Fact Sheet for General Permit for Discharges from Mineral Mines, Quarries, Borrow Pits and Concrete and Asphalt Plants

Background

COMAR 26.08.03.01 and 26.08.04.01, regulations pursuant to Maryland's Annotated Code, require a permit for discharge to State waters of any quantity of wastewater and for discharges of over 10,000 gallons per day (as a monthly average) of clean water. Additionally, 40 CFR122, a regulation pursuant to the federal Clean Water Act, requires a permit for any point source discharge of pollutants to navigable waters. Therefore, a permit is needed for almost any discharge associated with mineral mines, quarries, borrow pits and concrete and asphalt plants.

Mineral mines are addressed in two sections of the federal regulations, at 40CFR 436 which describes effluent quality requirements from mine dewatering and from processing of the mineral, and at 122.26. 40 CFR 436 which identifies storm water associated with industrial activity (other than that storm water regulated in 40 CFR 436) as subject to permitting.

The Department issues both individual permits and general permits, both effective for up to five years. A general permit is developed for a class of discharges which can be sufficiently covered with the same conditions, and simplifies the application process. A general permit has been the best way to address the demand for permitting mineral mines and associated facilities because of the similar discharges from the facilities, the number of discharges, and the relatively quick response the Department can achieve to permit requests for new facilities, which are often submitted on relatively short notice.

Who is this general permit for?

1) Mineral mines (other than industrial sand) that dewater (either mechanically or by gravity) the mining excavation.

2) Facilities that wash aggregate.

3) Facilities that make ready-mix concrete or other concrete products and that discharge either wash water, excess feed water, or storm water associated with their activity.

4) Bituminous concrete (commonly referred to as "asphalt") plants that discharge storm water only.

What will the permit regulate?

This general permit cannot address all possible pollutants, but addresses the most common: suspended sediments, pH, oil & grease, and temperature. The permit limits these parameters both directly and indirectly, i.e. by end-of-pipe numerical limits and by operational measures to prevent the generation or entrainment of pollutants.

Specific origins of the numerical limits

General: NPDES regulations require that all dischargers, as a minimum, reduce pollutants to the best extent practicable (commonly referred to as "technology-based limits"). However, if that level of reduction is not sufficient to protect receiving water quality for its designated uses, then further reductions are required (commonly referred to as "water quality-based limits").

Technology-based limits are derived from best professional judgment. For example, limits may be based on the record of an exemplary facility. They may be borrowed from standards used for similar facilities or facilities that have similar wastewater characteristics. For a number of major industrial categories, including non-coal mineral mining, standards may be defined in federal "effluent limitations guidelines."(ELGs). ELGs are the product of studies commissioned by the federal EPA where an industrial category is surveyed, pollution control technologies are assessed, and the output is quantified. For the mineral mining industry, the ELGs (described in 40CFR436) are flawed in that, through a decision in the 1980s, a court remanded the standard for the most significant parameter, total suspended solids, for the construction sand & gravel and crushed stone subcategories. Furthermore, the EPA has never developed the section on dimension stone. There are no ELGs for discharges from concrete plants or asphalt plants.

Water quality-based limits are derived from water quality criteria, which the Department establishes in its regulations, COMAR 26.08.02. Water quality criteria describe, by means of numerical standards, the range of physical and chemical conditions under which various State waters can achieve their designated uses, which may include supporting water contact recreation, fishing, aquatic life, wildlife, use as public water supply, and consumption of fish and shellfish. Just how these receiving water quality standards are applied to effluent is often determined by the size and assimilative capacity of the receiving waters. The application of water-quality based limits is described under proposed administrative procedures on page 6 of this document.

Specific numeric limits were chosen as follows:
Suspended solids must be limited for all discharges in this permit as mining exposes bare rock and soils, heavy equipment stirs up dust and sediment in standing water, and washing is performed specifically to remove and thus entrain solids. The origin of the decision to apply numeric limits to water associated with mining pits and washing was the 1977 ELG for this category, but the choice remains logical as these facilities are areas of concentrated disturbance and these flows are amenable to more thorough controls than just the best management practices for sediment and erosion control that are applied to construction activity.

All solids limits are technology-based. There are no water quality criteria for suspended solids, though the majority of Maryland's waters are impaired by solids. There are water quality standards for turbidity, but there is no direct correlation between suspended solids and turbidity. In this case, the technology standards are more stringent than the water quality standards. We established standards for quarries, sand & gravel mines (that includes borrow pits), aggregate washing, and concrete washing because those are the significant sources and removal of solids from the water is an important part of wastewater treatment. Sediment associated with storm water from asphalt plants can be adequately controlled by good management practices.

