STATE OF ARIZONA
AQUIFER PROTECTION PERMIT NO. P-105258
SIGNIFICANT AMENDMENT
PLACE ID 1390, LTF 72216

1.0 AUTHORIZATION

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3, Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 1 and 2, A. A. C. Title 18, Chapter 11, Article 4 and amendments thereto, and the conditions set forth in this permit, Freeport-McMoRan Bagdad Inc. is hereby authorized to operate the discharging facilities located at the Freeport-McMoRan Bagdad Inc. Bagdad Mine near Bagdad, Yavapai County, Arizona, over groundwater of the Burro Creek groundwater basin, in Township 14 North, Range 9 West and 10 West; and Township 15 North, Range 9 West and 10 West of the Gila and Salt River Base Line and Meridian.

This permit becomes effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods), unless suspended or revoked pursuant to A.A.C. R18-9-A213. The permittee shall construct, operate and maintain the permitted facilities:

1. Following all the conditions of this permit including the design and operational information documented or referenced below, and
2. Such that Aquifer Water Quality Standards (AWQS) are not violated at the applicable point(s) of compliance (POC) set forth below, or if an AWQS for a pollutant has been exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant, and as determined at the applicable POC, occurs as a result of the discharge from the facility.

1.1 PERMITTEE INFORMATION

Facility Name:	Freeport-McMoRan Bagdad Mine
Annual Registration Fee Flow Rate:	Greater than 10,000,000 gallons per day
Location:	0.5 miles northwest from the intersection of Lindahl and Main streets Bagdad, Arizona
County:	Yavapai
Permittee:	Freeport-McMoRan Bagdad, Inc. (FMBI)
Permittee Address:	P.O. Box 245 Bagdad, Arizona 86321
Facility Contact:	Trika Graham, Sr. Environmental Engineer
Emergency Phone No.:	(928) 633-6084 (work) (928) 713-5756 (cell)
Latitude/Longitude:	34º 35' 14" N / 113º 14' 10" W
Legal Description:	Township 14 North, Range 9 West and 10 West; and Township 15 North, Range 9 West and 10 West of the Gila and Salt River Baseline and Meridian

1.2 AUTHORIZING SIGNATURE

Trevor Baggiore	**Laura Malone**
Water Quality Division	**Waste Programs Division**
Arizona Department of Environmental Quality	**Arizona Department of Environmental Quality**
Signed this _____day of _____, 2019	**Signed this _____ day of _____, 2019**

THIS AMENDMENT SUPERCEDES ALL PREVIOUS AMENDMENTS

2.0 SPECIFIC CONDITIONS [A.R.S. §§ 49-203(4), 49-241(A)]

2.1 Facility / Site Description [A.R.S. § 49-243(K)(8)]

The site includes the following permitted discharging facilities:

Table 2.1 Discharging Facilities

Facility	Latitude	Longitude
Copper Creek PLS Pond System (pond and conveyance channel) (D-10)	34º 36' 12" N	113º 13' 46" W
Boulder Flood Basin (D-11)	34º 36' 19" N	113º 13' 48" W
Raffinate Pond (D-13)	34º 36' 05" N	113º 13' 00" W
PLS Surge Pond (D-14)	34º 36' 04" N	113º 12' 58" W
Strong PLS Pond (D-20)	34º 35' 46" N	113º 14' 03" W
Upper Niagara Leach Dump (D-6)	34º 35' 04" N	113º 13' 53" W
Plan IX Leach Dump (D-15)	34º 34' 36" N	113º 13' 30" W
Mineral Creek Leach Dump (D-18)	34º 34' 30" N	113º 12' 52" W
Copper Creek Leach Dump (D-7)	34º 35' 56" N	113º 13' 31" W
Crystal Mountain Leach Dump (D-19)	34º 35' 48" N	113º 13' 42" W
Mulholland Tailings Pond (D-1)	34º 35' 34" N	113º 15' 11" W
Mulholland Seepage Collection Pond (D-2)	34º 35' 51" N	113º 15' 26" W
Last Chance Pond (D-3)	34º 35' 39" N	113º 14' 20" W
Mammoth Tailings Impoundment (D-23)	34° 35' 04" N	113° 16' 11" W
Upper Mammoth Tailings Impoundment (D-24)	34° 34' 10" N	113° 14' 41" W
Mammoth Tailings Seepage Collection Pond (D-25)	34° 35' 19" N	113° 17' 50" W
South Waste Rock Disposal Facility (D-26)	34° 34' 07" N	113° 12' 10" W
Catchments within the PCCZ (D-27)	See Table 4.1.1	See Table 4.1.1
Butte Stockpile	34° 36’ 07” N	113° 11’ 03” W
Waste Management Facility (WMF): Construction Debris Landfill (CDL), Leachate Evaporation Pond (LEP), Bioremediation Land Treatment Unit (LTU), LTU Evaporation Pond	34° 35’ 47” N	113° 10’ 50” W

The permit authorizes the operation of the discharging facilities as described below:

2.1.1 Copper Creek PLS Pond System (D-10)(Process Solution Impoundment)

The facility is a process solution pond system consisting of an 80-mil HDPE-lined channel leading from the toe of the Copper Creek Leach Dump to the Copper Creek PLS Pond. The PLS pond system is constructed on Quaternary gravels of moderate hydraulic conductivity underlain by Precambrian granite. The pond has a design capacity of 4.5 million gallons, with a depth of 20 feet. Process solution from the pond is pumped to the SX-EW Plant for processing.

2.1.2 Boulder Flood Basin (D-11)(Non-stormwater Impoundment)

The facility is a double lined impoundment equipped with a Leak Collection and Removal System (LCRS) that receives stormwater run-off and contains process solution overflow due to process upsets in the Copper Creek leach system. The primary liner is an 80-mil HDPE geomembrane and the secondary liner consisting of a compacted, amended soil liner. The primary 80-mil HDPE liner is secured in an engineered anchor trench. The overflow ditch from the Copper Creek PLS Pond leading to the Boulder Flood Basin is lined with an 80-mil HDPE geomembrane. The impoundment is located in a Quaternary alluvium consisting of gravelly silts and clays partially underlain by Precambrian Alaskite Porphyry. The impoundment has a solution holding capacity of 37 million gallons. The impoundment has a 30 ft. deep by 12 ft. wide soil cutoff wall down gradient of the facility with an 80-mil HDPE lined face designed to intercept subsurface flows. The cutoff wall is equipped with a sump and pump-back system to capture any seepage from the cutoff wall. The impoundment receives stormwater run-off and contains process solution overflow due to process upsets in the Copper Creek leach system. The facility is designed with pumping system capability to divert solution to the Bagdad open pit, the Mulholland Tailings Pond, Mammoth Tailings Pond, or the Copper Creek PLS Pond System. Potential discharges from the Boulder Flood Basin to Boulder Creek are addressed under the terms and provisions of an individual AZPDES permit (AZ0022268).

2.1.3 Raffinate Pond (D-13)(Process Solution Impoundment)

The facility is a double-lined process solution impoundment equipped with LCRS. The liner system consists of an 80-mil HDPE primary geomembrane, with the secondary liner consisting of compacted two feet thick Gila Formation (rhyolite tuff and clay). The geomembrane is secured in an engineered anchor trench around the pond perimeter. The impoundment has a maximum solution holding capacity of approximately 0.5 million gallons, at a depth of approximately 6 feet.

To avoid potential overflow, the impoundment is equipped with an automatic, high level alarm system. The raffinate solution is used in the leach process.

2.1.4 PLS Surge Pond (D-14)(Process Solution Impoundment)

The facility is a double-lined process solution impoundment equipped with LCRS. The liner system consists of an 80-mil HDPE primary geomembrane, with the secondary liner consisting of compacted two feet thick Gila Formation (rhyolite tuff and clay). The geomembrane and the geonet/geotextile composite used in the LCRS are secured in an engineered anchor trench around the pond perimeter. The pond is constructed on non-mineralized material of the Mine Shop Overburden Dump. The pond has a maximum solution holding capacity of approximately 1.5 million gallons, with a depth of 8 feet. The pond receives process solution from various PLS collection facilities from where it is pumped to the SX-EW Plant for processing. To avoid potential overflow, the PLS Surge Pond is equipped with an automatic, high level alarm system.

2.1.5 Strong PLS Pond (D-20)(Process Solution Impoundment)

The facility is a double-lined impoundment equipped with LCRS. The double liner consists of a 60-mil HDPE primary and secondary liner, with a 200-mil HDPE geonet between the two liners for drainage. The lower liner is a composite liner underlain by a minimum of 6-inch minus low hydraulic conductivity compacted soil. The pond is designed to contain maximum fluid volume of 3.86 million gallons plus direct precipitation from the 100-year, 24-hour storm event while maintaining 2 feet of freeboard. The total depth of the pond is 26 feet.

2.1.6 Upper Niagara Leach Dump (D-6)(Leach Dump)

The facility is a low grade leach dump located on alluvial valley-fill, underlain primarily by the Precambrian crystalline bedrock. The leach dump is constructed over steeply sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the downstream toe of the dump and gravity flows to the Upper Niagara PLS Pond (D-5).

2.1.7 Copper Creek Leach Dump (D-7)(Leach Dump)

The facility is a low grade leach dump located on alluvial valley-fill, underlain primarily by the Precambrian crystalline bedrock. The leach dump is constructed over steeply sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the concrete cutoff wall constructed at the downstream toe of the dump and gravity flows to the Copper Creek PLS Pond System.

2.1.8 Plan IX Leach Dump (D-15)(Leach Dump)

The facility is a low grade leach dump located on alluvial valley-fill, underlain primarily by the Precambrian crystalline bedrock. The leach dump is constructed over steeply sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the downstream toe of the dump and gravity flows to the Alum Sump PLS Pond, Mineral Creek Sump and Kimberly Pond. Diversion ditches located up gradient of the dump divert the stormwater run-on away from the facility. The leach dump occupies approximately 1,661 acres, contains approximately 192,853,000 tons of leach material, and is permitted for a maximum height of 4,850 feet above mean sea level.

2.1.9 Mineral Creek Leach Dump (D-18)(Leach Dump)

The facility is a low grade leach dump located within a well-defined canyon, underlain primarily by the Precambrian crystalline bedrock. The leach dump is constructed over steeply sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the downstream toe of the dump. Residual PLS at the former Mineral Creek Sump area is directed to the bottom of the open pit. Diversion ditches are located up gradient of the dump to divert stormwater run-on away from the facility.

2.1.10 Crystal Mountain Leach Dump (D-19)(Leach Dump)

This facility is located within the footprint of the existing Copper Creek Leach dump. The ore material (mixed sulfide and oxide ore) is placed over existing leached ore that is underlain by Precambrian crystalline bedrock. The leach dump is constructed over steeply sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected by the Copper Creek PLS Pond System.

2.1.11 Mulholland Tailings Pond (D-1)(Tailings Impoundment)

The facility is a tailings dam used primarily as a recycled water storage facility for site-wide water management purposes and, as needed, as a secondary tailings disposal impoundment. The facility is constructed employing centerline dam construction method, using a combination of spigotting and cycloning of tailings material. The impoundment is located over predominantly Precambrian crystalline rocks. The tailings dam and pond cover an area of approximately 500 acres and contain approximately 120 million dry tons of tailings. The water in the tailings pond has an alkaline pH, reflecting the large volume of alkaline tailings that are stored within the impoundment. The Mulholland Tailings Pond includes a saddle dam to the south of the primary tailings embankment. Drainage from the saddle dam reports to the Mammoth Tailings Pond. At times, Bagdad Pit water and stormwater runoff and process solutions from the Boulder flood Basin (D-11) that is transferred to the Bagdad Pit will be directed to the Mulholland Tailings Pond. Before being discharged, these waters, and any other potentially acidic waters, are tested and the pH is adjusted, as necessary, to ensure compatibility with the impoundment and for operational reuse of the water. Upset flows from the concentrator area are also discharged to the impoundment. The facility receives effluent from the Concentrator Waste Water Treatment Plant (WWTP) and Bagdad Townsite WWTP. Downstream of the tailings impoundment is a seepage collection pond and pumpback system.

2.1.12 Mulholland Tailings Seepage Collection Pond (D-2)(Non-stormwater Impoundment)

The facility is a lined impoundment formed by a seepage collection dam constructed adjacent to the downstream toe of the Mulholland tailings embankment. The dam is a compacted rock-fill dam with a reinforced gunite facing on its entire surface and has a concrete lined basin. The seepage pond is

located over predominantly Precambrian crystalline rocks. The impoundment has an approximate storage capacity of 531,000 gallons, with an average depth of approximately 6 feet. Collected seepage is pumped back to the Mulholland Tailings Pond using two vertical turbine pumps. Both pumps are equipped with automatic level controls and have a combined design capacity of 1,175 gpm. The impoundment receives seepage of approximately 300 to 400 gpm from the Mulholland Tailings Pond. Potential discharges from the Mulholland Seepage Pond to Mulholland Wash are addressed under the terms and provisions of an individual AZPDES permit (AZ0022268).

2.1.13 Last Chance Pond (D-3)(Non-stormwater Impoundment)

The facility is a concrete-lined impoundment, located within the Mulholland Tailings Pond. The Mulholland Tailings Pond is located over predominantly Precambrian crystalline rocks (with minor Quaternary alluvium underlying Mulholland Impoundment). The pond solution is strongly alkaline (pH 11.1 SU), with a trace of metal concentrations and elevated sulfate. The pond is equipped with an automatic pumpback system to return solution to the concentrator circuit for re-use. The impoundment is used as a containment pond for runoff from the concentrator area and emergency process overflows from the concentrator circuit.

