



EPA **fact sheet** **underground injection control**

Aquifer Recharge and Aquifer Storage and Recovery Wells **Class V - Injection Well Information Request** **Draft Fact Sheet**

The Underground Injection Control (UIC) Program, created under the authority of the Safe Drinking Water Act (SDWA), is a preventative program aimed at protecting existing and future underground sources of drinking water (USDWs). Shallow wells or disposal systems that discharge fluids into the subsurface are known as Class V wells and can be authorized to inject by rule or permit. Class V wells that have the potential for ground water contamination or degradation are usually permitted. Those that do not have a potential to contribute to contamination or degradation of ground water are usually rule authorized, once inventory information has been submitted according to the requirements of 40 CFR 144.26. In addition to the inventory requirements, EPA may, under the authority of 40 CFR 144.27, require the owner or operator of any well authorized by rule to submit additional information to determine if injection activity could endanger a USDW. Rule Authorized wells do not require public notice or further monitoring of injection activities.

Artificial aquifer recharge (AR) is the enhancement of natural ground water supplies using man-made conveyances such as infiltration basins or injection wells. Aquifer storage and recovery (ASR) is a specific type of AR practiced with the purpose of both augmenting ground water resources and recovering the water in the future for various uses. While an AR well is used only to replenish the water in an aquifer, ASR wells are used to achieve two objectives: (1) storing water in the ground; and (2) recovering the stored water either using the same well or by pairing injection wells with recovery wells located on the same wellfield.

The following information is needed to evaluate the impact a Class V injection well used for aquifer recharge or ASR will have on the local hydrogeologic system, potential for USDW contamination, and whether a **permit** for this operation, rather than a **rule authorization**, should be required.

Please provide the following information to EPA:

- Property owner of facility including a physical and mailing address; phone and fax numbers;
- Operator of facility including a physical and mailing address; phone and fax numbers;
- Responsible party for the operation, maintenance, and closure of the injection system including a physical and mailing address; phone and fax numbers;
- Contact persons representing any other state or local agencies that have an interest in the site; include a physical and mailing address and phone number;
- Describe the project plan, including;
 - source of injectate,
 - injection procedures, injection rate, volume and pressure

- intended receiving formation, and
 - hydrogeology of the area
 - overlying and underlying aquifers that could be impacted,
 - the effect of injection activities on these aquifers,
 - public and private wells within 1 mile of the project area,
 - whether wells are completed in the intended receiving formation, and
 - the effect of injection activities on these wells.
- Determine the aerial extent of the aquifer(s) (i.e. fill-up volume) that would be impacted by the proposed injection based on the proposed injection volumes and rates. Identify all outcrops of the formation to receive injectate and any potential to create artificial springs. Identify mechanisms which will increase the volume of ground water infiltration into nearby surface water bodies. Identify all erosional intersections between the proposed formation to received injectate and potentially affected surface water drainage systems;
 - Map of the site location (1:24,000 topographic map or similar);
 - Hydrogeologic description, location, depth, and current use (if any) of the receiving formations;
 - Provide groundwater flow rates for the receiving formation(s) (if a shallow unconfined aquifer(s))
 - Aquifer characteristics: transmissivity, storage coefficient, hydraulic conductivity, saturated thickness, information from drawdown tests and specific capacity;
 - If injection is into an alluvial aquifer, provide locations of surface water bodies, i.e. rivers, streams, and lakes, within one mile of the injection site (may substitute topographic map);
 - Analysis of the water to be injected including constituents regulated under the Safe Drinking Water Act (SDWA), major anions and cations, ambient temperature and pH, presented as tabular data;
 - If available, analysis of the fluids in the receiving formation(s) including constituents regulated under the Safe Drinking Water Act (SDWA), major anions and cations, ambient temperature and pH, presented as tabular data;
 - To evaluate the impact of injected water on the receiving formation, plot the major anions and cations from the above analyses of the injectate, the receiving formation fluids, and mixed fluids on a trilinear diagram or Piper diagram. Provide a brief assessment regarding the compatibility of the injected water and the receiving formation fluids;
 - To identify any potential mineralogical constituents in the receiving formation that might be mobilized as a result of injection activities, provide chemical analysis of core samples from the receiving formation and results from column leachate tests simulating the chemical conditions of injection activities;
 - Completion diagram showing the construction plans for the proposed injection well(s);
 - A brief description of contingency plans for treating the well(s) to prevent or remediate bacteriological or mineral buildup in the well, which could affect the injection operation;
 - Briefly describe planned treatment of injectate proposed prior to injection, such a filtering to remove particulates which might plug the receiving formation;
 - Briefly describe the proposed monitoring program, including tracking of injectate volume, proposed for the operation;

- Presence of any ground water contamination plumes near the project area that could affect or be affected by injection activity;
- A description of any known surface water-subsurface water interactions which may be affected by injection activities;
- Provide the name of the operator of the recovering facility including Public Water System (PWS) Identification number, a physical and mailing address, and phone numbers;
- Provide the location and a description of any PWS drinking water wells or springs which will be recovering water from this aquifer (may be marked on topographic map indicating proposed injection wells, nearby surface water bodies, and locations of recovery wells at the recovering PWS, as well as identify PWS identification number and name of the next two closest PWSs);
- If injectate is treated water, does it contain chlorinated compounds? Is recovered water expected to meet current drinking water standards? If not, what exceedences are expected;
- Describe effect of injectate on the water-bearing formation and the groundwater: reaction products or by-products that are anticipated;
- Provide bench scale testing results, if available;
- Describe the proposed treatment to be used by any PWS recovering water from this aquifer to meet the National Primary Drinking Water Regulations; and
- Identify whether or not the recovered water will be regulated and treated as groundwater under the direct influence of surface water.

Send information to:

**Linda Bowling
EPA Region 8
1595 Wynkoop Street
8P-W-GW
Denver, Colorado 80202-1129
Phone 1-800-227-8917 x 6254 or 303-312-6254
FAX (303)-312-7084
bowling.linda@epa.gov**

or

**Craig Boomgaard
EPA Region 8
1595 Wynkoop Street
8P-W-GW
Denver, Colorado 80202-1129
Phone 1-800-227-8917 x 6794 or 303-312-6794
FAX (303)-312-7084
boomgaard.craig@epa.gov**

