APPENDIX K – Groundwater Quality Alert Levels and Compliance Monitoring

Exhibit P-1

Alert Levels

FLORENCE COPPER, INC.

UIC PERMIT APPLICATION

FLORENCE COPPER PROJECT – PRODUCTION TEST FACILITY

EXHIBIT P-1: ALERT LEVELS

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1.1 Introduction

Florence Copper, Inc. (Florence Copper) has prepared this Exhibit P-1 to Attachment P to provide information regarding proposed alert levels (ALs), discharge limitations, monitoring requirements, compliance schedules, and temporary cessation or related plans. Accordingly, this Exhibit includes information that describes the ALs, discharge limitations, monitoring requirements, compliance schedules, and temporary cessation plans proposed by Florence Copper.

1.2 Discharge Limitations

Florence Copper proposes the following discharge limitations:

1. All permitted facilities will be operated and maintained to prevent unauthorized discharges pursuant to Arizona Revised Statutes (A.R.S.) 49-201(12) resulting from failure or bypassing of Best Available Demonstrated Control Technology (BADCT) pollutant control technologies including liner failure[1], uncontrollable leakage, overtopping (e.g., exceeding the maximum storage capacity, defined as a fluid level exceeding the crest elevation of a permitted impoundment), berm breaches that result in an unexpected loss of fluid, accidental spills, or other unauthorized discharges.
2. Injection of lixiviant will not be conducted until all core holes and wells within 500 feet of an injection or recovery well located in the Production Test Facility (PTF) well field have been abandoned in accordance with the Plugging and Abandonment Plan included as Attachment Q of the Underground Injection Control (UIC) Permit application.
3. Florence Copper will initiate contingency actions identified in the Temporary Aquifer Protection Permit (APP) if process solution sampling data show that the polynuclear aromatic hydrocarbon (PAH) concentration in the lixiviant exceeds 20 milligrams per liter (mg/L) in any monthly sample, or 10 mg/L as a quarterly average.

1.3 Monitoring Activities

This section describes monitoring activities that are designed to provide an early detection and prompt response to any condition that might result in an unauthorized discharge to an aquifer or to the vadose zone, or that might cause a violation of an Aquifer Water Quality Standard (AWQS) at a Point of Compliance (POC) or supplemental monitoring well, or cause concentrations of discharge constituents to increase at a POC or supplemental monitoring well if the pre-operational concentrations of those constituents exceed AWQS. The activities include groundwater and facility/operational monitoring.

1.3.1 Monitoring and Analytical Requirements

All monitoring required under the UIC Permit will continue for the duration of the permit except as conducted in accordance with a temporary cessation plan approved by the United States Environmental Protection Agency (USEPA) and the Arizona Department of Environmental Quality (ADEQ) in accordance with Section 1.4 below. All sampling, preservation, and holding times will be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks, and duplicate samples will also be obtained and chain-of-custody procedures will be followed, in accordance with currently accepted standards of professional practice. Florence Copper will consult with the USEPA Code of Federal Regulations (CFR) for guidance in this regard. Copies of laboratory analyses and chain-of-custody forms will be maintained at the permitted facility. Upon request, these documents will be made immediately available for review by USEPA and ADEQ personnel.

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

All samples collected for compliance monitoring at the POC wells and operational monitoring at the supplemental monitoring wells will be analyzed using Arizona and USEPA approved methods. Regardless of the method used, the detection limits will be sufficient to determine compliance with the regulatory limits of the parameters specified in the UIC Permit. Analyses will be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification. For results to be considered valid, all analytical work will 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 17 Avenue
Phoenix, AZ 85007
Phone: (602) 364-0720

Monitoring equipment required by this permit will be installed and maintained so that representative samples required by the permit can be collected. If new groundwater wells are determined to be necessary, the construction details will be submitted to the USEPA and ADEQ for approval prior to installation, and the APP and the UIC Permit shall be amended to include any new monitoring points.

