AQUIFER PROTECTION PERMIT NO. P-511633
PLACE ID 147653, LTF 61397

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701 • (520) 628-6733

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, the Arizona Department of Environmental Quality (ADEQ) hereby authorizes Excelsior Mining Arizona, Inc. (Excelsior) to operate the Gunnison Copper Project located near the Town of Dragoon, Cochise County Arizona, over groundwater of the Willcox Groundwater Basin, in Township 15 South, Range 22 East, portions of Section 36, and all of Township 15 South, Range 23 East, Section 31, of the Gila and Salt River Base Line and Meridian of the Gila and Salt River Base Line and Meridian.

This permit does not authorize discharge of pollutants to any of the facilities covered under this permit until the permittee submits an amendment application as per Compliance Schedule Item (CSI) No. 13 in Section 3.0 to provide a financial assurance mechanism. Upon issuance of an amended permit, the permittee shall 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:	Gunnison Copper Project
Facility Address:	2600 North Johnson Road Dragoon, Arizona 85609
Annual Registration Fee Flow Rate:	7,600,000 gallons per day (gpd)
Permittee:	Excelsior Mining Arizona, Inc.
Permittee Address:	2999 N. 44th St., Suite 300 Phoenix, Arizona 85018
Facility Contact:	Matt Williams
Emergency Phone No.:	520-425-4245
Latitude/Longitude:	32° 05' 12" N /110° 02' 19" W
Legal Description:	Township 15 South, Range 22 East, portions of Section 36, and all of Township 15 South, Range 23 East, Section 31, of the Gila and Salt River Base Line and Meridian of the Gila and Salt River Base Line and Meridian.

1.2 Authorizing Signature

_____

Trevor Baggiore, Director, Water Quality Division
Arizona Department of Environmental Quality
Signed this _____day of _____, 2017

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 proposed project consists of an in-situ copper mine located on approximately 700 acres of land in Cochise County. The project is an in-situ leaching and recovery operation (ISR) using wells to inject and recover mining solutions. This process involves injecting leach solutions (lixiviant) into the orebody using injection wells and extracting copper-bearing solutions (pregnant leach solutions or PLS) through surrounding recovery wells. The lixiviant will be injected into the oxide zone of the bedrock beneath the site for the purposes of dissolving copper minerals from the ore body. The estimated injection zone is between approximately 250 feet below ground surface (ft bgs) to 1,500 ft bgs. The resulting copper-bearing solution will be pumped by recovery wells to the surface where copper will be removed from the solution in a solvent extraction electrowinning (SX/EW) plant. The barren solution from the SX/EW plant will be re-acidified and re-injected back into the oxide zone.

The project will be constructed and operated in three stages. Each stage of development is described in the sections that follow Table 2.1.1 below.

The site includes the following permitted discharging facilities:

Table 2.1-1
Permitted Facilities

Facility	Latitude	Longitude
Stage 1 Mine Blocks[1,2]		
Block 1	32° 04' 56.3"	110° 02' 35.2"
Block 2	32° 04' 54.1"	110° 02' 34.5"
Block 3	32° 04' 59.5"	110° 02' 33.7"
Block 4	32° 05' 00.8"	110° 02' 36.0"
Block 5	32° 04' 51.8"	110° 02' 33.0"
Block 6	32° 04' 51.9"	110° 02' 36.3"
Block 7	32° 04' 51.9"	110° 02' 39.1"
Block 8	32° 04' 55.1"	110° 02' 40.1"
Block 9	32° 04' 57.8"	110° 02' 37.8"
Block 10	32° 05' 00.7"	110° 02' 38.9"
Stage 2 Mine Blocks		
Block 11	TBD	TBD
Block 12	TBD	TBD
Block 13	TBD	TBD
Stage 3 Mine Blocks		
Block 14	TBD	TBD
Block 15	TBD	TBD
Block 16	TBD	TBD
Block 17	TBD	TBD

[1] Approximate center point of each mine block. The approximate location point for each injection/recovery well is presented in detail in Section 4.1, Tables 4.1-10, 4.1-11, and 4.1-12.
[2] Current order of mining is based on mine plan. See Section 2.2.4.1 for potential modification of mine order.

Stage 1 Ponds[3]		
Pipeline Drain Pond	32° 05' 23.0"	110° 02' 38.5"
Evaporation Pond #1	32° 04' 54.5"	110° 02' 07.2"
Stage 2 and 3 Ponds		
Raffinate Pond	32° 05' 09.1"	110° 02' 06.3"
PLS Pond	32° 05' 00.9"	110° 02' 17.8"
Recycled Water Pond	32° 05' 01.8"	110° 02' 08.3"
Solids Impoundment #1	32° 05' 20.3"	110° 02' 03.8"
Solids Impoundment #2	32° 05' 27.3"	110° 01' 54.7"
Plant Runoff Pond	32° 05' 09.6"	110° 01' 59.5"

2.1.1 Permitted Facility Description

2.1.1.1 Stage 1 Mining

Stage 1 will be developed in the southern part of the wellfield on approximately 21 acres in Township 15S, Range 23E, Section 31. The duration of this stage is 10 years and will generate approximately 25 million pounds of copper per year. During this stage, approximately 200 injection/recovery wells are planned to be installed and operated. Recovered solutions (PLS) will be conveyed between the Gunnison wellfield and process solution ponds located at the Johnson Camp Mine (JCM; permitted under the APP Permit No. P-100514) through several pipelines approximately 3 miles in length. Raffinate will be re-acidified at the JCM and pumped back as lixiviant to the project site. Pipeline Drain Pond and Evaporation Pond will be constructed during this stage.

2.1.1.2 Stage 2 Mining

Stage 2 will be developed on approximately 42 acres in Township 15S, Range 23E, Section 31. The duration of this stage is 3 years and will generate approximately 75 million pounds of copper per year. During this stage, approximately 230 injection/recovery wells are planned to be installed and operated. Several ponds, including a PLS pond, raffinate pond, recycled water pond, solids ponds 1 and 2, plant runoff pond, and the SX/EW plant will be constructed at the project site during this stage.

2.1.1.3 Stage 3 Mining

Stage 3 will be developed on approximately 161 acres in Township 15S, Range 23E, Section 31 and Township 15S, Range 22E, Section 36. The duration of this stage is 7 years and will generate approximately 125 million pounds of copper per year. During this stage, approximately 1004 injection/recovery wells are planned to be installed and operated.

2.1.1.4 Post-production Rinsing

A three-step rinsing strategy shall be implemented once mining has been deemed complete. Rinsing shall include using fresh groundwater or recycled water until applicable aquifer water quality standards (AWQS), and/or maximum contaminant levels (MCLs) and/or ambient water quality standards are met in each mine block; however, during early rinsing, recycled water may be used. The three-step rinsing process includes:

- Rinse three (3) pore volumes (based upon a 3% fracture porosity of the ore body)

[3] The Pipeline Drain Pond and the Evaporation Pond #1 is planned for usage during future Stages 2 and 3.

- Once initial (early) rinsing is complete, a resting period of approximately one-year shall be allowed
- Rinse commences a second time with two (2) pore volumes

Monitoring of groundwater from the mining block during the rinsing process shall be conducted to evaluate the effectiveness of the rinsing. Samples shall be collected from 100% of the rinse recovery wells after rinsing in Mine Block 1 of Stage 1. Samples in subsequent Mine Blocks shall be collected from 10% of the wells (Rinse Verification Wells (RVW)) within each actively rinsed mine block to evaluate effectiveness of the rinsing. Analytes to be analyzed are included in Section 4.1, Table 4.1-7.

Hydraulic control shall be maintained and monitoring at the observation wells (OW) until closure goals are achieved. Groundwater monitoring within the POC wells and Intermediate Monitoring Wells (IMW) shall continue until closure goals are achieved.

Prior to determining which Injection/Recovery wells shall become a Rinse Verification Well (RVW) and which other wells shall be plugged and abandonment in a rinsed and completed mine block, a Rinse Verification Report shall be submitted per Section 2.7.4.7, CSI No. 19 in Section 3.0, and Section 4.1, Table 4.1-7.

2.1.1.5 Pipeline Drain Pond

The Pipeline Drain Pond will be located north of the Gunnison plant site, on the north side of the Interstate 10 highway (I-10), and immediately north of Walnut Wash. I-10 is about 80 feet higher than Walnut Wash, with the wash being the low point on the pipeline route. A pipeline bridge shall be constructed in order for the pipelines to pass safely above the wash during the design storm. Consequently, the Pipeline Drain Pond will be the low point in the system between I-10 and the JCM SX/EW plant, allowing each pipe to be completely emptied into the pond. The Pipeline Drain Pond will be normally empty to maintain maximum available storage volume to receive pipeline contents when needed. A portable diesel-powered pump will be brought to the pond to empty the contents within 30 days after use. Solutions could be injected directly back into the pipeline after maintenance or repair is completed, or solutions could be transferred into a mobile tanker truck for transport to the appropriate operations pond at the plant site.

2.1.1.6 Evaporation Pond #1

Evaporation Pond #1 shall be constructed prior to commencement of Stage 1 production. Prior to mining operations, this pond may be used for the storage of groundwater. This facility is located southeast of and down-gradient from the plant and PLS Pond, and south of the Recycled Water Pond and future water treatment facilities. It is the primary storage component and location for the evaporation of excess water from the process.

Evaporation Pond #1 may receive solutions from the Recycled Water Pond, direct precipitation, neutralizing agents, and brine water from the reverse osmosis equipment within the water treatment plant. Prior to the construction of the Recycled Water Pond, solutions that it would normally contain will be delivered to Evaporation Pond #1 by direct pipeline. Since Evaporation Pond #1 will be the terminal element for solutions from other upstream process ponds, process reagents may be present.

Evaporation Pond #1 shall evaporate excess water from solutions circulated through the JCM plant and Stage 1 wellfield and will also receive solutions from the Recycled Water Tank. The facility will therefore be managed as a Process Solution Pond. During Stages 2 and 3, it will primarily receive solution from the Recycled Water Pond. Evaporation will be enhanced by use of mechanical evaporators. The solutions pumped to Evaporation

Pond #1 may be high in total dissolved solids (TDS) and mildly to moderately acidic; the evaporation process will generate precipitates that will collect in the pond.

2.1.1.7 PLS Pond

The PLS Pond shall be constructed prior to commencement of Stage 2 production. This facility will be located south of the Plant and adjacent to the northeast edge of the ore resource and wellfield. It is the primary storage component for PLS solution withdrawn from the ore resource through various recovery wells. It will be designed to hold a minimum 12-hour supply of PLS circulated through the Gunnison SX/EW plant during Stage 2 production, and hold a minimum 8-hour supply of raffinate circulated through the Gunnison SX/EW plant during Stage 3 production. The PLS Pond will normally receive PLS solution from the wellfield, a very small bleed stream of electrolyte, and direct precipitation.

2.1.1.8 Recycled Water Pond

The Recycled Water Pond shall be constructed prior to commencement of Stage 2 production. This facility will be located southeast of and down-gradient from the Plant. It is the primary storage component for solutions in transition, and often the solution in the pond would consist of dilute PLS. It will be designed to hold a minimum 8-hour supply of the maximum flow of solutions through the pond. The maximum flowrate through the pond occurs during Stage 2 operations.

The Recycled Water Pond may receive wellfield conditioning water, raffinate, rinse water, hydraulic control water, direct precipitation, and transferred stormwater accumulated within the Plant Runoff Pond. Wellfield conditioning water is groundwater from newly commissioned areas of the wellfield extracted during the span of time necessary for injected raffinate to migrate to the recovery wells. Its composition will range from clean groundwater to weak PLS solution. Rinse water is groundwater extracted from decommissioned areas of the wellfield. As recoverable copper diminishes below economically viable concentrations, wells in that area of the wellfield will be injected with clean water in order to rinse the aquifer. As the rinse cycle begins, the initial "first flush" may be PLS and may be directed to the PLS Pond. Subsequent flush volumes will be diluted PLS solutions and will be directed to the Recycled Water Pond. Hydraulic control water is clean groundwater from wells on the perimeter of the wellfield. The Recycled Water Pond will also receive transferred stormwater accumulated within the Plant Runoff Pond. Since the Plant Runoff Pond is potentially a contact water pond, trace amounts of process reagents may be present.

2.1.1.9 Raffinate Pond

The Raffinate Pond shall be constructed prior to commencement of Stage 2 production. This facility will be located east of and down-gradient from the mining blocks. It is the primary storage component for raffinate solution that will be introduced into the ore resource through various injection wells. It will be designed to hold a minimum 12-hour supply of raffinate circulated through the Gunnison SX/EW plant during Stage 2 production, and hold a minimum 8-hour supply of raffinate circulated through the Gunnison SX/EW plant during Stage 3 production, which will be a more restrictive phase of the project. The Raffinate Pond may also receive sump pump discharge from the acid unloading/storage area, and the tank farm area.

2.1.1.10 Solids Impoundment #1 & #2

The Solids Impoundments shall be constructed prior to commencement of Stage 2 production. These facilities will be located northeast of and down-gradient from the Plant, and are the primary storage component for densified precipitates formed within the Water Treatment Plant using the high density solids (HDS) process and unit operations

including lime addition, clarification/thickening, and reverse osmosis reclamation of water for return to the mining process. It is expected that a supernatant pond will form above the densified solids within these impoundments. Decant water from these supernatant ponds will be pumped to the Water Treatment Plant for return to the mining process. Since these impoundments are the terminal elements for solutions from other upstream process ponds, process reagents may be present.

The impoundments shall be constructed with two cells each to provide operational flexibility in the management of solutions and to provide the ability to allow one cell to rest, thereby promoting a greater settled density of solids within the cell.

2.1.1.11 Plant Runoff Pond

The Plant Runoff Pond, a non-stormwater pond, shall be constructed prior to commencement of Stage 2 production. It is located southeast of and down-gradient from the Plant. This facility will receive direct precipitation and stormwater run-off from the processing plant area. It will normally be empty to maintain maximum available storage volume for stormwater runoff. The Plant Runoff Pond will contain the volume generated by a 100-year, 24-hour storm event. A centrifugal pump will be installed on the perimeter that will pump stormwater to the Recycled Water Pond.

2.1.2 Annual Registration Fee [A.R.S. § 49-242 and A.A.C. R18-14-104]

The annual registration fee for this permit is payable to ADEQ each year. The permitted flow for fee calculation during Stage 1 is 7,600,000 gallons per day (gpd). If the facility is not yet constructed or is incapable of discharge at this time, the permittee may be eligible for reduced fees under the rule. Send all correspondence requesting reduced fees to the Water Quality Division of ADEQ. Please reference the permit number, LTF number and why reduced fees are requested under the rule.

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

The permittee shall demonstrate financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203 as discussed below. The permittee shall maintain financial capability throughout the life of the facility. The estimated closure and post-closure cost for Stage 1 for the purposes of financial assurance is $9,524,000. The financial assurance mechanism shall be demonstrated for both the UIC and APP permits, prior to commencement of injection and recovery operations for Stage 1 is required as described in CSI No. 13 in Section 3.0. Additional financial assurance mechanism requirements for Stages 2 and 3 are required as described in CSI Nos. 16 and 17 in Section 3.0.

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

Facilities regulated by this permit shall be designed, constructed, operated, and maintained to meet requirements specified by A.R.S. §49-243(B) and A.A.C. R18-9-A202(A)(5).

2.2.1 Engineering Design

BADCT description for the permitted facilities is presented in Section 4.1, Table 4.1-9.

2.2.2 Site-specific Characteristics

The following site-specific characteristics are applicable:

- The alluvium above the ore body is primarily unsaturated or if the alluvium is saturated, it is limited in extent and thickness
- The fault network and bedding plane fractures result in hydraulic connections over long distances
- Natural groundwater gradients are steep on the west side of the wellfield and less steep across the wellfield with overall gradients from west to east
- Large attenuation capacity of limestone within and downgradient of the zone of injection.

2.2.3 Pre-operational Requirements

a) All boreholes or wells, other than those approved for the in-situ project (including the IMWs), located within the active mine block shall be plugged and abandoned as per the Arizona Department of Water Resources (ADWR) rules and EPA Underground Injection Control (UIC) regulations prior to injection of solutions in a given mine block. All boreholes or wells within a 150-foot radius of any permitted ponds listed in the table above shall also be plugged and abandoned per the Arizona Department of Water Resources (ADWR) rules. Documentation and records for the plugging and abandonment of any boreholes and/or wells that are to be plugged and abandoned prior to the initiation of mining within Mine Block 1, any subsequent plugging and abandonment prior to additional Mine Block mining and prior to installation of any pond constructed at the site shall be submitted in accordance with Sections 2.7.4.4 and 2.7.4.6 and CSI Nos. 1and 4, in Section 3.0.

b) Stage 1 IMWs, point of compliance (POC) wells, hydraulic control (HC) and associated OWs shall be installed per the approved design submitted in the application and schedule prior to initiation of mining within Mine Block 1 and initiation of mining in other subsequent mine blocks. Documentation of the well installations shall be submitted in accordance with Sections 2.7.4.3 and 2.7.4.6 and CSI Nos. 1 and 3, in Section 3.0.

c) All Class III injection wells shall be drilled, cased and cemented according to the requirements of the UIC permit. Prior to commencement of operation, all new Class III injection wells shall meet the mechanical integrity testing (MIT) requirements of the UIC permit.

d) The permittee shall complete aquifer tests in at least four injection/recovery wells from Mine Block 1 in order to obtain subsurface characteristics prior to installation of the rest of the Injection/Recovery Wells in Mine Block 1. The information obtained from the aquifer tests shall be submitted in a report in accordance with Section 2.7.4.6 and the CSI No. 1, in Section 3.0.

e) Specific conductance shall be measured and ambient specific conductance determined for the IMWs, hydraulic control wells (HCW) and outer OWs in accordance with Sections 2.3.3, 2.5.3.2.1, 2.5.3.3.1, 2.5.3.4.1, and 2.7.4.5, and CSI Nos. 8, 9, and 18 in Section 3.0.

f) A Report shall be submitted that proposes alert levels (ALs) for specific conductance for the outer IMWs and outer OWs in accordance with Section 2.7.4.5 and 2.7.4.6 and CSI Nos. 8, 9, and 18 in Section 3.0.

g) The permittee shall establish hydraulic control by confirming that groundwater elevations at the OWs indicate an inward hydraulic gradient generated by the HCWs prior to operation of Mine Block 1 and shall be maintained during the life of the project. A report of inward hydraulic gradient demonstration shall be submitted in accordance with Section 2.7.4.6 and CSI No. 1, in Section 3.0 prior to injection.

h) The permittee shall begin the following two weeks prior to startup of Mine Block 1 operation :
   i. Demonstration of hydraulic control including groundwater contour maps that will document hydraulic containment of the active wellfield using groundwater elevations from IMWs and OWs.
   ii. An additional demonstration, if appropriate, of hydraulic control shall include groundwater chemistry, primarily specific conductance, shall be evaluated.

   The evaluation of hydraulic control shall be submitted in accordance with Section 2.7.4.6 and CSI No. 1, in Section 3.0.

i) The permittee shall establish ambient wellfield groundwater concentrations using an ADEQ approved statistical method (Section 2.5.3.2 and CSI No. 7 in Section 3.0) to determine pre-mining concentrations (i.e., Rinse Verification (RV) concentrations) within a given mining block.

2.2.4 Operational Requirements

A description of required inspections and operational monitoring for BADCT is included in Section 4.0, Tables 4.1-2, 4.1-3, and 4.1-8.

The injection wells at the site are classified as Class III Injection wells by the USEPA and are also permitted by EPA's UIC Program. The injection and recovery wells shall be designed to meet the mechanical integrity requirements in the UIC regulations, Code of Federal Regulations (CFR) part 144 and 146.

The mining operation relies on hydraulic control of the ISR solutions to demonstrate BADCT utilizing both Injection/Recovery wells within the mine block and HCWs located at the edge of the wellfield. Hydraulic control shall be confirmed through the use of IMWs and OWs. An inward hydraulic gradient shall be measured by changes in water level elevations in OWs due to pumping from the HCWs. Specific conductance shall monitored at the outer OWs and IMWs to provide additional evidence of hydraulic control. The rates of injection, recovery and hydraulic control shall be monitored and controlled so that the total volume of solution and water recovered is greater than the volume of solution injected, and shall be collected daily and re-balanced on a 48-hour basis so a 1% net extraction rate is maintained. After two months of operation, the permittee shall submit a report evaluating whether moving to a 30-day rolling average of injection versus extraction and pumping is as protective as a 48-hour flow re-balancing. Automated controls, shut off valves and alarms shall be used in the wellfield to ensure process upsets do not result in the loss of hydraulic control. Hydraulic control of the injected solutions shall be maintained from the time injection begins and until mining and rinsing is completed and approved by the appropriate agencies and groundwater in the mine blocks meet APP closure criteria.

The injection pressure in the Class III injection wells shall be kept below the fracture pressure of the oxide ore body. A fracture gradient (maximum injection pressure) of 0.75 pounds per square inch per foot (psi/ft) of depth is established in order to prevent hydraulic fracturing of the bedrock (see Section 4.0, Table 4.1-8).

2.2.4.1 Mine Block Order

The permittee's Stage 1 plan of operation is to mine Blocks 1 through 10 sequentially. The approved IMWs and future abandonment is based upon the current plan of operations. The sequence of hydraulic control well and observation well installation is also based upon the current plan of operations. The permittee may change the plan of operation to mine the mine blocks in a different sequence which may require abandonment of IMWs. The permittee shall notify the Groundwater Section of any future plan of operation change and propose replacement of intermediate monitoring well(s) or change of hydraulic control operational sequence (see CSI No. 18 in Section 3.0).

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 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, uncontrollable leakage, berm breaches, accidental spills, or other unauthorized discharges.

2.3.1. Injection and Recovery Mine Block(s) and Hydraulic Control Wells

Hydraulic control over the injected solutions shall be maintained during the operating life of the facility. In-situ solutions shall be injected and contained within the oxide unit. During the first year of operation, hydraulic control shall be achieved using a net withdrawal of fluids by maintaining an initial one percent net of hydraulic control pumping through operation of HCWs and inward hydraulic gradient as measured at the hydraulic control OWs. Hydraulic control shall be demonstrated through measurement of inward hydraulic gradients at hydraulic control OWs.

2.3.2 Pipeline Drain Pond

The Pipeline Drain Pond shall be designed and located to receive the contents of any of the process solution pipelines north of I-10. Accordingly, the pond could receive raffinate, pregnant leach solution, recycled water, fresh water, or hydraulic control water. Solutions in the recycled

water pipeline may be either wellfield conditioning water, raffinate, or rinse water. Wellfield conditioning water is groundwater from newly commissioned areas of the wellfield extracted during the span of time necessary for injected raffinate to migrate to the recovery wells. As such, its composition ranges from clean groundwater to weak PLS solution. Rinse water is groundwater extracted from decommissioned areas of the wellfield and may include clean or recycled water. As recoverable copper diminishes below economically viable concentrations, wells in that area of the wellfield shall be injected with clean water in order to rinse the aquifer. As the rinse cycle begins, the initial "first flush" will be PLS or recycled water. Subsequent flush volumes will be diluted PLS solutions. Hydraulic control water is clean groundwater or raffinate from wells on the perimeter of the wellfield.

2.3.3 Evaporation Pond #1

Evaporation Pond #1 shall normally receive solutions from the Recycled Water Pond, tank, pipeline, direct precipitation, neutralizing agents, and brine water from the reverse osmosis equipment within the water treatment plant. Prior to the construction of the Recycled Water Pond, solutions that it would normally contain will be delivered to Evaporation Pond #1 by direct pipeline. Since Evaporation Pond #1 is the terminal element for solutions from other upstream process ponds, process reagents may be present.

During Stage 2 and 3, in addition to the requirements in the above Sections 2.3.1, 2.3.2, and 2.3.3, discharge limitations for the following facilities shall be required.

2.3.4 Raffinate Pond

The Raffinate Pond shall normally receive only raffinate solution from SX/EW facilities, sulfuric acid from tank storage, fresh water make-up, wellfield conditioning water and rinse water (from the Recycled Water Pond), and direct precipitation. Raffinate will, as a normal course of operations, include some entrained organic phase (diluent and extractant). The organic phase shall routinely be skimmed from the surface and returned to the process. The Raffinate Pond may also receive sump pump discharge from the acid unloading/storage area, and the tank farm area. The Tank Farm Floor Sump will receive discharge from the Electrowinning Area Sump as well as any leaks or spills from tanks within the tank farm area. Thus trace amounts of guar gum and cobalt sulfate (EW reagents) may be present.

2.3.5 PLS Pond

The PLS Pond shall normally receive PLS solution from the wellfield, a very small bleed stream of electrolyte, and direct precipitation.

2.3.6 Recycled Water Pond

The Recycled Water Pond shall normally receive wellfield conditioning water, raffinate, rinse water, hydraulic control water, direct precipitation, and transferred stormwater accumulated within the Plant Runoff Pond. Wellfield conditioning water is groundwater from newly commissioned areas of the wellfield extracted during the span of time necessary for injected raffinate to migrate to the recovery wells. Its composition shall range from clean groundwater to weak PLS solution. Rinse water is groundwater extracted from decommissioned areas of the wellfield and may range from clean water to raffinate. As recoverable copper diminishes below economically viable concentrations, wells in that area of the wellfield will be injected with clean water or recycled water in order to rinse the aquifer. As the rinse cycle begins, the initial "first flush" will be PLS and will be directed to the PLS Pond. Subsequent flush volumes will be diluted PLS solutions and will be directed to the Recycled Water Pond. Hydraulic control water will range from clean groundwater from wells on the perimeter of the wellfield to PLS. The Recycled Water Pond will also receive transferred stormwater accumulated within the Plant Runoff Pond. Since the Plant Runoff Pond is potentially a contact water pond, trace amounts of process reagents may be present.

2.3.7 Solids Impoundment

The Solids Impoundments shall normally receive densified precipitates from the Water Treatment Plant, and direct precipitation. Since the Solids Impoundments are the terminal elements for solutions from other upstream process ponds, trace amounts of process reagents may be present.

2.3.8 Plant Runoff Pond

The Plant Runoff Pond shall be designed and located to receive all stormwater from the processing plant areas. It is considered a non-storm water pond under APP regulations, as the runoff may come into contact with materials in process areas.

2.4 Point(s) of Compliance [A.R.S. § 49-244]

The Point of Compliance (POC) well locations are established by the following monitoring location(s):

Table 2.4-1
Groundwater Monitoring Points of Compliance

POC ID	Latitude	Longitude	Purpose
Stage 1			
POC-1 (Wellfield)	32° 04' 46.4"	110° 02' 25.5"	South PMA boundary
POC-2 (Wellfield)	32° 04' 48.6"	110° 02' 03.5"	Southeast portion of the PMA, at the edge of the maximum capture zone at the end of mine life
POC-3 (Wellfield)	32° 05' 00.9"	110° 02' 05.4"	East portion of the PMA, at the edge of the maximum capture zone at the end of mine life
POC-6 (Conceptual)	32° 04' 56.2"	110° 02' 03.04"	East of Evaporation Pond #1
Stages 2 & 3			
POC-4 (Wellfield)	32° 05' 18.3"	110° 02' 19.9"	Northeast portion of the PMA, at the edge of the maximum capture zone at the end of mine life
POC-5 (Wellfield)	32° 05' 25.3"	110° 02' 38.9"	Northern portion of the PMA, at the edge of the maximum capture zone at the end of mine life
POC-7 (Conceptual)	32° 05' 02.3"	110° 02' 06.1"	East of Clean Water and Recycle Water Ponds
POC-8 (Conceptual)	32° 05' 10.1"	110° 01' 57.7"	East of Raffinate and Plant Runoff Ponds
POC-9 (Conceptual)	32° 05' 19.6"	110° 01' 56.3"	East of Solids Impoundment #1
POC-10 (Conceptual)	32° 05' 29.6"	110° 01' 51.5"	Northeast of Solids Impoundment #2

Groundwater monitoring is required for POC Wells POC-1 through POC-3 for Stage 1. Groundwater monitoring is required for POC Wells POC-1 through POC-5 for Stages 2 and 3 and Post-production Rinsing. Monitoring requirements for each POC are listed in Section 4.1, Tables 4.1-5A and 4.1-5B.

Groundwater monitoring is not required for the Conceptual POC locations.

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(B) and (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. Monitoring shall commence the first full monitoring period following permit issuance. 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. 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

During Stage 1, since discharge monitoring will be covered under the individual APP for the Johnson Camp Mine (Permit No. 100514; LTF 64109), discharge monitoring is not required for this permit. Discharge monitoring requirements for Stage 2 and 3 will be determined based on the results of the Stage 1 mining process.

During Stage 2, discharge monitoring shall be conducted on a one time basis within 120 days of start-up at the Raffinate Pond, PLS Pond, Recycled Water Pond, Evaporation Pond #1, Solids Impoundments #1 and #2, Plant Runoff Pond, and Pipeline Drain Pond in accordance with Section 4.1, Table 4.1-1A.

