



# DRAFT PERMIT

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ADEQ Inventory No. 105828  
LTF No. 65215

Permit No. AZ0026280  
Place ID No. 1494

## AUTHORIZATION TO DISCHARGE UNDER THE ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Article 3.1; the Federal Water Pollution Control Act, (33 USC §1251 et. seq., as amended), and Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 9 and 10, and amendments thereto,

U.S. Bureau of Reclamation  
Glen Canyon Field Division  
P.O. Box 1477  
Page, Arizona 86040

is authorized to discharge treated non-domestic wastewater from the Glen Canyon Dam and Power Plant located approximately 2 miles north of Page on U.S. Highway 89, in Coconino County, Arizona to the Colorado River in the Colorado River Basin at:

Outfall No.	Latitude	Longitude	Legal
001	36° 56' 24" N	111° 29' 12" W	Township 41N, Range 8E, Section 24

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein, and in the attached "Standard AZPDES Permit Conditions."

### Annual Registration Fee [A.R.S. 49-255.01 and A.A.C. R18-14-104]

The annual registration fee for this permit is payable to ADEQ each year. For the purposes of the annual fees, this permit is a Minor permit. If the facility is not yet constructed or is incapable of discharge at this time, the permittee may be eligible for reduced fees under 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 rule.

This permit shall become effective on \_\_\_\_\_, 2017.

This permit and the authorization to discharge shall expire at midnight, \_\_\_\_\_, 2022.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 2017.

\_\_\_\_\_  
Trevor Baggio, Director  
Water Quality Division  
Arizona Department of Environmental Quality

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    STANDARD CONDITIONS

**PART I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

**A. Effluent Limitations and Monitoring Requirements**

The permittee shall limit and monitor discharges from Outfall 001 as specified in Table 1 which follows.

**TABLE 1: Effluent Limitations and Monitoring Requirements**

Parameter	Maximum Allowable Discharge Limitations (6)		Monitoring Requirement (2) (5)	
	Concentration Limits			
	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type
Discharge Flow (MGD)	Report (1)	Report (1)	Continuous	Metered
Hardness (CaCO <sub>3</sub> ) - Receiving water (7)	Report [mg/L]	Report [mg/L]	1x/quarter	24-hour Composite (3)
Oil and Grease	10 mg/L	15 mg/L	1x/quarter	24-hour Composite
Total Suspended Solids (TSS)	30 mg/L	45 mg/L	1x/quarter	24-hour Composite
Copper (7)	15 ug/L	30 ug/L	1x/quarter	24-hour Composite
Selenium	2 ug/L	3 ug/L	1x/quarter	24-hour Composite
Silver (7)	3.6 ug/L	7.2 ug/L	1x/quarter	24-hour Composite
pH (4)	Not less than 6.5 standard units (S.U.) nor greater than 9.0 S.U.		1x/week	Discrete

Footnotes:

- (1) Monitoring and reporting required. No limit set at this time. The average and maximum flows shall be reported on the Discharge Monitoring forms. See Part II.B for reporting requirements.
- (2) Testing must coincide with the Whole Effluent Toxicity Test (WET) samples, if any, taken during that monitoring period as per Part I.C, Table 3 of the permit. See Part III of the permit.
- (3) For the purposes of this permit, a "24-hour composite" sample has been defined as a flow-proportioned mixture of not less than three discrete samples (aliquots) obtained at equal time intervals.
- (4) pH must be measured at the time of sampling and does not require use of a certified laboratory. Measurements must be obtained in accordance with the applicable method and must meet all method quality assurance/quality control requirements to be considered valid data.
- (5) If discharge is infrequent see Part I.D for minimum effluent characterization monitoring requirements.
- (6) All metals effluent limits are for total recoverable metals.
- (7) Limits listed are based on the average receiving water hardness of 240 mg/L as CaCO<sub>3</sub>. The receiving water must be tested for hardness at the same time that these metal samples are taken (see Part I.J.2 for location of the sampling point and Appendix A, Part B for the definition of hardness).