1.3.2 Groundwater Monitoring Sampling Protocols

The following describes the protocols that will be used for the collection and analysis of groundwater samples collected from the designated POC and supplemental monitoring wells shown on Figure P-1 and described in Tables P-1 and P-2. The protocols will be used for collecting and analyzing samples from POC wells and supplemental monitoring wells for which ALs and Aquifer Quality Limits (AQLs) have been established, and for collecting and analyzing groundwater samples for the purpose of developing groundwater quality data needed for the establishment of ALs and AQLs. The POC wells for which ALs and/or AQLs have been previously established include M14-GL, M15-GU, M22-O, and M23-UBF. The POC wells that will require ALs and AQLs to be established in accordance with the protocols discussed in Section 1.3.4 include M52-UBF, M54-O, and M54-LBF.

No ALs or AQLs have been established for the proposed supplemental monitoring wells because no groundwater quality data exists for these wells at this time. The supplemental monitoring wells that require ALs and AQLs to be established include M55-UBF, M56-LBF, M57-O, M58-O, M59-O, M60-O, and M61-LBF.

The POC wells M14-GL, M15-GU, M22-O, M23-UBF, and M52-UBF will continue to operate as POC wells under APP No. 101704.

Static water levels will be measured and recorded prior to sampling. Wells will be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well will 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 will be recorded as "dry" for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures will be reported and submitted with the quarterly report.

Florence Copper 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. If the low flow sampling method is used, the well will be purged until indicator parameters stabilize. Indicator parameters will include dissolved oxygen, turbidity, pH, temperature, and conductivity.

1.3.3 Existing ALs and AQLs

For each POC well listed in Tables P-1 and P-2, Tables P-3 and P-4 respectively list parameters that are to be monitored quarterly and semi-annually during the period of the permit. The tables also identify the ALs and AQLs that have been previously established for POC wells M14-GL, M15-GU, M22-O, and M23-UBF under Temporary APP No. 106360. Florence Copper proposes to use an updated procedure listed in Temporary APP No. 106360 to calculate ALs and AQLs for the proposed POC wells M52-UBF, M54-LBF, M54-O, and supplemental monitoring wells M55-UBF, M56-LBF, M57-O, M58-O, M59-O, M60-O, and M61-LBF.

1.3.4 New ALs and AQLs

The AQLs and ALs will be established and calculated using the method described below.

1.3.4.1 New ALs

Eight (8) rounds of groundwater sampling are required to establish ambient groundwater quality. ALs for POC and supplemental monitor wells will be calculated for all parameters with an established AWQS and for the other sampling parameters listed as "reserved" in Table P-3 and Table P-4 within 30 days of receipt of the laboratory analyses for the final sampling round of the ambient groundwater monitoring period for each POC and supplemental monitor well listed in Table P-2. Florence Copper will submit the ambient groundwater monitoring data in tabulated form to USEPA for review. Copies of all laboratory analytical reports, field notes, and the quality assurance/quality control (QA/QC) procedures used in the collection and analyses of the samples for all parameters listed in Tables P-3 and P-4 will be submitted to USEPA. Florence Copper will submit a report with the calculations for each AQL and AL included in the permit for review and approval by USEPA.

The ALs will be established and calculated by the following formula:

$$AL = M+KS$$

Where M = mean, S= standard deviation, and K = one-sided normal tolerance interval with a 95% confidence level (Lieberman, 1958). Obvious outliers should be excluded from the data used in the AL calculation.

Florence Copper will use the AL calculation criteria (set forth below) for establishing ALs for the new POC wells and supplemental monitoring wells. The following criteria will be used in establishing the ALs for all contaminants likely to be present in the discharge from the PTF with an established numeric AWQS. The criteria are:

1. The AL will be calculated for a parameter using the analyses from a minimum of eight consecutive monthly sample rounds. Florence Copper will not use more than eight sample rounds in the calculation.
2. Any data where the Practical Quantitation Limit (PQL) exceeds 80 percent of the AWQS will not be included in the AL calculation.
3. If a parameter is below the detection limit, Florence Copper will 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, Florence Copper will use a value of one-half the reported detection limit for the AL calculation.
4. If the analytical results from more than 50 percent of the samples for a specific parameter are non-detect, then the AL shall be set at 80 percent of the AWQS.
5. If the calculated AL for a specific constituent and well is less than 80 percent of the AWQS, the AL shall be set at 80 percent of the AWQS for that constituent in that well.

