facility has or will have a waste water discharge permit issued pursuant to chapter 90.48 RCW, including a National Pollutant Discharge Elimination System (NPDES) permit, the associated stormwater pollution prevention plan may be used in place of the well assessment to meet the nonendangerment standard provided the stormwater pollution prevention plan specifically addresses stormwater discharges to UIC wells; or

(ii) For unpermitted facilities, the preparation and implementation of a stormwater pollution prevention plan can be used in place of the well assessment to meet the nonendangerment standard if applied to the UIC wells or documentation must be provided to show that the well does not pose a threat to groundwater. Examples of documentation include, but are not limited to, a site drainage map for the UIC wells or a no-exposure certification form completed for discharges to ground.

(d) Owners or operators of municipal separate storm sewer systems regulated under section 1342(p) of the federal Water Pollution Control Act which also own or operate Class V UIC wells may satisfy the nonendangerment standard by applying the stormwater management programs developed to comply with the federal Water Pollution Control Act to their UIC wells. For existing UIC wells receiving new sources of stormwater, construction phase and post-construction stormwater controls must be applied to all development and redevelopment projects in accordance with applicable stormwater manuals.

(3) Class V UIC wells **not** used for **stormwater management:**

(a) **New** UIC wells that are **not** used for stormwater management must:

(i) Not directly discharge into an aquifer, except for wells listed in WAC 173-218-040 (5)(a)(ii) through (iv), (vii) through (xi), (xiii), (xiv) and (xv). A separation between the bottom of the well and the top of the aquifer is required; and

(ii) Meet additional groundwater protection requirements if the UIC well is located in a groundwater protection area (see WAC 173-218-030) as determined by other state laws or by local ordinances.

(b) **Existing registered** UIC wells that are **not** used for stormwater management are already considered to be rule authorized. To verify that current site practices are protective of groundwater quality, the owner or operator must complete a survey from the department except for UIC wells used at CERCLA sites. The department will provide written notification that the current site practices are adequate.

(c) **Existing** UIC wells that are **not registered** and **not** used for stormwater management must meet the requirements for new wells.

[Statutory Authority: Chapter 80.80 RCW. WSR 08-14-011 (Order 07-11), § 173-218-090, filed 6/19/08, effective 7/20/08. Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-090, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-090, filed 2/29/84.]

WAC 173-218-100 UIC wells that automatically meet the nonendangerment standard. (1) The following new and existing Class V UIC wells automatically meet the nonendangerment standard and are considered rule authorized after the well is registered. These Class V wells are not subject to the requirements of WAC 173-218-090:

(a) UIC wells which inject fluids that meet chapter 173-200 WAC, Water quality standards for groundwaters of the state of Washington, to control subsidence;

(b) UIC wells that temporarily inject fluids or other material for the purpose of maintaining a properly functioning water extraction well or dewatering well;

(c) Closed loop heating and cooling water return flow wells that have not added any chemicals or product to the water;

(d) Air conditioning or heat pump return flow wells that have not added any chemical or product to the water, and are used to return fluid to the supply aquifer. The fluids must not impair beneficial uses of groundwater or surface water;

(e) Aquifer recharge wells that meet the requirements in chapter 173-157 WAC Underground artificial storage and recovery;

(f) UIC wells used as part of a reclaimed water project that meet the requirements of the Water reclamation and reuse standards as authorized by RCW 90.46.042;

(g) Septic systems that serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day; and

(i) Receive operating permits, meet the requirements and are permitted in accordance with chapter 246-272B WAC Large on-site sewage system regulations; or

(ii) Meet the requirements of chapter 246-272A WAC On-site sewage systems.

(h) UIC wells receiving stormwater from nonpollution generating surfaces; and

(i) UIC wells that only receive runoff from a roof coated with an inert, nonleachable material and a roof that is not subject to venting of manufacturing, commercial, or other indoor pollutants.