2.1.14 Mammoth Tailings Impoundment (D-23)(Tailings Storage Facility)

The facility is a tailing dam constructed using the centerline dam construction method, via a combination of spigotting and cycloning of tailings material. The maximum areal extent of the tailings impoundment is described in Figure 1 of the approved design plans provided in the July 18, 2007, *Site Characterization & Design Studies*. Process fluids include: water from the Freeport-McMoRan Bagdad water supply system; water pumped from the tailings seepage collection system and the tailings water reclaim and return system; wastewater effluent from the Bagdad Townsite Wastewater Treatment Plant (WWTP) and reagents that are manufactured, processed, and used in compliance with the federal Toxic Substances Control Act. The facility has a maximum capacity of 900,000,000 tons of tailings and a maximum permitted dam crest elevation of 3,600 feet above mean sea level. Tailings are delivered to the tailings impoundment at a rate not exceeding 200,000 dry tons per day.

2.1.15 Upper Mammoth Tailings Impoundment (D-24)(Tailings Storage Facility)

The facility is a tailing dam constructed using the centerline dam construction method, via a combination of spigotting and cycloning of tailings material. The maximum areal extent of the tailings impoundment is depicted in Figure 1 of the approved design plans provided in the July 18, 2007, *Site Characterization & Design Studies*. Process fluids include: water from the Freeport-McMoRan Bagdad water supply system; water pumped from the tailings seepage collection system and the tailings water reclaim and return system; wastewater effluent from the Bagdad Townsite WWTP and reagents that are manufactured, processed, and used in compliance with the federal Toxic Substances Control Act. The facility has a maximum capacity of 600,000,000 tons of tailings and a maximum permitted dam crest elevation of 4,050 feet above mean sea level. Tailings are delivered to the tailings impoundment at a rate not exceeding 200,000 dry tons per day during ore processing.

2.1.16 Mammoth Tailings Seepage Collection Pond (D-25)(Non-stormwater Impoundment)

The facility is constructed with a gunite liner and has a normal operating capacity of approximately 350,000 gallons. The facility is located at an elevation of 2,740 feet above sea level. The dam, constructed upon crystalline bedrock, is a compacted rock fill dam with a 12-inch concrete facing on its entire surface. In addition, a seepage sump is located at an elevation of 2,730 feet above sea level immediately downstream from the dam. The seepage sump is a 1-foot-diameter well, extending to a depth of 11 feet in the gravels of Mammoth Wash. The seepage is pumped back to the Mammoth Tailings Impoundment.

2.1.17 South Waste Rock Disposal Facility (D-26)

The facility is a waste rock pile on approximately 624 acres and has a maximum permitted capacity of 875,839,000 tons of mining overburden. Maximum permitted elevation of the facility is 4,500 feet above mean sea level. The maximum areal extent of the waste rock disposal facility is shown in Table 3, page 16, of the *Request to Amend APP No. P-105258 to Extend Plan IX Leach Dump and South Waste Rock Disposal Facilities*, dated June 15, 2015.

2.1.18 Catchments within the PCCZ (D-27)

This group of facilities includes all existing (Upper Niagara Pond (D-4), Upper Niagara PLS Pond (D-5), Alum Sump PLS Pond (D-21), and Kimberly Pond (D-22)) and future collection and diversion points, including sumps and impoundments, for the process solution/stormwater within the passive containment capture zone (PCCZ) created by the mine open pit.

Upper Niagara Pond (D-4) (Process Solution Pond)

The facility is an impoundment located on top of the Upper Niagara Leach Dump (D-6) confined in a valley. The pond is lined with a 2-foot thick compacted clay liner, underlain by leach dump material placed on the Precambrian crystalline bedrock of relatively low hydraulic conductivity. The pond receives process solution and stormwater and has a design capacity of approximately 20 million gallons. Accumulated fluid in the impoundment is pumped back into the leach circuit. The pond is situated within the passive containment capture zone of the existing open pit. Consequently, any discharge from the pond will be captured by the open pit.

Upper Niagara PLS Pond (D-5) (Process Solution Pond)

The facility is an impoundment consisting of an earthen dam and 2-foot thick compacted clay liner underlain by Precambrian crystalline bedrock of relatively low hydraulic conductivity. The pond receives process solution and stormwater from the Upper Niagara Leach Dump which is conveyed by gravity through an HDPE pipeline to N5/N6 pumping station. Process solution from the N5/N6 pumping station is pumped to the SX/EW Plant, or when not actively leaching, residual flow can be diverted into Copper Creek Leach Dump (D-19). The pond operating volume is approximately 10,000 gallons and the average operating depth is 3 feet. Excess solution overflow is contained within the Copper Creek Leach Dump. The pond is situated within the passive containment capture zone of the existing open pit. Consequently, any discharge from the pond will be captured by the open pit.

Alum Sump PLS Pond (D-21) (Process Solution Impoundment)

The facility is a lined impoundment designed to receive leachate from the Plan IX Leach Dump. The impoundment has a total solution capacity of approximately 774,000 gallons, including approximately 414,000 gallons at the normal operating level, and an approximate total depth of 12 feet, including 8 feet at the normal operating level. Accumulated process solution is pumped through an HDPE pipeline to the SX-EW Plant. The pond is situated within the passive containment zone of the existing open pit. Consequently, any discharge from the pond will be captured by the open pit.

Kimberly Pond (D-22) (Process Solution Impoundment)

The facility receives leachate and stormwater runoff from the Plan IX leach stockpile. The base of Kimberly Pond is comprised of a 2-foot-thick layer of compacted Gila Conglomerate. The area is underlain by crystalline bedrock that is covered with approximately 150-feet of historic Kimberly tailings. The pond has an operating solution holding capacity of approximately 17.9-million gallons. The pond is protected from stormwater run-on by ditches and berms and is surrounded on all sides by leach stockpiles. A slope stability analysis for Kimberly Pond has determined acceptable factors of safety for both static and pseudostatic loading conditions. The pond is situated within the passive containment zone of the existing open pit. Consequently, any discharge from the pond will be captured by the open pit.

2.1.19 Butte Stockpile

The facility is a waste rock stockpile on approximately 1,248 acres and has a maximum permitted capacity of 769,200,000 cubic yards of mining overburden and waste rock. Maximum permitted elevation of the facility is 4,700 feet above mean sea level. The maximum area extent of the waste rock stockpile is represented on Figure 2-1 of the 2018 amendment application.

2.1.20 Waste Management Facility

The Waste Management Facility (WMF) includes a construction debris landfill (CDL), a leachate evaporation pond (LEP), a bioremediation land treatment unit (LTU), and a LTU evaporation pond. The CDL covers approximately 4.5 acres and is permitted to accept construction debris and other non-municipal solid wastes generated on the mine site. The LTU and LTU evaporation pond cover approximately 4 acres and are used to treat petroleum contaminated soils generated at the mine site.

APP Annual Registration Fee [A.R.S. § 49-242]

The Annual Registration Fee for this permit is established by A.R.S. § 49-242 and is payable to ADEQ each year. The annual registration fee flow is established in Section 1.1.

Solid Waste Annual Registration and Disposal Fees [A.R.S. §§ 49-747, 49-836]

The annual registration fee for the solid waste landfills is established by A.R.S. § 49-747 and A.A.C. R18-13-2102 and 2103 (effective July 1, 2012). The solid waste landfill disposal fees are established by A.R.S. § 49-836 based on the amount of waste landfilled. The fees are payable to ADEQ each year.

Financial Capability [A.R.S. § 49-243(N) and A.A.C. R18-9-A203]

The permittee shall maintain financial capability throughout the life of the facility. The financial assurance mechanism was demonstrated through A.A.C. R18-9-A203(C)(8) using two corporate guarantees as follows: a corporate guarantee in the amount of $68,844,193 to cover the financial assurance obligations of APPs P-105258 (consolidated with P-101353 [$67,650,193]), P-102896 ($746,000), and the Waste Management Facility APP P50007300A ($448,000) at the Bagdad mine site which is being consolidated into this permit; and a corporate guarantee in the amount of $101,474 to cover the financial obligation as a result of an amendment issued on March 30, 2017 (LTF 63318).

The permittee has a reclamation bond of $10,172,100 with the United States Bureau of Land Management (BLM) for a portion of the mine on Federal Lands, and reclamation guarantee of $13,012,532 with the Arizona State Mine Inspectors Office (ASMI) which will cover the costs associated with the "additional" requirements of A.R.S. 49-243(G)(2). This double-bonding more than covers these costs, as outlined in the BLM and ASMI reclamation plans, which includes but was not limited to regrading (topographic contouring and benching), crown-chaining, capping (up to 2-feet) with compaction, stormwater diversions (channels), and revegetation as controls measures to minimize the potential for leachate discharge to groundwater. The cost for neutralizing the PILD, if necessary, has also been provided for in the ASMI guarantee amount. Post-closure maintenance and monitoring is required for a 30-year period and those costs are also covered under BLM and ASMI.

2.2 Best Available Demonstrated Control Technology [A.R.S. § 49-243(B) and A.A.C. R18-9-A202(A)(5)]

All of the discharging facilities listed in Table 2.1 employ the BADCT requirements as set forth in Arizona Revised Statutes (A.R.S.) § 49-243.B.1. All permitted facilities shall be constructed, operated, and maintained in accordance with BADCT requirements, as outlined in the application and permit Section 4.0, Table 4.1.1. The operational requirements for BADCT are presented in Table 4.2.1. The mine open pit passive containment capture zone (PCCZ) shall be evaluated every five years in accordance with permit Section 2.5.3.6.

2.2.1 Engineering Design

The facilities list, with BADCT descriptions, is included in Section 4, Table 4.1.1.

2.2.2 Site-specific Characteristics

Site-specific characteristics such as foundation rock of low hydraulic conductivity and within the PCCZ support the BADCT demonstration for several regulated facilities. The passive containment created by the Bagdad Mine Open Pit is used as an integral part of BADCT (A.R.S. § 49-243[G]) for the following facilities:

Catchments within PCCZ (D-27) currently consist of existing facilities Kimberly Pond [D-22], Upper Niagara Pond [D-4], Upper Niagara PLS Pond [D-5], and Alum Sump PLS Pond [D-21]) and future facilities. These facilities have specific BADCT requirements. This permit allows catchments to be constructed and decommissioned in accordance with the following:

The proposed BADCT for new catchments includes:

- Catchments will be unlined excavations in foundation rock of low hydraulic conductivity;
- Catchments will be located within the PCCZ;
- An acceptable slope stability analysis (BADCT, Appendix E, embankments) of the pit walls, adjacent slopes, and stockpiles will be completed prior to the installation of a new catchment. A copy of the stability analysis will be provided to ADEQ in the biennial report.
- Slope stability of pit walls or stockpiles will be assessed prior to installation of each new catchment. Construction will include such methods as waterstop sealing, keying into bedrock, etc., as necessary, to reduce the possibility for slope/berm failure;
- Catchments will be sized to accommodate the maximum flow that would occur if PLS flow from leaching activities were contained with the runoff from a 100-year, 24-hour storm event;
- Pumps will be installed in the catchments, as necessary, to maintain a controlled ponded surface elevation and minimize the risk of overtopping during storm events;
- Should overtopping occur for catchments within the pit area, the overflow solution will be contained within the confines of the mine pit (within the PCCZ); and
- For new catchments constructed outside the pit, but within the PCCZ, a minimum of 2 feet of freeboard will be maintained to reduce the possibility of overflow. Pumps and piping will be on hand to direct excess PLS to the SX-EW plant, leach circuit, or other APP-regulated facility, as needed.

In addition to ongoing operational monitoring and maintenance, BADCT requirements for decommissioning will include:

- Reduction or cessation of inflow into the catchment;
- Routing of any remaining inflow to another facility regulated by the APP or allowing gravity flow over unfractured bedrock into the bottom of the pit for collection and recovery;
- Filling the catchment with rock material; and
- Conducting additional excavation at the bench for stabilization, as needed.

Other site-specific BADCT has been demonstrated for the following facilities within the PCCZ and incorporating additional controls to minimize discharge pursuant to A.R.S. § 49-243(G): South Waste Rock Disposal Facility (D-26); Upper Niagara Leach Dump (D-6); Plan IX Leach Dump (D-15); Mineral Creek Leach Dump (D-18); Raffinate Pond (D-13); PLS Surge Pond (D-14); and Butte Stockpile.

2.2.3 Pre-operational Requirements

Not applicable

2.2.4 Operational Requirements

A description of required inspections and operational monitoring is included in Section 4, Table 4.2.1. If damage is identified during an inspection that could cause or contribute to a discharge, proper repairs shall be promptly performed. A summary of the repairs, including a description of the procedures and materials used shall be maintained with the inspection records according to Section 2.7.2.

TABLE 2.2.4
Leak Collection and Removal System Monitoring

Note: The Action Leakage Rate (ALR) or Rapid and Large Leakage Rate (RLLR) is exceeded when the amount of leakage pumped from the sump for the pond is greater than the applicable quantity below. An exceedance of the ALR or the RLLR is not a violation of the permit unless the permittee fails to perform as required under Section 2.6.2.4 or Section 2.6.2.5, as applicable.

