Rosemont Copper Project

Stormwater Pollution Prevention Plan
For AZPDES MSGP - 2010

Permit No. AZMSG2010 - 003

July 2013
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- Information Posting Copy
- Designation of On-Site Representative
- Other Correspondence
- Notice of Termination (NOT)

**APPENDIX C.** Qualified Personnel

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**APPENDIX F.** Standard Operating Procedures for Calibration of Field Meter

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STORMWATER POLLUTION PREVENTION PLAN CERTIFICATION

This Stormwater Pollution Prevention Plan (SWPPP) is for the Rosemont Copper Project (Project) mining operation and covers exploration, construction, operational, and reclamation activities associated with the Project. This document addresses the pollution prevention requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) General Permit for Stormwater Discharges Associated with Industrial Activity – Mineral Industry (AZMSG2010-003 [MSGP-2010]) released by the Arizona Department of Environmental Quality (ADEQ) on December 20, 2010. A copy of the MSGP-2010 is included in Appendix A of this SWPPP. This SWPPP has been prepared in accordance with good engineering practices and the MSGP-2010 requirements.

This SWPPP is designed to:

- Identify sources of pollution potentially affecting the quality of stormwater discharges associated with industrial activities that are covered under the MSGP-2010;

- Describe and ensure implementation of practices to minimize and control pollutants in stormwater discharges from these industrial activities; and

- Ensure compliance with the terms and conditions of the MSGP-2010.

Katherine Arnold, P.E., the Vice President of Environmental and Regulatory Affairs for Rosemont Copper Company, is the authorized representative of Rosemont Copper Project for approving, signing, and certifying this SWPPP.

I certify under penalty of law that this document and all appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature
Katherine Ann Arnold – Vice President of Environmental and Regulatory Affairs

Date

NOTE: Once we enter the active mining phase, there needs to be a certification that no unauthorized non-stormwater discharges are present. See Part 8.6.5.3 of MSGP. But since we aren’t yet in the active phase, we don’t have to have it in the current SWPPP.
1.0 INTRODUCTION

Rosemont Copper Company (Rosemont) plans to develop an open-pit copper mining and mineral processing facility (Rosemont Copper Mine; Project) in the Santa Rita Mountains approximately 30 miles southeast of Tucson, Arizona in Pima County. Operations at the mine will include conventional crushing and flotation of sulfide ore to produce copper and molybdenum concentrate, which will be transported offsite for further processing. The facility is anticipated of having a project operating life of over 20 years with mining rates averaging 376,000 tons per day.

This Stormwater Pollution Prevention Plan (SWPPP) was prepared by Rosemont and covers exploration, construction, operational and reclamation activities associated with the Project. This document addresses the pollution prevention requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) General Permit for Stormwater Discharges Associated with Industrial Activity – Mineral Industry (AZMSG2010-003 [MSGP-2010]) released by the Arizona Department of Environmental Quality (ADEQ) on December 20, 2010. A copy of the MSGP-2010 is provided in Appendix A of this SWPPP. A copy of the completed Notice of Intent (NOI) is provided in Appendix B.

This SWPPP will cover activities conducted on the Project site, which encompasses approximately 4,200 acres. Figure 1 is the Project Location Map and shows the location of the Project and the primary washes in the vicinity of the Project.

This SWPPP has been prepared in accordance with good engineering practices and the MSGP-2010. This SWPPP is designed to:

- Identify sources of pollution potentially affecting the quality of stormwater discharges associated with industrial activities that are covered under the MSGP-2010;
- Describe and ensure implementation of practices to minimize and control pollutants in stormwater discharges from these industrial activities; and
- Ensure compliance with the terms and conditions of the MSGP-2010.
2.0 SITE DESCRIPTION

The Project consists of a proposed new copper production facility, located approximately 30 miles southeast of Tucson. Figure 1 shows the location of the Project and the major surface water drainages in the region. Open pit mining will be used to excavate ore to recover copper, molybdenum, silver, and gold. Rock material in the pit will be blasted and separated into two categories: sulfide ore or waste rock. Sulfide ore will be processed through crushing and concentrating. Waste rock will be loaded into haul trucks and transported to the Waste Rock Storage Area or other areas such as buttresses for the Dry Stack Storage Facility. Tailing material, produced from the sulfide ore processing operation, will be disposed of using the “dry stack” method. The dewatered tailings will be sent via conveyor belt to the Dry Stack Tailings Facility. Other facilities at the Project include two temporary ore stockpiles, onsite septic systems, and a waste management area (non-municipal solid waste landfill). No hazardous waste will be disposed of onsite. Buildings and structures necessary to support the mining and ore processing operations include the administrative offices, change house, warehouse with laydown yards, analytical laboratory, light vehicle and process maintenance building, mine truck shop, vehicle wash and lube facilities, explosives storage, and fuel and lubricant storage and dispensing facilities.

The Project consists of a group of patented mining claims, unpatented mining claims, and fee land that covers most of the historical Rosemont and Helvetia Mining Districts. The footprint of the Project will encompass approximately 4,200 acres, which includes the open pit, tailings and waste rock deposition areas, ore processing facilities, stormwater and spill containment ponds, non-municipal solid waste landfill, and support buildings.

Utility lines will be constructed from near the town of Sahuarita to the mine site to deliver potable water and electricity. A switchyard/substation and booster pump stations will be constructed and maintained within the corridor. Construction activities for the utility corridor will not be covered by this SWPPP but will be covered under the AZPDES General Permit for Stormwater Discharges Associated with Construction Activity (AZG2013-001) and any renewals of that permit.

Access to the property is from Interstate 10 to State Highway 83 south, then west on the Project Access Road. The mining operations will be located and conducted in portions of Sections 17, 20, 21 and 25-35 of Township 17 South; portions of Sections 31-35 of Township 17 South, Range 15 East; portions of Sections 1, 2, and 12 of Township 18 South, Range 14 East; portions of Sections 1, 2, 7, 10 -15, 17, 18, 20 – 25, 35 and 36 of Township 18 South, Range 15 East; portions of Sections 6 – 8, 14 - 23, and 27 - 33 of Township 18 South, Range 16 East; portions of Sections 1 and 2 of Township 19 South, Range 15 East; and portions of Sections 4, 5, and 6, Township 19 South, Range 16 East. In geographical terms, the Project is located at approximate coordinates 31° 50’ North and 110° 45’ West.

The Project area is mountainous and rugged with elevations ranging from 4,500 to 6,300 feet above mean sea level (amsl). The major drainage (or watershed) that occurs in the
Project area is Barrel Canyon Wash. The Barrel Canyon drainage forms the southern and eastern portions of the site and is approximately 2,308 acres; the footprint of the Project is designated by a dashed line in Figure 2. Tributary drainages to Barrel Canyon Wash include Wasp Canyon and Trail Creek washes, as shown on Figure 2. All smaller washes tributary to Wasp Canyon and Trail Creek washes, and the upper portion of Barrel Canyon, drain to the lower portion of Barrel Canyon. Lower Barrel Canyon Wash joins Davidson Canyon Wash approximately 3 miles downstream (northeast) of the Project area. All of the tributaries, as well as the main channels of Wasp Canyon, Trail Creek, McCleary Canyon and Barrel Canyon washes, are ephemeral.

Below the confluence with Barrel Canyon, Davidson Canyon Wash continues for approximately 12 miles to its confluence with Cienega Creek, at an elevation of 3,325 feet amsl. Pima County's Cienega Creek Natural Preserve encompasses the lower reaches of Davidson Canyon Wash and the adjacent reaches of Cienega Creek. A reach of Davidson Canyon Wash and a reach in Cienega Creek have been designated as Outstanding Arizona Waters (OAW) by ADEQ. Figure 3 shows the designated stretch of the OAW in Davidson Canyon Wash. The distance from the Rosemont Copper Project to the Davidson Canyon Wash OAW segment is approximately 12 miles. None of the drainages within the Project area or downstream have been designated by ADEQ as being impaired or having other water quality concerns.

Vegetation at the Project site generally consists of evergreen woodlands and semi-desert grassland, with widely scatter shrubs and cactuses. The evergreen woodlands cover the higher elevation portions of the site and the semi-desert grasslands are primarily located in the lower elevations.

Rosemont is up to date and compliant with all its environmental obligations. Additionally, the Project received its Aquifer Protection Permit (APP; No. P-106100) in April 2012. The primary permits that Rosemont is currently awaiting before beginning construction of mine facilities are the Record of Decision from the U.S. Forest Service on the Mine Plan of Operations and the Clean Water Act (CWA) Section 404 permit from the Corps of Engineers (along with the accompanying ADEQ Section 401 certification of that permit). Activities conducted on the Project site to date (exploration and pre-development activities) have been covered under the ADEQ AZPDES General Permit for Construction Activity Discharges (AZG-2008-001) and Rosemont’s Construction General Permit SWPPP (AZCON-35106).

## 2.1 Site Map

In accordance with Parts 5.1.2(3) and 8.G.6.2 of the MSGP-2010, topographic maps showing the footprint of the mine and associated facilities, as well as stormwater flow paths (designated by arrows), are provided in Figures 4 through 17. All drainages within the Project site are ephemeral. Springs in the area primarily flow in response to precipitation events.
2.2 Climate

The Project is located in the Santa Rita Mountains at elevations exceeding 5,000 feet amsl. The climate is typical of a semi-arid continental desert with hot summers and temperate winters. The average monthly minimum temperatures at the Project usually occur in January and are approximately 36˚F; maximum monthly temperatures usually occur in June and are above 90˚F (UA 1977).

Stormwater runoff occurs primarily during the monsoon season from mid-June or early July through September. Afternoon monsoon thunderstorms can result in short duration and high-intensity rainfall. The monsoon season months have the highest precipitation. These conditions are favorable for generating runoff in the normally dry drainage channels. Winter can have occasional low intensity rainstorm patterns that can last for multiple days. Average precipitation from August to March ranges from 8 to 14 inches. The lowest precipitation months are April, May, and June.

Based on precipitation data obtained from Rosemont’s onsite weather station (installed on April 1, 2006), the average annual precipitation is 17.7 inches per year for the Project area. Average annual precipitation data (WRCC 2013) obtained from weather stations within an approximately 30-mile radius of the Project range from 16.02 inches at Nogales to 22.2 inches at the Santa Rita Experimental Range (located on the west side of the Santa Rita Mountains.)

2.3 Receiving Waters

The receiving waters for possible stormwater discharges from the Rosemont Copper Project are Barrel Canyon Wash, Trail Creek, and McCleary Canyon Wash. These latter two ephemeral washes are tributary to Barrel Canyon Wash, which in turn is a tributary to the ephemeral upper stretch of Davidson Canyon (headwaters to unnamed spring at 31° 59' 00"N/110° 38' 46"W) at a point roughly 3 miles from the Rosemont site.

Outfall locations are described in Section 6.1 of this SWPPP and shown on the attached Figures 4 through 12 and 14 through 16. As ephemeral streams not listed in Appendix B to the Arizona surface water quality standards (SWQSs), the designated uses for Trail Creek, McCleary Canyon Wash and Barrel Canyon Wash pursuant to A.A.C. R18-11-105(1) are:

- Aquatic and Wildlife (ephemeral) (A&We); and
- Partial Body Contact (PBC).

The ephemeral stretch of Davidson Canyon Wash to which Barrel Canyon is tributary has been assigned those same uses as well as the agricultural and livestock watering (AgL) use.

Davidson Canyon Wash is tributary to lower Cienega Creek. A large section of Cienega Creek and the lower reach of Davidson Canyon Wash have been designated as OAWs. The Davidson Canyon Wash OAW segment extends from approximately 12 miles downstream of the Project site to the confluence with Cienega Creek (see Figure 3). A
more strict set of surface water quality standards (warm-water aquatic and wildlife) exists for the OAW reach downstream in Davidson Canyon.

Based on the planned stormwater control measures that will be implemented on the Project site, including onsite containment of stormwater during both the construction and operational phases, the infrequency of storm events in Arizona, distance from the Rosemont Copper Project to the Davidson Canyon Wash OAW segment (approximately 12 miles), and results from the waste rock and tailing material geochemical characterization (Rosemont 2012), stormwater runoff from the Rosemont Copper Project is not anticipated to degrade existing water quality in the downstream OAW segment of Davidson Canyon Wash or the ephemeral Barrel Canyon Wash.

The effects of stormwater management at the Project will start relatively early in the mine life, as Project facilities, including Project site stormwater retention, reduce the volume of upstream stormwater runoff to Davidson Canyon and lower Cienega Creek. However, the significance of reduced ephemeral stream flows on aquatic resources will be limited due to the short duration and relative infrequency of stream flows.
### 3.0 POLLUTION PREVENTION TEAM

Part 5.1.1 of the MSGP-2010 requires Rosemont to establish a stormwater pollution prevention team (PPT). The Rosemont PPT members are listed below in Table 3-1 and will:

- Have the authority and responsibility to effect and/or implement changes to controls, operations, and procedures as necessary to protect stormwater quality;
- Have the knowledge and experience of the mine operations necessary to ensure that all aspects of facility operation are considered for the SWPPP.
- Possess the local knowledge and skills to assess conditions and activities that could impact stormwater quality at the Project site, to evaluate the effectiveness of stormwater pollution control measures (CMs) and to participate in routine and annual inspections.
- Implement and maintain stormwater pollution control measures to prevent stormwater pollution and take corrective actions as necessary.

All members of the Rosemont PPT will meet the criteria for a “qualified personnel” as defined in Appendix A of the MSGP-2010:

“Qualified personnel” are those (either the permittee’s employees or outside consultants) who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of control measures.”

### Table 3-1 Rosemont Pollution Prevention Team Members

<table>
<thead>
<tr>
<th>Person</th>
<th>Position</th>
<th>Responsibility</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathy Arnold</td>
<td>Vice President Environmental and Regulatory Affairs</td>
<td>SWPPP Team Leader, SWPPP Manager; decision maker on appropriate CMs; responsible for implementation of Plan.</td>
<td>520-784-1972 (cell) 520-495-3502 (office)</td>
</tr>
<tr>
<td>Fermin Samarano</td>
<td>Mine Manager</td>
<td>Decision maker on appropriate CMs; relays changes in plant operations to PPT members; directs construction/implementation of CMs.</td>
<td>520-343-8765 (cell) 520-495-3503 (office)</td>
</tr>
<tr>
<td>Royce Smith</td>
<td>Process Manager</td>
<td>Decision maker on appropriate CMs; relays changes in plant operations to PPT members; directs construction/implementation of CMs.</td>
<td>520-205-2532 (cell) 520-495-3525 (office)</td>
</tr>
<tr>
<td>David Krizek</td>
<td>Environmental Manager</td>
<td>Environmental Manager; inspect CMs; maintain/revise SWPPP</td>
<td>520-260-3490 (cell) 520-495-3527 (office)</td>
</tr>
<tr>
<td>Karen Herther</td>
<td>Water Resources Supervisor</td>
<td>Training; maintain/revise SWPPP; record keeping; submitting reports; inspect CMs; stormwater sampler</td>
<td>602-312-3104 (cell) 520-495-3536 (office)</td>
</tr>
<tr>
<td>Holly Lawson</td>
<td>Reclamation Specialist</td>
<td>Stormwater sampler; inspect CMs</td>
<td>520-343-5174 (cell) 520-495-3510 (office)</td>
</tr>
<tr>
<td>Oscar White</td>
<td>Utility Technician</td>
<td>Stormwater sampler; Inspect CMs</td>
<td>520-351-1346 (cell) 520-495-3508 (office)</td>
</tr>
</tbody>
</table>
In addition to the above-listed PPT members, other Rosemont personnel who work in areas where industrial activities are exposed to stormwater, and who are responsible for implementing activities necessary to meet the conditions of the MSGP, will be documented on the form provided in Appendix C. The form itemizes their name, title, and basis of qualification, be it training, education, experience, or other.

3.1 Training

All members of the PPT and any other Rosemont personnel who are responsible for implementing activities necessary to meet the conditions of the MSGP, will receive training at least once a year. The training will be documented and maintained in Rosemont’s internal data management system (Intelex). Employee training is essential to effectively implement the SWPPP. The stormwater management training will contain the following elements:

- Use of the SWPPP;
- Goals and requirements of the SWPPP;
- Spill prevention, control, and response procedures;
- Good housekeeping and materials management practices;
- Other control measures contained in this SWPPP; and
- Stormwater monitoring, inspection, reporting and documentation requirements (for those employees who will implement these requirements).

Records of employee training, including the date training was received, will be made available to ADEQ upon request.
4.0 POTENTIAL POLLUTANT SOURCES

As required by Parts 5.1.3 and 8.G.6.3 of the MSGP-2010, this section lists facility activities and identifies potential stormwater pollutant sources on the Project site where stormwater discharges occur.

4.1 Facility Activities

Activities that will be conducted at the Project site during the exploration, construction, operational, and reclamation phases include, but are not limited to, the following:

- Exploration drilling (of boreholes, wells)
- Drilling, construction, development, testing, and monitoring of groundwater wells
- Well pad construction, drilling mud sumps
- Clearing, grading, excavation, and trenching
- Blasting, drilling
- Transportation of all equipment and materials to construct the Project, including haul trucks, shovels, dozers, graders, drills, water trucks, pumps, mills, thickeners, pressure vessels, conveyors, motors, wire, liners, concrete, steel, piping, mechanical platework, fuels, lubricants, etc.
- Construction of all facilities associated with the mine, including the open pit, tailings and waste rock deposition areas, ore processing facilities, lined impoundments, stormwater diversion structures, non-municipal solid waste landfill, support buildings, truck/equipment wash areas and maintenance shops, parking lots, access roads, and haul roads
- Excavation of ore, waste rock
- Transportation of ore, waste rock and tailings (by truck and/or conveyor)
- Ore processing, includes crushing, grinding, flotation circuits, and tailings thickening/filtering
- Construction of rock buttresses in the Dry Stack Tailings Facility area and perimeter berms in the Waste Rock Storage Area

4.2 Potential Stormwater Sources

Part 8.G.1.1 of the MSGP-2010 lists the various stormwater sources authorized under the permit. Potential stormwater sources identified in Part 8.G.1.1 that may contribute to stormwater discharges at the Rosemont Copper Project include:

- Onsite haul and access roads
- Waste rock buttresses/berms at the Dry Stack Tailings Facility and Waste Rock Storage Area
- Construction supply storage areas
- Parking areas

Other potential pollution sources exist at the site, such as the concentration building and mill site, but these sources are located in areas that will not discharge stormwater to waters of the United States.
The mine has not yet been constructed, so there is no existing stormwater discharge sampling data collected under the MSGP. However, as data is gathered in the future, a summary of the stormwater data will be added to this section of the SWPPP.

The facility does not have, and is never expected to have, salt storage piles.

### 4.3 Potential Pollutants

The primary potential pollutant in stormwater discharges reasonably expected to be present from the above-listed sources at the Project is fine sediment (settleable solids and suspended solids) from non-acid generating mine rock. During rain events, residues (fuel, oil, grease, solvents, heavy metals) on the trucks/vehicles and equipment under repair, or residuals from spills or leaks from stored trucks/vehicles or equipment, may be a minor source of potential pollutants that may be discharged to stormwater.

Because the Project site hosts an ore deposits, surface and subsurface soils will naturally contain elevated concentrations of certain metals as compared to soils not located near an ore deposit (e.g., Tucson basin). Based on stormwater sample data that have been collected from the Project site by Rosemont since 2008, metals that may be detected occasionally in the stormwater include: total and dissolved copper and total antimony, arsenic, chromium, lead, selenium, and zinc. However, most of these metals will be present at low levels (below the applicable surface water quality standard).

To date, many samples of Rosemont waste rock and tailing material have been tested to characterize the potential chemical quality of contact water. Geochemical testing included whole rock analysis, Synthetic Precipitation Leaching Procedure (SPLP), Meteoric Water Mobility Procedure (MWMP), Acid-Base Accounting (ABA) tests, and humidity cell tests (HCT). Leachability test (SPLP and MWMP) results indicate that stormwater runoff quality, with the exception of selenium, will meet applicable surface water quality standards. Considering the low contact time with the waste rock and minimal volume of stormwater that will actually be released from the Project site, even selenium is not anticipated to cause an exceedance of a surface water quality standard.

As discussed above in Section 2.3, stormwater runoff from the Rosemont Copper Project is not anticipated to degrade existing water quality in Barrel Canyon Wash or the downstream OAW segment of Davidson Canyon Wash.

### 4.4 Authorized Non-Stormwater Discharges

Part 1.1.3 of the MSGP-2010 authorizes discharges from emergency firefighting activities in all circumstances.

The MSGP-2010 also authorizes the following non-stormwater discharges if ancillary to mining purposes:

1. Fire-fighting system testing and maintenance, including hydrant flushings;
2. Discharges related to installation and maintenance of potable water supply systems, including disinfection and flushing activities, discharges resulting from
pressure releases or overflows, and discharges from wells approved by ADEQ for drinking water use;

3. Uncontaminated condensate from air conditioners, evaporative coolers, and other compressors and from the outside storage of refrigerated gases or liquids;

4. Irrigation drainage and irrigation line flushing;

5. Landscape watering provided all pesticides, herbicides, and fertilizers have been applied in accordance with the approved labeling;

6. Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);

7. Routine external building washdown that does not use detergents;

8. Water used to control dust, provided effluent or other wastewaters are not used;

9. Uncontaminated groundwater or spring water;

10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;

11. Incidental windblown mist from cooling towers that collects on rooftops and adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., “piped” cooling tower blowdown or drains);

12. Hydrostatic testing of new pipes, tanks or vessels using potable water, surface water, or uncontaminated groundwater;

13. Discharges of water associated with drilling, rehabilitation and maintenance of potable or non-potable water wells and piezometers, or water supply or water quality evaluations including:
   a. Discharges from any borehole not fully developed;
   b. Well purging; and
   c. Well/aquifer pump tests not associated with groundwater remediation activities.

14. Non-stormwater discharges subject to an effluent limitation guideline identified in Table 1-2 of MSGP-2010.

Should a fire occur, Rosemont may have discharges associated with emergency firefighting activities. In addition, some of the allowable non-stormwater discharges listed in MSGP-2010 may occur at the site, through any of the three outfalls identified in Section 6.1. The types of authorized non-stormwater discharges that may occur are identified in Section 5.10 below.
4.5 Unauthorized Non-Stormwater Discharges

Stormwater discharges that are mixed with non-stormwater, other than those specifically listed above in Section 4.4, are not authorized in the MSGP-2010.

4.6 Spills and Leaks

The MSGP-2010 Part 5.1.3.3 requires that the SWPPP include a list of significant spills and leaks of toxic or hazardous pollutants that occurred in the three years prior to the date of current version. Significant spills and leaks include, but are not limited to, release of oil or hazardous substances in excess of quantities that are reportable under Section 311 of the Clean Water Act (CWA) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Because this is a new operation, there have been no spills or leaks of toxic or hazardous pollutants that occurred in the previous three years.
5.0 STORMWATER CONTROL MEASURES

Parts 5.1.4 and 8.G.6.4 of the MSGP-2010 require that the SWPPP provide a description of the control measures (CMs) that will be implemented to control pollutants in stormwater discharges.

Stormwater pollution prevention CMs include best management practices (BMPs) or other measures designed to prevent or reduce the discharge of pollutants to Waters of the U.S. CMs may include physical measures (diversion, containment, treatment, etc.) as well as practices and procedures (e.g., good housekeeping).

The following sections describe the CMs that will be implemented during the construction phases and operational phase of the Project.

As described further below, diversion channels will be constructed to divert most upgradient stormwater flows around the area to be disturbed. CMs will be designed to handle any remaining stormwater run-on. There are no industrial activities upgradient of the site, so the quality of any run-on will reflect natural conditions.

5.1 Stormwater Control Measures for Pre-Construction Activities

Activities conducted prior to construction of the mining facilities will consist primarily of exploration drilling (of boreholes and wells), including drill pad construction, and access road construction/maintenance. In general, the CMs that will be used during pre-construction activities to reduce pollutants in stormwater discharges from the Project site will include:

- Velocity dissipation devices (i.e. rock check dams, hay bale check dams, or sand bag dams) placed across the channel of a wash or washes (upstream of the outfalls) and used to slow the speed of water, thereby reducing the waters’ erosional ability; and
- Sediment controls, such as hay bales or wattles.

If needed, sediment control structures will be installed to reduce the total suspended solids (TSS) loads to the minimum practicable level for storm events. Sediment ponds will be located and sized based on topography, available space, and the anticipated sediment generating capacity of the contributing basin. Sediments accumulated at any of the structural controls will be removed from the control and reused to fill in drilling sumps, maintain stock ponds, or other beneficial use.

5.1.1 Drill Pad Construction

Temporary drill pads will be constructed for and prior to, exploration/water well drilling activities. The pads will be graded to approximately level with a slight slope to assist stormwater runoff. Each pad will be encircled with an earthen berm or straw waddles to contain and control stormwater runoff. Gravel or other material may be placed on the pad if the pad is to be permanent (i.e., monitor well).
If the drill pad is temporary, reclamation activities will occur as soon as possible after drilling is completed. Reclamation activities may include a combination of re-contouring and re-seeding or by placing gravel or other material to dissipate velocity and minimize the erosion potential.

5.1.2 Road Construction and/or Maintenance

The following is a list of CM guidelines that will be followed with respect to road construction or maintenance within the Project site:

- The best combination of various design elements, such as ditches, temporary culverts, drainage dips, etc., will be utilized to insure proper surface drainage on new access roadways.

- One or more of the following CMs will be utilized wherever necessary to prevent surface erosion on slopes: mulching with straw, seeding, stormwater water diversion wattles, and/or fabric overlays. Berms will be constructed as needed to divert water away from road surfaces towards stable side slopes or drainage devices.

- Grading and filling to repair existing roads and new access roads will occur as necessary, to minimize erosion and to facilitate travel and access for vehicles and drill equipment. Erosion and storm water control measures will be utilized at repair sites as necessary.

Any dust control agents utilized on the site, other than water, will be evaluated to ensure they will not adversely impact the quality of potential stormwater runoff.

5.2 Stormwater Control Measures for Construction Activities

Rosemont anticipates that construction of the mine facilities will take approximately two years, beginning with the issuance of the Record of Decision (ROD) from the U.S. Forest Service. For the purposes of this SWPPP, these initial two years prior to copper production are referred to as Years -2 and -1. The first year of actual mining operation and tailings production is referred to as Year 1.

During construction of the open pit, metal processing and ancillary facilities, and pre-stripping of the waste rock and tailings storage area (in Years -2 and -1), a variety of temporary and permanent erosion and sediment control structures will be implemented to reduce sediment loading. In general, the CMs that will be used during construction activities to reduce pollutants in stormwater discharges from the Project site will include the same types of CMs used for pre-construction activities and listed in Section 5.1., as well as the construction diversion channels to divert upgradient flows around areas of planned disturbance. Additionally, numerous stormwater ponding areas/impoundments will be constructed and utilized. Many of the stormwater ponding areas/impoundments used during the construction phase will remain operative during the early production years.
Specific CMs proposed to be constructed and implemented during Years -2 and -1 are provided below. Figures 4 through 10 show the progression of construction activities by quarter during Years -2 and -1. Figures 11 through 17 show the layout of the Project site and specific facilities within the Project site beginning in Year 1.

During the construction phase, the pollutant of greatest concern is sediment in runoff from disturbed areas. The primary goal of the CMs discussed below is to provide containment of this runoff (i.e., to prevent sediment-containing runoff from reaching waters of the United States).

**Pit Diversion Channel**

The Pit Diversion Channel, shown in Figures 4 through 11, will be constructed in the first quarter of the first year of construction (Year -2) to divert unimpacted, upstream stormwater around and away from the Open Pit, Project area, and construction activities. As Figure 4 shows, during the first year of construction, stormwater flowing into the Pit Diversion Channel will be conveyed to the south, drain unimpeded into Barrel Canyon Wash, and ultimately flow offsite into Davidson Canyon Wash.

Within the first quarter of the second year of construction (Year -1), the South Haul Road will be completed. At the same time, Pond S3C will be constructed upstream (southwest) of the South Haul Road and within Barrel Canyon. With the construction of Pond S3C, stormwater flow from the Pit Diversion Channel will drain into and be contained within Pond S3C (see Figure 8).

As construction continues into the second half of Year -1, the rock buttress for the Waste Rock Storage Area will be built up along the southwest perimeter of the Project (see Figure 9). Pond PCA 2 will be constructed on the west (upstream) side of rock buttress. Upon completion of Pond PCA 2, unimpacted, upstream stormwater flowing into the Pit Diversion Channel will drain into and be contained within Pond PCA 2.

**Permanent Diversion Channel No. 1**

The Permanent Diversion Channel No. 1 will be constructed north of the Open Pit and Plant Site during Year -2 to divert unimpacted stormwater runoff from an upgradient watershed around the Plant Site and into a natural channel in the upper McCleary Canyon drainage (see Figures 4 through 12).

**Crusher Stormwater Pond**

The Crusher Stormwater Pond will be created by the construction of road fill (for the Heavy Vehicle Access Road) in Year -2 across the natural streambed of a small, unnamed tributary to Wasp Canyon Wash (see Figures 4 through 16). This impoundment can contain well over the precipitation and runoff from the 500-year, 24-hour event. Stormwater flows that enter the Crusher Stormwater Pond will either evaporate or infiltrate into the ground.

**Pit Stormwater Pond**
The Pit Stormwater Pond will be created at the end of Year -2 by the construction of Haul Road 7C and the Temporary Run of Mine (ROM) Stockpile Pad #2 across the Wasp Canyon wash (see Figures 5 through 13). This impoundment can contain well over the precipitation and runoff from the 500-year, 24-hour event. Stormwater flows that enter the Pit Stormwater Pond will either evaporate or infiltrate into the ground.

**Pond PCA 2**

During the second half of Year -1, discharge from the Pit Diversion Channel will be directed to Perimeter Containment Area (PCA) 2, located along the southwest side of the Waste Rock Storage Area (see bottom left of Figures 9, 10, 11 and 18). PCA 2 is positioned between the toe of the Waste Rock Storage Area and a natural ridge and will mainly receive unimpacted, upstream stormwater from the Pit Diversion Channel. The storage capacity in Pond PCA 2 can contain the 500-year, 24-hour event. Stormwater flows that enter Pond PCA 2 will either evaporate or infiltrate into the ground.

**Pond PCA 3**

This impoundment will be located at the south-westernmost edge of the Waste Rock Storage Area (see Figures 9, 10, 11 and 18). PCA 3 will be formed during the latter half of Year -1 as a result of placement of waste rock along the southern boundary of the Waste Rock Storage Area. The storage capacity in Pond PCA 3 can contain the 500-year, 24-hour event. Stormwater flows that enter Pond PCA 3 will either evaporate or infiltrate into the ground.

**Pond PCA 4**

This impoundment will be located along the south-eastern edge of the Waste Rock Storage Area (see Figures 9, 10, 11 and 18). Only stormwater flow volumes in excess of the 500-year, 24-hour event reaching PCA 2 would pass to PCA 4. The storage capacity in Pond PCA 4 can contain the 500-year, 24-hour event. Stormwater flows that enter Pond PCA 4 will either evaporate or infiltrate into the ground.

**Pond S1C**

Pond S1C will be created by the construction of Haul Road 10N and the Conveyor Transfer Tower Access Road during the last quarter of Year -2 (see Figures 6 through 16). This ponding area will be located approximately 1,000 feet east of the eastern edge of the Open Pit. In order to effectively manage stormwater in this area, a stormwater control berm will be constructed to create additional storage capacity in this pond. With the berm, this pond will be able to contain at least the runoff volume from a 100-year, 24-hour event. Stormwater flows that enter Pond S1C will either evaporate or infiltrate into the ground.

**Pond S2A**

During construction of the Dry Stack Haul Road and South Haul Road, ponding area S2A will be created to contain stormwater runoff from within the Project site (see Figures 6
through 16). Pond S2A will be constructed just south of the Dry Stack Haul Road and will be able to contain at least the runoff volume from a 100-year, 24-hour event. Stormwater flows that enter Pond S2A will either evaporate or infiltrate into the ground.

**Pond S3A and S3C**

During the first quarter of Year -1, Ponds S3A and S3C will be created to contain stormwater runoff from the Dry Stack Haul Road and South Haul Road (see Figures 7 through 11). Pond S3A will be constructed just south of the Dry Stack Haul Road and the Phase 1 tailings facility. Pond S3C will be constructed south of the South Haul Road and collect stormwater runoff from Barrel Canyon wash. These ponding areas will be constructed to contain at least the runoff volume from a 100-year, 24-hour event. Stormwater flows that enter Ponds S3A and S3C will either evaporate or infiltrate into the ground.

**Pond S1**

Pond S1 will be created during the first quarter of Year -1 by the construction of the Phase 1 tailings conveyor ramp and pad across Wasp Canyon Drainage (see Figures 7 through 11 and 14). This ponding area will be able to contain the runoff volume from at least the 100-year, 24-hour event. Stormwater flows that enter Pond S1 will either evaporate or infiltrate into the ground.

**Pond SM1**

Pond SM1 will be constructed during the second quarter of Year -1 in the northeastern portion of the Dry Stack Tailings Facility during the construction of the Phase 1 tailings starter buttress (see Figures 8, 9, and 10). Ponding area SM1 will be large enough to contain the runoff volume from at least the 100-year, 24-hour event. Stormwater flows that enter Pond SM1 will either evaporate or infiltrate into the ground.

**Sediment Control Structures**

Three sediment control structures will be constructed at the downstream perimeter of the Project. Sediment Control Structures No. 1 and 2 will be located downstream of the Dry Stack Tailings Facility/Waste Rock Storage Area (as shown on Figures 4 through 12 and 14, 15 and 16). Sediment Control Structure No. 3 will be located downstream of the Plant Site facilities (see Figures 4 through 12 and 14, 15 and 16). All of these sediment control structures will serve as the final sediment traps for stormwater runoff from the Project and where stormwater quality will be monitored and tested, i.e. outfalls (see Section 6.1).

Channels will be constructed below the outer shell slopes of the rock buttresses (around the Dry Stack Tailings Facility and Waste Rock Storage Area) to direct stormwater runoff to the sediment control structures.
The sediment control structures will be porous, rock-filled check dams, less than six feet tall, creating a basin and forming final sediment traps for the Project. Each will be constructed using chemically benign waste rock.

**PWTS Pond**

Once constructed within the Year -2/-1 time period, stormwater flows from the Plant Site will be directed into the PWTS Pond complex (see Figures 4 through 16). The PWTS Pond will be constructed as one lined impoundment divided into two sections (the PW Pond and the TS Pond) separated by a berm. The PW Pond will cover approximately 12 acres and have a storage capacity of 69.7 million gallons, which includes 2 feet of freeboard capacity. The PW Pond will be constructed with a double 60-mil HDPE liner and leak collection and removal system (LCRS). The PW Pond will contain tailings filter water, overflow water from the Primary Settling Basin, fresh water make-up, accumulated groundwater and stormwater from the Open Pit, stormwater runoff from the Plant Site area and Dry Stack Tailings Facility. The TS Pond will cover approximately 6.5 acres and will a storage capacity of 38.1 million gallons, which includes 2 feet of freeboard capacity. The TS Pond will be constructed with a 60-mil geomembrane liner underlain by a geosynthetic clay liner and prepared subgrade. Under normal operating conditions, the TS Pond will be dry.

The PWTS Pond is designed to handle stormwater runoff from a 100-year, 24-hour storm event, assuming the Primary Settling Basin contained three (3) days of tailings slurry and the TS Pond was empty. During significant storm events, the TS Pond will contain stormwater runoff and overflow from the PW Pond. All water directed to the PWTS Pond will be incorporated into the sulfide ore processing circuit to reduce the Project’s process water makeup requirement from well sources.

**Primary Settling Basin**

The Primary Settling Basin will be constructed in the Year -2/-1 time period and will consist of a lined non-stormwater pond. The Primary Settling Basin will be used for short-term storage of non-filtered tailings and stormwater (see Figures 4 through 16). The Primary Settling Basin covers approximately eight acres and is designed to contain runoff from a 100-year, 24-hour storm event when empty of tailings slurry. The basin has a volume of 56.3 million gallons to the invert of the overflow channel to the PW Pond.

**Miscellaneous Stormwater Ponds**

Other miscellaneous, relatively small, unlined ponds may be constructed throughout the Project site as needed to control stormwater runoff. Stormwater flows that enter into these miscellaneous small ponds will either evaporate or infiltrate into the ground.