(2) The following Class V UIC wells automatically meet the nonendangerment standard, are considered rule authorized and are exempt from registering:

(a) UIC wells used in residential settings that receive water from sump pumps, for basement flood control; and

(b) UIC wells that only receive runoff from a residential roof.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-100, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-100, filed 2/29/84.]

WAC 173-218-110 Permit terms and conditions if a UIC well is not rule authorized. If you are denied rule authorization and you are operating a UIC well, you must obtain a state waste discharge permit under chapter 173-216 WAC State waste discharge permit program or chapter 173-226 WAC Waste discharge general permit program or close the well.

(1) Permit terms and conditions must meet the requirements of chapter 173-216 or 173-226 WAC and this chapter.

(2) All injection activities including construction of an injection well are prohibited until the well is rule authorized or issued a permit 40 C.F.R. 144.31 (October 4, 2001).

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-110, filed 1/3/06, effective 2/3/06. Statutory Authority: RCW 43.21A.445. WSR 84-06-023 (Order DE 84-02), § 173-218-110, filed 2/29/84.]

WAC 173-218-115 Specific requirements for Class V wells used to inject carbon dioxide for permanent geologic sequestration. (1) **Permit required:**

(a) Class V UIC wells used for the geologic sequestration of carbon dioxide are not rule authorized and must obtain a state waste dis-

charge permit under chapter 173-216 WAC, State waste discharge permit program or chapter 173-226 WAC, Waste discharge general permit program.

(b) Class V injection wells used for the geologic sequestration of carbon dioxide may directly discharge into an aquifer only if:

(i) The aquifer contains "naturally nonpotable groundwater" as defined in WAC 173-200-020(18) and is beneath the lowermost geologic formation containing potable groundwater within the vicinity of the geologic sequestration project area;

(ii) The operator has obtained a permit under the state waste discharge permit program or the waste discharge general permit program establishing enforcement limits which may exceed the groundwater quality criteria, as allowed under WAC 173-200-050 (3)(b)(vi);

(iii) The operator uses all known, available and reasonable methods of prevention, control and treatment (AKART) to remove contaminants, such as sulfur compounds and other contaminants, from the injected CO_2. Geologic sequestration of carbon dioxide shall not be used for the disposal of non-CO_2 contaminants that can be removed with known treatment technologies; and

(iv) The operator is in compliance with all conditions of their state waste discharge permit or their waste discharge general permit.

(2) **Permit application:** A licensed geologist or engineer shall conduct the geologic and hydrogeologic evaluations required under this section. Technical evaluations shall reflect the best available scientific data as well as existing geologic, geophysical, geomechanical, geochemical, hydrogeological and engineering data available on the proposed project area. Existing data may be used in evaluations provided their source and chronology is identified and the effects of any subsequent modifications due to natural (seismic or other) or human induced (hydraulic fracturing, drilling or other) events are analyzed. The waste discharge permit application, under chapter 173-216 or 173-226 WAC, for a permit authorizing the geologic sequestration of carbon dioxide shall include information supporting the demonstration required by WAC 173-200-050 (3)(b)(vi) and all of the following:

(a) A description of how the project will address:

(i) All jurisdictional boundaries within ten miles of the geologic sequestration project boundary such as: International borders, state borders, local jurisdictions, tribal land, national parks or state parks;

(ii) Accessibility for operations and monitoring in areas where access is restricted by: Shorelines, flood plains, urban or other development, and any other natural or man-made limiting factors;

(iii) Active Holocene faults within five miles and seismic risks;

(b) A current site map showing:

(i) The boundaries of the geologic sequestration project which shall be calculated to include the area containing ninety-five percent of the injected CO_2 mass one hundred years after the completion of all CO_2 injection or the plume boundary at the point in time when expansion is less than one percent per year, whichever is greater, or another method approved by the department;

(ii) Location and well number of all proposed CO_2 injection wells;

(iii) Monitoring wells;

(iv) Location of all other wells including cathodic protection boreholes; and

(v) Location of all pertinent surface facilities, including atmospheric monitoring within the boundary of the project;