For quarry dewatering and process wastewater, the differing numbers reflect the varying rates of generation and settleability of solids for carbonate and noncarbonate mines. The numbers in the current permit and some of those proposed for this revision came from a 1981 report titled *Suspended Solids Removal in the Crushed Stone Industry* by Dolores Funke and P. Michael Terlecky, Frontier Technical Associates, Inc. The Department's understanding was that this study was to be the first step in returning solids limits to the ELG, but EPA has never since promulgated revised guidelines. MDE has, however, applied these numbers to the mining permits ever since then.

That report also proposed a separate set of limits for dewatering for wet weather, the assumption being that it is not practical to maintain quality control on storm surges. The

Department has been using these limits also, but now is proposing to end this practice. Regarding quarries, the above assumption of treatability has not really been tested as few quarries have anything more than collection sumps for their settling systems. The time is long overdue to either ensure reasonable settling capacity or begin working the quarries so that they can tolerate flooding for a few days while the water settles.
For fair weather dewatering of sand & gravel and borrow pits, the current limits are achievable and consistent with solids limits in other industrial sectors. So we left these unchanged.

The proposed wet weather dewatering limits (both for quarries and sand & gravel) are borrowed from the surface coal mining ELGs. While the coal regions have their unique geology, with their shale and sandstone mix, they represent a good average between the solid rock of some limestone quarries and the unconsolidated clays and sands of the coastal plain. Limited data on storm water settling ponds have also shown these limits to be readily achievable. **This change raises maximum limits only because the intermittent (often infrequent) nature of the discharge does not lend itself to obtaining enough samples to provide a meaningful average.**

The chart below contains monitoring requirements and suspended solids effluent limitations for several states, all of which are in the same ranges as the Maryland limits, which vary from 60 mg/l to 70 mg/l for wet weather.

State	Discharge Type	Average	Maximum	Monitoring frequency
Virginia		30	60	Quarterly
Michigan		30	45	
Oklahoma			45	
Washington		40	80	
		50 NTU		
		TDS 200		
Wisconsin		40		Quarterly
Alabama		35	70	2/month

It would not be reasonable to require compliance (with the proposed limits) for extreme storm events. Therefore the Department has chosen a ten-year frequency storm event, which was used in the coal mining ELGs. Weather service records state that the ten-year frequency storm varies from 4.5 inches in Garrett to 5.6 inches in Worcester, so the permit will include a table. Solids limits do not apply to discharges during storms greater than the 10-year storm.

To comply with these requirements, the permittee will need to keep a rain gauge on site and obtain a sample before the threshold amount of rain has fallen. Also, to avoid any misunderstanding of the monitoring responsibilities, the permit will direct the permittee to obtain a wet weather sample if possible, in addition to a fair weather sample. The permittee is also required to keep a record of precipitation on the day the wet weather sample is taken to verify that the facility is meeting the limits during moderate rainfall events.

This permit will also establish limits for that period between when mining ends and when reclamation is complete. This is a period where for hard-rock mines, there will be more movement of unconsolidated material. Because retention capacity and land grading will be in flux, retaining water during storm events will be more difficult. So again, we are looking to the

coal mining ELG for guidance, and therefore we are using that ELGs 0.5 ml/l settleable solids limit.

For process water (i.e. aggregate wash water), the Department has concluded that the Frontier recommendations for noncarbonated operations are too generous. Looking at other industries, proven achievable standards have ranged from 30 to 45 average and 45 to 60 mg/l max. The Department chose the highest from these ranges, considering what was previously allowed. Monitoring results from existing facilities show compliance with these proposed limits. For wash water from sand and gravel, so few have a need to consistently discharge that we have to assume that the current limits remain appropriate. For concrete associated wash water, the existing permit limits are tighter and the ability to comply demonstrated, so the currently used limits of 30 average and 60 mg/l maximum continue unchanged.

Oil & Grease: A limit is appropriate for discharges from plants that manufacture concrete products other than bulk concrete, where oil is used as mold releases, and could be appropriate for vehicle washing operations in excess of the typical dust spray or tire wash. The upper limit of 15 mg/l represents the concentration achievable by traditional oil separation technology. The exact origin of this number is lost in time, but has been used in Maryland permits without challenge for over 30 years, is used in other states' permits, and is used in some EPA effluent limitation guidelines. Because this is a technology limit, it must be applied before the wastewater commingles with other wastewaters.

The limit of 15 mg/l is not applicable to mining operations, ready-mix plants, and asphalt plants where minimal random dripping from vehicles occurs, but resultant oil levels would not approach the proposed limits. In lieu of numerical limits, we include a footnote prohibiting a visible sheen, since even low levels of oil and grease are visible to the naked eye.

pH: A pH limit applies to all discharges covered by this permit. Any activities involving Portland cement can cause an alkaline pH. Some coastal plain soils are acid forming when exposed to air. Most other mining has little effect on pH, but a limit is mandated by the ELG.