**B. Trace Substance Monitoring**

The permittee shall monitor discharges from Outfall 001 as specified in Table 2. Monitoring results above the Assessment Levels (ALs) listed below do not constitute a permit violation, but may trigger evaluation of Reasonable Potential (RP) by ADEQ. The permittee shall use an approved analytical method with a Limit of Quantitation (LOQ) lower than the AL values as described in Part II.A.4.

**TABLE 2: Trace Substance Monitoring Requirements**

Parameter	Assessment Levels (1) (2)		Monitoring Requirements (3) (4)	
	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type
Cyanide	4.3 µg/L	8.5 µg/L	1x/Quarter	Discrete
Iron	819 µg/L	1640 µg/L	1x/Quarter	24-hr. Composite
Mercury	0.01 µg/L	0.02 µg/L	1x/Quarter	Discrete
Total Dissolved Solids (TDS)(5) Source Water	Report [mg/L]	Report [mg/L]	1x/Quarter	Discrete
Total Dissolved Solids (TDS)(5) Effluent	Report [mg/L]	Report [mg/L]	1x/Quarter	Discrete
Total Dissolved Solids (TDS)(5) Net increase	Report [mg/L]	Report [mg/L]	1x/Quarter	Discrete

**Footnotes:**

- (1) Concentration values are calculated based on Arizona Water Quality Standards. Monitoring and reporting required.
- (2) All metals effluent Assessment Levels are for total recoverable metals.
- (3) Testing must coincide with the Whole Effluent Toxicity Test (WET) samples, if any, taken during that monitoring period as per Part I.C, Table 3 of the permit. See Part IV of the permit.
- (4) If discharge is infrequent see Part I.D for minimum effluent characterization monitoring requirements.
- (5) The permittee shall monitor and report both the source water and the effluent for total dissolved solids and calculate and report the difference as the net value. The difference between the two is the “incremental increase”, i.e. the increase between the source water supply and the effluent discharge. (Per the *Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program for Wastewater Treatment Plants*, adopted 10/2002 by the Colorado River Basin Salinity Control Forum). The incremental increase shall be less than 400 mg/L or the flow-weighted average annual net salt loading shall not exceed 1 ton/day.

**C. Whole Effluent Toxicity Monitoring**

The permittee shall monitor discharges from Outfall 001 for Whole Effluent Toxicity (WET) as specified in Table 3 which follows. If toxicity is detected above an Action Level specified as follows, the permittee must perform follow-up testing and, as applicable, follow the TIE/TRE processes in Part IV.E of the permit.

**TABLE 3: WET Testing**

Effluent Characteristic (1)	Action Levels		Monitoring Requirements	
	Daily Maximum (2) (3)	Monthly Median (3)	Monitoring Frequency (4)	Sample Type
Chronic Toxicity <i>Pseudokirchneriella subcapitata</i> (Green algae) (5)	1.6 TUC	1.0 TUC	1x in 2021	24-hr Composite
Chronic Toxicity <i>Pimephales promelas</i> (Fathead minnow)	1.6 TUC	1.0 TUC	1x in 2021	24-hr Composite

**TABLE 3: WET Testing**

Effluent Characteristic (1)	Action Levels		Monitoring Requirements	
	1.6 TUc	1.0 TUc	1x in 2021	24-hr Composite
Chronic Toxicity <i>Ceriodaphnia dubia</i> (Water flea)				

**Footnotes:**

- (1) See Part IV for additional requirements for testing and reporting Whole Effluent Toxicity (WET).
- (2) Since completion of one chronic WET test takes more than 24 hours, the daily maximum is considered to be the highest allowable test result.
- (3) If chronic toxicity is detected above the Action Levels in this table, the permittee must perform follow-up testing. See Part IV for details.
- (4) If discharge is infrequent see Part I.D for minimum effluent characterization monitoring requirements.
- (5) Formerly known as *Selenastrum capricornutum* or *Raphidocelis subcapitata*