(c) A technical evaluation of the proposed project, including but not limited to, the following:

(i) The names and lithologic descriptions of the geologic containment system;

(ii) The name, description, and average depth of the reservoir or reservoirs to be used for the geologic containment system;

(iii) A geophysical, geomechanical, geochemical and hydrogeologic evaluation of the geologic containment system, including:

(A) An evaluation of all existing information on all geologic strata overlying the geologic containment system including, the immediate caprock containment characteristics as well as those of other caprocks if included in the containment system and all designated subsurface monitoring zones;

(B) Geophysical data and assessments of any regional tectonic activity, local seismicity and regional or local fault zones; and

(C) A comprehensive description of local and regional structural or stratigraphic features;

(iv) The evaluation shall focus on the proposed geologic sequestration reservoir or reservoirs and a description of mechanisms of geologic containment, including but not limited to:

(A) Rock properties;

(B) Regional pressure gradients;

(C) Structural features; and

(D) Absorption characteristics or geochemical reaction/mineralization processes, with regard to the ability to prevent migration of CO_2 beyond the proposed geologic containment system;

(v) The evaluation shall also identify:

(A) Any productive oil and natural gas zones occurring stratigraphically above, below, or within the geologic containment system;

(B) All water-bearing horizons known in the immediate vicinity of the geologic sequestration project;

(C) The evaluation shall include a method to identify unrecorded wells that may be present within the project boundary;

(vi) The evaluation shall include exhibits, plans and maps showing the following:

(A) All wells, including but not limited to, water, oil, and natural gas exploration and development wells, injection wells and other man-made subsurface structures and activities, including any mines, within one mile of the geologic sequestration project;

(B) All man-made surface structures that are intended for temporary or permanent human occupancy within one mile of the geologic sequestration project;

(C) Any regional or local faulting within the boundary of the geologic sequestration project;

(D) An isopach map of the proposed CO_2 storage reservoir or reservoirs that make up the geologic containment system;

(E) An isopach map of the primary and any secondary caprock or containment barrier;

(F) A structure map of the top and base of the storage reservoir or reservoirs that make up the geologic containment system;

(G) Identification of all structural spill points or stratigraphic discontinuities controlling the isolation of CO_2 or associated fluids;

(H) An evaluation of the potential displacement of in situ fluids and the potential impact on groundwater resources, if any; and

(I) Structural and stratigraphic cross-sections that describe the geologic conditions at the geologic containment system;

(vii) An operations and maintenance plan including, but not limited to, a diagram of the entire injection system and a description of the proposed operating and maintenance procedures;

(viii) A review of the data of public record for all wells within the geologic sequestration project boundary which penetrate the geologic containment system including the primary and/or all other caprocks and those wells that penetrate these geologic formations within one mile of the geologic sequestration project boundary, or any other distance deemed necessary by the department. This review shall determine if all abandoned wells have been plugged in a manner that prevents the movement of CO_2 or associated native fluids away from the geologic containment system;

(ix) The proposed maximum bottom hole injection rate and injection pressure to be used at the geologic containment system. The maximum allowed injection pressure shall be no greater than eighty percent of the formation fracture pressure as determined by a mini-frac injection test or multiple-stage, minimum threshold fracture injection test or other method approved by the department. The geologic containment system shall not be subjected to injection pressures in excess of the calculated fracture pressure even for short periods of time. Higher operating pressures may only be allowed if approved in writing by the department;

(x) The proposed maximum long-term geologic containment system pressure and the necessary technical data to support the proposed geologic containment system storage pressure request;

(xi) The evaluation and data quality shall be sufficient to establish with a high degree of confidence that the geologic containment system has sufficient capacity, injectivity and other geologic characteristics to permanently sequester CO_2;

(d) The predicted extent of the injected CO_2 plume determined with modeling tools acceptable to the department that use all available geologic and reservoir engineering information, and the projected response and storage capacity of the geologic containment system. The assumptions used in the model and a discussion of the uncertainty associated with the estimate shall be clearly presented;