LCRS Sump	Parameter	ALR in gallons per day (gpd)	RLLR in gallons per day (gpd)	Monitoring Frequency
Raffinate Pond (D-13)	Liquid Pumped	223	670	Weekly
PLS Surge Pond (D-14)	Liquid Pumped	279	836	Weekly
Strong PLS Pond (D-20)	Liquid Pumped	515	1,545	Weekly

2.3 Discharge Limitations [A.R.S. §§ 49-201(14), 49-243 and A.A.C. R18-9-A205(B)]

The permittee shall operate and maintain all permitted facilities listed below to prevent unauthorized discharges pursuant to A.R.S. § 49-201(12) resulting from failure or bypassing of BADCT pollutant control technologies including liner failure[1], uncontrollable leakage, overtopping (e.g., exceeding the maximum storage capacity, defined as a fluid level exceeding the crest elevation of a permitted impoundment), berm breaches that result in an unexpected loss of fluid, accidental spills, or other unauthorized discharges. The discharge limitations in this section are not applicable to any discharge caused by precipitation in excess of a single 100-year, 24-hour storm event or process overflow during a power outage exceeding 24 hours in duration.

2.3.1 Leaching Facilities

The Leaching Facilities are designed and authorized for use in leaching ore. The Leaching Facilities shall be constructed and operated in accordance with the BADCT outlined in Section 4, Table 4.1.1, and the ultimate heights shall not exceed those set forth in the approved permit application and engineering study.

2.3.2 Pregnant Leach Solution Ponds and Impoundments

The Pregnant Leach Solution (PLS) Ponds and Impoundments are designed and authorized to receive pregnant leach solution, stormwater, process water and process upset events.

2.3.3 Non-stormwater Impoundments

The permitted non-stormwater impoundments are authorized to receive stormwater runoff and run-on, and process solutions as a result of storm events or process upset events.

2.3.4 Waste Management Facility

Discharges shall be controlled by the construction of a final cover system and surface water diversion structures during the 30-year post-closure care period. During operation, the facility shall provide adequate protection from inundation or intrusion of water into the waste management area, as well as restriction on the type of waste materials accepted at the landfill. The facility is restricted to accept offsite-generated waste, and is subject to the following restrictions.

2.3.4.1 General Restrictions

The following materials are prohibited from disposal at the Waste Management Facility

1. Municipal Solid Waste
2. Regulated hazardous waste
3. Special Waste as defined in A.R.S. § 49-851(A)(5)
4. Polychlorinated biphenyl (PCB) waste

[1] Liner failure in a single-lined impoundment is any condition that would result in a leakage exceeding 550 gallons per acre per day.

5. Infectious and/or biohazardous medical wastes
6. Any other waste which is prohibited by Federal or State of Arizona statute or regulation from disposal at a non-municipal solid waste landfill such as:
    a. Tires
    b. Automobiles
    c. Lead-acid batteries
    d. Freon-containing white goods
    e. Sewage or septic waste

2.3.4.2 Petroleum Contaminated Soils Restrictions

Under a separate facility plan for its Special Waste Treatment Facility, approval number 50178400.00, Freeport-McMoRan Bagdad Inc., has been approved to accept and treat Petroleum Contaminated Soils (PCS) that have been generated onsite. PCS is prohibited from disposal in the landfill. Treated soils (PCS remediated to concentrations below the non-residential soil remediation levels, as set forth in A.A.C. Title 18, Chapter 7, Article 2, Appendix A) may be disposed at the landfill facility.

2.4 Points of Compliance [A.R.S. § 49-244]

The POCs are established by the following monitoring location(s):

Well Number	Latitude	Longitude	ADWR Number
CMW-609	34° 36’ 25” N	113° 13’ 57” W	55-537609
CMW-610	34° 36’ 25” N	113° 13’ 56” W	55-537610
CMW-611	34° 35’ 51” N	113° 15’ 26” W	55-906854
020R (A01HB)	34° 35’ 47” N	113° 16’ 57” W	55-916349
803 (AH13HB)	34° 35’ 41” N	113° 17” 08” W	55-543803
283	34° 35’ 36” N	113° 17’ 57” W	55-588283
613 (A22HB)	34° 35’ 17” N	113° 17’ 30” W	55-546613
810R (A10HB)	34° 34' 57" N	113° 17' 33" W	55-920381

Monitoring requirements for each POC are listed in Section 4, Tables 4.2.2 through 4.2.4.

The Director may amend this permit to designate additional POCs, if information on groundwater gradients or groundwater usage indicates the need.

2.5 Monitoring Requirements [A.R.S. § 49-243(K)(1), A.A.C. R18-9-A206(A)]

Unless otherwise specified in this permit, all monitoring required in this permit shall continue for the duration of the permit, regardless of the status of the facility. All sampling, preservation and holding times shall be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks and duplicate samples shall also be obtained, and chain of custody procedures shall be followed, in accordance with currently accepted standards of professional practice. The permittee shall consult the most recent version of the ADEQ Quality Assurance Project Plan (QAPP) and EPA 40 CFR PART 136 for guidance in this regard. Copies of laboratory analyses and chain of custody forms shall be maintained at the permitted facility. Upon request these documents shall be made immediately available for review by ADEQ personnel.

2.5.1 Discharge Monitoring

Not applicable for this permit.

2.5.2 Facility / Operational Monitoring

The operational monitoring requirements for the facilities referenced in Section 4, Table 4.1.1 are listed in Section 4, Table 4.2.1.

2.5.3 Groundwater Monitoring and Sampling Protocols

Static water levels shall be measured and recorded prior to sampling. Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80% of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well shall be recorded as "dry" for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported and submitted with the Self-monitoring Report Form (SMRF).

Alternatively, the permittee may conduct sampling using the low-flow purging method as described in the ASTM International Standard D 6771-02, and EPA Groundwater Issue 540/S-95/504 Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures. The well must be purged until indicator parameters stabilize. Indicator parameters shall include pH, temperature, specific conductance, oxidation-reduction potential, dissolved oxygen and turbidity.

2.5.3.1 POC Well Replacement

In the event that one or more of the designated POC wells should become unusable or inaccessible due to damage, insufficient water in the well for more than two (2) sampling events, or any other event, a replacement POC well shall be constructed and installed upon approval by ADEQ. If the replacement well is 50 feet or less from the original well, the ALs and/or AQLs calculated for the designated POC well shall apply to the replacement well. Otherwise, the ALs and/or AQLs shall be set following the provisions in Section 2.5.3.4 and Section 2.5.3.5 of this permit.

2.5.3.2 Ambient Groundwater Quality Monitoring for POC Wells

Ambient monitoring requirements for new or replacement POC wells are detailed in Section 4, Table 4.2.2. The ambient monitoring program for all POC wells currently located at the facility has been completed.

2.5.3.3 Alert Levels for POC Wells

The AQLs and ALs shall be established and calculated by the following formula or another valid statistical method submitted to the Groundwater Protection Value Stream in writing and approved for this permit:

$AL = M + K\Phi$

Where M = mean, Φ = standard deviation, and K = one-sided normal tolerance interval with a 95% confidence level (Lieberman, G.J. (1958) Tables for One-sided Statistical Tolerance Limits: Industrial Quality Control, Vol. XIV, No. 10). Obvious outliers should be excluded from the data used in the AL calculation.

The following criteria shall be met in establishing ALs in the permit:

1. The AL shall be calculated for a parameter using the analyses from eight (8) consecutive sample rounds.
2. Any data where the PQL exceeds 80% of the AWQS shall not be included in the AL calculation.
3. If a parameter is below the detection limit, the permittee must report the value as "less than" the numeric value for the PQL or detection limit for the parameter, not just as "non-detect". For those parameters, the permittee shall use a value of one-half the reported detection limit for the AL calculation.
4. If the analytical results from more than 50% of the samples for a specific parameter are non-detect, then the AL shall be set at 80% of the AWQS.
5. If the calculated AL for a specific constituent and well is less than 80% of the AWQS, the AL shall be set at 80% of the AWQS for that constituent in that well.

2.5.3.4 Aquifer Quality Limits for POC Well

For each of the monitored analytes for which a numeric AWQS has been adopted, the AQL shall be established as follows:

1. If the calculated AL is less than the AWQS, then the AQL shall be set equal to the AWQS.
2. If the calculated AL is greater than the AWQS, then the AQL shall be set equal to the calculated AL value, and no AL shall be set for that constituent at that monitoring point.

2.5.3.5 Compliance Groundwater Quality Monitoring for POC Wells

For quarterly compliance monitoring, the permittee shall analyze groundwater samples for the parameters listed in Section 4, Table 4.2.3. In addition to quarterly compliance groundwater monitoring, an additional list of parameters shall be monitored at each POC well every 8th quarter (biennial). For the biennial monitoring events, the additional parameters listed in Section 4.0, Table 4.2.4 shall be analyzed. The permittee may submit a written request to the Groundwater Protection Value Stream to modify, reduce, or delete a monitoring parameter in the quarterly or biennial compliance groundwater monitoring tables (Section 4, Tables 4.2.3 and 4.2.4).

2.5.3.6 Passive Containment Demonstration

Based on supporting documentation provided in the Application, the permittee has satisfactorily predicted that the Bagdad open pit mine will create a "passive containment capture zone" (PCCZ), as per A.R.S. § 49-243(G). The water balance in the numerical model for the Bagdad open pit predicts that static equilibrium will be maintained in the pit lake following closure at an elevation of 2,300 feet above mean sea level (amsl). The model estimates that static equilibrium in the pit lake will not be reached for approximately 150 years. Demonstration of passive containment shall be based solely on natural or engineered topographical, geological or hydrological control measures that can operate without continuous maintenance.

A post-audit of the approved groundwater flow model shall be conducted 5 years from the effective date of this permit. Every five (5) years thereafter, the permittee shall compare the current groundwater data to the previous model predictions. Factors to be evaluated in the post-audit include groundwater inflow, the estimated static water level in the pit, the estimated time to reach static water level, and any potential for the water level in the pit to rise to an elevation where the hydraulic gradient reverses and the pit ceases to function as a passive containment. The assumptions about mine development and infiltration shall be revised in terms of the actual changes in the pit configuration, leaching areas, leach rates, sump locations, water balance, annual precipitation and storm events. The resulting compilation shall be compared to predictions provided by the groundwater flow model for the previous calibration period.

A report summarizing the original passive containment demonstration and the revisions made to the model shall be submitted to the Groundwater Protection Value Stream for review. The report shall include a table listing groundwater elevations from piezometer and monitor wells current at the time of the post-audit used to demonstrate the configuration of the hydraulic containment, and a potentiometric contour map based on groundwater elevations used in the post-audit demonstration. ADEQ will determine whether a full model recalibration is required. If a recalibration is necessary, a report describing the model output and the revisions and/or changes to the model shall be submitted to the Groundwater Protection Value Stream.

2.5.4 Surface Water Monitoring and Sampling Protocols
Not applicable for this permit.

2.5.5 Analytical Methodology
All samples collected for compliance monitoring shall be analyzed using Arizona state approved methods. If no state approved method exists, then any appropriate EPA approved method shall be used. Regardless of the method used, the detection limits must be sufficient to determine compliance with the regulatory limits of the parameters specified in this permit. Except for field parameters, analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of Arizona-State certified laboratories can be obtained at the address below:

Arizona Department of Health Services
Office of Laboratory Licensure and Certification
250 North 17th Avenue
Phoenix, AZ 85007
Phone: (602) 364-0720

2.5.6 Installation and Maintenance of Monitoring Equipment
Monitoring equipment required by this permit shall be installed and maintained so that representative samples required by the permit can be collected. If new groundwater wells are determined to be necessary, the construction details shall be submitted to the Groundwater Protection Value Stream for approval prior to installation and the permit shall be amended to include any new points.

2.5.7 Monitoring of Non-POC Wells
Non-POC wells shall be monitored for the analytes listed and at the frequency shown in Section 4.2, Table 4.2.5.

Well Number	Latitude	Longitude	ADWR Number
WMF-481	34° 35’ 47.43” N	113° 10’ 47.7” W	55-539481
WMF-482	34° 35’ 47.59” N	113° 10’ 47.3” W	55-539482
WMF-483	34° 36’ 44.40” N	113° 11’ 0.9” W	55-539483

2.6 Contingency Plan Requirements
[A.R.S. § 49-243(K)(3), (K)(7) and A.A.C. R18-9-A204 and R18-9-A205]

2.6.1 General Contingency Plan Requirements
At least one copy of the approved contingency and emergency response plan, (which was revised January 2018), shall be maintained at the location where day-to-day decisions regarding the operation of the facility are made. The permittee shall be aware of and follow the contingency and emergency plans.

Any alert level (AL) that is exceeded or any violation of an aquifer quality limit (AQL), discharge limit (DL), or other permit condition shall be reported to ADEQ following the reporting requirements in Section 2.7.3, unless more specific reporting requirements are set forth in Sections 2.6.2 through 2.6.5.

Some contingency actions involve verification sampling. Verification sampling shall consist of the first follow-up sample collected from a location that previously indicated a violation or the exceedance of an AL. Collection and analysis of the verification sample shall use the same protocols

and test methods to analyze for the pollutant or pollutants that exceeded an AL or violated an AQL. The permittee is subject to enforcement action for the failure to comply with any contingency actions in this permit. Where verification sampling is specified in this permit, it is the option of the permittee to perform such sampling. If verification sampling is not conducted within the timeframe allotted, ADEQ and the permittee shall presume the initial sampling result to be confirmed as if verification sampling has been conducted. The permittee is responsible for compliance with contingency plans relating to the exceedance of an AL or violation of a DL, AQL or any other permit condition.