Result of initial discharge monitoring shall be submitted in the next Quarterly Operations and Monitoring Report in accordance with Section 2.7.4.2 and CSI No. 12 Discharge Monitoring Sampling Parameters are listed in Section 4.1, Table 4.1-1B.

2.5.2 Facility / Operational Monitoring

At a minimum, permitted facilities shall be inspected for performance levels listed in Section 4.1, Tables 4.1-2, and 4.1-8. If damage is identified during an inspection that could cause or contribute to an unauthorized discharge pursuant to A.R.S. § 49-201(12), proper repairs shall be promptly performed. Results of these inspections and monitoring activities shall be documented and maintained at the facility location for at least 10 years, and as required by Section 2.7.2 of this permit.

2.5.3 Groundwater Monitoring and Sampling Protocols

Compliance groundwater monitoring is required under the terms of this permit. For all sampling methods, 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, and conductance) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80 percent 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).

As an alternative method for sampling, the permittee may conduct the sampling using the low-flow purging method as described in the Arizona Water Resources Research Center, March 1995 *Field Manual for Water Quality Sampling*. The well must be purged until indicator parameters stabilize. Indicator parameters shall include dissolved oxygen, turbidity, pH, temperature, and conductance.

As a third alternative method for sampling within POC wells with very low recharge rates, the permittee may conduct the sampling using no-purge sampling techniques using HydraSleeve™ or similar type methodology. The use of HydraSleeve™ or similar type samplers shall follow accepted EPA, USGS, and DOD protocols.

2.5.3.1 POC Wells

2.5.3.1.1POC Well Installation

Prior to Stage 1, groundwater monitor wells must be installed at POC locations POC-1, POC-2, and POC-3 prior to operations in accordance with the Section 2.2.3, Section 2.4, Table 2.4-1, and CSI No. 1 in Section 3.0.

Prior to Stage 2, groundwater monitor wells must be installed at POC locations POC-4 and POC-5 in accordance with the Section 2.2.3, Section 2.4, Table 2.4-1, and CSI No. 3 in Section 3.0.

2.5.3.1.2 Ambient Groundwater Monitoring for POCs

A minimum of eight (8) and a maximum of twelve (12) rounds of groundwater sampling are required to establish ambient groundwater quality at the POC wells listed in Section 2.4. Groundwater samples shall be obtained no more frequently than weekly and no less frequently than quarterly. Each ambient sample shall be analyzed for the parameters listed in Section 4.1, Table 4.1-5B. Alert levels and aquifer quality limits shall be established as required in Sections 2.5.3.1.2.1 and 2.5.3.1.3.

2.5.3.1.2.1 Alert Levels for POC Wells

ALs shall be calculated for all contaminants with an established numeric AWQS for each of the five POC wells listed in Section 4.1, Table 4.1-5B. For any new or replacement POC wells, ALs shall be calculated for all contaminants with an established numeric AWQS, as described below.

Within 90 days of the receipt of the laboratory analyses for the final month of the ambient groundwater monitoring period for each POC well referenced in Section 4.1, 4.1-5B the permittee shall submit the ambient groundwater data in tabulated form to the Groundwater Section for review. Copies of all laboratory analytical reports, field notes, and the Quality Assurance/Quality Control (QA/QC) procedures used in collection and analyses of the samples for all parameters listed in Section 4.1, Table 4.1-5B to be established for each POC well, shall be submitted to the Groundwater Section. The permittee shall submit a report with the calculations for each AL and AQL included in the permit for review and approval by ADEQ, or the permittee may defer calculation of the ALs and AQLs by the Groundwater Section. The ALs shall be established and calculated by the following formula, or another valid statistical method submitted to Groundwater Section in writing and approved for this permit by the Groundwater Section:

$$AL = M + KS$$

Where M = mean, S = sample 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) using a K value of 3.188 for eight samples from Table 1 of the Lieberman 1958 report. 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 a minimum of eight sample events.
2. Any data where the laboratory Practical Quantitation Limit (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.

2.5.3.1.3 Aquifer Quality Limits for POC Wells

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.
3. However, if the calculated AL is greater than the AWQS, but no analytical result had a detection greater than the AWQS, the AQL shall be set at the AWQS.

2.5.3.1.4 Compliance Groundwater Quality Monitoring for POC Wells

Compliance groundwater monitoring in each POC well shall commence within the first calendar quarter after completion of the ambient groundwater sampling period. For quarterly compliance monitoring, the permittee shall analyze groundwater samples for the parameters listed in Section 4.1, Table 4.1-5A. In addition to quarterly compliance groundwater monitoring, every year (annual) the permittee shall analyze samples from the POC wells for an expanded list of parameters listed in Section 4.1, Table 4.1-5B. Annual sampling will be conducted in the fourth quarter of each year.

2.5.3.1.5 Quarterly Compliance Groundwater Monitoring for POCs

The permittee shall perform quarterly compliance groundwater monitoring of the POC wells as specified in Section 4.1, Table 4.1-5A.

The permittee shall submit reports of the quarterly compliance monitoring in accordance with the reporting schedule at Section 2.7.6.

2.5.3.1.6 Annual Compliance Monitoring for POCs

The permittee shall perform annual compliance monitoring of the POC wells as specified in Section 4.1, 4.1-5B. The results of the monitoring shall be compared to the AQLs and ALs.

The permittee shall submit reports of the annual compliance monitoring in accordance with the reporting schedule at Section 2.7.6.

2.5.3.1.5 Point of Compliance Well Replacement

In the event that one or more of the designated POC wells should become unusable or inaccessible due to damage, 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 Sections 2.5.3.1.2, 2.5.3.1.2.1, and 2.5.3.1.3 of this permit.

2.5.3.2 Intermediate Monitoring Wells (BADCT Monitoring/Non-POC)

The IMWs are existing or proposed new wells that shall be used to monitor groundwater between the mine blocks and the HCWs. The IMW system shall include an inner and outer ring of wells that shall be monitored for specific conductance and groundwater

elevations daily. The IMWs listed in Table 2.5-1 that are identified proposed for monitoring in Stage 1, shall be installed and ALs set prior to start of mining operations.

The inner ring shall be used by the permittee to observe effects of changing operational conditions in the mine block. Some mining solutions are expected to be observed in the inner ring due to sweep of mining solutions at the margins of the mine block.

The outer ring shall be used as an early warning system to ensure all appropriate HCWs are installed to prevent escape of mining solutions. ALs shall be set for specific conductance in this ring.

A subset of RVWs (see Section 2.9.1) shall be selected as post-rinse IMWs representing a distribution of approximately one IMW per mining block. These IMWs shall be monitored for water elevation and specific conductance. A post-rinse ambient specific conductance level for the IMWs shall be set as an AL that is indicative of compliance with AWQSs and MCLs, based on RV data.

The proposed IMWs are as follows:

Table 2.5-1
Proposed Intermediate Monitoring Wells

Proposed Intermediate Monitoring Well ID	Stage(s) of Operation	Latitude	Longitude
NSH-005	1	32° 04' 59.6"	110° 02' 32.1"
NSH-019	1	32° 04' 53.7"	110° 02' 36.4"
NSH-024	1	32° 04' 54.8"	110° 02' 34.2"
NSM-001*	1	32° 05' 1.08"	110° 02' 37.6"
NSM-006	1	32° 04' 59.6"	110° 02' 39.1"
NSD-001	1	32° 04' 54.7"	110° 02' 40.5"
NSD-011	1	32° 04' 58.5"	110° 02' 34.4"
NSD-023*	1	32° 05' 1.01"	110° 02' 40.5"
NSH-003*	1 & 2	32° 05' 02.6"	110° 02' 35.9"
NSH-013*	1 & 2	32° 05' 02.6"	110° 02' 37.6"
NSH-017*	1 & 2	32° 04' 50.9"	110° 02' 41.1"
NSM-007*	1 & 2	32° 05' 04.1"	110° 02' 38.4"
CS-05	1 & 2	32° 04' 56.2"	110° 02' 31.1"
CS-06*	1 & 2	32° 05' 01.2"	110° 02' 31.5"
CS-10*	1 & 2	32° 05' 05.7"	110° 02' 37.5"
CS-11*	1 & 2	32° 05' 0.93"	110° 02' 43.4"
NSD-024	1 & 2	32° 04' 59.7"	110° 02' 28.9"
NSH-016*	1 to 3	32° 04' 51.1"	110° 02' 44.5"
NSH-026*	1 to 3	32° 04' 48.3"	110° 02' 24.9"
NSM-005A*	1 to 3	32° 04' 50.4"	110° 02' 29.2"
CS-21*	1 to 3	32° 05' 05.7"	110° 02' 32.1"
IMW-001*	1 to 3	32° 04' 48.9"	110° 02' 37.1"
IMW-002*	1 to 3	32° 05' 1.08"	110° 02' 25.1"
J-05*	1 to 3	32° 04' 56.3"	110° 02' 44.7"
NSD-009*	1 to 3	32° 04' 49.8"	110° 02' 21.8"
NSD-025*	1 to 3	32° 04' 49.9"	110° 02' 30.1"
NSD-043*	1 to 3	32° 04' 56.7"	110° 02' 23.6"
NSH-007*	2 & 3	32° 05' 08.1"	110° 02' 52.7"

NSM-013*	2 & 3	32° 05' 3.09"	110° 02' 52.3"
CS-09*	2 & 3	32° 05' 10.6"	110° 02' 31.8"
CS-13*	2 & 3	32° 05' 10.6"	110° 02' 43.3"
J-08	2 & 3	32° 05' 07.5"	110° 02' 35.5"
J-09	2 & 3	32° 05' 05.6"	110° 02' 39.8"
"*" – Indicates Proposed Outer IMWs			

2.5.3.2.1 Ambient Specific Conductance Groundwater Monitoring for Outer IMWs

A minimum of eight (8) rounds of daily monitoring for specific conductance is required to establish ambient specific conductance groundwater quality at the IMWs listed in Table 2.5-1. Alert levels for the outer IMWs shall be established as required in Sections2.5.3.2.1, and 2.5.3.2.1.1.

2.5.3.2.1.1 Specific Conductance Alert Levels for IMWs

ALs shall be calculated for specific conductance for each of the outer IMWs, as described below. For any new or replacement outer IMWs, ALs shall be calculated for specific conductance, as described below.

Within 30 days of completion of collecting specific conductance using specific conductance probes/groundwater samples for the final round of ambient monitoring, the permittee shall submit the ambient data in tabulated form to the Groundwater Section for review. Copies of all laboratory analytical reports (if appropriate), field notes, and the Quality Assurance/Quality Control (QA/QC) procedures (if appropriate) used in collection and analyses of the measurements of specific conductance established for each outer IMW, shall be submitted to the Groundwater Section. The permittee shall submit a report with the calculations for specific conductance AL for review and approval by ADEQ, or the permittee may defer calculation of the ALs by the Groundwater Section. The ALs shall be established and calculated by the following formula, or another valid statistical method submitted to Groundwater Section in writing and approved for this permit by the Groundwater Section:

$$AL = M + KS$$

Where M = mean, S = sample 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) using a K value of 3.188 for eight samples from Table 1 of the Lieberman 1958 report. 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 for specific conductance shall be calculated using the analyses from a minimum of eight sample events.

2.5.3.2.2 Compliance Monitoring for Intermediate Monitoring Wells

Compliance monitoring in the other ring of IMWs shall commence after completion of the ambient groundwater sampling period. For daily compliance monitoring, the permittee shall collect and analyze groundwater samples for specific conductance in accordance with Section 4.1, Table 4.1-6.

2.5.3.2.3 Rinse Verification Wells (Closure Criteria Monitoring/Non-POC)

Once a mine block has been rinsed and closed per Section 2.9.1, a subset of the RVWs (approximately one IMW per mine block) shall be used to monitor groundwater in a

closed mine block. The RVW system shall be monitored for specific conductance and groundwater elevations daily.

Alert levels (ALs) shall be set for specific conductance in the RVW subset of wells chosen as IMWs using method listed in Section 2.5.3.1.2.1.

2.5.3.3 Observation Wells (BADCT Monitoring/Non-POC)

The OWs shall be used to monitor groundwater between the HCWs and the POC wells. The OW system shall include inner and outer OWs that form a pair related to HCWs. In order to demonstrate that an inward groundwater hydraulic gradient exists at the HCWs, the permittee shall measure the water levels elevation in each OW on a daily basis. The water elevation in the outer OW must be greater than the water elevation in the inner OW such that the hydraulic gradient between the two wells is towards the wellfield at an amount of at least 0.01 feet/feet (ft/ft) (inward 1% gradient). In addition, the outer OW shall be monitored for specific conductance daily. The OWs with their associated HCWs for specific mine blocks shall be installed and monitored prior to start of mining the specific block.

ALs shall be set for specific conductance for the outer OW(s).

The OWs are as follows:

Table 2.5-2
Observation Wells

Observation Well ID*	Stage(s) of Operation	Latitude	Longitude	Activated with Hydraulic Control (HC) Well
OW-15-I	1 to 3	32° 05' 01.8"	110° 02' 23.5"	HC-15
OW-15-O	1 to 3	32° 05' 01.9"	110° 02' 21.3"	
OW-04-I	1 to 3	32° 04' 47.2"	110° 02' 30.9"	HC-04
OW-04-O	1 to 3	32° 04' 46.3"	110° 02' 29.9"	
OW-22-I	1 to 3	32° 05' 09.7"	110° 02' 33.9"	HC-22
OW-22-O	1 to 3	32° 05' 10.7"	110° 02' 32.2"	
OW-19-I	1 to 3	32° 05' 06.5"	110° 02' 28.1"	HC-19
OW-19-O	1 to 3	32° 05' 07.9"	110° 02' 26.5"	
OW-01-I	1 to 3	32° 04' 47.3"	110° 02' 41.06"	HC-01
OW-01-O	1 to 3	32° 04' 46.5"	110° 02' 41.3"	
OW-10-I	1 to 3	32° 04' 52.7"	110° 02' 18.8"	HC-10
OW-10-O	1 to 3	32° 04' 52.8"	110° 02' 16.7"	
OW-13-I	1 to 3	32° 04' 58.6"	110° 02' 19.9"	HC-13
OW-13-O	1 to 3	32° 04' 58.3"	110° 02' 17.8"	
OW-07-I	3	32° 04' 47.7"	110° 02' 21.2"	HC-07
OW-07-O	3	32° 04' 46.3"	110° 02' 20.4"	
OW-25-I	3	32° 05' 18.6"	110° 02' 37.4"	HC-25
OW-25-O	3	32° 05' 19.5"	110° 02' 35.6"	
OW-28-I	3	32° 05' 21.6"	110° 02' 44.07"	HC-28
OW-28-O	3	32° 05' 23.4"	110° 02' 43.00"	
OW-30-I	3	32° 05' 02.5"	110° 02' 44.4"	HC-30
OW-30-O	3	32° 05' 00.8"	110° 02' 44.7"	

* - "I" = inner OWs and "O" = outer OWs

2.5.3.3.1 Ambient Groundwater Monitoring for OWs

A minimum of eight (8) rounds of specific conductance groundwater sampling is required to establish ambient specific conductance groundwater quality at the outer OWs listed in Table 2.5-2. Alert levels (ALs) shall be set for specific conductance in the outer OWs using the method listed in Sections 2.5.3.2.1, and 2.5.3.1.2.1.

2.5.3.3.2 Compliance Monitoring for OWs

Compliance monitoring in the OW(s) shall begin after completion of the ambient groundwater sampling period. For daily compliance monitoring, the permittee shall measure and analyze groundwater samples for specific conductance in accordance with Section 4.1, Table 4.1-6.

2.5.3.3.3 Closure Verification Monitoring for OWs

Once all of the mine blocks have been rinsed and closed per Section 2.9.1, Closure verification monitoring in the OWs shall commence within the first calendar quarter after completion of the final mine block rinsing during the final stage of mining. For quarterly closure verification monitoring, the permittee shall analyze groundwater samples for specific conductance. In addition to quarterly closure groundwater monitoring, annual monitoring shall analyze groundwater samples for the parameters listed in Section 4.1, Table 4.1-7.

2.5.3.4 Hydraulic Control Wells (BADCT Monitoring/Non-POC)

The HCWs shall be used to establish net extraction and inward hydraulic gradient towards the wellfield. The HCWs shall include a combination of monitoring for net extraction (injection and recovery rates plus hydraulic control pumping) and monitoring groundwater levels to determine inward hydraulic gradients at observation well pairs as described in Section 2.5.3.3. The HCWs shall be monitored for flow rate, volume and specific conductance daily.

The HCW shall be used in conjunction with the inner and outer OWs to establish and observe inward hydraulic gradient. The HCWs shall establish the edge of the maximum capture zone at the end of mine life in Stage 3 and thereby provide the rationale for the location of the POC wells. The appropriate HCWs shall be installed, activated for the HCW's appropriate mine block and operated for the mine life. Alert levels (ALs) shall be set flow rate and volume.

The HCWs are as follows:

Table 2.5-3
Hydraulic Control Wells

Hydraulic Control Well ID	Stage(s) of Operation	Latitude	Longitude	Activated with Mine Block
HC-15	1 to 3	32° 05' 01.6"	110° 02' 23.6"	1
HC-17	1 to 3	32° 05' 04.1"	110° 02' 25.1"	1
HC-18	1 to 3	32° 05' 04.8"	110° 02' 26.9"	1
HC-03	1 to 3	32° 04' 47.4"	110° 02' 34.3"	2
HC-04	1 to 3	32° 04' 47.4"	110° 02' 30.7"	2
HC-22	1 to 3	32° 05' 09.5"	110° 02' 34.1"	4
HC-16	1 to 3	32° 05' 03.3"	110° 02' 23.8"	5
HC-20	1 to 3	32° 05' 07.6"	110° 02' 30.6"	5
HC-21	1 to 3	32° 05' 09.5"	110° 02' 31.8"	5
HC-02	1 to 3	32° 04' 47.4"	110° 02' 37.7"	6
HC-19	1 to 3	32° 05' 06.6"	110° 02' 28.3"	6
HC-01	1 to 3	32° 04' 47.4"	110° 02' 41.2"	7
HC-05	1 to 3	32° 04' 47.5"	110° 02' 27.3"	7
HC-06	1 to 3	32° 04' 48.00"	110° 02' 23.6"	7
HC-10	1 to 3	32° 04' 52.7"	110° 02' 19.05"	7
HC-11	1 to 3	32° 04' 54.7"	110° 02' 19.05"	7
HC-12	1 to 3	32° 04' 56.7"	110° 02' 19.05"	7
HC-13	1 to 3	32° 04' 58.6"	110° 02' 20.2"	7
HC-14	1 to 3	32° 05' 00.6"	110° 02' 21.3"	7
HC-07	3	32° 04' 47.9"	110° 02' 21.3"	16
HC-23	3	32° 05' 14.5"	110° 02' 36.4"	14
HC-24	3	32° 05' 16.5"	110° 02' 36.4"	14
HC-25	3	32° 05' 18.5"	110° 02' 37.6"	14

HC-26	3	32° 05' 19.4"	110° 02' 38.7"	14
HC-27	3	32° 05' 20.1"	110° 02' 41.2"	14
HC-28	3	32° 05' 21.6"	110° 02' 43.8"	14
HC-29	3	32° 05' 02.7"	110° 02' 52.9"	15
HC-08	3	32° 04' 48.8"	110° 02' 19.06"	16
HC-09	3	32° 04' 50.7"	110° 02' 17.8"	16
HC-30	3	32° 05' 02.7"	110° 02' 44.4"	17

2.5.3.4.1 Compliance Monitoring for HCWs

For operational flexibility in managing HCW discharge, specific conductance will be monitored.

HCWs shall be pumped at a rate sufficient to establish the inward hydraulic gradient described in Section 2.5.3.3. The permittee shall also maintain net extraction from the HCW pumping. Net extraction shall be defined as total extraction from the combination of mining recovery volumes plus HCW Volumes minus the total volume of injection. In addition, for the first year of operation, HCW pumping shall be at a rate of at least 1% of total injection volume.

Total mining injection volumes, total mining recovery (extraction) volumes and total hydraulic control volumes shall be measured daily. After the first year of operation, the rate of HCW pumping may be varied but shall remain at a rate sufficient to maintain the inward hydraulic gradient as described in Section 2.5.3.3 and maintain overall net extraction from the wellfield.

In addition to pumping enough to maintain inward hydraulic gradient, the Permittee shall operate the HCWs such that over each 48 hour period, net extraction shall be maintained. After the first two months of operation, the permittee may submit a report evaluating whether a rolling average calculation over a 30-day period is as effective as the 48-hour flow volume rebalancing. The permittee shall maintain a log book of flow volumes in support of this permit condition.

In the first year of operation, the ALs for Net Extraction shall be triggered if in any 48-hour period (or 30-day rolling average if so demonstrated), the total HCW extraction volume is less than 1 % of injection/recovery volume over the same period.

After the first year of operations the AL for Net Extraction shall be triggered if in any 30-day rolling average, Net Extraction is less than or equal to zero.

2.5.4 Surface Water Monitoring and Sampling Protocols

Not applicable.

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. If all methods have detection limits higher than the applicable limit, the permittee shall follow the contingency requirements of Section 2.6 and may propose "other actions" including amending the permit to set higher limits. Analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification unless exempted under A.R.S. § 36-495.02. 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 not listed or described in this permit are determined to be necessary, the construction details shall be submitted to the Groundwater Section for approval prior to installation and the permit shall be amended to include any new points.

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 this permit and the approved contingency and emergency response plan submitted in the application 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 plan.

Any AL that is exceeded or any violation of an AQL, discharge limit (DL), or other permit condition shall be reported to ADEQ following the reporting requirements in Section 2.7.3.

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

During Stage 1, Sections 2.6.2.1, 2.6.2.2, and 2.6.2.3 are applicable for the Pipeline Drain Pond and Evaporation Pond #1 only. Once all ponds are installed, Sections 2.6.2.1, 2.6.2.2 and 2.6.2.3 are applicable.

2.6.2.1 Exceeding of Performance Levels Set for Operational Conditions

2.6.2.1.1 Performance Levels Set for Freeboard

In the event that freeboard performance levels (PL) required by Section 4.1, Table 4.1-2 in a surface impoundment are not maintained, the permittee shall:

1. 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.
2. Within 5 days of discovery, evaluate the cause of the incident and adjust operational conditions or identify design improvements to the affected system as necessary to avoid future occurrences.
3. Within 30 days of discovery, initiate repairs to the affected system, structure, or other component as necessary to return the system to compliance with this permit, or remove the affected system(s) from service as specified in Section 2.8 (Temporary Cessation) and Section 2.9 (Closure) of this permit. Record any repair procedures, methods, and materials used to restore the facility to operating condition in the facility log/recordkeeping file.
4. If design improvements are necessary, submit an amendment application within 90 days of discovery.
5. 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.

2.6.2.1.2 Performance Levels, Other Than Freeboard

The following conditions are required to be followed for exceedance of performance levels (PLs) other than freeboard.

1. If an operational PL listed in Section 4.1, Table 4.1-2 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.
2. The PL exceedance, results of the investigation, and any corrective action taken shall be reported to the Groundwater Section, 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.
3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5 and any necessary contingency measures to resolve problems identified by the investigation which may have led to a PL being exceeded. To implement any other corrective action the permittee may choose to obtain prior approval from the Groundwater Section according to Section 2.6.6.

2.6.2.2 Exceedance of Alert Level #1 for Normal Liner Leakage

If an Alert Level #1 (AL #1) as specified in Section 4.1, Table 4.1-3, has been exceeded, the permittee shall take the following actions:

1. Within 5 days of AL #1 exceedance, notify Groundwater Section in accordance with Section 2.7.3 Permit Violation and Alert Level Status Reporting. Continue monitoring to determine if the leakage rate is increasing.
2. If the leakage rate continues to exceed AL#1 for 15 days following notification of initial AL #1 exceedance, perform a visual inspection of the liner above the solution level, to determine the location of the leaks in the primary liner.
3. Within 45 days of AL #1 exceedance, if liner damage is evident, the permittee shall complete liner repairs.
4. Within 45 days of AL #1 exceedance, if the visual inspection does not identify the location of leaks, formulate a corrective action plan to determine their location and repair them.
5. Within 90 days of AL #1 exceedance and following formulation of a corrective action plan, the permittee shall complete liner repairs.
6. Within 75 days of AL #1 exceedance (if repairs were completed in Step 3), or 120 days of AL #1 exceedance (if corrective action plan was implemented per Steps 4 and 5), if no alert level exceedance is observed for 30 consecutive days, notify Groundwater Section and document assessment and/or repairs in the log book.
7. Within 120 days of AL #1 exceedance (if repairs were completed in Step 3), or 165 days of AL #1 exceedance (if corrective action plan was implemented per Steps 4 and 5), if 30 consecutive days without an AL #1 exceedance is not achieved, notify Groundwater Section and reassess the entire liner system and complete any necessary repairs as described in Steps 2 and 3 (and if necessary Steps 4 and 5 also). Repeat the assessment and liner repair cycle until requirements of Step No. 6 are attained.
8. A liner leakage assessment and repair report shall be included in the next annual report described in Section 2.7.4.1 (Annual Reporting) of this permit. The permittee may also submit the liner leakage assessment report to the Groundwater Section prior to the annual report due date. This liner leakage assessment and repair report shall be submitted to the Groundwater Section. Upon review of the report, the Groundwater Section may require that the permittee take additional corrective actions to address the problems identified from the assessment of the liner and perform other applicable repair procedures.

2.6.2.3 Exceedance of Alert Level #2 for Liner Failure or Rips

If the Liner Leakage Discharge Limit (AL #2) specified in Section 4.1, Table 4.1-3 has been exceeded, the permittee shall:

1. As soon as practicable, cease all discharge to the impoundment, implement control measures to prevent new solution buildup that may subsequently report to the impoundment, and immediately notify Groundwater Section of the AL #2 exceedance.
2. Within 15 days of initial AL #2 exceedance, perform a visual inspection of the liner above the solution level to identify the location of the leak(s). The permittee shall complete liner repairs and discharge to the impoundment shall not be re-initiated until the leak(s) have been identified and repaired.
3. Within 60 days of initial AL #2 exceedance if leaks were found and fixed and if no AL #2 exceedance is observed for 30 consecutive days, submit a liner leakage assessment and repair report to the Groundwater Section. The report shall include the results of the initial liner evaluation, methods used to locate the leak(s), repair procedures and quality assurance/quality control implemented to restore the liner to

optimal operational status, and other information necessary to ensure the future occurrence of the incidence will be minimized.

4. Within 30 days of initial AL #2 exceedance if the visual inspection does not identify the location of leaks and AL #2 exceedance continues, formulate a corrective plan to determine their location and repair them. The corrective plan will take into account the schedule for a 3rd party contractor to perform electronic leak detection or other methods if required.
5. Within 75 days of initial AL #2 exceedance and following formulation of a corrective action plan, the permittee shall complete liner repairs
6. Within 105 days of AL #2 exceedance and implementation of the corrective action plan per Steps 4 and 5, if no AL #2 exceedance is observed for 30 consecutive days, notify Groundwater Section and document assessment and/or repairs in the log book.
7. Within 105 days of initial AL #2 exceedance, (if repairs were completed in Step 3), or 150 days of AL #2 exceedance (if corrective action plan was implemented per Steps 4, 5, and 6) if 30 consecutive days without an AL #2 exceedance is not achieved, repeat Steps 1 through 7 until AL #2 is not exceeded for 30 consecutive days. When the Steps 1 through 7 are repeated, the notification date is reset. Discharge to the impoundment shall not be re-initiated until the leak(s) have been identified and repaired.
8. Liner leakage assessment and repair reports required by Section 2.6.2.2, shall be referenced in the next annual report described in Section 2.7.4.1 (Annual Reporting) of this permit.

2.6.2.4 Exceeding of Alert Levels in Groundwater Monitoring

2.6.2.4.1 Alert Levels for Specific Conductance

The outer IMWs and outer OWs shall be used to detect the potential migration of mining fluids. Each mining block shall include two sets of IMWs; an inner set and an outer set. The inner set shall be used by the Permittee to monitor operations and will therefore not have specific conductance ALs. The outer set shall be used to detect the potential migration of mining fluids and shall have specific conductance ALs as described in Section 4.1, Tables 4.1-6 and 4.1-8.

Each HCW well shall have an associated inner and outer OW. The outer OW shall be monitored for specific conductance daily and shall have a specific conductance ALs.