**D. Effluent Characterization Testing**

The permittee shall monitor to characterize the facility’s effluent for the parameters listed in Tables 4.a & 4.b, whether discharging or not. When the facility discharges, monitoring is to be conducted at the frequency indicated in Tables 1 through 3. No limits or ALs are established, but the LOQ must be low enough to allow comparison of the results to the applicable water quality standards (WQS). If a LOQ below the WQS cannot be achieved, then the permittee shall use the method expected to achieve the lowest LOQ, as defined in Appendix A of this permit. Samples are to be representative of any seasonal variation in the discharge:

**TABLE 4.a: Effluent Characterization Testing – General Chemistry and Microbiology**

Parameter	Reporting Units	Monitoring Requirements	
		Monitoring Frequency (1)	Sample Type
Biochemical Oxygen Demand (BOD-5)	mg/L	Once in 2021	24-hour Composite
Chemical Oxygen Demand (COD)	mg/L	Once in 2021	24-hour Composite
Chlorine, Total Residual (TRC) (2)	ug/L	Once/year	Discrete
Dissolved Oxygen (2)	mg/L	Once/year	Discrete
<i>E. coli</i>	cfu/100 mL	Once/year	Discrete
Nitrate/Nitrite (as N)	mg/L	Once/year	24-hour Composite
Nitrogen, Total Kjeldahl (TKN)	mg/L	Once/year	24-hour Composite
Organic carbon, total (TOC)	mg/L	Once in 2021	24-hour Composite
Oil and Grease	mg/L	Once/year	Discrete
pH (2)	S.U.	Once/year	Discrete
Phosphorus	mg/L	Once/year	24-hour Composite
Temperature (Discharge) (2)	°Celsius	Once in Summer and Winter 2022	Discrete
Temperature (Receiving water) (2)	°Celsius	Once in Summer and Winter 2022	Discrete
Total Dissolved Solids (TDS)	mg/L	Once/year	24-hour Composite
Total Suspended Solids (TSS)	mg/L	Once/year	24-hour Composite

**Footnotes:**

- (1) If more frequent monitoring of any of these parameters is required by another part of this permit, those sampling results may be used to satisfy Table 4.a. requirements.
- (2) Temperature, pH, and dissolved oxygen must be measured at the time of sampling and do not require use of a certified laboratory. Measurements must be obtained in accordance with the applicable method and must meet all method quality assurance/quality control requirements to be considered valid data.

**TABLE 4.b: Effluent Characterization Testing – Selected Metals, Trace Substances and WET**

Parameter (1)	Reporting Units	Monitoring Requirements	
		Monitoring Frequency (2)	Sample Type
Antimony	µg/L	1x /year	24-hour Composite
Arsenic	µg/L	1x /year	24-hour Composite
Beryllium	µg/L	1x /year	24-hour Composite
Cadmium	µg/L	1x /year	24-hour Composite
Chromium (4)	µg/L	1x /year	24-hour Composite
Chromium VI (4)	µg/L	1x /year	Discrete
Copper	µg/L	1x /year	24-hour Composite
Iron	µg/L	1x /year	24-hour Composite
Lead	µg/L	1x /year	24-hour Composite
Mercury	µg/L	1x /year	Discrete
Nickel	µg/L	1x /year	24-hour Composite
Selenium	µg/L	1x /year	24-hour Composite
Silver	µg/L	1x /year	24-hour Composite
Thallium	µg/L	1x /year	24-hour Composite
Zinc	µg/L	1x /year	24-hour Composite
Hardness	mg/L	1x /year	24-hour Composite
Cyanide	µg/L	1x /year	Discrete
Whole Effluent Toxicity - chronic (all 3 species) (3)	TUc	1x /permit term	24-hour Composite