2.6.2 Exceeding of Alert Levels/Performance Levels

2.6.2.1 Exceeding of Performance Levels Set for Operational Conditions

1. Performance Levels Set for Freeboard

In the event that freeboard performance levels in a surface impoundment are not maintained, the permittee shall:

a. As soon as practicable, cease or reduce discharging to the impoundment to prevent overtopping. Remove and properly dispose or recycle to other operations the excess fluid in the reservoir until the water level is restored at or below the permitted freeboard limit.

b. Within five (5) days of discovery, evaluate the cause of the incident and adjust operational conditions as necessary to avoid future occurrences.

c. Record in the facility log, the amount of fluid removed, a description of the removal method, and the disposal arrangements. The facility log shall be maintained according to Section 2.7.2 (Operational Inspection / Log Book Recordkeeping).

d. The facility is no longer on alert status once the operational indicator no longer indicates that the freeboard performance level is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2. Performance Levels, Other Than Freeboard

a. If an operational performance level (PL) listed in Section 4, Table 4.2.1 has been observed or noted during required inspection and operational monitoring, such that the result could cause or contribute to an unauthorized discharge, the permittee shall immediately investigate to determine the cause of the condition. The investigation shall include the following:

i. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the operational performance condition.

ii. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences.

b. The PL exceedance, results of the investigation, and any corrective action taken shall be reported to the Groundwater Protection Value Stream within 30 days of the discovery of the condition. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.

c. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5 and any specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation which may have led to a PL being exceeded. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6.

2.6.2.2 Exceeding of Alert Levels Set for Discharge Monitoring

Not applicable for this permit.

2.6.2.3 Exceeding of Alert Levels in Groundwater Monitoring

2.6.2.3.1 Alert Levels for Indicator Parameters

Not applicable for this permit.

2.6.2.3.2 Alert Levels for Pollutants with Numeric Aquifer Water Quality Standards

1. If an AL for a pollutant set in Section 4, Tables 4.2.3, 4.2.4 or 4.2.5 has been exceeded, the permittee may conduct verification sampling within 5 days of becoming aware of an AL being exceeded. The permittee may use the results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.
2. If verification sampling confirms the AL being exceeded or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring to monthly. In addition, the permittee shall immediately initiate an investigation of the cause of the AL being exceeded, including inspection of all discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality.
3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5.0 and specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation which may have led to an AL being exceeded. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6. Alternatively, the permittee may submit a technical demonstration, subject to written approval by the Groundwater Protection Value Stream, that although an AL is exceeded, pollutants are not reasonably expected to cause a violation of an AQL. The demonstration may propose a revised AL or monitoring frequency for approval in writing by the Groundwater Protection Value Stream.
4. Within 30 days after confirmation of an AL being exceeded, the permittee shall submit the laboratory results to the Groundwater Protection Value Stream along with a summary of the findings of the investigation, the cause of the AL being exceeded, and actions taken to resolve the problem.
5. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
6. The increased monitoring required as a result of ALs being exceeded may be reduced to the regularly scheduled frequency if the results of three (3) monthly sequential sampling events demonstrate that no parameters exceed the AL.
7. If the increased monitoring required as a result of an AL exceedance continues for more than three sequential sampling events, the permittee shall submit a second report documenting an investigation of the continued AL exceedance within 30 days of the receipt of laboratory results of the third sampling event.

2.6.2.3.3 Alert Levels to Protect Downgradient Users from Pollutants Without Numeric Aquifer Water Quality Standards

Not applicable for this permit.

2.6.2.4 Exceedance of Action Leakage Rate (ALR)

If an ALR as specified in Table 2.2.4, has been exceeded, the permittee shall take the following actions:

1. Within five (5) days of discovery, determine if the fluid in the LCRS is operational/process solution from the impoundment by measuring the pH and conductivity of fluids in the impoundment and in the LCRS to allow direct comparison of solution characteristics.
2. Within 15 days, assess the condition of the liner system using visual methods for visible portions of the liner.
3. Repair all identified areas of leakage within 90 days of discovery.
4. Assess the potential for migration of liquids out of the containment system.
5. Within 30 days of discovery of exceeding an ALR, submit the results of the liner assessment, the suspected cause of the exceedance and actions taken or planned to resolve the exceedance in a report to the Groundwater Protection Value Stream.

2.6.2.5 Exceedance of Rapid and Large Leakage Rate (RLLR)

If an RLLR as specified in Table 2.2.4, has been exceeded, the permittee shall:

1. As soon as practicable, cease all discharge to the impoundment.
2. Within 24 hours of becoming aware of the exceedance, determine if the fluid in the LCRS is operational/process solution from the impoundment by measuring the pH and conductivity of fluids in the impoundment and in the LCRS to allow direct comparison of solution characteristics.
3. Within 24 hours of becoming aware of the exceedance, notify the Groundwater Protection Value Stream and include an assessment regarding the type of solution in the LCRS.
4. Within 15 days, assess the condition of the liner system using visual methods for visible portions of the liner.
5. Repair all identified areas of leakage within 90 days of discovery. Discharges to the impoundment shall not be re-initiated until the leak(s) have been identified and repaired.
6. Within 30 days of discovery of exceeding an RLLR, submit the results of the liner assessment, the suspected cause of the exceedance and actions taken or planned to resolve the exceedance in a report to the Groundwater Protection Value Stream. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
7. If the RLLR continues to be exceeded following completion of repairs, submit for approval to ADEQ, a corrective action plan including a re-assessment of liner system integrity and a schedule to complete the corrective actions to address all problems identified from the assessment of the liner system within 60 days of completion of repairs conducted in response to Item No. 5 above. Upon ADEQ approval, the permittee shall implement the approved plan and schedule of corrective actions.
8. Within 30 days of completion of corrective actions initiated from Item No. 7, submit to ADEQ, a written report as specified in Section 2.6.6 (Corrective Actions).

2.6.3 Discharge Limitations Violations

2.6.3.1 Liner Failure, Containment Structure Failure, or Unexpected Loss of Fluid

In the event of liner failure, containment structure failure, or unexpected loss of fluid as described in Section 2.3, the permittee shall take the following actions:

1. As soon as practicable, cease all discharges to the surface impoundment as necessary to prevent any further releases to the environment.
2. Within 24 hours of discovery, notify the Groundwater Protection Value Stream.
3. Within five (5) days of discovery of a failure that resulted in a release to the subsurface, collect representative samples of the fluid remaining in the surface impoundment.

Samples shall be analyzed for the parameters specified in Section 4, Table 4.2.3. Within 30 days of the incident, submit a copy of the analytical results to the Groundwater Protection Value Stream.

4. Within 15 days of discovery, initiate an evaluation to determine the cause for the incident. Identify the circumstances that resulted in the failure and assess the condition of the surface impoundment and liner system. Implement corrective actions as necessary to resolve the problems identified in the evaluation. Initiate repairs to any failed liner, system, structure, or other component as needed to restore proper functioning of the surface impoundment. The permittee shall not resume discharging to the surface impoundment until repairs of any failed liner or structure are performed. Repair procedures, methods, and materials used to restore the system(s) to proper operating condition shall be described in the facility log/recordkeeping file and available for ADEQ review.
5. As soon as practicable, remove fluid remaining in the surface impoundment as necessary to prevent further releases to the subsurface and/or to perform repairs. Record in the facility log/recordkeeping file the amount of fluid removed, a description of the removal method, and other disposal arrangements. The facility log/recordkeeping file shall be maintained according to Section 2.7.2 (Operation Inspection / Log/Recordkeeping File).
6. Within 30 days of discovery of the incident, submit a report to ADEQ as specified in Section 2.7.3.2 (Permit Violation and AL Status Reporting). Include a description of the actions performed in Subsections 1 through 5 listed above. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
7. Within 60 days of discovery, conduct an assessment of the impacts to the subsoil and/or groundwater resulting from the incident. If soil or groundwater is impacted such that it could cause or contribute to an exceedance of an AQL at the applicable point of compliance, submit to ADEQ, for approval, a corrective action plan to address such impacts, including identification of remedial actions and/or monitoring, and a schedule for completion of activities. At the direction of ADEQ, the permittee shall implement the approved plan.
8. Within 30 days of completion of corrective actions, submit to ADEQ, a written report as specified in section 2.6.6 (Corrective Actions). Upon review of the report, ADEQ may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.3.2 Overtopping of a Surface Impoundment

If overtopping of fluid from a permitted surface impoundment occurs, and results in a discharge pursuant to A.R.S. §§ 49-201(12), the permittee shall:

1. As soon as practicable, cease all discharges to the surface impoundment to prevent any further releases to the environment.
2. Within 24 hours of discovery, notify ADEQ WQCS.
3. Within five (5) days, collect representative samples of the fluid contained in the surface impoundment. Samples shall be analyzed for the parameters specified in Section 4, Table 4.2.3. Within 30 days of the incident, submit a copy of the analytical results to the Groundwater Protection Value Stream.
4. As soon as practicable, remove and properly dispose of excess water in the impoundment until the water level is restored at or below the appropriate freeboard as described in Table 4.2.1. Record in the facility log, the amount of fluid removed, a description of the removal method, and the disposal arrangements. The facility log/recordkeeping file shall be maintained according to Section 2.7.2 (Operation Inspection / Log/Recordkeeping File).
5. Within 30 days of discovery, evaluate the cause of the overtopping and identify the circumstances that resulted in the incident. Implement corrective actions and adjust operational conditions as necessary to resolve the problems identified in the

evaluation. Repair any systems as necessary to prevent future occurrences of overtopping.

6. Within 30 days of discovery of overtopping, submit a report to ADEQ as specified in section 2.7.3.2 (Permit Violation and AL Status Reporting). Include a description of the actions performed in Subsections 1 through 5 listed above. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
7. Within 60 days of discovery, and based on sampling in Subsection 3 above, conduct an assessment of the impacts to the subsoil and/or groundwater resulting from the incident.
8. If soil or groundwater is impacted such that it could cause or contribute to an exceedance of an AQL at the applicable point of compliance, submit to ADEQ for approval, a corrective action plan to address such impacts, including identification of remedial actions and/or monitoring, and a schedule for completion of activities. At the direction of ADEQ, the permittee shall implement the approved plan.
9. Within 30 days of completion of corrective actions, submit to ADEQ, a written report as specified in Section 2.6.6 (Corrective Actions). Upon review of the report, ADEQ may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.3.3 Inflows of Unexpected Materials to a Surface Impoundment

The types of materials that are expected to be placed in the permitted surface impoundments are specified in Section 2.3 (Discharge Limitations). If any unexpected materials flow to a permitted surface impoundment, the permittee shall:

1. As soon as practicable, cease all unexpected inflows to the surface impoundment(s).
2. Within 24 hours of discovery, notify the Groundwater Protection Value Stream.
3. Within five (5) days of the incident, identify the source of the material and determine the cause for the inflow. Characterize the unexpected material and contents of the affected impoundment, and evaluate the volume and concentration of the material to determine if it is compatible with the surface impoundment liner. Based on the evaluation of the incident, repair any systems or equipment and/or adjust operations, as necessary to prevent future occurrences of inflows of unexpected materials.
4. Within 30 days of an inflow of unexpected materials, submit a report to ADEQ as specified in section 2.7.3.2 (Permit Violation and AL Status Reporting). Include a description of the actions performed in Subsections 1 through 3 listed above. Upon review of the report, ADEQ may request additional monitoring or remedial actions.
5. Upon review of the report, ADEQ may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.4 Aquifer Quality Limit Violation

1. If an AQL set in Section 4, Tables 4.2.3 or 4.2.4 has been exceeded, the permittee may conduct verification sampling within five (5) days of becoming aware of an AQL being exceeded. The permittee may use the results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.
2. If verification sampling confirms that the AQL is violated for any parameter or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring to monthly. In addition, the permittee shall immediately initiate an evaluation for the cause of the violation, including inspection of all discharging units and all related pollution control devices, and review of any operational and maintenance practices that might have resulted in unexpected discharge.

   The permittee also shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. A verified exceedance of an AQL will be considered a violation unless the permittee demonstrates within 30 days that the exceedance was not caused or contributed to by pollutants

discharged from the facility. Unless the permittee has demonstrated that the exceedance was not caused or contributed to by pollutants discharged from the facility, the permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ approved contingency plan, or separately approved according to Section 2.6.6.

3. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.
4. The permittee shall notify any downstream or downgradient users who may be directly affected by the discharge.
5. The permittee shall continue monitoring at the increased frequency until the contaminant(s) is below the AQL and AL for three consecutive months.

2.6.5 Emergency Response and Contingency Requirements for Unauthorized Discharges pursuant to A.R.S. §49-201(12) and pursuant to A.R.S. § 49-241

2.6.5.1 Duty to Respond

The permittee shall act immediately to correct any condition resulting from a discharge pursuant to A.R.S. § 49-201(12) if that condition could pose an imminent and substantial endangerment to public health or the environment.