2.6.2.4.1.1 Outer Observation Wells and Outer Intermediate Monitor Wells

1. If an AL for specific conductance at an outer IMW and/or outer OW has been exceeded, the permittee shall continue daily measurement of specific conductance for one week (7 days). If the additional measurements show that the exceedance of the AL for specific conductance no longer persists after one week, no further action is required and the facility is no longer in alert status.
2. If the specific conductance AL exceedance has been confirmed, the permittee shall notify the Groundwater Section within 5 days.
3. The Permittee shall provide Groundwater Section with an action plan within 30 days after the confirmed exceedance of the AL. The Action Plan shall describe the proposed actions and their justification which may include but are not necessarily limited to any of the following:
   a. Continued monitoring

b. Adjust operations to reverse the trend (pull back solutions)

c. Adjust pumping in the appropriate HCWs

d. Install and activate additional interceptor HCWs (if not already installed)

4. After the Action Plan is approved by the Groundwater Section, the permittee shall implement the action plan and any reporting as specified in the action plan.

2.6.2.4.2 Alert Levels for Pollutants with Numeric Aquifer Water Quality Standards

1. If an AL for a pollutant set in Section 4.1, Table 4.1-5B has been exceeded, the permittee may conduct verification sampling within 5 days of becoming aware of an AL exceedance. 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 exceedance 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 exceedance, including inspection of all discharging facilities 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 exceedance. 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 Section, 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 Section.
4. Within 30 days after confirmation of an AL exceedance, the permittee shall submit the laboratory results to the Groundwater Section along with a summary of the findings of the investigation, the cause of the AL exceedance, 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 an AL exceedance may be reduced to the regularly scheduled frequency, if the results of three (3) 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 six (6) 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 sixth sampling event.

2.6.2.4.3 Exceeding BADCT Alert Level for Hydraulic Control

BADCT for hydraulic control consists of maintaining an inward hydraulic gradient at the HCWs (wellfield boundary) and maintaining net extraction from the HCWs.

2.6.2.4.3.1 Exceeding Alert Level for Inward Hydraulic Gradient

If an Alert Level for hydraulic gradient, as described in Sections 2.5.3.3 and 2.5.3.4.2 and as referenced in Table 4.1-8, is exceeded at OWs adjacent to HCWs, the Permittee shall take the following actions:

1. Obtain manual water level measurements from the observation well pair to confirm the AL exceedance.
2. Notify the Groundwater Section within five days of confirming the AL exceedance.
3. If the AL is not confirmed, the Permittee shall notify the Groundwater Section of the results. No further action is required until the next monitoring round.
4. If the AL is confirmed, the Permittee shall adjust the flow rate from the associated HCW so as to increase the hydraulic gradient observed in the observation well pair.
5. If the HCW cannot be operated so as to induce an inward hydraulic gradient sufficient to meet the AL, the Permittee shall increase pumping from the recovery wells in the area of the active mining block to maintain full control until the HCW can be fixed or replaced. If the inward hydraulic gradient is not obtained within three months, the Permittee shall cease injection operations.
6. The Permittee shall prepare a report that describes the AL exceedance and provides recommended actions that will correct the AL condition. The report shall be provided to the Groundwater Section within 30 days of confirmation of the AL.
7. Upon review of the submitted report, the Department may recommend additional investigations or actions to correct the AL exceedance.
8. The Permittee shall no longer be considered in exceedance once inward hydraulic gradient is reestablished and demonstrated.

2.6.2.4.3.2 Exceeding of Alert Levels for Net Extraction

If an AL for net extraction, as described in Sections 2.5.3.3 and 2.5.3.4.2 and as referenced in Table 4.1-8, is exceeded, the Permittee shall take the following actions:

1. Notify the Groundwater Section within five days of becoming aware of the alert level exceedance.
2. Conduct an inspection of the wellfield and HCWs including pumps, flow meters, totalizers, and other associated facilities.
3. Adjust HCW operations so that the net extraction AL is met.
4. If the HCW operations cannot meet the Alert Level for net extraction, the Permittee shall cease injection operations until net extraction is demonstrated.
5. Submit a report describing the AL exceedance, results of the inspection and corrective actions taken per Section 2.7.3.
6. The permittee is no longer considered to be exceeding the AL if the net extraction volumes are returned to permit conditions.

2.6.2.5 Exceeding of Alert Levels for Maximum Injection Pressure

The permittee shall initiate the following actions within 24 hours of becoming aware of an Alert Level exceedance listed in Section 4.1, Table 4.1-8 for the exceedance of a fracture gradient. The permittee shall:

1. Immediately investigate to determine the cause of the AL being exceeded, including:
    a. Inspection, testing, and assessment of the current condition of all components of the injection system that may have contributed to the AL being exceeded, which may include taking the affected well(s) out of service, and
    b. Review of all daily measurement data as recorded in the well's log book, test results, and other operational control information to identify any unusual occurrences.
    c. Repair system as necessary.
2. Within 30 days of an AL being exceeded, the permittee shall submit the related data to the Groundwater Section, along with a summary of the findings of the investigation, the cause of the AL being exceeded, and actions taken to resolve the problem. This report shall document all submittals to EPA, including but not limited to, monitoring and report data and reports checking engineering and integrity of the well.
3. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.
4. The facility is no longer on alert status once the operational indicator no longer indicates that an AL is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2.6.3 Discharge Limitation Violations

During Stage 1, Sections 2.6.3.1, 2.6.3.2, and 2.6.3.3 are applicable for the Pipeline Drain Pond and Evaporation Pond #1 only. Once all ponds are installed, Sections 2.6.3.1, 2.6.3.2 and 2.6.3.3 are applicable.

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

In the event of overtopping, liner failure, containment structure failure, or unexpected loss of fluid, the permittee shall take the following actions:

1. As soon as practicable, cease all discharges as necessary to prevent any further releases to the environment, including removal of any fluid remaining in the impoundment as necessary, and capture and containment of all escaped fluids.
2. Within 24 hours of discovery, notify Groundwater Section,
3. Within 24 hours of discovery of a failure estimate the quantity released, collect representative samples of the fluid remaining in affected impoundments and drainage structures, analyze sample(s) according to Section 4.1, Tables 4.1.2 and report in accordance with Section 2.7.3 (Permit Violation and AL Status Reporting). In the 30-day report required under Section 2.7.3, include a copy of the analytical results and forward the report to Groundwater Section.
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 discharging facility 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 discharging facility. The permittee shall not resume discharge to the facility 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. Record in the facility log/recordkeeping file the amount of fluid released, a description of any removal method and volume of any fluid

removed from the impoundment and/or captured from the release area. 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 Groundwater Section as specified in Section 2.7.3(2). 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 soil and/or groundwater resulting from the incident. If soil or groundwater is impacted such that it could or did 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 a schedule for completion of activities. At the approval of ADEQ, the permittee shall implement the approved plan.
8. Within 30 days of completion of corrective actions, submit to Groundwater Section, a written report as specified in Section 2.6.6 (Corrective Actions).
9. 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 Groundwater Section.
3. Within 24 hours, collect representative samples of the fluid contained in the surface impoundment. Samples shall be analyzed for the parameters specified in Section 4.1, Table 4.1-1B. Within 30 days of the incident, submit a copy of the analytical results to Groundwater Section.
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 Section 4.1, Table 4.1-2. Record in the facility log/recordkeeping file the amount of fluid released, a description of the removal method and volume of any fluid removed from the impoundment and/or captured from the release area. The facility log/recordkeeping file shall be maintained according to Section 2.7.2 (Operation Inspection/Log Book/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 Alert Level 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 Item No. 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 Groundwater Section.
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 Alert Level Status Reporting). Include a description of the actions performed in Subsections 1 through 3 listed above.
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 including remediation.

2.6.4 Aquifer Quality Limit Violation

1. If an AQL set in Section 4.1, Table 4.1-5B has been exceeded in a POC well, the permittee may conduct verification sampling within 5 days of becoming aware of an AQL exceedance. 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(2), 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 90 days or a longer time period if agreed to by ADEQ 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.

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 That Are Not Addressed Elsewhere in Section 2.6

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 Section 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 Section 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 Groundwater Section within 30 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.

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 Section 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; and/or
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 Section, 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. When submitting hard copy, the permittee shall complete the Self-monitoring Report Form (SMRF) provided by ADEQ including contact information for the person completing the Form. Submit the completed Form to the Groundwater Section.
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 reporting period, the permittee shall enter "not required" on the Form, include and explanation, and submit the Form to the Groundwater Section.
3. The tables contained in Section 4.1 list the monitoring parameters and the frequencies for reporting results on the SMRF:

   - Table 4.1-5B

   The parameters listed in the above identified tables from Section 4.1 are the only parameters for which SMRF reporting is required.

4. In addition to the SMRF, the information contained in A.A.C. R18-9-A206(B)(1) shall be included for exceeding an alert level (AL) or violation of an Aquifer Quality Limit (AQL), discharge limit (DL), or any other permit condition being reported in the current reporting period.

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 Section in writing within 5 days (except as provided in Section 2.6.5) of becoming aware of a violation of any permit condition, discharge limitation or of an AL exceedance.
2. The permittee shall submit a written report to the Groundwater Section 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. Permit section 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 AWQS;
   e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring; and
   f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

2.7.4 Operational, Other or Miscellaneous Reporting

2.7.4.1 Annual Report

If an Alert Level #1 or Alert Level #2 has been exceeded discussed in Sections 2.6.2.2 and 2.6.2.3, the permittee shall submit an annual report that summarizes the results of the liner assessment. The Liner Leakage Assessment Report shall also include information including but not limited to the following: number and location of holes identified; a table summarizing the exceedances including the frequency and quantity of fluid removed, and corrective actions taken.

2.7.4.2 Quarterly Operations and Monitoring Report(s)

The permittee shall submit quarterly reports concerning the operations and monitoring of the mine to the Groundwater Section. Quarterly reports shall be submitted no later than 30-days following the end of each calendar quarter. The quarterly report shall demonstrate whether hydraulic control and an inward hydraulic gradient was maintained during the quarterly monitoring period. Hydraulic control and hydraulic gradient shall be demonstrated by, including but not limited to, the following: inward hydraulic gradient at the OWs, groundwater contour maps that document hydraulic containment of the active wellfield using groundwater elevations from IMWs and OWs and changes in groundwater chemistry (primarily specific conductance), and compliance with ALs at the IMWs and OWs and ALs and AQLs at the POCs. Any data or task scheduled as annually shall submit the data in the Fourth Quarter Report. The report shall include:

1. Graphical representation of the volumes recovered, injected and hydraulic control pumping used to maintain hydraulic control.
2. Graphical representation that a continuous inward hydraulic gradient was maintained using water level elevations at the OWs. The report shall also include a figure showing the location and identity of each of the paired wells. In the event any one of the wells pairs does not indicate an inward hydraulic gradient, or in the event that any of the instruments used to measure the hydraulic gradient malfunctions or are out of service for more than 24-consecutive hours, the permittee shall submit a report showing for each day of the quarterly reporting period, the daily flow from the HCWs.
3. Provide three monthly potentiometric (groundwater elevation) contour maps and provide a description of hydraulic capture for the quarter.

4. Provide a summary of pressure readings and maximum pressure readings in each injection well.
5. A graphical representation of specific conductance readings for outer IMWs and outer OWs.
6. A description of any deviations from standard sampling protocols during the reporting period.
7. Summary of all exceedances of ALs, AQLs, Action Levels, DLs, or operational limits that occurred during the reporting period and provide the contingency actions completed to mitigate the effects of the violation, or to eliminate the recurrence of the exceedance or violation. The report shall also include identification and discussion of any laboratory results that fell outside of the laboratory QA/QC criteria and AQLs and ALs required by this permit.
8. Graphical time versus concentration plots of groundwater elevations and specific conductance for outer IMWs and outer OWs.
9. 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 screen interval.
10. Groundwater sampling results for the POC and BADCT monitoring wells including copies of all laboratory analytical reports, field notes, and QA/QC limits.
11. Data recorded in Table 4.1-8 shall be summarized.
12. Copies of Reports submitted to the EPA as required by the UIC permit, including groundwater monitoring results from wells not covered by this permit.

2.7.4.3 Well Installation Reports

A well installation report shall be submitted to the Groundwater Section within sixty (60) days after the completion of new well installations in accordance with Sections 2.5.3.1, 2.5.3.2. 2.5.3.3, and 2.5.3.4, and CSI Nos. 1 and 3 in Section 3.0. Each well installation report shall be completed in accordance with A.A.C. R12-15-801 et seq. and consist of the following:

- Copies of Arizona Dept. of Water Resources (ADWR) Notice of Intent and all related submittals to ADWR;
- Boring log and well as-built diagram;
- Total depth of well measured after installation;
- Top of well casing or sounding tube (whichever is used as the fixed reference measuring point) and ground surface elevation;
- Depth to groundwater;
- Geophysical logging reports and subsurface sampling results, if any;
- Description of well drilling method;
- Description of well development method;
- If dedicated sampling equipment installed, details on the equipment and at what depth the equipment was installed;
- Summary of analytical results for initial groundwater sample collected after installation;
- Corresponding analytical data sheets; and
- GPS coordinates for each new well.

2.7.4.4 Well Abandonment Reports

A well abandonment report shall be submitted to the Groundwater Section in accordance with Sections 2.2.3 and CSI Nos. 1, 4, and 11 in Section 3.0. If wells associated with this permit are abandoned due to poor performance, casing collapse, or other reasons, or are abandoned at the end of the post-closure period, then within 90 days of completing abandonment, the permittee shall submit a well abandonment report to Groundwater Section. Appropriate contents of the report shall be sealed by an Arizona professional

geologist or professional engineer, in accordance with Arizona Board of Technical Registration requirements. Well abandonment records shall be provided to the Groundwater Section within 60 days of monitor well abandonment and shall include:

1. Copies of ADWR Notice of Intent to Abandon
2. Copies of ADWR Abandonment Reports
3. A description of the methods used to seal the well casing and the perforated or screened interval of the well; and
4. Global Positioning System (GPS) coordinates of the former well location

2.7.4.5 Ambient Groundwater Quality Report

The permittee shall submit an ambient groundwater quality report of the data and calculations required in Sections 2.5.3.1.2, 2.5.3.2.1, and 2.5.3.3.1 and CSI Nos. 1, 5, 6, 7, 8, 9, and 10 in Section 3.0.

The report shall include copies of all laboratory analytical reports, field notes, the QA/QC limits used in collection and analysis of the samples and the statistical calculations of ALs and AQLs for the POC wells, and specific conductance ALs for the BADCT wells under the ambient water quality monitoring requirements listed in Section 2.5.

2.7.4.6 Pre-Operational Report

The permittee shall submit the results obtained from the aquifer tests as described in Section 2.2.3 and CSI No. 1 in Section 3.0. The appendix including the aquifer test shall discuss and evaluate whether the data confirms previous results. The evaluation shall verify previously calculated aquifer properties such as hydraulic conductivity, transmissivity, groundwater velocity, etc. The aquifer test report shall also include, at a minimum: all of the data generated during the aquifer tests, description of the aquifer tests, which analytical methods were used to analyze the aquifer test data, description of why those methods were chosen, input and output reports form the chosen aquifer test software.

The report shall also include the evaluation of inward hydraulic gradient at the HCWs. An appendix in the report shall include groundwater elevation data collected from the OWs, groundwater contour maps that will document hydraulic containment of the active wellfield using groundwater elevations from IMWs and observations wells and changes in groundwater chemistry (primarily specific conductance).

The report shall also include a description of new well construction and modifications including injection/recovery, POC, IMWs, Hydraulic Control and OWs. An appendix in the report shall include well installation reports for all new and modified wells including the information required in Section 2.7.4.3.

The report shall include a description of well abandonment. An appendix in the report shall include well abandonment reports including information as required in Section 2.7.4.4.

The report shall include a description of the ambient groundwater quality in the Intermediate Monitoring and OWs. An appendix in the report shall include ambient groundwater monitoring reports as required in Section 2.7.4.5.

The report shall include a description of the ambient groundwater quality monitoring within the wellfield by monitoring a selection of existing wells. The samples shall be analyzed for APP- and UIC- regulated constituents listed in the permit. An appendix in

the report shall include copies of laboratory analytical reports, field notes, the QA/QC limits used in collection and analysis of the samples, and a statistical calculation of the site-wide ambient groundwater quality to determine pre-mining concentrations (i.e., rinse verification concentrations).

2.7.4.7 Rinse Verification Report

The permittee shall submit Rinse Verification Report(s) at the conclusion of individual mine block rinsing operations and at closure of mine life in accordance with Section 2.9.1 and CSI No. 19 in Section 3.0. Rinse verification confirms when an individual mine block and the entire wellfield at mine closure meets either AWQS and/or ambient and/or MCLs. The Rinse Verification Report(s) shall include the rinse verification sampling, copies of laboratory analytical reports, field notes, the QA/QC limits used in collection and analysis of the samples and maps depicting the locations of rinse verifications wells.

2.7.5 Reporting Location

All SMRFs shall be submitted to:

Arizona Department of Environmental Quality
Groundwater Section
Mail Code: 5415B-3
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4571

Or

Through the myDEQ portal accessible on the ADEQ website at:
http://www.azdeq.gov/welcome-mydeq

All documents required by this permit to be submitted to the Groundwater Section shall be directed to:

Arizona Department of Environmental Quality
Groundwater Section
Mail Code: 5415B-3
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4999

2.7.6 Reporting Deadline

The following table lists the quarterly report due dates:

Table 2.7.6-1

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 annual report due dates:

Monitoring conducted:	Report due by:
Annual: October-December	January 30 of the following year

2.7.7 Changes to Facility Information in Section 1.0

The Groundwater Section shall be notified within 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 Section before ceasing operation of the facility for a period of 60 days or greater. The permittee shall take the following measures upon temporary cessation:

1. Submittal of SMRFs is still required; report "temporary cessation" in the comment section.
2. Immediately cease injection of lixiviant.
3. Maintain operation of those HCWs associated with mine blocks in operation at the time of mining cessation.
4. Continue monitoring of associated OWs to demonstrate the maintenance of an inward hydraulic gradient at the hydraulic control system.
5. If the temporary cessation is greater than a period of five (5) years, the appropriate recovery wells shall resume operation to begin pullback of solutions and shall continue until the specific conductance of recovered water decreases to the average value observed in outer IMWs and/or HCWs OWs.
6. Continue IMW monitoring for specific conductance.
7. Continue POC compliance monitoring for AWQS and MCLs as described in Section 2.5.3.1.4.

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's 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 Section 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.

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 Section of the permittee's intent to cease operation without resuming activity for which the facility was designed or operated. 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 Section, a Closure Plan which meets the requirements of A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(3). Furthermore, the plan shall include the following specific activities:

2.9.1.1 Rinsing

Rinsing shall occur in three steps as follows:

1. Rinse three (3) pore volumes (based on a 3% fracture porosity of the ore body)
2. Rest
3. Rinse two (2) pore volumes

Monitoring of groundwater from the mining block after rinsing shall be conducted to evaluate the effectiveness of the rinsing. Samples shall be collected from approximately 10% of the wells within the mining block after step 3. These wells (approximately 1 well per 1.5 acres) shall be designated the RVWs. Permittee shall select the RVWs based on their spatial, geological, hydrogeological, and geochemical representativeness. Only recovery wells shall be used as RVWs. Samples from these wells shall be analyzed by laboratory methods for constituents listed in Section 4.1, Table 4.1-7. If analyses

indicate that rinse verification standards are not achieved in the block, rinsing and/or resting shall resume.

When rinse verification standards are achieved in the RVWs, the remaining (non-RVW) wells in the mining block shall be plugged and abandoned, leaving only the RVWs open. The RVWs shall remain open and available throughout the mine life to assist with closure verification and post rinse remediation if required.

An appropriate number (a subset) of RVWs shall be selected as post-rinse IMWs representing a distribution of approximately one IMW per mining block.

2.9.1.2 Closure Verification Wells

When an area is to be closed because it is the end of the mine life or there is no future mining planned adjacent or up-gradient, a subset of the RVWs shall be identified (approximately 1 well every 13.5). These wells shall be designated as "Closure Verification Wells" or CVWs. Samples from these wells shall be analyzed by laboratory methods constituents listed in Section 4.1, Table 4.1-7. When all CVWs in an area meet rinse verification standards listed in Section 4.1, Table 4.1-7 then applicable HCWs shall be turned off (but not abandoned).

The permittee shall submit a Rinse Verification Report documenting results of CVW groundwater compliance sampling in accordance with Section 2.7.4.7 and CSI No. 19 in Section 3.0. When all CVWs have met rinse verification standards for five consecutive years, monitoring may stop and all wells (RVWs, CVWs, HC, Observation and POC) may be plugged and abandoned.

2.9.1.3 Closure Monitoring

After step 3 of rinsing as described in Section 2.9.1.2 above, the permittee shall collect samples from approximately 10 percent of the wells within the wellfield designated RVWs. Analytes measured in the samples shall include the parameters listed in Section 4.1, Table 4.1-7. If any samples exceed rinse verification standards, the rinsing sequence shall be continued and additional water quality samples shall be collected from the RVWs.

2.9.1.4 Outer Observation Wells

Closure verification samples shall be obtained from the outer OWs to ensure no constituents remain downgradient of the HCWs. Samples from these wells shall include the same constituents and time requirements as described in Section 2.9.1.2.

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 Section 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 1 year thereafter under a diligent schedule of closure actions;
2. Further action is necessary to keep the facility in compliance with AQLs at the applicable POC;
3. Continued action is required to verify that the closure design has eliminated discharge to the extent intended;
4. Remediation or mitigation measures are necessary to achieve compliance with Title 49, Ch. 2; and/or
5. Further action is necessary to meet property use restrictions.

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 Section.

In the event clean closure cannot be achieved pursuant to A.R.S. § 49-252, the permittee shall submit for approval to the Groundwater Section 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

A specific post-closure plan may be required upon the review of the closure plan.

2.10.2 Post-closure Completion

Not required at the time of permit issuance.

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

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 Section.

Table 3.0-1
Compliance Schedule Items

No.	Compliance Item	Description	Due by:	Permit Amendment Required?
1	Pre-Operational Report	Permittee shall submit a copy of the Pre-Operational Report as required in Sections 2.3.3 and 2.7.4.6	At least 30 days prior to beginning of operations	No
2	Evaporation Pond #1 and Pipeline Drain Pond Construction Report	Permittee shall submit a copy of signed, dated and sealed as-built drawings along with QA/QC documentation to confirm that all discharging facilities were constructed in accordance with the design report, engineering plans and specifications.	Within 30 days of completion of construction of Evaporation Pond #1 and Pipeline Drain Pond.	No
3	Well Completion Report(s)	Permittee shall submit a copy of well installation report(s) as required in Sections 2.3.3 and 2.7.4.3 for ADEQ approval.	Within 60 days of completing well installation(s).	No
4	Well Abandonment Report(s)	Permittee shall submit a well abandonment report(s) as required in Sections 2.3.3 and 2.7.4.4.	Within 30 days of abandoning well(s).	No
5	Stage 1 Ambient Groundwater Quality Monitoring for POC Wells, and submittal of ALs and AQLs.	Permittee shall initiate Ambient Groundwater Quality Monitoring for the Stage 1 POC wells in accordance with Section 2.3.3. The permittee shall submit an Ambient Groundwater Report for Stage 1 POC wells as well as a minor amendment application as required in Sections 2.5.3.1.2, 2.5.3.1.3 and 2.7.4.5.	Within 30 days of receipt of the laboratory analytical analysis of the final ambient sampling round and 30 days prior to start of Stage 1 ISR operations.	Yes
6	Stage 2 Ambient Groundwater Quality Monitoring for Wellfield POC Wells, and submittal of ALs and AQLs.	Permittee shall initiate Ambient Groundwater Quality Monitoring for the Stage 2 POC wells in accordance with Section 2.3.3. The permittee shall submit an Ambient Groundwater Report for Stage 1 POC wells as well as a minor amendment application as required in Sections 2.5.3.1.2, 2.5.3.1.3 and 2.7.4.5.	Within 30 days of receipt of the laboratory analytical analysis of the final ambient sampling round and prior to start of Stage 2 ISR operations.	Yes
7	Wellfield Ambient Groundwater Quality Monitoring	Permittee shall conduct Ambient Groundwater quality monitoring within the wellfield by monitoring a selection of existing wells. The samples shall be analyzed for APP- and UIC-regulated constituents listed in the permit. Permittee shall submit a report that includes copies of laboratory analytical reports, field notes, the QA/QC control limits, and a statistical calculation of the site-wide ambient groundwater quality in accordance with Sections 2.5.3.2.3, 2.5.3.3.3, 2.7.4.6 and 2.9.1.	Prior to Stage 1 ISR Operations	No

8	Alert Levels for Observation Wells	Permittee shall submit a report documenting effects of pumping HCWs on observation wells and submit ALs for establishing inward hydraulic gradient in accordance with Sections 2.3.3 and 2.5.3.3.	Within 30 days prior to Stage 1 ISR Operations and 30 days prior to start of operation of subsequent associated mining block(s)	Yes
9	Intermediate Monitoring Well Specific Conductance, Ambient Monitoring, and AL	Permittee shall monitor outer intermediate monitoring wells for specific conductance for eight (8) consecutive days. ALs shall be calculated in accordance with Sections 2.5.3.2.1 and 2.7.4.5.	Within 30 days prior to Stage 1 ISR Operations and 30 days prior to start of operation of subsequent associated mining block(s)	Yes
10	Stage 2 Ponds Construction Report	Permittee shall submit a copy of signed, dated and sealed as-built drawings along with QA/QC documentation to confirm that all discharging facilities were constructed in accordance with the design report, engineering plans and specifications.	Within 30 days of completion of construction of each Stage 2 Pond.	No
11	Abandon pre-existing borehole, coreholes and wells near ponds	Permittee shall abandon corehole(s), borehole(s) and well(s) within 150 feet of an impoundment in accordance with Section 2.3.3 and document abandonment activities in accordance with Section 2.7.4.4	Within 30 days prior to construction of impoundment	No
12	Quarterly Operations and Monitoring Report	Permittee shall submit Quarterly Operations and Monitoring Report in accordance with Section 2.7.4.2	See Table 2.7.6-1 for due dates and shall be submitted for life of mine	No
13	Stage 1 Closure Financial Assurance Mechanism	The permittee shall submit an amendment application to submit financial assurance mechanism as per A.A.C. R18-9-A203(C) for the estimated closure and post-closure costs for the APP facilities, and also provide an approved proof of financial demonstration made to the EPA for the amounts discussed in Section 2.1.3 of this permit.	A minimum of 60 days prior to discharge to any of the facilities covered under this permit.	Yes
14	Periodic Demonstration of Financial Capability	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. 2 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.	Every two years from the date of signed amended permit as required by CSI No. 13, and for the duration of the permit.	No
15	Periodic Update of Closure and Post-Closure Costs	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.	Every 6 years from the date of permit signature, for the duration of the permit.	Yes

16	Stage 2 Closure Costs and Closure Financial Assurance Mechanism	Prior to stepping up copper production to 75 million pounds per year, Excelsior shall update closure costs for new, permitted wells/facilities that will be operated in Stage 2. Bonding shall be in place before any new facilities are operated.	Six months prior to increasing production.	Yes
17	Stage 3 Closure Costs and Closure Financial Assurance Mechanism	Prior to stepping up copper production to 125 million pounds per year, Excelsior shall update closure costs for new, permitted wells/facilities that will be operated in Stage 3. Bonding shall be in place before any new facilities are operated.	Six months prior to increasing production.	Yes
18	Mine Block Order	The permittee shall notify ADEQ of any future significant change in the sequence of mine block operation for Stage 1 and proposed replacement of intermediate monitor wells or change of hydraulic control operational sequence and set ALs as appropriate.	As Necessary	Yes
19	Rinse Verification Report	Permittee shall submit Rinse Verification Report in accordance with Section 2.7.4.7	Within 30 days of receipt of the laboratory analytical analysis of the final verification sampling round; for each mine block closure, and final mine closure.	No

4.0 TABLES

4.1 BADCT TABLE

Table 4.1-1A One-time Sampling Event-Discharge Monitoring Locations
Table 4.1-1B Discharge Monitoring Sampling Parameters
Table 4.1-2 Required Inspections and Operational Monitoring
Table 4.1-3 Leak Collection and Removal System Monitoring
Table 4.1-4 Parameters for Ambient Groundwater Monitoring
Table 4.1-5A Quarterly POC Wells Compliance Groundwater Monitoring
Table 4.1-5B Annual POC Wells Compliance Groundwater Monitoring
Table 4.1-6 Specific Conductance Operational Groundwater Monitoring
Table 4.1-7 Rinse Verification Standards
Table 4.1-8 In-situ BADCT Monitoring
Table 4.1-9 Permitted Facilities and BADCT
Table 4.1-10 Stage 1 Injection and Recovery Wells
Table 4.1-11 Stage 2 Injection and Recovery Wells
Table 4.1-12 Stage 3 Injection and Recovery Wells

Table 4.1-1A **One-time Sampling Event-Discharge Monitoring Locations**			
Sampling Point Number	**Facility**	**Latitude**	**Longitude**
001	Pipeline Drain Pond	32° 05' 23.0"	110° 02' 38.5"
002	Evaporation Pond #1	32° 04' 54.5"	110° 02' 07.2"
003	Raffinate Pond	32° 05' 09.1"	110° 02' 06.3"
004	PLS Pond	32° 05' 00.9"	110° 02' 17.8"
005	Recycled Water Pond	32° 05' 01.8"	110° 02' 08.3"
006	Solids Impoundment #1	32° 05' 20.3"	110° 02' 03.8"
007	Solids Impoundment #2	32° 05' 27.3"	110° 01' 54.7"
008	Plant Runoff Pond	32° 05' 09.6"	110° 01' 59.5"

Table 4.1-1B **Discharge Monitoring Sampling Parameters (in mg/L unless otherwise noted)**		
pH – field & lab (SU)	Sodium	Nickel
Specific Conductance - field and lab (µmhos/cm)	Iron	Selenium
Total Dissolved Solids	Aluminum	Thallium
Total Alkalinity	Antimony	Zinc
Carbonate	Arsenic	Gross Alpha Particle Activity (pCi/L)[4]
Bicarbonate	Barium	Radium 226 + Radium 228 (pCi/L)
Nitrate	Beryllium	Uranium-Isotopes (pCi/L)[5]
Sulfate	Cadmium	Total Petroleum Hydrocarbons
Chloride	Chromium	Benzene
Fluoride	Cobalt	Toluene
Calcium	Copper	Ethylbenzene
Ammonia	Lead	Total Xylenes
Magnesium	Manganese	Uranium, Total (µg/L)
Potassium	Mercury	

NOTE: Metals shall be analyzed as dissolved metals.