**Footnotes:**

- (1) All metals analyses shall be for total recoverable metals, except chromium VI, which is dissolved.
- (2) If more frequent monitoring of any of these parameters is required by another part of this permit, those sampling results may be used to satisfy Table 4.b. requirements.
- (3) If chronic toxicity is detected above the Action Levels specified in Table 3 or an acute test fails, the permittee must perform follow-up testing and, as applicable, follow the TIE/TRE processes in Part IV.E of the permit, whether discharging or not. See Part IV for additional information on requirements for testing and reporting Whole Effluent Toxicity (WET).
- (4) If total chromium exceeds 8 µg/L, the permittee must conduct sampling for chromium VI for the remainder of the permit. Otherwise, monitoring for chromium VI is not required.

**E. The discharge shall be free from pollutants in amounts or combinations that:**

- 1. Settle to form bottom deposits that inhibit or prohibit the habitation, growth or propagation of aquatic life;
- 2. Cause objectionable odor in the area in which the surface water is located;
- 3. Cause off-taste or odor in drinking water;

4. Cause off-flavor in aquatic organisms;
  5. Are toxic to humans, animals, plants or other organisms;
  6. Cause the growth of algae or aquatic plants that inhibit or prohibit the habitation, growth or propagation of other aquatic life or that impair recreational uses;
  7. Change the color of the surface water from natural background levels of color.
- F.** The discharge shall be free from oil, grease and other pollutants that float as debris, foam, or scum; or that cause a film or iridescent appearance on the surface of the water; or that cause a deposit on a shoreline, bank or aquatic vegetation.
- G.** The discharge shall not cause an increase in the ambient water temperature of more than 1.0 degree Celsius.
- H.** The discharge shall not cause the dissolved oxygen concentration in the receiving water to fall below 7 mg/L, unless the percent saturation of oxygen remains equal to or greater than 90%.
- I.** The discharge shall not cause the receiving water to exceed 25 mg/L for suspended sediment concentration.
- J.** Samples taken for the monitoring requirements specified in Part I shall be collected at the following locations:
1. Discharge samples shall be taken downstream from the sumps and prior to mixing with the receiving water.
  2. Receiving water samples for hardness and temperature shall be taken within fifty (50) feet upstream of the discharge point (Outfall 001).

## **PART II. MONITORING AND REPORTING**

### **A. Sample Collection and Analysis**

1. The permittee is responsible for the quality and accuracy of all data required under this permit.
2. Quality Assurance (QA) Manual

The permittee shall keep a QA Manual on site that describes the sample collection and analyses processes. If the permittee collects samples or conducts sample analyses in house, the permittee shall develop a QA Manual that addresses these activities. If a third party collects and/or analyzes samples on behalf of the permittee, the permittee shall obtain a copy of the applicable QA procedures. The QA Manual shall be available for review by ADEQ upon request. The QA Manual shall be updated as necessary to reflect current conditions, and shall describe the following:

- a. Project Management, including:

