

Subsection G - Sector G - Metal Mining

G.1 Covered Stormwater Discharges.

The requirements in Subsection G apply to stormwater discharges associated with industrial activity from metal mining facilities, including mines abandoned on Federal lands, as identified by the SIC Codes specified under Sector G in Table D-1 of Appendix D. Coverage is required for metal mining facilities that discharge stormwater contaminated by contact with, or that has come into contact with, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the operation.

G.1.1 Covered Discharges from Inactive Facilities. All stormwater discharges.

G.1.2 Covered Discharges from Active and Temporarily Inactive Facilities. Only the stormwater discharges from the following areas are covered: waste rock and overburden piles if composed entirely of stormwater and not combining with mine drainage; topsoil piles; offsite haul and access roads; onsite haul and access roads constructed of waste rock, overburden, or spent ore if composed entirely of stormwater and not combining with mine drainage; onsite haul and access roads not constructed of waste rock, overburden, or spent ore except if mine drainage is used for dust control; runoff from tailings dams or dikes when not constructed of waste rock or tailings and no process fluids are present; runoff from tailings dams or dikes when constructed of waste rock or tailings and no process fluids are present, if composed entirely of stormwater and not combining with mine drainage; concentration building if no contact with material piles; mill site if no contact with material piles; office or administrative building and housing if mixed with stormwater from industrial area; chemical storage area; docking facility if no excessive contact with waste product that would otherwise constitute mine drainage; explosive storage; fuel storage; vehicle and equipment maintenance area and building; parking areas (if necessary); power plant; truck wash areas if no excessive contact with waste product that would otherwise constitute mine drainage; unreclaimed, disturbed areas outside of active mining area; reclaimed areas released from reclamation bonds prior to December 17, 1990; and partially or inadequately reclaimed areas or areas not released from reclamation bonds.

G.1.3 Covered Discharges from Exploration and Development of Metal Mining and/or Ore Dressing Facilities: All stormwater discharges.

G.1.4 Covered Discharges from Facilities at Mining Sites and Undergoing Reclamation. All stormwater discharges.

G.2 Industrial Activities Covered by Sector G.

NOTE: "metal mining" will connote any of the separate activities listed in Part G.2. Permittees under Sector G are primarily engaged in the following types of activities:

G.2.1 exploring for metallic minerals (ores), developing mines, and the mining of ores;

G.2.2 ore dressing and beneficiating, whether performed at collocated, dedicated mills, or at separate (i.e., custom) mills.

G.2.3 reclamation of mining sites.

G.3 Limitations on Coverage.

G.3.1 Prohibition of Stormwater Discharges. Stormwater discharges not authorized by this permit: discharges from active metal mining facilities that are subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

NOTE: Discharges that come in contact with overburden or waste rock are subject to 40 CFR Part 440, providing that the discharges drain to a point source (either naturally or as a result of intentional diversion) and they combine with “mine drainage” that is otherwise regulated under the Part 440 regulations. Discharges from overburden or waste rock can be covered under this permit if they are composed entirely of stormwater, do not combine with sources of mine drainage that are subject to 40 CFR Part 440, and meet other eligibility criteria contained in Part 1.3.2.1.

G.3.2 Prohibition of Non-Stormwater Discharges. Not authorized by this permit: adit drainage and contaminated springs or seeps. Contaminated seeps and springs discharging from waste rock dumps that do not directly result from precipitation events are not authorized by this permit (see also the standard Limitations on Coverage in Part 1.3.4).

G.4 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

G.4.1 Mining operation - typically consists of three phases, any one of which individually qualifies as a “mining activity.” The phases are the exploration and development phase, the active phase, and the reclamation phase.

G.4.2 Exploration and Development phase - entails exploration and land disturbance activities to determine the financial viability of a site. Development includes the building of site access roads and removal of overburden and waste rock to expose mineable minerals.

G.4.3 Active phase - activities including each step from extraction through production of a salable product.

G.4.4 Reclamation phase - activities intended to return the land to its pre-mining use

G.4.5 Active metal mining facility - a place where work or other activity related to the extraction, removal, or recovery of metal ore is being conducted. For surface mines, this

definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun.