### 5.3 Stormwater Control Measures for Operational Activities

In general, the CMs that will be used to manage stormwater discharges from the Project during the active (operational) phase include:
• Diversion of runoff from adjacent, undisturbed areas around the Project facilities to the greatest extent practicable, while runoff from rainfall that falls within the Project facilities will be retained and managed;

• Placement of major facilities (Dry Stack Tailings Facility and Waste Rock Storage Area) within a single drainage basin (Barrel Canyon Wash watershed);

• Design of the Open Pit, Plant Site, and Dry Stack Tailings Facility, as closed systems, with all direct precipitation and local runoff collected and pumped back into the process circuit or used for dust control within the respective closed basins;

• Design criteria of 100-Year, 24-Hour events for Process Water/Temporary Storage (PWTS) Pond and Primary Settling Basin;

• Design criteria of 500-Year, 24-Hour events for temporary storage and evaporation ponding areas, storage behind tailings perimeter containment berms, and evaporation areas on top of tailings;

• Design criteria of at least the 500-Year, 24-Hour event for the reclaimed landform water management structures (channels, drop structures);

• Construction of three Sediment Control Structures designed to reduce total suspended solid loads in any stormwater discharges from the site; and

• Designation of three (3) stormwater release points (i.e., outfalls, Sediment Control Structures) that will serve as the final compliance points where stormwater will be monitored prior to release to the natural drainage ways.

5.3.1 Open Pit and Southern Plant Site Area

The Open Pit itself is considered a closed system with all direct rainfall and local runoff being treated as mine drainage and collected in a sump in the pit bottom. During operations, the captured water will not be discharged and therefore, is not regulated under the MSGP-2010.

Stormwater controls associated with the Open Pit and southern Plant Site area consist of the following components, all of which will be constructed during Years -2 and -1 (as discussed above in Section 5.2):

• Crusher Stormwater Pond
• Pit Diversion Channels and Pond PCA 2
• Pit Stormwater Pond
• Pond S1C
• Pond S1

Figure 13 shows the Open Pit and southern Plant Site area with the associated stormwater ponds at Year 1 (beginning of mine production).

5.3.2 Main Plant Site Area
Stormwater controls associated with the Main Plant Site Area consist of the following components, all of which will be constructed during Years -2 and -1 (and discussed above in Section 5.2):

- Permanent Diversion Channel No. 1
- PWTS Pond
- Primary Settling Basin

Other miscellaneous, relatively small, unlined ponds may be constructed throughout the Plant Site as needed to control stormwater runoff.

### 5.3.3 Dry Stack Tailing Facility Control Measures

Stormwater management within the Dry Stack Tailings Facility footprint will accommodate rainfall up to the 500-year, 24-hour rainfall event without discharge. Stormwater within the footprint limits of the Dry Stack Tailings Facility will be managed by either retaining water at the interface between the tailings and the existing ground (at the toe of the tailings facility) or on the top surface of the tailings facility (see Figures 11, 15, and 16).

During the operational phase, the surface of the tailings area will be sloped so that all precipitation that falls on top of the active area will remain on top and evaporate or will be pumped to the PW Pond. Stormwater that falls on the top surface of the Dry Stack Tailings Facility will be also be contained via the use of 6-foot high berms constructed at the edge of the tailings. Stormwater runoff generated on natural ground from areas up-gradient of the tailings will be contained in a depression constructed in natural ground along the 6-foot high berm located along the edge of the dry stack tailings (see Tailings Perimeter Storage Ditches described below).

The outer slopes of the Dry Stack Tailings Facility will consist of a thick buttress of waste rock comprised of pit run rockfill. These perimeter waste rock buttresses will always be higher in elevation than the top of the tailings surface by at least 12.5 feet and will therefore prevent water that contacts the tailings from being discharged. Stormwater that falls on the outside face of the waste rock buttresses will discharge downstream to one of two sediment control structures (see Figure 11). Stormwater controls, in combination with the pit run rockfill buttress materials, will help control erosion on the outer slopes.

**Tailings Perimeter Storage Ditches**

Three Tailings Perimeter Storage Ditches will be constructed (excavated) along the upstream edge of the Dry Stack Tailings Facility (see Figures 11, 12 and 15). These stormwater control ditches will prevent stormwater runoff generated from upstream areas from flowing onto the Dry Stack Tailings Facility and will be adequate to contain runoff from at least the 100-year, 24-hour event.
5.3.4 Waste Rock Storage Area Control Measures

Management of stormwater for the Waste Rock Storage Area is similar to that for the Dry Stack Tailing Facility. Stormwater from the Waste Rock Storage Area, including the perimeter berms, will be routed to sediment control structures, where any overflow discharging offsite from these structures will be monitored in accordance with the MSGP-2010.

Ponds S3C, S3A, and S2A (discussed above in Section 5.2) will serve to contain stormwater runoff on and in the vicinity of the Waste Rock Storage Area (see Figures 7 through 17). Three Perimeter Containment Areas (PCAs) will be located along the southern toe of the Waste Rock Storage Area. PCAs 2, 3, and 4 are shown on Figures 9, 10, 11, and 18. PCA 2 will receive stormwater from the Pit Diversion Channel and will be able to contain runoff from up to the 500-year, 24-hour event. Runoff in excess of the 500-year event volume will flow via an overflow channel, located at the toe of the Waste Rock Storage Area, to PCA 4.

PCA 3 will only receive direct precipitation and runoff from the waste rock buttress in the immediate vicinity. Stormwater contained in the PCAs will either evaporate or infiltrate into the ground.

5.4 Stormwater Control Measures for Reclamation Activities

Rosemont Copper has been, and plans to continue, reclaiming areas previously disturbed, such as exploration drilling sites and temporary roadways. In most cases, the drill sites and temporary roadways are reclaimed by re-contouring the area to facilitate drainage and minimize erosion, spreading seeds, and installing waddles or velocity dissipation devices as necessary. Once the vegetation is re-established, waddles may be removed. Location-specific decisions are made regarding the use of BMPs based on the terrain and the potential for stormwater to run onto or off of the site.

In addition to the reclamation of drill sites, temporary roadways, and other small disturbance areas, Rosemont will begin concurrent reclamation activities in Year 1 (first year of operations) on the rock buttresses. Waste rock from the Open Pit will be used to construct the rock buttresses on the outer slopes of the Dry Stack Tailing Facility and Waste Rock Storage Area. The rock buttresses are designed to: 1) reduce visual impacts of the operation from Highway 83 and surrounding areas, and 2) allow reclamation to begin within the first year of operations. Topsoil will initially be salvaged and used as a vegetation growth media as soon as the rock buttresses are established. Waste rock will continue to be deposited behind/within the rock buttresses during the life of the mine. Concurrent reclamation will decrease the run-off potential as vegetation becomes established.

Successfully reclaimed areas are no longer subject to the MSGP, as per Part 8.G.9.1 of that permit.
5.5 **Stormwater Sediment Removal/Storage**

Sediment removed from sediment traps, stormwater catchment areas, or from the Project site will be transferred to an area that is isolated from stormwater flows. If necessary to control runoff from a sediment storage area (i.e., if such runoff is not addressed by other existing control measures), runoff will be managed through the use of berms (if practicable) or by the installation of silt fencing. Some removed sediments may be reused in construction projects or reclamation activities at the Project site as appropriate.

5.6 **Stabilization Practices**

Stabilization practices for pads and roads associated with the Project will take place as the pads and roads are developed. As stated in Section 5.1 above, pre-construction activities may include, but not be limited to, development of wells for production or aquifer testing, geotechnical drilling, roadway construction, site office and storage area construction, trenching for geotechnical testing, other site characterization activities, and pad, drill site, or roadway reclamation activities. As pads are installed, the area will be surrounded by waddles to manage both run-on and runoff. Once drilling is complete, the site will be re-contoured and re-seeded. Because some sites are to be maintained accessible for monitoring, only portions of the site may be stabilized leaving other portions accessible. All sites on U.S. Forest Service lands outside of the main disturbance area will be closed within one year.

5.7 **Good Housekeeping and Additional Measures**

The primary control measures that will be utilized at the site are the structural measures described above (diversion, containment, sediment control traps). In addition, the following measures (a combination of structural and non-structural) will be undertaken to minimize exposure of industrial activities to stormwater or to prevent discharges from areas where stormwater might contact exposed materials:

- Mine vehicle, machinery, and equipment maintenance and repair will be performed indoors when practicable.

- Fuel and oil tanks will be constructed within secondary containment structures to prevent stormwater runoff and run-on and to capture any fuel releases.

- Spill kits will be made available on-site to promptly clean up spills, and employees will be trained in spill response procedures.

- Industrial materials will be labeled, stored in appropriate containers, and kept in an orderly manner.

- Construction and waste materials will be stored according to their potential to impact stormwater. For instance, drill steel, etc., may be stored in an area with no stormwater protection.
• Waste materials generated during construction activities will be stored behind
berms or waddles to control run-on and run-off.

• All drums will be kept closed when not in use and maintained in secondary
containments.

A Spill Prevention, Control and Countermeasure (SPCC) Plan will be developed to
comply with the SPCC regulation (Code of Federal Regulations, Title 40 § 112.3(g)(1)).
Fuel spills that have the potential to impact stormwater will be immediately contained,
isolated, and cleaned up in accordance with the Project SPCC Plan.

5.8 Waste, Garbage and Floatable Debris
Solid waste, garbage and floatable debris will be collected in local, on-site trash bins and
dumpsters. The dumpsters will be hauled periodically to the Rosemont Waste
Management Area for disposal. Rosemont personnel will periodically inspect the mine
site to remove solid waste that may have accumulated.

5.9 Authorized Non-Stormwater Discharge Management
Authorized non-stormwater discharge management is anticipated to be as follows:

• Discharges from emergency fire-fighting activities – because fires are
unanticipated events, control measures cannot be designed in advance;

• Waters used to wash vehicles where soaps and solvents are not used – this
activity will take place only during the construction phase. During operation
vehicle washing will take place in permitted vehicle wash facilities from which no
discharge to waters of the U.S. is anticipated. The vehicle wash pad will be
concrete with 4-inch curbs; wash water from the wash pad will pass through an
oil/water separator and then into a single-lined (geomembrane) evaporation
pond.

• Water used to control dust – dust control water will be applied sparingly to the
area only in the amount necessary to control dust to meet applicable air quality
requirements. Effluents or wastewaters will not be used.

• Potable water sources including water line flushing – this activity is inevitable
with this Project and will be managed in several ways – for example, construction
of earthen berms and/or placement of straw wattles. Water lines will be flushed
only when necessary to check connections or to ensure flow.

• Routine external building wash down where detergents are not used – if it
becomes necessary to wash the construction offices, the water will be managed
through berms and/or discharged through a silt fence; detergents will not be
used.
• Uncontaminated air conditioning or compressor condensate – it is expected that these types of waters will be minimal.

• Uncontaminated groundwater or spring water – uncontaminated groundwater pumped during well drilling, development or purging activities will be discharged directly onto the ground surface and contained in ponding areas in the approximate location from which the water was originally withdrawn. The water will be allowed to evaporate or infiltrate back into the ground (pursuant to Arizona Administrative Code [A.A.C.] R18-9-B301.D, the type 1.04 General Aquifer Protection Permit). Alternatively, the pumped groundwater may be conveyed to holding tanks for reuse.
6.0 STORMWATER SAMPLING / MONITORING

6.1 Designated Outfalls

Three (3) outfalls have been designated for the Project area. The three outfalls will be the same during the construction phase as well as the operational phase, and are coincident with the three (3) Sediment Control Structures described above in Section 5.2.) Outfalls are locations where stormwater exits the property.

The three outfalls are shown on attached Figures 4 through 12 and 14, 15 and 16; all three outfalls are located within ephemeral washes. Outfall No. 1 (Sediment Control Structure No. 1) is proposed to be located in Lower Barrel Canyon Wash, just upstream of the confluence with McCleary Canyon Wash (see Figure 14) and just downstream from the northeast toe of the Dry Stack Tailings Facility. Outfall No. 2 (Sediment Control Structure No. 2) will be located approximately 4,500 feet south of Sediment Control Structure No. 1, at the upstream portion of Trail Creek, and downstream from the eastern edge of the Waste Rock Storage Area. Outfall No. 3 (Sediment Control Structure No. 3) will be located on McCleary Canyon Wash, approximately 8,600 feet upstream of the confluence with Lower Barrel Canyon Wash, downstream from the Plant Site.

Table 6-1 Outfall Information

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<thead>
<tr>
<th>Outfall ID</th>
<th>Discharge Type</th>
<th>Approximate Latitude / Longitude</th>
<th>Section / Township / Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>001 – Sediment Control Structure No. 1</td>
<td>Stormwater</td>
<td>31° 50' 34&quot;N  110° 43' 08&quot; W</td>
<td>Section 28, T18S, R16E</td>
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<tr>
<td>002 – Sediment Control Structure No. 2</td>
<td>Stormwater</td>
<td>31° 49' 48&quot;N  110° 43’ 10&quot; W</td>
<td>Section 33, T18S, R16E</td>
</tr>
<tr>
<td>003 – Sediment Control Structure No. 3</td>
<td>Stormwater</td>
<td>31° 50' 29&quot;N  110° 44’ 18&quot; W</td>
<td>Section 29, T18S, R16E</td>
</tr>
</tbody>
</table>

Based on different activities being conducted in the drainage areas of each outfall and therefore, the potential for different stormwater discharge quality from each area, these outfalls are not considered as “substantially identical outfalls” (Section 6.1.1.1 of the MSGP-2010). Hence, each outfall will be monitored as a separate and distinct monitoring point.

6.2 General Analytical Monitoring

Part 6 of the MSGP-2010 contains the general requirements for analytical monitoring, and Part 8.G.8 sets forth the specific requirements applicable to Rosemont’s proposed activities. One sample will be collected from each of the three outfalls defined in Section 6-1 for each sampling event.

Monitoring must be performed on a storm event that results in an actual discharge from the site that follows the preceding measurable storm event by at least 72 hours (three calendar days). The United States Environmental Protection Agency (USEPA) historically defined a “measurable storm” as one that produced 0.1 inch or more of
rainfall. However, the USEPA recently introduced, and ADEQ adopted (Part 6.1.2.2), the concept of a measurable storm event as any storm event that results in a discharge of stormwater from the facility, that is, enough stormwater to flow off the property.

Part 6.1.2.3 of the MSGP-2010 requires that the sample be collected within the first 30 minutes of the measurable storm event. If it is not possible to collect the sample within the first 30 minutes of a measurable storm event, the sample must be collected as soon as practicable after the first 30 minutes and documentation will be kept with the SWPPP, explaining why it was not possible to take samples within the first 30 minutes.

Part 8.G.8.2.1 of the MSGP-2010 specifies the parameters that must be analyzed for in discharges from waste rock and overburden piles at active mining sites. (Because all receiving washes are ephemeral, annual monitoring under Part 8.G.8.1 is not required.) The stormwater parameters listed in Part 8.G.8.2.1 of the MSGP-2010 and applicable to discharges at the Rosemont site are as follows (because receiving waters are all ephemeral, sampling for total suspended solids [TSS] and turbidity is not required under Part 8.G.8.2):

- pH
- Hardness (calculated from calcium and magnesium)
- Calcium
- Magnesium
- Antimony - analyzed as total recoverable (total)
- Arsenic - total
- Beryllium - total
- Cadmium - total and dissolved
- Copper – total and dissolved
- Iron - total and dissolved
- Lead - total and dissolved
- Mercury - total and dissolved
- Nickel - total and dissolved
- Selenium - total
- Silver - total and dissolved
- Zinc - total and dissolved

For each monitoring event, the date and estimated duration (in hours) of the rainfall event, estimated rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event must be recorded on a Stormwater Sample Collection Form. An example Stormwater Sample Collection Form is provided in Appendix D. For snowmelt monitoring, monitoring must be performed at a time when a measurable discharge occurs from the site.

Samples will be collected annually in alternating wet seasons once waste rock or overburden are exposed to stormwater at the site. Pursuant to Part 6.1.2.1, wet seasons are defined as June 1-October 31 (summer) and November 1- May 31 (winter).
The stormwater discharge samples collected will be submitted to Turner Laboratories, Inc. in Tucson.

The results of the annual stormwater discharge monitoring will be kept in Appendix E of this SWPPP for a minimum of three years from the date that Rosemont’s coverage under the MSGP-2010 ends, in accordance with Part 7.5 of the MSGP-2010.

6.3 Sample Collection Procedures

This section describes the procedures, methods, and considerations to be used by Rosemont personnel when collecting and handling stormwater samples in the field. All field and laboratory data will be reviewed and the quality evaluated. There are two (2) components to collecting water quality information: collecting samples of water to ship to the analytical laboratory and obtaining in situ, or field, parameter data of pH, temperature, specific conductance, and dissolved oxygen (optional).

A sampling equipment checklist may be developed to assist and expedite the preparation process. A list of the parameters to be sampled and analyzed will also be developed and used for sampling. The analytical laboratory will be contacted prior to sampling to notify them as to when the stormwater samples will be delivered. Only clean, unused laboratory-provided sample bottles are to be used for sampling. A sufficient number of laboratory-provided sample bottles will be kept on-site in anticipation of stormwater sampling. When stormwater samples are submitted to the laboratory, new, clean bottles will be picked up to replace the ones just submitted.

Automatic stormwater samplers will be used when possible. The automatic samplers consist of Nalgene sample bottles located in specific washes and attached by steel lines to permanent fixtures (i.e. trees, concrete structures). The automatic samplers will be located at each outfall and set up well in advance of a storm. After a measurable storm event, the Rosemont technician will retrieve the samplers and transfer the stormwater from the Nalgene sample bottles into clean, pre-preserved laboratory bottles. A small amount of stormwater from the automatic samplers will be used to obtain field parameters (pH, temperature, specific conductance). The field pH of the stormwater sample will be analyzed within 15 minutes of collection by the field technician.

Equipment used to collect water samples will be appropriately cleaned and decontaminated prior to sample collection. In situ water quality parameter meters should be calibrated the morning of or evening prior to sample collection. Water samples collected for dissolved metals will be collected in unpreserved bottles and submitted to the laboratory for filtering.

Each sample bottle label will contain the following information:

- Facility name and address
- Sample location (i.e. Outfall 001)
- Name or initials of sampling personnel
- Parameter and associated analytical method (e.g., Dissolved Metals, Nitrogen Species, Major Ions, etc.)
• Date and time of sampling event

In addition to the sample bottles, sampling supplies/equipment will include:

• Stormwater Collection Forms
• Field notebook
• pH/specific conductance/temperature meter
• Disposable nitrile or latex gloves
• Waterproof pens/markers
• Cooler and ice
• Camera

The following protocols will be used to collect stormwater samples:

• Wear disposable powder-free gloves for sampling
• Never touch the inside of a bottle or the lid
• Fill the sample bottle nearly to the top; do not rinse or overfill the bottles
• Sample only stormwater discharging from the outfalls (i.e., do not sample from puddles, ponds, or retention basins)

Once the labels are completed, the water samples will be immediately placed on ice in an insulated cooler. To prevent the ice from melting and possibly contaminating water samples, the ice will be packed into sealed (zip-locked), one-gallon size plastic bags. The ice bags will then be placed on top of and surrounding the water samples in the cooler. Samples must be maintained at a temperature of 4° Celsius or less until they are delivered to the laboratory. Laboratory-provided chain-of-custody forms must be completed and provided to the laboratory upon delivery of the samples. The samples should be delivered to the laboratory at the end of the day, or no later than the following morning.

For each stormwater sample collected, Rosemont will document on a Stormwater Collection Form the following information: the sample/outfall identifier; the duration between the storm event sampled and the end of the previous measurable storm event; the date and duration of the storm event sampled; rainfall measurement or estimate (in inches); and an estimate of the total volume of stormwater discharged from the outfall(s).

6.3.1 Calibration of In Situ Water Quality Meter

Measurements of field parameters (pH, temperature, and specific electrical conductance) must be collected within 15 minutes of sample collection and results reported on the water quality sample collection form. In addition, information regarding the date/time, standard(s) used for the most recent calibration must be documented on the water quality sample collection form.

Appendix F of this SWPPP provides a Standard Operating Procedures manual that describes the procedures for calibrating the field water quality meter.
6.4 Visual Assessments

Visual assessments will be performed on stormwater discharges that occur at least 72 hours (three calendar days) following the conclusion of a previous discharge as required in Part 4.2 of the MSGP-2010. For visual assessments, a stormwater sample from each outfall must be collected within the first 30 minutes of discharge or as soon thereafter as practicable. Visual assessment results will be recorded on a Visual Assessment Form. If the sample cannot be collected within the first 30 minutes of flow, it must be noted on the Visual Assessment Form along with the reason for the deviation. An example Visual Assessment Form is provided in Appendix D.

The visual assessments will be conducted as follows:

- Two during the Summer wet season – June 1 through October 31
- Two during the Winter wet season - November 1 through May 31

Visual assessments consist of collecting a grab sample of stormwater during a storm event from each outfall using a clean, clear glass or plastic container in a well-lit area. The samples are to be visually inspected for the following water quality characteristics:

- Color
- Odor
- Clarity
- Floating solids
- Settled solids
- Suspended solids
- Foam
- Oil sheen
- Other obvious indicators of stormwater pollution

If there are no qualifying rain events or if a sample could not be collected due to adverse conditions for a given quarter, the Visual Assessment Form will be marked indicating the reason why a sample was not assessed. Completed Visual Assessment Forms will be maintained with this SWPPP in Appendix G.

Findings from the visual assessments are used to trigger further facility inspections and corrective actions, if necessary, to modify problems found at the site.

6.5 Effluent Limitations Monitoring

Effluent limitations monitoring under Part 6.2.2 is not required for Sector G copper mining facilities.

6.6 Impaired Waters Monitoring

Because Rosemont will not be discharging to or within 2.5 miles of an impaired water or an outstanding Arizona water, there is no requirement for additional monitoring for this facility pursuant to Parts 6.2.3 or 8.G.4.4.
7.0 FACILITY INSPECTIONS

As required by Part 4.0 of the MSGP-2010, one or more members of the Rosemont PPT will conduct routine facility inspections, visual assessments, and Comprehensive Facility Inspections. A copy of a Facility Inspection form is provided in Appendix D.

7.1 Routine Facility Inspections

*Construction Phase:* During the exploration and construction phase (Years -2 and -1), inspections will occur monthly and within 24 hours of each measurable storm event, as required by Part 8.G.4.3.1(a).

Pursuant to Part 8.G.4.3.2, inspections will cover: (1) areas disturbed by clearing, grading and excavation; (2) areas used for storage of materials that are exposed to precipitation; (3) sedimentation and erosion control measures; (4) discharge locations (to assess whether control measures are effective in preventing significant impacts to waters of the U.S.); and (5) locations where vehicles enter and exit the site (to assess whether there is significant off-site sediment tracking).

A copy of the Facility Inspection Form to be used is included in Appendix D.

*Active (Operational) Phase:* During the active phase, routine facility inspections will be conducted every quarter in accordance with Parts 4.1.1 and 8.G.7 of the MSGP-2010. The inspections will be conducted by a member of the Rosemont PPT and will be documented on a Facility Inspection form (a copy of which is provided in Appendix D). At least one inspection each year will occur while a stormwater discharge is occurring or within 24 hours (or the first business day) following the end of a measurable storm event (Part 4.1.1).

Inspections will cover areas where industrial activities (as described by MSGP-2010) occur that are exposed to precipitation and that contribute to stormwater discharges from the site (Part 8.G.7). Within these areas, stormwater CMs used to comply with this permit, all of the potential sources/facilities listed in Section 4.2 above, and any other areas exposed to stormwater with the potential to discharge from the facility, will be inspected. The inspections will specifically look at the condition of the structures to determine if the CM is performing its function at a level that will protect surface water quality.

Completed inspection forms will be maintained in Appendix H of this SWPPP and Intelex.

Because the facility will not discharge to an outstanding Arizona water or a water listed as impaired for sediment, the requirement for monthly inspections during the active mining phase (MSGP-2010, Part 8.G.7) is not triggered.

7.2 Annual Comprehensive Facility Inspections

In accordance with Part 4.3 of the MSGP-2010, Rosemont will conduct a Comprehensive Facility Inspection (CFI) of all CMs once per calendar year, but not within six months of a previous CFI, to determine if the CMs are adequately and properly implemented. The
CFI must determine if additional CMs are needed. One or more members of the Rosemont PPT will conduct the CFI.

All mine facilities, access and haul roads, equipment and maintenance areas, structural stormwater management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in this SWPPP will be observed to ensure that they are operating correctly. Areas of any spills and leaks occurring within the last 3 years and having the potential to impact the quality of stormwater discharges will be inspected. In addition, a visual evaluation of all equipment needed to implement the SWPPP will be made. Results of the previous year’s visual assessments and analytical monitoring results will be reviewed in preparing for the annual CFI.

The annual CFI may be used as one of the routine inspections (discussed above in Section 7.1), provided that all components of both types of inspections are included.

During the inspections, members of the PPT will look for:

- CMs needing maintenance or repair;
- Failed CMs needing replacement;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Evidence demonstrating that previously unidentified discharges of pollutants have occurred from the Project site (for example, offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the Project site);
- Evidence of deviations from the SWPPP or MSGP-2010;
- Additional CMs needed to comply with the MSGP-2010 requirements;
- Industrial materials, residues or trash that could come into contact with stormwater and that are not addressed by existing CMs;
- Offsite tracking of industrial or waste materials, or sediment, where vehicles enter or exit the site; and
- Tracking or blowing of raw, final or waste materials from areas of no exposure to exposed areas.

CFI inspections will be documented on an inspection form; a blank Comprehensive Facility Inspection form is provided in Appendix D; completed inspection forms will be maintained in Appendix H of this SWPPP.

7.3 Maintenance

MSGP-2010 Part 2.1.1.3 requires that CMs identified in the SWPPP must be maintained in effective operating condition. If a maintenance problem is identified during inspections, the required maintenance will be indicated on the Site Inspection Form. A copy of this form will be provided to the Supervisor (or designee) and the maintenance scheduled. In addition, a Work Order or similar other form will be completed and entered into one of the internal data management systems (Ventex or Intelex). Maintenance, if required, normally will be performed within 72 hours of the inspection. (Part 2.1.1.3 of the MSGP-2010 allows repairs to be made up to 14 calendar days following discovery, or before the next measurable storm event, whichever is sooner; if
maintenance cannot be completed within this time frame an explanation must be provided in the SWPPP.) If the CM is determined not to be effective, an alternative will be investigated and installed.

### 7.4 Spill Prevention and Response Procedures

MSGP-2010 Parts 2.1.1.4 and 5.1.5.1 require procedures to be developed for preventing and responding to spills and leaks. Training regarding spill response procedures will be provided to Rosemont employees and contractors conducting industrial activities at the site. Plans such as the SPCC, or those described in the Aquifer Protection Permit (APP), will be used to define appropriate spill prevention procedures. A copy of the SPCC Plan and APP will be kept with this SWPPP and be made available upon request by ADEQ.

Reporting of significant spills will include the date(s) and descriptions of the incident (for a significant spill, leak or other release that resulted in a discharge of pollutants in stormwater to a water of the U.S.), the circumstances leading up to the release, and the measures taken to prevent the recurrence of such releases. Records reporting significant spills will be maintained in Intelex and in Appendix I of this SWPPP, as required by part 5.4 of the MSGP-2010.
8.0 REPORTING AND RECORDKEEPING

8.1 Annual Reporting
As required by Part 7.2 of the MSGP-2010, Rosemont will prepare an Annual Report (on a form provided by ADEQ) for the annual reporting period from June 1 to May 31. The Annual Report must be completed by July 15 and include, at a minimum:

- Findings from the CFIs;
- Corrective Action Forms and Reports; and
- DMR forms for the preceding two wet seasons.

Copies of the Annual Reports will be maintained with the SWPPP in Appendix K, as required by Part 7.2 of the MSGP-2010.

8.2 Reporting Address
Monitoring date, reports, and all written correspondence concerning the discharges covered under this MSGP-2010 will be sent to the ADEQ at the following address:

Arizona Department of Environmental Quality
Surface Water Section, Stormwater Permits Unit – MSGP Monitoring
1110 West Washington Street, Mail Code 5415 A-1
Phoenix, Arizona 85007

or

via fax to (602) 771-4528

8.3 Other Reporting

8.3.1 24-Hour Reporting of Non-Compliance
The MSGP-2010 Appendix B Part 12(d) requires Rosemont to report permit non-compliance issues that may endanger human health or the environment. Within 24-hours following discovery of such a non-compliance event, Rosemont will verbally notify ADEQ at:

ADEQ – Water Quality Compliance
1110 West Washington Street, Mail Code 5515 B-1
Phoenix, AZ 85007
Office: 602-771-2330; FAX: 602-771-4505

8.3.2 5-Day Follow-Up Reporting to the 24-Hour Reporting
Within five (5) days of becoming aware of an event triggering 24-hour reporting, Rosemont will provide ADEQ with a written submission that includes:

- Exact date and time of the incident and its duration;
- A description of the non-compliance issue and its cause;
8.3.3 Other Non-Compliance Reporting

Pursuant to Section 7.4 of the 2010 MSGP, in the event of a reportable quantity spill, Rosemont will verbally notify the ADEQ Emergency Response Duty Office at 602-771-2330.

All other instances of non-compliance (not addressed above) will be described and included in the annual report in accordance with Section 12(e), Appendix B of the 2010 MSGP.

8.4 Notification to Receiving MS4s/Local Authorities

Since this facility will not discharge to a MS4 (Municipal Separate Storm Sewer Systems), information (including a copy of the completed NOI) will not be submitted to any other authority.

8.5 Recordkeeping

As required by MSGP-2010 Part 7.5, Rosemont will retain a copy of the SWPPP, including records of all data used to complete the NOI, and other documentation described in Part 7.5 for a period of at least three (3) years from the date that coverage under the MSGP-2010 expires or is otherwise terminated.

Completed Visual Assessment Forms will be kept in Appendix G of this SWPPP; completed Facility Inspection Forms will be kept in Appendix H. Copies of analytical results for stormwater sampling will be kept in Appendix E. Records of significant spills and leaks will be kept in Appendix I. Annual reports will be kept in Appendix J.

8.6 Corrective Actions

As required by MSGP-2010 Part 3.1, Rosemont has established procedures to address the following corrective action triggers resulting in or from the failure of a CM:

- An unauthorized discharge to a water of the U.S.;
- A discharge causes or contributes to an exceedance of applicable water quality standard; and
- ADEQ determines that modifications to the CMs are necessary to meet the requirements of the MSGP-2010 Part 2.2.

If the non-compliance issue has not been corrected, the anticipated timeframe for when the non-compliance issue will be resolved; and Steps taken or planned to reduce, eliminate and prevent recurrence of the non-compliance issue.

Five-day follow-up reports will be submitted to:

ADEQ – Water Quality Compliance
1110 West Washington Street, Mail Code 5515 B-1
Phoenix, AZ 85007
Office: 602-771-2330; FAX: 602-771-4505
Within 72 hours of identifying one of these corrective action triggers, Rosemont will document the discovery with the following information on a Corrective Action Form (MSGP-2010 Part 3.3):

- Identification of the triggering condition
- Description of the problem identified
- Date the problem was identified

Within 14 calendar days of one of these corrective action triggers, Rosemont will document the following information in a Corrective Action Report:

- Summary of any corrective action(s) taken or to be taken;
- Whether SWPPP modifications are required as a result of the discovery or corrective action;
- Date corrective action was or will be initiated;
- Date the corrective action was completed or is expected to be completed.

Corrective Action Forms and Corrective Action Reports will be maintained with the SWPPP (as part of Appendix K) as required by MSGP-2010 Part 3.3.
9.0 SIGNATURE, PLAN REVIEW, AND PLAN AVAILABILITY

The SWPPP has been signed as required (see Stormwater Plan Certification page prior to page 1) and a copy will be retained on-site and accessible during business hours.

A notice will be posted at the Environmental Department at the Project site. A copy of that notice is provided in Appendix B.

This SWPPP is available at the time of an inspection or upon request to the ADEQ, or any other state, federal, or local agency with stormwater program authority. If otherwise requested by ADEQ, a copy of this plan will be provided to ADEQ within 14 calendar days of the request.
10.0 SWPPP MODIFICATIONS

As required by Part 5.2 of the MSGP-2010, the SWPPP will be modified whenever necessary to address any of the triggering conditions for corrective action identified in Section 8.4 above. Modifications will also be made as determined necessary based on the results of routine inspections and the annual CFI. Finally, the SWPPP will be modified as necessary when activities move into previously undisturbed areas.

A SWPPP modification log is provided with this Plan in Appendix L.
11.0 REFERENCES


Current Draft of SWPPP for Review
Printed copies are not controlled
APPENDIX A

Copy of AZPDES General Permit for Stormwater Discharges Associated with Industrial Activity – Mineral Industry (AZMSG2010-003)
STATE OF ARIZONA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION
PHOENIX, ARIZONA 85007

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT FOR STORMWATER DISCHARGES
ASSOCIATED WITH INDUSTRIAL ACTIVITY – MINERAL INDUSTRY
TO WATERS OF THE UNITED STATES

This permit provides authorization to discharge under the Arizona Pollutant Discharge Elimination System (AZPDES) program, in compliance with the provisions of the Arizona Revised Statutes, Title 49, Chapter 2, Article 3.1, the Arizona Administrative Code (A.C.C.), Title 18, Chapter 9, Articles 9 and Chapter 11, Article 1, and the Clean Water Act as amended (33 U.S.C. 1251 et seq.).

This general permit specifically authorizes stormwater discharges associated with category iii, Mineral Industry sites, pursuant to 40CFR 122.26(b)(14) in Arizona. All discharges authorized by this general permit shall be consistent with the terms and conditions of this general permit.

This general permit becomes effective on February 1, 2011.

This general permit and the authorization to discharge expire at midnight, January 31, 2016.

Signed this 20th day of December, 2010.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

[Signature]
Michael A. Fulton, Director
Water Quality Division

Stormwater Discharges Associated with the Mineral Industry – Sectors G, H, I & J
# AZPDES Multi-Sector General Permits for Stormwater Discharges Associated with Industrial Activity – Mineral Industry

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Appendixes

Appendix A. Definitions, Abbreviations, and Acronyms (for the purposes of this permit).
Appendix B. Standard Permit Conditions
1.0 Coverage under this Permit

1.1 Eligibility.

1.1.1 Facilities Covered

This general permit authorizes stormwater discharges associated with “industrial activities” as defined in Appendix A from facilities having primary industrial activities included in Table 1-1. This permit is not authorized for use by facilities with stormwater discharges associated with industrial activities on any Indian Country lands in Arizona. USEPA Region 9 is the permitting authority for Indian lands in Arizona.

Permit eligibility is limited to discharges from facilities of industrial activity in Sectors G and J (i.e., the “mining sectors”), summarized in Table 1-1. These sector descriptions are based on Standard Industrial Classification (SIC) Codes and Industrial Activity Codes. References to “sectors” in this permit (e.g., sector-specific monitoring requirements) refer to these groupings.

<table>
<thead>
<tr>
<th>Subsector (May be subject to more than one sector/subsector)</th>
<th>SIC Code or Activity Code</th>
<th>Activity Represented</th>
</tr>
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<tbody>
<tr>
<td>SECTOR G: METAL MINING (ORE MINING AND DRESSING)</td>
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<tr>
<td>G1</td>
<td>1021</td>
<td>Copper Ore and Mining Dressing Facilities</td>
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<td>SECTOR I: RESERVED (OIL AND GAS EXTRACTION)</td>
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<td>J1</td>
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<td>1411</td>
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<td>1481</td>
<td>Non-metallic Minerals Services, Except Fuels</td>
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<td>Miscellaneous Non-metallic Minerals, Except Fuels</td>
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<td>Clay, Ceramic, and Refractory Materials</td>
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<td></td>
<td>1474-1479</td>
<td>Chemical and Fertilizer Mineral Mining</td>
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1 A complete list of SIC Codes (and conversions from the newer North American Industry Classification System (NAICS) can be obtained from the Internet at http://www.osha.gov/pls/imis/sicsearch.html or in paper form from various locations in the document titled Handbook of Standard Industrial Classifications, Office of Management and Budget, 1987. Much of the information in the 1987 Handbook can be obtained from the Internet at http://www.osha.gov/pls/imis/sic_manual.html. Conversions from the NAICS can be obtained from the Internet at www.census.gov/epcd/www/naics.html.