(e) An analysis and selection of proposed treatment technology for non-CO_2 contaminant that identifies the technology which meets the requirement that all known, available and reasonable methods of prevention, control and treatment (AKART) to remove contaminants from the injected CO_2;

(f) A detailed description of the proposed project public safety and emergency response plan. The plan shall detail the safety procedures concerning the facility and residential, commercial, and public land use within one mile, or any other distance as deemed necessary by the department, of the boundary of geologic sequestration project area. The public safety and emergency response procedures shall include contingency plans for leakage from any well, flow lines, or other permitted facility. The public safety and emergency response procedures also shall identify specific contractors and equipment vendors capable of providing necessary services and equipment to respond to incidents such as: Injection well leaks or loss of containment from injection wells or releases from the geologic containment system.

These emergency response procedures shall be updated as necessary throughout the operational life of the permitted storage facilities;

(g) A detailed worker safety plan that addresses safety training and safe working procedures at the facility;

(h) A corrosion monitoring and prevention plan for all wells and surface facilities;

(i) A leak detection and monitoring plan for all wells and surface facilities. The approved leak detection and monitoring plan shall define the threshold for determining that a leak has occurred and shall address:

(i) Identification of any failure of the containment system;

(ii) Identification of release to the atmosphere;

(iii) Identification of degradation of any groundwater or surface water resources; and

(iv) Identification of migration of CO_2 or other contaminants into any overlying oil and natural gas reservoirs;

(j) A geologic sequestration project leak detection and monitoring plan using subsurface measurements to monitor movement of the CO_2 plume both within and to detect migration outside of the permitted geologic containment system. This must include:

(i) Collection of baseline information on formation pressure and background concentrations in groundwater, surface soils, and chemical composition of in situ waters within the geologic containment system and monitoring zone(s);

(ii) Monitoring of pressure responses and other appropriate information immediately above caprock of the geologic containment system;

(k) The approved subsurface leak detection and monitoring plan shall be based on the site-specific characteristics as documented by materials submitted in the permit application and shall address:

(i) Identification of any failure in the containment system;

(ii) Identification of release to the atmosphere;

(iii) Identification of degradation of any ground or surface water resources; and

(iv) Identification of migration of CO_2 or other contaminants into any overlying oil and natural gas reservoirs;

(l) A risk assessment that identifies and quantifies hazards, probabilities, features, events and processes that might result in undesirable impacts to public health and the environment;

(m) A mitigation and remediation plan that identifies trigger thresholds and corrective actions to be taken prior to a containment system failure, if groundwater quality in the monitoring zone or above is degraded, or if carbon dioxide is released to the atmosphere. The mitigation and remediation plan must conform to the standards set by subsection (8) of this section and must be approved by the department before injection begins;

(n) The proposed well casing, cementing and integrity testing program;

(o) A closure and post-closure plan, including a closure and post-closure cost estimate;

(p) The application shall designate a financial assurance mechanism sufficient to cover the cost to the department for the abandonment of the project or remediation of facility leaks should the operator not perform as required or cease to exist;

(q) The application shall designate a financial assurance mechanism sufficient to provide financial assurance to the department to

cover the plugging and abandonment or the remediation of a CO_2 injection and/or subsurface observation well should the operator not perform as required in accordance with the permit or cease to exist;

(r) The payment of the application fee; and

(s) Any other information that the department requires.

(3) **Geologic sequestration well standards.** (Note: In statutory references to chapter 344-12 WAC, the word "gas" shall include all injected carbon dioxide for geologic sequestration, including supercritical CO_2.) Wells used for geologic sequestration projects must meet the following:

(a) Casing materials and cement must be designed and tested to withstand the reactive fluids and expected conditions encountered during the geologic sequestration project, including the post-closure period.

(b) Minimum standards for construction and maintenance of wells. Chapter 173-160 WAC.

(c) Drilling fluid standards of WAC 344-12-098.

