# Class II Permit Conditions - 40 CFR

**Part 1 General Permit Conditions (144.51)** - conditions applicable to all permits, include: duty to comply, inspection / entry, reporting, prior to injection requirements, requirement to establish and maintain mechanical integrity.

**Part 2 Specific Permit Conditions (144.51)** - case-by-case permit requirements:

Construction requirements set forth in part 146 (note except as authorized by an area permit, no construction may begin until a permit has been issued - changes during construction can be approved as minor permit modification(s).

Corrective Action requirements set forth in 144.55 and 146.7

Operational requirements set forth in part 146 - shall establish maximum injection pressure necessary to assure fractures are not initiated in the confining zone, that injected fluids do not migrate into USDWs, or that formation fluids are not displaced into any USDW's.

Financial Responsibility must be established and maintained (can require lifetime permit holder to submit a revised estimate and/or coverage.

Mechanical Integrity set forth in 146.8 - the permit shall include a condition prohibiting injection until a satisfactory showing of MI.

Other case-by-case conditions to prevent migration of fluids into USDWs

Incorporation of conditions, must be either express or by specific citation to regulation

Recording and reporting of monitoring results (144.54)

Corrective Action (144.56) for all known wells in area of review that penetrate injection zone (note: Director may disregard CA for existing Class II wells). Existing well permit shall include compliance schedule for any CA, new well - no injection allowed until CA is complete. Director also may set a maximum injection pressure that does not exceed the hydrostatic at the site of any improperly constructed or abandoned well in the AOR.

**Part 3 Area of Review (146.6)** - must be determined by one of two ways:

by zone of endangering influence (calculated using formula in regulations), or by a fixed radius of not less than 1/4 mile. If fixed radius is used, permit shall consider the chemistry of both injection and formation fluids, hydrology, population and groundwater use, and historical practices.

**Part 4 Corrective Action (146.7)** - shall consider geology, hydrology, completion and plugging records, and hydraulic connections with USDWs.

**Part 5 Class II Specific Well Requirements (146.20 - 146.24)**

Construction Requirements (142.22)

All new Class II wells shall be sited to inject into a formation that is separated from any USDW by a confining zone that is free from known open faults or fractures within the area of review

All Class II wells shall be cased and cemented to prevent movement of fluids into or between USDWs. Factors to be considered in setting requirements include injection zone depth, depth to bottom of all USDWs, estimated maximum and average injection pressure, lithology of injection and confining zones, and hole size.

Appropriate logs and tests run during construction of new Class II wells, with a descriptive report interpreting the results related to 1) USDW(s) and adjacent confining zone(s), and 2) the injection and adjacent formations, prepared by a knowledgeable log analyst.

At a minimum, all new Class II wells shall determine or calculate for the injection formation: 1) fluid pressure, 2) estimated fracture pressure, 3) physical and chemical characteristics of the injection zone.

Operating Requirements (146.23)

Injection pressure at the wellhead shall not exceed a maximum calculated to assure that pressure during injection does not initiate new fractures or propagate existing fractures in the confining zones adjacent to USDWs. In no case shall injection pressure cause movement of injection or formation fluids into USDWs.

A demonstration of mechanical integrity at least once every five years.

Report at least annually, and include any major changes in characteristics or sources of injected fluid.

Information the Director must consider for authorizing Class II wells (146.24)

Prior to issuance of a permit for an existing Class II well to operate or the construction or conversion of a new Class II well, the Director shall consider the following:

Penetration of a USDW in an area subject to subsidence [144.31(g)].

a map showing the injection well area that shows number or name and location of all existing producing wells , injection wells, abandoned wells, dry holes, and water wells (this requirement does not apply to existing Class II wells).

a tabulation of data on all known wells in AOR describing the well type, construction, date drilled, location , depth, record of plugging, and other information required by the Director.

the proposed operating data, including average and maximum pressure and volume/rate

source and analysis of injected fluid

geologic data on injection and confining zone (lithology, geologic name, thickness and depth).

geologic name and depth to bottom of all USDWs which may be affected by the injection

schematic or other appropriate drawing(s) of construction details

Prior to granting approval for operation, the Director shall consider: 1) all available logging and testing information, 2) a demonstration of mechanical integrity, 3) anticipated maximum pressure and flow rate, 4) results of formation testing program, 5) actual injection procedures, and 6) the status of any required corrective action.

144.3 and 146.3 Definitions

aquifer - geologic formation, group of formations or part of a formation that is capable of yielding a significant amount of water to a well or spring.

confining bed - a body of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

confining zone - a geological formation, group of formations or part of a formation that is capable of limiting fluid movement above an injection zone.

fault - a surface or zone of rock fracture along which there has been displacement.

formation - a body of rock characterized by a degree of lithologic homogeneity which is prevailingly, but not necessarily, tabular and is mappable on the earths surface or traceable in the earths subsurface.

formation fluid - "fluid" present in a "formation" under natural conditions as opposed to introduced fluids, such as drilling mud.

ground water - water below the land surface in a zone of saturation.

injection zone - a geological formation, group of formations or part of a formation receiving fluids through a well.

lithology - the description of rocks based on their physical and chemical characteristics.

site - the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

surface casing - the first string of well casing to be installed in a well.

well plug - a watertight and gastight seal installed in a borehole or well to prevent movement of fluids.

plugging record - a systematic listing of permanent or temporary abandonment of water, oil, gas, test, exploration and waste injection wells, and may contain a well log, description of amounts and types of plugging materials used, the method employed for plugging, a description of formations which are being sealed and a graphic log of the well showing formation location, formation thickness, and location of plugging structures.

well stimulation - several processes used to clean the wellbore, enlarge channels and increase pore space in the interval to be injected thus making it possible for wastewater to move more readily into the formation, and includes 1) surging, 2) jetting, 3) blasting, 4) acidizing, 5) hydraulic fracturing.

well monitoring - the measurement, by on-site instruments or laboratory methods, of the quality of water in a well.

existing injection well - an injection well other than a 'new injection well'.

new injection well - an injection well which began injection after a UIC program for the State applicable to the well is approved or prescribed.