The range of 6.5 to 8.5 is the receiving water standard throughout Maryland. The range of 6.0 to 9.0 is the technology-based standard set in the ELG for mines, and most other ELGs. As with other pollutants, the technology standard is adequate as long as water quality standards are not compromised. For areas in western Maryland whose waters are impaired by low pH, the range of 6.5 to 8.5 is the permitted limit.

Predicting assimilative capacity of pH by mass balance is not practical, so the best way to provide some flexibility in discharges without compromising water quality is to allow measuring the pH in streams after mixing to compare the receiving water quality slightly downstream of the discharge to the water quality limit. In Maryland waters that are impaired by low pH, the in-stream pH may be used if the pH of the discharge is above 8.5; in other Maryland waters if pH ten feet downstream of the discharge meets the water quality limit, the discharge is considered in compliance. NOI reviews will specify the lower pH limit of 6.5 or 6.0 depending upon the potential vulnerability of receiving water.

The permit further allows a discharge that does not meet the stated limit if the permittee can show through monitoring upstream and downstream that the discharge does not reduce the pH in any receiving water with a pH below 6.5, and does not increase the pH in any receiving water with a pH above 8.5.

Temperature: An unintended effect of settling ponds is the solar heating of their contents, so the discharger must be responsible for avoiding any violation of stream standards. Depending on whether the discharge is to Use I, or II, III, or IV waters, the respective stream standards are 90°F, 90°F, 68°F, and 75°F. Our objective is not that the discharge is a certain temperature, but rather that it not cause the receiving water to exceed its standard, or if the receiving waters already do exceed standards, not make the waters even hotter, so the limit applies only during the summer months. A discharge may be as warm as the stream standard or, if the stream is warmer than the standard the discharge may be as warm as the stream. In either case, the discharge may not make the stream measurably warmer after a 50-ft mixing zone. This mixing zone is described in COMAR 26.08.03.03. We quantify this as "temperature difference" to create a monitoring result that is a single number rather than many with caveats, making the results more immediately understandable and more amenable to entry in a database. The limit is not applied to Use I or Use II waters as pond temperatures do not exceed 90°F (other than maybe at the surface) in Maryland.

Other Special Conditions are necessary and included as follows:

Storm Water Pollution Prevention Plan (SWPPP): To minimize the need for treatment of storm water, the Department requires the permittee to practice pollution prevention, i.e., keep the pollutants out of the storm water to begin with. For mining areas, operation under an approved sediment and erosion plan (as required by the facility's surface mining permit) fulfills a large part of this requirement. Beyond the sediment and erosion control plan, this permit's SWPPP is required to address other potential pollutant sources, such as vehicle maintenance and fueling and spillage, chemical storage, mechanical maintenance, and stockpile management at concrete plants.

The SWPPP includes an assessment of the site and development of controls in areas where pollutants may contact storm water. The plan will be made available to MDE and to the public electronically.

Chemical Additives: One way to achieve compliance with a solids limit is to enhance settling using polymers. Some of these products, however, may cause toxicity to aquatic life. This condition requires the submission the names of compounds used and their quantities, and except for the most commonly used treatment additives – inorganic acids, alum, and ferric chloride, any available aquatic toxicity information.

Concrete Admixtures are used to modify the properties of concrete to be used in specific applications, and include many compounds, including corrosion inhibitors, concrete accelerants, concrete retarders, air entraining agents, and plasticizers. The permit requires the submission the chemicals and quantities used for all facilities. Rather than establish limits for each chemical, the Department has included biomonitoring of wastewater at an internal point to determine whether these compounds may be having a negative impact upon receiving waters. The Department may require repeated toxicity testing, and may reopen the permit based upon the outcome of this testing.

TMDL Considerations: The Clean Water Act requires that EPA (or the delegated states) identify what water bodies fail to meet the quality required by that law and identify what pollutants are causing the problem. The next step is to determine what load of that pollutant the water body can accept, and still meet standards. This is called a "total maximum daily load." Once the tolerable load is determined, that capacity is divided between existing point source dischargers and other ambient sources. Therefore, new point sources can be allowed only if the new contribution of pollutants is offset by the elimination of existing sources, be they point or non-point source.

Impervious Surfaces: To encourage facilities to minimize impervious surfaces at their facilities, particularly near surface waters, the permit provides for a reduction in fees after the first year if the permittee can show that impervious surfaces have been reduced.

System Maintenance: Monitoring is only monthly and visits by inspectors are even less frequent. In lieu of frequent effluent monitoring, maintenance of the system is the best way to assure the best quality effluent at all times.

Proposed administrative procedures

The Department proposes to administer this general permit as follows. The applicant would submit a detailed NOI more resembling the EPA forms 3510-1 and 2 than traditional NOIs. A project manager would review the forms for sufficiency and determine the parameters of concern and what values are applicable, since they may vary according to the receiving waters' classification, and note which provisions of the permit are applicable.