1.1.2 Allowable Stormwater Discharges.

Unless otherwise ineligible under Part 1.1.4, the following are eligible for discharge under this permit:

1. Stormwater discharges associated with industrial activity for any primary industrial activities and co-located industrial activities authorized under this permit, as defined in Appendix A;
2. Discharges designated by ADEQ as needing a stormwater permit as provided in Sector AD;
3. Discharges that are not otherwise required to obtain AZPDES permit authorization but are commingled with discharges that are authorized under this permit; and
4. Discharges subject to any of the effluent limitations guidelines listed in Table 1-2.

| Table 1-2. Stormwater Specific Effluent Limitations Guidelines |
|-------------------|-------------------|----------------|
| Regulated Discharge | 40 CFR Section | MSGP Sector |
| Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities | Part 436, Subparts B, C, and D | J |

1.1.3 Allowable Non-Stormwater Discharges.

Discharges from emergency fire-fighting activities are an allowable non-stormwater discharge activity without regard to the receiving water. The following non-stormwater discharges are allowed under this permit provided they are ancillary to the permitted use:

1. Fire fighting system testing and maintenance, including hydrant flushings;
2. Discharges related to installation and maintenance of potable water supply systems, including disinfection and flushing activities, discharges resulting from pressure releases or overflows, and discharges from wells approved by ADEQ for drinking water use;
3. Uncontaminated condensate from air conditioners, evaporative coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
4. Irrigation drainage and irrigation line flushing;
5. Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
6. Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);
7. Routine external building washdown that does not use detergents;
8. Water used to control dust, provided effluent or other wastewaters are not used;
9. Uncontaminated groundwater or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains);
12. Hydrostatic testing of new pipes, tanks or vessels using potable water, surface water, or uncontaminated groundwater;

13. Discharges of water associated with drilling, rehabilitation and maintenance of potable or non-potable water wells and piezometers, or water supply or water quality evaluations including:
   a. Discharges from any borehole not fully developed;
   b. Well purging;
   c. Well/aquifer pump tests not associated with groundwater remediation activities;
   d. Backflushing of injection wells provided the discharge meets applicable water quality standards; and

14. Non-stormwater discharges subject to an effluent limitation guideline listed in Table 1-2.

1.1.4 Limitations on Coverage.

1.1.4.1 Discharges Mixed with Non-Stormwater. Stormwater discharges that are mixed with non-stormwater, other than allowable non-stormwater discharges listed in Part 1.1.3 are not eligible for coverage under this permit.

1.1.4.2 Stormwater Discharges Associated with Construction Activity. Stormwater discharges associated with construction activity are eligible for coverage under this permit, as specified in Sectors G and J of Part 8 of this permit.

1.1.4.3 Discharges Currently or Previously Covered by another Permit. Unless the permittee receives written notification from ADEQ specifically allowing these discharges to be covered under this permit, the following are not eligible for coverage under this general permit:

   1. Stormwater or non-stormwater discharges associated with industrial activity that is currently covered under an individual AZPDES permit or an alternative AZPDES general permit and has established numeric water quality-based limitations developed for the stormwater component of the discharge; or
   2. Discharges for which any AZPDES permit has been or is in the process of being denied, terminated, or revoked by ADEQ (this does not apply to the routine reissuance of permits every five years).

1.1.4.4 Stormwater Discharges Subject to Effluent Limitations Guidelines. For stormwater discharges subject to effluent limitation guidelines under 40 CFR, Subchapter N, only those discharges identified in Table 1-2 are eligible for coverage under this permit.

1.1.4.5 New Dischargers to Water Quality Impaired Waters. A new discharger to an impaired water, as defined in Appendix A, is not automatically eligible for coverage under this permit.

   1. To receive authorization under this permit, the applicant shall make one of the following demonstrations and retain such data and other technical information onsite with the stormwater pollution prevention plan (SWPPP):

      a. That the facility will employ measures to prevent all exposure to stormwater of the pollutant(s) for which the waterbody is impaired; or
      b. That the discharge from the site has no potential to contain the pollutants causing impairment; or
      c. That the discharge is not expected to cause or contribute to an exceedance of an applicable water quality standard. The applicant shall demonstrate either:

         i. The discharges are subject to stormwater control measures such that the discharges meet the applicable water quality standard, for the parameter causing the impairment, at the point of discharge into the waterbody; or
ii. The discharges are consistent with the provisions of the TMDL, including established TMDL allocations and implementation plans.

*Note:* Pursuant to A.A.C. R18-11-109(D)(2), if a receiving water is impaired for suspended solids, turbidity or sediment/sedimentation, a operator seeking authorization to discharge under this permit may satisfy the requirement of Part 1.1.4.5(1)(c)(i) either by discharging only within the first 48 hours after a local storm event, or by demonstrating that any discharge after that time satisfies the requirements of Part 1.1.4.5(1)(c)(i).

2. The applicant shall submit:
   a. The NOI in accordance with Part 1.3.1;
   b. A copy of the SWPPP. The SWPPP shall describe how the permittee will monitor for pollutants of concern in the discharge in accordance with Part 6.2.3; and
   c. The necessary information or documentation related to the demonstration selected above.

3. If the proposed discharge is to an upstream tributary within 2.5 miles of a water or portion thereof classified as impaired, the applicant shall submit a copy of the SWPPP.

4. Within 32 business days of receipt of information required in Part 1.1.4.5 (2) or (3), ADEQ will notify the applicant in writing that:
   a. It is acceptable to proceed under the general permit;
   b. The SWPPP is incomplete or otherwise deficient and must be revised. The applicant shall submit to ADEQ for review the revised SWPPP that addresses the deficiencies as identified in the notification; or
   c. It is not eligible for coverage under this permit and must apply for an individual permit under Part 1.6.

5. A new discharger to an upstream tributary within 2.5 miles of an impaired water is not required to meet the eligibility requirements set forth above, but must submit a copy of the SWPPP with the NOI and is subject to the additional evaluation requirements set forth in Part 1.3.1(2)(c).

### 1.1.4.6 Discharges to Outstanding Arizona Waters.

1. No new or expanded discharges directly to a water or portion thereof classified as an outstanding Arizona water (OAW) (see A.A.C. R18-11-112) are authorized under this permit.

2. New or expanded discharges to tributaries upstream of a water or portion thereof classified as an OAW are not automatically eligible for coverage under this permit. To receive authorization for a new or expanded discharge to a tributary upstream of a water or portion thereof classified as an OAW, the applicant shall:
   a. Submit the NOI in accordance with Part 1.3.1;
   b. Prepare a SWPPP that demonstrates the discharge will not degrade existing water quality in the downstream OAW and retain documentation supporting this demonstration onsite with the SWPPP. Information relevant to this demonstration may include, but is not limited to, some or all of the following: (1) the distance between the discharge and the water or portion thereof that is OAW; (2) the estimated size (volume) and duration of the discharge; (3) the expected frequency of the discharge; (4) the expected characteristics of the discharge; and (5) the known or expected water quality of the water or portion thereof that is the OAW during storm events; and
   c. If the proposed discharge is to an upstream tributary within 2.5 miles of a water or portion thereof classified as an OAW, submit a copy of the SWPPP that includes a sampling and analysis plan to collect data appropriate to verify the demonstration in subsection b, above.
3. Within 32 business days of receipt of information required in Part 1.1.4.6 (2), ADEQ will notify the applicant in writing that:
   a. It is acceptable to proceed under the general permit;
   b. The SWPPP is incomplete or otherwise deficient and must be revised. The applicant shall submit to ADEQ for review the revised SWPPP, including any additional parameter identified in accordance with Part 6.2.4, that addresses the deficiencies as identified in the notification; or
   c. It is not eligible for coverage under this permit and must apply for an individual permit under Part 1.6.

1.2 Permit Compliance.

Any noncompliance with any of the requirements of this permit constitutes a violation of the Clean Water Act and A.R.S. Title 49, Chapter 2, Article 3.1.

1.3 Authorization under this Permit.

1.3.1 Obtaining Authorization to Discharge.

1. Before obtaining authorization under this permit, the applicant shall:
   a. Ensure the facility is located in Arizona on land that is outside of Indian Country;
   b. Ensure that the facility meets the Part 1.1 eligibility requirements;
   c. Select, design, install, and implement control measures in accordance with Part 2.1;
   d. Develop a SWPPP according to the requirements in Part 5 of this permit. An applicant seeking authorization for a new discharge to or within 2.5 miles of an impaired water (see Part 1.1.4.5) or for a new or expanded discharge within 2.5 miles of an Outstanding Arizona Water (see Part 1.1.4.6) is required to submit a copy of the SWPPP, to the Department for review, along with the NOI in subsection (e);
   e. Submit to the Department a complete and accurate Notice of Intent (NOI) Form (either an original, or a photocopy/reproduction) in accordance with A.A.C. R18-9-C901(D) to the address listed in Part 7.6. Other NOI options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice.

If the facility has the potential to discharge to a regulated municipal separate storm sewer system (MS4), the applicant must provide:
   o The name of the MS4 operator in Section E of the NOI; and
   o Name of closest surface water receiving the discharge.

The NOI form is available at http://www.azdeq.gov/environment/water/permits/stormwater.html

2. Authorization to Discharge

   a. Routine Authorizations

   Unless otherwise notified, the applicant is authorized to discharge stormwater from an eligible facility upon either: receipt of the Authorization to Discharge; or 7 calendar days after a complete and accurate NOI is received by the Department, whichever is earlier.

   However, in order to rely on this 7 calendar day provision, the operator must submit the NOI in a manner that documents the date of ADEQ’s receipt (i.e., certified mail, hand delivery, fax, etc.).

   b. Authorizations to Discharge for New Dischargers to Impaired Waters and New or Expanded Discharges to Tributaries of OAWs

   Unless otherwise notified, an applicant subject to Part 1.1.4.5 or 1.1.4.6 is authorized to discharge stormwater from an eligible facility upon receipt of the Authorization to
Discharge or 32 business days after a complete and accurate NOI is received by the Department, whichever is earlier.

c. NOIs Requiring Additional Evaluation.
ADEQ may inform an applicant that authorization to discharge will not occur for up to 32 business days in the event that screening of the NOI provides information requiring further evaluation. ADEQ’s notification may be made either in writing, electronically, by fax or phone. The notification typically will be made within 7 calendar days after receipt of the NOI. Applicants who receive notice of a delay in coverage may discharge 32 business days after the date the NOI is received unless further notice is received from ADEQ during this timeframe. Such notice may confirm authorization to discharge, or request additional information to comply with the requirements of this permit.

d. Requirement to Obtain Alternate Coverage.
ADEQ may require the operator to submit an application for an individual AZPDES permit, as detailed in Part 1.6.1. In these instances, ADEQ will notify the operator in writing of: 1) the delay; or 2) the request for submission of an individual AZPDES permit application.

e. Discharges to a regulated MS4.
Permittees with discharges to a regulated MS4 shall submit to the MS4 operator a copy of the Department’s Authorization to Discharge.

3. Incomplete NOI Submitted. If ADEQ notifies the applicant that an NOI is incomplete or incorrect, the applicant must resubmit an amended NOI if the applicant still intends to obtain (or retain) coverage under this permit.

4. The time frames for discharge authorization are presented in Table 1-3, below.

<table>
<thead>
<tr>
<th>Category</th>
<th>NOI Submission Deadline</th>
<th>Discharge Authorization Status</th>
</tr>
</thead>
</table>
| **Existing Dischargers** – authorized for coverage under MSGP 2000. | The operator shall revise SWPPP documents to conform with this permit and apply for coverage no later than May 31, 2011. | Coverage under the MSGP 2000 is administratively continued until ADEQ:  
• Grants the applicant coverage under this permit (in accordance with Part 1.3.1(2)); or  
• Issues or denies an alternative permit in accordance with Part 1.6.1. |
| **Other Eligible Dischargers** – in operation prior to the effective date of this permit, but did not obtain coverage under the MSGP 2000 or another AZPDES permit. | The operator shall develop SWPPP documents to conform with this permit and apply for coverage no later than May 31, 2011. | Coverage will begin upon ADEQ issuance of an Authorization to Discharge (in accordance with Part 1.3.1(2)). |
| **New Dischargers** – will commence discharging after the effective date of this permit | As soon as possible, and at least 32 business days before discharge is anticipated. | Coverage begins upon ADEQ’s issuance of an Authorization to Discharge (in accordance with Part 1.3.1(2)). |
Table 1-3. NOI Submittal Deadlines

<table>
<thead>
<tr>
<th>Category</th>
<th>NOI Submission Deadline</th>
<th>Discharge Authorization Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change of ownership</strong> and/ or</td>
<td>Permitted owner/operator shall submit a NOT to ADEQ within 30 calendar days after the new owner/operator assumes responsibility for the facility. New owner/operator shall submit a NOI to ADEQ 7 calendar days before taking over operational control or initiating activities at the facility.</td>
<td>New owner/operator obtains coverage.</td>
</tr>
<tr>
<td>operation to a new owner/operator of an existing facility (discharger) whose discharge is authorized under this permit.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.3.2 Continuation of this Permit.

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with A.A.C. R18-9-C903(A) and remain in force and effect. If the operator is authorized to discharge under this permit prior to the expiration date, any discharges authorized under this permit will automatically remain covered by this permit until the earliest of:

1. The operator submits a timely, complete, and accurate NOI requesting authorization to discharge under a renewal or revision of this permit and ADEQ issues an Authorization to Discharge; or
2. The operator submits a Notice of Termination; or
3. ADEQ denies coverage under this general permit or denies or issues coverage under an individual permit or other alternative permit for the facility’s discharges; or
4. A formal permit decision is made by ADEQ not to reissue this general permit, at which time ADEQ will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.

1.4 Terminating Coverage.

To terminate permit coverage, the permittee shall submit a complete and accurate Notice of Termination (NOT) form to the address listed in Part 7.6. Other NOT options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet of by public notice. The facility’s authorization to discharge under this permit terminates at midnight of the day that a complete NOT form is received by the department. The permittee shall submit an NOT within 30 calendar days after a new owner or operator assumes ownership of or has taken over responsibility for the facility.

The permittee shall also submit an NOT when there are not or no longer will be discharges of stormwater associated with industrial activity from the facility.

The permittee is responsible for meeting the terms and conditions of this permit until the facility’s authorization is terminated.

1.5 Inactive and Unstaffed Sites – Conditional Exemption from No Exposure Requirements.

 Permit holders of inactive and unstaffed mining facilities may qualify for reduced inspections and monitoring provisions of the no exposure provisions of Parts 4.4 and 6.2.1.3, without certifying “there are no industrial materials or activities exposed to stormwater”. This exemption is predicated on the following:
To the extent practicable, the permittee shall implement the following control measures:

- Industrial materials used in the operations will be removed, covered or kept in appropriate containers or within containment if applicable so as to minimize discharges of stormwater associated with industrial activity as outlined in the facility’s SWPPP; and
- Stockpiles, waste rock, tailings and other spoil or waste piles shall be protected from erosion and/or downstream catchments shall be installed and maintained.

If circumstances change and the facility becomes active and/or staffed, this exemption no longer applies and the permittee shall immediately begin complying with the inspection requirements as if the facility were in the first year of permit coverage, including the requirements for the routine quarterly inspections (Part 4.1), wet season visual assessments (Part 4.2), the annual comprehensive facility inspections (Part 4.3) and applicable general analytical monitoring requirements (Part 6.2.1).

ADEQ retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause, or contribute to an exceedance of an applicable water quality standard, including designated uses.

To invoke the exemption for an inactive, unstaffed site, the permittee shall do the following:

- Maintain a statement in the SWPPP as required in Part 5.1.5.3 indicating that the site is inactive and unstaffed, in accordance with the substantive requirements of this section. The statement must be signed and certified in accordance with Appendix B, Subsection 9.
- If, during the period of coverage under this permit, the facility becomes qualified for the inactive and unstaffed exemption, the permittee shall include the same signed and certified statement as above and retain it with the facility’s records pursuant to Part 5.4.

Subject to the requirements above, if the facility is inactive and unstaffed, the permittee is waived from the requirement to conduct routine facility inspections, wet season visual assessments and general analytical monitoring. The permittee shall conduct one comprehensive facility inspection (CFI) each calendar year in accordance with Part 4.3. The permittee shall also inspect the site whenever there is a reasonable expectation that severe weather or other events may have damaged control measures or increased discharges.

1.6 Alternative Permits.

1.6.1 ADEQ Requiring Coverage under an Alternative AZPDES Permit.

ADEQ may require an operator to obtain authorization to discharge under either an individual AZPDES permit or an alternative AZPDES general permit in accordance with A.A.C. R18-9-C902(A). If ADEQ requires an operator to apply for an individual permit, any applications shall be submitted within 120 calendar days, unless ADEQ provides an extended deadline. In addition, a discharger already authorized under this permit, will be notified of a deadline to file a permit application. Coverage under this permit will terminate immediately if the facility fails to submit an individual AZPDES permit application by the specified deadline. ADEQ may take appropriate enforcement action for any unpermitted discharge.

1.6.2 Permittee Requesting Coverage under an Alternative Permit.

An applicant may elect to forego coverage under this general permit by applying for an individual permit. In such a case, the applicant must submit an individual permit application in accordance with the requirements of A.A.C. R18-9-B901(B)(2) to the Department at the address listed in Part 7.6 and include reasons supporting the request. The request may be granted by issuance of an individual permit or authorization of coverage under an alternative general permit if the Department finds that the reasons are adequate to support the request.

When an individual AZPDES permit is issued to the applicant or the applicant is authorized to discharge under an alternative AZPDES general permit, the authorization to discharge under this permit is terminated on the effective date of the individual permit or the date of authorization of coverage under
the alternative general permit.

2.0 Control Measures, Numeric Effluent Limitations and Water Quality Standards.

In Part 2.1 (Control Measures) and in Part 8 (Sector-Specific Requirements for Industrial Activity), the term "minimize" means reduce and/or eliminate to the extent achievable using control measures that are technologically available, economically practicable and achievable in consideration of best industry practice to meet any applicable numeric effluent limitations in Part 2.2.1 and the water-quality based requirements in Parts 2.2.2 and 2.2.3.

The requirement to implement control measures in accordance with Part 2.1 applies to all facilities. Part 8 contains additional control measures imposed on a sector-specific basis. In some cases, sector-specific provisions in Part 8 modify the terms of the general control measures set forth in Part 2.1.

2.1 Control Measures.

The permittee shall select, design, install, and implement control measures (including best management practices), as appropriate, to ensure the discharge meets the requirements of Part 2.2. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer’s specifications. If construction or a change in design, operation, or maintenance at the facility significantly changes the nature of pollutants discharged in stormwater, or significantly increases the quantity of pollutants discharged, the permittee shall review the selection, design, installation, and implementation of the facility’s control measures to determine if modifications are necessary to meet the requirements of this permit. If the facility’s control measures are not achieving their intended effect of minimizing pollutant discharges, the permittee shall modify these and/or add additional control measures to meet requirements of this permit. Regulated stormwater discharges from the facility include stormwater run-on that commingles with stormwater discharges associated with industrial activity at the facility.

The permittee shall consider all of the control measures listed below for implementation at the facility and select those that the permittee determines are appropriate, given the nature of the site, to meet the requirements set forth in Parts 2.1.1 and 2.2. The control measures listed below are not intended to be an exclusive list of acceptable control measures. In preparing the SWPPP in accordance with the requirements in Part 5 of this permit, the permittee shall explain the basis for the selection of the control measures to be utilized at the facility.

2.1.1 Control Measure Selection and Design Considerations.

The permittee shall assess the type and quantity of pollutants likely to discharge in stormwater or allowable non-stormwater from the site when designing and implementing control measures. The permittee shall select and design control measures incorporating one or more of the following principles:

- Preventing stormwater from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from stormwater;
- Using control measures in combination is more effective than using control measures in isolation for minimizing pollutants in the facility’s stormwater discharge;
- Attenuating high discharge flows with such control measures as using open vegetated swales and natural depressions to reduce in-stream impacts of erosive flows;
- Conserving and/or restoring of riparian buffers help protect streams from stormwater runoff and improve water quality; and
- Using containment to intercept stormwater flows before they leave the site, such as directing flows to non-discharging areas (pits), or installing runoff containment.

2.1.1.1 Minimize Exposure. The permittee shall minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff by implementing measures such as the following:
Locating industrial materials and activities inside or protect them with storm resistant coverings (although significant enlargement of impervious surface area is not recommended);

Covering fueling area(s) or minimize stormwater run-on/runoff to fueling area(s);

Using grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;

Locating materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas);

Using spill/overflow protection and cleanup equipment;

Draining fluids from equipment and vehicles prior to on-site storage or disposal;

Performing all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray; and

Ensuring that all washwater drains to a proper collection system (i.e., not the stormwater drainage system).

The discharge of vehicle and equipment washwater, including tank cleaning operations, is not authorized by this permit. These wastewaters must be covered under a separate AZPDES permit, discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements, or disposed of otherwise in accordance with applicable law.

2.1.1.2 **Good Housekeeping.** The permittee shall implement good housekeeping measures for all exposed areas that are potential sources of pollutants. Such measures may include:

- Sweeping at regular intervals;
- Keeping materials orderly and labeled;
- Storing materials in appropriate containers;
- Cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;
- Using drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible.

2.1.1.3 **Maintenance.** The permittee shall regularly inspect, test, maintain, and repair all industrial equipment and systems that have the potential for exposure to stormwater to avoid situations that may result in leaks, spills, and other releases of pollutants to stormwater discharged from the site. The permittee shall maintain all control measures and equipment in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If the permittee discovers control measures are not achieving the intended effect of minimizing pollutant discharges (i.e., control measures need repair or replacement), the permittee shall make any necessary changes within 14 calendar days following discovery, or before the next measurable storm event (see Part 6.1.2.2), whichever is sooner, to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based limitations in Parts 2.2.2 and 2.2.3 of this permit. If necessary changes cannot be implemented within the specified timeframe(s), the permittee shall document with the SWPPP the reasons for the delay, a schedule for completing the necessary changes, date completed and any back-up control measures in place to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based limitations in Parts 2.2.2 and 2.2.3 of this permit should a runoff event occur while a control measure is off-line (either in part or in whole).

2.1.1.4 **Spill Prevention and Response Procedures.** The permittee shall minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for timely and effective clean-up of spills if or when they occur by implementing measures such as:
• Procedures for plainly labeling containers (e.g., “Used Oil,” “Spent Solvents,” “Fertilizers and Pesticides,” etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;

• Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;

• Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause or detect a spill or leak should be knowledgeable in the proper reporting procedures established by their facility. Employees who are responsible for spill response and/or cleanup, must be properly trained and have necessary spill response equipment available; and

• Procedures for notification of appropriate facility personnel and emergency response. Where a leak, spill, or other release occurs that contains a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, the permittee shall notify ADEQ Emergency Response Duty Office at (602) 771-2330 or, toll free, at (800) 234-5677. Contact information must be in locations that are readily accessible and available.

2.1.1.5 Erosion and Sediment Controls. The permittee shall minimize on-site erosion and sedimentation, and the resulting discharge of pollutants by using methods such as:

• Stabilizing exposed areas;

• Containing runoff using structural and/or non-structural control measures;

• Placing flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants.

[Note: In selecting, designing, installing, and implementing appropriate control measures, permittees are encouraged to consult EPA’s internet-based resources relating to BMPs for erosion and sedimentation, including the sector-specific Industrial Stormwater Fact Sheet Series, (www.epa.gov/npdes/stormwater/msgp), National Menu of Stormwater BMPs (www.epa.gov/npdes/stormwater/menuofobmps), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (www.epa.gov/owow/nps/urbanmm/index.html).]

2.1.1.6 Management of Runoff. The permittee shall reduce stormwater runoff to minimize the discharge of pollutants from the facility by implementing control measures such as:

• Diverting, infiltrating, reusing, containing runoff, or

• Treating and/or recycling stormwater runoff collected.

[Note: In selecting, designing, installing, and implementing appropriate control measures, permittees are encouraged to consult EPA’s internet-based resources relating to runoff management, including the sector-specific Industrial Stormwater Fact Sheet Series, (www.epa.gov/npdes/stormwater/msgp), National Menu of Stormwater BMPs (www.epa.gov/npdes/stormwater/menuofobmps), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (www.epa.gov/owow/nps/urbanmm/index.html).]

2.1.1.7 Salt Storage Piles or Piles Containing Salt. The permittee shall enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if stormwater runoff from the piles is not discharged or if discharges from the piles are authorized under another AZPDES permit.

2.1.1.8 Sector Specific Control Measures. The permittee shall implement any additional control measures in the relevant sector-specific section(s) of Part 8, as appropriate.

2.1.1.9 Employee Training. The permittee shall train all employees who work in areas where
industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the facility's stormwater pollution prevention team (see Part 5.1.1). Training must cover both the specific control measures used to achieve the requirements in Part 2.2 and (for those who will be involved in these activities) the monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit. Training shall be conducted at least annually (or more often if circumstances warrant, such as high employee turnover).

2.1.1.10 Non-Stormwater Discharges. The permittee shall not allow any non-stormwater discharges from the facility unless they are specifically authorized in Part 1.1.3.

2.1.1.11 Litter, Garbage and Floatable Debris. The permittee shall ensure that litter, garbage, and floatable debris are not discharged to surface waters by keeping exposed areas free of such materials or by intercepting them before they leave the site.

2.1.1.12 Dust Generation and Vehicle Tracking of Industrial Materials. The permittee shall minimize generation of dust and off-site tracking of raw, final, or waste materials.

2.2 Numeric Effluent Limitations and Water Quality Standards.

2.2.1 Numeric Effluent Limitations Based on Effluent Limitations Guidelines.

Table 2-1 below identifies specific regulated activities with effluent limitations guidelines and the locations of effluent limitations guidelines in this permit. Discharges from such activities must meet the specified effluent limitations guidelines. Compliance with these effluent limits is to be determined based on discharges from these regulated activities independent of commingling with any other discharges allowed under this permit.

<table>
<thead>
<tr>
<th>Regulated Activity</th>
<th>40 CFR Part/Subpart</th>
<th>Effluent Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine dewatering discharges at crushed stone, construction sand and gravel, or</td>
<td>Part 436, Subparts B, C, or D</td>
<td>See Part 8.J.9</td>
</tr>
<tr>
<td>industrial sand mining facilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2.2 Water Quality Standards.

The permittee shall control discharge from the facility as necessary to not cause or contribute to an exceedance of an applicable water quality standard. ADEQ expects that compliance with other conditions in this permit will control discharges as necessary to not cause or contribute to an exceedance of an applicable water quality standard (A.A.C.R18-11, Article 1). However, if at any time the permittee becomes aware, or ADEQ determines, that the facility's discharge causes or contributes to an exceedance of an applicable water quality standard, the permittee shall take corrective action as required in Part 3.1, document the corrective actions as required in Parts 3.3 and 5.4, and report the corrective actions to ADEQ as required in Part 7.2.

Additionally, ADEQ may impose additional water quality-based requirements on a site-specific basis, or require the operator to obtain coverage under an individual permit in accordance with Part 1.6.1, if information in the Notice of Intent (NOI), required reports, or from other sources indicates the discharges are not controlled as necessary to not cause or contribute to an exceedance of an applicable water quality standard.
2.2.3 Discharges to Water Quality Impaired Waters.

2.2.3.1 Existing Discharges to an Impaired Water with an Approved TMDL. If the discharge is to an impaired water with or is otherwise referenced in an approved TMDL, the Department may require, as a condition of authorization, additional limits, controls, or monitoring necessary to be consistent with the assumptions of any available wasteload allocation in the TMDL. Alternatively, ADEQ will advise the permittee if coverage under an individual permit is necessary in accordance with Part 1.6.

2.2.3.2 Existing Discharges to an Impaired Water without an Approved TMDL. If the discharge is to an impaired water without an approved TMDL, the permittee shall comply with Part 2.2.2 and the monitoring requirements of Part 6.2.3. This subsection applies to discharges directly to impaired waters as well as to situations where ADEQ determines that the facility’s discharge is not controlled as necessary to meet water quality standards in a downstream water segment, even if the discharge is to a receiving water that is not specifically identified on a Section 303(d) list.

2.2.3.3 New Discharges to an Impaired Water. If the permittee’s authorization to discharge under this permit relied on Part 1.1.4.5 for a discharge to an impaired water, the permittee shall implement and maintain any control measures or conditions on the facility that enabled it to become eligible under Part 1.1.4.5. The permittee shall modify such measures or conditions as necessary in accordance with any Part 3 corrective actions. In addition, the permittee shall comply with Part 2.2.2 and the monitoring requirements of Part 6.2.3.

3.0 Corrective Actions.

3.1 Corrective Action Triggers.

3.1.1 Conditions Requiring Review and Revision of Control Measures to Eliminate a Problem.

If any of the following conditions occur resulting in or from a failure of a control measure, the permittee shall review the selection, design, installation, and implementation of the facility’s control measures and revise as necessary to ensure that the condition is eliminated:

- An unauthorized discharge (e.g., discharge of non-stormwater not authorized by this or another AZPDES permit) to a water of the U.S. or to a regulated MS4 occurs at the facility (Part 2.1);
- A discharge violates a numeric effluent limitation guideline (Table 2-1);
- The permittee becomes aware, or ADEQ determines, that the facility’s discharge causes or contributes to an exceedance of applicable water quality standard(s) (Part 2.2.2) or an adopted waste load allocation (WLA) (Part 2.2.3); or
- ADEQ, or an operator of a regulated MS4, determines that modifications to the control measures are necessary to meet the requirements of Part 2.2.

3.1.2 Substantially Identical Outfalls.

If the event triggering corrective action is linked to an outfall that represents other substantially identical outfalls, the facility’s review must assess the need for corrective action for each outfall represented by the outfall that triggered the review.

3.2 Corrective Action Deadlines.

The permittee shall document the discovery of any of the conditions listed in Part 3.1 within 72 hours of making such discovery. Within 14 calendar days of such discovery, the permittee shall document any corrective action(s) taken or to be taken to eliminate or further investigate the condition, or if no corrective action is needed, the basis for that determination. The specific documentation required within 72 hours and 14 calendar days is detailed in Part 3.3. When actions are determined necessary, the permittee shall make any necessary changes within 14 calendar days following discovery, or before the
next measurable storm event (see Part 6.1.2.2), whichever is sooner, to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit. If necessary changes cannot be implemented within the specified timeframe(s), the permittee shall document with the SWPPP the reasons for the delay, a schedule for completing the necessary changes, date completed and any back-up practices in place to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit should a runoff event occur while a control measure is off-line.

3.3 Corrective Action Report.

1. Within 72 hours of discovery of any condition listed in Part 3.1, the permittee shall document the following information, which shall be maintained with the SWPPP:
   a. Identification of the condition triggering the need for corrective action review;
   b. Description of the problem identified; and
   c. Date the problem was identified.

2. Within 14 calendar days of discovery of any condition listed in Part 3.1, the permittee shall document and maintain with the SWPPP the following information:
   a. Summary of corrective action taken or to be taken;
   b. Whether SWPPP modifications are required as a result of this discovery or corrective action;
   c. Date corrective action initiated or will be initiated; and
   d. Date corrective action completed or expected to be completed.

3. When any condition listed in Part 3.1 occurs, a permittee that operates a facility that discharges to an impaired water or OAW shall submit this documentation in an annual report as required in Part 7.2 and retain a copy of the corrective action report onsite with the SWPPP as required in Part 5.4.

4.0 Inspections.

   The permittee shall conduct inspections in accordance with Parts 4.1, 4.2, and 4.3 of this permit at the facility. If, during any quarterly routine facility inspection, visual assessment, or comprehensive facility inspection, or any other time, the facility’s control measures are found to be inadequate or otherwise not be properly operated and / or maintained, the permittee shall review the selection, design, installation, and implementation of the control measures to determine if maintenance and/or modifications are necessary to meet the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit, in accordance with the requirements of Part 2.1.1.3. Such modifications shall be documented in the SWPPP and implemented as expeditiously as practicable.

   Additional sector-specific inspection requirements may be described in Part 8 of this permit. If a conflict exists between the two, the requirements of Part 8 shall prevail.

4.1 Routine Facility Inspections.

4.1.1 Routine Facility Inspection Procedures.

   The permittee shall conduct routine inspections of all areas of the facility where industrial materials or activities are exposed to stormwater with the potential to discharge from the facility, and of all stormwater control measures used to comply with this permit. Such routine inspections shall be conducted at least once each calendar quarter beginning with the first full calendar quarter after the facility becomes covered under this permit (see Part 1.3.1(2) and Table 1-3). More frequent inspections (e.g., monthly) may be appropriate for some types of equipment, processes, and control measures or areas of the facility with significant activities and materials exposed to stormwater. The permittee shall specify the relevant inspection schedules in the SWPPP document as required in Part 5.1.5.

   A qualified person or persons (see definition in Appendix A) shall conduct routine facility
inspections. A member of the stormwater pollution prevention team (see Part 5.1.1) shall conduct or participate in the inspections. Inspections shall be performed during periods when the facility is in operation (i.e., is not inactive and unstaffed in accordance with the requirements of Part 1.5). The permittee shall initiate at least one of the routine facility inspections each calendar year while a stormwater discharge is occurring at one or more outfalls, but in no case later than 24 hours or the first business day (whichever comes later) following the end of the measurable storm event.

If there is no measurable storm event(s) during a calendar year, the permittee shall document the inability to perform an inspection during a measurable storm event as described in Part 5.4. In any case, the permittee must still complete routine quarterly inspections.

### 4.1.2 Routine Facility Inspection Documentation.

The permittee shall document the findings of each routine facility inspection performed and maintain this documentation with the SWPPP as required in Part 5.4. Inspection findings do not need to be submitted to ADEQ, unless specifically requested. At a minimum, the documentation for each routine facility inspection must include:

- The inspection date and time;
- The name(s) and signature(s) of the inspector(s);
- Weather information and a description of any discharges occurring at the time of the inspection;
- Evidence demonstrating that previously unidentified discharges of pollutants have occurred from the site;
- Any control measures needing maintenance or repairs;
- Any failed control measures that need replacement;
- Any other evidence of deviations from the permit or SWPPP observed; and
- Any additional control measures needed to comply with the permit requirements.

### 4.2 Visual Assessment of Stormwater Discharges.

The permittee shall perform two visual assessments during the summer wet season and two visual assessments during the winter wet season when the facility is discharging.

Wet seasons, for the purposes of visual assessments, are defined as follows:

- Summer wet season: June 1 – October 31
- Winter wet season: November 1 – May 31

The term ‘wet season’ applies statewide and includes areas of the state where freezing conditions exist that prevent runoff from occurring for extended periods. In areas where freezing conditions exist, the four visual assessments may be distributed during seasons when precipitation runoff occurs.

Visual assessment monitoring requirements in this permit begin immediately after authorization to discharge is received by the permittee unless authorization is received 90 calendar days or more after a wet season has begun, in which case visual assessment monitoring shall commence with the start of the next wet season.

### 4.2.1 Visual Assessment Procedures.

Visual assessment samples are not required to be collected consistent with 40 CFR Part 136 procedures.

The visual assessment shall be made:

- Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;
• On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and the permittee shall document why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, samples shall be taken during a period with a measurable discharge from the facility (see also Part 6.1.2.3); and

• On discharges that occur at least 72 hours (3 calendar days) from a previous discharge (see also Part 6.1.2.2).

The permittee shall visually inspect the sample for the following water quality characteristics:

• Color;
• Odor;
• Clarity;
• Floating solids;
• Settled solids;
• Suspended solids;
• Foam;
• Oil sheen; and
• Other obvious indicators of stormwater pollution.

4.2.2 Visual Assessment Documentation.

The permittee shall document the results of the visual assessments and maintain this documentation with the SWPPP as required in Part 5.4. The visual assessment findings need not be submitted to ADEQ, unless specifically requested by the Department. At a minimum, the documentation of the visual assessment shall include:

• Sample location(s);
• Sample collection date and time, and visual assessment date and time for each sample;
• Personnel collecting the sample and performing visual assessment, and their signatures;
• Nature of the discharge (i.e., runoff or snowmelt);
• Results of observations of the stormwater discharge;
• Probable sources of any observed stormwater contamination; and
• If applicable, why it was not possible to take samples within the first 30 minutes.

4.2.3 Exceptions to Visual Assessments.

Absence of Discharge: If no storm event results in a discharge from the facility or outfall(s) during a wet season, the permittee is excused from visual assessment for the facility or outfall(s) for that season provided the permittee documents the monitoring records and retains with the SWPPP why a sample could not be collected.

Adverse Conditions: Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling unsafe.

When adverse conditions prevent the collection of either visual assessment sample in a given wet season, the permittee shall document those conditions with the SWPPP and resume visual assessment monitoring in the subsequent wet season.

Substantially identical outfalls: If the facility has two or more outfalls that discharge substantially identical pollutants, as documented in Part 5.1.5.2, the permittee may conduct visual assessments of the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s). If possible, visual assessments of each substantially identical outfall shall be performed on a rotating basis throughout the period of coverage under this permit.
If a visual assessment performed on a sample collected at a substantially identical outfall demonstrates that control measures are not functioning as intended, the permittee shall assess and modify the control measures as appropriate for that outfall and, if necessary, other outfalls represented by the monitored outfall.

4.3 Comprehensive Facility Inspections.

4.3.1 Comprehensive Facility Inspection Procedures.

The permittee shall conduct annual comprehensive facility inspections while covered under this permit. Annual, as defined in this Part, means once per calendar year, but not within 6 months of the previous inspection for the facility throughout the duration of permit coverage.

If the facility’s coverage is administratively continued after the expiration date of this permit, the permittee shall continue to perform inspections annually until no longer covered by this permit.