- G.4.6 Inactive metal mining facility - a site or portion of a site where metal mining and/or milling occurred in the past but is not an active facility as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable State or Federal agency.
- G.4.7 Temporarily inactive metal mining facility - a site or portion of a site where metal mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable State or Federal agency.
- G.4.8 Final Stabilization - a site or portion of a site is “finally stabilized” when:
- a. All soil disturbing activities at the site have been completed and either of the two following criteria are met:
 - i. A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
 - ii. Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
 - b. When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, 70 percent of 50 percent ($0.70 \times 0.50 = 0.35$) would require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.

G.5 Clearing, Grading, and Excavation Activities.

Clearing, grading, and excavation activities being conducted as part of the exploration and development phase of a mining operation may be covered under this permit if the clearing, grading, and excavation activities meet the terms and conditions and applicable technical standards of the Construction General Permit 3-9001 or its replacement.

G.5.1 Management Practices for Clearing, Grading, and Excavation Activities.

- G.5.1.1 Selecting and installing control measures. A combination of erosion and sedimentation control measures are required to achieve maximum pollutant prevention and removal. All control measures must be properly selected, installed, and maintained in accordance with any relevant manufacturer specifications and good engineering practices.
- G.5.1.2 Removal of Sediment. If sediment escapes the site, off-site accumulations of sediment must be removed at a frequency sufficient to prevent off-site impacts.

- G.5.1.3 Good Housekeeping. Litter, debris, and chemicals must be prevented from becoming a pollutant source in stormwater discharges.
- G.5.1.4 Velocity Dissipation. Velocity dissipation devices must be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from disturbed areas and from any stormwater retention or detention facilities to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).
- G.5.1.5 Retention and Detention of Stormwater Runoff. For drainage locations serving more than one acre, sediment basins and/or temporary sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the development area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided.
- G.5.1.6 Temporary Stabilization of Disturbed Areas. Stabilization measures must be initiated immediately in portions of the site where development activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Until full vegetative stabilization is achieved, interim measures such as blankets and tackifiers must be employed.

G.5.2 Requirements for Inspection of Clearing, Grading, and Excavation Activities.

- G.5.2.1 Inspection Frequency. Inspections must be conducted at least once every 7 calendar days or at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. Inspection frequency may be reduced to at least once every month if the entire site is temporarily stabilized, if runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen).
- G.5.2.2 Qualified Personnel for Inspections. Inspections must be conducted by qualified personnel. "Qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment control who possesses the skills to assess conditions at the construction site that could impact stormwater quality and the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the clearing, grading, and excavation activities.
- G.5.2.3 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control

measures identified in the SWPPP must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

- G.5.2.4 Inspection Reports. For each inspection required above, you must complete an inspection report. At a minimum, the inspection report must include:
- a. The inspection date;
 - b. Names, titles, and qualifications of personnel making the inspection;
 - c. Weather information for the period since the last inspection (or note if it is the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
 - d. Weather information and a description of any discharges occurring at the time of the inspection;
 - e. Location(s) of discharges of sediment or other pollutants from the site;
 - f. Location(s) of BMPs that need to be maintained;
 - g. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
 - h. Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
 - i. Corrective action(s) required, including any changes to the SWPPP necessary and implementation dates.

A record of each inspection and of any actions taken in accordance with this Part must be retained as part of the SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the clearing, grading, and excavation activities are in compliance with the SWPPP and this permit. The report must be signed in accordance with Subpart 11 of Appendix B.

G.5.3 Maintenance of Controls for Clearing, Grading, and Excavation Activities

G.5.3.1 Maintenance of BMPs. All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If site inspections required by Section G.5.2 identify BMPs that are not operating effectively, maintenance must be performed as soon as possible and before the next storm event whenever practicable to maintain the continued effectiveness of stormwater controls.

G.5.3.2 Modification of BMPs. Existing BMPs need to be modified or, if additional

BMPs are necessary for any reason, implementation must be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation must be documented in the SWPPP and alternative BMPs must be implemented as soon as possible.

G.5.3.3 Maintenance of sediment traps and ponds. Sediment from sediment traps or sedimentation ponds must be removed when design capacity has been reduced by 50 percent.

G.5.4 Requirements for Cessation of Clearing, Grading, and Excavation Activities.

