

# Water Words Dictionary—Appendix B–10

## CLASS V<sup>1</sup> INJECTION WELLS —CLASSIFICATION & DESCRIPTION

Well Type, Description, Ground Water Contamination Potential, Potential Contaminants, and U.S. Environmental Protection Agency (EPA) Well Code

<b>Class and Type</b>	<b>Description</b>	<b>Groundwater Contamination Potential</b>	<b>Potential Contaminants</b>	<b>EPA Well Code</b>
<b>DRAINAGE WELLS</b>				
Agricultural Drainage Wells	Receive irrigation tailwaters, other field drainage, animal yard, feedlot, or dairy runoff, etc.	High	Pesticides, nutrients, pathogens, metals transported by sediments, sales.	5F1
Storm Water Drainage Wells	Receive storm water runoff from paved areas, including parking lots, streets, residential subdivisions, building roofs, highways, etc.	Moderate	Heavy metals (Copper, Lead, Zinc) organics, high levels of coliform bacteria. Contaminants from streets, roofs, landscaped areas, herbicides, pesticides	5D2
Improved Sinkholes	Received storm water runoff from developments located in karst topographic areas.	High-Moderate	Variable, pesticides, nutrients, coliform bacteria	5D3
Industrial Drainage Wells	Wells located in industrial areas which primarily received storm water runoff but are susceptible to spills, leads, or other chemical discharges.	High-Moderate	Usually organic solvents, acids, pesticides, and various other industrial waste constituents. Similar to storm drainage wells but usually higher concentrations	5D4
Special Drainage Wells	Used for disposing water from sources other than direct precipitations. Four types reported: landslide control drainage wells, potable water tank overflow drainage wells, swimming pool drainage wells, and lake level control drainage wells	Moderate-Low	Chlorinated and treated water, pH imbalance, algaecides, fungicides, muriatic acid	5G30
<b>GEOHERMAL REINJECTION WELLS</b>				
Electric Power Reinjection Wells	Reinject geothermal fluids used to generate electric power—deep wells	Moderate	pH imbalance, minerals and metals in solution (Arsenic, Bromide, Selenium), sulfates	5A5

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Direct Heat ReInjection Wells	Reinject geothermal fluids used to provide heat for large buildings or developments—deep wells	Moderate	Hot geothermal brines with TDS between 2,000 to 325,000 mg/l, CO <sub>3</sub> , CaSO <sub>4</sub> , Strontium, Barium, Arsenic.	5A6
Heat Pump Air Conditioning Return Flow Wells	Reinject groundwater used to heat or cool a building in a heat pump system—shallow wells	Low	Potable water with temperatures ranging from 90°F to 110°F, may have scale or corrosion inhibitors.	5A7
Groundwater Aquaculture Return Flow Wells	Reinject groundwater or geothermal fluids used to support aquaculture. Non-geothermal aquaculture disposal wells are also included in this category.	Moderate	Used geothermal waters which may be highly mineralized and include traces of arsenic, boron, fluoride, dissolved and suspended solids, animal detritus, perished animals and bacteria.	5A8
<b>DOMESTIC WASTEWATER DISPOSAL WELLS</b>				
Untreated Sewage Waste Disposal Wells	Receive raw sewage wastes from pumping trucks or other vehicles which collect such wastes from single or multiple sources (no treatment).	High	Soluble organic and inorganic compounds including household chemicals. Raw sewage with 99.9% water and 0.03% suspended solid. May contain pathogenic bacteria and viruses, nitrates, ammonia.	5W9
Cesspools	Including multiple dwelling, community, or regional cesspools, or other devices that receive wastes and which must have an open bottom and sometimes have perforated sides. Must serve greater than 20 persons per day if receiving solely sanitary wastes (settling of solids).	High	Soluble organic and inorganic compounds including household chemicals. Raw sewage with 99.9% water and 0.03% suspended solid. May contain pathogenic bacteria and viruses, nitrates, ammonia.	5W10