A qualified person or persons shall conduct comprehensive facility inspections (CFI). A member of the facility’s stormwater pollution prevention team shall conduct or participate in the inspection. CFIs must cover all areas of the facility affected by the requirements in this permit, including areas identified in the SWPPP as potential pollutant sources (see Part 5.1.3) where industrial materials or activities are exposed to stormwater with the potential to discharge from the facility, any areas where control measures are used to comply with the permit, and areas where significant spills (or spills that would contribute to the discharge of pollutants in stormwater) and leaks have occurred in the past 3 years. CFIs must also include a review of monitoring data collected in accordance with Part 6.2.

Inspectors must evaluate the results of the past year’s visual assessments and analytical monitoring when planning and conducting inspections to determine potential areas of concern for stormwater pollution. Inspectors shall look for the following:

- Industrial materials, residue, or trash that may have or could come into contact with stormwater;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas; and
- Control measures needing replacement, maintenance, or repair.

Inspectors shall examine all stormwater control measures required by this permit to ensure that they are functioning correctly. If discharge locations are inaccessible, nearby downstream locations shall be inspected.

The facility’s annual CFI may also be used as one of the routine inspections required by Part 4.1, provided that all components of both types of inspections are included.

4.3.2 Comprehensive Facility Inspection Documentation.

All permittees shall document the findings of each CFI and maintain this documentation with the SWPPP. At a minimum, the following information shall be included:

- The date of the inspection;
- The name(s) and title(s) of the personnel making the inspection;
- Findings from the examination of areas of the facility identified in Part 4.3.1;
- All observations relating to the implementation of the control measures including:
  - Previously unidentified discharges from the site,
  - Previously unidentified pollutants in existing discharges,
  - Evidence of, or the potential for, pollutants entering the drainage system that are not contemplated in the SWPPP;
4.4 Exceptions for Inspection Requirements for Inactive and Unstaffed Mining Sites

Each calendar year, a permit holder of an inactive and unstaffed mining facility shall conduct one comprehensive facility inspection in accordance with the requirements of Part 4.3. The permittee shall also inspect the site whenever there is a reasonable expectation that severe weather or other events may have damaged control measures or increased discharges. The permittee is waived from general analytical monitoring, routine facility inspections and visual assessments inspection requirements in accordance with Part 1.5.

Although stormwater monitoring is not waived for inactive and unstaffed mining sites that discharge to impaired waters, the monitoring frequency is reduced in accordance with Part 6.2.3.3.

5.0 Stormwater Pollution Prevention Plan (SWPPP)

The permittee shall prepare a SWPPP for the facility, or review and update an existing one, as appropriate, before submitting the Notice of Intent (NOI) for permit coverage. The SWPPP shall document the basis for selection, design, and installation of control measures utilized at the facility. The additional documentation requirements (see Part 5.4) are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements. Additional sector-specific SWPPP requirements may be described in Part 8 of this permit. If a conflict exists between the two, the requirements of Part 8 shall prevail.

5.1 Contents of the SWPPP.

The SWPPP shall contain all of the following elements:

- Identification of the stormwater pollution prevention team (see Part 5.1.1);
- Site description (see Part 5.1.2);
- Summary of potential pollutant sources (see Part 5.1.3);
- Description of control measures (see Part 5.1.4);
- Schedules and procedures (see Part 5.1.5);
- Signature requirements (see Part 5.1.6);
- Identify each outfall authorized by this permit and describe the rationale for any substantially identical outfall determinations; and
- Sampling and analysis plan (SAP) (see Part 6.1.3).

Where the SWPPP refers to procedures in other facility documents, such as other environmental permits, a Spill Prevention, Control and Countermeasure (SPCC) Plan or an Environmental Management System (EMS) developed for an Environmental Performance Track facility, copies of the relevant portions of those documents must be kept with the SWPPP.
5.1.1 Stormwater Pollution Prevention Team.

The permittee shall identify the members (by name or title) that comprise the facility’s stormwater pollution prevention team as well as their individual responsibilities. The team may include members who are not employed by the facility (such as third party consultants). The stormwater pollution prevention team is responsible for assisting the facility manager in developing and revising the SWPPP as well as maintaining control measures and taking corrective actions where required. Each member of the stormwater pollution prevention team must have access to either an electronic or paper copy of applicable portions of this permit and the SWPPP.

5.1.2 Site Description.

The SWPPP shall include all of the following:

1. **Activities at the Facility.** Provide a description of the nature of the industrial activities at the facility.

2. **General location map.** Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of the facility and surface waters receiving stormwater discharges from the facility.

3. **Site map.** Provide a legible site map (or maps) completed to scale, that identifies at a minimum the:
   - Size of the property in acres;
   - Location of significant structures;
   - Directions of stormwater flow (e.g., use arrows);
   - Locations of stormwater conveyances (e.g., ditches, pipes, and swales);
   - Locations of all existing structural control measures;
   - Locations of surface waters receiving the facility’s discharges and any impaired waters or OAWs within 2.5 miles downstream of the facility;
   - Locations where the facility’s stormwater discharges to a regulated MS4 (where applicable);
   - Locations of potential pollutant sources identified under Part 5.1.3.2;
   - Locations where significant spills or leaks identified under Part 5.1.3.3 have occurred;
   - Locations of all stormwater monitoring points;
   - Locations of stormwater outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2, etc), indicating whether one or more outfalls are being treated as “substantially identical” under Parts 4.2.3, 5.1.5.2, and 6.1.1.1 and an approximate outline of the areas draining to each outfall;
   - Identification of all outfalls having the potential to contain allowable non-stormwater discharges under Part 1.1.3 and the corresponding type(s) of discharges;
   - Location of on-site drywell(s); include a list of the on-site drywells and their registration number(s);
   - Locations of the following activities where such activities are exposed to stormwater with potential to discharge from the facility:
     - fueling stations;
     - vehicle and equipment maintenance and/or cleaning areas;
     - loading/unloading areas;
     - locations used for the treatment, storage, or disposal of wastes;
     - liquid storage tanks;
     - processing and storage areas;
     - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
     - transfer areas for substances in bulk; and
5.1.3 Summary of Potential Pollutant Sources.

The permittee shall describe in the SWPPP areas at the facility where industrial materials or activities are exposed to stormwater with the potential to discharge and from which allowable non-stormwater discharges are released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. Material handling activities include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For each area identified, the description must include:

5.1.3.1 Activities in the area A list of the industrial activities exposed to stormwater (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).

5.1.3.2 Pollutants A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity. The pollutant list must include all significant materials that are handled, treated, stored, or disposed, and that have been exposed to stormwater including any past activities or incidents that may impact present stormwater discharges (see Note in Part 5.1.3.3).

5.1.3.3 Spills and Leaks The permittee shall document where significant spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfall(s) that would be impacted by stormwater in contact with such spills and leaks. The permittee shall also document all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the 3 years prior to the date that the SWPPP was prepared or amended.

Note: Significant spills and leaks include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under CWA Section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC §9602. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 relating to spills or other releases of oils or hazardous substances.

5.1.3.4 Unauthorized Non-Stormwater Discharges Unauthorized non-stormwater discharges are those not specifically allowed under Part 1.1.3. The permittee shall identify and evaluate all unauthorized non-stormwater discharges. Documentation of this evaluation shall include:

- The date of the evaluation;
- A description of the evaluation criteria used;
- A list of the outfalls and/ or upgradient drainage locations that were directly observed during the evaluation;
- The different types of unauthorized non-stormwater discharge(s) and source locations; and
- The action(s) taken, such as a list of control measures used to eliminate unauthorized non-stormwater discharge(s), if any were identified or obtaining an AZPDES permit for the discharge. For example, a floor drain was sealed, a sink drain was re-routed to the sanitary sewer, or an AZPDES permit application was submitted for an unauthorized cooling water discharge.

5.1.3.5 Salt Storage The permittee shall document the location of any storage piles containing salt used for deicing or other commercial or industrial purposes.
5.1.3.6 **Sampling Data** The permittee shall summarize all stormwater discharge sampling data collected at the facility during the previous permit term.

5.1.4 **Description of Control Measures.**

The permittee shall describe in the SWPPP the location and type of control measures installed and implemented at the site to comply with Parts 2 and 8 of this permit. This documentation must describe how the control measures at the site address both the pollutant sources identified in Part 5.1.3 and any stormwater run-on that commingles with any discharges covered under this permit.

5.1.5 **Schedules and Procedures.**

5.1.5.1 **Control Measures.**

The following must be described in the SWPPP:

- Good Housekeeping measures, procedures and related schedules (See Part 2.1.1.2);
- Maintenance measures, procedures and related schedules (See Part 2.1.1.3) – Preventative maintenance procedures, including regular inspections, testing, maintenance, and repair of all industrial equipment and systems exposed to stormwater with the potential to discharge, and associated control measures, to avoid situations that may result in leaks, spills, and other releases that affect the quality of stormwater discharges; and
- Spill Prevention and Response Procedures (See Part 2.1.1.4) – Procedures for preventing and responding to spills and leaks. The permittee may reference the existence of other plans, such as the Spill Prevention Control and Countermeasure (SPCC) plan developed for the facility under Section 311 of the CWA or BMP programs otherwise required by an AZPDES permit or an aquifer protection permit for the facility, provided that a copy of that other plan is kept with the SWPPP consistent with Part 5.3; and
- Employee Training (Part 2.1.1.9) – A schedule for all types of necessary training in accordance with the sector-specific requirements described in Part 8.

5.1.5.2 **Monitoring and Inspection**

**Monitoring:** The permittee shall describe in the SWPPP the procedures for conducting the four types of analytical monitoring specified by this permit, when and where applicable. The four types of analytical monitoring are:

- General analytical monitoring (see Part 6.2.1);
- Effluent limitations guidelines monitoring (see Part 6.2.2);
- Impaired waters monitoring (see Part 6.2.3); and
- Additional monitoring as required by ADEQ (see Part 6.2.4).

For the required monitoring, the SWPPP shall contain a SAP either as a separate section or as an appendix to the SWPPP. The contents of the SAP are outlined in Part 6.1.3.

**Inspection:** The permittee shall describe in the SWPPP the procedures for performing, as appropriate, the three types of inspections specified by this permit, including:

- Routine facility inspections (see Part 4.1);
- Visual assessment of stormwater discharges (see Part 4.2); and
- Comprehensive facility inspections (see Part 4.3).

For each type of inspection performed, the SWPPP shall identify:

- Person(s) or positions of person(s) responsible for inspection;
- Schedules for conducting inspections; and
• Specific items to be covered by the inspection.

Substantially Identical Outfalls: The permittee shall describe the following in the SWPPP when using the substantially identical outfall exception for the visual assessment requirements in Part 4.2 or the facility’s general analytical monitoring requirements in Part 6.2.1:

• Location of each of the substantially identical outfalls;
• Description of the general industrial activities conducted in the drainage area of each outfall;
• Description of the control measures implemented in the drainage area of each outfall;
• Description of the exposed materials located in the drainage area of each outfall that are likely to be significant contributors of pollutants to stormwater discharges;
• An estimate of the runoff coefficient of the drainage areas (low = under 40%; medium = 40 to 65%; high = above 65%); and
• Why the outfalls are expected to discharge substantially identical effluents.

5.1.5.3 Inactive and Unstaffed Sites. When the permittee declares that the site has become inactive and unstaffed, the SWPPP shall include the information that supports this claim as required by Parts 1.5 and 6.2.1.4.

5.1.6 Signature Requirements.

The permittee shall sign the SWPPP in accordance with Appendix B, Subsection 9, including the date of signature.

5.2 Required SWPPP Modifications.

The permittee shall modify the SWPPP whenever necessary to address any of the triggering conditions for corrective action in Part 3.1. Changes to the SWPPP to reflect corrective actions shall be made in accordance with the corrective action deadlines in Parts 3.2 and 3.3, and signed and dated in accordance with Appendix B, Subsection 9.

In addition, the permittee shall modify the SWPPP to reflect new or modified control measures (see Parts 2.1 and 4.0), including measures implemented at active mining operations as mining activities expand into previously undisturbed areas (see Part 8.G.5.2).

5.3 SWPPP Availability.

The permittee shall retain a copy of the current SWPPP at the facility, and it shall be made immediately available to ADEQ, EPA, or another Federal, State or local agency having stormwater program authority, or the operator of a regulated MS4 receiving discharges from the facility (where applicable) at the time of an onsite inspection or upon request. If otherwise requested by ADEQ, the permittee shall submit copies of the SWPPP documents within 14 calendar days of request.

Inactive and Unstaffed Sites: Permittees with facilities that meet the requirements for inactive and unstaffed are not required to maintain the SWPPP on-site. However, the SWPPP must be locally available (i.e., in Arizona) and must be on-site when conducting the inspections required by Part 4. For the purpose of a regulatory inspection, the SWPPP shall be made available to ADEQ, EPA, or other Federal, State or local authority having stormwater program authority, within 48 hours of request. If otherwise requested by ADEQ, the permittee shall submit copies of these documents within 14 calendar days of request.

5.4 Documentation Requirements.

The permittee shall keep the following inspection, monitoring, and certification records complete and up-to-date. Retaining these records with the SWPPP (unless otherwise specified below) is necessary to demonstrate compliance with the conditions of this permit.
- A copy of the NOI submitted to ADEQ, including: any correspondence exchanged between the operator and ADEQ specific to coverage under this permit and the permit authorization number assigned by ADEQ;
- A copy of this permit (an electronic copy easily available to SWPPP personnel is also acceptable);
- Descriptions and dates of any incidences of significant spills, leaks, or other releases that resulted in discharges of pollutants in stormwater to a regulated MS4 or to waters of the U.S., the circumstances leading to the release and actions taken in response to the release and measures taken to prevent the recurrence of such releases (see Part 2.1.1.4 and 5.1.3.3);
- Records of employee training, including date training received. Training records need not be maintained with the SWPPP but shall be made available to ADEQ, EPA, or another Federal, State or local agency upon request (see Part 2.1.1.9);
- Documentation of repairs of structural control measures, including the date(s) of discovery of areas in need of repair/replacement, date(s) that the structural control measure(s) returned to full function, and the justification for any extended repair schedules (see Part 2.1.1.3). Documentation of maintenance of industrial equipment and systems in accordance with part 2.1.1.3 need not be maintained with the SWPPP but shall be made available to ADEQ, EPA, or another Federal, State or local agency upon request. The maintenance records shall include the date(s) of regular maintenance. However, the justification for any extended maintenance schedules shall be maintained with the SWPPP (see Part 2.1.1.3);
- All inspection reports, including the Routine Facility Inspection Reports (see Part 4.1), the Visual Assessment Reports (see Part 4.2), and the Comprehensive Facility Inspection Reports (see Part 4.3);
- Description of and rationale for any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of a measurable storm event) (see Parts 4.1.1, 4.2.1, 6.1.2.3, and 6.2.1);
- Description of any corrective action taken at the site, including triggering event and dates when problems were discovered and modifications occurred; and
- Documentation to support the permittee’s claim that the facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections (see Part 4.1.3), visual assessments (see Part 4.2.3), and/or general analytical monitoring (see Part 6.2.1.4).

6.0 Analytical Monitoring Program.

In addition to visual assessments required in Part 4 of this permit, the permittee shall collect and analyze stormwater samples and document monitoring activities consistent with the procedures described in Part 6 and Appendix B, Subsections 9, 11 and 12 and any sector-specific requirements in Part 8. Refer to Part 7 for additional reporting and recordkeeping requirements.

6.1 Analytical Monitoring Procedures.
6.1.1 Analytical Monitoring Locations.

6.1.1.1 Monitored Outfalls.

Applicable monitoring requirements apply to each outfall authorized by this permit. If the facility has two or more outfalls believed to discharge substantially identical stormwater and/or allowable non-stormwater, based on the similarities of the general industrial activities and control measures, exposed materials that may significantly contribute pollutants to stormwater, and runoff coefficients of their drainage areas, the permittee may monitor the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s). The allowance for monitoring only one of the
substantially identical outfalls is not applicable to any outfalls with numeric effluent limitations set forth in Part 2.2.1. The permittee is required to monitor each outfall covered by a numeric effluent limitation as identified in Part 6.2.2.

6.1.1.2 Commingled Discharges.
If discharges authorized by this permit commingle with discharges not authorized under this permit, any required sampling of the authorized discharges must be performed at a point before they mix with other unauthorized discharges to the extent practicable.

6.1.1.3 Monitoring for Allowable Non-Stormwater Discharges
Unless otherwise specified by ADEQ, permittees are required to monitor allowable non-stormwater discharges (as delineated in Part 1.1.3) only when they are commingled with stormwater discharges associated with industrial activity.

6.1.2 Monitoring Events.

6.1.2.1 Monitoring Periods.
Monitoring requirements in this permit begin within 90 calendar days of receiving the Department’s authorization to discharge. The required monitoring events may be distributed during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the site.

Wet seasons, for the purposes of analytical monitoring, apply statewide and are defined as follows:

- Summer wet season: June 1 – October 31
- Winter wet season: November 1 – May 31

The term ‘wet season’ includes areas of the state where freezing conditions exist that prevent runoff from occurring for extended periods. In areas where freezing conditions exist, the required monitoring and sample collection may be distributed during seasons when precipitation runoff, either as melting snow or rain mixed with melting snow, occurs.

6.1.2.2 Measurable Storm Events.
All required monitoring must be performed on a storm event that results in a discharge from the facility (“measurable storm event”) that follows the preceding measurable storm event by at least 72 hours (3 calendar days). The 72 hour (3 day) storm interval does not apply if the permittee is able to document that less than a 72 hour interval is representative for local storm events during the sampling period. In the case of snowmelt, the monitoring must be performed at a time when a measurable discharge occurs at the site.

For each monitoring event, except snowmelt monitoring, the permittee shall identify the person performing the monitoring, the date and estimated duration (in hours) of the rainfall event, estimated rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event. For snowmelt monitoring, the permittee shall identify the sample as ‘snowmelt’ and the date of the sampling event.

6.1.2.3 Sample Type.
The permittee shall take a minimum of one grab sample from a discharge resulting from a measurable storm event that produces a sufficient volume to allow collection of a sample. With the exception of samples to be analyzed for Suspended Sediment Concentration (SSC), samples must be collected within the first 30 minutes of a measurable storm event. If it is not possible to collect the sample within the first 30 minutes of a measurable storm event, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with the SWPPP explaining why it was not possible to take samples within the first 30 minutes. Samples for SSC shall be collected 48 hours
after the storm event that resulted in a measurable discharge. In the case of snowmelt, samples must be taken during a period with a measurable discharge.

6.1.2.4 Adverse Conditions.

When adverse conditions as described in Part 4.2.3 prevent the collection of the analytical sample(s) required in a given wet season, the permittee shall document those conditions with the SWPPP and resume analytical monitoring in the subsequent wet season. Adverse conditions do not exempt the permittee from the requirement to file a discharge monitoring report (DMR) in accordance with the facility’s sampling schedule. The permittee shall report any failure to monitor as specified in Part 7.1 indicating the basis for not sampling during the usual reporting period.

6.1.3 Sampling and Analysis Plan.

The permittee shall develop a written SAP covering all analytical monitoring required by this permit. The SAP shall be a part of the SWPPP as either an appendix or a separate SWPPP section. The SAP shall include the following:

6.1.3.1 Sample Collection, Preservation, Tracking, and Handling Information

- Designate and train personnel to collect, maintain, and handle samples in accordance with the appropriate sample protocols.
- Identify water quality parameters/pollutants to be sampled including any pollutant(s) of concern in accordance with Parts 6.2.3 and 6.2.4;
- Identify the required sample analyses and associated analytical methods (analytical laboratory and field analyses).
- Written procedures for:
  - Sample collection (equipment and containers, calibration procedures, document site conditions during sampling, field notes and conditions under which the sample was taken),
  - Preservation (sample preparation to meet holding times),
  - Tracking (including chain-of-custody procedures), and
  - Handling (packing, transporting and shipping procedures to maximize sample integrity).

6.1.3.2 Calibration and Maintenance of Monitoring Equipment.

All monitoring instruments and equipment (including permittee’s field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturer’s recommendations.

6.1.3.3 Analytical Methods and Laboratories.

Other than parameters required to be sampled at the time of sample collection (e.g., field parameters), all samples shall be analyzed by a laboratory that is licensed by the Arizona Department of Health Service (ADHS) Office of Laboratory Licensure and Certification. Identification of the analytical methods and related limits of detection (if applicable) for each parameter is required. The samples shall be analyzed using analytical methods with a limit of quantitation (LOQ) that is at or below the applicable surface water quality standards, ELGs or other criteria specified in this permit. If all methods have LOQs higher than the specific criteria, the samples shall be analyzed using the analytical method with the lowest LOQ.

All laboratory analyses shall be conducted according to test procedures specified in 40 CFR 136, unless other test procedures have been specified in this general permit. This requirement does not apply to parameters that require analysis at the time of sample collection as long as the testing methods used are approved by ADHS. The permittee may conduct field analysis of turbidity if the permittee has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to properly perform the field analysis.
6.1.3.4 Records.

The permittee shall retain records of all stormwater monitoring information and reports with the SWPPP in accordance with Part 7.5 and any additional requirements in Appendix B, Subsection 11 of this permit.

6.2 Required Monitoring.

This permit includes four types of required analytical monitoring, one or more of which may apply to the facility’s discharge:

- General analytical monitoring (see Part 6.2.1)
- Effluent limitations monitoring (see Part 6.2.2);
- Impaired waters monitoring (see Part 6.2.3); and
- Additional monitoring as required by ADEQ (see Part 6.2.4).

When more than one type of monitoring for the same parameter at the same outfall applies (e.g., total suspended solids once per year for an effluent limitation and twice per wet season for general analytical monitoring at a given outfall), a single sample may be used to satisfy both monitoring requirements.

6.2.1 General Analytical Monitoring.

This permit requires mining Sectors G and J to conduct general analytical monitoring as outlined in Part 8.

6.2.1.1 Applicability of General Analytical Monitoring.

The permittee shall monitor stormwater discharges for parameters specified in Part 8 for the primary industrial activity, and any co-located industrial activities authorized under this permit. If any of the parameters are hardness-dependent, the permittee must also characterize for hardness. The results of the general analytical monitoring, including hardness, shall be submitted to ADEQ in accordance with Part 7. For discharges to:

- Perennial or intermittent waters, the hardness shall be of the surface water receiving the discharge.
- Ephemeral waters, the hardness shall be of the discharge leaving the facility.

6.2.1.2 Exception for Stormwater Discharges to Ephemeral Waters.

Facilities that discharge to ephemeral surface waters are not required to monitor for Total Suspended Solids (TSS) and turbidity as part of the general analytical monitoring requirements specified in Part 8.

6.2.1.3 Exception for Inactive and Unstaffed Sites.

The requirement for general analytical monitoring does not apply at a facility that is inactive and unstaffed if the requirements of Part 1.5 are met.

6.2.2 Effluent Limitations Monitoring.

6.2.2.1 Monitoring Based on Effluent Limitations Guidelines.

Table 6-1 identifies the stormwater discharges subject to effluent limitation guidelines that are authorized for coverage under this permit. Commencing with the first wet season of permit coverage (in accordance with Section 6.1.2.1), the permittee shall monitor once per year at each outfall containing the discharges identified in Table 6-1 for the parameters specified in the sector-specific section of Part 8.
Table 6-1. Required Monitoring for Effluent Limitations Based on Effluent Limitations Guidelines

<table>
<thead>
<tr>
<th>Regulated Activity</th>
<th>Effluent Limit</th>
<th>Monitoring Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities</td>
<td>See Part 8.J.9</td>
<td>1/year</td>
<td>Grab</td>
</tr>
</tbody>
</table>

6.2.2.2 Substantially Identical Outfalls.
The permittee shall monitor each outfall discharging runoff from any regulated activity identified in Table 6-1. The substantially identical outfall monitoring provisions are not available for numeric effluent limitations monitoring.

6.2.3 Impaired Waters Monitoring.

6.2.3.1 Permits Required to Monitor Discharges to Impaired Waters.
If a facility discharges to an impaired water, the permittee shall develop a monitoring program in accordance with Part 6.1.3 and monitor for all pollutants for which the waterbody is impaired (except as provided in Part 6.2.3.2) and for which a standard analytical method exists (see 40 CFR Part 136).

If the waterbody is impaired for suspended solids, turbidity or sediment/ sedimentation and the discharge occurs for more than 48 hours after the storm event, the permittee shall monitor for SSC. If the pollutant for which the waterbody is impaired is expressed in the form of an indicator or surrogate pollutant, the permittee shall monitor for that indicator or surrogate pollutant. No monitoring is required when a waterbody’s biological communities are impaired but no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment, or when a waterbody’s impairment is related to hydrologic modifications, impaired hydrology, or temperature.

6.2.3.2 Impaired Waters Monitoring Schedule.

Discharges to impaired waters without an approved TMDL.
Beginning in the first wet season following the permittee’s discharge authorization, the permittee shall monitor twice per wet season at each outfall discharging stormwater to an impaired water without an approved TMDL. Once the four (4) samples have been collected, if the pollutant for which the water is impaired is not detected above applicable water quality standards, the permittee may discontinue further monitoring for that pollutant, under this section. The permittee shall keep records of this finding with the SWPPP. If the pollutant for which the water is impaired is found in the discharge above applicable water quality standards for any of the samples collected in the first year of sampling, the permittee shall continue monitoring twice during each wet season.

Further, this monitoring requirement does not apply after one year if the pollutant for which the waterbody is impaired is not detected above natural background levels in the discharge, and the permittee documents, as required in Part 5.4, that this pollutant is not expected to be present above natural background levels in the discharge.

If the pollutant for which the water is impaired is not present and not expected to be present in the facility’s discharge, or it is present but it has been determined using a methodology approved by ADEQ that the presence is caused solely by natural background sources, the permittee shall include a notification to this effect in the first monitoring report, after which annual monitoring under this subsection may be discontinued. To support this determination, the following documentation must be submitted with the first monitoring report and kept with the SWPPP records:
- An explanation of why the presence of the pollutant causing the impairment in your discharge is not related to the activities at the facility; and
- Data and/or studies that tie the presence of the pollutant causing the impairment in the discharge to natural background sources in the watershed.

**Discharges to impaired waters with an ADEQ approved TMDL.**

For stormwater discharges assigned a WLA in an approved TMDL, the facility shall monitor for the pollutant for which the TMDL was written. Beginning in the first wet season following the facility’s date of discharge authorization, the permittee shall monitor twice per wet season at each outfall discharging stormwater to the impaired water with an approved TMDL. ADEQ’s authorization to discharge will include specifications on any additional pollutant(s) to monitor.

If the pollutant for which the water is impaired is not detected above the applicable WLA in the TMDL after the four samples have been collected, the permittee may discontinue further monitoring, under this section. The permittee shall keep records of this finding onsite with the SWPPP.

If the pollutant for which the water is impaired is found above the applicable WLA in the TMDL in the discharge for any of the samples collected in the first year of sampling, the permittee shall continue monitoring twice during each wet season. Attainment of the WLA for SSC will be based on the median of four samples collected from four different measurable storm events.

**6.2.3.3 Exception for Inactive and Unstaffed Mine Sites.**

The requirement for impaired waters monitoring at a facility that is inactive and unstaffed is reduced to once per year, if the requirements of Part 1.5 are met.

**6.2.4 Additional Monitoring Required by ADEQ.**

ADEQ may notify the permittee, in writing, of additional discharge monitoring required to ensure protection of receiving water quality in cases where there is evidence that a pollutant is being discharged that is not being monitored for by the permittee and that the pollutant may be causing or contributing to exceedances of a water quality standard. Any such notice will provide an explanation of the reasons for the monitoring, locations, and parameters to be monitored, frequency and period of monitoring, sample types, and reporting requirements.

**6.3 Follow-up Actions if Discharge Exceeds a Numeric Effluent Limit or a Water Quality Standard.**

The permittee shall conduct follow-up monitoring within 30 calendar days (or during the next qualifying runoff event, should none occur within the 30 days) of implementing corrective action(s) taken in accordance with Part 3 in response to an exceedance of a numeric effluent limit or water quality standard contained in this permit as described in Part 2.2.1 and 2.2.2. Monitoring must be performed for any pollutant(s) that exceeds the effluent limit or water quality standard. If this follow-up monitoring exceeds the applicable effluent limit or water quality standard, the permittee shall comply with both Parts 6.3.1 and 6.3.2.

**6.3.1 Submit an Exceedance Report.**

The permittee shall submit an Exceedance Report consistent with Part 7.3.

**6.3.2 Continue to Monitor.**

The permittee shall continue to monitor, at least twice per wet season, until the discharge is in compliance with the effluent limit or water quality standard or until ADEQ waives the requirement for additional monitoring.
7.0 Reporting and Recordkeeping.

7.1 Reporting Monitoring Data to ADEQ.
7.1.1 The permittee shall submit monitoring data collected in accordance with Parts 4.2, 6.2, 6.3, and 6.4 to ADEQ at the address in Part 7.6.

7.1.3 The permittee shall compile all sampling results for the previous two wet seasons onto DMR form(s). Except as provided in Part 7.2 below, the permittee shall submit the DMRs to ADEQ not later than July 15 of each year of permit coverage.

7.2 Annual Report.
All facilities shall prepare an Annual Report on a form provided by the Department and retain a copy of the report with the SWPPP. The Annual Report for the reporting period June 1 to May 31 shall be completed by July 15 and include, at a minimum:

- The findings from the facility’s Part 4.3 comprehensive facility inspection;
- Any corrective action documentation as required in Part 3.3;
- The DMR form(s) as required in Part 7.1 for the preceding two wet seasons; and
- The results of any monitoring required in Part 6.2 for those facilities that discharge to a water (or within 2.5 miles of a water if required by ADEQ) or portion thereof, classified as an OAW or an impaired water, or
- The results of any monitoring required in Part 6.2 if notified by the Department in accordance with Part 1.3.1(2)(c).

Permittees with facilities that discharge to a water (or within 2.5 miles of a water if required by ADEQ, or is otherwise referenced within an approved TMDL) or portion thereof, classified as an OAW or an impaired water shall submit the annual report to ADEQ on or before July 15 (postmark date).

7.3 Exceedance Report for Numeric Effluent Limitations or Water Quality Standards.
If follow-up monitoring pursuant to Part 6.3 exceeds a numeric effluent limit or water quality standard, the permittee shall submit an Exceedance Report to ADEQ no later than 30 calendar days after receiving the facility’s lab results. The facility’s Exceedance Report shall include the following:

- Facility name, physical address and location;
- AZPDES permit tracking number;
- Name of receiving water;
- Monitoring data from this and the preceding monitoring event(s);
- An explanation of the situation; including what actions the permittee has completed or intends to complete (if corrective actions are not yet complete) to correct the violation; and
- Contact person name, title, and phone number.

7.4 Other Reporting.
The permittee is subject to the reporting requirements stipulated in Part 7, in addition to the standard permit reporting provisions of Appendix B, Subsection 12.

- 24-hour reporting (see Appendix B, Subsection 12.d);
- 5-day follow-up reporting to the 24 hour reporting (see Appendix B, Subsection 12.d.(ii)).
• Reportable quantity spills (verbal report only; see Part 2.1.1.4).
• Planned changes (see Appendix B, Subsection 12.a);
• Anticipated noncompliance (see Appendix B, Subsection 12.c);
• Transfer of ownership and/or operation – (see Table 1-2);
• Other noncompliance (see Appendix B, Subsection 12.e); and
• Other information (see Appendix B, Subsection 12.f).

Where a written report is required, the permittee shall submit these reports to the Department’s address listed in Part 7.6. If the facility discharges to a regulated MS4, the permittee shall also submit these reports to the MS4 operator (in accordance with Part 5.1.2).

7.5 Recordkeeping.

The permittee shall retain copies of the SWPPP (including any modifications made during the term of this permit), additional documentation requirements pursuant to Part 5.4 (including documentation related to corrective actions taken pursuant to Part 3), all reports and certifications required by this permit, monitoring data, and records of all data used to complete the NOI to be covered by this permit, for a period of at least 3 years from the date that the facility’s coverage under this permit expires or is terminated.

7.6 Addresses for Reports.

Signed copies of monitoring data and any other reports required, shall be submitted to the address below. Other options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice. Notices of Intent and Notices of Termination (or a photocopy/reproduction) shall be signed and dated in accordance with Appendix B, Subsection 9 of this permit and submitted to ADEQ at the address below. DMR forms and paper copies of any reports required in Parts 6 and 7 shall be sent to the address below. All other written correspondence concerning discharges covered under this permit shall likewise be sent to the address listed below:

Arizona Department of Environmental Quality  
Surface Water Section, Stormwater Permits Unit—MSGP Monitoring  
1110 W. Washington Street, Mail Code 5415 A-1  
Phoenix, AZ 85007  
Fax: 602/771 – 4528

Reports of non-compliance shall be reported to:

Arizona Department of Environmental Quality  
Water Quality Compliance Section  
1110 W. Washington Street, Mail Code 5515 B-1  
Phoenix, AZ 85007  
Office: 602-771 – 2330; Fax 602/771 – 4505
Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart G – Sector G – Metal Mining.

The permittee shall comply with Part 8 sector-specific requirements associated with the facility’s primary industrial activity and any co-located industrial activities authorized under this permit, as defined in Appendix A. The sector-specific requirements apply to those areas of the facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit. In some cases, these sector-specific requirements modify more general requirements set forth in Parts 1-7 of this permit (e.g., Part 8.G.9. below).

8.G.1 Covered Stormwater Discharges.

The requirements in Subpart 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 1-1 of this permit. Coverage is required only for mining operations 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.

8.G.1.1 Covered Discharges from Active Facilities. Only the stormwater discharges from the areas described in Table 8.G.1.1 and the allowable non-stormwater discharges identified in Part 1.1.3 are covered:

<table>
<thead>
<tr>
<th>Discharge/source of discharge</th>
<th>AZPDES General Permit Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piles</td>
<td></td>
</tr>
<tr>
<td>Waste rock/overburden</td>
<td>Discharge under GP must be composed entirely of stormwater and not combined with mine drainage. See Note below.</td>
</tr>
<tr>
<td>Topsoil piles</td>
<td></td>
</tr>
<tr>
<td>Roads constructed of waste rock or spent ore</td>
<td></td>
</tr>
<tr>
<td>Onsite haul roads and haul/access roads used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility.</td>
<td>Discharge under the GP must be composed entirely of stormwater and not combined with mine drainage. See Note below.</td>
</tr>
<tr>
<td>Roads not constructed of waste rock or spent ore</td>
<td></td>
</tr>
<tr>
<td>Onsite haul roads and haul/access roads used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility.</td>
<td>Discharge acceptable under GP except if “mine drainage” is used for dust control.</td>
</tr>
<tr>
<td>Milling/concentrating</td>
<td></td>
</tr>
<tr>
<td>Runoff from tailings dams/dikes when constructed of waste rock/tailings</td>
<td>Discharges must be composed entirely of stormwater and not combined with mine drainage; not applicable if process fluids are present. See Note below.</td>
</tr>
<tr>
<td>Runoff from tailings dams/dikes when not constructed of waste rock/tailings</td>
<td>Discharge acceptable under GP except if process fluids are present.</td>
</tr>
<tr>
<td>Concentration building</td>
<td>Discharge acceptable under GP if discharge is stormwater only and there is no contact with concentrate piles.</td>
</tr>
<tr>
<td>Mill site</td>
<td>Discharge acceptable under GP if discharge is stormwater only and there is no contact with concentrate piles.</td>
</tr>
</tbody>
</table>
### Discharge/source of discharge

<table>
<thead>
<tr>
<th>Ancillary areas</th>
<th>AZPDES General Permit Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office/administrative building and housing</td>
<td>Discharge acceptable under GP if mixed with stormwater from the industrial area. <em>(Note: coverage is unnecessary if drainage from these areas is not mixed with stormwater from industrial areas.)</em></td>
</tr>
<tr>
<td>Chemical storage &amp; Docking facility</td>
<td>Discharge under GP must be composed entirely of stormwater and not combined with mine drainage.</td>
</tr>
<tr>
<td>Explosive storage Fuel storage (oil tanks/coal piles) Vehicle/equipment maintenance area/building Parking areas</td>
<td>Discharge acceptable under GP <em>(Note: coverage is unnecessary for drainage exclusively from employee and visitor-type parking areas.)</em></td>
</tr>
<tr>
<td>Power plant Truck wash area</td>
<td>Discharge under GP must be composed entirely of stormwater and not combined with mine drainage.</td>
</tr>
</tbody>
</table>

### Reclamation-related areas

| Any disturbed area (unreclaimed) Reclaimed areas released from reclamation bonds prior to Dec. 17 1990 Partially/inadequately reclaimed areas or areas not released from reclamation bond | Discharge acceptable under GP only if not in active mining area. |

*Note:* Stormwater runoff from these sources is subject to the AZPDES program for stormwater unless mixed with discharges subject to 40 CFR Part 440 that are regulated by another permit prior to mixing. Non-stormwater discharges from these sources are subject to AZPDES 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 they: (1) drain naturally (or are intentionally diverted) to a point source; and (2) combine with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit is available if the discharge composed entirely of stormwater does not combine with other sources of mine drainage that are subject to 40 CFR Part 440, and that meets other eligibility criteria contained in Part 1.1 of this permit. Permit applicants bear the initial responsibility for determining the applicable technology-based standard for such discharges.