(d) Directional or other appropriate surveys shall be completed for all wells to verify location at depth.

(e) Wells must be logged with appropriate geophysical methods which include: Cement bonding and evaluation logs, and casing inspection logs. In addition a standard suite of wireline logs shall be run on each well to document physical properties of the well, the well integrity and any potential leakage points. The wireline logging suite must include: Gamma ray, resistivity, temperature, formation pressure, both p- and v-sonic and neutron-density. The department may approve alternate logging suites that provide equivalent information or allow the use of improved methods as new technologies are developed.

(f) All collected geologic data, including geophysical logs, geologists logs, mud logs, and drilling logs, core, drill cuttings, and all other logs and surveys shall be submitted to the department of natural resources, division of geology and earth resources, within thirty days after well completion. Submitted information shall include one paper and one digital copy of logs. (Note: The department of natural resources maintains geologic records in the state to enhance the scientific, economic and environmental values of the people of the state.)

(g) One paper and one digital copy of all reports and data collected from surface geological and geophysical surveys of sequestration sites shall be submitted to the department of natural resources, division of geology and earth resources within thirty days after completion.

(h) Wells that are completed within or below the geologic containment system must in addition:

(i) Meet the well casing and cementing standards of WAC 344-12-087;

(ii) Verify the integrity of cement behind casings, including the location of any channels, contamination or missing cement, by a cement map that incorporates data from a cement bond log, a variable density display, and an ultrasonic image, unless an alternative evaluation has been approved in writing by the department;

(iii) Meet the blowout prevention standards of WAC 344-12-092;

(iv) Wells shall be periodically tested to assess their structural integrity. Annual tests shall include wireline surveys for casing integrity/corrosion assessment and other appropriate tests. An injection well casing pressure test will be conducted prior to use and re-

tested at least once prior to each permit renewal or when casing integrity/corrosion assessments identify risks. Any finding of inadequate structural integrity shall be reported to the department within twenty-four hours.

(i) Notify the department thirty days prior to beginning any substantial work on wells including, deepening, repair or closure. Advance notice period may be reduced by the department when the work is intended to address immediate threats to public health, safety or the environment.

(4) **Permit terms and conditions.** All terms and conditions listed in WAC 173-216-110, state waste discharge permit program, apply. In addition, the following terms and conditions shall apply to injection permits for the geologic sequestration of carbon dioxide:

(a) To be issued a permit, an applicant must demonstrate the following:

(i) That the geology, including geochemistry, of the site and all proposed plans developed for the permit application will:

(A) Provide "permanent sequestration" of carbon dioxide as defined by WAC 173-407-110; and

(B) The caprock and other features of the geologic containment system have the appropriate characteristics to prevent migration of carbon dioxide, other contaminants and nonpotable water.

(ii) A monitoring program has been developed to identify leakage from the geologic containment system to the atmosphere, surface water and groundwater. The monitoring program must be able to identify groundwater quality degradation in aquifers prior to degradation of any potable aquifer. The monitoring program shall include observations in the monitoring zone(s) that can identify migration to aquifers as close stratigraphically to the geologic containment system as practicable.

(iii) Design and construction standards of all facility structures and wells are sufficient to prevent migration of carbon dioxide or nonpotable water that will degrade water quality or impact beneficial uses outside the geologic containment system.

(iv) All known, available and reasonable methods of prevention, control and treatment (AKART) will be used to remove contaminants from the injected CO_2. Geologic sequestration of carbon dioxide shall not be used for the disposal of non-CO_2 contaminants that can be removed with known treatment technologies.

