Ohio Administrative Code

Rule 1501:14-5-01 Hydrology.

Effective: June 27, 2024

Except as provided in paragraph (C) of this rule, the following are to be included in each application for a permit that proposes to dewater :

(A) A hydrologic map consisting of a single map using the most recent USGS 7.5 minute topographic maps at a scale of 1:24,000 as a base or other approved format showing all of the following:

(1) The proposed permit area;

(2) A line identifying the area encompassing a four mile radius from the boundary of the proposed permit area, to be known as the hydrologic study area;

(3) The location of the cross-sections required under paragraph (B)(5) of this rule;

(4) The location of the selected water supply wells identified in paragraph (B)(4)(a) of this rule and other water sources used for domestic, agricultural, or industrial use including an assigned identification number; and

(5) Any well, well field, reservoir, river, water source used for a public water supply or facility registered under section 1521.16 of the Revised Code on or within the hydrologic study area.

(6) Additional information within or beyond the hydrologic study area be shown on the map if such identification is necessary based on site-specific conditions.

(B) A hydrogeologic description in sufficient detail to determine the hydrologic cone of depression for the proposed operation, which:

(1) Includes a general statement of the geology within the proposed permit and hydrologic study area

down to and including the deeper of either the first stratigraphic unit below the lowest mineral deposit to be mined or any aquifer below the lowest mineral deposit to be mined. Additionally, the areal and structural geology of the permit and hydrologic study area, and other parameters which may affect the occurrence, availability, movement, quantity, and quality of potentially affected ground waters are to be included. The general statement will be based on information available to the applicant from test borings, core drillings, well logs, and geologic literature and practices.

(2) Contains information available in the public domain related to the ground water hydrology for the proposed permit and hydrologic study area, including, at a minimum:

(a) The elevation and the horizontal extent of the aquifer(s), intervening lithology, and overburden;

(b) The lithology and thickness of the aquifer(s);

(c) Known uses of the water in the aquifer(s);

(d) The elevation of water in the mineral deposit(s), and each water-bearing stratum above and below the mineral deposit;

(e) The transmissivity of the aquifer(s);

(f) The storativity of the aquifer(s);

(g) The hydraulic conductivity of the aquifer(s);

(h) The specific yield of unconfined aquifer(s);

(i) The location and elevation of any existing dewatering sumps (including state plane coordinates and north american datum (NAD) year); and

(j) The rate of discharge of any currently registered water withdrawals shown pursuant to paragraph (A)(5) of this rule.

(3) Includes a listing of the published information and data used in preparation of the items in paragraphs (B)(1) and (B)(2) of this rule, and copies of the unpublished records and data used in preparation of these items including, but not limited to, core descriptions, cutting descriptions, stratigraphic descriptions, and pump or slug test records.

(4) Contains a water supply inventory, representing all aquiferssubmitted in a format prescribed by the chief including, at a minimum:

(a) A listing of water sources in the proposed permit and hydrologic study area as shown pursuant to paragraphs (A)(4) and (A)(5) of this rule. The representative water sources selected are to include recently drilled wells, represent all aquifers and producing zones within the aquifers, and reflect a uniform geographical distribution of wells within the study area. The inventory information also includes: all of the existing water wells if there are fewer than one hundred wells or, ifthere are more than one hundred wells within the study area, one hundred wells plus twenty-five per cent of those wells in excess of one hundred but not more than a total of three hundred. For each water well, include a list of the following:

(i) Map identification number assigned under paragraph (A)(4) of this rule;

(ii) Ohio department of natural resources, division of water resources number assigned to the log form filed under section 1521.05 of the Revised Code;

(iii) Township;

(iv) Year drilled;

(v) State plane coordinates (including NAD year);

(vi) Surface elevation of the well (feet);

(vii) Total depth of the well in feet below the land surface;

(viii) Depth to bedrock (feet);

(ix) Description of unconsolidated material;

(x) Static water level of the well in feet below the land surface;

(xi) Casing length (feet);

(xii) Lithology of the screen interval/open borehole;

(xiii) Length of any well screen (feet);

(xiv) Test rate (gallons per minute);

(xv) Duration of test; and

(xvi) Drawdown (feet);

(b) A listing of the location and type of any public water supply sources on the permit and within the hydrologic study area; and

(c) A copy of the division of water resources well logs for the selected wells.