[4] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[5] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

Table 4.1-2
Required Inspections and Operational Monitoring

Facility Category	Facility Name	Operational Requirements	Inspection Frequency
Process Solution Impoundment	Evaporation Pond #1 Raffinate Pond PLS Pond Recycled Water Pond	▪ Maintain 2 feet of freeboard ▪ All discharge and sump pumps operational ▪ No substantial erosion, subsidence, cracking ▪ No evidence of seepage or other damage to berms ▪ No visible cracks or damage to liner ▪ Full access to leak detection system maintained	Daily
Single-Lined Non-Stormwater Pond	Pipeline Drain Pond Plant Runoff Pond	▪ Maintain 2 feet of freeboard ▪ Spillway clear of sediment or obstructions ▪ No visible cracking or damage to liner ▪ No operational damage to enclosure wall ▪ All pumps operational ▪ Backup power supply operational ▪ No ponding of spilled material in pond and sumps ▪ Sediment deeper than 1 inch deep removed from sumps ▪ Fluids in sumps maintained at less than pump-down levels	Weekly
Storm water control structures	Site-wide stormwater ditches	▪ No substantial erosion or structural damage ▪ Maintained free of sediments vegetation or obstructions	Monthly
Monitoring Wells	Site-wide - monitoring wells	Wellhead cap or box locks are observed to be secure.	Quarterly, as sampled
Pumps	Site-wide: – Barge Pumps – Run-Off Transfer Pumps – Sump Pumps – Discharge Pumps	Check hour meters – -visual inspection for leaks – -Lubrication – -Maintenance and test run	Weekly Per manufacturers specification Every 1,000 to 1,200 hours of operation
In-Situ Area Injection and Recovery Well Block	Wellfield	No leakage from pipelines, manifolds or well heads.	Daily

Table 4.1-3 **Leak Collection and Removal System Monitoring**				
Facility Name	**Alert Level #1 (gallons per day; gpd)**	**Alert Level #2 (gpd)**	**Monitoring Method**	**Monitoring Frequency**
Stage 1, 2, and 3 Pond				
Evaporation Pond #1	12,972	86,480	Automated	Daily
Stage 2 and 3 Ponds[6]				
Raffinate Pond	3,618	24,117	Automated	Daily
PLS Pond	3,618	24,117	Automated	Daily
Recycled Water Pond	639	4,260	Automated	Daily
Solids Impoundment #1 Cell 1A	15,513	103,417	Automated	Daily
Solids Impoundment #1 Cell 1B	15,513	103,417	Automated	Daily
Solids Impoundment #2 Cell 2A	15,513	103,417	Automated	Daily
Solids Impoundment #2 Cell 2B	15,513	103,417	Automated	Daily

NOTE: The volume of liquid pumped from the LCRS shall be entered in a facility log book on a daily basis. The Alert Level 1 (AL1) or Alert Level 2 (AL2) shall be exceeded when the amount of leakage pumped from the sump for a given pond is greater than the applicable quantities stated above. Contingency requirements of Sections 2.6.2.2 and 2.6.2.3 shall be followed for AL1 and AL2 exceedances, respectively. An exceedance of AL 1 or AL2 is not a violation of the permit unless the permittee fails to perform actions as required under the Sections referenced above. No SMRF reporting is required.

[6] Not applicable during Stage 1 operations. See Section 2.1.1 for timing of pond installation.

Table 4.1-4 **Parameters for Ambient Groundwater Monitoring[7] (in mg/L unless otherwise noted)**		
Depth to Water Level (feet)	Potassium	Nickel
Water Level Elevation (feet amsl)	Sodium	Selenium
Temperature- field (°F)	Iron	Thallium
pH – field & lab (SU)	Aluminum	Zinc
Specific Conductance- field & lab (µmhos/cm)	Antimony	Adjusted Gross Alpha (pCi/L)[8]
Total Dissolved Solids	Arsenic	Radium 226 + 228 (pCi/L)
Total Alkalinity	Barium	Uranium-Isotopes(pCi/L)[9]
Bicarbonate	Beryllium	Benzene
Carbonate	Cadmium	Toluene
Hydroxide	Chromium	Ethylbenzene
Sulfate	Cobalt	Total Xylenes
Chloride	Copper	Uranium, Total (µg/L)
Fluoride	Lead	
Nitrate + Nitrite	Manganese	
Calcium	Mercury	
Magnesium	Molybdenum	

Note: Metals must be analyzed as dissolved metals.

[7] List of parameters for wellfield ambient monitoring and POC ambient monitoring.
[8] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[9] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

TABLE 4.1-5A Quarterly POC Well Compliance Groundwater Monitoring (in mg/L unless otherwise noted)										
Parameter	**POC Well # 1**		**POC Well # 2**		**POC Well # 3**		**POC Well # 4**		**POC Well # 5**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor[10]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft. amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH- field (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature-field (ºF)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total dissolved solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

[10] Monitoring required, but no AQL or AL will be established in the permit. No SMRF reporting is required.

TABLE 4.1-5B Annual POC Well Compliance Groundwater Monitoring (in mg/L unless otherwise noted)										
Parameter	**POC Well # 1**		**POC Well # 2**		**POC Well # 3**		**POC Well # 4**		**POC Well # 5**	
	AQL (mg/l)	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**	**AQL (mg/l)**	**AL (mg/l)**
Depth to Groundwater (ft. bgs)	Monitor[11]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Water Level Elevation (ft. amsl)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH- field (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature-field(°F)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance – lab (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved[12]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Nitrate + Nitrite	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Iron	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

[11] Monitoring required, but no AQL or AL will be established in the permit.
[12] At the conclusion of ambient groundwater monitoring; the permittee shall submit an Ambient Groundwater Quality Report and a permit amendment to propose AQLs and ALs in accordance with Section 2.7.4.5 and CSI Nos. 1, 5, and 6 in Section 3.0. AQLs and ALs shall be established as required in Sections 2.5.3.1.2, 2.6.3.1.2.1 and 2.5.3.1.3.

Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Copper	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Adjusted Gross Alpha (pCi/L)[13]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 (pCi/L)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium-Isotopes (pCi/L) [14]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Toluene	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Ethylbenzene	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Total Xylenes	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium, Total (µg/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

Note: Metals must be analyzed as dissolved metals

[13] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[14] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.
SMRF reporting is required after completion of ambient groundwater monitoring.

TABLE 4.1-6 **Specific Conductance Operational Groundwater Monitoring (μmhos/cm)**	
Wells	**ALs**
OW-15-O	Reserved[15]
OW-04-O	Reserved
OW-22-O	Reserved
OW-19-O	Reserved
OW-01-O	Reserved
OW-10-O	Reserved
OW-13-O	Reserved
OW-07-O	Reserved
OW-25-O	Reserved
OW-28-O	Reserved
OW-30-O	Reserved
NSM-001	Reserved
NSD-023	Reserved
NSH-003	Reserved
NSH-013	Reserved
NSH-017	Reserved
NSM-007	Reserved
CS-06	Reserved
CS-10	Reserved
CS-11	Reserved
NSH-016	Reserved
NSH-026	Reserved
NSM-005A	Reserved
CS-21	Reserved
IMW-001	Reserved
IMW-002	Reserved
J-05	Reserved
NSD-009	Reserved
NSD-025	Reserved
NSD-043	Reserved
NSH-007	Reserved
NSM-013	Reserved
CS-09	Reserved
CS-13	Reserved

[15] At the conclusion of ambient specific conductance; the permittee shall submit an Ambient Groundwater Quality Report and a permit amendment to propose ALs in accordance with Section 2.7.4.6 and CSI Nos. 1, 8, 9, and 10 in Section 3.0. AQLs and ALs shall be established as required in Sections 2.5.3.2.1, and 2.5.3.2.1.1.
No SMRF reporting is required.

TABLE 4.1-7
Rinse Verification Standards (in mg/L unless otherwise noted)

Parameters	Mine Block 1	Mine Block 2	Mine Block 3	Mine Block 4	Mine Block 5	Mine Block 6
pH- field (S.U.)	Monitor[16]	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature-field(ºF)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance – lab (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved[17]	Reserved	Reserved	Reserved	Reserved	Reserved
Nitrate + Nitrite	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Iron	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Copper	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

[16] Monitoring required, but no rinse verification standard will be established in the permit.
[17] At the conclusion of wellfield ambient groundwater monitoring; the permittee shall submit an Ambient Groundwater Quality Report to propose rinse verification standards in accordance with Section 2.7.4.6 and CSI Nos. 1 and 7 in Section 3.0. Rinse verification standards shall be established as required in Sections 2.5.3.2.3, 2.5.3.3.3, and 2.9.1.

Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Adjusted Gross Alpha (pCi/L)[18]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 (pCi/L)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium-Isotopes(pCi/L)[19]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium, Total (µg/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

Note: Metals must be analyzed as dissolved metals

[18] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[19] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

TABLE 4.1-7 - Continued Rinse Verification Standards (in mg/L unless otherwise noted)						
Parameters	**Mine Block 7**	**Mine Block 8**	**Mine Block 9**	**Mine Block 10**	**Mine Block 11**	**Mine Block 12**
pH- field (S.U.)	Monitor[20]	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature-field(ºF)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance – lab (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved[21]	Reserved	Reserved	Reserved	Reserved	Reserved
Nitrate + Nitrite	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Iron	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Copper	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

[20] Monitoring required, but no rinse verification standard will be established in the permit.
[21] At the conclusion of wellfield ambient groundwater monitoring; the permittee shall submit an Ambient Groundwater Quality Report to propose rinse verification standards in accordance Section 2.7.4.6 and CSI Nos. 1 and 7 in Section 3.0. Rinse verification standards shall be established as required in Sections 2.5.3.2.3, 2.5.3.3.3, and 2.9.1.

Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Adjusted Gross Alpha (pCi/L)[22]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 (pCi/L)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium-Isotopes(pCi/L)[23]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium, Total (µg/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

Note: Metals must be analyzed as dissolved metals

[22] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

[23] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

TABLE 4.1-7 - Continued **Rinse Verification Standards (in mg/L unless otherwise noted)**					
Parameters	**Mine Block 13**	**Mine Block 14**	**Mine Block 15**	**Mine Block 16**	**Mine Block 17**
pH- field (S.U.)	Monitor[24]	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature- field(ºF)	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance – lab (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved[25]	Reserved	Reserved	Reserved	Reserved
Nitrate + Nitrite	Reserved	Reserved	Reserved	Reserved	Reserved
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor
Iron	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium	Reserved	Reserved	Reserved	Reserved	Reserved
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor
Copper	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved
Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor

[24] Monitoring required, but no rinse verification standard will be established in the permit.
[25] At the conclusion of wellfield ambient groundwater monitoring; the permittee shall submit an Ambient Groundwater Quality Report to propose rinse verification standards in accordance with Section 2.7.4.6 and CSI Nos. 1 and 7 in Section 3.0. Rinse verification standards shall be established as required in Sections 2.5.3.2.3, 2.5.3.3.3, and 2.9.1.
[26] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

Adjusted Gross Alpha (pCi/L)[26]	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 (pCi/L)	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium-Isotopes(pCi/L)[27]	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium, Total (µg/L)	Monitor	Monitor	Monitor	Monitor	Monitor

Note: Metals must be analyzed as dissolved metals

[26] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[27] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

TABLE 4.1-7 - Continued **Rinse Verification Standards (in mg/L unless otherwise noted)**					
Parameters	**OW-15-O**	**OW-04-O**	**OW-22-O**	**OW-19-O**	**OW-01-O**
pH- field (S.U.)	Monitor[28]	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature- field(ºF)	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance – lab (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved[29]	Reserved	Reserved	Reserved	Reserved
Nitrate + Nitrite	Reserved	Reserved	Reserved	Reserved	Reserved
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor
Iron	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium	Reserved	Reserved	Reserved	Reserved	Reserved
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor
Copper	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved
Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor

[28] Monitoring required, but no rinse verification standard will be established in the permit.
[29] At the conclusion of Outer Observation Well ambient groundwater monitoring; the permittee shall submit an Ambient Groundwater Quality Report to propose rinse verification standards in accordance with Section 2.7.4.6 and CSI Nos. 1 and 7 in Section 3.0. Rinse verification standards shall be established as required in Sections 2.5.3.2.3, 2.5.3.3.3, and 2.9.1.
[30] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

Adjusted Gross Alpha (pCi/L)[30]	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 (pCi/L)	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium-Isotopes(pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium, Total (µg/L)[31]	Monitor	Monitor	Monitor	Monitor	Monitor

Note: Metals must be analyzed as dissolved metals

[30] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[31] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

TABLE 4.1-7 - Continued Rinse Verification Standards (in mg/L unless otherwise noted)						
Parameters	**OW-10-O**	**OW-13-O**	**OW-07-O**	**OW-25-O**	**OW-28-O**	**OW-30-O**
pH- field (S.U.)	Monitor[32]	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance-field (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature-field(ºF)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance – lab (µmhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Dissolved Solids	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Alkalinity	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Hydroxide	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved[33]	Reserved	Reserved	Reserved	Reserved	Reserved
Nitrate + Nitrite	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Magnesium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Iron	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cobalt	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Copper	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Lead	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

[32] Monitoring required, but no rinse verification standard will be established in the permit.
[33] At the conclusion of wellfield ambient groundwater monitoring; the permittee shall submit an Ambient Groundwater Quality Report to propose rinse verification standards in accordance with Section 2.7.4.6 and CSI Nos. 1 and 7 in Section 3.0.. Rinse verification standards shall be established as required in Sections 2.5.3.2.3, 2.5.3.3.3, and 2.9.1.

Molybdenum	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nickel	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Adjusted Gross Alpha (pCi/L)[34]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 +228 (pCi/L)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium-Isotopes(pCi/L)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium, Total (µg/L)[35]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor

Note: Metals must be analyzed as dissolved metals

[34] The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).
[35] Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha. No SMRF reporting is required.

TABLE 4.1-8
In-Situ BADCT Monitoring

Parameter	Wells Monitored	Monitoring Frequency	Alert Level	Method	Reporting Frequency[36]
Injection/Recovery Rate of Wellfield and Hydraulic Control Wells	Stage 1 Injection/Recovery and Hydraulic Control Wells	Daily Average	When Greater than 6000 gpm	Flow Meter	Quarterly
Injection/Recovery Rate of Wellfield and Hydraulic Control Wells	Stage 2 Injection/Recovery and Hydraulic Control Wells	Daily Average	When Greater than 17,000 gpm	Flow Meter	Quarterly
Injection/Recovery Rate of Wellfield and Hydraulic Control Wells	Stage 3 Injection/Recovery and Hydraulic Control Wells	Daily Average	When Greater than 28,000 gpm	Flow Meter	Quarterly
Net Extraction	Injection/Recovery and Hydraulic Control Wells	48 hour flow rebalancing[37]	When Total Hydraulic Control Well Extraction is Less than 1% of Injection Volumes Over the Same Period	Flow Meter	Quarterly
Recovered Volume to Injection Volume	Comparison of all Injection Wells to both Recovery Wells and HCWs	Daily	Recovered Volume is Less than Injected Volume	Flow Meter	Quarterly
Inward Hydraulic Gradient	Inner and Outer Observation Wells	Daily	Less than 1% Inward Hydraulic Gradient	Hand Levels/Transducer	Quarterly
Maximum Injection Pressure	All Injection Wells	Daily	When Greater than 0.75 psi/ft	Pressure Gauge	Quarterly
Specific Conductance	Outer Intermediate and Outer Observation Wells	Daily	Increasing specific conductivity trends from ambient conditions	Fluid Sample/Transducer	Quarterly

[36] Report Frequency – Information collected in this table shall be recorded in the logbooks and submitted to ADEQ in accordance to Sections 2.7.4.2 and Section 3.0.
[37] May change to 30-day rolling average if as protective as 48-hour flow rebalancing in accordance with Section 2.2.4.

Table 4.1-9 **Permitted Facilities and BADCT**
Stage 1, 2, and 3 Mine Blocks
Design, construction, testing (mechanical integrity), and operation of injection and recovery wells shall follow EPA Class III rules (40 CFR Part 146). The maximum fracture pressure shall be no greater than 0.75 pounds per square inch per foot (psi/ft) of depth. Hydraulic control shall be maintained at all times by pumping recovery wells at approximately equal rates as injection, and also pumping at the HCWs. The injection, extraction, and hydraulic control volumes shall be metered at the well-heads, monitored daily, and recorded in the logbook.
Stage 1 Ponds
Pipeline Drain Pond (Non-Stormwater Pond): The Pipeline Drain Pond is single-lined with a minimum 60-mil HDPE liner underlain by a minimum 6 inch thick layer of 3/8 inch minus native or natural material compacted to achieve a saturated hydraulic conductance no greater than 10^{-6} cm/s, which is underlain by 6 inch thick layer of compacted native material. The liner shall be secured in an engineered anchor trench. The impoundment dimensions are 90 feet by 90 feet, by 11 feet deep (including 2 feet freeboard) and has a total volume of 1.05 acre-feet (342,174 gallons). Side slopes shall be no steeper than 2.5:1 H:V (horizontal to vertical). This pond is designed to accept the volume of the largest diameter (24 inch) pipeline between I-10 and the JCM plant, plus the volume of the 100-year, 24-hour design storm entering the pond from precipitation within the contributing watershed with a minimum of 2 feet of freeboard. The perimeter embankments of the pond shall be elevated on three sides, and the west edge is designed to be slightly below the adjacent ground. Run-on drainage shall be blocked and diverted by pipes placed on ground.
Evaporation Pond #1 (Process Solution Pond): The Evaporation Pond #1 is a double-lined pond with a leak collection and recovery system (LCRS) between the upper and lower liners. The impoundment dimensions are 500 feet by 500 feet, by 47 feet deep (including 2 feet freeboard) and has a total volume of 151.66 acre-feet (49.41 million gallons). The liner system from bottom to top shall consist of minimum 6 inch layer of compacted native or natural material overlain by minimum 6 inches of 3/8 inch minus native or natural materials compacted to achieve a saturated hydraulic conductance no greater than 10-6 cm/sec, a minimum 60-mil HDPE geomembrane lower liner, a minimum 200 mil HDPE geonet LCRS, and a minimum 60-mil HDPE geomembrane upper liner. Side slopes shall be no steeper than 2.5:1 H:V. The HDPE liner shall be secured in an engineered anchor trench around the impoundment perimeter. The impoundment is designed to hold solutions from a variety of source with a range of water chemistry ranging from clean water to PLS. In addition, the pond is designed to hold the volume of the 100-year, 24-hour design storm entering the pond from precipitation within the contributing watershed with a minimum of 2 feet of freeboard. Shore-mounted mechanical evaporators that receive incoming solutions by pipes connected directly to the units shall be installed. The eastern and parts of the northern and southern embankments of Evaporation Pond #1 shall be elevated relative to adjacent ground, and the remaining pond perimeter shall be at or below grade.
Stage 2 & 3 Ponds
Raffinate Pond – (Process Solution Pond): The Raffinate Pond is a double-lined pond with a leak collection and recovery system (LCRS) between the upper and lower liners. The impoundment dimensions are 375 feet by 250 feet, by 25 feet deep (including 2 feet freeboard) and has a total volume of 32.47 acre-feet (10.58 million gallons). The liner system from bottom to top shall consist of minimum 6 inch layer of compacted native or natural material overlain by minimum 6 inches of 3/8 inch minus native or natural materials compacted to achieve a saturated hydraulic conductance no greater than 10-6 cm/sec, a minimum 60-mil HDPE geomembrane lower liner, a minimum 200 mil HDPE geonet LCRS, and a minimum 60-mil HDPE geomembrane upper liner. Side slopes shall be no steeper than 2.5:1 H:V. The HDPE liner shall be secured in an engineered

anchor trench around the impoundment perimeter. Additionally, the pond is designed to hold the volume of the 100-year, 24-hour design storm entering the pond from precipitation within the contributing watershed with a minimum of 2 feet of freeboard. The perimeter embankments shall be elevated relative to adjacent ground or stormwater ditches installed in order to prevent inflow of surface drainage.

PLS Pond – (Process Solution Pond):

The PLS Pond is a double-lined pond with a leak collection and recovery system (LCRS) between the upper and lower liners. The impoundment dimensions are 375 feet by 250 feet, by 25 feet deep (including 2 feet freeboard) and has a total volume of 32.47 acre-feet (10.58 million gallons). The liner system from bottom to top shall consist of minimum 6 inch layer of compacted native or natural material overlain by minimum 6 inches of 3/8 inch minus native or natural materials compacted to achieve a saturated hydraulic conductance no greater than 10-6 cm/sec, a minimum 60-mil HDPE geomembrane lower liner, a minimum 200 mil HDPE geonet LCRS, and a minimum 60-mil HDPE geomembrane upper liner. Side slopes shall be no steeper than 2.5:1 H:V. The HDPE liner shall be secured in an engineered anchor trench around the impoundment perimeter. Additionally, the pond is designed to hold the volume of the 100-year, 24-hour design storm entering the pond from precipitation within the contributing watershed with a minimum of 2 feet of freeboard. The perimeter embankments shall be elevated relative to adjacent ground or stormwater ditches installed in order to prevent inflow of surface drainage.

Recycled Water Pond – (Process Solution Pond):

The Recycled Water Pond is a double-lined pond with a leak collection and recovery system (LCRS) between the upper and lower liners. The impoundment dimensions are 145 feet by 145 feet, by 16 feet deep (including 2 feet freeboard) and has a total volume of 4.12 acre-feet (1.34 million gallons). The liner system from bottom to top shall consist of minimum 6 inch layer of compacted native or natural material overlain by minimum 6 inches of 3/8 inch minus native or natural materials compacted to achieve a saturated hydraulic conductance no greater than 10-6 cm/sec, a minimum 60-mil HDPE geomembrane lower liner, a minimum 200 mil HDPE geonet LCRS, and a minimum 60-mil HDPE geomembrane upper liner. Side slopes shall be no steeper than 2.5:1 H:V. The HDPE liner shall be secured in an engineered anchor trench around the impoundment perimeter. The pond is designed to contain solutions in transition which are primarily considered diluted PLS. Additionally, the pond is designed to hold the volume of the 100-year, 24-hour design storm entering the pond from precipitation within the contributing watershed with a minimum of 2 feet of freeboard. The perimeter embankments shall be elevated relative to adjacent ground in order to prevent inflow of surface drainage.

Plant Runoff Pond – (Non-Stormwater Pond):

The Plant Runoff Pond is single-lined with a minimum 60-mil HDPE liner underlain by a minimum 6 inch thick layer of 3/8 inch minus native compacted to achieve a saturated hydraulic conductance no greater than 10^{-6} cm/s, which is underlain by 6 inch thick layer of compacted native material. The liner shall be secured in an engineered anchor trench. The impoundment dimensions are 230 feet by 230 feet, by 12 feet deep (including 2 feet freeboard) and has a total volume of 11.10 acre-feet (3.62 million gallons). Side slopes shall be no steeper than 2.5:1 H:V (horizontal to vertical). This pond is sized to contain direct precipitation and stormwater runoff from the processing plant area, including the 100-year, 24-hour design storm entering the pond from precipitation within the contributing watershed, with a minimum of 2 feet of freeboard. The perimeter embankments of the pond shall be elevated on three sides, and the west edge is designed to be at or grade or slightly below grade to promote inflow of surface drainage.

Solids Impoundment #1 and #2 – (Settling/Storage Pond):

The Solids Impoundments #1 and #2 are double-lined ponds with a leak collection and recovery system (LCRS) between the upper and lower liners. Each of the Solid Impoundments #1 and #2 contain two cells, and each cell is 595 feet by 515 feet by 42 feet deep (including 2 feet freeboard). Each impoundment (both cells) has a total volume of 353.40 acre-feet (115.16 million gallons). The liner system from bottom to top shall consist of minimum 6 inch layer of compacted native or natural material overlain by minimum 6 inches of 3/8 inch minus native or natural materials compacted to achieve a

saturated hydraulic conductance no greater than 10-6 cm/sec, a minimum 60-mil HDPE geomembrane lower liner, a minimum 200 mil HDPE geonet LCRS, and a minimum 60-mil HDPE geomembrane upper liner. Side slopes shall be no steeper than 2.5:1 H:V. The HDPE liner shall be secured in an engineered anchor trench around the impoundment perimeter. The pond shall be primarily be used for the storage of densified precipitate slurry solution from the Water Treatment Plant during Stages 2 and 3.

