

OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Mineral Resources Management
Industrial Minerals

Checklist of Required Materials to Submit to ODNR to Perform Ground-Water Modeling

The checklist details items that must be submitted for ODNR, Division of Mineral Resources Management (DMRM) and ODNR, Division of Water Resources (DWR) to complete a ground-water flow model for an Industrial Minerals hydrology review. Requirements for the data and information are detailed as required by the Ohio Administrative Code 1501: 14-5-01. Please review your submission carefully with this checklist to insure that all required attachments are included. The submission may not exactly match the checklist, because additional text and/or figures might be necessary to convey the quarry setting.

Submissions are reviewed in the order received. Information required in this document is utilized in the ground-water modeling process, and thus, all information must be approved for completeness and accuracy before the modeling begins. Failure to include required items will result in a delayed approval. After the initial review is complete, comments are sent to the operator and the consultant. When all comments are addressed, the submission is approved, and work will commence on the model. At that time, the operator and consultant will be informed of expected time of completion for the ground-water model and report.

Operators and consultants new to the ground-water modeling hydrology application process are encouraged to schedule a premodeling meeting with the Industrial Minerals geologist, Kelly Barrett. (Kelly.Barrett@dnr.state.oh.us or 614-265-6502) Suggested topics for the meeting include information to include on the maps, sources of data, and any other topic the operator or consultant wishes to discuss. Mail completed materials to Kelly Barrett, ODNR Division of Mineral Resources Management, 2045 Morse Road, Building H-3, Columbus, OH 43229-6693.

A. Submit the following maps with the most recent USGS 7.5-minute topographic base map at a scale of 1:24,000 (1 inch = 2,000 feet) or at another approved scale at which the base map and data are easily viewed. A north arrow, scale, and map title should appear on each map. All items depicted on the map should be defined in a legend or labeled.

Quarry Map

Designate each of the following mining extents with a contrasting color or pattern:

- Significant historic extents
- Current extent (Corresponds to area currently mined)
- Proposed extent (Entire area to be mined; can show as multiple expansions)

For each extent, label:

- Sump location and elevation
- Quarry floor elevation(s)
- Timeframe extent was, is, or will be present

Water Well Location Map

Show the following information:

- DWR water well locations labeled with a unique identifier
 - Wells represent all aquifers and producing zones within the aquifers.
 - Wells are distributed throughout the study area.
- Water Withdrawal Facilities
 - Indicate with different color or symbol from DWR water wells
 - Label with registration number or facility name
- Location and type of any Ohio EPA public water supplies
- Location of reservoirs, lakes, and streams
- Location of cross sections
- Locations of any aquifer test wells
- Proposed quarry extent(s)

B. Provide description of the following:

Permit Information

Indicate:

- Industrial Minerals permit number
- Industrial Minerals operator

Quarry History

Describe significant events at the quarry including:

- Start of mining date
- Date and extent of any previous significant deepening and expansions
- Date and elevation changes in quarry floor and sump
- Start date of any previous dewatering
- Relate quarry mining history to quarry map

Proposed Quarry Expansion

Describe if the proposed quarry expansion is vertical, lateral, or both:

- If the expansion is vertical, indicate the change in elevation.
- If the expansion is lateral, indicate the change in acreage.
- Indicate if multiple expansion scenarios are planned. For each scenario:
 - Indicate change in elevation and/or acreage of mining
 - Indicate the location and elevation of the sump

Hydrogeologic Setting

Describe hydrogeologic conditions at the quarry and regionally:

Surface Water

- Identify significant streams and surface water bodies

Glacial Geology

- Map unit(s)
- Age
- Composition
- Thickness

Bedrock Geology

- Map units(s)
- Age
- Thickness
- Lithology

Where applicable, describe:

- Regional dip
- Significant structural geology (fractures, faults, arch, etc.)
- Solution or karst features (caves, sinkholes, etc.)

Show geologic framework in a generalized section

- Map unit(s) (Formation Name)
- Period (ex. Devonian)
- Unit thickness (can be reported as a range of thicknesses)
- Reference(s)

Principal Aquifers

- Identify by map unit(s)
- Type of aquifer (confined, unconfined, etc.)
- Uses of the water in the aquifer
- Indicate any available alternate aquifers

Hydraulic Conductivity

- List published values in a table with reference
- Indicate location of aquifer test data
- List transmissivity and storativity values with reference if available

C. Provide the following in the report:

DWR Water Well Spreadsheet

List all water wells depicted on the Well Location Map in an Excel spreadsheet. Indicate the following information from the DWR Water Well log record for each well:

- Unique identifier indicated on map
- DWR well log number
- Township (and county if needed)
- Completion date (month/day/year)
- XY coordinates (specify coordinate system, zone, and datum)
- Surface elevation of the well (feet above mean sea level)
- Total depth of well (feet below land surface)
- Depth to bedrock (feet below land surface)
- Geology of screened or open borehole (type and thickness)
- Static water level (feet below land surface)
- Casing length (feet)
- Length of screen (feet)
- Test rate (gallons per minute)
- Test Duration (hours)
- Drawdown (feet)

Each row should contain data for a single well.

Each column should contain one attribute from the list above.

If well information is not available from the well log then leave that cell blank.
Submit the spreadsheet as a table appended to the text. The spreadsheet can also be submitted digitally as an Excel file on a CD or DVD.

DWR Water Withdrawal Facilities Registration Program Spreadsheet

Note: These are not included in the DWR water well database. Contact DWR to request Water Withdrawal Facility data.

Indicate the following information for each facility depicted on Well Location Map:

- Water Withdrawal registration number
- Owner and name of facility
- Volume of water withdrawn yearly
- XY coordinates of facility (specify coordinate system, zone, and datum)

DWR Water Well Logs

Submit the water well log for each well depicted on the Water Well Location Map.
Submit each log as either a paper copy with report or a digital copy on a CD or DVD.

Cross Sections

Submit two or more cross sections that intersect at the quarry. The horizontal scale of the cross sections should match that of the Well Location Map. Cross sections must show:

- Location where cross sections intersect
- Horizontal and vertical variations in surficial and bedrock geology
- Locations of boreholes and wells used to create cross sections
- Static water levels in boreholes and wells
- Depiction of the existing and proposed quarry depths and extents
- Vertical and horizontal exaggeration

D. References

Please consult the document 'References & Data Sources for Data or Model Submissions' for references that are commonly used in existing reports or data submissions and for sources of data that are required to be included. Only include references cited in the text of for data shown on maps. Use a consistent style to list references that is based on a widely used format.

For questions and concerns about these guidelines or the model review process, contact Kelly Barrett at (614) 265-6502 or Kelly.Barrett@dnr.state.oh.us.