8.G.1.2 **Covered Discharges from Inactive Facilities.** All stormwater discharges.

8.G.1.3 **Covered Discharges from Exploration and Construction of Metal Mining and/or Ore Dressing Facilities.** All stormwater discharges.

8.G.1.4 **Covered Discharges from Facilities Undergoing Reclamation.** All stormwater discharges.

8.G.2 **Limitations on Coverage.**

8.G.2.1 **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).

8.G.2.2 **Prohibition of Non-Stormwater Discharges.** The following discharges are not authorized by this permit: adit drainage, and contaminated springs or seeps discharging from waste rock dumps that do not directly result from precipitation events (see also the standard Limitations on Coverage in Part 1.1.4).
8.G.3 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).

8.G.3.1 Mining operation - Consists of active, inactive, reclamation phases and the exploration and construction phases.

8.G.3.2 Exploration phase - Entails exploration and land disturbance activities to delineate the dimensions and financial viability of a metal mining site.

8.G.3.3 Construction phase - Includes the initial building of site access roads and initial removal of overburden and waste rock to expose mineable minerals at a mining site. In addition, any subsequent construction activity on undisturbed areas of an existing mine property is also considered part of the construction phase if stormwater discharges are not managed by pre-existing or permanent control measures.

8.G.3.4 Active phase - Activities including the extraction, removal or recovery of metal ore. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of “active mining area” found at 40 CFR 440.132(a). The active phase is considered part of “mining operations.”

Note: 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).

8.G.3.5 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. This definition is derived from the definition of “active mining area” found at 40 CFR 440.132(a).

8.G.3.6 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. An inactive metal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an AZPDES industrial stormwater permit.

8.G.3.7 Reclamation phase - Activities undertaken following the cessation of the “exploration phase” or the “active phase” at a site or a portion of a site, intended to return the land to an appropriate post-mining land use in order to meet applicable Federal and State reclamation requirements or the requirements of Part 8.G.9.1 at a site or portion of a site not subject to Federal and State reclamation requirements. The reclamation phase is considered part of “mining operations.”

8.G.3.8 Stabilization - A site or portion of a site is “stabilized” when it has implemented all applicable Federal and State reclamation requirements.

8.G.4 Stormwater Discharges Associated with the Exploration and Construction Phases of Mining (Clearing, Grading, and Excavation Activities).

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at mining sites are covered under this permit (or may be covered under an alternate AZPDES stormwater permit such as the AZPDES General Permit for Discharge from Construction Activities (AZG2008-001)) if they disturb one acre or more. Exploration and construction activities disturbing less than one acre do not require permit coverage unless they are integrally related to other exploration or construction activities that collectively disturb one acre or more.
For all areas affected by exploration and construction activities that will occur at an active site or previously mined site, the permittee shall select, design, install, and implement the following control measures or their equivalents, as necessary to minimize the discharge of pollutants to stormwater. The control measures selected shall be documented in the SWPPP.

Once the areas subject to construction and exploration activities are stabilized or the area(s) become part of the mining operation, the control measures, inspections, monitoring, and other requirements in Parts 8.G.4 are no longer required; however, the facility remains subject to Parts 1 through 7, Parts 8.G.5 through 8.G.9, and all other applicable provisions of this permit.

8.G.4.1 Additional Control Measures.

The permittee shall implement, as applicable, control measures for erosion control, sediment control, perimeter control, good housekeeping, material storage, fueling and maintenance, concrete washouts, and non-stormwater discharges. In the SWPPP, identify and describe all temporary and/or permanent control measures to be implemented during the exploration and construction phases.

8.G.4.1.1 Erosion and Sediment Controls. Design and implement a combination of erosion and/or sediment control BMPs to keep sediment in place and/or to capture sediment to the extent practicable before it leaves the site. At a minimum, such controls must be designed, installed and maintained to:

a. Control stormwater volume and velocity within the site to minimize soil erosion;
b. Control stormwater discharges by minimizing both peak flow rates and total stormwater volume, to minimize erosion;
c. Phase or sequence exploration and construction activities, as practicable, to minimize the area of disturbance at any one time;
d. Minimize sediment discharges from the site;
e. Where practicable, increase sediment removal and maximize stormwater infiltration and/or reuse; and
f. Where practicable, minimize soil compaction and preserve topsoil.

8.G.4.1.2 Maintenance of control measures. The permittee shall maintain all control measures identified in the SWPPP in effective operating condition. Repairs or modifications of control measures shall be accomplished in accordance with Part 2.1.1.3.

8.G.4.1.3 Dewatering. The permittee shall ensure all discharges from dewatering or basin draining activities, including discharges from dewatering of trenches and excavations, are discharged in a manner that do not cause nuisance conditions, including erosion in receiving channels or on surrounding properties.

8.G.4.1.4 Pollution Prevention Measures. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
b. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

c. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

8.G.4.1.5 Prohibited Discharges. The following discharges are prohibited:
a. Wastewater from washout of concrete, unless managed by an appropriate control;
b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing
compounds and other construction materials. If concrete washout is conducted at
the facility, appropriate control measures must be implemented to prevent
discharge of pollutants;
c. Fuels, oils, or other pollutants used in vehicle and equipment operation and
maintenance; and
d. Soaps or solvents used in vehicle and equipment washing.

8.G.4.1.6 *Surface Outlets.* When culverts or other surface outlets are present on the site, the
permittee shall include measures to sufficiently minimize the threat of erosion at
surface outlet locations that prevent the formation of rills and gullies.

8.G.4.1.7 *Good Housekeeping.* (See also Part 2.1.1.2) The permittee shall implement practices
to ensure litter, debris, and chemicals are prevented from contact with stormwater
discharges. These procedures shall include storage practices to minimize exposure of
the materials to stormwater, and spill prevention and response practices.

8.G.4.1.8 *Soil Stabilization.* After construction has ceased and until stabilization is achieved or
active mining commences at the site, the permittee shall maintain the control
measures, in accordance with Part 8.G.4.2, and conduct site inspections at least
quarterly.

8.G.4.2 *Additional SWPPP Requirements.*

The requirements in Part 8.G.4.2 are applicable to exploration and construction activities.

*Note:* ADEQ recommends activities associated with the exploration and construction activities be kept as a separate chapter or appendix in the facility’s SWPPP to distinguish from other
mining operations.

8.G.4.2.1 *Nature of Exploration and Construction Activities.* (See also Part 5.1.2) Document in
the facility’s SWPPP the exploration and construction activities that can potentially
affect the stormwater discharges covered by this permit.

8.G.4.2.2 The SWPPP shall describe the nature of the construction and exploration activities,
including: a description of the exploration and construction phases on the mining
property; and an estimate of the total area of the site (in acres) to be disturbed.

8.G.4.3 *Inspections.* (See also Part 4) Except as provided in Part 8.G.4.1.8, the permittee shall conduct
inspections as indicated below to ensure BMPs are functional and that the SWPPP is being
properly implemented.

8.G.4.3.1 Inspection Schedule.

a. Inspections shall be conducted once every 30 calendar days and within 24 hours of
the end of each measurable storm event.

b. *Inspection Schedule for Sites within 2.5 miles of an Impaired or Outstanding Arizona
Water.* If any discharge point from the construction site is within 2.5 miles of an
impaired or outstanding Arizona water, the permittee shall inspect the site at least
once every 7 calendar days.

*Note:* If the inspection day falls on a Saturday or holiday, the inspection may be
conducted on the preceding workday. If the inspection day falls on a Sunday, the
inspection shall be conducted on the following Monday.

8.G.4.3.2 *Location of Inspections.* Inspections must include all areas of the site disturbed by
clearing, grading, and/or excavation activities and areas used for storage of materials...
that are exposed to precipitation. Sedimentation and erosion control measures implemented 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 significant off-site sediment tracking.

8.G.4.3.3 Inspection Reports. (See also Part 4.1) For each inspection required above, the permittee shall document the findings of the inspections in accordance with Part 4.1, and maintain this documentation with the SWPPP. In addition to the information required in Part 4.1, the inspection report shall include:

a. Location(s) of discharges of sediment or other pollutants from the site;

b. For inspections occurring during or after a measurable storm event, a description of stormwater that is discharging from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable), when present;

c. Identification of all sources of non-stormwater discharges occurring at the site and associated BMPs in place;

d. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas.

8.G.4.4 Monitoring and Reporting Requirements for Discharges to Impaired and Outstanding Arizona Waters. The permittee shall conduct monitoring and reporting as required in Part 8.G.4.3.1.b for stormwater discharges resulting from exploration and construction activities that are within 2.5 miles of an impaired water or outstanding Arizona water. The visual assessment and analytical monitoring requirements in this subpart are in addition to those required in Part 4.2, Part 6, Part 8.G.8 and Part 8.G.9, but may be combined where appropriate.

In accordance with Part 4.2.3 and Part 6.1.2.4, the permittee is not required to conduct visual assessments or analytical monitoring during adverse conditions.

8.G.5 Additional Control Measures for the Active and Inactive Mining Phases.

8.G.5.1 Additional Stormwater Controls to be Evaluated. The permittee shall evaluate whether some or all of the following control measures are necessary in order to meet the requirements of Part 2.2 and implement if necessary. These control measures must be evaluated in addition to those measures identified in Part 2.1.1. The potential pollutants identified in Part 8.G.6.3 shall determine the priority and appropriateness of the control measures selected.

8.G.5.1.1 Stormwater Diversions: Consider diversion of stormwater away from potential pollutant sources using one or more of the following measures: 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.

8.G.5.1.2 Capping: Consider capping potential pollutant sources. When capping is utilized to minimize pollutant discharges in stormwater, identify the source being capped and the material used to construct the cap.

8.G.5.1.3 Treatment: If treatment of stormwater (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is determined to be necessary to meet the requirements of Part 2.2, describe the type and location of stormwater runoff is encouraged where practicable. 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).

8.G.5.2 Sediment and Erosion Control. At sites where the active phase has commenced, in addition to measures evaluated pursuant to Part 2.1.1.5, the permittee shall implement appropriate erosion and/or sediment controls, in accordance with Part 8.G.4, when clearing, grading or excavation activities occur in previously undisturbed areas where discharges are not controlled by pre-existing or permanent control measures. The purpose of these sediment and/or control measures is to minimize the discharge of sediment from the newly disturbed areas. Where structural control measures are used for sediment control, such measures shall be installed prior to major land disturbance activities commencing.

8.G.5.3 Certification of Discharge Testing. (See also Part 5.1.3.4) 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. The certification may be kept with the facility’s SWPPP consistent with Part 8.G.6.6.

8.G.6 Additional SWPPP Requirements for Mining Operations.
The requirements in Part 8.G.6 are applicable to all mining operations, except inactive and unstaffed sites.

8.G.6.1 Nature of Industrial Activities. (See also Part 5.1.2) Briefly document in the facility’s SWPPP the mining and associated activities that can potentially affect the stormwater discharges covered by this permit.

8.G.6.2 Site Map. (See also Part 5.1.2) Document the following in the SWPPP (as appropriate):

- Location of the site relative to major transportation routes and communities;
- Site boundaries of co-located facilities;
- Temporary control measures that may be utilized during the exploration or construction phase;
- 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 AZPDES permit;
- The locations of the following, if they are located such that they will contribute to discharge from a stormwater outfall covered by this permit:
  - Mining or milling site boundaries; immediate access roads and haul roads;
  - Overburden, materials, soils, or waste storage areas;
  - Outdoor equipment storage, fueling, and maintenance areas;
  - Materials handling areas;
  - Outdoor manufacturing, outdoor storage, and material disposal areas;
  - Outdoor chemicals and explosives storage areas;
  - Reclaimed areas;
- Location of mine drainage, dewatering or other process water;
- Off-site points of discharge for mine dewatering and process water; and
- Boundary of areas that contribute discharges subject to effluent limitations guidelines.

8.G.6.3 Potential Pollutant Sources. (See also Part 5.1.3) For each area of the mine or mill site where stormwater discharges associated with industrial activities occur, document in the SWPPP the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. To identify potential pollutants, evaluate these factors: the mineralogy of the ore and waste rock
8.G.6.4 **Documentation of Control Measures.** All control measures implemented at the site shall be documented in the SWPPP, in accordance with Part 8.G.5.1 and Part 5.1.4. If control measures are implemented or planned but are not listed in Part 8.G.5.1 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in the SWPPP.

8.G.6.5 **Employee Training.** All employee training conducted in accordance with Part 2.1.1.9 shall be documented with the SWPPP.

8.G.6.6 **Certification of Permit Coverage for Commingled Non-Stormwater Discharges:** If the permittee is able to certify, consistent with Part 8.G.5.2 above, that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate AZPDES permit, and that permit subjects the non-stormwater portion to effluent limitations prior to any commingling, such certification shall be retained with the SWPPP. This certification must identify the non-stormwater discharges, the applicable AZPDES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

8.G.7 **Additional Inspection Requirements for the Active Mining Phase.** (See also Part 4.1)

As required by Part 4.1, the permittee shall conduct routine facility inspections at active mine sites at least quarterly unless adverse weather conditions make the site inaccessible. Inspections are only required to cover areas where industrial activities occur that are exposed to precipitation and that contribute to stormwater discharges from the site covered under this permit.

Unless otherwise approved by ADEQ, active sites which discharge to waters designated as OAWs or waters which are impaired for sediment must be inspected monthly. The permittee may submit a request to the Department to reduce the inspection frequency to quarterly at one or more outfalls to an OAW or a water impaired for sediment. The request must be based on the frequencies of discharges and the performance of the control measure(s).

8.G.8 **Monitoring and Reporting Requirements.** (See also Part 6.)

*Note:* There are no Part 8.G.8 monitoring and reporting requirements for inactive and unstaffed sites.

8.G.8.1 **General Analytical Monitoring for Active Copper Ore Mining and Dressing Facilities.** Active copper ore mining and dressing facilities shall sample and analyze stormwater discharges for the pollutants listed in Table 8.G-8.1. Permittees discharging to perennial or intermittent waters must sample and analyze stormwater discharges, on an annual basis, alternating wet seasons each year, beginning in year one of permit coverage. Permittees discharging to ephemeral waters are not required to sample under this subsection.

<table>
<thead>
<tr>
<th>Subsector G1. Active Copper Ore Mining and Dressing Facilities (SIC 1021)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td></td>
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<tr>
<td>Chemical Oxygen Demand (COD)</td>
<td></td>
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</tbody>
</table>
8.G.8.2 Monitoring Requirements for Discharges from Waste Rock and Overburden Piles at Active Metal Mining Facilities

8.G.8.2.1 General Analytical Monitoring.

For discharges from waste rock and overburden piles, the permittee shall sample and analyze stormwater discharges for the parameters listed in Table 8.G-8.2. The permittee shall retain all report, monitoring data and methodologies in accordance with Part 7.5 of the permit.

Permittees discharging to perennial or intermittent waters: the permittee shall sample and analyze, on a semi-annual basis, once each wet season, beginning in year one of permit coverage. In addition to analyzing the stormwater discharge for hardness, the permittee shall characterize the hardness of the receiving water. Such characterization may include analysis of samples from the surface water receiving the discharge or surface water data collected by a third party provided the data is credible, scientifically defensible and is representative of current conditions. The data and the methodology for determining the hardness values must be submitted to ADEQ in the first year of permit coverage.

For permittees discharging to ephemeral waters: the permittee shall sample and analyze, on an annual basis in alternating wet seasons, beginning in year one of permit coverage. Permittees discharging to ephemeral waters are not required to sample TSS or turbidity, in accordance with Part 6.2.1.2.

<table>
<thead>
<tr>
<th>Subsector (Discharges may be subject to requirements for more than one sector/subsector)</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsector G2. 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)</td>
<td>Total Suspended Solids (TSS)</td>
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<td></td>
<td>Turbidity</td>
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<td>pH</td>
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<tr>
<td></td>
<td>Hardness (as CaCO₃; calc. from Ca, Mg)¹</td>
</tr>
<tr>
<td></td>
<td>Antimony</td>
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<td></td>
<td>Arsenic</td>
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<td>Beryllium</td>
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<td>Cadmium, total &amp; dissolved¹</td>
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<td></td>
<td>Copper, total &amp; dissolved¹</td>
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<tr>
<td></td>
<td>Iron, total &amp; dissolved</td>
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<tr>
<td></td>
<td>Lead, total &amp; dissolved¹</td>
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<tr>
<td></td>
<td>Mercury, total &amp; dissolved</td>
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<td></td>
<td>Nickel, total &amp; dissolved¹</td>
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<td></td>
<td>Selenium</td>
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<td></td>
<td>Silver, total &amp; dissolved¹</td>
</tr>
<tr>
<td></td>
<td>Zinc, total &amp; dissolved¹</td>
</tr>
</tbody>
</table>

¹ These metals are hardness-dependent and require sampling for water hardness. Note: 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 separate hardness analysis.
8.G.8.2.2  **Additional Analytical Monitoring For Uranium, Vanadium or Radium Ores Mining Facilities.** These permittees shall also conduct additional monitoring for the parameters in Table 8.G-8.3 at the same frequencies required in Part 8.G.8.2.1.

<table>
<thead>
<tr>
<th>Table 8.G-8.3</th>
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<tbody>
<tr>
<td><strong>Subsector</strong></td>
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<tr>
<td>(Discharges may be subject to requirements for more than one sector/subsector)</td>
</tr>
<tr>
<td><strong>Subsector G2:</strong> Uranium-Vanadium-Radium Ore Mining (SIC Code 1094)</td>
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</table>

8.G.8.2.3  **Additional Monitoring.** The Director may require the permittee to perform additional monitoring to accurately characterize the quality and quantity of pollutants discharged from waste rock and overburden piles in accordance with Part 6.2.4.

8.G.9  **Termination of Permit Coverage**

8.G.9.1  **Termination of Permit Coverage for Sites Reclaimed After December 17, 1990.** A site (or a portion of a site) that was released from applicable state or federal reclamation requirements after December 17, 1990, is not required to maintain coverage under this permit.

   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 not required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 8.G.9.2.

8.G.9.2  **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:

   (1) Stormwater runoff that comes into contact with 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 as necessary 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.
Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart H – Sector H – Coal Mines and Coal Mining-Related Facilities.
RESERVED
Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart I – Sector I – Oil and Gas Extraction.
RESERVED
Part 8 – Sector-Specific Requirements for Industrial Activity


The permittee shall comply with Part 8 sector-specific requirements associated with the facility’s primary industrial activity and any co-located industrial activities authorized under this permit, as defined in Appendix A. The sector-specific requirements apply to those areas of the facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

8.J.1 Covered Stormwater Discharges.

The requirements in Subpart J apply to stormwater discharges associated with industrial activity from Active and Inactive Non-Metallic Mineral Mining and Dressing facilities as identified by the SIC Codes specified under Sector J in Table 1-1 of this permit.

8.J.1.1 Covered Discharges from Active Non-Metallic Mineral Mining Facilities. All stormwater discharges, except for most stormwater discharges subject to the existing effluent limitation guideline at 40 CFR Part 436. Mine dewatering discharges composed entirely of stormwater or uncontaminated groundwater seepage from: construction sand and gravel, industrial sand, and crushed stone mining facilities are covered by this permit.

8.J.1.2 Covered Discharges from Inactive Facilities. All stormwater discharges.

8.J.1.3 Covered Discharges from Exploration and Construction of Non-Metallic Mineral Mining Facilities. All stormwater discharges.

8.J.1.4 Covered Discharges from Sites Undergoing Reclamation. All stormwater discharges.

8.J.2 Limitations on Coverage.

Most stormwater discharges subject to an existing effluent limitation guideline at 40 CFR Part 436 are not authorized by this permit. An exception to this is mine dewatering discharges composed entirely of stormwater or uncontaminated groundwater seepage from construction sand and gravel, industrial sand, and crushed stone mining facilities, which are covered under this permit.

8.J.3 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).

8.J.3.1 Mining operation - Consists of active, inactive, reclamation phases and the exploration and construction phases.

8.J.3.2 Explo ration phase - Entails exploration and land disturbance activities to delineate the dimensions and financial viability of a non-metallic mineral mining site.

8.J.3.3 Construction phase - Includes the initial building of site access roads and initial removal of overburden and waste rock to expose mineable minerals at a mining site. In addition, any subsequent construction activity on undisturbed areas of an existing mine property is also considered part of the construction phase if stormwater discharges are not managed by pre-existing or permanent control measures.

8.J.3.4 Active phase - Activities including the extraction, removal or recovery of minerals. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of
“active mining area” found at 40 CFR 440.132(a). The active phase is considered part of “mining operations.”

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

8.J.3.5 **Active Mineral Mining Facility** - A site or portion of a site where work or other activity related to the extraction, removal, or recovery of non-metallic minerals 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. This definition is derived from the definition of “active mining area” found at 40 CFR 440.132(a).

8.J.3.6 **Inactive Mineral Mining Facility** - A site or portion of a site where non-metallic mineral mining and/or milling occurred in the past but is not an active facility as defined above. An inactive mineral mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials, and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an AZPDES industrial stormwater permit.

8.J.3.7 **Reclamation phase** - Activities undertaken, following the cessation of the exploration phase or the “active phase” at a site or a portion of a site, intended to return the land to an appropriate post-mining land use in order to meet applicable Federal and State reclamation requirements or the requirements of Part 8.J.10.1 at a site or portion of a site not subject to Federal and State reclamation requirements. The reclamation phase is considered part of “mining operations”.

8.J.3.8 **Stabilization** - a site or portion of a site is “stabilized” when it has implemented all applicable Federal and State reclamation requirements.

8.J.3.9 **Uncontaminated** - Free from the presence of pollutants attributable to industrial activity.

8.J.4 **Stormwater Discharges Associated with the Exploration and Construction Phases of Mining (Clearing, Grading, and Excavation Activities).**

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at mining sites are covered under this permit (or may be covered under an alternate AZPDES stormwater permit such as the AZPDES General Permit for Discharge from Construction Activities (AZG2008-001)) if they disturb one acre or more. Exploration and construction activities disturbing less than one acre do not require permit coverage unless they are integrally related to other exploration or construction activities that collectively disturb one acre or more.

For all areas affected by exploration and construction activities that will occur at an active site or previously mined site, the permittee shall select, design, install, and implement the following control measures or their equivalents, as necessary to minimize the discharge of pollutants to stormwater. The control measures selected shall be documented in the SWPPP.

Once the areas subject to construction and exploration activities are stabilized or the area(s) become part of the mining operation, the control measures, inspections, monitoring, and other requirements in Parts 8.J.4 are no longer required; however, the facility is still subject to Parts 1 through 7 and all other applicable provisions of this permit.

8.J.4.1 **Additional control measures.** The permittee shall implement, as applicable, control measures for erosion control, sediment control, perimeter control, good housekeeping, material storage, fueling and maintenance, concrete washouts, and non-stormwater discharges. In the SWPPP, identify and describe all temporary and/or permanent control measures to be implemented during the exploration and construction phases.
8.J.4.1.1 *Erosion and Sediment Controls.* The permittee shall design and implement a combination of erosion and/or sediment control BMPs to keep sediment in place and/or to capture sediment to the extent practicable before it leaves the site. At a minimum, such controls must be designed, installed and maintained to:

a. Control stormwater volume and velocity within the site to minimize soil erosion;

b. Control stormwater discharges by minimizing both peak flow rates and total stormwater volume to control erosion;

c. Phase or sequence exploration and construction activities, as practicable, to minimize the area of disturbance at any one time;

d. Minimize sediment discharges from the site;

e. Where practicable, increase sediment removal and maximize stormwater infiltration and/or reuse; and

f. Where practicable, minimize soil compaction and preserve topsoil.

8.J.4.1.2 *Maintenance of control measures.* The permittee shall maintain all control measures identified in the SWPPP in effective operating condition. Repairs or modifications of control measures shall be accomplished in accordance with Part 2.1.1.3.

8.J.4.1.3 *Dewatering.* The permittee shall ensure all discharges from dewatering or basin draining activities, including discharges from dewatering of trenches and excavations, are discharged in a manner that do not cause nuisance conditions, including erosion in receiving channels or on surrounding properties.

8.J.4.1.4 *Pollution Prevention Measures.* The permittee shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

b. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

c. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

8.J.4.1.5 *Prohibited Discharges.* The following discharges are prohibited:

a. Wastewater from washout of concrete, unless managed by an appropriate control;

b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials. If concrete washout is conducted at the facility, appropriate control measures must be implemented to prevent discharge of pollutants;

c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

d. Soaps or solvents used in vehicle and equipment washing.

8.J.4.1.6 *Surface Outlets.* When culverts or other surface outlets are present on the site, the permittee shall include measures to sufficiently minimize the threat of erosion at surface outlet locations that prevent the formation of rills and gullies.
8.J.4.1.7 **Good Housekeeping.** (See also Part 2.1.1.2) The permittee shall implement practices to ensure litter, debris, and chemicals are prevented from contact with stormwater discharges. These procedures shall include storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.

8.J.4.1.8 **Soil Stabilization.** After construction has ceased and until stabilization is achieved or active mining commences at the site, the permittee shall maintain the control measures, in accordance with Part 8.J.4.2, and conduct site inspections at least quarterly.

8.J.4.2 **Additional SWPPP Requirements.**

The requirements in Part 8.J.4.2 are applicable to exploration and construction activities.

*Note:* ADEQ recommends activities associated with the exploration and construction activities be kept as a separate chapter or appendix in the facility’s SWPPP to distinguish from mining operations.

8.J.4.2.1 **Nature of Exploration and Construction Activities.** (See also Part 5.1.2) Document in the facility’s SWPPP the exploration and construction activities that can potentially affect the stormwater discharges covered by this permit.

8.J.4.2.2 The SWPPP shall describe the nature of the construction and exploration activities, including: a description of the exploration and construction phases on the mining property; and an estimate of the total area of the site (in acres) to be disturbed.

8.J.4.3 **Inspections.** (See also Part 4) Except as provided in Part 8.J.4.1.8, the permittee shall conduct inspections as indicated below to ensure BMPs are functional and that the SWPPP is being properly implemented.

8.J.4.3.1 **Inspection Schedule.**

a. Inspections shall be conducted once every 30 calendar days and within 24 hours of the end of each measurable storm event.

b. **Inspection Schedule for Sites within 2.5 miles of an Impaired or Outstanding Arizona Water.** If any discharge point from the construction site is within 2.5 miles of an impaired or outstanding Arizona water, the permittee shall inspect the site at least once every 7 calendar days.

*Note:* If the inspection day falls on a Saturday or holiday, the inspection may be conducted on the preceding workday. If the inspection day falls on a Sunday, the inspection shall be conducted on the following Monday.

8.J.4.3.2 **Location of Inspections.** Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures implemented 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 significant off-site sediment tracking.

8.J.4.3.3 **Inspection Reports.** (See also Part 4.1) For each inspection required above, the permittee shall document the findings of the inspections in accordance with Part 4.1, and maintain this documentation with the SWPPP. In addition to the information required in Part 4.1, the inspection report shall include:
a. Location(s) of discharges of sediment or other pollutants from the site;

b. For inspections occurring during or after a measurable storm event, a description of stormwater that is discharging from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable), when present;

c. Identification of all sources of non-stormwater discharges occurring at the site and associated BMPs in place;

d. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas.

8.1.4.4 Monitoring and Reporting Requirements for Discharges to Impaired and Outstanding Arizona Waters. The permittee shall conduct monitoring and reporting as required in Part 8.1.4.3.1.b for stormwater discharges resulting from exploration and construction activities that are within 2.5 miles of an impaired water or outstanding Arizona water. The visual assessment and analytical monitoring requirements in this subpart are in addition to those required in Part 4.2, Part 6, Part 8.1.8 and Part 8.1.9, but may be combined where appropriate.

In accordance with Parts 4.2.3 and 6.1.2.4, the permittee is not required to conduct visual assessments or analytical monitoring during adverse conditions.

8.1.5 Additional Control Measures for Active and Inactive Mining Phases.

8.1.5.1 Additional Stormwater Controls. The permittee shall evaluate whether some or all of the following control measures are necessary, and implement as appropriate, in order to meet the requirements of Part 2. These control measures are apart from, or in addition to, the control measures implemented by the permittee to meet the Part 2 effluent limits. The potential pollutants identified in Part 8.1.6.3 shall determine the priority and appropriateness of the control measures selected.

8.1.5.1.1 Stormwater Diversions: As necessary, divert stormwater away from potential pollutant sources using one or more of the following measures: 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.

8.1.5.1.2 Treatment: If treatment of stormwater (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is determined to be necessary to meet the requirements of Part 2.2, 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 Mineral Mining and Processing Point Source Category (40 CFR Part 436), except as those subparts identified in Table 2-1 of this permit.

8.1.5.2 Sediment and Erosion Control. At sites where the active phase has commenced, in addition to measures evaluated pursuant to Part 2.1.1.5, the permittee shall implement appropriate erosion and/or sediment controls, in accordance with Part 8.1.4, when clearing, grading or excavation activities occur in previously undisturbed areas where discharges are not controlled by pre-existing or permanent control measures. The purpose of these sediment and/or control measures is to minimize the discharge of sediment from the newly disturbed areas. Where structural control measures are used for sediment control, such measures shall be installed prior to major land disturbance activities commencing.

8.1.5.3 Certification of Discharge Testing: (See also Part 5.1.4.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-stormwater discharges such as
discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 436). The certification may be kept with the facility’s SWPPP consistent with Part 8.J.6.6.

8.J.6 Additional SWPPP Requirements for Mining Operations.
The requirements in Part 8.J.6 are applicable to all mining operations, except inactive and unstaffed sites.

8.J.6.1 Nature of Industrial Activities. (See also Part 5.1.2) Document in the facility’s SWPPP the mining and associated activities that can potentially affect the stormwater discharges covered by this permit.

8.J.6.2 Site Map. (See also Part 5.1.2) Document the following in the SWPPP (as appropriate):
  - Location of the site relative to major transportation routes and communities;
  - Site boundaries of co-located facilities;
  - Temporary control measures that may be utilized during the exploration or construction phase.
  - 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 AZPDES permit;
  - The locations of the following, if they are located such that they will contribute to discharge from a stormwater outfall covered by this permit:
    - Mining or milling site boundaries; immediate access roads and haul roads;
    - Overburden, materials, soils, or waste storage areas;
    - Outdoor equipment storage, fueling, and maintenance areas;
    - Materials handling areas;
    - Outdoor manufacturing, outdoor storage, and material disposal areas;
    - Outdoor chemicals and explosives storage areas;
  - Reclaimed areas;
  - Location of mine drainage, dewatering or other process water;
  - Off-site points of discharge for mine dewatering and process water; and
  - Boundary of areas that contribute discharges subject to effluent limitations guidelines.

8.J.6.3 Potential Pollutant Sources. (See also Part 5.1.3) For each area of the mine site where stormwater discharges associated with industrial activities occur, document in the SWPPP the types of pollutants (e.g., oil, sediment) likely to be present in significant amounts. To identify potential pollutants, evaluate these factors: 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. If applicable include in the SWPPP a summary of any existing waste rock or overburden characterization data and test results for potential generation of acid rock drainage.

8.J.6.4 Documentation of Control Measures. To the extent that any of the control measures in Part 8.J.5.1 are used, the permittee shall document them in the facility’s SWPPP pursuant to Part 5.1.4. If control measures are implemented or planned but are not listed in Part 8.J.5.1 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in the SWPPP.

8.J.6.5 Employee Training. All employee training conducted in accordance with Part 2.1.1.9 shall be documented with the SWPPP.
8.J.6.5 Certification of Permit Coverage for Commingled Non-Stormwater Discharges. If the permittee is able to certify, consistent with Part 8.J.5.2 above, that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate AZPDES permit, and that permit subjects the non-stormwater portion to effluent limitations prior to any commingling, such certification shall be retained with the SWPPP. This certification must identify the non-stormwater discharges, the applicable AZPDES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

8.J.7 Additional Inspection Requirements for the Active Mining Phase. (See also Part 4.1)

As required by Part 4.1, the permittee shall conduct routine facility inspections at active mining sites at least quarterly unless adverse weather conditions make the site inaccessible. Inspections are only required to cover areas where industrial activities occur that are exposed to precipitation and that contribute to stormwater discharges from the site covered under this permit.

Unless otherwise approved by ADEQ, active sites which discharge to waters designated as OAWs or waters which are impaired for sediment must be inspected monthly. The permittee may submit a request to the Department to reduce the inspection frequency to quarterly at one or more outfalls to an OAW or a water impaired for sediment. The request must be based on the frequencies of discharges and the performance of the control measure(s).

8.J.8 Monitoring and Reporting Requirements. (See also Part 6)

Note: There are no Part 8.J.8 monitoring and reporting requirements for inactive and unstaffed sites.

Table 8.J-1 identifies general analytical monitoring that applies to the specific subsectors of Sector J. These monitoring requirements apply to both the facility’s primary industrial activity and any co-located industrial activities authorized under this permit, which describe the site’s activities. Permittees discharging to perennial or intermittent waters must sample and analyze stormwater discharges for the pollutants listed in Table 8.J-8.1, on a semi-annual basis, once each wet season, beginning in year one of permit coverage. Permittees discharging to ephemeral waters are not required to sample TSS, in accordance with Part 6.2.1.2.

<table>
<thead>
<tr>
<th>Table 8.J-8.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsector (Facility discharges may be subject to requirements for more than one sector/subsector)</td>
</tr>
<tr>
<td>Subsector J1. Sand and Gravel Mining (SIC 1442, 1446)</td>
</tr>
<tr>
<td>Subsector J2. Dimension and Crushed Stone and Non-metallic Minerals (except fuels) (SIC 1411, 1422-1429, 1481, 1499)</td>
</tr>
</tbody>
</table>

8.J.9 Effluent Limitations Based on Effluent Limitations Guidelines (See also Part 6.2.2.1.)

Table 8.J-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other discharges that may be allowed under this permit.
Table 8.J-2

<table>
<thead>
<tr>
<th>Industrial Activity</th>
<th>Parameter</th>
<th>Effluent Limitation¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine dewatering discharges at crushed stone mining facilities (SIC 1422 - 1429)</td>
<td>pH</td>
<td>6.0 – 9.0 s.u.</td>
</tr>
<tr>
<td>Mine dewatering discharges at construction sand and gravel mining facilities (SIC 1442)</td>
<td>pH</td>
<td>6.0 – 9.0 s.u.</td>
</tr>
<tr>
<td>Mine dewatering discharges at industrial sand mining facilities (SIC 1446)</td>
<td>Total Suspended Solids (TSS)</td>
<td>25 mg/L, monthly avg.</td>
</tr>
<tr>
<td></td>
<td>pH</td>
<td>45 mg/L, daily maximum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.0 – 9.0 s.u.</td>
</tr>
</tbody>
</table>

¹Monitor annually.

8.J.10 Termination of Permit Coverage

8.J.10.1 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 not required to maintain coverage under this permit. 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 not required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 8.J.10.2.

8.J.10.2 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:

1. Stormwater runoff that comes into contact with 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 as necessary 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.
Appendix A

Definitions, Abbreviations and Acronyms
Appendix A. Definitions, Abbreviations, and Acronyms (for the purposes of this permit).

Approved Total Maximum Daily Loads (TMDLs) – Approved TMDLs are those that are developed by the Arizona Department of Environmental Quality and approved by EPA.

Best Management Practices (BMPs) – schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR 122.2.

Co-located Industrial Activities – Any industrial activities, excluding primary industrial activity(ies), located on-site that are defined by the stormwater regulations at 122.26(b)(14)(i)-(ix) and (xi). An activity at a facility is not considered co-located if the activity, when considered separately, does not meet the description of a category of industrial activity covered by the stormwater regulations or identified by the SIC code list in Appendix D.

Control Measure – refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director – a means the Director of the Arizona Department of Environmental Quality or an authorized representative.

Discharge – when used without qualification, means the “discharge of a pollutant.” See 40 CFR 122.2.

Discharge of a pollutant – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

Existing Discharger – an operator applying for coverage under this permit for discharges authorized previously under an AZPDES general or individual permit.

Facility or Activity – any AZPDES “point source” (including land or appurtenances thereto) that is subject to regulation under the AZPDES program. See 40 CFR 122.2.

Federal Facility – any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

Impaired water – waters that have been assessed by ADEQ, under the CWA, Section 303(d), as not attaining a water quality standard for at least one designated use, and are listed in Arizona’s 2006 – 2008 §303(d) and Other Impaired Waters List.

Indian Country – (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (b) all dependent Indian communities within the borders of the United States, whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe. (18 U.S.C. 1151)

Industrial Activity – the 10 categories of industrial activities included in the definition of “stormwater discharges associated with industrial activity” as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).
Industrial Stormwater – stormwater runoff from industrial activity.

Municipal Separate Storm Sewer – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

(ii) Designed or used for collecting or conveying stormwater;

(iii) Which is not a combined sewer; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2. See 40 CFR 122.26(b)(4) and (b)(7).