2.6.5.2 Discharge of Hazardous Substances or Toxic Pollutants

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of suspected hazardous substances (A.R.S. § 49-201(19)) or toxic pollutants (A.R.S. § 49-243(I)) on the facility site, the permittee shall promptly isolate the area and attempt to identify the discharged material. The permittee shall record information, including name, nature of exposure and follow-up medical treatment, if necessary, on persons who may have been exposed during the incident. The permittee shall notify the Groundwater Protection Value Stream within 24-hours upon discovering the discharge of hazardous material which: a) has the potential to cause an AWQS or AQL to be exceeded; or b) could pose an endangerment to public health or the environment.

2.6.5.3 Discharge of Non-hazardous Materials

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of non-hazardous materials from the facility, the permittee shall promptly attempt to cease the discharge and isolate the discharged material. Discharged material shall be removed and the site cleaned up as soon as possible. The permittee shall notify the Groundwater Protection Value Stream within 24-hours upon discovering the discharge of non-hazardous material which: a) has the potential to cause an AQL to be exceeded; or b) could pose an endangerment to public health or the environment.

2.6.5.4 Reporting Requirements

The permittee shall submit a written report for any unauthorized discharges reported under Sections 2.6.5.2 and 2.6.5.3 to the Groundwater Protection Value Stream within thirty days of the discharge or as required by subsequent ADEQ action. The report shall summarize the event, including any human exposure, and facility response activities and include all information specified in Section 2.7.3. If a notice is issued by ADEQ subsequent to the discharge notification, any additional information requested in the notice shall also be submitted within the time frame specified in that notice. Upon review of the submitted report, ADEQ may require additional monitoring or corrective actions.

A post-audit report regarding the passive containment demonstration is required within five (5) years of the effective date of this permit, and every five (5) years thereafter, in accordance with Section 2.5.3.6 of this permit.

2.6.6 Corrective Actions

Specific contingency measures identified in Section 2.6 and actions identified in the approved contingency plan referenced in Section 5.0 have already been approved by ADEQ and do not require written approval to implement. With the exception of emergency response actions taken under Section 2.6.5, the permittee shall obtain written approval from the Groundwater Protection Value Stream prior to implementing a corrective action to accomplish any of the following goals in response to exceeding an AL or violation of an AQL, DL, or other permit condition:

1. Control of the source of an unauthorized discharge;
2. Soil cleanup;
3. Cleanup of affected surface waters;
4. Cleanup of affected parts of the aquifer;
5. Mitigation to limit the impact of pollutants on existing uses of the aquifer.

Within 30 days of completion of any corrective action, the operator shall submit to the Groundwater Protection Value Stream, a written report describing the causes, impacts, and actions taken to resolve the problem.

2.7 Reporting and Recordkeeping Requirements [A.R.S. § 49-243(K)(2) and A.A.C. R18-9-A206(B) and R18-9-A207]

2.7.1 Self-monitoring Report Form

1. The permittee shall complete the SMRFs provided by ADEQ.
2. The permittee shall complete the SMRF to the extent that the information reported may be entered on the form. If no information is required during a quarter, the permittee shall enter "not required" on the SMRF and submit the report to ADEQ. The permittee shall use the format devised by ADEQ.
3. The following tables, contained in Section 4.0, list the parameters to be monitored and the frequency for reporting results on the SMRFs: Tables 4.2.3 and 4.2.4.

2.7.2 Operation Inspection / Log Book Recordkeeping

A signed copy of this permit shall be maintained at all times at the location where day-to-day decisions regarding the operation of the facility are made. A log book (paper copies, forms or electronic data) of the inspections and measurements required by this permit shall be maintained at the location where day-to-day decisions are made regarding the operation of the facility. The log book shall be retained for ten years from the date of each inspection, and upon request, the permit and the log book shall be made immediately available for review by ADEQ personnel. The information in the log book shall include, but not be limited to, the following information as applicable:

1. Name of inspector;
2. Date and shift inspection was conducted;
3. Condition of applicable facility components;
4. Any damage or malfunction, and the date and time any repairs were performed;
5. Documentation of sampling date and time;
6. Any other information required by this permit to be entered in the log book, and
7. Monitoring records for each measurement shall comply with R18-9-A206(B)(2).

2.7.3 Permit Violation and Alert Level Status Reporting

1. The permittee shall notify the Groundwater Protection Value Stream in writing within five days (except as provided in Section 2.6.5) of becoming aware of a violation of any permit condition, discharge limitation or of an Alert Level being exceeded for which notification requirements are not specified in Sections 2.6.2 through 2.6.5.
2. The permittee shall submit a written report to the Groundwater Protection Value Stream within 30 days of becoming aware of the violation of any permit condition or discharge limitation. The report shall document all of the following:

a. Identification and description of the permit condition for which there has been a violation and a description of its cause.
b. The period of violation including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue.
c. Any corrective action taken or planned to mitigate the effects of the violation, or to eliminate or prevent a recurrence of the violation.
d. Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an Aquifer Water Quality Standard.
e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring.
f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

2.7.4 Operational, Other or Miscellaneous Reporting

The permittee shall, upon completion of the biennial sampling described in Table 4.2.4, submit a monitoring summary report to the Groundwater Protection Value Stream. This report shall be due at the same time as the SMRF form for the biennial sampling event. The report shall include, but not be limited to the following:

1. A description of any deviations from standard sampling protocols during the reporting period.
2. A summary of all exceedances of ALs, AQLs, Action Levels, or operational limits that occurred during the reporting period.
3 Graphical time versus concentration plots of field pH, sulfate, total dissolved solids, and any parameter which exceeded an applicable AL or AQL in the past eight quarters at each POC well, and tabulated sampling data for all wells required to be sampled by this permit during the last eight quarters.
4. An updated table of all monitor wells and piezometers in the Discharge Impact Area including, but not limited to, location of well, depth of well, depth to water, and water level elevation.
5. A summary of any groundwater monitor wells replaced in the reporting period including, but not limited to, location of well, depth of well, depth to water, water level elevation, and screened interval.
6. A list of any new sumps, impoundments, or vehicle washes constructed within the passive containment, unless exempt or covered by a general APP.
7. A summary of new Catchments within PCCZ (D-27) including location, and a description of the BADCT/installation.
8. A list of any catchments within the PCCZ decommissioned during the past two (2) years.

2.7.5 Reporting Location

All Self-monitoring Report Forms (SMRFs) shall be submitted to:

Arizona Department of Environmental Quality
Groundwater Protection Value Stream
Mail Code: 5415B-1
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4581

All documents required to be submitted to the Groundwater Protection Value Stream shall be directed to:

Arizona Department of Environmental Quality
Groundwater Protection Value Stream
Mail Code: 5415B-1
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4497

2.7.6 Reporting Deadline

The following table lists the quarterly report due dates:

Monitoring conducted during quarter:	Quarterly Report due by:
January-March	April 30
April-June	July 30
July-September	October 30
October-December	January 30

The following table lists the semi-annual report due dates:

Monitoring conducted:	Report due by:
Semi-annual: January-June	July 30
Semi-annual: July-December	January 30

The following table lists the due date for the biennial report:

Monitoring conducted during the year:	Biennial Report due by:
January-December	January 30 of the following year

2.7.7 Changes to Facility Information in Section 1.0

The Groundwater Protection Value Stream shall be notified within ten (10) days of any change of facility information including Facility Name, Permittee Name, Mailing or Street Address, Facility Contact Person or Emergency Telephone Number.

2.8 Temporary Cessation [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A209(A)]

The permittee shall give written notice to the Groundwater Protection Value Stream before ceasing operation of the facility for a period of 60 days or greater. At the time of notification the permittee shall submit for ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Immediately following ADEQ approval, the permittee shall implement the approved plan. If necessary, ADEQ shall amend permit conditions to incorporate conditions to address temporary cessation. During the period of temporary cessation, the permittee shall provide written notice to the Groundwater Protection Value Stream of the operational status of the facility every three years. If the permittee intends to permanently cease operation of any facility, the permittee shall submit closure notification, as set forth in Section 2.9 below. Submittal of Self-Monitoring Report Forms (SMRFs) is still required; report "temporary cessation" in the comment section

2.9 Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(B)]

For a facility addressed under this permit, the permittee shall give written notice of closure to the Groundwater Protection Value Stream of the permittee's intent to cease operation without resuming activity for which the facility was designed or operated. Notice of decommissioning of Catchments within the PCCZ (D-27) shall comply with the requirements of Section 2.7.4. Submittal of SMRFs is still required; report "closure in process" in the comment section.

2.9.1 Closure Plan

Within 90 days following notification of closure, the permittee shall submit for approval to the Groundwater Protection Value Stream, a closure plan which meets the requirements of A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(3).

If the closure plan achieves clean-closure immediately, ADEQ shall issue a letter of approval to the permittee. If the closure plan contains a schedule for bringing the facility to a clean-closure

configuration at a future date, ADEQ may incorporate any part of the schedule as an amendment to this permit.

2.9.2 Closure Completion

Upon completion of closure activities, the permittee shall give written notice to the Groundwater Protection Value Stream indicating that the approved closure plan has been implemented fully and providing supporting documentation to demonstrate that clean-closure has been achieved (soil sample results, verification sampling results, groundwater data, as applicable). If clean-closure has been achieved, ADEQ shall issue a letter of approval to the permittee at that time. If any of the following conditions apply, the permittee shall follow the terms of post-closure stated in this permit:

1. Clean-closure cannot be achieved at the time of closure notification or within one year thereafter under a diligent schedule of closure actions;
2. Further action is necessary to keep the facility in compliance with aquifer water quality standards at the applicable point of compliance or, for any pollutant for which the AWQS was exceeded at the time this permit was issued, further action is necessary to prevent the facility from further degrading the aquifer at the applicable point of compliance;
3. Remedial, mitigative or corrective actions or controls are necessary to comply with A.R.S. § 49-201(30) and Title 49, Ch. 2, Art. 3;
4. Further action is necessary to meet property use restrictions.

2.9.3 Decommissioned Facilities

The following facilities were originally listed in the APP, issued March 25, 2009. They have been decommissioned, and closure shall be addressed at final mine closure.

Tucker Pond	34º 35' 35" N	113º 13' 44" W
EW Catchment Basin	34º 36' 10" N	113º 12' 57" W
Mineral Creek Sump	34º 34' 39" N	113º 12' 58" W

2.10 Post-closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(C)]

Post-closure requirements shall be established based on a review of facility closure actions and will be subject to review and approval by the Groundwater Protection Value Stream.

In the event clean-closure cannot be achieved pursuant to A.R.S. § 49-252, the permittee shall submit for approval to the Groundwater Protection Value Stream a post-closure plan that addresses post-closure maintenance and monitoring actions at the facility. The post-closure plan shall meet all requirements of A.R.S. §§ 49-201(30) and 49-252 and A.A.C. R18-9-A209(C). Upon approval of the post-closure plan, this permit shall be amended or a new permit shall be issued to incorporate all post-closure controls and monitoring activities of the post-closure plan.

2.10.1 Post-closure Plan

Reserved

2.10.2 Post-closure Completion

Reserved

3.0 COMPLIANCE SCHEDULE [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

Unless otherwise directed, for each compliance schedule item listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Protection Value Stream.

No.	Description	Due by:	Permit Amendment Required?
1	**Passive Containment Demonstration Update** The permittee shall submit an update to the passive containment demonstration, in accordance with Section 2.5.3.6.	March 25, 2024, and every five (5) years thereafter for the duration of the permit.	No
2	**Biennial Report** The permittee shall submit the Biennial Monitoring Summary Report, in accordance with Section 2.7.4	January 30, 2020, and every two (2) years thereafter for the duration of the permit.	No
3	**Financial Assurance Mechanism** The permittee shall submit a demonstration that the financial assurance mechanism listed in Section 2.1, Financial Capability, is being maintained as per A.R.S. 49-243.N.4 and A.A.C. R18-9-A203(H) for all estimated closure and post-closure costs including updated costs submitted under Section 3.0, No. 4 (below). The demonstration shall include a statement that the closure and post-closure strategy has not changed, the discharging facilities listed in the permit have not been altered in a manner that would affect the closure and post-closure costs, and discharging facilities have not been added. The demonstration shall also include information in support of the corporate guarantee demonstration as required in A.A.C. R18-9-A203(C)(8).	April 1, 2020 and every two (2) years thereafter for the duration of the permit.	No
4	**Updated Closure Cost Estimates** The permittee shall submit updated cost estimates for facility closure and post-closure as per A.A.C. R18-9-A201(B)(5) and A.R.S. 49-243.N.2.a.	April 1, 2022 and every six (6) years thereafter for the duration of the permit.	Yes
5	The permittee shall submit construction QA/QC Report and as-built drawings, sealed by an Arizona registered professional engineer, which indicate that the downgradient sediment control structures (DG-1 and DG-2) and up gradient stormwater impoundments (UG-1, UG-2 and UG-3) were constructed in accordance with plans and specifications approved by ADEQ.	Within 90 days of construction of each structure.	No
6	The permittee shall submit a plan for installation and monitoring of landfill methane gas probes if any permanent buildings or enclosed structures are constructed within 1000 feet of the Construction Debris Landfill	Within 90 days of construction of a permanent building or enclosed structure.	Yes