The following criteria will be met in establishing ALs in the permit for constituents without an AWQS:

1. The AL will be calculated for a parameter using the analyses from a minimum of eight (8) consecutive sample rounds. Florence Copper will not use more than eight sample rounds in the calculation.
2. If a parameter is below the detection limit, Florence Copper will 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.

1.3.4.2 New AQLs

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

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

1.3.5 Replacement POC and Supplemental Monitoring Wells

In the event that one or more of the designated POC or supplemental monitoring wells should become unusable or inaccessible due to damage, or any other event, a replacement well will be constructed and installed upon approval by USEPA and ADEQ. If the replacement well is 50 feet or less from the original well, the ALs and/or AQLs calculated for the designated POC or supplemental monitoring well will apply to the replacement well.

1.3.6 Compliance Monitoring

Florence Copper will begin compliance monitoring at the designated POC and operational monitoring at the supplemental monitoring wells once applicable ALs and/or AQLs have been established. Florence Copper will continue to monitor each well listed in Tables P-1 and P-2 in accordance with the parameters and frequencies stated in Tables P-3 and P-4. If monitoring indicates that an AL or AQL has been exceeded, Florence Copper will follow the requirements outlined in Section 2.6.2.4 of Temporary APP No. 106360, and Parts II.H.2 of the UIC Permit. The results of compliance monitoring will be documented and submitted with the quarterly report to USEPA and ADEQ.

1.3.7 Facility/Operational Monitoring

1.3.7.1 Facility Monitoring

Table 1 of Exhibit K-2 of Attachment K of this Application (Operations Plan), lists facility components that will be monitored to maintain normal operations. Many of the components listed will be equipped with electronic monitors and automatic shutoffs. Conditions requiring initiation of the contingency plan are described in Table 1 of Exhibit K-2 of Attachment K of this Application.

1.4 Temporary Cessation

Florence Copper will give written notice to USEPA and ADEQ before ceasing operation of the facility for a period of 60 days or greater. At the time of notification, Florence Copper will submit for USEPA and ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Immediately following USEPA and ADEQ approval, Florence Copper will implement the approved plan. If necessary, USEPA and ADEQ will amend APP and UIC permit conditions to incorporate conditions to address temporary cessation. During the period of temporary cessation, Florence Copper will provide written notice to USEPA and ADEQ of the operational status of the facility every two years. If Florence Copper intends to permanently cease operation of any facility, Florence Copper will submit written notification of closure to USEPA and ADEQ in accordance with permit conditions.

1.5 References

Aquifer Protection Permit No. P-106360. State of Arizona Temporary Aquifer Protection Permit, place ID 1579, LTF 55656.

Lieberman, G.J., 1958. Tables for One-sided Statistical Tolerance Limits: Industrial Quality Control, Vol. XIV, No. 10.

Table P-3. Quarterly Compliance Monitoring Tables (Level 1 Parameters)

Parameter	POC Well M14-GL		POC Well M15-GU		POC Well M22-O		POC Well M23-UBF	
	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4.0	3.2	4.0	3.2	4.0	3.2	4.0	3.2
Magnesium	Monitor	23	Monitor	44	Monitor	8.6	Monitor	69
Sulfate	Monitor	144	Monitor	126	Monitor	86	Monitor	411
Total Dissolved Solids	Monitor	874	Monitor	1359	Monitor	1094	Monitor	2392
Parameter	POC Well M52-UBF		POC Well M54-LBF		POC Well M54-O		Supp Monitor Well M55-UBF	
	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Magnesium	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Sulfate	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Total Dissolved Solids	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved

AQL = Aquifer Quality Limit
mg/L = milligrams per liter
mhos/cm = mhos per centimeter
POC = point-of-compliance
S.U. = Standard Units
TBD = to be determined

Table P-3. Quarterly Compliance Monitoring Tables (Level 1 Parameters)

Parameter	Supp Monitor Well M56-LBF		Supp Monitor Well M57-O		Supp Monitor Well M58-O		Supp Monitor Well M59-O	
	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Magnesium	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Sulfate	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Total Dissolved Solids	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Parameter	Supp Monitor Well M60-O		Supp Monitor Well M61-LBF					
	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)				
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor				
Specific Conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor				
Temperature (field)	Monitor	Monitor	Monitor	Monitor				
Fluoride	Reserved	Reserved	Reserved	Reserved				
Magnesium	Monitor	Reserved	Monitor	Reserved				
Sulfate	Monitor	Reserved	Monitor	Reserved				
Total Dissolved Solids	Monitor	Reserved	Monitor	Reserved				