New Discharger – a facility from which there is a discharge, that did not commence the discharge at a particular site prior to August 13, 1979, which is not a new source, and which has never received a finally effective AZPDES permit for discharges at that site. See 40 CFR 122.2.

New Source – any building, structure, facility, or installation from which there is or may be a “discharge of pollutants,” the construction of which commenced:

- After promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- After proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal. See 40 CFR 122.2.


No exposure – all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. See 40 CFR 122.26(g).

Operator – any entity with a stormwater discharge associated with industrial activity that meets either of the following two criteria:

(i) The entity has operational control over industrial activities, including the ability to modify those activities; or

(ii) The entity has day-to-day operational control of activities at a facility necessary to ensure compliance with the permit (e.g., the entity is authorized to direct workers at a facility to carry out activities required by the permit).

Outstanding Arizona Water – a surface water that has been designated by ADEQ as an outstanding state resource under A.A.C. R18-11-112.

Person – an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof. See 40 CFR 122.2.

Point source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or
may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff. See 40 CFR 122.2.

**Pollutant** – dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. See 40 CFR 122.2.

**Pollutant of concern** – A pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing an impairment in a state's 303(d) list.

**Primary industrial activity** – includes any activities performed on-site which are (1) identified by the facility's primary SIC code; or (2) included in the narrative descriptions of 122.26(b)(14)(i), (iv), (v), or (vi), and (ix). [For co-located activities covered by multiple SIC codes, it is recommended that the primary industrial determination be based on the value of receipts or revenues or, if such information is not available for a particular facility, the number of employees or production rate for each process may be compared. The operation that generates the most revenue or employs the most personnel is the operation in which the facility is primarily engaged. In situations where the vast majority of on-site activity falls within one SIC code, that activity may be the primary industrial activity.] Narrative descriptions in 40 CFR 122.26(b)(14) identified above include: (i) activities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards; (iv) hazardous waste treatment storage, or disposal facilities including those that are operating under interim status or a permit under subtitle C of the Resource Conservation and Recovery Act (RCRA); (v) landfills, land application sites and open dumps that receive or have received industrial wastes; (vii) steam electric power generating facilities; and (ix) sewage treatment works with a design flow of 1.0 mgd or more.

**Qualified Personnel** – Qualified personnel are those (either the permittee’s employees or outside consultants) who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of control measures.

**Reportable Quantity Release** – a release of a hazardous substance at or above the established legal threshold that requires emergency notification. Refer to 40 CFR Parts 110, 117, and 302 for complete definitions and reportable quantities for which notification is required.

**Runoff coefficient** – the fraction of total rainfall that will appear at the conveyance as runoff. See 40 CFR 122.26(b)(11).

**Significant materials** – includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges. See 40 CFR 122.26(b)(12).

**Stormwater** – stormwater runoff, snow melt runoff, and surface runoff and drainage. See 40 CFR 122.26(b)(13).

**Stormwater Discharges Associated with Construction Activity** – a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

**Stormwater Discharges Associated with Industrial Activity** – the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities

**Stormwater Discharges Associated with the Mineral Industry – Appendix A**
or activities excluded from the AZPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant’s industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in 40 CFR 122.26(b)(14). The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v). See 40 CFR 122.26(b)(14).

**Total Maximum Daily Loads (TMDLs)** – A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant’s sources. A TMDL includes wasteload allocations (WLAs) for point source discharges; load allocations for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

**Water Quality Standards** – A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)). Water quality standards also include an antidegradation policy. See P.U.D. o. 1 of Jefferson County et al v. Wash Dept of Ecology et al, 511 US 701, 705 (1994).

**A.2. ABBREVIATIONS AND ACRONYMS**

ADHS – Arizona Department of Health Service

BOD₅ – Biochemical Oxygen Demand (5-day test)

BMP – Best Management Practice

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

COD – Chemical Oxygen Demand

CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)

DMR – Discharge Monitoring Report

EPA – Environmental Protection Agency

MDMR – MSGP Discharge Monitoring Report

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi-Sector General Permit

NAICS – North American Industry Classification System
NOI – Notice of Intent
NOT – Notice of Termination
OAW – outstanding Arizona water
SIC – Standard Industrial Classification
SPCC – Spill Prevention, Control, and Countermeasures
SSC – Suspended Sediment Concentration
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids
WLA – Wasteload Allocation
WQS – Water Quality Standard
Appendix B
Standard Permit Conditions
Appendix B.  Standard Permit Conditions.

Standard permit conditions in Appendix B are consistent with the general permit provisions required under 40 CFR 122.41 and A.A.C. R-18-9-A905(A)(3).

1. Duty to Comply.  [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(a)(1) and A.R.S. §§ 49-261, 262, 263.01, and 263.02.]
   a. The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act; A.R.S. Title 49, Chapter 2, Article 3.1; and A.A.C. Title 18, Chapter 9, Articles 9 and 10, and is grounds for enforcement action, permit termination, revocation and reissuance, or modification, or denial of a permit renewal application.
   b. The issuance of this permit does not waive any federal, state, county, or local regulations or permit requirements with which a person discharging under this permit is required to comply.

2. Duty to Reapply / Continuation of the Expired General Permit.  [A.A.C. R18-9-A905 which incorporates 40 CFR 122.41(b)]
   a. Upon reissuance of the general permit, the permittee shall file an NOI, within the timeframe specified in the new general permit, and shall obtain new written authorization to discharge from the Director.
   b. If the Director does not reissue the general permit before the expiration date, the current general permit will be administratively continued and remain in force and effect until the general permit is reissued.
   c. Any permittee granted authorization to discharge under the general permit before the expiration date automatically remains covered by the continued general permit until the earlier of:
      i. Reissuance or replacement of the general permit, at which time the permittee shall comply with the NOI conditions of the new general permit to maintain authorization to discharge; or
      ii. The date the permittee has submitted a Notice of Termination; or
      iii. The date the Director has issued an individual permit for the discharge; or
      iv. The date the Director has issued a formal permit decision not to reissue the general permit, at which time the permittee shall seek coverage under an alternative general permit or an individual permit, or cease discharge.

3. Need To Halt or Reduce Activity Not a Defense.  [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(c)]

   It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.


   The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance.  [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(e)]

   The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are
installed by a permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

6. **Permit Actions.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(f)]
   This permit may be modified, revoked and reissued, or terminated for cause. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. **Property Rights.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(g)]
   This permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, nor any infringement of federal, state, Indian tribe, or local laws or regulations.

8. **Duty to Provide Information.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(h)]
   The permittee must furnish to ADEQ, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to ADEQ upon request, copies of records required to be kept by this permit.

9. **Signatory Requirements.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(k) and (l); A.A.C. R18-9-A905(A)(1)(c), which incorporates 40 CFR 122.22] All Notices of Intent (NOI) and Notices of Termination (NOT), must be signed as follows:
   a. NOIs and NOTs:
      i. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
      ii. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or
      iii. For a municipality, State, Federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal (or state) agency includes: (1) The chief executive officer (or director) of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
   b. All reports required by this permit and other information requested by ADEQ as follows:
      i. A person described in Section 9.a or by a duly authorized representative of that person. A person is a duly authorized representative only if the authorization is made in writing by a person described in Section 9.a and contained in the SWPPP.
      ii. The authorization must specify either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).
c. All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 9.a above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
  i. The authorization is made in writing by a person described in Part 9.a;
  ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may be either a named individual or any individual occupying a named position); and
  iii. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to ADEQ, upon request.

d. Changes to Authorization. If the information on the NOI filed for permit coverage is no longer accurate because a different owner / operator has responsibility for the overall operation of the facility, a new NOI satisfying the requirements of Part 1.3.1 must be submitted to ADEQ prior to or together with any reports, information, or applications to be signed in accordance with Appendix B, Subsection 9.c above. The change in authorization must be submitted within the time frame specified in Table A.3, and sent to the address specified in Part 7.6.

e. Certification. Any person signing documents under the terms of this permit must make the following certification:

  I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

10. Inspection and Entry. [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(i)]

a. The permittee must allow ADEQ or an authorized representative to:
  i. Enter upon the permittee’s premises where a regulated facility or activity is located or conducted or where records are kept under the conditions of this permit;
  ii. Have access to and copy at reasonable times, any records that are kept under the conditions of this general permit; and
  iii. Inspect at reasonable times any facility or equipment (including monitoring and control equipment), practices or operations regulated or required under this permit;
  iv. Sample or monitor at reasonable times any substances or parameters at any location, for the purposes of assuring permit compliance or as otherwise authorized by A.R.S. Title 49, Chapter 2, Article 3.1, and 18 A.A.C. 9, Articles 9 and 10; and

b. If the facility discharges to an MS4, the permittee must allow representatives of the municipal operator or the separate storm sewer receiving the discharge to inspect the site and obtain copy of records pertaining to the discharge or the conditions of this permit.


a. Representative Samples/Measurements. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

b. Retention of Records. The permittee must retain records of all monitoring information,
including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for at least three (3) years from the date this permit expires. This period may be extended by request of the Director at any time. Permittees must submit any such records to ADEQ upon request. The permittee must retain the SWPPP developed in accordance with Part 5 of this permit, for at least three (3) years after the last modification or amendment is made to the plan.

c. **Records Contents.** Records of monitoring information must include:

   i. The date, exact place, and time of sampling or measurements;

   ii. The initials or name(s) of the individual(s) who performed the sampling or measurements;

   iii. The date(s) analyses were performed;

   iv. The time(s) analyses were initiated;

   v. The initials or name(s) of the individual(s) who performed the analyses;

   vi. References and written procedures, when available, for the analytical techniques or methods used; and

   vii. The analytical techniques or methods used; and

   viii. The results of such analyses.

d. **Approved Monitoring Methods.** Monitoring must be conducted according to test procedures approved under 40 CFR 136, unless specific test procedures have been otherwise specified in this permit.

e. Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained in this permit is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which includes the possibility of fines and/or imprisonment.

12. **Reporting Requirements.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(l)]

a. **Planned changes.** The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

   i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b) (incorporated by reference at A.A.C. R18-9-A905(A)(1)(e)); or

   ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1) (incorporated by reference at A.A.C. R18-9-A905(A)(3)(b)).

b. **Monitoring reports.** Monitoring results must be reported at the intervals specified elsewhere in this permit.

   i. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms (paper or electronic) provided or specified by ADEQ. Pursuant to Part 7.1, all monitoring data collected pursuant to Part 6.2 and 6.3 must be submitted to the Department using the MSGP Discharge Monitoring Report (MDMR) form, available at http://www.azdeq.gov/environ/water/permits/stormwater.html.

   ii. If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

   iii. Calculations for all limitations which require averaging of measurements must use an arithmetic mean and non-detected results must be incorporated in calculations as the
limit of quantitation for the analysis.

c. **Anticipated noncompliance.** The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

d. **Twenty-four hour reporting.**

i. The permittee shall report to ADEQ any noncompliance with this permit which may endanger human health or the environment. The permittee shall orally notify the office listed below within 24 hours:

   Arizona Department of Environmental Quality – Water Quality Compliance
   1110 W. Washington Street, Mail Code 5515 B-1
   Phoenix, AZ 85007
   Office: 602-771 – 2330; Fax 602-771 – 4505

ii. A written submission shall also be provided to the office identified above within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

iii. The following shall be included as information which must be reported within 24 hours under this paragraph.
   1) Any upset which exceeds any effluent limitation in the permit.
   2) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See 40 CFR 122.44(g) which is incorporated by reference at A.A.C. R18-9-A905(A)(3)(d)).

iv. ADEQ may waive the written report on a case-by-case basis for reports under this subsection if the oral report has been received within 24 hours.

e. **Other noncompliance.** The permittee shall report all instances of noncompliance not otherwise required to be reported under this subsection, at the time monitoring reports are submitted. The reports shall contain the information listed in subsection 12(d).

f. **Other information.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Department, the permittee shall promptly submit the facts or information to ADEQ at the address listed in Part 7.6.

13. **Reopener Clause.** [A.A.C. R18-9-A905(A)(3)(d) which incorporates 40 CFR 122.44(c)] The Department may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines, which may be promulgated in the course of the current permit cycle.

14. **Other Environmental Laws.** No condition of this general permit releases the permittee from any responsibility or requirements under other environmental statutes or regulations. For example, this permit does not authorize the “taking” of endangered or threatened species as prohibited by Section 9 of the Endangered Species Act, 16 U.S.C. 1538. Information regarding the location of endangered and threatened species and guidance on what activities constitute a “taking” are available from the U.S. Fish and Wildlife Service. The permittee must also comply with applicable State and Federal laws, including Spill Prevention Control and Countermeasures (SPCC).

15. **State or Tribal Law.** [Pursuant to A.A.C. R18-9-A904(C)] Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State or Tribal law or regulation under authority preserved by Section 510 of the Clean Water Act.
16. Severability. The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstance, is held invalid, the application of the provision to other circumstances, and the remainder of this general permit shall not be affected.

17. Requiring Coverage under an Individual Permit or an Alternative General Permit.
   a. The Director may require a person authorized by this permit to apply for and/or obtain either an individual AZPDES permit or an alternative AZPDES general permit. Any interested person may petition the Department to take action under this section. The Department may require a permittee authorized to discharge under this permit to apply for an individual permit in any of the following cases:
      i. A change occurs in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;
      ii. Effluent limitation guidelines are promulgated for point sources covered by the general permit;
      iii. An Arizona Water Quality Management Plan containing requirements applicable to the point sources is approved;
      iv. Circumstances change after the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary;
      v. If the Director determines that the discharge is a significant contributor of pollutants. When making this determination, the Director shall consider:
         1) The location of the discharge with respect to waters of the United States,
         2) The size of the discharge,
         3) The quantity and nature of the pollutants discharged to waters of the U.S., and
         4) Any other relevant factor.
   b. If an individual permit is required, the Director shall notify the discharger in writing of the decision. The notice shall include:
      i. A brief statement of the reasons for the decision;
      ii. An application form;
      iii. A statement setting a deadline to file the application;
      iv. A statement that on the effective date of issuance or denial of the individual permit, coverage under the general permit will automatically terminate;
      v. The applicant’s right to appeal the individual permit requirement with the Water Quality Appeals Board under A.R.S. § 49-323, the number of days the applicant has to file a protest challenging the individual permit requirement, and the name and telephone number of the Department contact person who can answer questions regarding the appeals process; and
      vi. The applicant’s right to request an informal settlement conference under A.R.S. 41-1092.03(A) and 41-1092.06.
   c. The discharger shall apply for an individual permit within 90 days of receipt of the notice, unless the Director grants a later date. In no case shall the deadline be more than 180 days after the date of the notice.
   d. If the discharger fails to submit the individual permit application within the time period established in Appendix B.17.c the applicability of the general permit to the discharger is automatically terminated at the end of the day specified by the Director for application submittal.
   e. Coverage under the general permit shall continue until an individual permit is issued or denied unless the general permit coverage is terminated under Appendix B. Subsection 17.d.
18. Request for an Individual Permit.
   a. A permittee may request an exclusion from coverage of a general permit by applying for an individual permit.
      i. The permittee shall submit an individual permit application under R18-9-B901(B) and include the reasons supporting the request no later than 90 days after publication of the general permit.
      ii. The Director shall grant the request if the reasons cited by the permittee are adequate to support the request.
   b. If an individual permit is issued to a person otherwise subject to a general permit, the applicability of the general permit to the discharge is automatically terminated on the effective date of the individual permit.

19. Transfer of Coverage
   a. Transfer of coverage from one operator to a different operator (e.g., facility sold to a new company): the new owner/operator must complete and file a Notice of Intent in accordance with Part 1.3.1 at least 5 days prior to taking over operational control of the facility. The old owner/operator must file a Notice of Termination within thirty (30) days after the new owner/operator has assumed responsibility for the facility.
   b. Simple name changes of the permittee (e.g., Company “A” changes name to “ABC, Inc.”) may be done by filing an amended Notice of Intent referencing the facility’s assigned permit number and requesting a simple name change.

20. Bypass
   a. Definitions.
      1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility
      2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
   b. Bypass not exceeding limitations. The permittee may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions Appendix B, Subsections 20.c and 20.d.
   c. Notice
      1 Anticipated bypass. If the permittee knows in advance of the need for a bypass, prior notice shall be submitted at least ten days before the date of the bypass.
      2 Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Appendix B, Subsection 12.d.
   d. Prohibition of bypass.
      1. Bypass is prohibited, and ADEQ may take enforcement action against the permittee for bypass, unless:
         i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
         ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering
judgment to prevent a bypass which occurred during normal periods of equipment
downtime or preventive maintenance; and

iii. The permittee submitted notices as required under Appendix B, Subsection 20.c.

2. ADEQ may approve an anticipated bypass, after considering its adverse effects, if the
Department determines that it will meet the three conditions listed above in this Appendix
B, Subsection 20.d.

21. Upset

a. Definition. Upset means an exceptional incident in which there is unintentional and
temporary noncompliance with technology based permit effluent limitations because of
factors beyond your reasonable control. An upset does not include noncompliance to the
extent caused by operational error, improperly designed treatment facilities, inadequate
treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for
noncompliance with such technology based permit effluent limitations if the requirements of
Appendix B, Subsection 21.c are met. No determination made during administrative review of
claims that noncompliance was caused by upset, and before an action for noncompliance, is
final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish
the affirmative defense of upset must demonstrate, through properly signed,
contemporaneous operating logs, or other relevant evidence that:

1 An upset occurred and that the permittee can identify the cause(s) of the upset;
2 The permitted facility was at the time being properly operated;
3 The permittee submitted notice of the upset as required in Appendix B, Subsection 12.d
   (ii); and
4 The permittee complied with any remedial measures required under Appendix B,
   Subsection 4.

d. Burden of proof. In any enforcement proceeding, the permittee, who is seeking to
establish the occurrence of an upset, has the burden of proof.

G. Penalties for Violations of Permit Conditions.

Any permit noncompliance constitutes a violation and is grounds for an enforcement action, permit
termination, revocation and reissuance, modification, or denial of a permit renewal application.

1. Civil Penalties. A.R.S. § 49-262 provides that any person who violates any provision of A.R.S.
Title 49, Chapter 2, Article 2, 3 or 3.1 or a rule, permit, discharge limitation or order issued or
adopted under A.R.S. Title 49, Chapter 2, Article 3.1 is subject to a civil penalty not to exceed
$25,000 per day per violation.

2. Criminal Penalties. Any a person who violates a condition of this general permit, or violates a
provision under A.R.S. Title 49, Chapter 2, Article 3.1, or A.A.C. Title 18, Chapter 2, Articles 9
and 10 is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article
4, which may include the possibility of fines and/or imprisonment.
APPENDIX B

Notice of Intent (NOI)
Arizona Department of Environmental Quality (ADEQ) Response
Other Correspondence
Notice of Termination (NOT)
NOTICE OF INTENT (NOI)
for Stormwater Discharges Associated with
INDUSTRIAL ACTIVITY
under the AZPDES 2010 Multi-Sector Permits

FOR COVERAGE, A COMPLETE AND ACCURATE NOI MUST BE SUBMITTED TO:
Arizona Department of Environmental Quality; Surface Water Section/Stormwater Program
1110 West Washington, 5415A-1; Phoenix, Arizona 85007

Submitting this completed Notice of Intent (NOI) constitutes notice that the operator identified in Section B of this form requests authorization to discharge pollutants to waters of the United States from the facility identified in Section C under the AZPDES Multi-Sector General Permit(s) (MSGP) for industrial stormwater. Submitting this NOI constitutes your notice to ADEQ that the facility identified in Section C of this form meets the eligibility conditions of Part 1.1 of the MSGP. Please read and make sure you comply with all eligibility requirements, including the requirement to prepare a Stormwater Pollution Prevention Plan. Refer to the instructions at the end of this form to complete your NOI.

A. NOI REVISION (Follow instructions carefully.)
   ▶ Is this NOI a revision for a facility previously filed under the AZPDES 2010 Multi-Sector General Permit? □ YES ☑ NO If “YES,” complete the following:
   1. Provide your current authorization #: AZMSG-
   2. Provide the name of the facility listed in Part C.1 and only the specific information being revised.
   3. Complete the certification section (Part F) and have this document signed by the authorized signatory.

B. FACILITY OPERATOR INFORMATION
   ▶ Contact Name: Katherine Arnold, P.E. Phone: 520-495-3502 Ext: __________
   ▶ E-mail: karnold@rosemontcopper.com Fax: 520-495-3540
   ▶ Operator Business Name: ROSEMONT COPPER COMPANY
   ▶ Mailing Address: P.O. Box 35130
   ▶ City: Tucson State: AZ Zip Code: 85740

C. FACILITY INFORMATION
   1. Facility Name: ROSEMONT COPPER OPERATIONS
   2. Facility physical location (include the address, if applicable, otherwise provide directions from the nearest municipality):
      ▶ Street: From Interstate 10, exit south on State Route 83 to Soncita (SR-83; Exit 281); approximately 12 miles to Rosemont Copper entrance (milepost 46.8), exit SR-83 - turn right onto access road. Travel approximately 2 miles to Rosemont Guard House for check in prior to entering property.
      ▶ City: Vail State: AZ Zip Code: 85641
      ▶ County: Pima Phone: 520-495-3506 Ext: ________
   3. Provide the latitude and longitude of the outfall (discharge location) of the facility in degrees/minutes/seconds:
      Latitude: 31° 1′ 41" 41° 6" 0 0" (Degrees, minutes, seconds)
      Longitude: 111° 1′ 0" 4° 5′ 0 0" (Degrees, minutes, seconds)
   4. Have stormwater discharges from the facility been covered previously under an EPA or AZPDES permit? □ YES ☑ NO
      If yes, provide one of the following:
      ▶ The EPA tracking number: AZR05 OR
      ▶ The AZPDES MSGP authorization number: AZMSG- OR
      ▶ The AZPDES Individual Permit number:
   5. Is the facility located on Indian Country land? □ YES ☑ NO
      ▶ If you answered yes, DO NOT submit this NOI to ADEQ. The Department does not have permitting authority on Indian Country land.

AZPDES 2010 MSGP Notice of Intent (NOI) June 2011
6. PRIMARY INDUSTRIAL ACTIVITY: Identify the sector, subsector, and 4-digit Standard Industrial Classification (SIC) or Activity Code (AC) that best represents the products produced or services rendered for which your facility is primarily engaged, as defined in the MSGP.

Sector [ ] Subsector [ ] SIC or AC [1,0,2,1]

Area of industrial activity at the primary site that is exposed to stormwater: 4,400 acres

7. CO-LOCATED INDUSTRIAL ACTIVITY: Identify the applicable sector(s), subsector(s) of co-located industrial activity, and 4-digit Standard Industrial Classification (SIC) or Activity Code (AC) for which you are requesting permit coverage.

Sector [ ] Subsector [ ] SIC or AC [1,0,2,1] Area of industrial activity exposed to stormwater: 4,400 acre(s)

8. Is the facility expected to be inactive and unstaffed at any time during the permit term? □ YES □ NO

If yes, indicate the estimated starting and ending dates that you expect the facility to be inactive and unstaffed:

From __________________ to __________________

D. DISCHARGE INFORMATION

1. Does the facility discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? □ YES □ NO

If yes, name the MS4 operator: ____________________________

2. Receiving Water (provide the name of the closest water that receives stormwater, either directly or through a MS4 or other conveyance):

Barrel Canyon wash (an ephemeral wash), tributary to Davidson Canyon Wash.

3. Impaired Waters:

a. Does the facility discharge directly to an impaired water or to an upstream tributary within 2.5 miles of an impaired water? □ Yes □ No

b. Are there any NEW discharges to an impaired water or to an upstream tributary within 2.5 miles of an impaired water? □ Yes □ No

c. What pollutant(s) are causing the impairment? □ Yes □ No

c.2. Are the pollutant(s) causing the impairment present in the discharge? □ Yes □ No

c.3. Has a TMDL been completed for the pollutant(s) causing the impairment? □ Yes □ No

4. Outstanding Arizona Waters (OAW):

a. Are there any NEW or EXPANDED discharges DIRECTLY to an OAW? □ YES □ NO

b. Are there existing discharges within 2.5 miles of an OAW? □ YES □ NO

c. Are there any NEW or EXPANDED discharges to an upstream tributary within 2.5 miles of an OAW? □ YES □ NO

5. Effluent Limitation Guidelines (ELGs) and Sector-Specific Requirements.

a. Are you requesting permit coverage for any stormwater discharges subject to effluent limitation guidelines? □ YES □ NO

If yes, which effluent limitation guidelines apply to the stormwater discharges? (see page 3)
NOI for Coverage under AZPDES Permits: AZMSG 2010-002 and AZMSG 2010-003

E. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

1. I confirm that a SWPPP meeting the requirements of the general permit has been developed and will be implemented prior to discharging stormwater from this facility. [ ] YES [ ] NO

2. Name of the person to contact to view the SWPPP: Kathy Arnold, P.E., Vice President of Environmental & Regulatory Affairs

3. Telephone number of the SWPPP contact: 520-495-3502 Ext: Fax:

4. E-mail: karnold@rosemontcopper.com

5. If the answer to Items D.3.b or D.4.c is “yes,” have you included a copy of the SWPPP with this NOI? [ ] YES [ ] NO

F. FEES

I confirm that the correct fee payment is included with the NOI. [ ] YES [ ] NO

Less than or equal to 1 acre = $350.00 [ ]
Greater than 1 acre but less than or equal to 40 acres = $500.00 [ ]
Greater than 40 acres = $1,000.00 [ ]

SWPPP required (see section E.5 above) $1,000.00 [ ]

Total Fee Amount Included: $ 1,000.00

G. CERTIFICATION

I certify under penalty of law that I have met the eligibility conditions of this permit and that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Print Name: Katherine Ann Arnold
Title: Vice President of Environmental and Regulatory Affairs
Date: 23 Jan 2013

Signature: Katherine Ann Arnold

Business Name: Rosemont Copper Company
Address: P.O. Box 35130
City: Tucson
State: AZ
Zip Code: 85705
E-Mail: karnold@rosemontcopper.com
Phone: 520-495-3502

AZPDES 2010 MSGP Notice of Intent (NOI)
APPENDIX C

Qualified Personnel
APPENDIX D

Blank Inspection and Assessment Forms
# Facility Inspection Form

<table>
<thead>
<tr>
<th>Rosemont Copper Company, Vail, Arizona</th>
<th>Permit Number: AZMSG2010-003</th>
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<tbody>
<tr>
<td>Inspector: __________________________</td>
<td>Date: ______________________</td>
</tr>
<tr>
<td>Title: ______________________________</td>
<td>Inspector’s Contact Information: ____________________</td>
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</tbody>
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Note: See Appendix C in the SWPPP for documentation of qualifications.

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<thead>
<tr>
<th>INSPECTION TYPE (CHECK ONE):</th>
<th>QUARTERLY ROUTINE</th>
<th>ANNUAL CFI</th>
<th>FOLLOWING STORM</th>
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</thead>
</table>

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<tr>
<th>WEATHER DURING INSPECTION:</th>
<th>PRE-STORM</th>
<th>DURING STORM</th>
<th>POST-STORM</th>
</tr>
</thead>
</table>

| DESCRIBE PROJECT PHASE: | |
|-------------------------| |

Weather at time of facility inspection:

Storm information since last inspection:

Date of storm: __________________ Duration of storm event: __________ inches: __________

Date of storm: __________________ Duration of storm event: __________ inches: __________

Date of storm: __________________ Duration of storm event: __________ inches: __________

<table>
<thead>
<tr>
<th>Location: Discharge (Stormwater or Non-Stormwater), CM, Material Storage, Discharge Point or Operating Area Inspected</th>
<th>Is CM Effective?</th>
<th>Corrections or Maintenance Required</th>
<th>Date Corrections Completed</th>
</tr>
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<th>Date Corrections Completed</th>
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<td>Yes</td>
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Were incidents due to non-compliance with the SWPPP or Permit? (check one) Yes____ No____

Does the SWPPP need to be modified? (check one) Yes____ No____

If there are no incidents of non-compliance (or after incidents of non-compliance are corrected), this form must be signed and dated by the designated representative below:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: __________________ Title: __________________ Date: __________

Note: Use as many forms as necessary to document inspection of the entire site. Fill out both sides.
### Facility Inspection Form (cont.)

<table>
<thead>
<tr>
<th>Location: Discharge (Stormwater or Non-Stormwater), CM, Material Storage, Discharge Point or Operating Area Inspected</th>
<th>Is CM Effective?</th>
<th>Corrections or Maintenance Required</th>
<th>Date Corrections Completed</th>
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 Were incidents due to non-compliance with the SWPPP or Permit? (check one)  Yes_______  No_______  

 Does the SWPPP need to be modified? (check one)  Yes_______  No_______  

 For inspections occurring during or after a measurable storm event, provide a description of the stormwater that is discharging from the site (i.e. presence of suspended sediment, turbid water, discoloration, and/or oil sheen, etc.): 

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Facility Inspection Form (cont.)

<table>
<thead>
<tr>
<th>Rosemont Copper Company</th>
<th>Permit Number: AZMSG2010-003</th>
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<tbody>
<tr>
<td>Vail, Arizona</td>
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</table>

<table>
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<tr>
<th>Questions to consider during inspection</th>
<th>Is CM Effective?</th>
<th>Is CM Effective?</th>
<th>Corrections or Maintenance Required</th>
<th>Date Corrections Completed</th>
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<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<td>Are all areas not actively being worked properly stabilized?</td>
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<td>Are natural resource areas protected using CMs?</td>
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<td>Are perimeter controls and sediment barriers installed and maintained?</td>
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<tr>
<td>If not, describe:</td>
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<td>Are discharge points free of sediments?</td>
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<td>If not, give locations:</td>
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<td>Are storm drain inlets properly protected?</td>
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<tr>
<td>Is there evidence of sediment being tracked into the street?</td>
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<tr>
<td>Is trash/litter from work areas collected and placed in covered dumpsters?</td>
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<tr>
<td>Are vehicle and equipment fueling activities, cleaning, material storage, and maintenance areas free of spills, leaks, or any other deleterious materials?</td>
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<td>If not, describe:</td>
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<tr>
<td>Are non-stormwater discharges properly controlled?</td>
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<tr>
<td>If not, describe:</td>
<td></td>
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<tr>
<td>Are there additional CMs necessary?</td>
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<tr>
<td>If so, describe:</td>
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<tr>
<td>Other comments:</td>
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</table>

Note: Use as many forms as necessary to document inspection of the entire site.
### AZPDES MSGP VISUAL ASSESSMENT FORM

*(Complete a separate form for each outfall you assess)*

<table>
<thead>
<tr>
<th>Rosemont Copper Company, Vail, Arizona</th>
<th>Permit Number: <strong>AZMSG2010-003</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspector: __________________________</td>
<td>Date:__________________________</td>
</tr>
<tr>
<td>Title: ______________________________</td>
<td>Inspector’s Contact Information:</td>
</tr>
<tr>
<td>Note: See Appendix C in the SWPPP for documentation of qualifications.</td>
<td></td>
</tr>
<tr>
<td>Outfall ID: _________________________</td>
<td>Date &amp; Time Discharge Began:</td>
</tr>
<tr>
<td>Date &amp; Time Sample Collected: ________</td>
<td>Date &amp; Time Examined: __________</td>
</tr>
<tr>
<td>Substitute Sample? ☐ NO ☐ YES (Identify quarter/year when sample was originally scheduled to be collected)</td>
<td></td>
</tr>
<tr>
<td>Nature of Discharge: ☐ RAINFALL ☐ SNOWMELT</td>
<td></td>
</tr>
<tr>
<td>If rainfall: Rainfall Amount: __________ inches</td>
<td></td>
</tr>
<tr>
<td>Weather During Assessment: ☐ PRE-STORM ☐ DURING STORM ☐ POST-STORM</td>
<td></td>
</tr>
<tr>
<td>Previous Storm Ended &gt; 72 hours before start of this storm? ☐ YES ☐ NO * (Explain)</td>
<td></td>
</tr>
<tr>
<td>Color: ☐ NONE ☐ OTHER (DESCRIBE) ________________________________</td>
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<tr>
<td>Odor: ☐ NONE ☐ OTHER (DESCRIBE) ________________________________ (i.e. musty, sulfur, sour, petroleum, etc)</td>
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<tr>
<td>Clarity: ☐ CLEAR ☐ SLIGHTLY CLOUDY ☐ CLOUDY ☐ OPAQUE ☐ OTHER__________</td>
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<tr>
<td>Floating Solids: ☐ NO ☐ YES (DESCRIBE) ________________________________</td>
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<tr>
<td>Settled Solids**: ☐ NO ☐ YES (DESCRIBE) ________________________________</td>
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<tr>
<td>Suspended Solids: ☐ NO ☐ YES (DESCRIBE) ________________________________</td>
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<tr>
<td>Foam (gently shake sample): ☐ NO ☐ YES (DESCRIBE) ________________________________</td>
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<tr>
<td>Oil Sheen: ☐ NONE ☐ FLECKS ☐ GLOBES ☐ SHEEN ☐ SLICK ☐ OTHER__________</td>
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<tr>
<td>Other Obvious Indicators of Stormwater Pollution: ________________________________</td>
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</table>

### Notes:

* The 72-hour interval between storms can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period.

** Observe for settled solids after allowing the sample to sit for approximately 30 minutes.

Detail any concerns, additional comments, descriptions of pictures taken, and any corrective actions taken on Page 2 of this form (attach additional sheets if necessary).
AZPDES MSGP VISUAL ASSESSMENT FORM – Continued

<table>
<thead>
<tr>
<th>Explain concerns, additional comments, descriptions of pictures taken, and any corrective actions:</th>
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APPENDIX E

Stormwater Discharge Monitoring Analytical Results and Associated Records
APPENDIX F

Standard Operating Procedures for Calibration of Field Meter
Technical Memorandum

Subject: Standard Operating Procedures for Calibration of Field Meter

From: Karen Herther

To: Rosemont Copper Company Water Samplers

Date: August 17, 2012

This Standard Operating Procedure (SOP) provides basic information on the procedures for calibrating, using, and maintaining the Rosemont Copper Project (Project) multi-parameter water quality meter required for measuring pH, temperature, and specific conductance in groundwater, surface water, and stormwater samples.

1.0 PURPOSE

This SOP provides a description of the calibration and operating procedures defined in the manufacturers’ instruction manual as well as incorporating the U.S. Environmental Protection Agency’s (EPA’s) Standard Methods (SM) 4500H-B (for pH), 2510B (for specific conductance), and 2550B (for temperature). This SOP shall be used as a general reference and the manufacturer’s instruction manual should be followed at all times by field team members.

Rosemont Copper Company (Rosemont) routinely collects and assesses stormwater, groundwater, and surface water samples for various permits and studies. All water samples collected in the field will have the pH, specific conductance, and temperature measured in the field and recorded pursuant to this SOP.

2.0 MONITORING EQUIPMENT

This SOP is for an Oakton Instruments (Oakton) Waterproof PC10 hand-held multi-parameter water quality meter. The meter measures pH, conductivity, and temperature on one probe.

3.0 CALIBRATION PROCEDURES

The Oakton PC10 water quality meter requires daily calibration. In addition, the meter must be calibrated every 12 months by a facility certifying that the instrument was calibrated under standards traceable to the National Institute of Standards and Technology (NIST) and using a calibration system that conforms to the requirements of the American National Standards Institute (ANSI). Calibration documentation will be maintained in the project file at the Project administration office.

The parameters should be measured in the following units:

- Standard pH units (S.U.)
- Specific conductance – microSiemans per centimeter (μS/cm)
• Temperature - degrees Centigrade (°C)

A relative accuracy of ± 0.1 S.U. for pH, ± 3% µS/cm for specific conductance, and ± 1°C for temperature is required in order to meet the data quality objectives for this project.

NOTE: The Oakton pH CON10 series meter does not require % slope of calibration. Per correspondence with the Arizona Department of Health Services (ADHS; April 23, 2012 regarding Freeport-McMoRan United Verde site), a pH 7 buffer calibration check is acceptable (ADHS Approved Exempt Method SM 4500H-B [AZHM] For Use With Field pH Meters for AZPDES, APP or Reuse Permit Required Compliance Testing).

The multi-parameter water quality meters should be calibrated in a controlled environment, such as the office, because calibrating in the field can introduce error. If calibration must be performed in the field, it should be conducted indoors or in an area that is close to room temperature (between 23 to 27°C, 77 to 81° F). Allow the probe to stabilize before calibrating. A probe is considered stable if the readout does not significantly change (≤ 0.1 units) within 10 seconds.

Calibrate using standards that are within the printed expiration date or within six months of the date of opening/date of preparation if no expiration date is printed. Calibrate probes each day the unit goes into the field.

3.1 Calibration of pH Meter

Calibration of the pH will be in accordance with Section 4.4 of the manufacturer’s instructions (provided in Attachment 1) and, in general, EPA method SM 4500H-B. A copy of Method SM 4500H-B is provided in Attachment 2. SM 4500H-B requires that three buffers (ideally, 4.0, 7.0, and 10.0) be used for each calibration of the pH meter.

