

Noncoal Permitting: Regulatory framework regarding hydrology and health and safety

(Draft for discussion purposes)

Background: Large noncoal surface mining operations often pump considerable volumes of groundwater in order to maintain operations. The effects of pumping can range from minimal localized groundwater impacts to far-reaching impacts on groundwater and surface water resources. The degree and nature of the hydrologic impacts is often controlled by the geologic setting. Water intercepted by pumping at noncoal surface mining operations can result from groundwater flow via primary permeability, fracture flow from secondary permeability, inrushes from cavities in carbonate rocks, inrushes along fault conduits, and direct or indirect flow from nearby bodies of surface water. Premining predictions of inflows to surface excavations can be inexact and often benefit from refinement based on data gathered during the course of active mining operations. There are often confounding factors, including other influences which need to be identified as part of application, that need to be assessed to fully evaluate potential hydrologic impacts.

Noncoal mining, particularly in karst settings, can contribute to sinkhole development. While the creation, propagation, or interconnection of sinkholes and solution cavities can have impacts on the local hydrology, there may also be public health and safety hazards and nuisances related to these features.

Legal and Regulatory Standards: Chapter 77 establishes criteria for the issuance of noncoal mining permits and establishes permit application requirements and performance standards for noncoal mining activities.

The following sections of Chapter 77 provide specific permit application requirements relating to permit approval, baseline hydrologic data, and probable hydrologic impacts:

- Section 77.126(a)(3) does not allow a permit to be issued unless an applicant affirmatively demonstrates “.. *that there is no presumptive evidence of potential pollution of the waters of this Commonwealth.*”
- Section 77.403 provides an outline of required hydrologic and geologic information, including predictive techniques designed to characterize the potential for adverse hydrologic impacts.
- Sections 77.405, 77.406, and 77.407 require groundwater and surface water information and include alternative water supply provisions.
- Section 77.457 requires a description of measures that will be implemented to ensure the protection of surface and groundwater resources within the proposed permit and adjacent areas and addresses the protection of the rights of present users of those resources. The section also requires a determination of probable effects of mining on the hydrology of the proposed permit and adjacent areas.
- Section 77.521 requires that mining activities be planned and conducted to prevent pollution and minimize disturbances to the hydrologic balance in the permit and adjacent areas.

- Section 77.532(b) provides that appropriate analyses and aquifer testing be conducted to demonstrate that an alternative source of water is available if mining adversely impacts a public or private water supply.

Also, the following sections include provisions governing health and safety:

- Section 77.126 requires that the Department find that mining can be reasonably accomplished under the regulations, permit and statute prior to issuance.
- Section 77.130(1) requires that permits include conditions that ensure prevention of adverse impacts to health and safety.
- Section 77.243 provides that sufficient bond be held to cover measures needed to prevent adverse impacts to health and safety

Additional underlying legal guidance is provided by court rulings regarding health and safety and hydrologic impact issues at mining operations and other groundwater use activities and by specific prevailing language contained in the Clean Stream Law, which includes definitions of “*waters of the Commonwealth*” and “*pollution.*”

In particular, the courts have held:

1. Total dewatering of a stream constitutes pollution.
2. A reduction in the flow of a stream that does not affect its uses is not pollution.
3. The Department must determine that the hydrologic balance is protected.
4. A permit applicant must demonstrate that there is no evidence that presumptively indicates pollution will occur.
5. The Department’s duty to ensure that mining can be reasonably accomplished requires it to ensure that the mining can be performed without an undue risk to health, safety, and welfare.
6. For permit revisions, the project as a whole must be evaluated to determine if mining can be safely and reasonably accomplished.
7. There is no prescriptive right to continue a condition that is declared by statute to constitute a nuisance; therefore, permit renewals require the Department to ensure that a continuation of the permitted activity is appropriate based upon up-to-date information.

The courts have found that relevant decision-making criteria include; the effects of past mining on the hydrologic balance in the same area, the analysis of background or monitoring data, and predictive modeling results. In cases where there is presumptive evidence of potential pollution, the courts have rejected that permits should be issued based on the operator’s willingness and ability to mitigate the pollution. (Regardless, the courts have indicated that it is appropriate to require an applicant to demonstrate the feasibility of mitigation measures in the event of unanticipated pollution.)