(d) An applicant may, prior to submission of an application, request in writing, a reduction of the number and/or extent of the submittals set forth in paragraph (B)(4) of this rule. The request may be granted only if the chief makes a written determination that this reduction will not diminish the level of accuracy in the ground water model. If there is a disagreement as to the amount or extent of the water resources information necessary, the chief will consult with the chief of the division of water resources prior to determining the final extent of data necessary. If the chief grants a reduction, the written request and determination are to be submitted with the permit application.

(5) Contains a minimum of two perpendicular hydrogeologic cross-sections of the same scale for the study area based on available information which at a minimum:

(a) Are of uniform horizontal scale;

(b) Are of uniform vertical scale;

(c) Depict the information set forth in paragraphs (B)(2)(a), (B)(2)(b), (B)(2)(d), and (B)(2)(i) of this rule;

(d) Intersect the center of the proposed operation; and

(e) Include the data points used to construct the cross section.

(6) Where informationto be included in the water supply inventory of paragraph (B)(4) of this rule is unobtainable, the application is to include a statement to that effect giving the reasons therefor.

(C) Ground water model submitted by the applicant.

An applicant for a permit may choose to submit a ground water model with their application that defines the projected cone of depression for the proposed operation, accurately reflects the ground water flow conditions associated with the hydrologic study area, and is consistent with ASTM international standards. The website for ASTM international is http://www.astm.org/. Detailed explanations of the hydrologic and geologic parameters used to construct the model are to be included in the submission and model results submitted in a format prescribed by the chief.

A ground water model submitted to the chief is to be a three-dimensional ground water flow model utilizing finite difference modeling software such as MODFLOW. MODFLOW is available from the U.S. geological survey at the website http://water.usgs.gov/nrp/gwsoftware/modflow.html. An applicant may request the chief to accept a two-dimensional ground water flow model using finite difference software, provided the chief determines, based on written justification submitted with the request, that the model will accurately represent the ground water flow in the hydrologic study area.

(D) Staging of the projected cone of depression.

(1) An applicant for a permit may request the chief to establish the projected cone of depression in

stages to reflect the development of the dewatering operations over the life of the proposed permit. Such staged cone of depression will reflect a maximum of four vertical or horizontal sump locations within the proposed permit area. For each stage, the applicant is to identify the sump location and elevation and the part of the permit to be dewatered.

(2) If the applicant submits a staged ground water model under paragraph (C) of this rule, the projected cones of depression are to be depicted on the map(s) submitted under paragraph (A) of this rule. The responsibility for water replacement within the cone of depression provided in division (B) of section 1514.13 of the Revised Code will be based on the cones of depression established by the chief at the time of permit issuance. For the purposes of division (B) of section 1514.13 of the Revised Code, where horizontal staging of the cone of depression is accepted for a proposed permit area, the cone of depression applied to water replacement responsibilities will be based on the cumulative boundary of the cones of depression of the permit area affected at the time of the complaint.

(3) If the projected cone of depression is staged, the applicant is to identify the exact location, elevation, and pumping rate of the dewatering sump(s) for the surface mining operation on each annual map submitted under section 1514.03 of the Revised Code. The applicant is to notify the chief in writing at least sixty days prior to altering the horizontal or vertical location of the dewatering sump.

(E) For applications that include a ground water model submitted under paragraph (C) of this rule and meet all other permit requirements of Chapter 1514. of the Revised Code, the chief may issue a surface mining permit conditioned on final review and approval of the ground water model, provided the applicant submits a ground water model pursuant to paragraph (C) of this rule that also contains a preliminary regulatory ten-foot cone of depression map based upon guidelines established by the chief. The permittee shall comply with the final cone of depression as established by the chief.