4.0 TABLES OF MONITORING REQUIREMENTS

4.1 FACILITY AND POC TABLES

4.2 COMPLIANCE AND OPERATIONAL MONITORING TABLES

TABLE 4.1.1 FACILITIES LIST AND BADCT	
Facility Name and Number	**Facility BADCT**
PROCESS SOLUTION IMPOUNDMENTS:	
Catchments within PCCZ (D-27)	**Individual BADCT:** These facilities consist of existing (Upper Niagara Pond (D-4), Upper Niagara PLS Pond (D-5), Alum Sump PLS Pond (D-21), and Kimberly Pond (D-22)) and future collection and diversion points including catchments, sumps and impoundments, for process solution/stormwater within the PCCZ. This permit allows catchments within the PCCZ to be constructed, operated, maintained, and decommissioned without requiring any permit amendments in accordance with the following: The facilities will be equipped with pumps, as necessary, to maintain a controlled ponded surface elevation and minimize the risk of overtopping during storm events. Should overtopping occur for catchments within the pit area, the overflow solution will be contained within the confines of the mine pit (within the PCCZ). For new catchments constructed outside the pit, but within the PCCZ, a minimum of 2 feet of freeboard will be maintained to reduce the possibility of overflow. Pumps and piping will be on hand to direct excess PLS to the SX-EW plant, leach circuit, or other APP-regulated facility, as needed. The slope stability of pit walls and stockpiles shall be assessed for new catchments prior to installation. Facilities will be decommissioned by (1) reducing or ceasing inflow, (2) routing of remaining inflow to another facility regulated by the APP or allowing gravity flow over unfractured bedrock into the bottom of the pit for collection and recovery, and (3) filling with rock material.
Copper Creek PLS Pond System (PLS pond and conveyance channel) (D-10)	The facility is a process solution pond system consisting of an 80-mil HDPE-lined channel leading from the toe of the Copper Creek Leach Dump to the Copper Creek PLS Pond. The PLS pond system is constructed on Quaternary gravels of moderate hydraulic conductivity underlain by Precambrian granite. The pond has a design capacity of 4.5 million gallons, with a depth of 20 feet. Process solution from the pond is pumped to the SX-EW Plant for processing. During process upset or severe storm events, overflow shall report to Boulder Flood Basin (D-11) via a lined overflow channel.
Boulder Flood Basin (D-11)	The facility is a double-lined, impoundment equipped with a Leak Collection and Removal System (LCRS). The primary liner is an 80-mil HDPE geomembrane, secured in an engineered anchor trench, and a secondary liner consisting of a compacted, amended soil liner. The overflow channel from the Copper Creek PLS Pond leading to the Boulder Flood Basin is lined with an 80-mil HDPE geomembrane. The impoundment has a solution holding capacity of 37 million gallons. The impoundment receives stormwater runoff and contains process solution overflow due to process upsets in the Copper Creek leach system. The facility is designed with pumping system capability to divert solution to the Bagdad open pit, the Mulholland Tailings Pond, Mammoth Tailings Pond, or the Copper Creek PLS Pond System. Potential discharges from the Boulder Flood Basin to Boulder Creek are addressed under the terms and provisions of an individual AZPDES permit (AZ0022268).
Raffinate Pond (D-13)	Facility is located within the passive containment zone of the open pit. The facility is a double-lined process solution impoundment equipped with LCRS. The liner system consists of an 80-mil HDPE primary geomembrane, with the secondary liner consisting of compacted two feet thick Gila Formation (rhyolite tuff and clay). The geomembrane is secured in an engineered anchor trench around the pond perimeter. The impoundment has a maximum solution holding capacity of approximately 0.5 million gallons, at a depth of approximately 6 feet. To avoid potential overflow, the impoundment is equipped with an automatic, high-level alarm system. The raffinate solution is used in the leach process. To minimize the potential for discharge, surface water run-on is diverted away from the facility. The ALR and RLLR for the pond are established at 223 gpd and 670 gpd respectively. During process upset or severe storm events, the piped overflow reports to the Copper Creek Leach Dump.

PLS Surge Pond (D-14)	Facility is located within the passive containment zone of the open pit. The facility is a double-lined process solution impoundment equipped with LCRS. The liner system consists of an 80-mil HDPE primary geomembrane, with the secondary liner consisting of compacted two feet thick Gila Formation (rhyolite tuff and clay). The geomembrane and the geonet/geotextile composite used in the LCRS are secured in an engineered anchor trench around the pond perimeter. The pond is constructed on non-mineralized material of the Mine Shop Overburden Dump. The pond has a maximum solution holding capacity of approximately 1.5 million gallons, with a depth of 8 feet. The pond receives process solution from various PLS collection facilities from where it is pumped to the SX-EW Plant for processing. To avoid potential overflow, the PLS Surge Pond is equipped with an automatic, high-level alarm system. To minimize the potential for discharge, surface water run-on is diverted away from the facility. The ALR and RLLR for the pond are established at 279 gpd and 836 gpd respectively.
Strong PLS Pond (D-20)	**Prescriptive BADCT:** The facility (D20) is a double-lined impoundment equipped with a leak detection and removal system (LCRS). The double liner consists of a 60-mil HDPE primary and secondary liner, with a 200-mil HDPE geonet between the two liners for drainage. The lower liner is a composite liner underlain by a minimum of 6-inch minus low permeability soil compacted to achieve a saturated hydraulic conductivity of no greater than 1×10^{-6} cm/sec. The pond is designed to contain maximum fluid volume of 3.86 million gallons plus direct precipitation from the 100-year, 24-hour storm event while maintaining 2 feet of freeboard. The total depth of the pond is 26 feet. Berms and diversion channels are designed to prevent surface stormwater from entering the pond. The ALR and RLLR for the pond are established at 515 gpd and 1,545 gpd, respectively (Ref. Area-wide APP Application Addendum, July 2002).
LEACH DUMPS:	
Upper Niagara Leach Dump (D-6)	Facility is located within the passive containment zone of the open pit. The facility is a low-grade leach dump located on alluvial valley-fill, underlain primarily by Precambrian crystalline bedrock. The leach dump is constructed over steeply-sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the downstream toe of the dump and gravity flows to the Upper Niagara PLS Pond (D-5). To minimize discharge, surface water run-on is diverted away from the facility.
Plan IX Leach Dump (D-15)	Facility is located within the passive containment zone of the open pit. The facility is a low-grade leach dump located on alluvial valley-fill, underlain primarily by Precambrian crystalline bedrock. The leach dump is constructed over steeply-sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the downstream toe of the dump and gravity flows to the Alum Sump PLS Pond and Kimberly Pond. Diversion ditches located up-gradient of the dump divert the stormwater run-on away from the facility. The leach dump occupies approximately 1,661 acres, contains approximately 192,853,000 tons of leach material, and is permitted for a maximum height of 4,850 feet above mean sea level. To minimize discharge, surface water run-on is diverted away from the facility.
Mineral Creek Leach Dump (D-18)	Facility is located within the passive containment zone of the open pit. The facility is a low-grade leach dump located within a well-defined canyon, underlain primarily by Precambrian crystalline bedrock. The leach dump is constructed over steeply-sloping natural terrain using end dumping method of construction. The leachate (PLS) from the dump is collected at the downstream toe of the dump. Residual PLS at the former Mineral Creek Sump area is directed to the bottom of the open pit. Diversion ditches are located up-gradient of the dump to divert stormwater run-on away from the facility. To minimize discharge, surface water run-on is diverted into the open pit.
Copper Creek Leach Dump (D-7)	The stability analysis, water balance and aquifer loading analysis, as well as solution, ore and waste characterization, sighting considerations, design, construction and operational measures received in submittals dated March 25, 2010, July 1, 2010 and February 14, 2018 (updated stability analysis and modified design) have satisfied the requirements of A.R.S. 49-243 and A.A.C. R-18-9-A202. The maximum dump elevation shall be 3,900 feet above mean sea level.

Crystal Mountain Leach Dump (D-19)	The stability analysis, water balance and aquifer loading analysis, as well as solution, ore and waste characterization, sighting considerations, design, construction and operational measures received in submittals dated March 25, 2010 and July 1, 2010 have satisfied the requirements of A.R.S. 49-243 and A.A.C. R-18-9-A202.
TAILINGS IMPOUNDMENTS:	
Mulholland Tailings Pond (D-1)	The facility is a tailings dam used primarily as a recycled water storage facility for site-wide water management purposes and, as needed, as a secondary tailings disposal impoundment. The facility is constructed employing centerline dam construction method, using a combination of spigotting and cycloning of tailings material. The impoundment is located over predominantly Precambrian crystalline rocks. The tailings dam and pond cover an area of approximately 500 acres and contain approximately 120 million dry tons of tailings.
Mulholland Seepage Collection Pond (D-2)	The facility is a lined impoundment formed by a seepage collection dam constructed adjacent to the downstream toe of the Mulholland tailings embankment. The dam is a compacted rock-fill dam with a reinforced gunnite facing on its entire surface and has a concrete lined basin. The impoundment has an approximate storage capacity of 531,000 gallons, with an average depth of approximately 6 feet. Collected seepage is pumped back to the Mulholland Tailings Pond using two vertical turbine pumps. Both pumps are turbine pumps. Both pumps are equipped with automatic level controls and have a combined design capacity of 1,175 gpm. Potential discharges from the Mulholland Seepage Pond to Mulholland Wash are addressed under the terms and provisions of an individual AZPDES permit (AZ0022268).
Mammoth Tailings Impoundment (D-23)	The facility has a maximum capacity of 900,000,000 tons of tailings and a maximum permitted dam crest elevation of 3,600 feet above mean sea level. Tailings are delivered to the tailings impoundment at a rate not exceeding 200,000 dry tons per day. Process fluids include: water from the Freeport-McMoRan Bagdad water supply system; water pumped from the tailings seepage collection system and the tailings water reclaim and return system; wastewater effluent from the Bagdad Townsite Wastewater Treatment Plant (WWTP) and reagents that are manufactured, processed, and used in compliance with the federal Toxic Substances Control Act.
Mammoth Tailings Seepage Collection Pond (D-25)	The tailings seepage collection pond (SCP) is constructed with a gunnite liner and has a normal operating capacity of 350,000 with a minimum freeboard of 1 foot The facility is located at an elevation of 2,740 feet above sea level. The pump-back dam, constructed upon crystalline bedrock, is a compacted rock fill dam with a 12-inch concrete facing on its entire surface. In addition, a seepage sump (SS) is located at an elevation of 2,730 feet above sea level immediately downstream from the facility. The SS is a 1-foot-diameter well, extending to a depth of 11 feet in the gravels of Mammoth Wash, immediately downstream from the SCP.
Upper Mammoth Tailings Impoundment (D-24)	The Upper Mammoth Tailings Impoundment shall be constructed, operated, and maintained according to Plans and Specifications provided in the March 24, 1995 titled *Site Characterization & Design Studies*, the December 2010 Upper Mammoth Tailing Feasibility Level Design, and amendments and supplements referenced in Section 5 of this Permit. The Upper Mammoth Tailings impoundment has a maximum capacity of 600,000,000 tons of tailings. The maximum permitted dam crest elevation shall not exceed 4,050 feet above mean sea level, and the maximum areal extent of the tailings impoundment shall not exceed the footprint shown in Figure 1 of the approved design plans provided in the July 18, 2007, *Site Characterization & Design Studies*. Tailings shall be delivered to the tailings impoundment at a rate not to exceed 200,000 dry tons per day during ore processing.
Last Chance Pond (D-3)	Facility is located within the passive containment capture zone of the open pit. The facility is an impoundment located within the footprint of the Mulholland Tailings Impoundment designed to accept inflows of stormwater from the concentrate storage area and emergency overflow of process solution from the mill/concentrator. The pond was originally a clay-lined containment pond that was later lined with gunite and bermed on all uphill sides. The normal operating capacity is approximately 500,000 gallons with a center depth of 3 feet. Collected solutions are pumped to the concentrator circuit. Overflows discharge to the Mulholland Tailings Impoundment.

WASTE ROCK STORAGE FACILITY	
South Waste Rock Disposal Facility (D-26)	The South Waste Rock Disposal Facility is located within the PCCZ encompassing approximately 624 acres and with a maximum permitted capacity of 875,839,000 tons of mining waste rock. Maximum permitted elevation of the facility is 4,500 feet above mean sea level. The maximum areal extent of the waste rock disposal facility is shown in Table 3, page 16, of the *Request to Amend APP No. P-105258 to Extend Plan IX Leach Dump and South Waste Rock Disposal Facilities*, dated June 15, 2015. The facility shall consist of 50-foot lift heights with 36º angle of repose and 43.5-foot horizontal benches between lifts, resulting in an inter-ramp slope of 24º.
Butte Stockpile	Facility is located within the passive containment capture zone of the open pit. The facility has a maximum capacity of 769,200,000 cubic yards of mining overburden, a maximum slope height of 900 feet, and a maximum permitted elevation of 4,700 feet above mean sea level. The maximum area extent of the waste rock stockpile shall not exceed the footprint represented in Figure 2-1 of the November 2018 amendment application, received by ADEQ on November 26, 2018; approximately 1,248 acres. The design value for the angle of repose is 1.4 horizontal to one vertical (1.4H:1V) that results in a minimum inter-ramp slope angle of two horizontal to one vertical (2H:1V) for the stockpile. Half of the stockpile slope has a 130 foot wide access road, which provides a minimum overall slope of 2.5 horizontal to one vertical (2.5H:1V). Three downgradient sediment control structures, DG-1, DG-2 and the Basalt Plug, shall detain, decelerate, and allow infiltration of runoff and sediment from the stockpile along the northern boundary resulting from the design storm event (100-year, 24-hour). Surface water from watershed areas upstream of the stockpile shall be retained in two upgradient stormwater impoundments, UG-1 and UG-2, located at the northeastern corner of the stockpile, and a third impoundment, UG-3, within the main stem of the Copper Creek channel upstream of the main gate.
WASTE MANAGEMENT FACILITIES	
Waste Management Facility (WMF): Construction Debris Landfill, Leachate Evaporation Pond (LEP), Bioremediation Land Treatment Unit (LTU), LTU Evaporation Pond	Facility is located within the passive containment capture zone of the open pit. The facility covers approximately 10 acres on the mine property and is primarily used for disposal of construction debris. The WMF is situated on non-mineralized overburden material that was excavated to house the Construction Debris Landfill (CDL). The sides and bottom of the CDL excavation are lined with a geosynthetic clay liner and the landfill includes a leachate collection system. The bottom of the landfill is approximately 35 feet below the level of the perimeter berm. The LTU is underlain by a geosynthetic clay liner with soil cover. Both evaporation ponds include primary and secondary 60-mil high density polyethylene (HDPE) geomembrane liners. Surface water run-on and run-off diversions have been constructed and maintained to direct peak flows away from the landfill in accordance with plans referenced in SRK Consultant (2001). These structures shall be maintained until facility closure. Facility closure will be accomplished by burial under the Butte Stockpile which will be graded and maintained to direct stormwater runoff away from the facility area.