G.5.4.1 Inspections and Maintenance. Inspections and maintenance of BMPs associated with clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of a mining operation must continue until final stabilization has been achieved on all portions of the disturbed area.

G.5.4.2 Final Stabilization. Stabilization measures must be initiated immediately in portions of the site where development activities have permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has permanently ceased. Until final stabilization is achieved temporary stabilization measures, such as blankets and tackifiers, must be used.

G.6 Stormwater Pollution Prevention Plan (SWPPP) Requirements.

The SWPPP requirements in Part G.6 are applicable for active metal mining facilities, inactive mining facilities, temporarily inactive metal mining facilities, temporarily inactive metal mining facilities, and sites undergoing reclamation. In addition to the following requirements, you must also comply with the requirements listed in Part 2 in the permit.

G.6.1 Nature of Industrial Activities. (See also Part 2.1.2.) Briefly describe the mining and associated activities that can potentially affect the stormwater discharges covered by this permit, including a general description of the location of the site relative to major transportation routes and communities.

G.6.2 Site Map. (See also Part 2.1.2) Also identify the locations of the following (as appropriate): mining or milling site boundaries; access and haul roads; outline of the drainage areas of each stormwater outfall within the facility with indications of the types of discharges from the drainage areas; location(s) of all permitted discharges covered under an individual NPDES permit, outdoor equipment storage, fueling, and maintenance areas; materials handling areas; outdoor manufacturing, outdoor storage, and material disposal areas; outdoor chemicals and explosives storage areas; overburden, materials, soils, or waste storage areas; location of mine drainage (where water leaves mine) or other process water; tailings piles and ponds (including proposed ones); heap leach pads; off-site points of discharge for mine drainage and process water; surface waters; boundary of tributary areas that are subject to effluent limitations guidelines; and location(s) of reclaimed areas.

- G.6.3 Potential Pollutant Sources. (See also Part 2.1.4) For each area of the mine or mill site where stormwater discharges associated with industrial activities occur, identify the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. Consider these factors: the mineralogy of the ore and waste rock (e.g., acid forming); toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. Also include a summary of any existing ore or waste rock or overburden characterization data and test results for potential generation of acid rock. If any new data is acquired due to changes in ore type being mined, update your SWPPP with this information.
- G.6.4 Site Inspections. (See also Part 2.1.5.6 and G.5.2) Inspect sites at least monthly unless adverse weather conditions make the site inaccessible. Sites which discharge to waters which are designated as outstanding waters or waters which are impaired for parameters listed in Table G-2 must be inspected monthly.
- G.6.5 Employee Training. (See also Part 2.1.5.7) Conduct employee training at least annually at active and temporarily inactive sites. All employee training(s) must be documented in the SWPPP.
- G.6.6 Stormwater Controls. (See also Part 2.1.5) Consider each of the following BMPs. The potential pollutants identified in Part G.6.3 shall determine the priority and appropriateness of the BMPs selected. If BMPs are implemented or planned but are not listed here (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in your SWPPP.
- G.6.6.1 Stormwater Diversions: Consider diverting stormwater away from potential pollutant sources. Following are some BMP options: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.
- G.6.6.2 Sediment and Erosion Control: (See also Part 2.1.5.8) Consider a range of erosion controls within the broad categories of: flow diversion (e.g., swales); stabilization (e.g., temporary or permanent seeding); and structural controls (e.g., sediment traps, dikes, silt fences).
- G.6.6.3 Management of Runoff: (See also Part 2.1.5.9) Consider the potential pollutant sources given in Part G.6.3 when determining reasonable and appropriate measures for managing runoff.
- G.6.6.4 Capping: When capping is necessary to minimize pollutant discharges in stormwater, identify the source being capped and the material used to construct the cap.

G.6.6.5 Treatment: If treatment of stormwater (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is necessary to protect water quality, describe the type and location of treatment used. Passive and/or active treatment of stormwater runoff is encouraged. Treated runoff may be discharged as a stormwater source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

G.6.6.6 Certification of Discharge Testing: (See also Part 2.1.4.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-stormwater discharges such as seeps or adit discharges, or discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 440), such as mine drainage or process water. Alternatively (if applicable), you may certify in your SWPPP that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate NPDES permit, and that permit subjects the non-stormwater portion to effluent limitations prior to any commingling. This certification must identify the non-stormwater discharges, the applicable NPDES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

G.7 Monitoring and Reporting Requirements. (See also Part 3 of the permit.)