(b) Pilot studies at potential geologic sequestration project sites shall be encouraged to collect site characterization, risk assessment and feasibility information. Permits for pilot studies may be issued without meeting all the Class V geologic sequestration project requirements only when:

(i) The pilot study is for a limited time duration;

(ii) Public health and the environment are protected;

(iii) The pilot study will collect detailed site-specific information used to establish the feasibility of permanent sequestration in developing a permit application that meets the standards of this section. The pilot study permit shall be based upon an operator submitted pilot study plan that addresses:

(A) Site-specific geologic information including reasons for selecting a site as a potential geologic sequestration project;

(B) Site-specific hydrogeologic information that includes information on potable aquifers and how their water quality will be protected;

(C) A detailed plan of work for the pilot study that includes monitoring and quarterly reporting;

(D) The information to be gained by the study;

(E) The total quantity of CO_2 to be injected and an estimated injection schedule for the study. CO_2 injections for pilot studies shall be limited to no more than 1,000 metric tons CO_2, unless the operator demonstrates in the plan that a larger quantity is necessary to determine the feasibility and risks of a project;

(F) The procedures to be implemented to protect public health and the environment;

(iv) Pilot study permits shall not be used for a full scale carbon sequestration project. Injection of carbon dioxide associated with a pilot study permit shall be of limited quantity and duration, not to exceed five years.

(c) The permit shall include an injection pressure limitation and a maximum working pressure in the geologic containment system, calculated from information provided in the application, that assures that the pressure in the injection zone does not initiate new fractures or propagate existing fractures in the injection zone or caprock. In no case shall the injection pressure initiate fractures in the caprock or cause the movement of injected fluids or formation fluids into shallower aquifers. Controlled artificial fracturing of the injection zone of the geologic containment system may be allowed with a plan that has been approved by the department.

(d) If the operator identifies leakage in excess of the thresholds established in the mitigation and remediation plan, water quality degradation in shallower aquifers or leaks to the surface, including those around wells or within well casing, the operator must:

(i) Notify the department within twenty-four hours;

(ii) Take all necessary actions to protect public health, safety and the environment;

(iii) Stop injecting immediately, until the project obtains approval for redefining the geologic containment system and its relevant dimensions by the department;

(iv) Implement the mitigation and remediation plan to arrest and reverse environmental impacts. Amendments to the mitigation plan shall be developed in consultation with the department;

(e) Monitoring for geologic sequestration projects shall include:

(i) Characterization of injected fluids;

(ii) Continuous recording of injection pressure, flow rate and volume;

(iii) Continuous recording of pressure on annulus between tubing and long string casing;

(iv) Monitoring zone leak detection identified in (a)(ii) of this subsection;

(v) Sufficient monitoring to confirm the spatial distribution of the CO_2 in the subsurface.

(f) Quarterly reports shall be submitted to the department that include the following:

(i) Physical, chemical and other relevant characterization of the injected fluids;

(ii) Monthly average, maximum and minimum values for injection pressure, flow rate, volume injected and annular pressure;

(iii) Updated data for modeling that will project and/or establish the spatial distribution of CO_2 in the subsurface;

(iv) Results from monitoring zone leak detection;

(v) Results from any other tests/work completed during the reporting period, such as mechanical integrity tests, geophysical surveys, acoustic monitoring, well repairs, etc.

(g) Annual reports shall be submitted to the department that include:

(i) A summary of the data collected throughout the year, including any trends, observations, predictions as well as calculated spatial distribution of injected CO_2;

(ii) List of all noncompliance with the permit along with an explanation of the cause(s) and subsequent remedial measures taken;

(iii) Updated modeling based on the monitoring observations and measurements including a summary of calculated spatial distribution of CO_2 and all other conditions in the subsurface necessary to establish the effectiveness of the geologic containment system, as well as a discussion of history matching and an assessment of the model's accuracy to date. Updated projections of project response and capacity based on operational experience, including all new geologic data and information;

(iv) Observed anomalies from predicted behavior shall be identified and explained;

(v) Discussion of suggested changes in project management or suggested amendment of permit conditions;

(vi) A report on the financial assurance account which includes updated calculation of cost estimates for all closure and post-closure activities and documentation that the account is adequately funded to cover the calculated cost.