Pollution: Section 5 of The Clean Streams Law broadly defines “*waters of the Commonwealth*” to include all groundwater and surface waters. “*Pollution*” is also broadly defined as:

...contamination of any waters of the Commonwealth such as will create or is likely to create a nuisance or to render such waters harmful, detrimental or injurious to public health, safety or welfare, or to domestic, municipal, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life, including but not limited to such contamination by alteration of the physical, chemical or biological properties of such waters, or change in temperature, taste, color or odor thereof, or the discharge of any liquid, gaseous, radioactive, solid or other substances into such waters.

Therefore, pollution occurs if there is a substance discharged into the waters of the Commonwealth or there is a change in the water's physical characteristics creating a nuisance, risk of harm to the public or an adverse impact on the water's related uses. Diminution in quantity of the water is recognized to be a change in physical characteristics that can constitute pollution.

Adverse Hydrologic Impacts: A noncoal permit application must contain sufficient information and data to affirmatively demonstrate that the mining can be accomplished under the proposed operation and reclamation plan to ensure the protection of the quality and quantity of surface and groundwater, including the rights of present users of those resources, from the adverse effects of mining. Adverse hydrologic impacts would include:

- Draining of aquifers supplying water to public water supply wells.
- Draining of aquifers supplying water to domestic water supplies where there is no demonstrated replacement supply.
- Draining of groundwater that provides baseflow to surface waters resulting in the loss of existing uses of those surface waters.
- Direct draining of surface water to mining excavations or mining-induced excavations resulting in the loss of existing uses of those surface waters.
- The shifting of natural groundwater divides resulting in permanent draining of shallow aquifers.

Nuisances and Adverse Health and Safety Impacts: A noncoal permit application must contain sufficient information and data to affirmatively demonstrate that the mining can be reasonably accomplished to prevent adverse impacts to public health and safety. Adverse impacts health and safety impacts (nuisances) include, but are not limited to:

- Landslides
- Cave-ins
- Subsidence
- Sinkholes
- Un-guarded or Un-fenced open pits

Permit Review and Issuance Standards:

1. Noncoal mining operations should be planned and conducted to prevent pollution and adverse hydrologic impacts and to minimize disturbances to the hydrologic balance.
2. Permit applications cannot be approved in cases where the effects of past mining, the results of groundwater and/or surface water monitoring, and/or the results of predictive models provide presumptive evidence of potential pollution or where there is a clear anticipation of adverse impacts.
3. Noncoal permits should not be approved based on an applicant's willingness or ability to mitigate anticipated pollution and/or adverse hydrologic impacts.
4. Where it is anticipated that mining activities will contaminate, interrupt, or dewater private water supplies, noncoal permits should not be approved unless the applicant demonstrates that an adequate alternative supply exists.
5. Permit applications for new mines, revision applications, and permit renewals cannot be approved in cases where there is a clear anticipation that mining will cause, contribute to, or perpetuate an unavoidable and serious health or safety hazard.

Assessing the Potential for Adverse Hydrologic Impacts and public Health and Safety Nuisances:

New Permits – For new noncoal permits, where the applicant is proposing to mine below the water table, the application shall include:

- The results of on-site pumping tests designed to provide information regarding appropriate aquifer properties, including but not limited to transmissivity, storativity (specific yield), and radius of influence. The pumping tests should include a sufficient number of observation points to allow a characterization of the groundwater flow system.
- Sufficient surface water flow data to characterize the gaining and/or losing nature of streams within the zone of influence of the proposed mine. The flow data should be sufficient to allow the implementation of a site-specific life-of-operation monitoring network capable of providing early warnings of stream losses before they approach the level of an adverse impact.
- A fully developed conceptual groundwater flow model of the proposed mining site based on results of the pumping tests and surface water characterization referenced above. Boundary conditions are key. The creation of artificial boundaries must be documented and justified by the applicant.
- The results of a site-specific mathematical groundwater model. The model should be calibrated as mining progresses using observed heads and flows.
- For karst settings - A fully supported evaluation of future and current groundwater withdrawals and the impacts those activities would have on sinkhole development, including the potential for impacts to public health and safety and adjacent land uses.

Existing Permits – For existing permits, where the mining has taken place below the water table, each permitting action (NPDES renewals or permit amendments) shall be reviewed to determine if pollution has occurred or may be anticipated. Additional hydrologic data and/or modelling may be necessary to demonstrate that the continuation of mining, particularly with

amendments requesting a depth correction, will not result in pollution or the perpetuation, or creation, of a nuisance.