G.7.1 *Analytic Monitoring for Copper Ore Mining and Dressing Facilities.* Active copper ore mining and dressing facilities must sample and analyze stormwater discharges for the pollutants listed in Table G-1.

Table G-1 Sector-specific Numeric Effluent Limitations and Benchmark Monitoring for Copper Ore Mining and Dressing Facilities			
Subsector (Discharges may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration¹	Effluent Limit Guidelines
Copper Ore Mining and Dressing Facilities (SIC 1021)	Total Suspended Solids (TSS)	100 mg/L	--
	Nitrate plus Nitrite Nitrogen	0.68 mg/L	--
	Chemical Oxygen Demand (COD)	120 mg/L	--

¹ You must monitor quarterly in the first year of your coverage for each benchmark parameter (see Part 3.2.2.1). For each parameter, no additional benchmark monitoring is required if the average of your 4 monitoring values does not exceed the benchmark (see Part 3.2.2.3). However, for each parameter there are additional requirements if the average of your four monitoring values exceeds the benchmark (see Part 3.2.2.4).

G.7.2 Analytic Monitoring Requirements for Discharges From Waste Rock and Overburden

Piles at Active Sites, Inactive Sites, and Sites Undergoing Reclamation. For discharges from waste rock and overburden piles, perform analytic monitoring quarterly in the first year of your coverage for the parameters listed in Table G-2 (see Part 3.2.2.1). Permittees must also conduct analytic monitoring quarterly in the first year of your coverage for the parameters listed in Table G-3 (see Part 3.2.2.1). The monitoring schedule is specified in Part 3.2.2.1. The Secretary may also notify you that you must perform additional monitoring to accurately characterize the quality and quantity of pollutants discharged from your waste rock and overburden piles.

Table G-2. Sector-specific Numeric Effluent Limitations and Benchmark Monitoring for Discharges from Waste Rock and Overburden Piles from Active Ore Mining or Dressing Facilities, and Sites Undergoing Reclamation			
Subsector (Discharges may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration¹	Effluent Limit Guidelines
Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores, Except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099)	Total Suspended Solids (TSS)	100 mg/L	--
	Turbidity	50 NTU	--
	pH	6.0-9.0 s.u.	--
	Hardness (as CaCO ₃ ; calc. From Ca, Mg) ²	no benchmark value	--
See above, as applicable (when analyzing hardness for a suite of metals, it is more cost effective to add analysis of calcium and magnesium, and have hardness calculated than to require hardness analysis separately)	Total Recoverable Antimony	0.64 mg/L	--
	Total Recoverable Arsenic	0.15 mg/L	--
	Total Recoverable Beryllium	0.13 mg/L	--
	Total Recoverable Cadmium ³	0.0021 mg/L	--
	Total Recoverable Copper ⁴	0.014 mg/L	--
	Total Recoverable Iron	1.0 mg/L	--
	Total Recoverable Lead ⁵	0.082 mg/L	--
	Total Recoverable Mercury	0.0014 mg/L	--
	Total Recoverable Nickel ⁶	0.47 mg/L	--
	Total Recoverable Selenium	0.005 mg/L	--
Total Recoverable Silver ⁷	0.0038 mg/L	--	

Table G-2. Sector-specific Numeric Effluent Limitations and Benchmark Monitoring for Discharges from Waste Rock and Overburden Piles from Active Ore Mining or Dressing Facilities, and Sites Undergoing Reclamation			
Subsector (Discharges may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration¹	Effluent Limit Guidelines
	Total Recoverable Zinc ⁸	0.12 mg/L	--

¹ You must monitor quarterly in the first year of your coverage for each benchmark parameter (see Part 3.2.2.1). For each parameter, no additional benchmark monitoring is required if the average of your 4 monitoring values does not exceed the benchmark (see Part 3.2.2.3). However, for each parameter there are additional requirements if the average of your four monitoring values exceeds the benchmark (see Part 3.2.2.4).

²Benchmark monitoring cutoff concentrations for hardness dependent elements are based on a nominal hardness of 100 mg/L CaCO₃.