(5) **Closure.** If all of the project's carbon dioxide injections are interrupted for a period of one hundred eighty consecutive days, the operator shall begin implementing the approved closure plan. Injection project management may include injection and resting periods possibly exceeding one hundred eighty days for individual injection wells. The closure triggers are for the entire injection facility, not individual wells. The department may extend this one hundred eighty day period, in writing, upon the request of the operator, if the operator demonstrates that carbon dioxide injection will resume within a period of not more than two years. The operator shall review and amend the closure plan as needed, at a minimum the plan shall be reviewed at each permit renewal. Proposed amendments shall be effective only after approved in writing by the department. Approval of proposed amendments shall not delay the commencement of closure activities using the most recent approved closure plan. If the operator fails to begin closure, or is not able to begin closure, the department shall use the financial assurance account to begin closure activities.

(6) **Post-closure activities.** The operator is obligated to renew and be covered under permit and pay all appropriate permit fees throughout the post-closure period. The operator shall continue all required monitoring and reporting throughout the closure and post-closure period. The operator shall review and amend the post-closure plan as needed, at a minimum the plan shall be reviewed at each permit renewal. The post-closure period shall continue until the department determines that modeling and monitoring demonstrate that conditions in the geologic containment system indicate that there is little or no risk of future environmental impacts and there is high confidence in the effectiveness of the containment system and related trapping mechanisms. The post-closure period shall be complete only after the operator has received written approval from the department. If the opera-

tor fails to or is not able to continue the post-closure activities as required, the department shall use the financial assurance account to complete post-closure activities. Any funds remaining in the financial assurance account shall be released to the operator upon the department's approval of the completion of the post-closure period.

(7) **Financial assurance.**

(a) The owner or operator shall establish a closure and post-closure account to cover all closure and post-closure expenses. The performance security held in the account may be:

(i) Bank letters of credit;

(ii) Cash deposits;

(iii) Negotiable securities;

(iv) An assignment of savings account;

(v) A savings certificate in a Washington bank;

(vi) A corporate surety bond executed in favor of the department by a corporation authorized to do business in the state of Washington; or

(vii) Other financial instruments or performance security acceptable to the department.

(b) The department may for any reason refuse any performance security not deemed adequate.

(c) The cost of the closure and post-closure activities shall be calculated using current cost of hiring a third party to close all existing facilities and to provide post-closure care, including monitoring identified in the closure and post-closure plan.

(d) The closure and post-closure cost estimate shall be revised annually to include any changes in the facility and to include cost changes due to inflation.

(e) The obligation to maintain the account for closure and post-closure care survives the termination of any permits and the cessation of injection. The requirement to maintain the closure and post-closure account is enforceable regardless of whether the requirement is a specific condition of the permit.

(8) **Mitigation and remediation.** Each project must develop a mitigation and remediation plan that identifies trigger thresholds and corrective actions to be taken if the containment system fails, if water quality outside the geologic containment system is degraded, if carbon dioxide is released to the atmosphere or if any other factor poses an unacceptable risk to public health or the environment. A mitigation and remediation plan must be approved by the department before injection begins and amended as needed. The operator shall review and amend the mitigation and remediation plan as needed, at a minimum the plan shall be thoroughly reviewed at each permit renewal. The mitigation and remediation plan shall:

(a) Define leakage (i.e., trigger threshold), leak detection and identification;

(b) Address caprock and spill-point leaks;

(c) Address well bore leaks from project wells or previously unidentified wells;

(d) Identify immediate responses to protect public health, safety and the environment;

(e) Provide a detailed list of notifications and surveys;

(f) Address remedial measures such as: Well repairs, reduced injection pressure, reservoir or formation pressure, creation of a pressure barrier through increased pressure above geologic containment

system, interception, recovery and reinjection of CO_2 or the removal of injected materials;

(g) Address redefining the geologic containment system or closure and abandonment of the sequestration project.

[Statutory Authority: Chapter 80.80 RCW. WSR 08-14-011 (Order 07-11), § 173-218-115, filed 6/19/08, effective 7/20/08.]