Notes:

1. Prescriptive BADCT design involves a prescribed engineering approach that utilizes pre-approved discharge control technologies or engineering equivalents to meet the requirements of A.R.S. 49-243(B)(1).
2. Individual BADCT requirements are described in the ADEQ Arizona Mining BADCT Guidance Manual. For existing facilities, consideration of additional factors as listed in A.R.S. §§ 49-243(B)(1)(a) through (h) and 49-243(G) apply.
3. Acronyms:
   - BADCT Best Available Demonstrated Control Technology
   - HDPE High-density Polyethylene
   - ALR Action Leakage Rate
   - RLLR Rapid and Large Leakage Rate

TABLE 4.2.1 **REQUIRED INSPECTIONS AND OPERATIONAL MONITORING**	
Facility Name and Number	**Operational Requirements**
LEACH DUMPS	
Upper Niagara Leach Dump (D-6) Copper Creek Leach Dump (D-7) Plan IX Leach Dump (D-15) Mineral Creek Leach Dump (D-18) Crystal Mountain Leach Dump (D-19)	**Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (precipitation shall be measured based on readings obtained from the mine weather station used for such measurements): Visually inspect and take appropriate action if any evidence of: -instability, including surface cracks, slides, sloughs or unusual differential settlement; -excessive erosion in conveyances and diversions; -excessive accumulation of debris in conveyances and diversions; and -impairment of access.
PROCESS SOLUTION IMPOUNDMENTS, DOUBLE-LINED - OUTSIDE THE PCCZ	
Boulder Flood Basin (D-11) Strong PLS Pond (D-20)	**Daily:** Check and take appropriate action in the case of any evidence of blockages of overflow pipes/spillway structures. Visually inspect and maintain applicable freeboard in impoundment - Strong PLS Pond - 2 feet **Weekly:** **Strong PLS Pond** Measure flow rate in the LCRS: confirm that it is less than specified ALR (see Section 2.6.2.4 and Table 2.2.4) and less than the specified rate for RLLR (see Section 2.6.2.5 and Table 2.2.4); and take appropriate action if exceedance is observed in the values. **Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements.): Visually inspect and take appropriate action if any evidence of: -instability, including surface cracks, slides, sloughs or unusual differential settlement; -excessive erosion in conveyances and diversions; -excessive accumulation of debris in conveyances and diversions; and -impairment of access. At pump locations, inspect pumps, valves and structures for pump operation and structural integrity. **Annually:** Remove excess sediments/sludge from the impoundment as needed to maintain at least 80 percent of design capacity.
PROCESS SOLUTION IMPOUNDMENTS, LINED - OUTSIDE THE PCCZ	
Copper Creek PLS Pond System (PLS Pond and Conveyance Channel (D-10))	**Daily:** Check and take appropriate action in the case of any evidence of blockages of overflow pipes/spillway structures or conveyance channel. **Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements.): Visually inspect and take appropriate action if any evidence of:

	-perforated cut, tear of damaged liner and impairment of anchor trench integrity of the Conveyance Channel; -impairment of embankment integrity; -excessive erosion or accumulation of debris in conveyances and diversions; and -impairment of access. At pump locations, inspect pumps, valves and structures for pump operation and structural integrity. **Annually:** Remove excess sediments/sludge from the impoundment as needed to maintain at least 80 percent of design capacity.
TAILINGS IMPOUNDMENTS	
Mulholland Tailings Pond (D-1)	**Daily:** Check and take appropriate action in the case of any evidence of blockages of overflow pipes/spillway structures or conveyance channel. **Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements.): Visually inspect and take appropriate action if any evidence of: -perforated cut, tear of damaged liner and impairment of anchor trench integrity of the Conveyance Channel; -impairment of embankment integrity; -excessive erosion or accumulation of debris in conveyances and diversions; and -impairment of access. At pump locations, inspect pumps, valves and structures for pump operation and structural integrity.
PROCESS SOLUTION IMPOUNDMENTS WITHIN THE PCCZ	
Catchments within PCCZ (D-27)	**Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements.): Visually inspect and take appropriate action if any evidence of: -instability, including surface cracks, slides, sloughs or unusual differential settlement; -excessive erosion in conveyances and diversions; -excessive accumulation of debris in conveyances and diversions; and -impairment of access. At pump locations, inspect pumps, valves and structures for pump operation and structural integrity.
PROCESS SOLUTION IMPOUNDMENTS, DOUBLE-LINED - WITHIN THE CAPTURE ZONE OF THE HYDROLOGIC SINK	
Raffinate Pond (D-13) PLS Surge Pond (D-14)	**Daily:** Check and take appropriate action in the event of any evidence of: -blockages of overflow pipes/spillway structures. **Weekly:** **Raffinate Pond and PLS Surge Pond** Measure flow rate in the LCRS; confirm that it is less than specified ALR (See Section 2.6.2.4 and Table 2.2.4) and less than specified rate for RLLR (see Section 2.6.2.5 and Table 2.2.4); and take appropriate action if exceedance is observed in the values. **Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements.):

	Visually inspect and take appropriate action if any evidence of: -perforated cut, tear or damaged liner and impairment of anchor trench integrity; -impairment of embankment integrity; -excessive erosion in conveyances and diversions; -excessive accumulation of debris in conveyances and diversions; and -impairment of access. At pump locations, inspect pumps, valves and structures for pump operation and structural integrity. **Annually:** Remove excess sediments/sludge from the impoundment as needed to maintain at least 80 percent of designed capacity.
TAILINGS IMPOUNDMENTS	
Mulholland Tailings Pond (D-1)	**Daily during operational use (disposal of tailings, recycled water or process solution during upset conditions), and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements): Visually inspect and maintain a minimum of four (4) feet of freeboard. **Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (Precipitation shall be measured based on readings obtained from the mine weather station used for such measurements.): Visually inspect and take appropriate action if any evidence of: -tailings dam deformation, including surface cracks, slides, sloughs, seeps, erosion features or differential settlement-affecting dam stability; -excessive erosion or accumulation of debris in conveyances and diversions; and -impairment of access; At pump installations, inspect pumps, valves and structures for pump operation and structural integrity. **<u>REQUIREMENTS SPECIFIC TO WATER QUALITY</u>** Insure that the pH of all potentially acidic waters directed to the Mulholland Tailings Pond shall be tested and adjusted upward as needed to a pH greater than 4.5 SU before being discharged to the impoundment.
Mammoth Tailings Impoundment (D-23)	**Daily:** Tailings Dam(s) Integrity -Check for erosion beyond that due to normal deposition -Check for evidence of unexpected seepage, header damage, or excessive construction water flows Tailings Impoundments -Check tailing water reclaim pumps -Check for minimum ten (10) feet of freeboard
Upper Mammoth Tailings Impoundment (D-24)	
NON-STORM WATER IMPOUNDMENTS	
Mulholland Seepage Collection Pond (D-2)	**Weekly:** Visually inspect and take appropriate action if: -seepage from the Mulholland Tailings Pond into the seepage pond exceeds the pumping capacity of 1,175 gpm **Monthly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (precipitation shall be measured based on readings obtained from the mine weather station used for such measurements): Visually inspect and take appropriate action if any evidence of: -instability, including surface cracks or unusual differential settlement;

	-seepage through surface cracks along the embankment; -excessive erosion or accumulation of debris in conveyances and diversions; and -impairment of access; -at pump installations, inspect pumps, valves and structures for pump operation and structural integrity.
Last Chance Pond (D-3)	**Quarterly and following precipitation events measuring at least one (1) inch in a 24-hour period:** (precipitation shall be measured based on readings obtained from the mine weather station used for such measurements): Visually inspect and take appropriate action if any evidence of: -excessive erosion or accumulation of debris in conveyances and diversions; and -impairment of access; -at pump installations, inspect pumps, valves and structures for pump operation and structural integrity. **Annually:** Remove excess sediments/sludge from the impoundment as needed to maintain at least 80 percent of designed capacity.
Mammoth Tailings Seepage Collection Pond (D-25)	**Daily:** Visually inspect and take appropriate action if any evidence of: -visible leaks or seepage -check seepage return pumps for proper function -check for water level below weir -check for minimum 1 foot of freeboard -check for evidence of seepage -inspect Seepage Collection Pumpback Dam for visible leaks or structural failure -inspect Seepage Sump (below Pumpback dam) for overflow and check down-hole pump operation
WASTE ROCK STORAGE FACILITY	
South Waste Rock Disposal Facility (D-26)	**Monthly:** Visually inspect and take appropriate action if any evidence of: -dump or stockpile deformation, including surface cracks, slides, sloughs, or differential settlement affecting slope stability.
Butte Stockpile	**Monthly:** Visually inspect and take appropriate action if any evidence of: -dump or stockpile deformation, including surface cracks, slides, sloughs, or differential settlement affecting slope stability. **Quarterly and following precipitation events measuring at least 1 inch in a 24-hour period:** (Precipitation depth to be measured based on readings obtained from the mine weather station used for such measurements) Visually inspect and take appropriate action if any evidence of: -impairment or erosion of downgradient sediment control structures (DG-1, DG-2 and Basalt Plug) and up gradient stormwater impoundments (UG-1, UG-2 and UG-3); **Annually:** Remove excess sediments from downgradient sediment control structures (DG-1, DG-2 and Basalt Plug) and up gradient stormwater impoundments (UG-1, UG-2 and UG-3) as needed to maintain at least 80 percent of designed capacity.
WASTE MANAGEMENT FACILITIES WITHIN THE PCCZ	
Waste Management Facility	At least quarterly, and after every significant rainfall event, the leachate evaporation pond located in the northwest corner of the CDL shall be inspected to ensure sediment buildup, evidence of seepage, cracking, piping, sloughing, or sliding do not occur. Sediment shall be removed from the pond as necessary to ensure adequate capacity. A significant rain event shall be defined as 0.50 inches, or greater, of precipitation within a 24-hour period.

TABLE 4.2.2 **PARAMETERS FOR AMBIENT GROUNDWATER MONITORING FOR ALL POC WELLS**		
Depth to Water Level (feet bgs)	Potassium	Nickel
Water Level Elevation (feet amsl)	Sodium	Selenium
Temperature - field (^{0}F)	Iron	Thallium
pH - field and lab (S.U.)	Aluminum	Zinc
Field Specific Conductance (µmhos/cm)	Antimony	Free Cyanide
Total Dissolved Solids - lab	Arsenic	Adjusted Gross Alpha Activity (pCi/L)
Total Alkalinity	Barium	Radium 226 (pCi/L)
Bicarbonate	Beryllium	Radium 228 (pCi/L)
Carbonate	Cadmium	Uranium (mg/L)
Hydroxide	Chromium	Carbon Disulfide
Sulfate	Cobalt	Benzene
Chloride	Copper	Toluene
Fluoride	Lead	Ethylbenzene
Nitrate+Nitrite	Manganese	Total Xylenes
Calcium	Mercury	TPH
Magnesium	Molybdenum	
This table is being provided in the event that it becomes necessary to install additional POC wells; SMRF reporting is not required for ambient groundwater monitoring results. Metals must be analyzed as dissolved metals. All parameters are in milligrams per liter (mg/L) unless otherwise noted. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, minus radon and total uranium activity (the sum of the uranium 238, uranium 235 and uranium 234 isotopes).		

TABLE 4.2.3
QUARTERLY COMPLIANCE GROUNDWATER MONITORING AND REPORTING REQUIREMENTS FOR POC WELLS CMW 609, 610, 611, and 020R

PARAMETER	CMW-609		CMW-610		CMW-611		020R	
	AQL	AL	AQL	AL	AQL	AL	AQL	AL
Depth to Water (in feet bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (in feet amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field pH (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field Specific Conductance (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature - field (^{0}F)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	6.0	None	7.45	None	4.0	3.2	4.0	3.2
Nitrate+Nitrite	10	8	10	8	10	8	10	8
Arsenic	0.050	0.040	0.360	None	0.050	0.040	0.050	0.040
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Chromium	0.10	0.08	0.40	None	0.10	0.08	0.10	0.08
Copper	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	0.10	0.08	1.58	None	0.10	0.08	0.10	0.08
Selenium	0.05	0.04	0.05	0.04	0.05.	0.04	0.05.	0.04
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

Monitor = Monitoring is required, but no AQL or AL is established in the permit.
AQL = Aquifer Quality Limit
AL = Alert Level

All concentrations are in milligrams per liter (mg/L) unless otherwise specified.