Table 4.1-10 Stage 1 Injection and Recovery Wells		
Well ID	**Latitude**	**Longitude**
IR_07_4926	32° 04' 50.79758N""	110° 02' 39.97794W"
IR_07_4927	32° 04' 50.79645N"	110° 02' 38.81558W"
IR_07_4928	32° 04' 50.79531N"	110° 02' 37.65323W"
IR_06_4929	32° 04' 50.79417N"	110° 02' 36.49088W"
IR_06_4930	32° 04' 50.79303N"	110° 02' 35.32852W"
IR_05_4931	32° 04' 50.79189N"	110° 02' 34.16617W"
IR_05_4932	32° 04' 50.79074N"	110° 02' 33.00381W"
IR_05_4933	32° 04' 50.78959N"	110° 02' 31.84146W"
IR_07_4994	32° 04' 51.78721N"	110° 02' 39.97662W"
IR_07_4995	32° 04' 51.78608N"	110° 02' 38.81426W"
IR_06_4996	32° 04' 51.78495N"	110° 02' 37.65191W"
IR_06_4997	32° 04' 51.78381N"	110° 02' 36.48955W"
IR_06_4998	32° 04' 51.78267N"	110° 02' 35.32719W"
IR_05_4999	32° 04' 51.78152N"	110° 02' 34.16484W"
IR_05_5000	32° 04' 51.78038N"	110° 02' 33.00248W"
IR_05_5001	32° 04' 51.77923N"	110° 02' 31.84012W"
IR_07_5062	32° 04' 52.77684N"	110° 02' 39.97531W"
IR_07_5063	32° 04' 52.77571N"	110° 02' 38.81295W"
IR_06_5064	32° 04' 52.77458N"	110° 02' 37.65059W"
IR_06_5065	32° 04' 52.77344N"	110° 02' 36.48823W"
IR_06_5066	32° 04' 52.77230N"	110° 02' 35.32586W"
IR_05_5067	32° 04' 52.77116N"	110° 02' 34.16351W"
IR_05_5068	32° 04' 52.77001N"	110° 02' 33.00114W"
IR_05_5069	32° 04' 52.76886N"	110° 02' 31.83878W"
IR_08_5129	32° 04' 53.76761N"	110° 02' 41.13636W"
IR_08_5130	32° 04' 53.76648N"	110° 02' 39.97400W"
IR_07_5131	32° 04' 53.76535N"	110° 02' 38.81163W"
IR_02_5132	32° 04' 53.76421N"	110° 02' 37.64927W"
IR_02_5133	32° 04' 53.76307N"	110° 02' 36.48690W"
IR_02_5134	32° 04' 53.76193N"	110° 02' 35.32454W"
IR_02_5135	32° 04' 53.76079N"	110° 02' 34.16217W"
IR_02_5136	32° 04' 53.75964N"	110° 02' 32.99981W"
IR_02_5137	32° 04' 53.75849N"	110° 02' 31.83745W"
IR_08_5197	32° 04' 54.75724N"	110° 02' 41.13505W"
IR_08_5198	32° 04' 54.75611N"	110° 02' 39.97268W"
IR_08_5199	32° 04' 54.75498N"	110° 02' 38.81031W"
IR_01_5200	32° 04' 54.75384N"	110° 02' 37.64795W"
IR_01_5201	32° 04' 54.75271N"	110° 02' 36.48558W"
IR_02_5202	32° 04' 54.75156N"	110° 02' 35.32321W"
IR_02_5203	32° 04' 54.75042N"	110° 02' 34.16084W"
IR_02_5204	32° 04' 54.74927N"	110° 02' 32.99847W"
IR_08_5265	32° 04' 55.74687N"	110° 02' 41.13374W"
IR_08_5266	32° 04' 55.74574N"	110° 02' 39.97137W"
IR_08_5267	32° 04' 55.74461N"	110° 02' 38.80900W"
IR_01_5268	32° 04' 55.74348N"	110° 02' 37.64663W"
IR_01_5269	32° 04' 55.74234N"	110° 02' 36.48425W"
IR_01_5270	32° 04' 55.74120N"	110° 02' 35.32188W"
IR_01_5271	32° 04' 55.74006N"	110° 02' 34.15951W"

IR_01_5272	32° 04' 55.73891N"	110° 02' 32.99714W"
IR_08_5334	32° 04' 56.73538N"	110° 02' 39.97005W"
IR_09_5335	32° 04' 56.73425N"	110° 02' 38.80768W"
IR_09_5336	32° 04' 56.73311N"	110° 02' 37.64531W"
IR_01_5337	32° 04' 56.73197N"	110° 02' 36.48293W"
IR_01_5338	32° 04' 56.73083N"	110° 02' 35.32055W"
IR_01_5339	32° 04' 56.72969N"	110° 02' 34.15818W"
IR_01_5340	32° 04' 56.72854N"	110° 02' 32.99580W"
IR_09_5403	32° 04' 57.72388N"	110° 02' 38.80636W"
IR_09_5404	32° 04' 57.72274N"	110° 02' 37.64398W"
IR_09_5405	32° 04' 57.72161N"	110° 02' 36.48160W"
IR_01_5406	32° 04' 57.72046N"	110° 02' 35.31922W"
IR_01_5407	32° 04' 57.71932N"	110° 02' 34.15685W"
IR_01_5408	32° 04' 57.71817N"	110° 02' 32.99447W"
IR_09_5471	32° 04' 58.71351N"	110° 02' 38.80504W"
IR_09_5472	32° 04' 58.71238N"	110° 02' 37.64266W"
IR_09_5473	32° 04' 58.71124N"	110° 02' 36.48028W"
IR_03_5474	32° 04' 58.71010N"	110° 02' 35.31790W"
IR_03_5475	32° 04' 58.70896N"	110° 02' 34.15552W"
IR_03_5476	32° 04' 58.70781N"	110° 02' 32.99313W"
IR_10_5538	32° 04' 59.70428N"	110° 02' 39.96611W"
IR_10_5539	32° 04' 59.70315N"	110° 02' 38.80373W"
IR_10_5540	32° 04' 59.70201N"	110° 02' 37.64134W"
IR_04_5541	32° 04' 59.70087N"	110° 02' 36.47896W"
IR_03_5542	32° 04' 59.69973N"	110° 02' 35.31657W"
IR_03_5543	32° 04' 59.69859N"	110° 02' 34.15419W"
IR_03_5544	32° 04' 59.69744N"	110° 02' 32.99180W"
IR_03_5545	32° 04' 59.69629N"	110° 02' 31.82942W"
IR_10_5606	32° 05' 00.69391N"	110° 02' 39.96480W"
IR_10_5607	32° 05' 00.69278N"	110° 02' 38.80241W"
IR_04_5608	32° 05' 00.69164N"	110° 02' 37.64002W"
IR_04_5609	32° 05' 00.69051N"	110° 02' 36.47763W"
IR_04_5610	32° 05' 00.68936N"	110° 02' 35.31524W"
IR_04_5611	32° 05' 00.68822N"	110° 02' 34.15285W"
IR_03_5612	32° 05' 00.68707N"	110° 02' 32.99046W"
IR_10_5674	32° 05' 01.68354N"	110° 02' 39.96348W"
IR_10_5675	32° 05' 01.68241N"	110° 02' 38.80109W"
IR_10_5676	32° 05' 01.68128N"	110° 02' 37.63870W"
IR_04_5677	32° 05' 01.68014N"	110° 02' 36.47631W"
IR_04_5678	32° 05' 01.67900N"	110° 02' 35.31391W"
IR_07_7631	32° 05' 50.30333N"	110° 02' 40.55977W"
IR_07_7632	32° 05' 51.29296N"	110° 02' 40.55846W"
IR_07_7633	32° 04' 51.29183N"	110° 02' 39.39610W"
IR_07_7634	32° 04' 50.30220N"	110° 02' 39.39742W"
IR_07_7639	32° 04' 50.30106N"	110° 02' 38.23507W"
IR_06_7640	32° 04' 51.29069N"	110° 02' 38.23375W"
IR_06_7641	32° 04' 51.28956N"	110° 02' 37.07139W"
IR_06_7642	32° 04' 50.29993N"	110° 02' 37.07271W"
IR_06_7647	32° 04' 50.29879N"	110° 02' 35.91036W"
IR_06_7648	32° 04' 51.28842N"	110° 02' 35.90904W"
IR_05_7655	32° 04' 50.29765N"	110° 02' 34.74801W"
IR_05_7656	32° 04' 51.28728N"	110° 02' 34.74668W"

IR_05_7657	32° 04' 51.28613N"	110° 02' 33.58433W"
IR_05_7658	32° 04' 50.29650N"	110° 02' 33.58566W"
IR_05_7665	32° 04' 50.29535N"	110° 02' 32.42331W"
IR_05_7666	32° 04' 51.28498N"	110° 02' 32.42197W"
IR_05_7667	32° 04' 51.28383N"	110° 02' 31.25961W"
IR_05_7668	32° 04' 50.29420N"	110° 02' 31.26095W"
IR_07_7713	32° 04' 52.28259N"	110° 02' 40.55715W"
IR_07_7714	32° 04' 52.28146N"	110° 02' 39.39479W"
IR_06_7715	32° 04' 52.28033N"	110° 02' 38.23243W"
IR_06_7716	32° 04' 52.27919N"	110° 02' 37.07007W"
IR_06_7717	32° 04' 52.27805N"	110° 02' 35.90771W"
IR_05_7718	32° 04' 52.27691N"	110° 02' 34.74535W"
IR_05_7719	32° 04' 52.27577N"	110° 02' 33.58299W"
IR_05_7720	32° 04' 52.27462N"	110° 02' 32.42063W"
IR_05_7721	32° 04' 52.27347N"	110° 02' 31.25827W"
IR_02_7728	32° 04' 53.26310N"	110° 02' 31.25693W"
IR_02_7729	32° 04' 53.26425N"	110° 02' 32.41930W"
IR_02_7730	32° 04' 53.26540N"	110° 02' 33.58166W"
IR_02_7731	32° 04' 53.26655N"	110° 02' 34.74402W"
IR_02_7732	32° 04' 53.26769N"	110° 02' 35.90638W"
IR_02_7733	32° 04' 53.26883N"	110° 02' 37.06874W"
IR_02_7734	32° 04' 53.26996N"	110° 02' 38.23111W"
IR_07_7735	32° 04' 53.27110N"	110° 02' 39.39347W"
IR_07_7736	32° 04' 53.27223N"	110° 02' 40.55583W"
IR_08_7737	32° 04' 53.27335N"	110° 02' 41.71820W"
IR_08_7738	32° 04' 54.26299N"	110° 02' 41.71689W"
IR_08_7739	32° 04' 54.26186N"	110° 02' 40.55452W"
IR_07_7740	32° 04' 54.26073N"	110° 02' 39.39216W"
IR_01_7741	32° 04' 54.25959N"	110° 02' 38.22979W"
IR_01_7742	32° 04' 54.25846N"	110° 02' 37.06742W"
IR_01_7743	32° 04' 54.25732N"	110° 02' 35.90506W"
IR_02_7744	32° 04' 54.25618N"	110° 02' 34.74269W"
IR_02_7745	32° 04' 54.25503N"	110° 02' 33.58033W"
IR_02_7746	32° 04' 54.25389N"	110° 02' 32.41796W"
IR_02_7747	32° 04' 54.25273N"	110° 02' 31.25559W"
IR_08_7808	32° 04' 55.25262N"	110° 02' 41.71558W"
IR_08_7807	32° 04' 55.25149N"	110° 02' 40.55321W"
IR_08_7806	32° 04' 55.25036N"	110° 02' 39.39084W"
IR_01_7805	32° 04' 55.24923N"	110° 02' 38.22847W"
IR_01_7804	32° 04' 55.24809N"	110° 02' 37.06610W"
IR_01_7803	32° 04' 55.24695N"	110° 02' 35.90373W"
IR_10_7849	32° 05' 02.17666N"	110° 02' 38.21924W"
IR_01_7802	32° 04' 55.24581N"	110° 02' 34.74136W"
IR_04_7850	32° 05' 01.18703N"	110° 02' 38.22055W"
IR_01_7801	32° 04' 55.24467N"	110° 02' 33.57899W"
IR_04_7851	32° 05' 00.19739N"	110° 02' 38.22187W"
IR_01_7800	32° 04' 55.24352N"	110° 02' 32.41662W"
IR_09_7852	32° 04' 59.20776N"	110° 02' 38.22319W"
IR_04_7853	32° 04' 59.20662N"	110° 02' 37.06081W"
IR_03_7854	32° 04' 59.20549N"	110° 02' 35.89843W"
IR_03_7855	32° 04' 59.20434N"	110° 02' 34.73604W"
IR_03_7856	32° 04' 59.20320N"	110° 02' 33.57366W"

IR_03_7857	32° 04' 59.20205N"	110° 02' 32.41128W"
IR_03_7858	32° 04' 59.20090N"	110° 02' 31.24889W"
IR_01_7791	32° 04' 56.23315N"	110° 02' 32.41529W"
IR_01_7790	32° 04' 56.23430N"	110° 02' 33.57766W"
IR_01_7789	32° 04' 56.23544N"	110° 02' 34.74003W"
IR_01_7788	32° 04' 56.23659N"	110° 02' 35.90241W"
IR_01_7787	32° 04' 56.23772N"	110° 02' 37.06478W"
IR_03_7865	32° 05' 00.19053N"	110° 02' 31.24755W"
IR_01_7786	32° 04' 56.23886N"	110° 02' 38.22715W"
IR_03_7866	32° 05' 00.19168N"	110° 02' 32.40994W"
IR_08_7785	32° 04' 56.23999N"	110° 02' 39.38953W"
IR_03_7867	32° 05' 01.18132N"	110° 02' 32.40860W"
IR_08_7784	32° 04' 56.24112N"	110° 02' 40.55190W"
IR_08_7783	32° 04' 56.24225N"	110° 02' 41.71427W"
IR_04_7898	32° 05' 00.19626N"	110° 02' 37.05949W"
IR_03_7897	32° 05' 00.19512N"	110° 02' 35.89710W"
IR_03_7896	32° 05' 00.19398N"	110° 02' 34.73471W"
IR_08_7777	32° 04' 57.23076N"	110° 02' 40.55058W"
IR_03_7895	32° 05' 00.19283N"	110° 02' 33.57233W"
IR_08_7776	32° 04' 57.22963N"	110° 02' 39.38821W"
IR_03_7894	32° 05' 01.18246N"	110° 02' 33.57099W"
IR_09_7775	32° 04' 57.22850N"	110° 02' 38.22583W"
IR_04_7893	32° 05' 01.18361N"	110° 02' 34.73338W"
IR_01_7774	32° 04' 57.22736N"	110° 02' 37.06345W"
IR_04_7892	32° 05' 01.18475N"	110° 02' 35.89577W"
IR_01_7773	32° 04' 57.22622N"	110° 02' 35.90108W"
IR_04_7891	32° 05' 01.18589N"	110° 02' 37.05816W"
IR_01_7772	32° 04' 57.22508N"	110° 02' 34.73870W"
IR_04_7890	32° 05' 02.17552N"	110° 02' 37.05684W"
IR_01_7771	32° 04' 57.22393N"	110° 02' 33.57633W"
IR_04_7889	32° 05' 02.17438N"	110° 02' 35.89445W"
IR_01_7770	32° 04' 57.22279N"	110° 02' 32.41395W"
IR_04_7888	32° 05' 02.17324N"	110° 02' 34.73205W"
IR_01_7761	32° 04' 58.21242N"	110° 02' 32.41261W"
IR_01_7760	32° 04' 58.21357N"	110° 02' 33.57499W"
IR_01_7759	32° 04' 58.21471N"	110° 02' 34.73737W"
IR_01_7758	32° 04' 58.21585N"	110° 02' 35.89975W"
IR_09_7757	32° 04' 58.21699N"	110° 02' 37.06213W"
IR_09_7756	32° 04' 58.21813N"	110° 02' 38.22451W"
IR_09_7755	32° 04' 58.21926N"	110° 02' 39.38689W"
IR_10_7829	32° 04' 59.21002N"	110° 02' 40.54796W"
IR_10_7830	32° 05' 00.19966N"	110° 02' 40.54665W"
IR_10_7831	32° 05' 01.18929N"	110° 02' 40.54533W"
IR_10_7832	32° 05' 02.17892N"	110° 02' 40.54402W"
IR_10_7840	32° 05' 02.17779N"	110° 02' 39.38163W"
IR_10_7841	32° 05' 01.18816N"	110° 02' 39.38295W"
IR_10_7842	32° 05' 00.19853N"	110° 02' 39.38426W"
IR_09_7843	32° 04' 59.20889N"	110° 02' 39.38558W"

Table 4.1-11 Stage 2 Injection and Recovery Wells		
Well ID	**Latitude**	**Longitude**
IR_12_4924	32° 04' 50.79983N"	110° 02' 42.30265W"
IR_12_4925	32° 04' 50.79871N"	110° 02' 41.14029W"
IR_12_4992	32° 04' 51.78947N"	110° 02' 42.30134W"
IR_12_4993	32° 04' 51.78834N"	110° 02' 41.13898W"
IR_12_5059	32° 04' 52.78022N"	110° 02' 43.46239W"
IR_12_5060	32° 04' 52.77910N"	110° 02' 42.30003W"
IR_12_5061	32° 04' 52.77797N"	110° 02' 41.13767W"
IR_12_5127	32° 04' 53.76985N"	110° 02' 43.46109W"
IR_12_5128	32° 04' 53.76873N"	110° 02' 42.29872W"
IR_12_5195	32° 04' 54.75949N"	110° 02' 43.45979W"
IR_12_5196	32° 04' 54.75836N"	110° 02' 42.29742W"
IR_13_5205	32° 04' 54.74813N"	110° 02' 31.83611W"
IR_13_5206	32° 04' 54.74697N"	110° 02' 30.67374W"
IR_12_5264	32° 04' 55.74800N"	110° 02' 42.29611W"
IR_13_5273	32° 04' 55.73776N"	110° 02' 31.83477W"
IR_13_5274	32° 04' 55.73661N"	110° 02' 30.67240W"
IR_13_5275	32° 04' 55.73545N"	110° 02' 29.51002W"
IR_13_5276	32° 04' 55.73429N"	110° 02' 28.34766W"
IR_12_5331	32° 04' 56.73876N"	110° 02' 43.45718W"
IR_12_5332	32° 04' 56.73763N"	110° 02' 42.29480W"
IR_12_5333	32° 04' 56.73651N"	110° 02' 41.13243W"
IR_13_5341	32° 04' 56.72739N"	110° 02' 31.83343W"
IR_13_5342	32° 04' 56.72624N"	110° 02' 30.67106W"
IR_13_5343	32° 04' 56.72509N"	110° 02' 29.50868W"
IR_13_5344	32° 04' 56.72393N"	110° 02' 28.34631W"
IR_12_5398	32° 04' 57.73623N"	110° 02' 44.46488W"
IR_12_5399	32° 04' 57.72839N"	110° 02' 43.45588W"
IR_12_5400	32° 04' 57.72726N"	110° 02' 42.29350W"
IR_12_5401	32° 04' 57.72614N"	110° 02' 41.13112W"
IR_12_5402	32° 04' 57.72501N"	110° 02' 39.96874W"
IR_13_5409	32° 04' 57.71703N"	110° 02' 31.83209W"
IR_13_5410	32° 04' 57.71587N"	110° 02' 30.66971W"
IR_13_5411	32° 04' 57.71472N"	110° 02' 29.50733W"
IR_13_5412	32° 04' 57.71356N"	110° 02' 28.34496W"
IR_12_5468	32° 04' 58.71690N"	110° 02' 42.29219W"
IR_12_5469	32° 04' 58.71577N"	110° 02' 41.12981W"
IR_12_5470	32° 04' 58.71464N"	110° 02' 39.96743W"
IR_13_5477	32° 04' 58.70666N"	110° 02' 31.83075W"
IR_13_5478	32° 04' 58.70551N"	110° 02' 30.66837W"
IR_13_5479	32° 04' 58.70435N"	110° 02' 29.50599W"
IR_13_5480	32° 04' 58.70319N"	110° 02' 28.34361W"
IR_12_5534	32° 04' 59.70864N"	110° 02' 44.47035W"
IR_12_5535	32° 04' 59.70766N"	110° 02' 43.45327W"
IR_12_5536	32° 04' 59.70653N"	110° 02' 42.29088W"
IR_12_5537	32° 04' 59.70541N"	110° 02' 41.12850W"
IR_13_5546	32° 04' 59.69514N"	110° 02' 30.66703W"
IR_13_5547	32° 04' 59.69399N"	110° 02' 29.50464W"
IR_13_5548	32° 04' 59.69283N"	110° 02' 28.34226W"

IR_11_5602	32° 05' 00.69827N"	110° 02' 44.46905W"
IR_11_5603	32° 05' 00.69729N"	110° 02' 43.45196W"
IR_11_5604	32° 05' 00.69616N"	110° 02' 42.28957W"
IR_11_5605	32° 05' 00.69504N"	110° 02' 41.12719W"
IR_13_5613	32° 05' 00.68593N"	110° 02' 31.82808W"
IR_13_5614	32° 05' 00.68477N"	110° 02' 30.66569W"
IR_13_5615	32° 05' 00.68362N"	110° 02' 29.50330W"
IR_13_5616	32° 05' 00.68246N"	110° 02' 28.34091W"
IR_11_5670	32° 05' 01.68789N"	110° 02' 44.45968W"
IR_11_5671	32° 05' 01.68692N"	110° 02' 43.45066W"
IR_11_5672	32° 05' 01.68580N"	110° 02' 42.28827W"
IR_11_5673	32° 05' 01.68467N"	110° 02' 41.12588W"
IR_11_5679	32° 05' 01.67786N"	110° 02' 34.15152W"
IR_11_5680	32° 05' 01.67671N"	110° 02' 32.98913W"
IR_11_5739	32° 05' 02.67655N"	110° 02' 43.44936W"
IR_11_5740	32° 05' 02.67543N"	110° 02' 42.28696W"
IR_11_5741	32° 05' 02.67430N"	110° 02' 41.12457W"
IR_11_5742	32° 05' 02.67317N"	110° 02' 39.96217W"
IR_11_5743	32° 05' 02.67204N"	110° 02' 38.79977W"
IR_11_5744	32° 05' 02.67091N"	110° 02' 37.63738W"
IR_11_5745	32° 05' 02.66977N"	110° 02' 36.47498W"
IR_11_5746	32° 05' 02.66863N"	110° 02' 35.31258W"
IR_11_5747	32° 05' 02.66749N"	110° 02' 34.15019W"
IR_11_5748	32° 05' 02.66634N"	110° 02' 32.98779W"
IR_11_5809	32° 05' 03.66394N"	110° 02' 41.12326W"
IR_11_5810	32° 05' 03.66281N"	110° 02' 39.96086W"
IR_11_5811	32° 05' 03.66168N"	110° 02' 38.79845W"
IR_11_5812	32° 05' 03.66054N"	110° 02' 37.63606W"
IR_11_5813	32° 05' 03.65940N"	110° 02' 36.47366W"
IR_11_5814	32° 05' 03.65826N"	110° 02' 35.31126W"
IR_11_5815	32° 05' 03.65712N"	110° 02' 34.14886W"
IR_11_5816	32° 05' 03.65597N"	110° 02' 32.98646W"
IR_11_5878	32° 05' 04.65244N"	110° 02' 39.95954W"
IR_11_5879	32° 05' 04.65131N"	110° 02' 38.79714W"
IR_11_5880	32° 05' 04.65018N"	110° 02' 37.63474W"
IR_11_5881	32° 05' 04.64904N"	110° 02' 36.47233W"
IR_11_5882	32° 05' 04.64790N"	110° 02' 35.30993W"
IR_11_5883	32° 05' 04.64675N"	110° 02' 34.14753W"
IR_11_5884	32° 05' 04.64561N"	110° 02' 32.98512W"
IR_11_5947	32° 05' 05.64094N"	110° 02' 38.79582W"
IR_11_5948	32° 05' 05.63981N"	110° 02' 37.63342W"
IR_11_5949	32° 05' 05.63867N"	110° 02' 36.47101W"
IR_11_6016	32° 05' 06.62944N"	110° 02' 37.63209W"
IR_11_6017	32° 05' 06.62830N"	110° 02' 36.46968W"
IR_12_7623	32° 04' 50.30558N"	110° 02' 42.88447W"
IR_12_7624	32° 04' 51.29521N"	110° 02' 42.88317W"
IR_12_7625	32° 04' 51.29408N"	110° 02' 41.72081W"
IR_12_7626	32° 04' 50.30445N"	110° 02' 41.72212W"
IR_07_7631	32° 04' 50.30333N"	110° 02' 40.55977W"
IR_07_7632	32° 04' 51.29296N"	110° 02' 40.55846W"
IR_12_7704	32° 04' 52.28484N"	110° 02' 42.88186W"
IR_12_7705	32° 04' 52.28596N"	110° 02' 44.04422W"

IR_12_7706	32° 04' 53.27560N"	110° 02' 44.04292W"
IR_12_7707	32° 04' 54.26523N"	110° 02' 44.04162W"
IR_12_7708	32° 04' 55.25487N"	110° 02' 44.04032W"
IR_12_7709	32° 04' 55.25374N"	110° 02' 42.87795W"
IR_12_7710	32° 04' 54.26411N"	110° 02' 42.87925W"
IR_12_7711	32° 04' 53.27448N"	110° 02' 42.88056W"
IR_12_7712	32° 04' 52.28372N"	110° 02' 41.71951W"
IR_07_7713	32° 04' 52.28259N"	110° 02' 40.55715W"
IR_07_7736	32° 04' 53.27223N"	110° 02' 40.55583W"
IR_08_7737	32° 04' 53.27335N"	110° 02' 41.71820W"
IR_08_7738	32° 04' 54.26299N"	110° 02' 41.71689W"
IR_02_7746	32° 04' 54.25389N"	110° 02' 32.41796W"
IR_02_7747	32° 04' 54.25273N"	110° 02' 31.25559W"
IR_13_7748	32° 04' 54.25158N"	110° 02' 30.09323W"
IR_08_7808	32° 04' 55.25262N"	110° 02' 41.71558W"
IR_11_7844	32° 05' 06.95279N"	110° 02' 37.98584W"
IR_11_7845	32° 05' 06.13519N"	110° 02' 38.21396W"
IR_11_7846	32° 05' 05.14556N"	110° 02' 38.21528W"
IR_11_7847	32° 05' 04.15593N"	110° 02' 38.21660W"
IR_11_7848	32° 05' 03.16629N"	110° 02' 38.21792W"
IR_10_7849	32° 05' 02.17666N"	110° 02' 38.21924W"
IR_01_7800	32° 04' 55.24352N"	110° 02' 32.41662W"
IR_13_7799	32° 04' 55.24237N"	110° 02' 31.25425W"
IR_13_7798	32° 04' 55.24121N"	110° 02' 30.09188W"
IR_13_7797	32° 04' 55.24006N"	110° 02' 28.92951W"
IR_13_7796	32° 04' 55.23890N"	110° 02' 27.76715W"
IR_13_7795	32° 04' 56.22853N"	110° 02' 27.76580W"
IR_03_7857	32° 04' 59.20205N"	110° 02' 32.41128W"
IR_13_7794	32° 04' 56.22969N"	110° 02' 28.92817W"
IR_03_7858	32° 04' 59.20090N"	110° 02' 31.24889W"
IR_13_7793	32° 04' 56.23085N"	110° 02' 30.09054W"
IR_13_7792	32° 04' 56.23200N"	110° 02' 31.25291W"
IR_13_7859	32° 04' 59.19975N"	110° 02' 30.08651W"
IR_01_7791	32° 04' 56.23315N"	110° 02' 32.41529W"
IR_13_7860	32° 04' 59.19859N"	110° 02' 28.92412W"
IR_13_7861	32° 04' 59.19743N"	110° 02' 27.76174W"
IR_13_7862	32° 05' 00.18706N"	110° 02' 27.76039W"
IR_13_7863	32° 05' 00.18822N"	110° 02' 28.92278W"
IR_13_7864	32° 05' 00.18938N"	110° 02' 30.08517W"
IR_03_7865	32° 05' 00.19053N"	110° 02' 31.24755W"
IR_03_7866	32° 05' 00.19168N"	110° 02' 32.40994W"
IR_03_7867	32° 05' 01.18132N"	110° 02' 32.40860W"
IR_08_7784	32° 04' 56.24112N"	110° 02' 40.55190W"
IR_13_7868	32° 05' 01.18016N"	110° 02' 31.24621W"
IR_08_7783	32° 04' 56.24225N"	110° 02' 41.71427W"
IR_12_7782	32° 04' 56.24338N"	110° 02' 42.87664W"
IR_13_7869	32° 05' 01.17901N"	110° 02' 30.08382W"
IR_12_7781	32° 04' 56.24450N"	110° 02' 44.03902W"
IR_13_7870	32° 05' 01.17785N"	110° 02' 28.92143W"
IR_12_7780	32° 04' 57.23413N"	110° 02' 44.03771W"
IR_13_7871	32° 05' 01.17669N"	110° 02' 27.75904W"
IR_12_7779	32° 04' 57.23301N"	110° 02' 42.87534W"

IR_12_7778	32° 04' 57.23189N"	110° 02' 41.71296W"
IR_08_7777	32° 04' 57.23076N"	110° 02' 40.55058W"
IR_08_7776	32° 04' 57.22963N"	110° 02' 39.38821W"
IR_03_7894	32° 05' 01.18246N"	110° 02' 33.57099W"
IR_04_7893	32° 05' 01.18361N"	110° 02' 34.73338W"
IR_04_7890	32° 05' 02.17552N"	110° 02' 37.05684W"
IR_04_7889	32° 05' 02.17438N"	110° 02' 35.89445W"
IR_01_7770	32° 04' 57.22279N"	110° 02' 32.41395W"
IR_04_7888	32° 05' 02.17324N"	110° 02' 34.73205W"
IR_13_7769	32° 04' 57.22163N"	110° 02' 31.25157W"
IR_11_7887	32° 05' 02.17210N"	110° 02' 33.56966W"
IR_13_7768	32° 04' 57.22048N"	110° 02' 30.08920W"
IR_11_7886	32° 05' 02.17095N"	110° 02' 32.40727W"
IR_13_7767	32° 04' 57.21932N"	110° 02' 28.92682W"
IR_13_7766	32° 04' 57.21816N"	110° 02' 27.76444W"
IR_11_7884	32° 05' 03.16173N"	110° 02' 33.56833W"
IR_13_7765	32° 04' 58.20780N"	110° 02' 27.76309W"
IR_11_7883	32° 05' 03.16288N"	110° 02' 34.73072W"
IR_13_7764	32° 04' 58.20896N"	110° 02' 28.92547W"
IR_11_7882	32° 05' 03.16402N"	110° 02' 35.89312W"
IR_13_7763	32° 04' 58.21011N"	110° 02' 30.08785W"
IR_11_7881	32° 05' 03.16516N"	110° 02' 37.05552W"
IR_13_7762	32° 04' 58.21127N"	110° 02' 31.25023W"
IR_11_7880	32° 05' 04.15479N"	110° 02' 37.05419W"
IR_01_7761	32° 04' 58.21242N"	110° 02' 32.41261W"
IR_11_7879	32° 05' 04.15365N"	110° 02' 35.89180W"
IR_11_7878	32° 05' 04.15251N"	110° 02' 34.72939W"
IR_11_7877	32° 05' 04.15136N"	110° 02' 33.56699W"
IR_11_7876	32° 05' 04.15021N"	110° 02' 32.40459W"
IR_11_7875	32° 05' 05.13985N"	110° 02' 32.40326W"
IR_11_7874	32° 05' 05.14100N"	110° 02' 33.56566W"
IR_09_7755	32° 04' 58.21926N"	110° 02' 39.38689W"
IR_11_7873	32° 05' 05.14214N"	110° 02' 34.72806W"
IR_12_7754	32° 04' 58.22039N"	110° 02' 40.54927W"
IR_11_7872	32° 05' 05.14328N"	110° 02' 35.89047W"
IR_12_7753	32° 04' 58.22152N"	110° 02' 41.71165W"
IR_12_7752	32° 04' 58.22264N"	110° 02' 42.87403W"
IR_11_7905	32° 05' 05.14442N"	110° 02' 37.05287W"
IR_12_7751	32° 04' 58.22377N"	110° 02' 44.03641W"
IR_11_7904	32° 05' 06.13405N"	110° 02' 37.05155W"
IR_12_7809	32° 04' 58.22461N"	110° 02' 44.91477W"
IR_11_7903	32° 05' 06.13291N"	110° 02' 35.88914W"
IR_12_7810	32° 04' 57.23498N"	110° 02' 44.91607W"
IR_11_7902	32° 05' 07.12255N"	110° 02' 35.88782W"
IR_12_7811	32° 04' 59.21423N"	110° 02' 44.90540W"
IR_11_7901	32° 05' 07.12369N"	110° 02' 37.05023W"
IR_11_7812	32° 05' 00.20387N"	110° 02' 44.90410W"
IR_11_7900	32° 05' 04.15932N"	110° 02' 41.70380W"
IR_11_7813	32° 05' 01.19350N"	110° 02' 44.90280W"
IR_11_7899	32° 05' 03.17193N"	110° 02' 44.02990W"
IR_11_7814	32° 05' 02.18313N"	110° 02' 44.90150W"
IR_11_7815	32° 05' 02.18230N"	110° 02' 44.03121W"