³ The benchmark value of cadmium is determined as a function of hardness (in units of mg/L) in the water column. The value given in Table G-2 (i.e. 0.0021 mg/L) corresponds to a hardness of 100 mg/L and should be used if you either did not analyze water hardness, other hardness data are not available, or the water hardness is less than 100 mg/L. If a laboratory analysis indicates that the water hardness is below 100 mg/L, then you should use the benchmark for 100 mg/L. If a laboratory analysis indicates that the water hardness is greater than 100 mg/L, then the following equation may be used to determine the benchmark value for cadmium:

$$\text{Benchmark} = (e^{[(1.0166)(\ln \text{hardness}) - 3.924]})/1000$$

Example: Laboratory analysis of your water sample indicates the hardness is 175 mg/L.

$$\begin{aligned} \text{Benchmark} &= (e^{[(1.0166)(\ln 175) - 3.924]})/1000 \\ &= (e^{1.327})/1000 \\ &= 3.76/1000 \\ &= 0.0038 \text{ mg/L} \end{aligned}$$

The following are example benchmark values for cadmium:

<u>Hardness (mg/L)</u>	<u>Benchmark value (mg/L)</u>
100	0.0021
125	0.0027
150	0.0032
175	0.0038
200	0.0043
225	0.0049
250	0.0054

⁴ The benchmark value of copper is determined as a function of hardness (in units of mg/L) in the water column. The value given in Table G-2 (i.e. 0.014 mg/L) corresponds to a hardness of 100 mg/L and should be used if you either did not analyze water hardness, other hardness data are not available, or the water hardness is less than 100 mg/L. If a laboratory analysis indicates that the water hardness is below 100 mg/L, then you should use the benchmark for 100 mg/L. If a laboratory analysis indicates that the water hardness is greater than 100 mg/L, then the following equation may be used to determine the benchmark value for copper:

$$\text{Benchmark} = (e^{[(0.9422)(\ln \text{hardness}) - 1.700]})/1000$$

Example: Laboratory analysis of your water sample indicates the hardness is 175 mg/L.

$$\begin{aligned} \text{Benchmark} &= (e^{[(0.9422)(\ln 175) - 1.700]})/1000 \\ &= (e^{3.166})/1000 \\ &= 23.72/1000 \\ &= 0.024 \text{ mg/L} \end{aligned}$$

The following are example benchmark values for copper:

<u>Hardness (mg/L)</u>	<u>Benchmark value (mg/L)</u>
100	0.014
125	0.017
150	0.021
175	0.024
200	0.027
225	0.030
250	0.033

⁵ The benchmark value of lead is determined as a function of hardness (in units of mg/L) in the water column. The value given in Table G-2 (i.e. 0.082 mg/L) corresponds to a hardness of 100 mg/L and should be used if you either did not analyze water hardness, other hardness data are not available, or the water hardness is less than 100 mg/L. If a laboratory analysis indicates that the water hardness is below 100 mg/L, then you should use the benchmark for 100 mg/L. If a laboratory analysis indicates that the water hardness is greater than 100 mg/L, then the following equation may be used to determine the benchmark value for lead:

$$\text{Benchmark} = (e^{[(1.273)(\ln \text{hardness}) - 1.460]})/1000$$

Example: Laboratory analysis of your water sample indicates the hardness is 175 mg/L.

$$\begin{aligned} \text{Benchmark} &= (e^{[(1.273)(\ln 175) - 1.460]})/1000 \\ &= (e^{5.1148})/1000 \\ &= 166.46/1000 \\ &= 0.17 \text{ mg/L} \end{aligned}$$

The following are example benchmark value for lead:

<u>Hardness (mg/L)</u>	<u>Benchmark value (mg/L)</u>
100	0.082
125	0.11
150	0.14
175	0.17
200	0.20
225	0.23
250	0.26

⁶ The benchmark value of nickel is determined as a function of hardness (in units of mg/L) in the water column. The value given in Table G-2 (i.e. 0.47 mg/L) corresponds to a hardness of 100 mg/L and should be used if you either did not analyze water hardness, other hardness data are not available, or the water hardness is less than 100 mg/L. If

a laboratory analysis indicates that the water hardness is below 100 mg/L, then you should use the benchmark for 100 mg/L. If a laboratory analysis indicates that the water hardness is greater than 100 mg/L, then the following equation may be used to determine the benchmark value for nickel:

$$\text{Benchmark} = (e^{[(0.8460)(\ln \text{hardness}) + 2.255]})/1000$$

Example: Laboratory analysis of your water sample indicates the hardness is 175 mg/L.