Prior to calibration, inspect the probe to ensure it is not cracked, scratched, or broken. Ensure that the cable from the probe to the meter is in good condition, and that the probe is plugged in to the meter securely.

NOTE: Temperature affects pH measurements, and standard pH buffers have a specified pH at indicated temperatures (e.g., pH 10.0 at 25°C). It is important to record the temperature of the sample at the time that the pH is measured and/or calibrated.

To calibrate pH on the Oakton meter, remove the protective cap off the probe before calibration or measurement. Always immerse the probe beyond the electrode band. **Soak the probe in pH 4.0 buffer solution or tap water for at least 5 to 10 minutes before calibration to hydrate the pH electrode surface and minimize drift.**

To calibrate:

1. Rinse the probe thoroughly with de-ionized (DI), or distilled, water; do not wipe the probe.
2. Briefly rinse the probe with fresh pH 7.0 buffer solution.
3. Place the probe into the pH 7.0 buffer solution, making sure that the probe is immersed beyond the electrode band.
4. Gently stir the solution with the probe.
5. Press "CAL/MEAS" to enter pH calibration mode. The primary display will show the measured reading while the smaller secondary display will indicate the pH buffer solution.
6. Wait for the measured pH value to stabilize. The “READY” light will display when the reading stabilizes.

7. After the reading has stabilized and the “READY” light is displayed, press “ENTER” to confirm calibration. The meter is now calibrated to the buffer indicated in the secondary display.

8. Record the reading in the appropriate section of the calibration log sheet.

9. Repeat steps 1 through 8 for pH 4.0 and 10.0 buffers.

10. Once the instrument has been calibrated, verify the calibration by analyzing a second source buffer at pH 7.0. Read and record the pH value and temperature. If the value is NOT within ± 0.1 units, the instrument needs to be re-calibrated (that is, repeat steps 1 through 10).

For specific instructions on how to calibrate pH using the Oakton 10 meter, see Section 4.4 of the manual provided in Attachment 1.

NOTE: SM 4500H-B requires that the buffer solution and the groundwater sample be brought to the same temperature, preferably room temperature, prior to calibrating. This requirement is not practical for field sampling for a number of reasons. First, standard industry practice recommends that the pH meter be calibrated indoors, prior to going into the field. Hence, no groundwater samples have been collected yet. Secondly, if calibrated in the field, it may take several minutes for the buffer and groundwater sample to reach the same temperature, in which case, the well may pump dry and no sample could be collected. Thirdly, this requirement is contradictory to the requirement that field pH be measured within 15 minutes of sample collection.

Therefore, for the Rosemont groundwater monitoring project, the pH meter will be calibrated, preferably, in the office the night or morning before going onto the mine site. If not possible, the pH meter will be calibrated in the field prior to collecting a groundwater sample. The temperature of each buffer solution will be measured and recorded prior to the pH probe calibration. The SM 4500H-B requirement that the buffer and groundwater sample be brought to similar temperatures during calibration, will not be strictly adhered to.

### 3.2 Calibration of Specific Conductance Meter

Calibration for specific conductance is described in Section 4.6 of the manufacturer’s instruction manual (provided in Attachment 1) and generally adheres to EPA Method SM 2510B. A copy of EPA Method SM 2510 is provided in Attachment 3.

The Oakton multi-parameter water quality meter has four specific conductivity measuring ranges. Select the appropriate conductivity range based on existing water quality data, if possible. If there are no existing water quality data available, start with the “0 to 1999 µS” range, then adjust accordingly.

The meter is factory set to a temperature coefficient of 2.00% per °C. The factory default value for normalization temperature is 25 °C.

To calibrate:

1. Pour out two separate portions of the conductivity standard (i.e. 1413 µS.)
2. Press MODE key to select Conductivity Mode. The µS and mS indicator will appear on the right side of the display.
3. Rinse the probe thoroughly with DI water; do not wipe the probe.
4. Rinse the probe in one portion of the calibration standard.
5. Dip the probe into the second portion of the calibration standard, making sure that the probe is immersed beyond the electrode band.
6. Wait for the reading to stabilize. When the readings are stable, the “READY” light appears.
7. Press the “CAL/MEAS” key. The CAL indicator appears above the primary display. The primary display shows the measured reading and the secondary display shows the temperature.
8. Read and record the specific conductance measurement.
9. Press ▼ or ▲ key to scroll to the value of the conductivity standard. (See Attachment 4 for specific conductance values based on temperatures.)
10. Press “ENTER” key to confirm calibration.

3.3 Operation of pH and Specific Conductance Meter
See Section 5 of the Oakton manual provided in Attachment 1.

1. Rinse the probe with DI water before use.
2. Turn the meter on (“ON/OFF” button).
3. Rinse the probe with a small amount of the water sample to be measured.
4. Dip the probe into the water sample, making sure that the probe is immersed beyond the electrode band.
5. Stir the sample to create a homogenous sample.
6. Allow time for water sample to stabilize.
7. When the readings are stable, the “READY” light appears.
8. Read and record pH measurement.
9. To toggle between pH and conductivity readings, press the “MODE” key.
10. Read and record the specific conductance.
11. Read and record the temperature.

3.4 Care and Maintenance of the Oakton Multi-Parameter Water Quality Meter
See Section 7 of the manufacturer’s instructions for water quality meter care and maintenance (see Attachment 1).

Remove the protective cap of the pH probe before use and always immerse the probe beyond the electrode band. Before use, rinse the probe twice with DI water.

Soak the probe in pH 4.0 buffer solution or tap water for at least 5 to 10 minutes before calibration. Keep electrodes wet whenever meter/probe is not in use. Recommended solutions for short-term storage of electrodes vary with type of electrode and manufacturer, but generally have a conductivity greater than 4,000 µS/cm. Tap water is a better substitute than distilled
water; pH 4 buffer is best for the single glass electrode. Under typical operating conditions, the probe will need to be replaced every 6 to 12 months.

### 3.5 Calibration of Temperature Probe

The temperature sensor of the Oakton probe is factory calibrated. Calibrate the temperature only if errors are suspected over a long period of time or a replacement probe is not available. See Section 4.3 of manufacturer’s instruction manual for temperature calibration procedures.

The temperature will be checked (compared) periodically with a NIST-certified thermometer. Turner Laboratories, Inc. (2445 North Coyote Drive, Suite 104, Tucson) has a NIST-certified thermometer and has agreed to allow Rosemont to check our Oakton thermometer with their NIST-certified thermometer. Any deviation from the NIST certified thermometer will be recorded and the meter will be calibrated per the manufacturer’s instructions. If it is not possible to calibrate the instrument it may be:

- Returned to the manufacturer for calibration; or
- A permanent notation documenting the discrepancy between the pH value read on the Oakton probe and the pH of the NIST-certified thermometer will be kept with the meter and included in all data reported using the meter.

### 4.0 QUALITY CONTROL

In order to ensure and document the quality of the pH, specific conductance, and temperature calibration procedures described in this SOP, the following quality control (QC) measures will be performed.

#### 4.1 Frequency

The Oakton PC10 probe will be calibrated for pH and specific conductance each day it is to be used in the field.

#### 4.2 Acceptance Criteria

Acceptance criteria for the Oakton PC10 are as follows:

- pH must be within ± 0.1 SU of the true value.
- Specific conductance must be within ± 20% of the true value.
- Temperature must be within ± 0.1 ºC of the true value.

#### 4.3 Duplicates

For all Rosemont water quality sample collection activities, a duplicate sample will be collected to verify consistency and identify “drift” of the pH/specific conductance meter. To do this, two containers will be used to collect two samples at the same time. These samples will be analyzed with the pH and specific conductance values noted along with the temperature. If the percent variance between the two samples is greater than 10%, the meter will be checked as indicated in Section 4.4 below.

#### 4.4 Field Checking pH

A 7.0 pH buffer will be analyzed after every 10 samples (or after four hours from the time of the initial calibration), and after all samples have been collected. The measured pH should agree
within ± 0.1 S.U. of the specified value for the buffer. If the value obtained is more than ± 0.1 S.U. of the true value, the meter should be recalibrated and the samples reanalyzed.

4.5 Second Source pH Buffer
Once a quarter, a second source of pH buffer solution (i.e., from a different manufacturer) will be used to check the pH and confirm the accuracy of the pH meter.

4.6 Corrective Actions
If the pH meter fails to calibrate properly, refer to the manufacturer's instructions in Attachment 1 of this SOP. If cleaning the probes and successive calibration attempts continue to fail, the instrument should be returned to the manufacturer or their authorized representative for servicing. Any data acquired using the faulty meter must be noted as such.

5.0 ANALYST TRAINING
All Rosemont personnel calibrating the Oakton PC10 meter will read and sign a copy of the Analyst’s Training Record form. A copy of the Analyst’s Training Record is provided in Attachment 5.
ATTACHMENT 1
COPY OF OAKTON PC10 OWNERS MANUAL
Instruction Manual

PC 10

Waterproof Hand-held pH/Conductivity/Temperature Meter
This manual serves to explain the use of the Waterproof PC 10 hand-held meters. It functions as a step by step guide to help you operate the meter and as a handy reference guide. It is written to cover as many anticipated applications of the Waterproof PC 10 meters as possible.

If there are doubts in the use of this meter, please do not hesitate to contact the nearest Authorised Distributor.

Eutech Instruments/ Oakton Instruments cannot accept any responsibility for damage or malfunction to the meter caused by improper use of the instrument.

The information presented in this manual is subject to change without notice as improvements are made, and does not represent a commitment on the part of Eutech Instruments Pte Ltd/ Oakton Instruments.

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Rev 5, 08/04
1. INTRODUCTION

Thank you for selecting the Waterproof PC 10 portable meter. The meter is a microprocessor-based instrument that measures pH, conductivity, and temperature with just one probe. This meter has many user-friendly features – all of which are completely accessible through the water-resistant membrane keypad.

Your meter includes 4 “AAA” batteries and a combination pH / conductivity / temperature probe with 3-meter submersible cable. Please read this manual thoroughly before operating your meter.

Figure 1: Waterproof PC 10 portable meter
2. DISPLAY AND KEYPAD FUNCTIONS

2.1. Display

The LCD has a primary and secondary display.

- The primary display shows the measured pH or conductivity (µS or mS) reading.

- The secondary display shows the temperature in °C.

The display also shows error messages, keypad functions and program functions. See Figure 2.

![Figure 2: A full LCD screen](image-url)
2.2. Keypad

The large membrane keypad makes the instrument easy to use. Each button, when pressed, has a corresponding graphic indicator on the LCD. See Figure 3.

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON/OFF</td>
<td>Powers on and shuts off the meter. The meter powers on in the mode it was shut off in. For example, if you shut the meter off in Conductivity measurement mode, the meter will be in Conductivity measurement mode when you switch the meter on.</td>
</tr>
<tr>
<td>HOLD</td>
<td>Freezes the measured reading. To activate, press HOLD while in measurement mode. To release, press HOLD again.</td>
</tr>
<tr>
<td>MODE</td>
<td>Selects the measurement parameter (conductivity or pH). Press MODE to toggle between pH and Conductivity mode.</td>
</tr>
<tr>
<td>CAL/MEAS</td>
<td>Toggles user between Calibration and Measurement mode.</td>
</tr>
<tr>
<td></td>
<td>If you were in Conductivity Measurement mode, press CAL/MEAS to enter Conductivity Calibration mode.</td>
</tr>
<tr>
<td></td>
<td>If you were in pH Measurement mode, press CAL/MEAS to enter pH Calibration mode.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Temperature calibration is accessible from pH Calibration mode; see pages 10 for instructions.</td>
</tr>
<tr>
<td>ENTER</td>
<td>Press to confirm your calibration values in Calibration mode.</td>
</tr>
<tr>
<td>▲ / ▼</td>
<td>Scrolls values up and down in Calibration mode.</td>
</tr>
<tr>
<td></td>
<td>In pH mode, ▲ / ▼ scrolls through the auto buffer values 4.00, 7.00 and 10.00.</td>
</tr>
<tr>
<td></td>
<td>In Conductivity and Temperature Calibration mode, ▲ / ▼ lets you increase or decrease the calibration value.</td>
</tr>
</tbody>
</table>

Figure 3: Keypad membranes of Waterproof PC 10
3. PREPARATION

3.1 Inserting the Batteries

The meter is packaged with 4 “AAA” alkaline batteries required for operation. To insert the batteries into the meter, follow the procedure outlined below.

1. Use a Philips screwdriver to remove the two screws holding the battery cover. See Figure 6 below.
2. Remove battery cover.
3. Insert batteries. Follow the diagram inside the cover for correct polarity.
4. Replace the battery cover into its original position using the two screws removed earlier.

Figure 4: Battery Compartment
3.2 Connecting the Probe

The Waterproof PC 10 meter uses a special combination pH / Conductivity / Temperature probe. The probe cable has a notched 6-pin connector to attach the probe to the meter.

NOTE: Do not substitute other probes or electrodes. For replacement probe, see the "Accessories" section, page 21-23.

NOTE: Keep connector dry and clean. Do not touch connector with soiled hands.

To connect the pH / Conductivity / Temperature probe:

1. Line up the notch and 6 pins of the meter’s connector with the holes in the probe’s connector. Push down and screw the metal sleeve to lock the probe connector into place. See Figure 5.

2. To remove probe, unscrew the metal sleeve and slide up the probe connector. While holding onto metal sleeve, pull probe away from the meter.

CAUTION: Do not pull on the probe cord or the probe wires might disconnect.

Figure 5: Probe Connector
4. CALIBRATION

4.1. Important Information on Meter Calibration

When you recalibrate your meter, old pH and conductivity calibration data are replaced on a point by point basis. For example, if you previously calibrated your meter at pH 4.0, 7.0, and 10.0, and you recalibrate at pH 7.0, the meter retains the old calibration data at pH 4.0 and pH 10.0.

To completely recalibrate your meter, or when you use a replacement probe, it is best to set the meter to its factory defaults and recalibrate the meter at all points.

To reset the meter to its factory defaults:
1. While in Measurement mode, press CAL/MEAS and hold for 3 seconds.
2. The meter will prompt RST in the lower display and CAL in the upper display. See Figure 6.
3. Press ENTER to reset your meter to its factory defaults. If you do not want to erase existing calibration data, press CAL/MEAS to escape this mode.

For information on how to calibrate your meter:
See Section 4.3 on page 8 for Temperature calibration.
See Section 4.4 on pages 10 for pH calibration.
See Section 4.5 on pages 12 for conductivity calibration.
4.2. Preparing the Meter for Calibration

The pH/conductivity/temperature probe included with this meter is designed for use with this meter only. Do not substitute other types of probes or electrodes. For a replacement probe, see the “Accessories” section, page 21.

Be sure to remove the protective cap of the pH probe before calibration or measurement. Always immerse the probe beyond the electrode band.

Immerse the probe in tap water for 10 minutes before calibrating or taking readings to hydrate the pH electrode surface and minimise drift.

Rinse your probe in DI water after use. Storage in electrode storage solution is ideal. Alternatively, pH 4.0 or 7.0 calibration standards can be used for short term storage. Do not reuse buffer solutions after calibration. Contaminants in the solution can affect the calibration, and eventually the accuracy of the measurements.
4.3. Temperature Calibration

The built-in temperature sensor included in the probe is factory calibrated. Calibrate your sensor only if you suspect temperature errors may have occurred over a long period of time or if you have a replacement probe.

1. Turn the meter on. Press MODE to select pH Measurement mode.

2. Press the CAL/MEAS key to enter pH calibration mode. The CAL indicator will appear above the primary display.

See Figure 10.

3. While in pH calibration mode, press the MODE key to enter temperature calibration mode. The primary display shows the temperature reading with zero offset and the secondary display shows you what the temperature value was initially.

See Figure 11.

4. Dip the probe into a solution with known temperature (i.e. a temperature bath). Allow sufficient time for the meter’s temperature reading to stabilize.

5. Press the ▲ or ▼ key to set the primary display reading to the correct temperature value. (i.e. the temperature of the temperature bath)

See Figure 12.
6. Press the ENTER key to confirm temperature calibration. The CON indicator will flash to confirm calibration.

See Figure 13.

**NOTES**

To exit from Temperature Calibration mode without confirming calibration, DO NOT press ENTER in step 6. Press CAL/MEAS instead.

Temperature calibration is restricted to ±5°C from the initial value displayed during calibration (shown in the secondary display).

Since temperature readings affect the accuracy of the pH and conductivity measurements, it is strongly recommended to carry out pH and conductivity calibration after a temperature calibration is done.
4.4. **pH Calibration**

This instrument is capable of up to 3-point pH calibration to ensure accuracy across the entire pH range of the meter. You can perform 1, 2, or 3 point calibration with standard pH buffers of 4.01, 7.00 and 10.00.

We recommend that you perform at least 2-point calibration using standard buffers that covers the expected sample range. You can also perform a 1-point calibration, but make sure that the buffer value is close to the sample value you are measuring.

This meter features three pre-programmed pH buffers (pH 4.01, 7.00 and 10.00). The meter automatically recognizes and calibrates to these standard buffer values, which makes pH calibration faster and easier.

**Calibrating for pH:**

1. If necessary, press the MODE key to select pH mode. The pH indicator appears in the upper right hand corner of the display.

2. Rinse the probe thoroughly with DI water or a rinse solution. Do not wipe the probe; this causes a build-up of electrostatic charge on the glass surface.

3. Dip the probe into the calibration buffer. The end of the probe must be completely immersed into the sample. Stir the sample using the probe gently to create a homogeneous sample.

4. Press CAL/MEAS to enter pH calibration mode. The primary display will show the measured reading while the smaller secondary display will indicate the pH standard buffer solution.

See Figure 11.

**NOTE:** If using a pH buffer other than pH 7, press the ▲ or ▼ key to scroll up or down until the secondary display value is the same as your pH buffer value (pH 4.00, 7.00 or 10.00).

5. Wait for the measured pH value to stabilize. The READY indicator will display when the reading stabilizes.

See Figure 12.
6. After the reading has stabilized and the READY indicator is displayed, press ENTER to confirm calibration. A confirming indicator (CON) flashes and disappears. The meter is now calibrated to the buffer indicated in the secondary display.

See Figure 13.

The secondary display automatically scrolls to the next buffer calibration option.

If you are performing multi-point calibration, go to step 7.

If you are performing one-point calibration, go to step 10.

7. Press the ▲ or ▼ key to select the next buffer value you want to calibrate (pH 4.00, 7.00 or 10.00).

See Figure 14.

8. Rinse the probe with DI water or a rinse solution, and place it in the next pH buffer you want to calibrate.

9. Follow steps 5 to 8 for all calibration processes (up to 3 points).

10. When calibration is complete, press CAL/MEAS to return to pH measurement mode.

**NOTES**

To exit from pH Calibration mode without confirming calibration, DO NOT press ENTER in step 6. Press CAL/MEAS instead.

If the selected buffer value is not within ±1.00 pH from the measured pH value:

The electrode and buffer icon blink and the ERR annunciator appears in the lower left corner of the display. These indicators also flash if the buffer used is not the same as the buffer value on the secondary display.
4.5. Conductivity Calibration

The Important Information on Conductivity Calibration

Your meter has four measuring ranges. You can calibrate one point in each of the measuring ranges (up to four points). If you are measuring values in more than one range, make sure to calibrate each of the ranges you are measuring.

The following table lists the corresponding conductivity range. You should calibrate each range using a solution that falls between the values in the “recommended calibration solution range” column.

<table>
<thead>
<tr>
<th>Conductivity Range</th>
<th>Recommended Calibration Solution Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 to 19.99 µS</td>
<td>6.00 to 17.00 µS</td>
</tr>
<tr>
<td>0.0 to 199.9 µS</td>
<td>60.0 to 170.0 µS</td>
</tr>
<tr>
<td>0 to 1999 µS</td>
<td>600 to 1700 µS</td>
</tr>
<tr>
<td>0.00 to 19.99 mS</td>
<td>6.00 to 17.00 mS</td>
</tr>
</tbody>
</table>

NOTE:
Minimum calibration value should be 20% of full scale for the specific range. E.g.: The LOWEST calibration value for the range of 0.00 to 19.99 µS is 4.00 µS.

When you recalibrate your meter, old calibrations are replaced on a range basis. For example, if you previously calibrated your conductivity meter at 1413 µS in the 0 to 1999 µS range and you recalibrate at 1500 µS (also in the 0 to 1999 µS range), the meter will replace the old calibration data (1413 µS) in that range. The meter will retain all calibration data in other ranges.

To completely recalibrate your meter, or when you use a replacement probe, it is best to clear all calibration data in memory. To erase all the old conductivity data, see Section 4.1: Important Information on Meter Calibration.

NOTE:
These meters are factory set to a temperature coefficient of 2.00% per °C. For most applications this will provide good results. The factory default value for normalization temperature is 25°C.
4.6. Calibrating for Conductivity:

1. Pour out two separate portions of your calibration standard and one of DI water into separate clean containers.

2. If necessary, press MODE key to select Conductivity Mode. The µS and mS indicator will appear on the right side of the display.

3. Rinse your probe with DI water, then rinse the probe in one portion of the calibration standard. Immerse the probe into the second portion of the calibration standard. The meter auto ranging function selects the appropriate conductivity range (four ranges are possible). Be sure the probe is free from air bubbles and sufficient calibration standard is used to cover the conductivity sensor. Wait for the reading to stabilize. The READY indicator lights when the reading is stable. See Figure 18

4. Press the CAL/MEAS key. The CAL indicator appears above the primary display. The primary display shows the measured reading and the secondary display shows the temperature. See Figure 19.

5. Press the ▼ or ▲ key to scroll to the value of your conductivity standard. Press and hold the ▼ or ▲ keys to scroll faster. See Figure 20.

![Figure 15: Stabilized measurement](image)

![Figure 16: CAL Indicator](image)

![Figure 17: Adjust to standard value](image)
6. Press the ENTER key to confirm calibration. Upon confirmation, the CON indicator appears briefly. The meter automatically switches back into Measurement mode. The display now shows the calibrated, temperature compensated conductivity value. See Figure 21.

7. For calibration in other ranges (maximum: four ranges) repeat steps 1 through 6 with the appropriate calibration standards.

**NOTES:**

To exit from Conductivity Calibration mode without confirming calibration, DO NOT press ENTER in step 6. Press CAL/MEAS instead.

If the calibration value input into the meter is different from the initial value displayed by more than 20%, the ERR annunciator appears in the lower left corner of the display.
5. MEASUREMENT

The READY indicator appears on the display when the readings stabilise. It will turn off if the readings start to fluctuate.

NOTE: Be sure to remove the protective cap of the pH electrode before measurement.

To take readings:

1. Rinse the probe with DI water before use to remove any impurities adhering to the probe body. If the pH electrode has dehydrated, soak it for 30 minutes in tap water.

2. Switch on the meter. The MEAS annunciator appears on the top center of the LCD. The ATC indicator appears in the lower right hand corner to indicate Automatic Temperature Compensation. See Figure 22.

3. Dip the probe into the sample.

   NOTE: When measuring a sample, make sure that the probe is immersed beyond the electrode band. See figure in Section 4.2. Stir the sample using the probe gently to create a homogenous sample. Allow time for the readings to stabilize. Note the readings on the display. When the readings are stable, the READY annunciator appears.

4. To toggle between pH and conductivity readings, press the MODE key. See Figures 23 and 24.

   NOTE: Conductivity readings are auto ranging and will automatically move to the correct range (four ranges possible).
6. HOLD FUNCTION

This feature lets you freeze the value of the pH or conductivity reading for a delayed observation. HOLD can be used any time when in MEAS mode.

1. To hold a measurement, press the HOLD key while in measurement mode. “HOLD” will appear on the display.

See Figure 25.

2. To release the held value, press HOLD again. Continue to take measurements.

NOTE: This meter will hold a reading for up to 20 minutes, after which time the meter will automatically shutoff to conserve batteries without retaining the value that was held.
7. PROBE CARE AND MAINTENANCE

Under typical operating conditions, the probe will need to be replaced every 6 to 12 months. In extreme applications, the probe may wear out sooner. Proper care and maintenance will help you receive the maximum probe life and ensure more accurate readings.

Keep the probe clean. Before use, rinse the probe twice. Be sure to remove the protective cap of the pH probe before use and always immerse the probe beyond the electrode band. For the best accuracy, soak your probe in electrode storage solution, pH 4.0 buffer, or tap water for at least 5 to 10 minutes before calibration.

Gently stir the probe in the solution while you take readings. Tap the probe gently against the bottom and sides of your container to remove any air bubbles, which may interfere with accuracy.

Clean the probe thoroughly by immersing it in an agitated mild detergent bath. To clean the conductivity cell, remove the plastic sleeve and use a cotton swab soaked in isopropyl alcohol to clean the steel pins. Wipe the steel pins if needed with soft tissue paper. Replace the sleeve which is necessary for calibration and measurement. DO NOT wipe the pH bulb as it may cause static build-up. After cleaning the probe, rinse the probe well with clean water. Recalibrate the meter after cleaning the probe.

Do not strike the probe against any hard surface. Do not immerse the probe in oily solutions. Store the probe in its cap filled with electrode storage solution. To order a replacement probe and other accessories, see “Accessories” section on page 21.
## 8. TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No display when turned on</td>
<td>1. Batteries not in place.</td>
<td>1. Check that batteries are in place and making good contact.</td>
</tr>
<tr>
<td></td>
<td>2. Batteries not in correct polarity (+ and -).</td>
<td>2. Reinsert batteries with correct polarity.</td>
</tr>
<tr>
<td></td>
<td>3. Weak batteries</td>
<td>3. Attach optional AC adapter (only for Standard PC 10 meter) or replace batteries.</td>
</tr>
<tr>
<td>Unstable readings</td>
<td>1. Air bubbles in probe.</td>
<td>1. Tap probe to remove bubbles.</td>
</tr>
<tr>
<td></td>
<td>2. Dirty probe.</td>
<td>2. Clean the probe and recalibrate.</td>
</tr>
<tr>
<td></td>
<td>3. Probe not deep enough in sample.</td>
<td>3. Make sure sample entirely covers the probe sensors.</td>
</tr>
<tr>
<td></td>
<td>4. External noise pickup or induction caused by nearby electric motor.</td>
<td>4. Move or switch off interfering motor.</td>
</tr>
<tr>
<td>&quot;OR&quot; on upper display</td>
<td>1. Probe is shorted.</td>
<td>1. Test probe. Make sure probe is fully connected to meter.</td>
</tr>
<tr>
<td></td>
<td>2. Probe is in an out-of-range solution.</td>
<td>2. Use different solution.</td>
</tr>
<tr>
<td>Temperature reading erratic or lower</td>
<td>1. Temperature sensor is dirty.</td>
<td>1. Clean temperature sensor with isopropyl alcohol.</td>
</tr>
<tr>
<td>display reads &quot;OR&quot;</td>
<td>2. Temperature of solution is out of range.</td>
<td>2. Heat or cool solution.</td>
</tr>
</tbody>
</table>
9. ERROR MESSAGES

<table>
<thead>
<tr>
<th>LCD Display</th>
<th>Indicates</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Err annunciator</td>
<td>Unrecognised input from keypad</td>
<td>Wrong input in selected mode.</td>
<td>Release key. Select valid operations depending on mode.</td>
</tr>
<tr>
<td>CAL &amp; Err annunciators</td>
<td>Calibration error.</td>
<td>Wrong value input at calibration.</td>
<td>Check your input value, clean probe.</td>
</tr>
<tr>
<td>blink.</td>
<td></td>
<td>Dirty probe.</td>
<td>See Calibration sections or Probe Maintenance section.</td>
</tr>
<tr>
<td>Battery indicator blink</td>
<td>Low battery level.</td>
<td>Need new batteries or battery connection is bad.</td>
<td>Clean battery contacts. Replace batteries with fresh ones, noting polarity.</td>
</tr>
<tr>
<td>Err 1 (in primary display)</td>
<td>Memory write error.</td>
<td>Instrument too old (&gt; 10 years). Hardware failure.</td>
<td>Turn meter on and off again. If message persists, return unit*.</td>
</tr>
<tr>
<td>Err 3</td>
<td>A/D converter error.</td>
<td>Faulty hardware</td>
<td>Return unit *.</td>
</tr>
</tbody>
</table>

* See “Warranty” on page 24 and “Return of Items” on page 25.

If an error message appears in the primary display (the upper row of larger digits), switching off the meter and switching it on again may eliminate the error message. See Figure 26 below.

If error persists, or the meter shows incorrect values, return the meter.

For a complete diagram of the LCD display, see Figure 2 on page 2.

Figure 23: Error message on LCD
### 10. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Mode</th>
<th>pH</th>
<th>Temperature</th>
<th>Conductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>0.00 to 14.00 pH</td>
<td>0.0 to 100.0 °C</td>
<td>0 to 19.99 µS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 to 199.9 µS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 to 1999 µS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 to 19.99 mS</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.01 pH</td>
<td>0.1 °C</td>
<td>0.01 µS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.1 µS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 µS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.01 mS</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>± 0.01 pH</td>
<td>± 0.5 °C</td>
<td>±1% Full Scale</td>
</tr>
<tr>
<td><strong>Calibration</strong></td>
<td>Up to three points (pH 4.01, 7.00, 10.01) with automatic buffer recognition</td>
<td>Offset in 0.1 °C increments</td>
<td>Up to four points (one point per range)</td>
</tr>
<tr>
<td><strong>Conductivity Cell constant (k)</strong></td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Conductivity Temperature Coefficient</strong></td>
<td></td>
<td></td>
<td>2.00 % per °C fixed</td>
</tr>
<tr>
<td><strong>Temperature Compensation</strong></td>
<td></td>
<td>Automatic from 0 to 50 °C</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td></td>
<td>0 to 50 °C</td>
<td></td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>four 1.5 V AAA-sized batteries (included) or AC adapter (only for Standard PC 10 meter; optional; order separately on &quot;Accessories&quot; section)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Battery life</strong></td>
<td>&gt; 50 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>Waterproof PC 10 meter: 19 cm (L) x 10 cm (W) x 6 cm (H)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boxed: 24 cm (L) x 23 cm (W) x 7 cm (H)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Probe: 180 mm (L) x 51 mm (Diameter), with 3-m cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shipping weight</strong></td>
<td>0.92 kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
11. ACCESSORIES

11.1. Replacement Meter and Meter accessories

<table>
<thead>
<tr>
<th>Item</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterproof PC 10 pH / Conductivity / Temperature meter and electrode (EC-COMBI03M / 35630-50)</td>
<td>EC-PCWP10/03K includes kit (EC-PCWP-KIT)</td>
</tr>
<tr>
<td>Replacement pH / Conductivity / Temperature electrode. Combination double-junction pH sensor with 2-pin stainless steel conductivity cell, 3 m (10-ft) cable</td>
<td>EC-COMBI03M</td>
</tr>
<tr>
<td>Kit for Waterproof PC 10 Meter – Plastic Carrying Case comprises 1 x pH 7.00, 1413 µS and 12.88 mS KCl (60 mL) and 1 x rinse bottle (480 mL– empty)</td>
<td>EC-PCWP-KITJ</td>
</tr>
<tr>
<td>Hard carrying case for Standard &amp; Waterproof PC 10</td>
<td>EC-WPDRYKIT</td>
</tr>
<tr>
<td>Replacement red cap for pH sensor</td>
<td>15X278301</td>
</tr>
<tr>
<td>Replacement clear cover for conductivity sensor</td>
<td>15X278601</td>
</tr>
<tr>
<td>Item</td>
<td>Ordering Code</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Waterproof PC 10 pH / Conductivity / Temperature meter and electrode (EC-COMBI03M / 35630-50)</td>
<td>35630-02</td>
</tr>
<tr>
<td>Replacement pH / Conductivity / Temperature electrode. Combination double-junction pH sensor with 2-pin stainless steel conductivity cell, 3 m (10-ft) cable</td>
<td>35630-50</td>
</tr>
<tr>
<td>Waterproof PC 10 Kit; includes pH / Conductivity / Temperature meter (35630-02) and electrode (35630-50), Hard carrying case, pH pouches (3 each of pH 4, 7, 10, and rinse), conductivity pouches (447, 1413, 2764, 15000 µS).</td>
<td>35630-62</td>
</tr>
<tr>
<td>pH / Conductivity / Temperature electrode. Combination double-junction pH sensor. 173 mm (6.8&quot;) length x 35mm (1.375&quot;) diameter. 3 m (10-ft) cable.</td>
<td>35630-52</td>
</tr>
<tr>
<td>pH / Conductivity / Temperature electrode. Combination double-junction pH sensor. 173 mm (6.8&quot;) length x 35mm (1.375&quot;) diameter. 7.6 m (25-ft) cable.</td>
<td>35630-54</td>
</tr>
<tr>
<td>pH / Conductivity / Temperature electrode. Combination double-junction pH sensor. 173 mm (6.8&quot;) length x 35mm (1.375&quot;) diameter. 30.5 m (100-ft) cable.</td>
<td>35630-56</td>
</tr>
<tr>
<td>Hard carrying case for Waterproof PC 10</td>
<td>35632-98</td>
</tr>
<tr>
<td>Replacement red cap for pH sensor</td>
<td>00120JQ</td>
</tr>
<tr>
<td>Replacement clear cover for conductivity sensor</td>
<td>00120JP</td>
</tr>
</tbody>
</table>
11.2. Calibration Solutions

Note: pH buffer solutions have ±0.01 pH accuracy at 25 °C.

<table>
<thead>
<tr>
<th>Item</th>
<th>Eutech Instruments Ordering Code</th>
<th>Oakton Instruments Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH 4.01 buffer solution, 480 mL bottle (1 pint)</td>
<td>EC-BU-4BT</td>
<td>00654-00</td>
</tr>
<tr>
<td>pH 7.00 buffer solution, 480 mL bottle (1 pint)</td>
<td>EC-BU-7BT</td>
<td>00654-04</td>
</tr>
<tr>
<td>pH 10.01 buffer solution, 480 mL bottle (1 pint)</td>
<td>EC-BU-10BT</td>
<td>00654-08</td>
</tr>
<tr>
<td>pH 4.01 buffer pouches, 20 mL x 20 each</td>
<td>EC-BU-4BS</td>
<td>35653-01</td>
</tr>
<tr>
<td>pH 7.00 buffer pouches, 20 mL x 20 each</td>
<td>EC-BU-7BS</td>
<td>35653-02</td>
</tr>
<tr>
<td>pH 10.01 buffer pouches, 20 mL x 20 each</td>
<td>EC-BU-10BS</td>
<td>35653-03</td>
</tr>
<tr>
<td>12.88 mS Calibration Solution in 480-mL bottle (1 pint)</td>
<td>EC-CON-1288BT</td>
<td>00606-10</td>
</tr>
<tr>
<td>10 µS Conductivity Pouches, 20 mL x 20 each</td>
<td>EC-CON-10BS</td>
<td>35653-09</td>
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<tr>
<td>447 µS Conductivity Pouches (20 units x 20 mL per box)</td>
<td>EC-CON-447BS</td>
<td>35653-10</td>
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<tr>
<td>1,413 µS Conductivity Pouches (20 units x 20 mL per box)</td>
<td>EC-CON-1413BS</td>
<td>35653-11</td>
</tr>
<tr>
<td>2,764 µS Conductivity Pouches (20 units x 20 mL per box)</td>
<td>EC-CON-2764BS</td>
<td>35653-12</td>
</tr>
<tr>
<td>15,000 µS Conductivity Pouches (20 units x 20 mL per box)</td>
<td>EC-CON-15000BS</td>
<td>35653-13</td>
</tr>
</tbody>
</table>

Conductivity standard solutions have ±1% accuracy at 25°C. Pouches are individually sealed packets containing 20 mL of calibration solution designed for single-use.
12. WARRANTY

This meter is supplied with a three-year warranty, six-month warranty for probe against significant deviations in material and workmanship.

If repair or adjustment is necessary and has not been the result of abuse or misuse within the designated period, please return – freight pre-paid – and correction will be made without charge. Eutech Instruments/Oakton Instruments will determine if the product problem is due to deviations or customer misuse.

Out of warranty products will be repaired on a charged basis.

Exclusions

The warranty on your instrument shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorised modification or misuse
- Operation outside of the environment specifications of the products
13. RETURN OF ITEMS

Authorisation must be obtained from our Customer Service Department or authorised distributor before returning items for any reason. A “Return Goods Authorisation” (RGA) form is available through our authorised distributor. Please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Eutech Instruments/ Oakton Instruments will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorised returns.