IR_11_7816	32° 05' 01.19266N"	110° 02' 44.03251W"
IR_11_7817	32° 05' 00.20303N"	110° 02' 44.03381W"
IR_12_7818	32° 04' 59.21340N"	110° 02' 44.03511W"
IR_12_7819	32° 04' 59.21228N"	110° 02' 42.87273W"
IR_11_7820	32° 05' 00.20191N"	110° 02' 42.87142W"
IR_11_7821	32° 05' 01.19154N"	110° 02' 42.87012W"
IR_11_7822	32° 05' 02.18118N"	110° 02' 42.86881W"
IR_11_7823	32° 05' 03.17081N"	110° 02' 42.86750W"
IR_11_7824	32° 05' 03.16968N"	110° 02' 41.70511W"
IR_11_7825	32° 05' 02.18005N"	110° 02' 41.70642W"
IR_11_7826	32° 05' 01.19042N"	110° 02' 41.70773W"
IR_11_7827	32° 05' 00.20079N"	110° 02' 41.70904W"
IR_12_7828	32° 04' 59.21115N"	110° 02' 41.71034W"
IR_10_7829	32° 04' 59.21002N"	110° 02' 40.54796W"
IR_10_7830	32° 05' 00.19966N"	110° 02' 40.54665W"
IR_10_7831	32° 05' 01.18929N"	110° 02' 40.54533W"
IR_10_7832	32° 05' 02.17892N"	110° 02' 40.54402W"
IR_11_7833	32° 05' 03.16856N"	110° 02' 40.54271W"
IR_11_7834	32° 05' 04.15819N"	110° 02' 40.54140W"
IR_11_7835	32° 05' 05.14782N"	110° 02' 40.54009W"
IR_11_7836	32° 05' 06.13632N"	110° 02' 39.37637W"
IR_11_7837	32° 05' 05.14669N"	110° 02' 39.37768W"
IR_11_7838	32° 05' 04.15706N"	110° 02' 39.37900W"
IR_11_7839	32° 05' 03.16743N"	110° 02' 39.38031W"
IR_10_7840	32° 05' 02.17779N"	110° 02' 39.38163W"
IR_09_7843	32° 04' 59.20889N"	110° 02' 39.38558W"

Table 4.1-12 Stage 3 Injection and Recovery Wells		
IR_14_4788	32° 04' 48.75025N"	110° 02' 42.30427W"
IR_14_4789	32° 04' 48.74913N"	110° 02' 41.14192W"
IR_14_4790	32° 04' 48.74800N"	110° 02' 39.97958W"
IR_14_4791	32° 04' 48.74687N"	110° 02' 38.81723W"
IR_14_4792	32° 04' 48.74573N"	110° 02' 37.65488W"
IR_14_4793	32° 04' 48.74460N"	110° 02' 36.49253W"
IR_14_4794	32° 04' 48.74346N"	110° 02' 35.33019W"
IR_14_4795	32° 04' 48.74231N"	110° 02' 34.16784W"
IR_14_4796	32° 04' 48.74117N"	110° 02' 33.00550W"
IR_14_4797	32° 04' 48.74002N"	110° 02' 31.84315W"
IR_14_4798	32° 04' 48.73886N"	110° 02' 30.68080W"
IR_14_4799	32° 04' 48.73771N"	110° 02' 29.51846W"
IR_14_4800	32° 04' 48.73655N"	110° 02' 28.35611W"
IR_14_4801	32° 04' 48.73539N"	110° 02' 27.19376W"
IR_14_4802	32° 04' 48.73423N"	110° 02' 26.03142W"
IR_14_4803	32° 04' 48.73306N"	110° 02' 24.86907W"
IR_14_4804	32° 04' 48.73189N"	110° 02' 23.70672W"
IR_14_4805	32° 04' 48.73072N"	110° 02' 22.54438W"
IR_14_4806	32° 04' 48.72954N"	110° 02' 21.38203W"
IR_14_4807	32° 04' 48.72836N"	110° 02' 20.21968W"
IR_14_4856	32° 04' 49.81020N"	110° 02' 42.30395W"
IR_14_4857	32° 04' 49.80907N"	110° 02' 41.14160W"
IR_14_4858	32° 04' 49.80794N"	110° 02' 39.97925W"
IR_14_4859	32° 04' 49.80681N"	110° 02' 38.81690W"
IR_14_4860	32° 04' 49.80568N"	110° 02' 37.65455W"
IR_14_4861	32° 04' 49.80454N"	110° 02' 36.49220W"
IR_14_4862	32° 04' 49.80340N"	110° 02' 35.32985W"
IR_14_4863	32° 04' 49.80225N"	110° 02' 34.16750W"
IR_14_4864	32° 04' 49.80111N"	110° 02' 33.00515W"
IR_14_4865	32° 04' 49.79996N"	110° 02' 31.84280W"
IR_14_4866	32° 04' 49.79881N"	110° 02' 30.68045W"
IR_14_4867	32° 04' 49.79765N"	110° 02' 29.51810W"
IR_14_4868	32° 04' 49.79649N"	110° 02' 28.35575W"
IR_14_4869	32° 04' 49.79533N"	110° 02' 27.19340W"
IR_14_4870	32° 04' 49.79417N"	110° 02' 26.03105W"
IR_14_4871	32° 04' 49.79300N"	110° 02' 24.86870W"
IR_14_4872	32° 04' 49.79183N"	110° 02' 23.70634W"
IR_14_4873	32° 04' 49.79066N"	110° 02' 22.54400W"
IR_14_4874	32° 04' 49.78948N"	110° 02' 21.38164W"
IR_14_4875	32° 04' 49.78830N"	110° 02' 20.21930W"
IR_14_4876	32° 04' 49.78712N"	110° 02' 19.05694W"
IR_14_4934	32° 04' 50.78844N"	110° 02' 30.67911W"
IR_14_4935	32° 04' 50.78729N"	110° 02' 29.51675W"
IR_14_4936	32° 04' 50.78613N"	110° 02' 28.35440W"
IR_14_4937	32° 04' 50.78497N"	110° 02' 27.19204W"
IR_14_4938	32° 04' 50.78380N"	110° 02' 26.02969W"
IR_14_4939	32° 04' 50.78264N"	110° 02' 24.86734W"
IR_14_4940	32° 04' 50.78147N"	110° 02' 23.70498W"
IR_14_4941	32° 04' 50.78029N"	110° 02' 22.54263W"

IR_14_4942	32° 04' 50.77912N"	110° 02' 21.38027W"
IR_14_4943	32° 04' 50.77794N"	110° 02' 20.21792W"
IR_14_4944	32° 04' 50.77676N"	110° 02' 19.05557W"
IR_14_5002	32° 04' 51.77808N"	110° 02' 30.67776W"
IR_14_5003	32° 04' 51.77692N"	110° 02' 29.51541W"
IR_14_5004	32° 04' 51.77576N"	110° 02' 28.35305W"
IR_14_5005	32° 04' 51.77460N"	110° 02' 27.19069W"
IR_14_5006	32° 04' 51.77344N"	110° 02' 26.02834W"
IR_14_5007	32° 04' 51.77227N"	110° 02' 24.86598W"
IR_14_5008	32° 04' 51.77110N"	110° 02' 23.70362W"
IR_14_5009	32° 04' 51.76993N"	110° 02' 22.54126W"
IR_14_5010	32° 04' 51.76875N"	110° 02' 21.37891W"
IR_14_5011	32° 04' 51.76757N"	110° 02' 20.21655W"
IR_14_5012	32° 04' 51.76639N"	110° 02' 19.05419W"
IR_14_5070	32° 04' 52.76771N"	110° 02' 30.67642W"
IR_14_5071	32° 04' 52.76655N"	110° 02' 29.51406W"
IR_14_5072	32° 04' 52.76539N"	110° 02' 28.35170W"
IR_14_5073	32° 04' 52.76423N"	110° 02' 27.18934W"
IR_14_5074	32° 04' 52.76307N"	110° 02' 26.02698W"
IR_14_5075	32° 04' 52.76190N"	110° 02' 24.86462W"
IR_14_5076	32° 04' 52.76073N"	110° 02' 23.70226W"
IR_14_5077	32° 04' 52.75956N"	110° 02' 22.53990W"
IR_14_5078	32° 04' 52.75838N"	110° 02' 21.37754W"
IR_14_5138	32° 04' 53.75734N"	110° 02' 30.67508W"
IR_14_5139	32° 04' 53.75619N"	110° 02' 29.51271W"
IR_14_5140	32° 04' 53.75503N"	110° 02' 28.35035W"
IR_14_5141	32° 04' 53.75387N"	110° 02' 27.18799W"
IR_14_5142	32° 04' 53.75270N"	110° 02' 26.02562W"
IR_14_5143	32° 04' 53.75154N"	110° 02' 24.86326W"
IR_14_5144	32° 04' 53.75037N"	110° 02' 23.70089W"
IR_14_5145	32° 04' 53.74919N"	110° 02' 22.53853W"
IR_14_5207	32° 04' 54.74582N"	110° 02' 29.51137W"
IR_14_5208	32° 04' 54.74466N"	110° 02' 28.34900W"
IR_14_5209	32° 04' 54.74350N"	110° 02' 27.18663W"
IR_14_5210	32° 04' 54.74233N"	110° 02' 26.02427W"
IR_15_5211	32° 04' 54.74117N"	110° 02' 24.86190W"
IR_15_5212	32° 04' 54.74000N"	110° 02' 23.69953W"
IR_15_5213	32° 04' 54.73882N"	110° 02' 22.53717W"
IR_15_5214	32° 04' 54.73765N"	110° 02' 21.37480W"
IR_15_5215	32° 04' 54.73647N"	110° 02' 20.21243W"
IR_15_5277	32° 04' 55.73313N"	110° 02' 27.18528W"
IR_15_5278	32° 04' 55.73197N"	110° 02' 26.02291W"
IR_15_5279	32° 04' 55.73080N"	110° 02' 24.86054W"
IR_15_5280	32° 04' 55.72963N"	110° 02' 23.69817W"
IR_15_5281	32° 04' 55.72846N"	110° 02' 22.53580W"
IR_15_5282	32° 04' 55.72728N"	110° 02' 21.37343W"
IR_15_5283	32° 04' 55.72610N"	110° 02' 20.21106W"
IR_15_5345	32° 04' 56.72277N"	110° 02' 27.18393W"
IR_15_5346	32° 04' 56.72160N"	110° 02' 26.02156W"
IR_15_5347	32° 04' 56.72044N"	110° 02' 24.85918W"
IR_15_5348	32° 04' 56.71927N"	110° 02' 23.69681W"
IR_15_5349	32° 04' 56.71809N"	110° 02' 22.53443W"

IR_15_5350	32° 04' 56.71692N"	110° 02' 21.37206W"
IR_15_5351	32° 04' 56.71574N"	110° 02' 20.20968W"
IR_15_5413	32° 04' 57.71240N"	110° 02' 27.18258W"
IR_15_5414	32° 04' 57.71123N"	110° 02' 26.02020W"
IR_15_5415	32° 04' 57.71007N"	110° 02' 24.85782W"
IR_15_5481	32° 04' 58.70203N"	110° 02' 27.18123W"
IR_15_5482	32° 04' 58.70087N"	110° 02' 26.01885W"
IR_15_5483	32° 04' 58.69970N"	110° 02' 24.85646W"
IR_15_5484	32° 04' 58.69853N"	110° 02' 23.69408W"
IR_15_5485	32° 04' 58.69736N"	110° 02' 22.53170W"
IR_15_5486	32° 04' 58.69618N"	110° 02' 21.36932W"
IR_15_5549	32° 04' 59.69167N"	110° 02' 27.17987W"
IR_15_5550	32° 04' 59.69050N"	110° 02' 26.01749W"
IR_15_5551	32° 04' 59.68934N"	110° 02' 24.85510W"
IR_15_5552	32° 04' 59.68817N"	110° 02' 23.69272W"
IR_15_5553	32° 04' 59.68699N"	110° 02' 22.53033W"
IR_15_5554	32° 04' 59.68582N"	110° 02' 21.36795W"
IR_15_5617	32° 05' 00.68130N"	110° 02' 27.17852W"
IR_15_5618	32° 05' 00.68013N"	110° 02' 26.01613W"
IR_15_5619	32° 05' 00.67897N"	110° 02' 24.85374W"
IR_15_5620	32° 05' 00.67780N"	110° 02' 23.69135W"
IR_15_5654	32° 05' 01.70555N"	110° 03' 03.21133W"
IR_15_5655	32° 05' 01.70448N"	110° 03' 02.04894W"
IR_15_5656	32° 05' 01.70341N"	110° 03' 00.88655W"
IR_15_5657	32° 05' 01.70233N"	110° 02' 59.72415W"
IR_15_5658	32° 05' 01.70125N"	110° 02' 58.56176W"
IR_15_5659	32° 05' 01.70016N"	110° 02' 57.39937W"
IR_15_5660	32° 05' 01.69908N"	110° 02' 56.23697W"
IR_15_5681	32° 05' 01.67556N"	110° 02' 31.82674W"
IR_15_5682	32° 05' 01.67441N"	110° 02' 30.66435W"
IR_15_5683	32° 05' 01.67325N"	110° 02' 29.50195W"
IR_15_5684	32° 05' 01.67209N"	110° 02' 28.33956W"
IR_15_5685	32° 05' 01.67093N"	110° 02' 27.17717W"
IR_15_5686	32° 05' 01.66977N"	110° 02' 26.01478W"
IR_15_5687	32° 05' 01.66860N"	110° 02' 24.85239W"
IR_15_5721	32° 05' 02.69626N"	110° 03' 04.37248W"
IR_15_5722	32° 05' 02.69519N"	110° 03' 03.21009W"
IR_15_5723	32° 05' 02.69411N"	110° 03' 02.04769W"
IR_15_5724	32° 05' 02.69304N"	110° 03' 00.88530W"
IR_15_5725	32° 05' 02.69196N"	110° 02' 59.72290W"
IR_15_5726	32° 05' 02.69088N"	110° 02' 58.56050W"
IR_15_5727	32° 05' 02.68979N"	110° 02' 57.39811W"
IR_15_5728	32° 05' 02.68871N"	110° 02' 56.23571W"
IR_15_5729	32° 05' 02.68745N"	110° 02' 54.89169W"
IR_15_5749	32° 05' 02.66519N"	110° 02' 31.82540W"
IR_15_5750	32° 05' 02.66404N"	110° 02' 30.66300W"
IR_15_5751	32° 05' 02.66288N"	110° 02' 29.50061W"
IR_15_5752	32° 05' 02.66172N"	110° 02' 28.33821W"
IR_15_5753	32° 05' 02.66056N"	110° 02' 27.17582W"
IR_15_5754	32° 05' 02.65940N"	110° 02' 26.01342W"
IR_15_5755	32° 05' 02.65823N"	110° 02' 24.85103W"
IR_15_5788	32° 05' 03.68696N"	110° 03' 05.53364W"

IR_15_5789	32° 05' 03.68589N"	110° 03' 04.37124W"
IR_15_5790	32° 05' 03.68482N"	110° 03' 03.20884W"
IR_15_5791	32° 05' 03.68375N"	110° 03' 02.04645W"
IR_15_5792	32° 05' 03.68267N"	110° 03' 00.88404W"
IR_15_5793	32° 05' 03.68159N"	110° 02' 59.72164W"
IR_15_5794	32° 05' 03.68051N"	110° 02' 58.55925W"
IR_15_5795	32° 05' 03.67943N"	110° 02' 57.39684W"
IR_15_5796	32° 05' 03.67834N"	110° 02' 56.23444W"
IR_15_5797	32° 05' 03.67725N"	110° 02' 55.07205W"
IR_16_5798	32° 05' 03.67616N"	110° 02' 53.90965W"
IR_16_5799	32° 05' 03.67506N"	110° 02' 52.74725W"
IR_15_5817	32° 05' 03.65482N"	110° 02' 31.82406W"
IR_15_5818	32° 05' 03.65367N"	110° 02' 30.66166W"
IR_15_5819	32° 05' 03.65252N"	110° 02' 29.49926W"
IR_15_5820	32° 05' 03.65136N"	110° 02' 28.33686W"
IR_15_5821	32° 05' 03.65020N"	110° 02' 27.17446W"
IR_15_5858	32° 05' 04.67445N"	110° 03' 03.20760W"
IR_15_5859	32° 05' 04.67338N"	110° 03' 02.04520W"
IR_15_5860	32° 05' 04.67231N"	110° 03' 00.88279W"
IR_15_5861	32° 05' 04.67123N"	110° 02' 59.72039W"
IR_15_5862	32° 05' 04.67015N"	110° 02' 58.55799W"
IR_15_5863	32° 05' 04.66906N"	110° 02' 57.39558W"
IR_15_5864	32° 05' 04.66798N"	110° 02' 56.23318W"
IR_15_5865	32° 05' 04.66689N"	110° 02' 55.07078W"
IR_16_5866	32° 05' 04.66579N"	110° 02' 53.90837W"
IR_16_5867	32° 05' 04.66470N"	110° 02' 52.74597W"
IR_16_5868	32° 05' 04.66342N"	110° 02' 51.40194W"
IR_15_5885	32° 05' 04.64446N"	110° 02' 31.82272W"
IR_15_5886	32° 05' 04.64331N"	110° 02' 30.66032W"
IR_15_5887	32° 05' 04.64215N"	110° 02' 29.49792W"
IR_15_5888	32° 05' 04.64099N"	110° 02' 28.33552W"
IR_15_5925	32° 05' 05.66516N"	110° 03' 04.36876W"
IR_15_5926	32° 05' 05.66409N"	110° 03' 03.20635W"
IR_15_5927	32° 05' 05.66301N"	110° 03' 02.04395W"
IR_15_5928	32° 05' 05.66194N"	110° 03' 00.88154W"
IR_15_5929	32° 05' 05.66086N"	110° 02' 59.71913W"
IR_15_5930	32° 05' 05.65978N"	110° 02' 58.55673W"
IR_15_5931	32° 05' 05.65869N"	110° 02' 57.39432W"
IR_15_5932	32° 05' 05.65761N"	110° 02' 56.23191W"
IR_15_5933	32° 05' 05.65652N"	110° 02' 55.06951W"
IR_16_5934	32° 05' 05.65542N"	110° 02' 53.90710W"
IR_16_5935	32° 05' 05.65433N"	110° 02' 52.74470W"
IR_16_5936	32° 05' 05.65323N"	110° 02' 51.58229W"
IR_16_5937	32° 05' 05.65213N"	110° 02' 50.41988W"
IR_16_5938	32° 05' 05.65102N"	110° 02' 49.25748W"
IR_15_5950	32° 05' 05.63753N"	110° 02' 35.30860W"
IR_15_5951	32° 05' 05.63639N"	110° 02' 34.14620W"
IR_15_5952	32° 05' 05.63524N"	110° 02' 32.98379W"
IR_15_5953	32° 05' 05.63409N"	110° 02' 31.82139W"
IR_15_5954	32° 05' 05.63294N"	110° 02' 30.65898W"
IR_15_5955	32° 05' 05.63178N"	110° 02' 29.49657W"
IR_15_5993	32° 05' 06.65479N"	110° 03' 04.36752W"

IR_15_5994	32° 05' 06.65372N"	110° 03' 03.20511W"
IR_15_5995	32° 05' 06.65265N"	110° 03' 02.04270W"
IR_15_5996	32° 05' 06.65157N"	110° 03' 00.88029W"
IR_15_5997	32° 05' 06.65049N"	110° 02' 59.71788W"
IR_15_5998	32° 05' 06.64941N"	110° 02' 58.55547W"
IR_15_5999	32° 05' 06.64833N"	110° 02' 57.39306W"
IR_15_6000	32° 05' 06.64724N"	110° 02' 56.23065W"
IR_15_6001	32° 05' 06.64615N"	110° 02' 55.06824W"
IR_16_6002	32° 05' 06.64506N"	110° 02' 53.90583W"
IR_16_6003	32° 05' 06.64396N"	110° 02' 52.74342W"
IR_16_6004	32° 05' 06.64286N"	110° 02' 51.58101W"
IR_16_6005	32° 05' 06.64176N"	110° 02' 50.41860W"
IR_16_6006	32° 05' 06.64065N"	110° 02' 49.25619W"
IR_16_6007	32° 05' 06.63936N"	110° 02' 47.89702W"
IR_15_6018	32° 05' 06.62716N"	110° 02' 35.30727W"
IR_15_6019	32° 05' 06.62602N"	110° 02' 34.14487W"
IR_15_6020	32° 05' 06.62487N"	110° 02' 32.98245W"
IR_15_6021	32° 05' 06.62372N"	110° 02' 31.82005W"
IR_15_6022	32° 05' 06.62257N"	110° 02' 30.65764W"
IR_15_6061	32° 05' 07.56894N"	110° 03' 04.02582W"
IR_15_6062	32° 05' 07.64335N"	110° 03' 03.20386W"
IR_15_6063	32° 05' 07.64228N"	110° 03' 02.04145W"
IR_15_6064	32° 05' 07.64120N"	110° 03' 00.87904W"
IR_15_6065	32° 05' 07.64012N"	110° 02' 59.71662W"
IR_15_6066	32° 05' 07.63904N"	110° 02' 58.55421W"
IR_15_6067	32° 05' 07.63796N"	110° 02' 57.39180W"
IR_15_6068	32° 05' 07.63687N"	110° 02' 56.22938W"
IR_15_6069	32° 05' 07.63578N"	110° 02' 55.06697W"
IR_16_6070	32° 05' 07.63469N"	110° 02' 53.90456W"
IR_16_6071	32° 05' 07.63359N"	110° 02' 52.74214W"
IR_16_6072	32° 05' 07.63249N"	110° 02' 51.57973W"
IR_16_6073	32° 05' 07.63139N"	110° 02' 50.41732W"
IR_16_6074	32° 05' 07.63029N"	110° 02' 49.25490W"
IR_16_6075	32° 05' 07.62918N"	110° 02' 48.09249W"
IR_16_6076	32° 05' 07.62807N"	110° 02' 46.93008W"
IR_16_6077	32° 05' 07.62695N"	110° 02' 45.76766W"
IR_15_6086	32° 05' 07.61679N"	110° 02' 35.30594W"
IR_15_6087	32° 05' 07.61565N"	110° 02' 34.14353W"
IR_15_6088	32° 05' 07.61450N"	110° 02' 32.98112W"
IR_15_6089	32° 05' 07.61335N"	110° 02' 31.81871W"
IR_15_6130	32° 05' 08.63299N"	110° 03' 03.20262W"
IR_15_6131	32° 05' 08.63191N"	110° 03' 02.04020W"
IR_15_6132	32° 05' 08.63084N"	110° 03' 00.87779W"
IR_15_6133	32° 05' 08.62976N"	110° 02' 59.71537W"
IR_15_6134	32° 05' 08.62868N"	110° 02' 58.55295W"
IR_15_6135	32° 05' 08.62759N"	110° 02' 57.39053W"
IR_15_6136	32° 05' 08.62651N"	110° 02' 56.22812W"
IR_15_6137	32° 05' 08.62542N"	110° 02' 55.06570W"
IR_16_6138	32° 05' 08.62432N"	110° 02' 53.90328W"
IR_16_6139	32° 05' 08.62323N"	110° 02' 52.74087W"
IR_16_6140	32° 05' 08.62213N"	110° 02' 51.57845W"
IR_16_6141	32° 05' 08.62102N"	110° 02' 50.41603W"

IR_16_6142	32° 05' 08.61992N"	110° 02' 49.25362W"
IR_16_6143	32° 05' 08.61881N"	110° 02' 48.09120W"
IR_16_6144	32° 05' 08.61770N"	110° 02' 46.92879W"
IR_16_6145	32° 05' 08.61659N"	110° 02' 45.76637W"
IR_16_6146	32° 05' 08.65842N"	110° 02' 44.59885W"
IR_15_6155	32° 05' 08.60528N"	110° 02' 34.14220W"
IR_15_6156	32° 05' 08.60414N"	110° 02' 32.97978W"
IR_15_6157	32° 05' 08.60299N"	110° 02' 31.81737W"
IR_15_6198	32° 05' 09.62262N"	110° 03' 03.20137W"
IR_15_6199	32° 05' 09.62155N"	110° 03' 02.03896W"
IR_15_6200	32° 05' 09.62047N"	110° 03' 00.87653W"
IR_15_6201	32° 05' 09.61939N"	110° 02' 59.71411W"
IR_15_6202	32° 05' 09.61831N"	110° 02' 58.55169W"
IR_15_6203	32° 05' 09.61723N"	110° 02' 57.38927W"
IR_15_6204	32° 05' 09.61614N"	110° 02' 56.22685W"
IR_15_6205	32° 05' 09.61505N"	110° 02' 55.06443W"
IR_16_6206	32° 05' 09.61396N"	110° 02' 53.90201W"
IR_16_6207	32° 05' 09.61286N"	110° 02' 52.73959W"
IR_16_6208	32° 05' 09.61176N"	110° 02' 51.57717W"
IR_16_6209	32° 05' 09.61066N"	110° 02' 50.41475W"
IR_16_6210	32° 05' 09.60955N"	110° 02' 49.25233W"
IR_16_6211	32° 05' 09.60845N"	110° 02' 48.08991W"
IR_16_6212	32° 05' 09.60733N"	110° 02' 46.92749W"
IR_16_6213	32° 05' 09.60622N"	110° 02' 45.76507W"
IR_16_6214	32° 05' 09.60510N"	110° 02' 44.60265W"
IR_16_6215	32° 05' 09.60382N"	110° 02' 43.27374W"
IR_15_6224	32° 05' 09.59377N"	110° 02' 32.97845W"
IR_15_6269	32° 05' 10.60902N"	110° 02' 59.71286W"
IR_15_6270	32° 05' 10.60794N"	110° 02' 58.55044W"
IR_15_6271	32° 05' 10.60686N"	110° 02' 57.38801W"
IR_15_6272	32° 05' 10.60577N"	110° 02' 56.22558W"
IR_16_6273	32° 05' 10.60468N"	110° 02' 55.06316W"
IR_16_6274	32° 05' 10.60359N"	110° 02' 53.90074W"
IR_16_6275	32° 05' 10.60249N"	110° 02' 52.73832W"
IR_16_6276	32° 05' 10.60139N"	110° 02' 51.57589W"
IR_16_6277	32° 05' 10.60029N"	110° 02' 50.41347W"
IR_16_6278	32° 05' 10.59918N"	110° 02' 49.25105W"
IR_16_6279	32° 05' 10.59808N"	110° 02' 48.08862W"
IR_16_6280	32° 05' 10.59697N"	110° 02' 46.92620W"
IR_16_6281	32° 05' 10.59585N"	110° 02' 45.76377W"
IR_16_6282	32° 05' 10.59473N"	110° 02' 44.60135W"
IR_16_6283	32° 05' 10.59361N"	110° 02' 43.43893W"
IR_17_6284	32° 05' 10.59249N"	110° 02' 42.27650W"
IR_17_6285	32° 05' 10.59137N"	110° 02' 41.11408W"
IR_15_6338	32° 05' 11.59758N"	110° 02' 58.54918W"
IR_15_6339	32° 05' 11.59649N"	110° 02' 57.38675W"
IR_15_6340	32° 05' 11.59540N"	110° 02' 56.22432W"
IR_16_6341	32° 05' 11.59431N"	110° 02' 55.06189W"
IR_16_6342	32° 05' 11.59322N"	110° 02' 53.89947W"
IR_16_6343	32° 05' 11.59212N"	110° 02' 52.73704W"
IR_16_6344	32° 05' 11.59103N"	110° 02' 51.57461W"
IR_16_6345	32° 05' 11.58992N"	110° 02' 50.41218W"