AQL = Aquifer Quality Limit
mg/L = milligrams per liter
mhos/cm = mhos per centimeter
POC = point-of-compliance
S.U. = Standard Units
TBD = to be determined

Table P-4. Semiannual and Contingency Monitoring Tables (Level 2 Parameters)

	POC Well M14-GL		POC Well M15-GU		POC Well M22-0		POC Well M23-UBF	
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	4	3.2	4	3.2	4	3.2	4	3.2
Magnesium	Monitor	23	Monitor	44	Monitor	8.6	Monitor	69
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	144	Monitor	126	Monitor	86	Monitor	411
Total dissolved solids	Monitor	874	Monitor	1359	Monitor	1094	Monitor	2392
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71
Antimony	0.006	0.0048	0.006	0.0048	0.006	0.0048	0.006	0.0048
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2	1.6	2	1.6	2	1.6	2	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.02	Monitor	0.02	Monitor	0.005	0.004
	POC Well M14-GL		POC Well M15-GU		POC Well M22-0		POC Well M23-UBF	
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
Chromium (total)	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08
Cobalt	Monitor	0.005	Monitor	0.005	Monitor	0.005	Monitor	0.005
Copper	Monitor	0.51	Monitor	0.51	Monitor	0.51	Monitor	0.51
Iron	Monitor	2.2	Monitor	2.2	Monitor	2.2	Monitor	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	Monitor	0.22	Monitor	0.22	Monitor	0.22	Monitor	0.22
Mercury	0.002	0.0011	0.002	0.0011	0.002	0.0011	0.002	0.0011
Nickel	0.1	0.08	0.13	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.027	0.05	0.027	0.05	0.027	0.05	0.027
Thallium	0.002	0.0016	0.002	0.0016	0.01	Monitor	0.012	Monitor
Zinc	Monitor	2.5	Monitor	2.5	Monitor	2.5	Monitor	2.5
Gross Alpha	Monitor	15	Monitor	15	Monitor	15	Monitor	15
Adjusted Alpha [2, 3]	15	12	15	12	15	12	15	12
Radium 226 + 228 [2]	5	4	5	4	5	4	5	4
Uranium Isotopes[2]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium Total	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
TPH - diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene [4]	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene [4]	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene [4]	1	0.8	1	0.8	1	0.8	1	0.8
Total Xylene [4]	10	8	10	8	10	8	10	8

Table P-4. Semiannual and Contingency Monitoring Tables (Level 2 Parameters)

	POC Well M52-UBF		POC Well M54-LBF		POC Well M54-O		Supp Monitor Well M55-UBF	
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Magnesium	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Total dissolved solids	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium (total)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
	POC Well M52-UBF		POC Well M54-LBF		POC Well M54-O		Supp Monitor Well M55-UBF	
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
Cobalt	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Copper	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Iron	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Lead	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Nickel.	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Gross Alpha	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Adjusted Alpha [2, 3]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 [2]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium Isotopes[2]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium Total	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
PAH	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Ethylbenzene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Toluene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Total Xylene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Table P-4. Semiannual and Contingency Monitoring Tables (Level 2 Parameters)

	Supp Monitor Well M56-LBF		Supp Monitor Well M57-O		Supp Monitor Well M58-O		Supp Monitor Well M59-O	
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Specific conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Temperature (field)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
pH (lab)	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Fluoride	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Magnesium	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sulfate	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Total dissolved solids	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Antimony	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Arsenic	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Barium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Beryllium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Cadmium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Chromium (total)	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
	Supp Monitor Well M56-LBF		Supp Monitor Well M57-O		Supp Monitor Well M58-O		Supp Monitor Well M59-O	
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)
Cobalt	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Copper	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Iron	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Lead	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Manganese	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Mercury	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Nickel.	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Selenium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Thallium	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Zinc	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Gross Alpha	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved	Monitor	Reserved
Adjusted Alpha [2, 3]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Radium 226 + 228 [2]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Uranium Isotopes[2]	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Uranium Total	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
PAH	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Ethylbenzene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Toluene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Total Xylene [4]	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Table P-4. Semiannual and Contingency Monitoring Tables (Level 2 Parameters)