Metals will be analyzed as dissolved metals

Table 4.2.3 indicates the parameters for monitoring on a quarterly basis. The Self-Monitoring Report Form shall be completed for every quarterly sampling event. On a biennial basis, the additional parameters listed in Table 4.2.4 shall be analyzed, and reported on the Self-Monitoring Report Form for biennial sampling.

TABLE 4.2.3
QUARTERLY COMPLIANCE GROUNDWATER MONITORING AND REPORTING REQUIREMENTS FOR POC WELLS 803, 283, 613, and 810R

PARAMETER	803		283		613		810R	
	AQL	AL	AQL	AL	AQL	AL	AQL	AL
Depth to Water (in feet bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (in feet amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field pH (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field Specific Conductance (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature - field (^{0}F)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Nitrate+Nitrite	10	8	10	8	10	8	10	8
Arsenic	0.050	0.040	0.050	0.04	0.050	0.040	0.050	0.040
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Chromium	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Copper	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	0.10	0.08	0.10	0.08	0.10	0.08	0.12	None
Selenium	0.050	0.040	0.050	0.040	0.050	0.040	0.050	0.040
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

Monitor = Monitoring is required, but no AQL or AL is established in the permit.
AQL = Aquifer Quality Limit
AL = Alert Level

All concentrations are in milligrams per liter (mg/L) unless otherwise specified.

Metals will be analyzed as dissolved metals

Table 4.2.3 indicates the parameters for monitoring on a quarterly basis. The Self-Monitoring Report Form shall be completed for every quarterly sampling event. On a biennial basis, the additional parameters listed in Table 4.2.4 shall be analyzed, and reported on the Self-Monitoring Report Form for biennial sampling.

Table 4.2.4
BIENNIAL COMPLIANCE GROUNDWATER MONITORING AND REPORTING REQUIREMENTS FOR POC WELLS CMW 609, 610, 611, and 020R

PARAMETER	CMW-609		CMW-610		CMW-611		020R	
	AQL	AL	AQL	AL	AQL	AL	AQL	AL
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	0.006	0.0048	0.006	0.0048	0.006	0.0048	0.006	0.0048
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Iron	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	0.050	0.040	0.050	0.040	0.050	0.040	0.050	0.040
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Adjusted Gross Alpha Activity (pCi/L)	15	12	15	14	15	12	15	12
Radium226+Radium228 (pCi/L)	6.72	None	5.0	4.07	5.0	4.74	5.0	4.17
Uranium (mg/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Free Cyanide	0.2	0.16	0.2	0.16	0.2	0.16	0.2	0.16
Carbon Disulfide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
TPH	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Toluene	1	0.8	1	0.8	1	0.8	1	0.8
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Total Xylenes	10	8	10	8	10	8	10	8

Monitor = Analysis required but no AQL or AL established in the permit.
AQL = Aquifer Quality Limit
AL = Alert Level
All concentrations are in milligrams per liter (mg/L) unless otherwise specified.
Metals will be analyzed as dissolved metals.

If the gross alpha particle activity is greater than the AL or AQL, then test for and report adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity including radium226, minus radon and total uranium (the sum of the uranium 238, 235 and 234 isotopes).

Table 4.2.4 lists the parameters for monitoring on a biennial basis (i.e. every 8th quarter). The Self-Monitoring Report Form shall be completed for every biennial sampling event. The biennial sampling shall be conducted concurrently with a quarterly sampling event, so that analysis shall be conducted for both the biennial and quarterly parameters listed in Tables 4.2.3 and 4.2.4, respectively. See also permit Section 2.5.3.5 and 2.7.

Table 4.2.4
BIENNIAL COMPLIANCE GROUNDWATER MONITORING AND REPORTING REQUIREMENTS FOR POC WELLS 803, 283, 613, and 810R

PARAMETER	803		283		613		810R	
	AQL	AL	AQL	AL	AQL	AL	AQL	AL
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	0.006	0.0048	0.006	0.0048	0.006	0.0048	0.006	0.0048
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Iron	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	0.050	0.040	0.050	0.040	0.050	0.040	0.050	0.040
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Adjusted Gross Alpha Activity (pCi/L)	15	12	20.4	None	28.7	None	42.1	None
Radium226+Radium228 (pCi/L)	5.0	4.0	5.0	4.0	5.0	4.0	5.2	None
Uranium (mg/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Free Cyanide	0.2	0.16	0.2	0.16	0.2	0.16	0.2	0.16
Carbon Disulfide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
TPH	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Toluene	1	0.8	1	0.8	1	0.8	1	0.8
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Total Xylenes	10	8	10	8	10	8	10	8

Monitor = Analysis required but no AQL or AL established in the permit.
AQL = Aquifer Quality Limit
AL = Alert Level
All concentrations are in milligrams per liter (mg/L) unless otherwise specified.
Metals will be analyzed as dissolved metals.

If the gross alpha particle activity is greater than the AL or AQL, then test for and report adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity including radium226, minus radon and total uranium (the sum of the uranium 238, 235 and 234 isotopes).

Table 4.2.4 lists the parameters for monitoring on a biennial basis (i.e. every 8th quarter). The Self-Monitoring Report Form shall be completed for every biennial sampling event. The biennial sampling shall be conducted concurrently with a quarterly sampling event, so that analysis shall be conducted for both the biennial and quarterly parameters listed in Tables 4.2.3 and 4.2.4, respectively. See also permit Section 2.5.3.5 and 2.7.

Table 4.2.5
SEMI-ANNUAL GROUNDWATER MONITORING AND REPORTING
FOR NON-POC WELLS (WMF-481, WMF-482, WMF-483)

PARAMETER	WMF-481		WMF-482		WMF-483	
	AQL	AL	AQL	AL	AQL	AL
Total Alkalinity	NR	NR	NR	NR	Monitor	Monitor
Temperature - field (^{0}F)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Depth to Water (in feet bgs)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field pH (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Field Specific Conductance (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	NR	NR	NR	NR	Monitor	Monitor
Fluoride	NR	NR	NR	NR	Monitor	3.2
Nitrate	NR	NR	NR	NR	Monitor	8.0
Antimony	NR	NR	NR	NR	Monitor	0.0048
Arsenic	NR	NR	NR	NR	Monitor	0.04
Barium	NR	NR	NR	NR	Monitor	1.6
Cadmium	NR	NR	NR	NR	Monitor	0.0048
Chromium	NR	NR	NR	NR	Monitor	0.08
Lead	NR	NR	NR	NR	Monitor	0.04
Mercury	NR	NR	NR	NR	Monitor	0.0016
Selenium	NR	NR	NR	NR	Monitor	0.04
Benzene	NR	NR	NR	NR	Monitor	0.004
Carbon tetrachloride	NR	NR	NR	NR	Monitor	0.004
Dichloromethane	NR	NR	NR	NR	Monitor	0.004
1,2-Dichlorobenzene	NR	NR	NR	NR	Monitor	0.48
1,3-Dichlorobenzene	NR	NR	NR	NR	Monitor	0.060
1,2-Dichloroethane	NR	NR	NR	NR	Monitor	0.004
1,1-Dichloroethene	NR	NR	NR	NR	Monitor	0.0056
trans-1,2-Dichloroethene	NR	NR	NR	NR	Monitor	0.08
1,2-Dichloropropane	NR	NR	NR	NR	Monitor	0.004
Ethylbenzene	NR	NR	NR	NR	Monitor	0.56
Styrene	NR	NR	NR	NR	Monitor	0.08
Tetrachloroethylene	NR	NR	NR	NR	Monitor	0.004
Toluene	NR	NR	NR	NR	Monitor	0.8
1,1,1-Trichloroethane	NR	NR	NR	NR	Monitor	0.16
1,1,2 - Trichloroethane	NR	NR	NR	NR	Monitor	0.004
Trichloroethene	NR	NR	NR	NR	Monitor	0.004
Vinyl Chloride	NR	NR	NR	NR	Monitor	0.0016
Xylenes (Total)	NR	NR	NR	NR	Monitor	8

Monitor = Analysis required but no AQL or AL established in the permit.
NR = Not required = Analysis not required for this parameter.
AQL = Aquifer Quality Limit
AL = Alert Level
All concentrations are in milligrams per liter (mg/L) unless otherwise specified.
Metals will be analyzed as dissolved metals.

5.0 REFERENCES AND PERTINENT INFORMATION

The terms and conditions set forth in this permit have been developed based upon the information contained in the following, which are on file with the Department:

Significant Amendment Application dated November 2018

6.0 NOTIFICATION PROVISIONS

6.1 Annual Registration Fees

The permittee is notified of the obligation to pay an Annual Registration Fee to ADEQ. The Annual Registration Fee is based upon the amount of daily influent or discharge of pollutants in gallons per day as established by A.R.S. § 49-242. If the facility is not constructed or is incapable of discharge, the permittee may be eligible for reduced fees under the rule. Send all correspondence requesting reduced fees to the ADEQ Water Quality Division. Please reference the permit number, LTF number, and the reason for requesting reduced fees under the rule.

6.2 Duty to Comply [A.R.S. §§ 49-221 through 49-263]

The permittee is notified of the obligation to comply with all conditions of this permit and all applicable provisions of Title 49, Chapter 2, Articles 1, 2 and 3 of the Arizona Revised Statutes, Title 18, Chapter 9, Articles 1 through 4, and Title 18, Chapter 11, Article 4 of the Arizona Administrative Code. Any permit non-compliance constitutes a violation and is grounds for an enforcement action pursuant to Title 49, Chapter 2, Article 4 or permit amendment, suspension, or revocation.

6.3 Duty to Provide Information [A.R.S. §§ 49-243(K)(2) and 49-243(K)(8)]

The permittee shall furnish to the Director, or an authorized representative, within a time specified, any information which the Director may request to determine whether cause exists for amending or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

6.4 Compliance with Aquifer Water Quality Standards [A.R.S. §§ 49-243(B)(2) and 49-243(B)(3)]

The permittee shall not cause or contribute to a violation of an aquifer water quality standard at the applicable point of compliance for the facility. Where, at the time of issuance of the permit, an aquifer already exceeds an aquifer water quality standard for a pollutant, the permittee shall not discharge that pollutant so as to further degrade, at the applicable point of compliance for the facility, the water quality of any aquifer for that pollutant.

6.5 Technical and Financial Capability

[A.R.S. §§ 49-243(K)(8) and 49-243(N) and A.A.C. R18-9-A202(B) and R18-9-A203(E) and (F)]

The permittee shall have and maintain the technical and financial capability necessary to fully carry out the terms and conditions of this permit. Any bond, insurance policy, trust fund, or other financial assurance mechanism provided as a demonstration of financial capability in the permit application, pursuant to A.A.C. R18-9-A203(D), shall be in effect prior to any discharge authorized by this permit and shall remain in effect for the duration of the permit.

6.6 Reporting of Bankruptcy or Environmental Enforcement [A.A.C. R18-9-A207(C)]

The permittee shall notify the Director within five days after the occurrence of any one of the following:

1. The filing of bankruptcy by the permittee.
2. The entry of any order or judgment not issued by the Director against the permittee for the enforcement of any environmental protection statute or rule.

6.7 Monitoring and Records [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A206]

The permittee shall conduct any monitoring activity necessary to assure compliance with this permit, with the applicable water quality standards established pursuant to A.R.S. §§ 49-221 and 49-223 and §§ 49-241 through 49-252.

6.8 Inspection and Entry [A.R.S. §§ 41-1009, 49-203(B) and 49-243(K)(8)]
In accordance with A.R.S. §§ 41-1009 and 49-203(B), the permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to enter and inspect the facility as reasonably necessary to ensure compliance with Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes, and Title 18, Chapter 9, Articles 1 through 4 of the Arizona Administrative Code and the terms and conditions of this permit.

6.9 Duty to Modify [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A211]
The permittee shall apply for and receive a written amendment before deviating from any of the designs or operational practices specified by this permit.

6.10 Permit Action: Amendment, Transfer, Suspension & Revocation
[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]
This permit may be amended, transferred, renewed, or revoked for cause, under the rules of the Department.

The permittee shall notify the Groundwater Protection Value Stream in writing within 15 days after any change in the owner or operator of the facility. The notification shall state the permit number, the name of the facility, the date of property transfer, and the name, address, and phone number where the new owner or operator can be reached. The operator shall advise the new owner or operators of the terms of this permit and the need for permit transfer in accordance with the rules.

7.0 ADDITIONAL PERMIT CONDITIONS

7.1 Other Information [A.R.S. § 49-243(K)(8)]
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit the correct facts or information.

7.2 Severability
[A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]
The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby. The filing of a request by the permittee for a permit action does not stay or suspend the effectiveness of any existing permit condition.

7.3 Permit Transfer
This permit may not be transferred to any other person except after notice to and approval of the transfer by the Department. No transfer shall be approved until the applicant complies with all transfer requirements as specified in A.A.C. R18-9-A212(B) and (C).