IR_16_6346	32° 05' 11.58882N"	110° 02' 49.24976W"
IR_16_6347	32° 05' 11.58771N"	110° 02' 48.08733W"
IR_16_6348	32° 05' 11.58660N"	110° 02' 46.92491W"
IR_16_6349	32° 05' 11.58549N"	110° 02' 45.76248W"
IR_16_6350	32° 05' 11.58437N"	110° 02' 44.60005W"
IR_17_6351	32° 05' 11.58325N"	110° 02' 43.43762W"
IR_17_6352	32° 05' 11.58213N"	110° 02' 42.27519W"
IR_17_6353	32° 05' 11.58100N"	110° 02' 41.11277W"
IR_17_6354	32° 05' 11.57987N"	110° 02' 39.95034W"
IR_15_6407	32° 05' 12.58612N"	110° 02' 57.38549W"
IR_15_6408	32° 05' 12.58504N"	110° 02' 56.22305W"
IR_16_6409	32° 05' 12.58394N"	110° 02' 55.06063W"
IR_16_6410	32° 05' 12.58285N"	110° 02' 53.89819W"
IR_16_6411	32° 05' 12.58176N"	110° 02' 52.73576W"
IR_16_6412	32° 05' 12.58066N"	110° 02' 51.57333W"
IR_16_6413	32° 05' 12.57955N"	110° 02' 50.41090W"
IR_16_6414	32° 05' 12.57845N"	110° 02' 49.24847W"
IR_16_6415	32° 05' 12.57734N"	110° 02' 48.08604W"
IR_16_6416	32° 05' 12.57623N"	110° 02' 46.92361W"
IR_16_6417	32° 05' 12.57512N"	110° 02' 45.76118W"
IR_16_6418	32° 05' 12.57400N"	110° 02' 44.59875W"
IR_17_6419	32° 05' 12.57288N"	110° 02' 43.43632W"
IR_17_6420	32° 05' 12.57176N"	110° 02' 42.27389W"
IR_17_6421	32° 05' 12.57063N"	110° 02' 41.11146W"
IR_17_6422	32° 05' 12.56950N"	110° 02' 39.94903W"
IR_17_6423	32° 05' 12.56837N"	110° 02' 38.78660W"
IR_16_6477	32° 05' 13.57358N"	110° 02' 55.05936W"
IR_16_6478	32° 05' 13.57249N"	110° 02' 53.89692W"
IR_16_6479	32° 05' 13.57139N"	110° 02' 52.73449W"
IR_16_6480	32° 05' 13.57029N"	110° 02' 51.57205W"
IR_16_6481	32° 05' 13.56919N"	110° 02' 50.40962W"
IR_16_6482	32° 05' 13.56808N"	110° 02' 49.24719W"
IR_16_6483	32° 05' 13.56697N"	110° 02' 48.08475W"
IR_16_6484	32° 05' 13.56586N"	110° 02' 46.92232W"
IR_16_6485	32° 05' 13.56475N"	110° 02' 45.75988W"
IR_16_6486	32° 05' 13.56363N"	110° 02' 44.59745W"
IR_17_6487	32° 05' 13.56251N"	110° 02' 43.43502W"
IR_17_6488	32° 05' 13.56139N"	110° 02' 42.27258W"
IR_17_6489	32° 05' 13.56026N"	110° 02' 41.11015W"
IR_17_6490	32° 05' 13.55913N"	110° 02' 39.94771W"
IR_17_6491	32° 05' 13.55800N"	110° 02' 38.78528W"
IR_17_6492	32° 05' 13.55687N"	110° 02' 37.62285W"
IR_16_6546	32° 05' 14.56212N"	110° 02' 53.89565W"
IR_16_6547	32° 05' 14.56102N"	110° 02' 52.73321W"
IR_16_6548	32° 05' 14.55992N"	110° 02' 51.57077W"
IR_16_6549	32° 05' 14.55882N"	110° 02' 50.40833W"
IR_16_6550	32° 05' 14.55772N"	110° 02' 49.24590W"
IR_16_6551	32° 05' 14.55661N"	110° 02' 48.08346W"
IR_16_6552	32° 05' 14.55550N"	110° 02' 46.92102W"
IR_16_6553	32° 05' 14.55438N"	110° 02' 45.75859W"
IR_16_6554	32° 05' 14.55327N"	110° 02' 44.59615W"
IR_17_6555	32° 05' 14.55215N"	110° 02' 43.43371W"

IR_17_6556	32° 05' 14.55102N"	110° 02' 42.27127W"
IR_17_6557	32° 05' 14.54990N"	110° 02' 41.10884W"
IR_17_6558	32° 05' 14.54877N"	110° 02' 39.94640W"
IR_17_6559	32° 05' 14.54764N"	110° 02' 38.78396W"
IR_17_6560	32° 05' 14.54650N"	110° 02' 37.62152W"
IR_16_6612	32° 05' 15.55393N"	110° 02' 56.21926W"
IR_16_6613	32° 05' 15.55284N"	110° 02' 55.05682W"
IR_16_6614	32° 05' 15.55175N"	110° 02' 53.89438W"
IR_16_6615	32° 05' 15.55065N"	110° 02' 52.73194W"
IR_16_6616	32° 05' 15.54955N"	110° 02' 51.56949W"
IR_16_6617	32° 05' 15.54845N"	110° 02' 50.40705W"
IR_16_6618	32° 05' 15.54735N"	110° 02' 49.24461W"
IR_16_6619	32° 05' 15.54624N"	110° 02' 48.08217W"
IR_16_6620	32° 05' 15.54513N"	110° 02' 46.91973W"
IR_16_6621	32° 05' 15.54401N"	110° 02' 45.75729W"
IR_16_6622	32° 05' 15.54290N"	110° 02' 44.59485W"
IR_17_6623	32° 05' 15.54178N"	110° 02' 43.43241W"
IR_17_6624	32° 05' 15.54065N"	110° 02' 42.26997W"
IR_17_6625	32° 05' 15.53953N"	110° 02' 41.10753W"
IR_17_6626	32° 05' 15.53840N"	110° 02' 39.94508W"
IR_17_6627	32° 05' 15.53727N"	110° 02' 38.78264W"
IR_17_6628	32° 05' 15.53613N"	110° 02' 37.62020W"
IR_16_6680	32° 05' 16.54357N"	110° 02' 56.21799W"
IR_16_6681	32° 05' 16.54248N"	110° 02' 55.05555W"
IR_16_6682	32° 05' 16.54138N"	110° 02' 53.89310W"
IR_16_6683	32° 05' 16.54029N"	110° 02' 52.73066W"
IR_16_6684	32° 05' 16.53919N"	110° 02' 51.56821W"
IR_16_6685	32° 05' 16.53809N"	110° 02' 50.40577W"
IR_16_6686	32° 05' 16.53698N"	110° 02' 49.24333W"
IR_16_6687	32° 05' 16.53587N"	110° 02' 48.08088W"
IR_16_6688	32° 05' 16.53476N"	110° 02' 46.91844W"
IR_16_6689	32° 05' 16.53365N"	110° 02' 45.75599W"
IR_16_6690	32° 05' 16.53253N"	110° 02' 44.59355W"
IR_17_6691	32° 05' 16.53141N"	110° 02' 43.43110W"
IR_17_6692	32° 05' 16.53029N"	110° 02' 42.26866W"
IR_17_6693	32° 05' 16.52916N"	110° 02' 41.10622W"
IR_17_6694	32° 05' 16.52803N"	110° 02' 39.94377W"
IR_17_6695	32° 05' 16.52690N"	110° 02' 38.78132W"
IR_17_6696	32° 05' 16.52577N"	110° 02' 37.61888W"
IR_16_6749	32° 05' 17.53211N"	110° 02' 55.05428W"
IR_16_6750	32° 05' 17.53101N"	110° 02' 53.89183W"
IR_16_6751	32° 05' 17.52992N"	110° 02' 52.72938W"
IR_16_6752	32° 05' 17.52882N"	110° 02' 51.56693W"
IR_16_6753	32° 05' 17.52772N"	110° 02' 50.40448W"
IR_16_6754	32° 05' 17.52661N"	110° 02' 49.24204W"
IR_16_6755	32° 05' 17.52550N"	110° 02' 48.07959W"
IR_16_6756	32° 05' 17.52439N"	110° 02' 46.91714W"
IR_16_6757	32° 05' 17.52328N"	110° 02' 45.75469W"
IR_16_6758	32° 05' 17.52216N"	110° 02' 44.59225W"
IR_17_6759	32° 05' 17.52104N"	110° 02' 43.42980W"
IR_17_6760	32° 05' 17.51992N"	110° 02' 42.26735W"
IR_17_6761	32° 05' 17.51879N"	110° 02' 41.10490W"

IR_17_6762	32° 05' 17.51766N"	110° 02' 39.94246W"
IR_17_6763	32° 05' 17.51653N"	110° 02' 38.78001W"
IR_17_6764	32° 05' 17.51540N"	110° 02' 37.61756W"
IR_16_6817	32° 05' 18.52174N"	110° 02' 55.05301W"
IR_16_6818	32° 05' 18.52065N"	110° 02' 53.89056W"
IR_16_6819	32° 05' 18.51955N"	110° 02' 52.72811W"
IR_16_6820	32° 05' 18.51845N"	110° 02' 51.56565W"
IR_16_6821	32° 05' 18.51735N"	110° 02' 50.40320W"
IR_16_6822	32° 05' 18.51624N"	110° 02' 49.24075W"
IR_16_6823	32° 05' 18.51514N"	110° 02' 48.07830W"
IR_16_6824	32° 05' 18.51403N"	110° 02' 46.91585W"
IR_16_6825	32° 05' 18.51291N"	110° 02' 45.75340W"
IR_16_6826	32° 05' 18.51179N"	110° 02' 44.59094W"
IR_17_6827	32° 05' 18.51067N"	110° 02' 43.42850W"
IR_17_6828	32° 05' 18.50955N"	110° 02' 42.26604W"
IR_17_6829	32° 05' 18.50843N"	110° 02' 41.10359W"
IR_17_6830	32° 05' 18.50730N"	110° 02' 39.94114W"
IR_17_6831	32° 05' 18.50616N"	110° 02' 38.77869W"
IR_16_6886	32° 05' 19.51028N"	110° 02' 53.88928W"
IR_16_6887	32° 05' 19.50919N"	110° 02' 52.72683W"
IR_16_6888	32° 05' 19.50809N"	110° 02' 51.56438W"
IR_16_6889	32° 05' 19.50698N"	110° 02' 50.40192W"
IR_16_6890	32° 05' 19.50588N"	110° 02' 49.23947W"
IR_16_6891	32° 05' 19.50477N"	110° 02' 48.07701W"
IR_16_6892	32° 05' 19.50366N"	110° 02' 46.91456W"
IR_16_6893	32° 05' 19.50254N"	110° 02' 45.75210W"
IR_16_6894	32° 05' 19.50143N"	110° 02' 44.58964W"
IR_17_6895	32° 05' 19.50031N"	110° 02' 43.42719W"
IR_17_6896	32° 05' 19.49918N"	110° 02' 42.26474W"
IR_16_6959	32° 05' 20.49440N"	110° 02' 48.07572W"
IR_16_6960	32° 05' 20.49329N"	110° 02' 46.91326W"
IR_16_6961	32° 05' 20.49218N"	110° 02' 45.75080W"
IR_17_6962	32° 05' 20.49106N"	110° 02' 44.58834W"
IR_17_6963	32° 05' 20.48994N"	110° 02' 43.42589W"
IR_16_7028	32° 05' 21.44399N"	110° 02' 46.62443W"
IR_16_7029	32° 05' 21.48181N"	110° 02' 45.74951W"
IR_14_7621	32° 04' 48.14556N"	110° 02' 42.88429W"
IR_14_7622	32° 04' 49.31594N"	110° 02' 42.88578W"
IR_12_7623	32° 04' 50.30558N"	110° 02' 42.88447W"
IR_12_7626	32° 04' 50.30445N"	110° 02' 41.72212W"
IR_14_7627	32° 04' 49.31482N"	110° 02' 41.72343W"
IR_14_7628	32° 04' 48.16023N"	110° 02' 41.71451W"
IR_14_7629	32° 04' 48.15911N"	110° 02' 40.55217W"
IR_14_7630	32° 04' 49.31369N"	110° 02' 40.56108W"
IR_07_7631	32° 04' 50.30333N"	110° 02' 40.55977W"
IR_07_7634	32° 04' 50.30220N"	110° 02' 39.39742W"
IR_14_7635	32° 04' 49.31256N"	110° 02' 39.39874W"
IR_14_7636	32° 04' 48.15798N"	110° 02' 39.38983W"
IR_14_7637	32° 04' 48.15684N"	110° 02' 38.22748W"
IR_14_7638	32° 04' 49.31143N"	110° 02' 38.23639W"
IR_07_7639	32° 04' 50.30106N"	110° 02' 38.23507W"
IR_06_7642	32° 04' 50.29993N"	110° 02' 37.07271W"

IR_14_7643	32° 04' 49.31029N"	110° 02' 37.07403W"
IR_14_7644	32° 04' 48.15571N"	110° 02' 37.06513W"
IR_14_7645	32° 04' 48.15457N"	110° 02' 35.90279W"
IR_14_7646	32° 04' 49.30915N"	110° 02' 35.91169W"
IR_06_7647	32° 04' 50.29879N"	110° 02' 35.91036W"
IR_14_7653	32° 04' 48.15343N"	110° 02' 34.74044W"
IR_14_7654	32° 04' 49.30801N"	110° 02' 34.74934W"
IR_05_7655	32° 04' 50.29765N"	110° 02' 34.74801W"
IR_05_7658	32° 04' 50.29650N"	110° 02' 33.58566W"
IR_14_7659	32° 04' 49.30687N"	110° 02' 33.58699W"
IR_14_7660	32° 04' 48.15228N"	110° 02' 33.57810W"
IR_14_7663	32° 04' 48.15113N"	110° 02' 32.41576W"
IR_14_7664	32° 04' 49.30572N"	110° 02' 32.42464W"
IR_05_7665	32° 04' 50.29535N"	110° 02' 32.42331W"
IR_05_7667	32° 04' 51.28383N"	110° 02' 31.25961W"
IR_05_7668	32° 04' 50.29420N"	110° 02' 31.26095W"
IR_14_7669	32° 04' 49.30457N"	110° 02' 31.26229W"
IR_14_7670	32° 04' 48.14998N"	110° 02' 31.25341W"
IR_14_7673	32° 04' 48.14883N"	110° 02' 30.09107W"
IR_14_7674	32° 04' 49.30341N"	110° 02' 30.09995W"
IR_14_7675	32° 04' 50.29305N"	110° 02' 30.09860W"
IR_14_7676	32° 04' 51.28268N"	110° 02' 30.09726W"
IR_14_7677	32° 04' 51.28152N"	110° 02' 28.93490W"
IR_14_7678	32° 04' 50.29189N"	110° 02' 28.93625W"
IR_14_7679	32° 04' 49.30226N"	110° 02' 28.93759W"
IR_14_7680	32° 04' 48.14767N"	110° 02' 28.92872W"
IR_14_7683	32° 04' 48.14652N"	110° 02' 27.76638W"
IR_14_7684	32° 04' 49.30110N"	110° 02' 27.77525W"
IR_14_7685	32° 04' 50.29073N"	110° 02' 27.77390W"
IR_14_7686	32° 04' 51.28036N"	110° 02' 27.77255W"
IR_14_7687	32° 04' 51.27920N"	110° 02' 26.61019W"
IR_14_7688	32° 04' 50.28957N"	110° 02' 26.61154W"
IR_14_7689	32° 04' 49.29993N"	110° 02' 26.61290W"
IR_14_7690	32° 04' 48.14535N"	110° 02' 26.60403W"
IR_14_7693	32° 04' 48.14419N"	110° 02' 25.44169W"
IR_14_7694	32° 04' 49.29877N"	110° 02' 25.45055W"
IR_14_7695	32° 04' 50.28840N"	110° 02' 25.44919W"
IR_14_7696	32° 04' 50.28724N"	110° 02' 24.28684W"
IR_14_7697	32° 04' 49.29760N"	110° 02' 24.28820W"
IR_14_7698	32° 04' 48.14302N"	110° 02' 24.27934W"
IR_14_7701	32° 04' 48.14185N"	110° 02' 23.11700W"
IR_14_7702	32° 04' 49.29643N"	110° 02' 23.12585W"
IR_14_7703	32° 04' 50.28606N"	110° 02' 23.12449W"
IR_05_7721	32° 04' 52.27347N"	110° 02' 31.25827W"
IR_14_7722	32° 04' 52.27231N"	110° 02' 30.09591W"
IR_14_7723	32° 04' 52.27116N"	110° 02' 28.93355W"
IR_14_7724	32° 04' 52.27000N"	110° 02' 27.77120W"
IR_14_7725	32° 04' 53.25963N"	110° 02' 27.76985W"
IR_14_7726	32° 04' 53.26079N"	110° 02' 28.93221W"
IR_14_7727	32° 04' 53.26195N"	110° 02' 30.09457W"
IR_02_7728	32° 04' 53.26310N"	110° 02' 31.25693W"
IR_02_7747	32° 04' 54.25273N"	110° 02' 31.25559W"

IR_13_7748	32° 04' 54.25158N"	110° 02' 30.09323W"
IR_14_7749	32° 04' 54.25042N"	110° 02' 28.93086W"
IR_14_7750	32° 04' 54.24926N"	110° 02' 27.76850W"
IR_13_7798	32° 04' 55.24121N"	110° 02' 30.09188W"
IR_13_7797	32° 04' 55.24006N"	110° 02' 28.92951W"
IR_13_7796	32° 04' 55.23890N"	110° 02' 27.76715W"
IR_13_7795	32° 04' 56.22853N"	110° 02' 27.76580W"
IR_13_7861	32° 04' 59.19743N"	110° 02' 27.76174W"
IR_13_7862	32° 05' 00.18706N"	110° 02' 27.76039W"
IR_03_7867	32° 05' 01.18132N"	110° 02' 32.40860W"
IR_13_7868	32° 05' 01.18016N"	110° 02' 31.24621W"
IR_13_7869	32° 05' 01.17901N"	110° 02' 30.08382W"
IR_13_7870	32° 05' 01.17785N"	110° 02' 28.92143W"
IR_13_7871	32° 05' 01.17669N"	110° 02' 27.75904W"
IR_11_7886	32° 05' 02.17095N"	110° 02' 32.40727W"
IR_15_7885	32° 05' 03.15073N"	110° 02' 32.34596W"
IR_13_7766	32° 04' 57.21816N"	110° 02' 27.76444W"
IR_13_7765	32° 04' 58.20780N"	110° 02' 27.76309W"
IR_11_7876	32° 05' 04.15021N"	110° 02' 32.40459W"
IR_11_7875	32° 05' 05.13985N"	110° 02' 32.40326W"
IR_11_7874	32° 05' 05.14100N"	110° 02' 33.56566W"
IR_11_7873	32° 05' 05.14214N"	110° 02' 34.72806W"
IR_11_7872	32° 05' 05.14328N"	110° 02' 35.89047W"
IR_11_7903	32° 05' 06.13291N"	110° 02' 35.88914W"
IR_11_7902	32° 05' 07.12255N"	110° 02' 35.88782W"
IR_15_7992	32° 05' 02.16633N"	110° 02' 27.75769W"
IR_15_7993	32° 05' 02.16749N"	110° 02' 28.92008W"
IR_15_7994	32° 05' 02.16865N"	110° 02' 30.08248W"
IR_15_7995	32° 05' 02.16980N"	110° 02' 31.24487W"
IR_15_7996	32° 05' 03.15943N"	110° 02' 31.24353W"
IR_15_7997	32° 05' 03.15828N"	110° 02' 30.08114W"
IR_15_7998	32° 05' 03.15712N"	110° 02' 28.91874W"
IR_15_7999	32° 05' 03.15596N"	110° 02' 27.75634W"
IR_15_8000	32° 05' 03.15480N"	110° 02' 26.59394W"
IR_15_8001	32° 05' 03.15363N"	110° 02' 25.43154W"
IR_15_8002	32° 05' 03.15247N"	110° 02' 24.26915W"
IR_15_8003	32° 05' 04.14443N"	110° 02' 26.59259W"
IR_15_8004	32° 05' 04.14559N"	110° 02' 27.75499W"
IR_15_8005	32° 05' 04.14675N"	110° 02' 28.91739W"
IR_15_8006	32° 05' 04.14791N"	110° 02' 30.07979W"
IR_15_8007	32° 05' 04.14906N"	110° 02' 31.24219W"
IR_15_8008	32° 05' 05.13870N"	110° 02' 31.24085W"
IR_15_8009	32° 05' 05.13754N"	110° 02' 30.07845W"
IR_14_7909	32° 04' 48.14067N"	110° 02' 21.95465W"
IR_15_8010	32° 05' 05.13639N"	110° 02' 28.91604W"
IR_14_7910	32° 04' 48.13950N"	110° 02' 20.79231W"
IR_14_7911	32° 04' 48.13831N"	110° 02' 19.62996W"
IR_15_8011	32° 05' 05.13523N"	110° 02' 27.75364W"
IR_15_8012	32° 05' 06.12602N"	110° 02' 28.91469W"
IR_14_7912	32° 04' 49.29525N"	110° 02' 21.96350W"
IR_15_8013	32° 05' 06.12717N"	110° 02' 30.07710W"
IR_14_7913	32° 04' 49.29408N"	110° 02' 20.80116W"

IR_15_8014	32° 05' 06.12833N"	110° 02' 31.23951W"
IR_14_7914	32° 04' 49.29290N"	110° 02' 19.63881W"
IR_15_8015	32° 05' 06.12948N"	110° 02' 32.40192W"
IR_14_7915	32° 04' 49.29171N"	110° 02' 18.47646W"
IR_15_8016	32° 05' 06.13063N"	110° 02' 33.56433W"
IR_14_7916	32° 04' 50.28489N"	110° 02' 21.96213W"
IR_15_8017	32° 05' 06.13177N"	110° 02' 34.72673W"
IR_14_7917	32° 04' 50.28371N"	110° 02' 20.79978W"
IR_15_8018	32° 05' 07.12141N"	110° 02' 34.72540W"
IR_14_7918	32° 04' 50.28253N"	110° 02' 19.63743W"
IR_15_8019	32° 05' 07.12026N"	110° 02' 33.56299W"
IR_14_7919	32° 04' 50.28135N"	110° 02' 18.47508W"
IR_15_8020	32° 05' 07.11911N"	110° 02' 32.40058W"
IR_14_7920	32° 04' 51.27804N"	110° 02' 25.44783W"
IR_15_8021	32° 05' 07.11796N"	110° 02' 31.23817W"
IR_14_7945	32° 04' 51.27687N"	110° 02' 24.28548W"
IR_15_8022	32° 05' 08.10760N"	110° 02' 31.23683W"
IR_14_7921	32° 04' 51.27570N"	110° 02' 23.12312W"
IR_15_8033	32° 05' 03.19054N"	110° 03' 03.79066W"
IR_15_8023	32° 05' 08.10875N"	110° 02' 32.39925W"
IR_14_7922	32° 04' 51.27452N"	110° 02' 21.96077W"
IR_15_8034	32° 05' 03.19161N"	110° 03' 04.95306W"
IR_15_8024	32° 05' 08.10990N"	110° 02' 33.56166W"
IR_14_7923	32° 04' 51.27334N"	110° 02' 20.79841W"
IR_15_8035	32° 05' 03.19267N"	110° 03' 06.11546W"
IR_15_8025	32° 05' 08.11104N"	110° 02' 34.72407W"
IR_14_7924	32° 04' 51.27216N"	110° 02' 19.63606W"
IR_15_8036	32° 05' 04.18230N"	110° 03' 06.11423W"
IR_15_8026	32° 05' 08.11218N"	110° 02' 35.88649W"
IR_14_7925	32° 04' 51.27098N"	110° 02' 18.47370W"
IR_15_8037	32° 05' 04.18124N"	110° 03' 04.95182W"
IR_15_8027	32° 05' 09.10067N"	110° 02' 34.72274W"
IR_14_7944	32° 04' 52.26884N"	110° 02' 26.60884W"
IR_15_8038	32° 05' 04.18017N"	110° 03' 03.78942W"
IR_15_8028	32° 05' 09.09953N"	110° 02' 33.56033W"
IR_14_7943	32° 04' 52.26767N"	110° 02' 25.44648W"
IR_15_8039	32° 05' 04.17910N"	110° 03' 02.62702W"
IR_15_8029	32° 05' 09.09838N"	110° 02' 32.39791W"
IR_14_7942	32° 04' 52.26650N"	110° 02' 24.28412W"
IR_15_8040	32° 05' 04.17803N"	110° 03' 01.46462W"
IR_15_8030	32° 05' 09.09723N"	110° 02' 31.23549W"
IR_14_7941	32° 04' 52.26533N"	110° 02' 23.12176W"
IR_15_8031	32° 05' 10.08801N"	110° 02' 32.39657W"
IR_14_7940	32° 04' 52.26416N"	110° 02' 21.95940W"
IR_15_8032	32° 05' 10.08916N"	110° 02' 33.55899W"
IR_14_7939	32° 04' 52.26298N"	110° 02' 20.79704W"
IR_14_7938	32° 04' 53.25847N"	110° 02' 26.60748W"
IR_14_7937	32° 04' 53.25730N"	110° 02' 25.44512W"
IR_14_7936	32° 04' 53.25614N"	110° 02' 24.28276W"
IR_14_7935	32° 04' 53.25496N"	110° 02' 23.12039W"
IR_14_7934	32° 04' 53.25379N"	110° 02' 21.95803W"
IR_14_7933	32° 04' 53.25261N"	110° 02' 20.79567W"

IR_14_7932	32° 04' 54.24810N"	110° 02' 26.60613W"
IR_14_7931	32° 04' 54.24694N"	110° 02' 25.44376W"
IR_14_7930	32° 04' 54.24577N"	110° 02' 24.28140W"
IR_14_7929	32° 04' 54.24460N"	110° 02' 23.11903W"
IR_14_7928	32° 04' 54.24342N"	110° 02' 21.95666W"
IR_15_7927	32° 04' 54.24224N"	110° 02' 20.79430W"
IR_15_7926	32° 04' 54.24106N"	110° 02' 19.63193W"
IR_14_7946	32° 04' 55.23774N"	110° 02' 26.60477W"
IR_14_7947	32° 04' 55.23657N"	110° 02' 25.44240W"
IR_15_7948	32° 04' 55.23540N"	110° 02' 24.28004W"
IR_15_7949	32° 04' 55.23423N"	110° 02' 23.11767W"
IR_15_7950	32° 04' 55.23306N"	110° 02' 21.95530W"
IR_15_7951	32° 04' 55.23188N"	110° 02' 20.79293W"
IR_15_7952	32° 04' 55.23070N"	110° 02' 19.63056W"
IR_15_7953	32° 04' 56.22033N"	110° 02' 19.62918W"
IR_15_7954	32° 04' 56.22151N"	110° 02' 20.79156W"
IR_15_7955	32° 04' 56.22269N"	110° 02' 21.95393W"
IR_15_7956	32° 04' 56.22386N"	110° 02' 23.11630W"
IR_15_7957	32° 04' 56.20449N"	110° 02' 24.26816W"
IR_15_7958	32° 04' 56.22620N"	110° 02' 25.44105W"
IR_15_7959	32° 04' 56.22737N"	110° 02' 26.60342W"
IR_15_7960	32° 04' 57.21700N"	110° 02' 26.60207W"
IR_15_7961	32° 04' 57.21584N"	110° 02' 25.43969W"
IR_15_7962	32° 04' 57.21467N"	110° 02' 24.27732W"
IR_15_7963	32° 04' 57.21350N"	110° 02' 23.11494W"
IR_15_7964	32° 04' 57.21232N"	110° 02' 21.95256W"
IR_15_7965	32° 04' 57.21114N"	110° 02' 20.79019W"
IR_15_7966	32° 04' 57.20996N"	110° 02' 19.62781W"
IR_15_7967	32° 04' 58.20664N"	110° 02' 26.60071W"
IR_15_7968	32° 04' 58.20547N"	110° 02' 25.43833W"
IR_15_7969	32° 04' 58.20430N"	110° 02' 24.27595W"
IR_15_7970	32° 04' 58.20313N"	110° 02' 23.11357W"
IR_15_7971	32° 04' 58.20195N"	110° 02' 21.95119W"
IR_15_7972	32° 04' 58.20078N"	110° 02' 20.78881W"
IR_15_7973	32° 04' 59.19041N"	110° 02' 20.78744W"
IR_15_7974	32° 04' 59.19159N"	110° 02' 21.94982W"
IR_15_7975	32° 04' 59.19276N"	110° 02' 23.11221W"
IR_15_7976	32° 04' 59.19393N"	110° 02' 24.27459W"
IR_15_7977	32° 04' 59.19510N"	110° 02' 25.43697W"
IR_15_7978	32° 04' 59.18605N"	110° 02' 26.60901W"
IR_15_7979	32° 05' 00.18590N"	110° 02' 26.59800W"
IR_15_7980	32° 05' 00.18473N"	110° 02' 25.43562W"
IR_15_7981	32° 05' 00.18357N"	110° 02' 24.27323W"
IR_15_7982	32° 05' 00.18239N"	110° 02' 23.11084W"
IR_15_7983	32° 05' 00.18122N"	110° 02' 21.94846W"
IR_15_7984	32° 05' 00.18004N"	110° 02' 20.78607W"
IR_15_7985	32° 05' 01.17203N"	110° 02' 23.10948W"
IR_15_7986	32° 05' 01.17320N"	110° 02' 24.27187W"
IR_15_7987	32° 05' 01.17437N"	110° 02' 25.43426W"
IR_15_7988	32° 05' 01.17553N"	110° 02' 26.59665W"
IR_15_7989	32° 05' 02.16283N"	110° 02' 24.27051W"
IR_15_7990	32° 05' 02.16400N"	110° 02' 25.43290W"