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Septic Systems (Undifferentiated Disposal Method)	Used to inject the waste or effluent from a multiple dwelling, business establishment, community, or regional business establishment septic tank. Must serve greater than 20 persons per day if receiving solely sanitary wastes (primary treatment).	High-Low	Varies with type of system: fluids typically 99.9% water (by weight) and 0.03% suspended solid; major constituents include nitrates, chlorides, sulfates, sodium, calcium, and fecal coliform.	5W11
Septic Systems (Well Disposal Method)	Examples include actual wells, seepage pits, cavitettes, etc. The largest surface dimension is less than or equal to the depth dimension. Must serve greater than 20 persons per day if receiving solely sanitary wastes.	High-Low	Varies with type of system: fluids typically 99.9% water (by weight) and 0.03% suspended solid; major constituents include nitrates, chlorides, sulfates, sodium, calcium, and fecal coliform.	5W31
Septic System (Drainfield Disposal Method)	Examples include drain or tile lines, and trenches. Must serve more than 20 persons per day if receiving solely sanitary wastes.	High-Low	Varies with type of system: fluids typically 99.9% water (by weight) and 0.03% suspended solid; major constituents include nitrates, chlorides, sulfates, sodium, calcium, and fecal coliform.	5W32
Domestic Wastewater Treatment Plant Effluent Disposal Well	Dispose of treated sewage or domestic effluent from small package plants up to large municipal treatment plants	High-Low	Lower levels of organics and bacteria than other septic systems and cesspools.	5W12
<b>MINERAL AND FOSSIL FUEL RECOVERY RELATED WELLS</b>				
Mining, Sand, or Other Backfill Wells	Used to inject a mixture of water and sand, mill tailings, and other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not. Also includes special wells used to control mine fires and acid mine drainage wells.	Moderate	Acidic waters	5X13

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Solution Mining Wells	Used for <i>in-situ</i> solution mining in conventional mines, such as slope leaching.	Moderate-Low	2.4% sulfuric acid, pH less than 2 for copper and ferric cyanide solution for gold or silver	5X14
In-Situ Fossil Fuel Recovery Wells	Used for in-situ recovery of coal, lignite, oil shale, and tar sands.	Moderate	Steam, air, solvent, igniting agents.	5X15
Spent-Brine Return Flow Wells	Used to reinject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts.	Low	Variable	5X16
<b>INDUSTRIAL/COMMERCIAL/UTILITY DISPOSAL WELLS</b>				
Cooling Water Return Flow Wells	Used to inject water which was used in a cooling process, both open and closed loop processes.	Low-Moderate	Anti-sealing additives, thermal pollution, potential for industrial spills reaching the groundwater.	5A19
Industrial Process Water and Water Disposal Wells	Used to dispose of a wide variety of wastes and wastewaters from industrial, commercial, or utility processes. Industries include electrical power plants, refineries, chemical plants, smelters, pharmaceutical plants, laundromats and dry cleaners, tanneries, carwashes, laboratories, etc.	High	Potentially any fluid disposed by various industries, suspended solids, alkalinity, sulfate volatile organic compounds.	5W20
Automobile Service Station Disposal Well	Repair bay drains connected to a disposal well. Suspected of disposal of dangerous or toxic wastes.	High	Heavy metals, solvents, cleaners, used oil and fluids, detergents, organic compounds.	5X28
<b>RECHARGE WELLS</b>				
Aquifer Recharge Wells	Used to recharge depleted aquifers and may inject fluids from a variety of sources such as lakes, streams, domestic wastewater treatment plants, other aquifers, etc.	High-Low	Variable: water is generally of good quality	5R21

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Saline Water Intrusion Barrier Wells	Used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers.	Low	Varies: advanced treated sewage, surface urban and agricultural runoff, and imported surface waters.	5B22
Subsidence Control Wells	Used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with overdraft of fresh water and not used for the purpose of oil or natural gas production.	Low	No specific type of injected fluid noted, similar to aquifer recharge wells.	5S23
<b>MISCELLANEOUS WELLS</b>				
Radioactive Waste Disposal Wells	All radioactive waste disposal wells other than Class IV wells	Unknown	Low-level radioactive wastes.	5N24
Experimental Technology Wells	Wells used in experimental or unproven technologies such as pilot scale in-situ solution mining wells in previously unmined areas.	Low-Moderate	Varies depending on project.	5X25
Aquifer Remediation Related Wells	Wells used to prevent, control, or remediate aquifer pollution, including but not limited to Superfund sites.	Unknown	Nutrients used in biodegradation of organics, oil/grease, phenols, toluene.	5X26
Abandoned Drinking Water Wells	Used for disposal of waste.	Moderate	Potentially any kind of fluid, particularly brackish or saline water, hazardous chemicals and sewage.	5X29
Other Wells	Any other unspecified Class V well.	Unknown	Variable	5X27

<sup>1</sup> According to the U.S. Environmental Protection Agency (EPA) injection well classification system, **Class V** injection wells are those wells not falling into one of the following classes: **Class I**—Injection wells related to hazardous, industrial nonhazardous, and municipal wastewater disposal below the underground sources of drinking water (USDW); **Class II**—Injection wells related to oil and gas activity; **Class III**—Injection wells related to mineral extraction; or **Class IV**—Injection wells related to hazardous and radioactive wastewater disposal into or above USDWs (currently the use of these wells have been banned by the EPA).

Source: *Injection Wells: An Introduction to Their Use, Operation and Regulation*, U.S. Environmental Protection Agency (EPA), Washington, D.C., 1988.