WAC 173-218-120 Decommissioning a UIC well. (1) Decommissioning standards for all UIC wells:

(a) Wells must be decommissioned in a manner that prevents movement of fluid containing any contaminant into the groundwater (40 C.F.R. 144.82); and

(b) When decommissioning wells, the owner or operator must dispose or otherwise manage any soil, gravel, sludge, liquids or other materials removed from or adjacent to the wells in accordance with all applicable federal, state, and local requirements (40 C.F.R. 144.82b).

(2) Decommissioning standards for UIC wells that are determined to be an imminent public health hazard or prohibited:

(a) Class I wells are prohibited and must be decommissioned in accordance with 40 C.F.R. 146;

(b) Class III wells are prohibited and must be decommissioned in accordance with 40 C.F.R. 146;

(c) Class IV wells that are prohibited must be decommissioned in accordance with 40 C.F.R. 144, 146; or

(d) Class V wells that are determined to be an imminent public health hazard or are prohibited in this rule must be decommissioned at the earliest extent possible as approved by the department and meet the decommissioning standards, except for:

(i) Existing cesspools that serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day must be decommissioned immediately (40 C.F.R. 144.88); and

(ii) Motor vehicle waste disposal wells must be decommissioned immediately.

(3) Decommissioning standards for allowed UIC wells:

(a) Class II wells must meet the closure requirements found in chapter 344-12 WAC General rules;

(b) Class V wells must be decommissioned by filling or plugging the well so that it will not result in an environmental, public health or safety hazard, and will not serve as a channel for movement of water or pollution to an aquifer:

(i) UIC wells that are in contact with an aquifer, even if they are in contact with only the seasonal high aquifer, must be decommissioned in accordance with the most applicable method found in chapter 173-160 WAC Minimum standards for construction and maintenance of wells; or

(ii) UIC wells that are not in contact with an aquifer must be decommissioned by:

(A) Removing any structure within three feet of the land surface;

(B) Backfilling up to three feet below the land surface with material that is uncontaminated, chemically and biologically inert, and that drains equal to or more slowly than the native material surrounding the UIC well; and

(C) Filling the remaining three feet directly below the land surface with native soil or other structurally sound material common with current engineering practices.

(c) Septic systems that receive only sanitary waste and serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day must be decommissioned in accordance with chapter 246-272B WAC Large on-site sewage system regulations or chapter 246-272A WAC On-site sewage systems;

(d) The department may require additional measures to those above prior to the decommissioning of a UIC well if such measures are deemed necessary to protect the public health and safety.

(4) Decommissioning recordkeeping requirements for UIC wells:

(a) The owner or operator of a Class I, II, III, or IV well must notify the department thirty days prior to decommissioning the UIC well;

(b) An owner or operator of a Class V well that is determined to be an imminent public health hazard or that is prohibited must notify the department thirty days prior to decommissioning the well (40 C.F.R. 144.88); or

(c) After adoption of this rule, an owner or operator of a Class V well that is determined not to be an imminent public health hazard and is not prohibited must notify the department within one year of the closure except for existing UIC wells used for stormwater management and septic systems that are permitted and meet the requirements of chapter 246-272B WAC Large on-site sewage system regulations. The owner or operator must submit to the department, on an annual basis, an update on the wells that have been decommissioned, once the initial well registration(s) has been sent to the department.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-120, filed 1/3/06, effective 2/3/06.]

WAC 173-218-130 Enforcement. (1) For violations of this chapter, the department shall rely upon the provisions of the Water Pollution Control Act, chapter 90.48 RCW, and all other applicable statutes.

(2) All injection well operations not operated in accordance with the provisions of this chapter, that cause or tend to cause entry of fluids into the waters of the state as a result of a violation of these provisions, constitutes pollution of the waters of the state in violation of RCW 90.48.080.

[Statutory Authority: Chapters 43.21A and 90.48 RCW. WSR 06-02-065 (Order 01-10), § 173-218-130, filed 1/3/06, effective 2/3/06.]