IR_15_7991	32° 05' 02.16517N"	110° 02' 26.59530W"
IR_15_8041	32° 05' 01.21127N"	110° 03' 03.79315W"
IR_15_8042	32° 05' 01.21020N"	110° 03' 02.63076W"
IR_15_8043	32° 05' 01.20913N"	110° 03' 01.46837W"
IR_15_8044	32° 05' 01.20805N"	110° 03' 00.30598W"
IR_15_8045	32° 05' 01.20697N"	110° 02' 59.14359W"
IR_15_8046	32° 05' 01.20589N"	110° 02' 57.98119W"
IR_15_8047	32° 05' 01.20480N"	110° 02' 56.81881W"
IR_15_8048	32° 05' 01.20371N"	110° 02' 55.65641W"
IR_15_8049	32° 05' 02.20091N"	110° 03' 03.79191W"
IR_15_8050	32° 05' 02.20197N"	110° 03' 04.95430W"
IR_15_8051	32° 05' 02.19983N"	110° 03' 02.62951W"
IR_15_8052	32° 05' 02.19876N"	110° 03' 01.46712W"
IR_15_8053	32° 05' 02.19768N"	110° 03' 00.30473W"
IR_15_8054	32° 05' 02.19660N"	110° 02' 59.14233W"
IR_15_8055	32° 05' 02.19552N"	110° 02' 57.97993W"
IR_15_8056	32° 05' 02.19444N"	110° 02' 56.81754W"
IR_15_8057	32° 05' 02.19335N"	110° 02' 55.65515W"
IR_15_8058	32° 05' 02.19198N"	110° 02' 54.20518W"
IR_16_8060	32° 05' 03.17970N"	110° 02' 52.16669W"
IR_16_8061	32° 05' 03.18079N"	110° 02' 53.32908W"
IR_16_8062	32° 05' 03.18160N"	110° 02' 54.18878W"
IR_15_8063	32° 05' 03.18298N"	110° 02' 55.65388W"
IR_15_8064	32° 05' 03.18407N"	110° 02' 56.81628W"
IR_15_8065	32° 05' 03.18516N"	110° 02' 57.97867W"
IR_15_8066	32° 05' 03.18624N"	110° 02' 59.14107W"
IR_15_8067	32° 05' 03.18732N"	110° 03' 00.30347W"
IR_15_8068	32° 05' 03.18839N"	110° 03' 01.46587W"
IR_15_8069	32° 05' 03.18947N"	110° 03' 02.62827W"
IR_15_8070	32° 05' 04.17695N"	110° 03' 00.30222W"
IR_15_8071	32° 05' 04.17587N"	110° 02' 59.13982W"
IR_15_8072	32° 05' 04.17479N"	110° 02' 57.97741W"
IR_15_8073	32° 05' 04.17370N"	110° 02' 56.81501W"
IR_15_8074	32° 05' 04.17261N"	110° 02' 55.65261W"
IR_15_8075	32° 05' 04.17152N"	110° 02' 54.49021W"
IR_16_8076	32° 05' 04.17043N"	110° 02' 53.32781W"
IR_16_8077	32° 05' 04.16933N"	110° 02' 52.16541W"
IR_16_8078	32° 05' 04.16794N"	110° 02' 50.70030W"
IR_16_8080	32° 05' 05.15565N"	110° 02' 48.67692W"
IR_16_8081	32° 05' 05.15676N"	110° 02' 49.83932W"
IR_16_8082	32° 05' 05.15759N"	110° 02' 50.71416W"
IR_16_8083	32° 05' 05.15896N"	110° 02' 52.16413W"
IR_16_8084	32° 05' 05.16006N"	110° 02' 53.32654W"
IR_15_8085	32° 05' 05.16115N"	110° 02' 54.48894W"
IR_15_8086	32° 05' 05.16225N"	110° 02' 55.65134W"
IR_15_8087	32° 05' 05.16333N"	110° 02' 56.81375W"
IR_15_8088	32° 05' 05.16442N"	110° 02' 57.97615W"
IR_15_8089	32° 05' 05.16550N"	110° 02' 59.13856W"
IR_15_8090	32° 05' 05.16658N"	110° 03' 00.30097W"
IR_15_8091	32° 05' 05.16766N"	110° 03' 01.46337W"
IR_15_8092	32° 05' 05.16873N"	110° 03' 02.62577W"
IR_15_8093	32° 05' 05.16981N"	110° 03' 03.78818W"

IR_15_8094	32° 05' 05.17087N"	110° 03' 04.95058W"
IR_15_8095	32° 05' 06.16050N"	110° 03' 04.94934W"
IR_15_8096	32° 05' 06.15944N"	110° 03' 03.78693W"
IR_15_8097	32° 05' 06.15837N"	110° 03' 02.62453W"
IR_15_8098	32° 05' 06.15729N"	110° 03' 01.46212W"
IR_15_8099	32° 05' 06.15621N"	110° 03' 00.29971W"
IR_15_8100	32° 05' 06.15513N"	110° 02' 59.13730W"
IR_15_8101	32° 05' 06.15405N"	110° 02' 57.97489W"
IR_15_8102	32° 05' 06.15297N"	110° 02' 56.81249W"
IR_15_8103	32° 05' 06.15188N"	110° 02' 55.65008W"
IR_15_8104	32° 05' 06.15079N"	110° 02' 54.48767W"
IR_16_8105	32° 05' 06.14969N"	110° 02' 53.32526W"
IR_16_8106	32° 05' 06.14859N"	110° 02' 52.16285W"
IR_16_8107	32° 05' 06.14749N"	110° 02' 51.00045W"
IR_16_8108	32° 05' 06.14639N"	110° 02' 49.83804W"
IR_16_8109	32° 05' 06.14528N"	110° 02' 48.67563W"
IR_16_8110	32° 05' 06.14390N"	110° 02' 47.22565W"
IR_16_8112	32° 05' 07.13158N"	110° 02' 45.18711W"
IR_16_8113	32° 05' 07.13269N"	110° 02' 46.34952W"
IR_16_8114	32° 05' 07.13353N"	110° 02' 47.22436W"
IR_16_8115	32° 05' 07.13492N"	110° 02' 48.67434W"
IR_16_8116	32° 05' 07.13602N"	110° 02' 49.83675W"
IR_16_8117	32° 05' 07.13713N"	110° 02' 50.99917W"
IR_16_8118	32° 05' 07.13823N"	110° 02' 52.16157W"
IR_16_8119	32° 05' 07.13932N"	110° 02' 53.32399W"
IR_15_8120	32° 05' 07.14042N"	110° 02' 54.48640W"
IR_15_8121	32° 05' 07.14151N"	110° 02' 55.64881W"
IR_15_8122	32° 05' 07.14260N"	110° 02' 56.81122W"
IR_15_8123	32° 05' 07.14369N"	110° 02' 57.97363W"
IR_15_8124	32° 05' 07.14477N"	110° 02' 59.13605W"
IR_15_8125	32° 05' 07.14585N"	110° 03' 00.29846W"
IR_15_8126	32° 05' 07.14693N"	110° 03' 01.46087W"
IR_15_8127	32° 05' 07.14800N"	110° 03' 02.62328W"
IR_15_8128	32° 05' 07.14907N"	110° 03' 03.78569W"
IR_15_8129	32° 05' 06.98029N"	110° 03' 04.74651W"
IR_15_8130	32° 05' 07.72921N"	110° 03' 04.45233W"
IR_15_8131	32° 05' 08.13870N"	110° 03' 03.78445W"
IR_15_8132	32° 05' 08.13763N"	110° 03' 02.62203W"
IR_15_8133	32° 05' 08.13656N"	110° 03' 01.45962W"
IR_15_8134	32° 05' 08.13548N"	110° 03' 00.29721W"
IR_15_8135	32° 05' 08.13440N"	110° 02' 59.13479W"
IR_15_8136	32° 05' 08.13332N"	110° 02' 57.97237W"
IR_15_8137	32° 05' 08.13223N"	110° 02' 56.80996W"
IR_15_8138	32° 05' 08.13115N"	110° 02' 55.64754W"
IR_15_8139	32° 05' 08.13005N"	110° 02' 54.48513W"
IR_16_8140	32° 05' 08.12896N"	110° 02' 53.32271W"
IR_16_8141	32° 05' 08.12786N"	110° 02' 52.16030W"
IR_16_8142	32° 05' 08.12676N"	110° 02' 50.99788W"
IR_16_8143	32° 05' 08.12566N"	110° 02' 49.83547W"
IR_16_8144	32° 05' 08.12455N"	110° 02' 48.67305W"
IR_16_8145	32° 05' 08.12344N"	110° 02' 47.51064W"
IR_16_8146	32° 05' 08.12233N"	110° 02' 46.34822W"

IR_16_8147	32° 05' 08.12121N"	110° 02' 45.18581W"
IR_16_8148	32° 05' 08.07139N"	110° 02' 43.73632W"
IR_16_8151	32° 05' 09.10830N"	110° 02' 42.54182W"
IR_16_8152	32° 05' 09.10946N"	110° 02' 43.74965W"
IR_16_8153	32° 05' 09.11084N"	110° 02' 45.18451W"
IR_16_8154	32° 05' 09.11196N"	110° 02' 46.34693W"
IR_16_8155	32° 05' 09.11307N"	110° 02' 47.50935W"
IR_16_8156	32° 05' 09.11418N"	110° 02' 48.67177W"
IR_16_8157	32° 05' 09.11529N"	110° 02' 49.83418W"
IR_16_8158	32° 05' 09.11639N"	110° 02' 50.99660W"
IR_16_8159	32° 05' 09.11749N"	110° 02' 52.15902W"
IR_16_8160	32° 05' 09.11859N"	110° 02' 53.32144W"
IR_15_8161	32° 05' 09.11968N"	110° 02' 54.48386W"
IR_15_8162	32° 05' 09.12078N"	110° 02' 55.64628W"
IR_15_8163	32° 05' 09.12187N"	110° 02' 56.80870W"
IR_15_8164	32° 05' 09.12295N"	110° 02' 57.97111W"
IR_15_8165	32° 05' 09.12403N"	110° 02' 59.13353W"
IR_15_8166	32° 05' 09.12511N"	110° 03' 00.29595W"
IR_15_8167	32° 05' 09.12619N"	110° 03' 01.45837W"
IR_15_8168	32° 05' 09.12726N"	110° 03' 02.62079W"
IR_15_8169	32° 05' 09.12834N"	110° 03' 03.78320W"
IR_15_8170	32° 05' 10.11763N"	110° 03' 03.41618W"
IR_15_8171	32° 05' 10.11690N"	110° 03' 02.61954W"
IR_15_8172	32° 05' 10.11582N"	110° 03' 01.45712W"
IR_15_8173	32° 05' 10.11475N"	110° 03' 00.29470W"
IR_15_8174	32° 05' 10.11367N"	110° 02' 59.13227W"
IR_15_8175	32° 05' 10.11259N"	110° 02' 57.96985W"
IR_15_8176	32° 05' 10.11150N"	110° 02' 56.80743W"
IR_15_8177	32° 05' 10.11041N"	110° 02' 55.64501W"
IR_15_8178	32° 05' 10.10932N"	110° 02' 54.48259W"
IR_16_8179	32° 05' 10.10822N"	110° 02' 53.32016W"
IR_16_8180	32° 05' 10.10713N"	110° 02' 52.15774W"
IR_16_8181	32° 05' 10.10603N"	110° 02' 50.99532W"
IR_16_8182	32° 05' 10.10492N"	110° 02' 49.83290W"
IR_16_8183	32° 05' 10.10382N"	110° 02' 48.67048W"
IR_16_8184	32° 05' 10.10271N"	110° 02' 47.50806W"
IR_16_8185	32° 05' 10.10159N"	110° 02' 46.34563W"
IR_16_8186	32° 05' 10.10048N"	110° 02' 45.18321W"
IR_16_8187	32° 05' 10.09936N"	110° 02' 44.02079W"
IR_17_8188	32° 05' 10.09795N"	110° 02' 42.55565W"
IR_17_8189	32° 05' 10.09711N"	110° 02' 41.69595W"
IR_17_8190	32° 05' 10.09599N"	110° 02' 40.53352W"
IR_17_8191	32° 05' 11.08449N"	110° 02' 39.36979W"
IR_17_8192	32° 05' 11.08562N"	110° 02' 40.53221W"
IR_17_8193	32° 05' 11.08675N"	110° 02' 41.69464W"
IR_16_8194	32° 05' 11.08787N"	110° 02' 42.85706W"
IR_16_8195	32° 05' 11.08899N"	110° 02' 44.01949W"
IR_16_8196	32° 05' 11.09011N"	110° 02' 45.18191W"
IR_16_8197	32° 05' 11.09123N"	110° 02' 46.34434W"
IR_16_8198	32° 05' 11.09234N"	110° 02' 47.50676W"
IR_16_8199	32° 05' 11.09345N"	110° 02' 48.66919W"
IR_16_8200	32° 05' 11.09456N"	110° 02' 49.83161W"

IR_16_8201	32° 05' 11.09566N"	110° 02' 50.99404W"
IR_16_8202	32° 05' 11.09676N"	110° 02' 52.15646W"
IR_16_8203	32° 05' 11.09786N"	110° 02' 53.31889W"
IR_16_8204	32° 05' 11.09895N"	110° 02' 54.48132W"
IR_15_8205	32° 05' 11.10004N"	110° 02' 55.64374W"
IR_15_8206	32° 05' 11.10113N"	110° 02' 56.80617W"
IR_15_8207	32° 05' 11.10222N"	110° 02' 57.96859W"
IR_15_8208	32° 05' 11.10330N"	110° 02' 59.13102W"
IR_15_8209	32° 05' 12.09293N"	110° 02' 59.12976W"
IR_15_8210	32° 05' 12.09185N"	110° 02' 57.96733W"
IR_15_8211	32° 05' 12.09076N"	110° 02' 56.80490W"
IR_15_8212	32° 05' 12.08968N"	110° 02' 55.64247W"
IR_16_8213	32° 05' 12.08858N"	110° 02' 54.48005W"
IR_16_8214	32° 05' 12.08749N"	110° 02' 53.31762W"
IR_16_8215	32° 05' 12.08639N"	110° 02' 52.15519W"
IR_16_8216	32° 05' 12.08529N"	110° 02' 50.99276W"
IR_16_8217	32° 05' 12.08419N"	110° 02' 49.83033W"
IR_16_8218	32° 05' 12.08308N"	110° 02' 48.66790W"
IR_16_8219	32° 05' 12.08197N"	110° 02' 47.50547W"
IR_16_8220	32° 05' 12.08086N"	110° 02' 46.34304W"
IR_16_8221	32° 05' 12.07974N"	110° 02' 45.18061W"
IR_16_8222	32° 05' 12.07862N"	110° 02' 44.01818W"
IR_17_8223	32° 05' 12.07750N"	110° 02' 42.85575W"
IR_17_8224	32° 05' 12.07638N"	110° 02' 41.69333W"
IR_17_8225	32° 05' 12.07525N"	110° 02' 40.53090W"
IR_17_8226	32° 05' 12.07412N"	110° 02' 39.36847W"
IR_17_8227	32° 05' 12.07299N"	110° 02' 38.20604W"
IR_17_8228	32° 05' 13.06148N"	110° 02' 37.04229W"
IR_17_8229	32° 05' 13.06262N"	110° 02' 38.20472W"
IR_17_8230	32° 05' 13.06375N"	110° 02' 39.36716W"
IR_17_8231	32° 05' 13.06488N"	110° 02' 40.52958W"
IR_17_8232	32° 05' 13.06601N"	110° 02' 41.69202W"
IR_17_8233	32° 05' 13.06714N"	110° 02' 42.85445W"
IR_16_8234	32° 05' 13.06826N"	110° 02' 44.01688W"
IR_16_8235	32° 05' 13.06938N"	110° 02' 45.17932W"
IR_16_8236	32° 05' 13.07049N"	110° 02' 46.34175W"
IR_16_8237	32° 05' 13.07160N"	110° 02' 47.50418W"
IR_16_8238	32° 05' 13.07271N"	110° 02' 48.66661W"
IR_16_8239	32° 05' 13.07382N"	110° 02' 49.82904W"
IR_16_8240	32° 05' 13.07492N"	110° 02' 50.99148W"
IR_16_8241	32° 05' 13.07602N"	110° 02' 52.15391W"
IR_16_8242	32° 05' 13.07712N"	110° 02' 53.31634W"
IR_16_8243	32° 05' 13.07822N"	110° 02' 54.47878W"
IR_15_8244	32° 05' 13.07931N"	110° 02' 55.64121W"
IR_16_8245	32° 05' 14.06894N"	110° 02' 55.63994W"
IR_16_8246	32° 05' 14.06785N"	110° 02' 54.47750W"
IR_16_8247	32° 05' 14.06675N"	110° 02' 53.31507W"
IR_16_8248	32° 05' 14.06566N"	110° 02' 52.15263W"
IR_16_8249	32° 05' 14.06455N"	110° 02' 50.99020W"
IR_16_8250	32° 05' 14.06345N"	110° 02' 49.82776W"
IR_16_8251	32° 05' 14.06234N"	110° 02' 48.66533W"
IR_16_8252	32° 05' 14.06123N"	110° 02' 47.50289W"

IR_16_8253	32° 05' 14.06012N"	110° 02' 46.34045W"
IR_16_8254	32° 05' 14.05901N"	110° 02' 45.17802W"
IR_16_8255	32° 05' 14.05789N"	110° 02' 44.01558W"
IR_17_8256	32° 05' 14.05677N"	110° 02' 42.85314W"
IR_17_8257	32° 05' 14.05564N"	110° 02' 41.69071W"
IR_17_8258	32° 05' 14.05451N"	110° 02' 40.52827W"
IR_17_8259	32° 05' 14.05338N"	110° 02' 39.36584W"
IR_17_8260	32° 05' 14.05225N"	110° 02' 38.20340W"
IR_17_8261	32° 05' 14.05111N"	110° 02' 37.04096W"
IR_17_8262	32° 05' 15.04075N"	110° 02' 37.03964W"
IR_17_8263	32° 05' 15.04188N"	110° 02' 38.20208W"
IR_17_8264	32° 05' 15.04302N"	110° 02' 39.36452W"
IR_17_8265	32° 05' 15.04415N"	110° 02' 40.52696W"
IR_17_8266	32° 05' 15.04528N"	110° 02' 41.68940W"
IR_17_8267	32° 05' 15.04640N"	110° 02' 42.85184W"
IR_16_8268	32° 05' 15.04752N"	110° 02' 44.01428W"
IR_16_8269	32° 05' 15.04864N"	110° 02' 45.17672W"
IR_16_8270	32° 05' 15.04976N"	110° 02' 46.33916W"
IR_16_8271	32° 05' 15.05087N"	110° 02' 47.50160W"
IR_16_8272	32° 05' 15.05198N"	110° 02' 48.66404W"
IR_16_8273	32° 05' 15.05308N"	110° 02' 49.82647W"
IR_16_8274	32° 05' 15.05419N"	110° 02' 50.98892W"
IR_16_8275	32° 05' 15.05529N"	110° 02' 52.15135W"
IR_16_8276	32° 05' 15.05639N"	110° 02' 53.31379W"
IR_16_8277	32° 05' 15.05748N"	110° 02' 54.47623W"
IR_16_8278	32° 05' 15.05857N"	110° 02' 55.63867W"
IR_16_8279	32° 05' 15.05966N"	110° 02' 56.80111W"
IR_16_8280	32° 05' 16.04930N"	110° 02' 56.79985W"
IR_16_8281	32° 05' 16.04821N"	110° 02' 55.63740W"
IR_16_8282	32° 05' 16.04712N"	110° 02' 54.47496W"
IR_16_8283	32° 05' 16.04602N"	110° 02' 53.31252W"
IR_16_8284	32° 05' 16.04492N"	110° 02' 52.15007W"
IR_16_8285	32° 05' 16.04382N"	110° 02' 50.98763W"
IR_16_8286	32° 05' 16.04272N"	110° 02' 49.82519W"
IR_16_8287	32° 05' 16.04161N"	110° 02' 48.66275W"
IR_16_8288	32° 05' 16.04050N"	110° 02' 47.50030W"
IR_16_8289	32° 05' 16.03939N"	110° 02' 46.33786W"
IR_16_8290	32° 05' 16.03827N"	110° 02' 45.17542W"
IR_16_8291	32° 05' 16.03716N"	110° 02' 44.01298W"
IR_17_8292	32° 05' 16.03603N"	110° 02' 42.85053W"
IR_17_8293	32° 05' 16.03491N"	110° 02' 41.68809W"
IR_17_8294	32° 05' 16.03378N"	110° 02' 40.52565W"
IR_17_8295	32° 05' 16.03265N"	110° 02' 39.36321W"
IR_17_8296	32° 05' 16.03152N"	110° 02' 38.20076W"
IR_17_8297	32° 05' 16.03038N"	110° 02' 37.03832W"
IR_17_8298	32° 05' 17.02001N"	110° 02' 37.03700W"
IR_17_8299	32° 05' 17.02115N"	110° 02' 38.19944W"
IR_17_8300	32° 05' 17.02228N"	110° 02' 39.36189W"
IR_17_8301	32° 05' 17.02341N"	110° 02' 40.52433W"
IR_17_8302	32° 05' 17.02454N"	110° 02' 41.68678W"
IR_17_8303	32° 05' 17.02566N"	110° 02' 42.84923W"
IR_16_8304	32° 05' 17.02679N"	110° 02' 44.01167W"

IR_16_8305	32° 05' 17.02790N"	110° 02' 45.17412W"
IR_16_8306	32° 05' 17.02902N"	110° 02' 46.33657W"
IR_16_8307	32° 05' 17.03013N"	110° 02' 47.49901W"
IR_16_8308	32° 05' 17.03124N"	110° 02' 48.66146W"
IR_16_8309	32° 05' 17.03235N"	110° 02' 49.82390W"
IR_16_8310	32° 05' 17.03345N"	110° 02' 50.98635W"
IR_16_8311	32° 05' 17.03455N"	110° 02' 52.14880W"
IR_16_8312	32° 05' 17.03565N"	110° 02' 53.31124W"
IR_16_8313	32° 05' 17.03675N"	110° 02' 54.47369W"
IR_16_8314	32° 05' 17.03784N"	110° 02' 55.63614W"
IR_16_8315	32° 05' 18.02747N"	110° 02' 55.63487W"
IR_16_8316	32° 05' 18.02638N"	110° 02' 54.47242W"
IR_16_8317	32° 05' 18.02528N"	110° 02' 53.30997W"
IR_16_8318	32° 05' 18.02419N"	110° 02' 52.14752W"
IR_16_8319	32° 05' 18.02309N"	110° 02' 50.98507W"
IR_16_8320	32° 05' 18.02198N"	110° 02' 49.82262W"
IR_16_8321	32° 05' 18.02088N"	110° 02' 48.66017W"
IR_16_8322	32° 05' 18.01977N"	110° 02' 47.49772W"
IR_16_8323	32° 05' 18.01865N"	110° 02' 46.33527W"
IR_16_8324	32° 05' 18.01754N"	110° 02' 45.17282W"
IR_16_8325	32° 05' 18.01642N"	110° 02' 44.01037W"
IR_17_8326	32° 05' 18.01530N"	110° 02' 42.84792W"
IR_17_8327	32° 05' 18.01417N"	110° 02' 41.68547W"
IR_17_8328	32° 05' 18.01305N"	110° 02' 40.52302W"
IR_17_8329	32° 05' 18.01192N"	110° 02' 39.36057W"
IR_17_8330	32° 05' 18.01078N"	110° 02' 38.19812W"
IR_17_8331	32° 05' 19.00041N"	110° 02' 38.19680W"
IR_17_8332	32° 05' 19.00155N"	110° 02' 39.35926W"
IR_17_8333	32° 05' 19.00268N"	110° 02' 40.52171W"
IR_17_8334	32° 05' 19.00380N"	110° 02' 41.68416W"
IR_17_8335	32° 05' 19.00493N"	110° 02' 42.84661W"
IR_16_8336	32° 05' 19.00605N"	110° 02' 44.00907W"
IR_16_8337	32° 05' 19.00717N"	110° 02' 45.17152W"
IR_16_8338	32° 05' 19.00828N"	110° 02' 46.33397W"
IR_16_8339	32° 05' 19.00940N"	110° 02' 47.49643W"
IR_16_8340	32° 05' 19.01051N"	110° 02' 48.65888W"
IR_16_8341	32° 05' 19.01161N"	110° 02' 49.82133W"
IR_16_8342	32° 05' 19.01272N"	110° 02' 50.98379W"
IR_16_8343	32° 05' 19.01382N"	110° 02' 52.14624W"
IR_16_8344	32° 05' 19.01492N"	110° 02' 53.30870W"
IR_16_8345	32° 05' 19.01601N"	110° 02' 54.47115W"
IR_16_8346	32° 05' 20.00564N"	110° 02' 54.46988W"
IR_16_8347	32° 05' 20.00455N"	110° 02' 53.30742W"
IR_16_8348	32° 05' 19.79043N"	110° 02' 52.16946W"
IR_16_8349	32° 05' 19.44826N"	110° 02' 50.98323W"
IR_16_8350	32° 05' 20.00125N"	110° 02' 49.82005W"
IR_16_8351	32° 05' 20.00014N"	110° 02' 48.65760W"
IR_16_8352	32° 05' 19.99903N"	110° 02' 47.49514W"
IR_16_8353	32° 05' 19.99792N"	110° 02' 46.33268W"
IR_16_8354	32° 05' 19.99680N"	110° 02' 45.17022W"
IR_16_8355	32° 05' 19.99568N"	110° 02' 44.00777W"
IR_17_8356	32° 05' 19.99456N"	110° 02' 42.84531W"

IR_17_8357	32° 05' 20.98420N"	110° 02' 42.84400W"
IR_17_8358	32° 05' 20.98532N"	110° 02' 44.00646W"
IR_16_8359	32° 05' 20.98644N"	110° 02' 45.16893W"
IR_16_8360	32° 05' 20.98755N"	110° 02' 46.33138W"
IR_16_8361	32° 05' 20.98866N"	110° 02' 47.49385W"
IR_16_8362	32° 05' 20.66869N"	110° 02' 48.65673W"
IR_16_8363	32° 05' 21.42414N"	110° 02' 47.16046W"
IR_16_8364	32° 05' 21.97718N"	110° 02' 46.33009W"
IR_16_8365	32° 05' 21.97607N"	110° 02' 45.16763W"
IR_15_8366	32° 05' 11.10438N"	110° 03' 00.29344W"
IR_15_8367	32° 05' 13.08148N"	110° 02' 57.96607W"
IR_15_8368	32° 05' 13.08040N"	110° 02' 56.80364W"
IR_17_8369	32° 05' 18.00965N"	110° 02' 37.03567W"
IR_17_8370	32° 05' 19.99344N"	110° 02' 41.68285W"
IR_16_8371	32° 05' 19.01680N"	110° 02' 55.31070W"
IR_16_8372	32° 05' 17.03851N"	110° 02' 56.35459W"
IR_14_8375	32° 04' 52.26061N"	110° 02' 18.47232W"
IR_14_8374	32° 04' 52.26180N"	110° 02' 19.63468W"
IR_15_8373	32° 05' 07.11681N"	110° 02' 30.07576W"

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:

1. APP Application Dated: January 2016.
2. Public Notice Date:
3. Grant Date:
4. Issue Date:

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.

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 Section 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).