	Supp Monitor Well M60-O		Supp Monitor Well M61-LBF					
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)				
pH (field) (S.U.)	Monitor	Monitor	Monitor	Monitor				
Specific conductance (field) (mhos/cm)	Monitor	Monitor	Monitor	Monitor				
Temperature (field)	Monitor	Monitor	Monitor	Monitor				
pH (lab)	Monitor	Monitor	Monitor	Monitor				
Bicarbonate	Monitor	Monitor	Monitor	Monitor				
Calcium	Monitor	Monitor	Monitor	Monitor				
Carbonate	Monitor	Monitor	Monitor	Monitor				
Chloride	Monitor	Monitor	Monitor	Monitor				
Fluoride	Reserved	Reserved	Reserved	Reserved				
Magnesium	Monitor	Reserved	Monitor	Reserved				
Nitrate as nitrogen	Monitor	Monitor	Monitor	Monitor				
Potassium	Monitor	Monitor	Monitor	Monitor				
Sodium	Monitor	Monitor	Monitor	Monitor				
Sulfate	Monitor	Reserved	Monitor	Reserved				
Total dissolved solids	Monitor	Reserved	Monitor	Reserved				
Cation/anion balance	Monitor	Monitor	Monitor	Monitor				
Aluminum	Monitor	Reserved	Monitor	Reserved				
Antimony	Reserved	Reserved	Reserved	Reserved				
Arsenic	Reserved	Reserved	Reserved	Reserved				
Barium	Reserved	Reserved	Reserved	Reserved				
Beryllium	Reserved	Reserved	Reserved	Reserved				
Cadmium	Reserved	Reserved	Reserved	Reserved				
Chromium (total)	Reserved	Reserved	Reserved	Reserved				
	Supp Monitor Well M60-O		Supp Monitor Well M61-LBF					
Parameter	AQL (mg/L)	Alert Level (mg/L)	AQL (mg/L)	Alert Level (mg/L)				
Cobalt	Monitor	Reserved	Monitor	Reserved				
Copper	Monitor	Reserved	Monitor	Reserved				
Iron	Monitor	Reserved	Monitor	Reserved				
Lead	Reserved	Reserved	Reserved	Reserved				
Manganese	Monitor	Reserved	Monitor	Reserved				
Mercury	Reserved	Reserved	Reserved	Reserved				
Nickel.	Reserved	Reserved	Reserved	Reserved				
Selenium	Reserved	Reserved	Reserved	Reserved				
Thallium	Reserved	Reserved	Reserved	Reserved				
Zinc	Monitor	Reserved	Monitor	Reserved				
Gross Alpha	Monitor	Reserved	Monitor	Reserved				
Adjusted Alpha [2, 3]	Reserved	Reserved	Reserved	Reserved				
Radium 226 + 228 [2]	Reserved	Reserved	Reserved	Reserved				
Uranium Isotopes[2]	Monitor	Monitor	Monitor	Monitor				
Uranium Total	Monitor	Monitor	Monitor	Monitor				
PAH	Monitor	Monitor	Monitor	Monitor				
Benzene [4]	Reserved	Reserved	Reserved	Reserved				
Ethylbenzene [4]	Reserved	Reserved	Reserved	Reserved				
Toluene [4]	Reserved	Reserved	Reserved	Reserved				
Total Xylene [4]	Reserved	Reserved	Reserved	Reserved				

Table P-4. Semiannual and Contingency Monitoring Tables (Level 2 Parameters)

1. *Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.*

2. These parameters are to be analyzed for only if the concentration of Gross Alpha Particle Activity exceeds the alert level of 15 picoCuries per liter.

3. Adjusted gross alpha includes radium-226 but excludes radon-222 and total uranium.

levels.

AQL = Aquifer Quality Limit

mg/L = milligrams per liter

mhos/cm = mhos per centimeter

POC = point-of-compliance

S.U. = Standard Units

TBD = to be determined