$$\begin{aligned} \text{Benchmark} &= (e^{[(0.8460)(\ln 175) + 2.255]})/1000 \\ &= (e^{6.624})/1000 \\ &= 753.26/1000 \\ &= 0.75 \text{ mg/L} \end{aligned}$$

The following are example benchmark values for nickel:

<u>Hardness (mg/L)</u>	<u>Benchmark value (mg/L)</u>
100	0.47
125	0.57
150	0.66
175	0.75
200	0.84
225	0.93
250	1.02

⁷ The benchmark limitation value of silver is determined as a function of hardness (in units of mg/L) in the water column. The value given in Table G-2 (i.e. 0.0038 mg/L) corresponds to a hardness of 100 mg/L and should be used if you either did not analyze water hardness, other hardness data are not available, or the water hardness is less than 100 mg/L. If a laboratory analysis indicates that the water hardness is below 100 mg/L, then you should use the benchmark for 100 mg/L. If a laboratory analysis indicates that the water hardness is greater than 100 mg/L, then the following equation may be used to determine the benchmark value for silver:

$$\text{Benchmark} = (e^{[(1.72)(\ln \text{hardness}) - 6.59]})/1000$$

Example: Laboratory analysis of your water sample indicates the hardness is 175 mg/L.

$$\begin{aligned} \text{Benchmark} &= (e^{[(1.72)(\ln 175) - 6.59]})/1000 \\ &= (e^{2.293})/1000 \\ &= 9.909/1000 \\ &= 0.0099 \text{ mg/L} \end{aligned}$$

The following are example benchmark values for silver:

<u>Hardness (mg/L)</u>	<u>Benchmark value (mg/L)</u>
100	0.0038
125	0.0056
150	0.0076
175	0.0099
200	0.013
225	0.015
250	0.018

⁸ The benchmark value of zinc is determined as a function of hardness (in units of mg/L) in the water column. The

value given in Table G-2 (i.e. 0.12 mg/L) corresponds to a hardness of 100 mg/L and should be used if you either did not analyze water hardness, other hardness data are not available, or the water hardness is less than 100 mg/L. If a laboratory analysis indicates that the water hardness is below 100 mg/L, then you should use the benchmark for 100 mg/L. If a laboratory analysis indicates that the water hardness is greater than 100 mg/L, then the following equation may be used to determine the benchmark value for zinc:

$$\text{Benchmark} = (e^{[(0.8473)(\ln \text{hardness}) + 0.884]})/1000$$

Example: Laboratory analysis of your water sample indicates the hardness is 175 mg/L.

$$\begin{aligned} \text{Benchmark} &= (e^{[(0.8473)(\ln 175) + 0.884]})/1000 \\ &= (e^{5.26})/1000 \\ &= 192.51/1000 \\ &= 0.19 \text{ mg/L} \end{aligned}$$

The following are example benchmark values for zinc:

<u>Hardness (mg/L)</u>	<u>Benchmark value (mg/L)</u>
100	0.12
125	0.14
150	0.17
175	0.19
200	0.22
225	0.24
250	0.26

G.7.3 Additional Analytic Monitoring Requirements for Discharges From Waste Rock and Overburden Piles. Table G-3 contains additional monitoring requirements for specific ore mine categories. Perform the monitoring quarterly in the first year of coverage (see Part 3.2.2.1). The monitoring schedule is specified in Part 3.2.2.1. The initial sampling event for a pollutant parameter required in Table G-2 satisfies the requirement for the first sample of any pollutant measurement in Table G-3.