NOTE: Eutech Instruments Pte Ltd/ Oakton Instruments reserves the right to make improvements in design, construction, and appearance of products without notice.
Current Draft of SWPPP for Review
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For more information on Eutech Instruments/ Oakton Instruments’ products, contact your nearest distributor or visit our website listed below:

<table>
<thead>
<tr>
<th>Oakton Instruments</th>
<th>Eutech Instruments Pte Ltd.</th>
<th>Distributed by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.O Box 5136,</td>
<td>Blk 55, Ayer Rajah Crescent,</td>
<td></td>
</tr>
<tr>
<td>Vernon Hills, IL 60061, USA</td>
<td>#04-16/24 Singapore 139949</td>
<td></td>
</tr>
<tr>
<td>Tel: (1) 888-462-5866</td>
<td>Tel: (65) 6776 8976</td>
<td></td>
</tr>
<tr>
<td>Fax: (1) 847-247-2984</td>
<td>Fax: (65) 6773 0836</td>
<td></td>
</tr>
<tr>
<td>E-mail: <a href="mailto:info@4oakton.com">info@4oakton.com</a></td>
<td>E-mail: <a href="mailto:marketing@eutechinst.com">marketing@eutechinst.com</a></td>
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<tr>
<td><a href="http://www.oaktoninstruments.com">www.oaktoninstruments.com</a></td>
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</tbody>
</table>
ATTACHMENT 2
COPY OF EPA METHOD SM 4500
4500-H⁺  pH VALUE*

4500-H⁺ A. Introduction

1. Principles

Measurement of pH is one of the most important and frequently used tests in water chemistry. Practically every phase of water supply and wastewater treatment, e.g., acid-base neutralization, water softening, precipitation, coagulation, disinfection, and corrosion control, is pH-dependent. pH is used in alkalinity and carbon dioxide measurements and many other acid-base equilibria. At a given temperature the intensity of the acidic or basic character of a solution is indicated by pH or hydrogen ion activity. Alkalinity and acidity are the acid- and base-neutralizing capacities of a water and usually are expressed as milligrams CaCO₃ per liter. Buffer capacity is the amount of strong acid or base, usually expressed in moles per liter, needed to change the pH value of a 1-L sample by 1 unit. pH as defined by Sorensen is \(-\log [H]^{+}\); it is the “intensity” factor of acidity. Pure water is very slightly ionized and at equilibrium the ion product is

\[
[H^+][OH^-] = K_w = 1.01 \times 10^{-14} \text{ at } 25^\circ\text{C}
\]

and

\[
[H^+] = [OH^-] = 1.005 \times 10^{-7}
\]

where:

\[ [H^+] = \text{activity of hydrogen ions, moles/L,} \]
\[ [OH^-] = \text{activity of hydroxyl ions, moles/L, and} \]
\[ K_w = \text{ion product of water.} \]

Because of ionic interactions in all but very dilute solutions, it is necessary to use the “activity” of an ion and not its molar concentration. Use of the term pH assumes that the activity of the hydrogen ion, \(a_{H^+}\), is being considered. The approximate equivalence to molarity, \([H^+]\) can be presumed only in very dilute solutions (ionic strength <0.1).

A logarithmic scale is convenient for expressing a wide range of ionic activities. Equation 1 in logarithmic form and corrected to reflect activity is:

\[( -\log_{10} a_{H^+} ) + ( -\log_{10} a_{OH^-} ) = 14 \quad (2)\]

or

\[ \text{pH} + \text{pOH} = pK_w \]

where:

\[ \text{pH} = \log_{10} a_{H^+} \text{ and} \]
\[ \text{pOH} = \log_{10} a_{OH^-} \]

Equation 2 states that as pH increases pOH decreases correspondingly and vice versa because pKₜ is constant for a given temperature. At 25°C, pH 7.0 is neutral, the activities of the hydrogen and hydroxyl ions are equal, and each corresponds to an approximate activity of \(10^{-7}\) moles/L. The neutral point is temperature-dependent and is pH 7.5 at 0°C and pH 6.5 at 60°C.

The pH value of a highly dilute solution is approximately the same as the negative common logarithm of the hydrogen ion concentration. Natural waters usually have pH values in the range of 4 to 9, and most are slightly basic because of the presence of bicarbonates and carbonates of the alkali and alkaline earth metals.

2. Reference


† p designates \(-\log_{10}\) of a number.

4500-H⁺ B. Electrometric Method

1. General Discussion

a. Principle: The basic principle of electrometric pH measurement is determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode. The hydrogen electrode consists of a platinum electrode across which hydrogen gas is bubbled at a pressure of 101 kPa. Because of difficulty in its use and the potential for poisoning the hydrogen electrode, the glass electrode commonly is used. The electromotive force (emf) produced in the glass electrode system varies linearly with pH. This linear relationship is described by plotting the measured emf against the pH of different buffers. Sample pH is determined by extrapolation.

Because single ion activities such as \(a_{H^+}\) cannot be measured, pH is defined operationally on a potentiometric scale. The pH measuring instrument is calibrated potentiometrically with an indicating (glass) electrode and a reference electrode using National Institute of Standards and Technology (NIST) buffers having assigned values so that:
where: 
\[ \text{pH}_B = -\log_{10}[A_{H^+}] \]

where: 
\( \text{pH}_B \) = assigned pH of NIST buffer.

The operational pH scale is used to measure sample pH and is defined as:

\[ \text{pH}_x = \frac{E_x - E_s}{2.303 RT} \]

where:
\( \text{pH}_x \) = potentiometrically measured sample pH,
\( F = \) Faraday: 9.649 \times 10^{-4} \text{ coulomb/mole},
\( E_x = \) sample emf, V,
\( E_s = \) buffer emf, V,
\( R = \) gas constant; 8.314 joule/(mole °K), and
\( T = \) absolute temperature, °K.

**NOTE**: Although the equation for pH\(_x\) appears in the literature with a plus sign, the sign of emf readings in millivolts for most pH meters manufactured in the U.S. is negative. The choice of negative sign is consistent with the IUPAC Stockholm convention concerning the sign of electrode potential.\(^1\)

The activity scale gives values that are higher than those on Sorenson’s scale by 0.04 units:

\[ \text{pH (activity)} = \text{pH (Sorenson)} + 0.04 \]

The equation for pH\(_x\) assumes that the emf of the cells containing the sample and buffer is due solely to hydrogen ion activity unaffected by sample composition. In practice, samples will have varying ionic species and ionic strengths, both affecting H\(^+\) activity. This imposes an experimental limitation on pH measurement; thus, to obtain meaningful results, the differences between \( E_s \) and \( E_x \) should be minimal. Samples must be dilute aqueous solutions of simple solutes (<0.2M). (Choose buffers to bracket the sample.) Determination of pH cannot be made accurately in nonaqueous media, suspensions, colloids, or high-ionic-strength solutions.

**b. Interferences**: The glass electrode is relatively free from interference from color, turbidity, colloidal matter, oxidants, reductants, or high salinity, except for a sodium error at pH > 10. Reduce this error by using special “low sodium error” electrodes.

pH measurements are affected by temperature in two ways: mechanical effects that are caused by changes in the properties of the electrodes and chemical effects caused by equilibrium changes. In the first instance, the Nernstian slope increases with increasing temperature and electrodes take time to achieve thermal equilibrium. This can cause long-term drift in pH. Because chemical equilibrium affects pH, standard pH buffers have a specified pH at indicated temperatures.

Always report temperature at which pH is measured.

2. Apparatus

**a. pH meter** consisting of potentiometer, a glass electrode, a reference electrode, and a temperature-compensating device. A circuit is completed through the potentiometer when the electrodes are immersed in the test solution. Many pH meters are capable of reading pH or millivolts and some have scale expansion that permits reading to 0.001 pH unit, but most instruments are not that precise.

For routine work use a pH meter accurate and reproducible to 0.1 pH unit with a range of 0 to 14 and equipped with a temperature-compensation adjustment.

Although manufacturers provide operating instructions, the use of different descriptive terms may be confusing. For most instruments, there are two controls: intercept (set buffer, asymmetry, standardize) and slope (temperature, offset); their functions are shown diagramatically in Figures 4500-H\(^\circ\):1 and 2.

The intercept control shifts the response curve laterally to pass through the isopotential point with no change in slope.
permits bringing the instrument on scale (0 mV) with a pH 7 buffer that has no change in potential with temperature.

The slope control rotates the emf/pH slope about the isopotential point (0 mV/pH 7). To adjust slope for temperature without disturbing the intercept, select a buffer that brackets the sample with pH 7 buffer and adjust slope control to pH of this buffer. The instrument will indicate correct millivolt change per unit pH at the test temperature.

b. Reference electrode consisting of a half cell that provides a constant electrode potential. Commonly used are calomel and silver: silver-chloride electrodes. Either is available with several types of liquid junctions.

The liquid junction of the reference electrode is critical because at this point the electrode forms a salt bridge with the sample or buffer and a liquid junction potential is generated that in turn affects the potential produced by the reference electrode. Reference electrode junctions may be annular ceramic, quartz, or asbestos fiber, or the sleeve type. The quartz type is most widely used. The asbestos fiber type is not recommended for strongly basic solutions. Follow the manufacturer’s recommendation on use and care of the reference electrode.

Refill nonsealed electrodes with the correct electrolyte to proper level and make sure junction is properly wetted.

c. Glass electrode: The sensor electrode is a bulb of special glass containing a fixed concentration of HCl or a buffered chloride solution in contact with an internal reference electrode. Upon immersion of a new electrode in a solution the outer bulb surface becomes hydrated and exchanges sodium ions for hydrogen ions to build up a surface layer of hydrogen ions. This, together with the repulsion of anions by fixed, negatively charged silicate sites, produces at the glass-solution interface a potential that is a function of hydrogen ion activity in solution.

Several types of glass electrodes are available. Combination electrodes incorporate the glass and reference electrodes into a single probe. Use a “low sodium error” electrode that can operate at high temperatures for measuring pH over 10 because standard glass electrodes yield erroneously low values. For measuring pH below 1 standard glass electrodes yield erroneously high values; use liquid membrane electrodes instead.

d. Beakers: Preferably use polyethylene or TFE* beakers.

e. Stirrer: Use either a magnetic, TFE-coated stirring bar or a mechanical stirrer with inert plastic-coated impeller.

f. Flow chamber: Use for continuous flow measurements or for poorly buffered solutions.

3. Reagents

a. General preparation: Calibrate the electrode system against standard buffer solutions of known pH. Because buffer solutions may deteriorate as a result of mold growth or contamination, prepare fresh as needed for accurate work by weighing the amounts of chemicals specified in Table 4500-H⁺:I, dissolving in distilled water at 25°C, and diluting to 1000 mL. This is particularly important for borate and carbonate buffers.

Boil and cool distilled water having a conductivity of less than 2 μhos/cm. To 50 mL add 1 drop of saturated KCl solution suitable for reference electrode use. If the pH of this test solution is between 6.0 and 7.0, use it to prepare all standard solutions.

Dry KH₂PO₄ at 110 to 130°C for 2 h before weighing but do not heat unstable hydrated potassium tetroxalate above 60°C nor dry the other specified buffer salts.

Although ACS-grade chemicals generally are satisfactory for preparing buffer solutions, use certified materials available from the National Institute of Standards and Technology when the greatest accuracy is required. For routine analysis, use commercially available buffer tablets, powders, or solutions of tested quality. In preparing buffer solutions from solid salts, ensure dryness and store in solid acids, insure complete solution.

As a rule, select and prepare buffer solutions classed as primary standards in Table 4500-H⁺:I; reserve secondary standards for extreme situations encountered in wastewater measurements. Consult Table 4500- H⁺:II for accepted pH of standard buffer solutions at temperatures other than 25°C. In routine use, store buffer solutions and samples in polyethylene bottles. Replace buffer solutions every 4 weeks.

* Teflon or equivalent

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**Table 4500-H⁺:I. Preparation of pH Standard Solutions**³

<table>
<thead>
<tr>
<th>Standard Solution (molality)</th>
<th>pH at 25°C</th>
<th>Weight of Chemicals Needed/1000 mL Pure Water at 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary standards:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydrogen tartrate (saturated at 25°C)</td>
<td>3.557</td>
<td>&gt; 7 g KHC₆H₄O₆*</td>
</tr>
<tr>
<td>0.05 potassium dihydrogen citrate</td>
<td>3.776</td>
<td>11.41 g KH₂C₂H₃O₇</td>
</tr>
<tr>
<td>0.05 potassium hydrogen phthalate</td>
<td>4.004</td>
<td>10.12 g KH₂C₄H₄O₄</td>
</tr>
<tr>
<td>0.025 potassium dihydrogen phosphate + 0.025 disodium hydrogen phosphate</td>
<td>6.863</td>
<td>3.537 g KH₂PO₄ + 3.533 g Na₂HPO₄†</td>
</tr>
<tr>
<td>0.008 695 potassium dihydrogen phosphate + 0.030 43 disodium hydrogen phosphate</td>
<td>7.415</td>
<td>1.179 g KH₂PO₄ + 4.303 g Na₂HPO₄†</td>
</tr>
<tr>
<td>0.01 sodium borate decahydrate (borax)</td>
<td>9.183</td>
<td>3.80 g Na₂B₄O₇ · 10H₂O†</td>
</tr>
<tr>
<td>0.025 sodium bicarbonate + 0.025 sodium carbonate</td>
<td>10.014</td>
<td>2.092 g NaHCO₃ + 2.640 g Na₂CO₃</td>
</tr>
<tr>
<td>Secondary standards:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.05 potassium tetroxalate dihydrate</td>
<td>1.679</td>
<td>12.61 g KH₂C₄H₄O₆</td>
</tr>
<tr>
<td>Calcium hydroxide (saturated at 25°C)</td>
<td>12.454</td>
<td>&gt; 2 g Ca(OH)₂*</td>
</tr>
</tbody>
</table>

³ Approximate solubility.
† Prepare with freshly boiled and cooled distilled water (carbon-dioxide-free).

---

* The symbol H⁺ is used throughout the text to represent hydrogen ion activity.
b. Saturated potassium hydrogen tartrate solution: Shake vigorously an excess (5 to 10 g) of finely crystalline KHC\textsubscript{4}H\textsubscript{4}O\textsubscript{6} with 100 to 300 mL distilled water at 25°C in a glass-stoppered bottle. Separate clear solution from undissolved material by decantation or filtration. Preserve for 2 months or more by adding one thymol crystal (8 mm diam) per 200 mL solution.

c. Saturated calcium hydroxide solution: Calcine a well-washed, low-alkali grade CaCO\textsubscript{3} in a platinum dish by igniting. Cool, filter, and collect solid Ca(OH)\textsubscript{2} on a fritted glass filter of medium porosity. Dry at 110°C, cool, and pulverize to uniformly fine granules. Vigorously shake an excess of fine granules with distilled water in a stoppered polyethylene bottle. Let temperature come to 25°C after mixing. Filter supernatant under suction through a sifted glass filter of medium porosity and use filtrate as the buffer solution. Discard buffer solution when atmospheric CO\textsubscript{2} causes turbidity to appear.

d. Auxiliary solutions: 0.1N NaOH, 0.1N HCl, 5N HCl (dilute five volumes 6N HCl with one volume distilled water), and acid potassium fluoride solution (dissolve 2 g KF in 2 mL conc H\textsubscript{2}SO\textsubscript{4} and dilute to 100 mL with distilled water).

4. Procedure

a. Instrument calibration: In each case follow manufacturer’s instructions for pH meter and for storage and preparation of electrodes for use. Recommended solutions for short-term storage of electrodes vary with type of electrode and manufacturer, but generally have a conductivity greater than 4000 \mu\text{hos/cm}. Tap water is a better substitute than distilled water, but pH 4 buffer is best for the single glass electrode and saturated KCl is preferred for a calomel and Ag/AgCl reference electrode. Saturated KCl is the preferred solution for a combination electrode. Keep electrodes wet by returning them to storage solution whenever pH meter is not in use.

Before use, remove electrodes from storage solution, rinse, blot dry with a soft tissue, place in initial buffer solution, and set the isopotential point (§ 2a above). Select a second buffer within 2 pH units of sample pH and bring sample and buffer to same temperature, which may be the room temperature, a fixed temperature such as 25°C, or the temperature of a fresh sample. Remove electrodes from first buffer, rinse thoroughly with distilled water, blot dry, and immerse in second buffer. Record temperature of measurement and adjust temperature dial on meter so that meter indicates pH value of buffer at test temperature (this is a slope adjustment).

Use the pH value listed in the tables for the buffer used at the test temperature. Remove electrodes from second buffer, rinse thoroughly with distilled water and dry electrodes as indicated above. Immerse in a third buffer below pH 10, approximately 3 pH units different from the second; the reading should be within 0.1 unit for the pH of the third buffer. If the meter response shows a difference greater than 0.1 pH unit from expected value, look for trouble with the electrodes or potentiometer (see §§ 5a and b below).

The purpose of standardization is to adjust the response of the glass electrode to the instrument. When only occasional pH measurements are made standardize instrument before each measurement. When frequent measurements are made and the instrument is stable, standardize less frequently. If sample pH

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>Tartrate (Saturated)</th>
<th>Citrate (0.05M)</th>
<th>Phthalate (0.05M)</th>
<th>Phosphate (1:1)</th>
<th>Phosphate (1:3.5)</th>
<th>Borax (0.01M)</th>
<th>Bicarbonate-Carbonate (0.025M)</th>
<th>Tetroxalate (0.05M)</th>
<th>Calcium Hydroxide (Saturated)</th>
</tr>
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<tr>
<td>0</td>
<td>4.003</td>
<td>6.982</td>
<td>7.534</td>
<td>9.460</td>
<td>10.321</td>
<td></td>
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<td>1.666</td>
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<tr>
<td>15</td>
<td>3.996</td>
<td>6.898</td>
<td>7.449</td>
<td>9.276</td>
<td>10.120</td>
<td></td>
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<td>1.672</td>
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<tr>
<td>20</td>
<td>3.999</td>
<td>6.878</td>
<td>7.430</td>
<td>9.227</td>
<td>10.064</td>
<td></td>
<td></td>
<td>1.675</td>
<td></td>
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<tr>
<td>40</td>
<td>3.549</td>
<td>4.024</td>
<td>6.839</td>
<td>7.392</td>
<td>9.093</td>
<td></td>
<td></td>
<td>1.694</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>3.674</td>
<td>4.21</td>
<td>6.831</td>
<td>7.384</td>
<td>9.017</td>
<td>9.831</td>
<td></td>
<td>1.806</td>
<td></td>
</tr>
</tbody>
</table>
values vary widely, standardize for each sample with a buffer having a pH within 1 to 2 pH units of the sample.

b. Sample analysis: Establish equilibrium between electrodes and sample by stirring sample to insure homogeneity; stir gently to minimize carbon dioxide entrainment. For buffered samples or those of high ionic strength, condition electrodes after cleaning by dipping them into sample for 1 min. Blot dry, immerse in a fresh portion of the same sample, and read pH.

With dilute, poorly buffered solutions, equilibrate electrodes by immersing in three or four successive portions of sample. Take a fresh sample to measure pH.

5. Trouble Shooting

a. Potentiometer: To locate trouble source disconnect electrodes and, using a short-circuit strap, connect reference electrode terminal to glass electrode terminal. Observe change in pH when instrument calibration knob is adjusted. If potentiometer is operating properly, it will respond rapidly and evenly to changes in calibration over a wide scale range. A faulty potentiometer will fail to respond, will react erratically, or will show a drift upon adjustment. Switch to the millivolt scale on which the meter should read zero. If inexperienced, do not attempt potentiometer repair other than maintenance as described in instrument manual.

b. Electrodes: If potentiometer is functioning properly, look for the instrument fault in the electrode pair. Substitute one electrode at a time and cross-check with two buffers that are about 4 pH units apart. A deviation greater than 0.1 pH unit indicates a faulty electrode. Glass electrodes fail because of scratches, deterioration, or accumulation of debris on the glass surface. Rejuvenate electrode by alternately immersing it three times each in 0.1N HCl and 0.1N NaOH. If this fails, immerse tip in KF solution for 30 s. After rejuvenation, soak in pH 7.0 buffer overnight. Rinse and store in pH 7.0 buffer. Rinse again with distilled water before use. Protein coatings can be removed by soaking glass electrodes in a 10% pepsin solution adjusted to pH 1 to 2.

To check reference electrode, oppose the emf of a questionable reference electrode against another one of the same type that is known to be good. Using an adapter, plug good reference electrode into glass electrode jack of potentiometer; then plug questioned electrode into reference electrode jack. Set meter to read millivolts and take readings with both electrodes immersed in the same electrolyte (KCl) solution and then in the same buffer solution. The millivolt readings should be 0 ± 5 mV for both solutions. If different electrodes are used, i.e., silver: silver-chloride against calomel or vice versa, the reading will be 44 ± 5 mV for a good reference electrode.

Reference electrode troubles generally are traceable to a clogged junction. Interruption of the continuous trickle of electrolyte through the junction causes increase in response time and drift in reading. Clear a clogged junction by applying suction to the tip or by boiling tip in distilled water until the electrolyte flows freely when suction is applied to tip or pressure is applied to the fill hole. Replaceable junctions are available commercially.

6. Precision and Bias

By careful use of a laboratory pH meter with good electrodes, a precision of ±0.02 pH unit and an accuracy of ±0.05 pH unit can be achieved. However, ±0.1 pH unit represents the limit of accuracy under normal conditions, especially for measurement of water and poorly buffered solutions. For this reason, report pH values to the nearest 0.1 pH unit. A synthetic sample of a Clark and Lubs buffer solution of pH 7.3 was analyzed electrometrically by 30 laboratories with a standard deviation of ±0.13 pH unit.

7. References

ATTACHMENT 3
COPY OF EPA METHOD SM 2510
2510  CONDUCTIVITY*#(1)

2510 A.  Introduction

Conductivity, $k$, is a measure of the ability of an aqueous solution to carry an electric current. This ability depends on the presence of ions; on their total concentration, mobility, and valence; and on the temperature of measurement. Solutions of most inorganic compounds are relatively good conductors. Conversely, molecules of organic compounds that do not dissociate in aqueous solution conduct a current very poorly, if at all.

1. Definitions and Units of Expression

Conductance, $G$, is defined as the reciprocal of resistance, $R$:

$$G = \frac{1}{R}$$

where the unit of $R$ is ohm and $G$ is ohm$^{-1}$ (sometimes written mho). Conductance of a solution is measured between two spatially fixed and chemically inert electrodes. To avoid polarization at the electrode surfaces the conductance measurement is made with an alternating current signal. The conductance of a solution, $G$, is directly proportional to the electrode surface area, $A$, cm$^2$, and inversely proportional to the distance between the electrodes, $L$, cm. The constant of proportionality, $k$, such that:

$$G = k \left(\frac{A}{L}\right)$$

is called “conductivity” (preferred to “specific conductance”). It is a characteristic property of the solution between the electrodes. The units of $k$ are 1/ohm-cm or mho per centimeter. Conductivity is customarily reported in micromhos per centimeter ($\mu$mho/cm).

In the International System of Units (SI) the reciprocal of the ohm is the siemens (S) and conductivity is reported as millisiemens per meter (mS/m); 1 mS/m = 10 $\mu$mhos/cm and 1 $\mu$S/cm = 1 $\mu$mho/cm. To report results in SI units of mS/m divide $\mu$mhos/cm by 10.

To compare conductivities, values of $k$ are reported relative to electrodes with $A = 1$ cm$^2$ and $L = 1$ cm. Absolute conductances, $G_s$, of standard potassium chloride solutions between electrodes of precise geometry have been measured; the corresponding standard conductivities, $k_s$, are shown in Table 2510:I.
The equivalent conductivity, $\Lambda$, of a solution is the conductivity per unit of concentration. As the concentration is decreased toward zero, $\Lambda$ approaches a constant, designated as $\Lambda^\circ$. With $k$ in units of micromhos per centimeter it is necessary to convert concentration to units of equivalents per cubic centimeter; therefore:

$$\Lambda = 0.001k/\text{concentration}$$

where the units of $\Lambda$, $k$, and concentration are mho-cm$^2$/equivalent, $\mu$mho/cm, and equivalent/L, respectively. Equivalent conductivity, $\Lambda$, values for several concentrations of KCl are listed in Table 2510:I. In practice, solutions of KCl more dilute than 0.001 M will not maintain stable conductivities because of absorption of atmospheric CO$_2$. Protect these dilute solutions from the atmosphere.

2. Measurement

   a. Instrumental measurements: In the laboratory, conductance, $G_s$, (or resistance) of a standard KCl solution is measured and from the corresponding conductivity, $k_s$, (Table 2510:I) a cell constant, $C$, cm$^{-1}$, is calculated:

   $$C = \frac{k_s}{G_s}$$

   Most conductivity meters do not display the actual solution conductance, $G$, or resistance, $R$; rather, they generally have a dial that permits the user to adjust the internal cell constant to match the conductivity, $k_s$, of a standard. Once the cell constant has been determined, or set, the conductivity of an unknown solution,

   $$k_u = CG_u$$

will be displayed by the meter.

Distilled water produced in a laboratory generally has a conductivity in the range 0.5 to 3 $\mu$mhos/cm. The conductivity increases shortly after exposure to both air and the water container.

The conductivity of potable waters in the United States ranges generally from 50 to 1500 $\mu$mhos/cm. The conductivity of domestic wastewaters may be near that of the local water supply, although some industrial wastes have conductivities above 10 000 $\mu$mhos/cm. Conductivity instruments are used in pipelines, channels, flowing streams, and lakes and can be incorporated in multiple-parameter monitoring stations using recorders.

Most problems in obtaining good data with conductivity monitoring equipment are related to electrode fouling and to inadequate sample circulation. Conductivities greater than 10 000 to 50 000 $\mu$mho/cm or less than about 10 $\mu$mho/cm may be difficult to measure with usual
Laboratory conductivity measurements are used to:

• Establish degree of mineralization to assess the effect of the total concentration of ions on chemical equilibria, physiological effect on plants or animals, corrosion rates, etc.
• Assess degree of mineralization of distilled and deionized water.
• Evaluate variations in dissolved mineral concentration of raw water or wastewater. Minor seasonal variations found in reservoir waters contrast sharply with the daily fluctuations in some polluted river waters. Wastewater containing significant trade wastes also may show a considerable daily variation.
• Estimate sample size to be used for common chemical determinations and to check results of a chemical analysis.
• Determine amount of ionic reagent needed in certain precipitation and neutralization reactions, the end point being denoted by a change in slope of the curve resulting from plotting conductivity against buret readings.
• Estimate total dissolved solids (mg/L) in a sample by multiplying conductivity (in micromhos per centimeter) by an empirical factor. This factor may vary from 0.55 to 0.9, depending on the soluble components of the water and on the temperature of measurement. Relatively high factors may be required for saline or boiler waters, whereas lower factors may apply where considerable hydroxide or free acid is present. Even though sample evaporation results in the change of bicarbonate to carbonate the empirical factor is derived for a comparatively constant water supply by dividing dissolved solids by conductivity.
• Approximate the milliequivalents per liter of either cations or anions in some waters by multiplying conductivity in units of micromhos per centimeter by 0.01.

b. Calculation of conductivity:

For naturally occurring waters that contain mostly Ca\(^{2+}\), Mg\(^{2+}\), Na\(^{+}\), K\(^{+}\), HCO\(_3\)^{−}, SO\(_4\)^{2−}, and Cl\(^{−}\) and with TDS less than about 2500 mg/L, the following procedure can be used to calculate conductivity from measured ionic concentrations. The abbreviated water analysis in Table 2510:II illustrates the calculation procedure.

At infinite dilution the contribution to conductivity by different kinds of ions is additive. In general, the relative contribution of each cation and anion is calculated by multiplying equivalent conductances, \(\lambda^+\) and \(\lambda^-\), mho-cm\(^2\)/equivalent, by concentration in equivalents per liter and correcting units. Table 2510:III contains a short list of equivalent conductances for ions commonly found in natural waters. Trace concentrations of ions generally make negligible contribution to the overall conductivity. A temperature coefficient of 0.02/deg is applicable to all ions, except H\(^{+}\) (0.0139/deg) and OH\(^{−}\) (0.018/deg).

At finite concentrations, as opposed to infinite dilution, conductivity per equivalent decreases with increasing concentration (see Table 2510:I). For solutions composed of one anion type and one cation type, e.g., KCl as in Table 2510:I, the decrease in conductivity per equivalent with
concentration can be calculated, ±0.1%, using an ionic-strength-based theory of Onsager.\(^9\) When mixed salts are present, as is nearly always the case with natural and wastewaters, the theory is quite complicated.\(^10\) The following semiempirical procedure can be used to calculate conductivity for naturally occurring waters:

First, calculate infinite dilution conductivity (Table 2510:II, Column 4):

\[
k^\circ = \sum |z_i| (\lambda_{+i}^\circ) (mM_i) + \sum |z_i| (\lambda_{-i}^\circ)(mM_i)
\]

where:

- \( |z_i| \) = absolute value of the charge of the \( i \)-th ion,
- \( mM_i \) = millimolar concentration of the \( i \)-th ion, and
- \( \lambda_{+i}^\circ, \lambda_{-i}^\circ \) = equivalent conductance of the \( i \)-th ion.

If \( mM \) is used to express concentration, the product, \( (\lambda_{+i}^\circ) (mM_i) \) or \( (\lambda_{-i}^\circ)(mM_i) \), corrects the units from liters to cm\(^3\). In this case \( k^\circ \) is 578.2 \( \mu \)mho/cm (Table 2510:II, Column 4).

Next, calculate ionic strength, \( IS \) in molar units:

\[
IS = \sum z_i^2 (mM_i)/2000
\]

The ionic strength is 15.33/2000 = 0.00767 \( M \) (Table 2510:II, Column 5).

Calculate the monovalent ion activity coefficient, \( y \), using the Davies equation for \( IS \leq 0.5 \) \( M \) and for temperatures from 20 to 30\( ^\circ \)C,\(^9,11\)

\[
y = 10^{-0.5[ISS^{1/2}/(1 + ISS^{1/2}) - 0.3IS]}
\]

In the present example \( IS = 0.00767 \) \( M \) and \( y = 0.91 \).

Finally, obtain the calculated value of conductivity, \( k_{\text{calc}} \), from:

\[
k_{\text{calc}} = k^\circ y^2
\]

In the example being considered, \( k_{\text{calc}} = 578.2 \times 0.91^2 = 478.8 \) \( \mu \)mho/cm versus the reported value as measured by the USGS of 477 \( \mu \)mho/cm.

For 39 analyses of naturally occurring waters,\(^7,12\) conductivities calculated in this manner agreed with the measured values to within 2%.

3. References

2510 B. Laboratory Method

1. General Discussion
   See Section 2510A.

2. Apparatus
   a. Self-contained conductivity instruments: Use an instrument capable of measuring conductivity with an error not exceeding 1% or 1 µmho/cm, whichever is greater.

   b. Thermometer, capable of being read to the nearest 0.1°C and covering the range 23 to 27°C. Many conductivity meters are equipped to read an automatic temperature sensor.

   c. Conductivity cell:
      1) Platinum-electrode type—Conductivity cells containing platinized electrodes are available in either pipet or immersion form. Cell choice depends on expected range of conductivity. Experimentally check instrument by comparing instrumental results with true conductivities of the KCl solutions listed in Table 2510:1. Clean new cells, not already coated and ready for use,
with chromic-sulfuric acid cleaning mixture [see Section 2580B.3(a2)] and platinize the electrodes before use. Subsequently, clean and replatinize them whenever the readings become erratic, when a sharp end point cannot be obtained, or when inspection shows that any platinum black has flaked off. To platinize, prepare a solution of 1 g chloroplatinic acid, $\text{H}_2\text{PtCl}_6\cdot6\text{H}_2\text{O}$, and 12 mg lead acetate in 100 mL distilled water. A more concentrated solution reduces the time required to platinize electrodes and may be used when time is a factor, e.g., when the cell constant is 1.0/cm or more. Immerse electrodes in this solution and connect both to the negative terminal of a 1.5-V dry cell battery. Connect positive side of battery to a piece of platinum wire and dip wire into the solution. Use a current such that only a small quantity of gas is evolved. Continue electrolysis until both cell electrodes are coated with platinum black. Save platinizing solution for subsequent use. Rinse electrodes thoroughly and when not in use keep immersed in distilled water.

2) Nonplatinum-electrode type—Use conductivity cells containing electrodes constructed from durable common metals (stainless steel among others) for continuous monitoring and field studies. Calibrate such cells by comparing sample conductivity with results obtained with a laboratory instrument. Use properly designed and mated cell and instrument to minimize errors in cell constant. Very long meter leads can affect performance of a conductivity meter. Under such circumstances, consult the manufacturer’s manual for appropriate correction factors if necessary.

3. Reagents

a. Conductivity water: Any of several methods can be used to prepare reagent-grade water. The methods discussed in Section 1080 are recommended. The conductivity should be small compared to the value being measured.

b. Standard potassium chloride solution, KCl, 0.0100 M: Dissolve 745.6 mg anhydrous KCl in conductivity water and dilute to 1000 mL in a class A volumetric flask at 25°C and store in a CO$_2$-free atmosphere. This is the standard reference solution, which at 25°C has a conductivity of 1412 $\mu$hmhos/cm. It is satisfactory for most samples when the cell has a constant between 1 and 2 cm$^{-1}$. For other cell constants, use stronger or weaker KCl solutions listed in Table 2510:I. Care must be taken when using KCl solutions less than 0.001 M, which can be unstable because of the influence of carbon dioxide on pure water. For low conductivity standards, Standard Reference Material 3190, with a certified conductivity of 25.0 $\mu$S/cm ± 0.3 $\mu$S/cm, may be obtained from NIST. Store in a glass-stoppered borosilicate glass bottle.

4. Procedure

a. Determination of cell constant: Rinse conductivity cell with at least three portions of 0.01 M KCl solution. Adjust temperature of a fourth portion to 25.0 ± 0.1°C. If a conductivity meter displays resistance, $R$, ohms, measure resistance of this portion and note temperature. Compute cell constant, $C$: 
Standard Methods for the Examination of Water and Wastewater

\[ C, \ \text{cm}^{-1} = (0.001412)(R_{KCl})[1 + 0.0191(t - 25)] \]

where:

\[ R_{KCl} = \text{measured resistance, ohms, and} \]

\[ t = \text{observed temperature, } ^\circ\text{C}. \]

Conductivity meters often indicate conductivity directly. Commercial probes commonly contain a temperature sensor. With such instruments, rinse probe three times with 0.0100M KCl, as above. Adjust temperature compensation dial to 0.0191 C\(^{-1}\). With probe in standard KCl solution, adjust meter to read 1412 \(\mu \text{mho/cm}\). This procedure automatically adjusts cell constant internal to the meter.

b. Conductivity measurement: Thoroughly rinse cell with one or more portions of sample. Adjust temperature of a final portion to about 25°C. Measure sample resistance or conductivity and note temperature to ±0.1°C.

5. Calculation

The temperature coefficient of most waters is only approximately the same as that of standard KCl solution; the more the temperature of measurement deviates from 25.0°C, the greater the uncertainty in applying the temperature correction. Report temperature-compensated conductivities as ‘‘\(\mu \text{mho/cm 25.0°C}’’.’’

a. When sample resistance is measured, conductivity at 25°C is:

\[ k = \frac{(1\ 000\ 000)(C)}{R_m[1 + 0.0191(t - 25)]} \]

where:

\[ k = \text{conductivity, } \mu \text{mhos/cm,} \]

\[ C = \text{cell constant, cm}^{-1}, \]

\[ R_m = \text{measured resistance of sample, ohms, and} \]

\[ t = \text{temperature of measurement.} \]

b. When sample conductivity is measured without internal temperature compensation conductivity at 25°C is:
Standard Methods for the Examination of Water and Wastewater

\[
k, \mu\text{mho/cm} = \frac{(k_m)}{1 + 0.0191(t - 25)}
\]

where:

\[k_m = \text{measured conductivity in units of } \mu\text{mho/cm at } t^\circ\text{C, and other units are defined as above.}\]

For instruments with automatic temperature compensation and readout directly in \(\mu\text{mho/cm}\) or similar units, the readout automatically is corrected to 25.0\(^\circ\text{C}\). Report displayed conductivity in designated units.

6. Precision and Bias

The precision of commercial conductivity meters is commonly between 0.1 and 1.0\%. Reproducibility of 1 to 2\% is expected after an instrument has been calibrated with such data as is shown in Table 2510:I.
Standard Methods for the Examination of Water and Wastewater

Endnotes

1 (Popup - Footnote)
* APPROVED BY STANDARD METHODS COMMITTEE, 1997.
ATTACHMENT 4

1413 STANDARD CONDUCTIVITY CALIBRATION CHART
# 1413 Conductivity Standard Calibration

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Golder Training Sheet

It is the responsibility of the Project Manager to ensure that this SOP is prepared and the contents communicated to all applicable Golder field staff at the start of the field activities with a copy held onsite. This SOP has been reviewed or prepared by the Project Manager.

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**Golder Sign-Off**

Signing below indicates you have read the SOP and the manufacturer’s guidelines and that you agree to comply with the information contained in the SOP and manufacturer’s guidelines.

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APPENDIX G

Copies of Completed Visual Assessment Forms
APPENDIX H

Copies of Completed Inspection Forms
APPENDIX I

SWPPP Modification Log
## SWPPP Modification Log

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