

3745-34-57 **Testing and monitoring requirements.**

Testing and monitoring requirements for all class I injection wells shall include monitoring of the injected wastes:

- (A) The owner or operator of a class I injection well shall submit a written waste analysis plan to the director for approval that describes the procedures to be carried out to obtain a detailed chemical and physical analysis of a representative sample of the injected waste, including the quality assurance procedures used. The plan shall include:
  - (1) The parameters for which the waste will be analyzed and the rationale for the selection of these parameters; and
  - (2) The test methods that will be used to test for these parameters; and
  - (3) The sampling method that will be used to obtain a representative sample of the waste to be analyzed.
- (B) The owner or operator of a class I injection well shall repeat the analysis of the injected wastes as described in the waste analysis plan at frequencies specified in the waste analysis plan and when process or operating changes occur that may significantly alter the characteristics of the waste stream.
- (C) The owner or operator of a class I injection well shall conduct continuous or periodic monitoring of selected parameters as may be required by the director.
- (D) The owner or operator of a class I injection well shall assure that the waste analysis plan remains accurate and the analyses remain representative.
- (E) The owner or operator of a class I injection well shall as part of the waste analysis plan submit information demonstrating to the satisfaction of director that the waste stream and its anticipated reaction products will not alter the permeability, thickness or other relevant characteristics of the confining or injection zones such that they would no longer meet the requirements specified in rule 3745-34-51 of the Administrative Code.
- (F) The owner or operator of a class I injection well shall as part of the waste analysis plan demonstrate that the waste stream will be compatible with the well materials with which the waste is expected to come into contact, and submit to the director a description of the methodology used to make that determination. Compatibility for purposes of this requirement is established if contact with injected fluids will not cause the well materials to fail to satisfy any design requirement imposed by rule 3745-34-54 of the Administrative Code.

- (G) The owner or operator of a class I hazardous waste injection well that injects corrosive waste, or any other waste determined by the director to be potentially interactive with the materials of well construction, shall continuously monitor for corrosion of the construction materials used in the well by:
- (1) Placing coupons of the well construction materials in contact with the waste stream; or
  - (2) Routing the waste stream through a loop constructed with the material used in the well; or
  - (3) Using an alternative method approved by the director.
- (H) The owner or operator of a class I hazardous waste injection well that injects corrosive waste, or any other waste determined by the director to be potentially interactive with the materials of well construction, shall implement a corrosion monitoring program including:
- (1) Using materials identical to those used in the construction of the well, and such materials must be continuously exposed to the operating pressures and temperatures (measured at the wellhead) and flow rates of the injection operation; and
  - (2) Monitoring the materials of construction for loss of mass, thickness, cracking, pitting and other signs of corrosion on a quarterly basis to ensure that the well components meet the minimum standards for material strength and performance set forth in rule 3745-34-54 of the Administrative Code.
- (I) Mechanical integrity testing

The owner or operator of a class I hazardous waste injection well shall conduct the mechanical integrity testing required by rule 3745-34-34 of the Administrative Code and approved by the administrator of U.S. EPA as follows:

- (1) The long string casing, injection tube, and annular seal shall be tested by means of a pressure test approved by the director, utilizing a liquid or gas, annually and whenever there has been a well work over; and
- (2) On an annual basis the bottom-hole cement shall be tested by means of a radioactive tracer survey approved by the director; and
- (3) A temperature, noise, or other log approved by the director shall be run

at least once every three years to test for movement of fluid along the bore hole. The director may require such tests whenever the well is worked over; and

- (4) Casing inspection logs shall be run whenever the owner or operator conducts a workover in which the injection string is pulled, unless the director waives this requirement due to well construction or other factors which limit the test's reliability, or based upon the satisfactory results of a casing inspection log run within the previous five years. The director may require that a casing inspection log be run every five years, if he has reason to believe that the integrity of the long string casing of the well may be adversely affected by naturally occurring or man-made events; and
  - (5) Any other test approved by the administrator of U.S. EPA and the director in accordance with the procedures in rule 3745-34-34 of the Administrative Code may also be used.
- (J) Monitoring program
- (1) Based on a site specific assessment of the potential for fluid movement from the well or injection zone, and on the potential value of monitoring wells to detect such movement, the director shall require the owner or operator to submit for approval, a monitoring program plan. The director shall require monitoring of the pressure buildup in the injection zone annually, including at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve.
  - (2) When prescribing a monitoring system the director may also require:
    - (a) Continuous monitoring for pressure changes in the first aquifer overlying the confining zones. When such a well or wells is/are installed, the owner or operator shall, on a quarterly basis, sample the aquifer and analyze for constituents specified in the approved monitoring program plan; and
    - (b) The use of indirect geophysical techniques to determine the position of the waste front, the water quality in a formation(s) designated in the approved monitoring program plan, or to provide other site specific data; and
    - (c) Periodic monitoring of the pressure and ground water quality in the first permeable zone (that is, a zone from which a

representative sample may be obtained within seventy-two hours) overlying the injection zone; and

- (d) Periodic monitoring of the ground water quality in the lowermost USDW; and
  - (e) Any additional monitoring necessary to determine whether fluids are moving into or between USDWs.
- (K) The director may require the owner or operator of a class I injection well to submit a seismicity monitoring plan for approval when he has reason to believe that injection activity may have the capacity to cause seismic disturbances.

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