

3745-34-40 **Seismic reflection survey requirements for class I wells.**

- (A) A seismic reflection data survey shall be conducted at each injection site where a class I injection well is located or is proposed to be located in order to determine the presence or absence of such geologic faults or fractures as may be identified by seismic reflection survey data within or near the area around the well where the formation pressures may be increased due to the operation of the well.
- (B) A new seismic reflection data survey is not required, if a seismic reflection data survey was conducted at an injection site in accordance with a work plan approved by the director or a seismic reflection data survey was conducted at an injection site and the results were approved in writing by the director.
- (C) The owner of a class I injection well shall re-evaluate the seismic reflection data collected per paragraph (A) or (B) of this rule, if there is a change in the area of review of an injection well or if the owner or operator is proposing a new well to be located at the injection site. The director may require the owner or operator to submit additional seismic reflection data as may be necessary or appropriate, if the director determines that the existing data are inadequate to determine the presence or absence of geologic faults or fractures as may be identified by seismic reflection survey data within the altered area of review or within the area of pressure buildup of the new well.
- (D) Prior to conducting a seismic reflection data survey, the owner or operator shall submit for approval by the director, a work plan detailing the activities and methods to be used to fulfill the requirements of paragraph (A) of this rule. The activities and methods described in the plan shall include those used in data acquisition, processing, interpreting and reporting the seismic reflection data. This work plan shall, at a minimum, include the following:
 - (1) Provisions for data acquisition, processing, and plotting no less than three seconds of data.
 - (2) Proposed line locations and appropriate acquisition and processing parameters for the data. The survey shall include adequate horizontal data coverage which will image and properly identify any known or unknown geologic features that may affect the site, both during operation and post-closure periods of the wells.
 - (3) Provisions for keeping detailed and dated field notes and records of all geophysical investigations.
 - (4) Provisions for headers on final line plots to indicate the shotpoint ranges of the various energy sources, if multiple energy sources are utilized within a survey. Any changes in shooting or processing parameters utilized should be specified within the headers as well.
 - (5) Provisions for having lines plotted at an appropriate vertical scale.
 - (6) Other additional information determined necessary by the director.

- (E) The owner or operator shall conduct the seismic reflection survey per the plan approved by the director under paragraph (D) of this rule, unless during the conducting of the seismic reflection survey unanticipated conditions cause a reasonable deviation from the approved plan. Any deviation from the plan shall be reported to Ohio EPA within one business day of the deviation taking place. Any deviations from the approved plan shall continue to allow the resulting seismic reflection survey to meet the requirements of paragraph (A) of this rule. All deviations from the approved plan shall be listed within the report required by paragraph (F) of this rule with an explanation as to why the deviation was necessary and how the deviation continued to allow the seismic reflection survey to continue to meet the requirements of paragraph (A) of this rule.
- (F) The owner shall submit to the director four copies of the final report and digital data with all appropriate header information detailing the results of the seismic reflection data survey required by paragraph (A) of this rule. This report shall be submitted with the permit to drill application required by rules 3745-34-12 and 3745-34-13 of the Administrative Code. The report shall be certified in accordance with rule 3745-34-17 of the Administrative Code. The report shall describe, where present, the faults and fractures within or near the area around the well where the formation pressures may be increased due to the operation of the well. Where there are no faults and fractures present within or near the area around the well where the formation pressures may be increased due to the operation of the well, the report shall state this. The report shall, at a minimum, include the following:
- (1) A copy of the seismic reflection field digital data. The field digital data shall be submitted in a format approved by the director within the work plan required.
 - (2) A surveyed base map illustrating the following:
 - (a) Surveyed line locations with shot points annotated.
 - (b) All wells in the area that penetrate the confining zone, with permit numbers, total depth and standard symbols utilized to denote these wells. The producing zone(s) of these wells should be listed within the final report.
 - (c) The facility property boundaries.
 - (d) County and township boundaries and names (or numbers).
 - (e) Highways, pipelines, railways and transmission lines.
 - (3) Provisions for including processed digital data of seismic profiles in the final report.
 - (a) Brute stack.
 - (b) Structure stack.
 - (c) Migration stack.
 - (4) The compilation and presentation of processing step notes with the data. These notes should be detailed so the entire processing sequence may be duplicated by an outside party. Intermediate data, specific procedures and the technical basis for selected

procedures applied in all static corrections should be provided in digital form.

- (5) A copy of interpreted profile sections as requested by the director with all significant geologic horizons annotated. The stratigraphic nomenclature shall be that currently in use by the Ohio department of natural resources, division of geologic survey. Wellbores shall be projected along regional geologic strike and annotated on nearby sections. The distance and azimuth of the projection shall be noted on any seismic lines for each well location. One copy of the uninterpreted seismic sections shall be included within the report.
- (6) Other additional information determined necessary by the director.
- (G) The director may require a passive seismic monitoring program be maintained at or near the injection site if the director determines that the operation of a class I injection well may cause seismic disturbances. The director may require that a microseismicity monitoring program be maintained at an injection site when determined to be necessary or appropriate.

Effective: 11/11/2016

Five Year Review (FYR) Dates: 08/24/2016 and 07/14/2021

Promulgated Under: 119.03
Statutory Authority: 6111.043
Rule Amplifies: 6111.043
Prior Effective Dates: 03/11/02, 04/23/09