Table G-3. Additional Monitoring Requirements for Discharges from Waste Rock and Overburden Piles from Active Ore Mining or Dressing Facilities, Inactive Sites, and Sites Undergoing Reclamation			
Supplemental Requirements			
Type of Ore Mined	Pollutants of Concern		
	Total Suspended Solids (TSS)	pH	Metals, Total Recoverable
Tungsten Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Nickel Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Aluminum Ore	X	X	Iron
Mercury Ore	X	X	Nickel (H)
Iron Ore	X	X	Iron (Dissolved)

Table G-3. Additional Monitoring Requirements for Discharges from Waste Rock and Overburden Piles from Active Ore Mining or Dressing Facilities, Inactive Sites, and Sites Undergoing Reclamation			
Supplemental Requirements			
Type of Ore Mined	Pollutants of Concern		
	Total Suspended Solids (TSS)	pH	Metals, Total Recoverable
Platinum Ore			Cadmium (H), Copper (H), Mercury, Lead (H), Zinc (H)
Titanium Ore	X	X	Iron, Nickel (H), Zinc (H)
Vanadium Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead, Zinc (H)
Copper, Lead, Zinc, Gold, Silver, and Molybdenum	X	X	Arsenic, Cadmium (H), Copper (H), Lead, Mercury, Zinc (H)
Uranium, Radium, and Vanadium	X	X	Chemical Oxygen Demand, Arsenic, Radium (Dissolved and Total), Uranium, Zinc (H)

Note: (H) indicates that hardness must also be measured when this pollutant is measured.

G.7.4 Reporting Requirements for Stormwater Discharges from Waste Rock and Overburden Piles. Submit monitoring results for each outfall discharging stormwater from waste rock and overburden piles, or certifications in accordance with Part 3.6.

Table G-4. Applicability of the Multi-Sector General Permit to Stormwater Runoff From Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation	
Discharge/Source of Discharge	Note/Comment
Piles	
Waste rock/overburden	If composed entirely of stormwater and not combining with mine drainage. See note below.
Topsoil	
Roads constructed of waste rock or spent ore	
Onsite haul roads	If composed entirely of stormwater and not combining with mine drainage. See note below.
Offsite haul and access roads	
Roads not constructed of waste rock or spent ore	
Onsite haul roads	Except if mine drainage is used for dust control
Offsite haul and access roads	
Milling/concentrating	
Runoff from tailings dams and dikes when constructed of waste rock/tailings	Except if process fluids are present and only if composed entirely of stormwater and not combining with mine drainage. See Note below.
Runoff from tailings dams/dikes when not constructed of waste rock and tailings	Except if process fluids are present
Concentration building	If stormwater only and no contact with piles
Mill site	If stormwater only and no contact with piles
Ancillary areas	
Office and administrative building and housing	If mixed with stormwater from the industrial area
Chemical storage area	
Docking facility	Except if excessive contact with waste product that would otherwise constitute mine drainage
Explosive storage	
Fuel storage (oil tanks/coal piles)	
Vehicle and equipment maintenance area/building	
Parking areas	But coverage unnecessary if only employee and visitor-type parking

Table G-4. Applicability of the Multi-Sector General Permit to Stormwater Runoff From Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation	
Power plant	
Truck wash area	Except when excessive contact with waste product that would otherwise constitute mine drainage
Reclamation-related areas	
Any disturbed area (unreclaimed)	Only if not in active mining area
Reclaimed areas released from reclamation bonds prior to Dec. 17, 1990	
Partially/inadequately reclaimed areas or areas not released from reclamation bond	

Note: Stormwater runoff from these sources are subject to the NPDES program for stormwater unless mixed with discharges subject to the 40 CFR Part 440 that are not regulated by another permit prior to mixing. Non-stormwater discharges from these sources are subject to NPDES permitting and may be subject to the effluent limitation guidelines under 40 CFR Part 440. Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless: (1) it drains naturally (or is intentionally diverted) to a point source; and (2) combines with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit would be available if the discharge composed entirely of stormwater does not combine with other sources of mine drainage that are not subject to 40 CFR Part 440, as well as meeting other eligibility criteria contained in Part I.B. of the permit. Permit applicants bear the initial responsibility for determining the applicable technology-based standard for such discharges. Contact the Agency for assistance determining the nature and scope of the "active mining area" on a mine-by-mine basis, as well as to determine the appropriate permitting mechanism for authorizing such discharges.

G.8. Termination of Permit Coverage

G.8.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit, provided that the covered stormwater discharges do not have the potential to cause or contribute to violations of state water quality standards. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part G.8.2.

G.8.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990. A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if stormwater runoff that comes into contact with 1) raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards, (2) soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated,

will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.