- Purpose of sample collection and sample frequency;
  - When and where samples will be collected;
  - How samples will be collected;
  - Who will collect samples and their qualifications;
  - Laboratory(s) that will perform analyses;
  - Any field tests to be conducted (detail methods and specify equipment, including a description of any needed calibrations); and
  - Pollutants or analytes being measured and for each, the permit-specific limits, Assessment Levels, or thresholds, (e.g. the associated detection limits needed.)
- b. Sample collection procedures including
- Equipment to be used;
  - Type and number of samples to be collected including QA/QC samples (i.e., background samples, duplicates, and equipment or field blanks);
  - Types, sizes, and number of sample bottles needed;
  - Preservatives and holding times for the samples (see methods under 40 CFR 136 or 9 A.A.C. 14, Article 6 or any condition within this permit that specifies a particular test method); and
  - Chain of custody procedures.
- c. Specify approved analytical method(s) to be used and include;
- Limits of Detection (LOD) and Limits of Quantitation (LOQs);
  - Required quality control (QC) results to be reported (e.g., matrix spike recoveries, duplicate relative percent differences, blank contamination, laboratory control sample recoveries, surrogate spike recoveries, etc.) and acceptance criteria; and
  - Corrective actions to be taken by the permittee or the laboratory as a result of problems identified during QC checks.
- d. How the permittee will perform data review; complete DMRs and records used to report results to ADEQ; resolve data quality issues; and identify limitations on the use of the data.
3. Sample collection, preservation and handling shall be performed as described in 40 CFR 136 including the referenced Edition of *Standard Methods for the Examination of Water and Wastewater*, or by procedures referenced in A.R.S Title 9, Chapter 14 of the Arizona Department of Health Services (ADHS) Laboratory Licensure rules. The permittee shall outline the proper procedures in the QA Manual, and samples taken for this permit must conform with these procedures whether collection and handling is performed directly by the permittee or contracted to a third-party.
4. Analytical requirements
- a. The permittee shall use a laboratory licensed by the ADHS Office of Laboratory Licensure and Certification that has demonstrated proficiency within the last 12 months under R9-14-609, for each parameter to be sampled under this permit. However, this requirement



does not apply to parameters which require analysis at the time of sample collection as long as the testing methods used are approved by ADHS or ADEQ in accordance with A.R.S. 36-495.02(A)(3). (These parameters may include flow, dissolved oxygen, pH, temperature, and total residual chlorine.)

- b. The permittee must utilize analytical methods specified in this permit. If no test procedure is specified, the permittee shall analyze the pollutant using:
  - i. A test procedure listed in 40 CFR 136 which is also approved under A.A.C. R9-14-610;
  - ii. An alternative test procedure approved by EPA as provided in 40 CFR 136 and which is also approved under A.A.C. R9-14-610;
  - iii. A test procedure listed in 40 CFR 136, with modifications allowed by EPA or approved as a method alteration by ADHS under A.A.C. R9-14-610(C); or
  - iv. If no test procedure for a pollutant is available under (3)(b)(i) through (3)(b)(iii) above, any Method approved under A.A.C. R9-14-610(B) for wastewater may be used, except the use of field kits is not allowed unless otherwise specified in this permit. If there is no approved wastewater method for a parameter, any other method identified in 9 A.A.C. 14, Article 6 that will achieve appropriate detection and reporting limits may be used for analyses.
- c. For results to be considered valid, all analytical work, including those tests conducted by the permittee at the time of sampling (see Part II.A.4.a), shall meet quality control standards specified in the approved methods.
- d. The permittee shall use analytical methods with a Limit of Quantitation (LOQ) that is lower than the effluent limitations, Assessment Levels, Action Levels, or other water quality criteria, if any, specified in this permit. If all methods have LOQs higher than the applicable water quality criteria, the Permittee shall use the approved analytical method with the lowest LOQ.
- e. The permittee shall use a standard calibration curve when applicable to the method, where the lowest standard point is equal to or less than the LOQ.
- f. If requested, the permittee shall participate in the annual NPDES DMR/QA study and submit the results of this study to ADEQ and ADHS for all laboratories used in monitoring compliance with this permit.

5. Mercury Monitoring

The permittee shall use an ADHS-certified low-level mercury analytical method such as EPA method 245.7 or 1631E to achieve a reporting limit at or below the discharge limitations or assessment levels for mercury as specified in this permit. The permittee shall also use a “clean hands/dirty hands” sampling technique such as EPA Method 1669 if necessary to achieve these reporting limits.

6. Metals Analyses

In accordance with 40 CFR 122.45(c), all effluent metals concentrations, with the exception of chromium VI, shall be measured as “total recoverable metals”. Discharge Limits and Assessment Levels in this permit, if any, are for total metals, except for chromium VI for which the levels listed are dissolved.

## **B. Reporting of Monitoring Results**

1. The permittee shall report monitoring results on Discharge Monitoring Report (DMR) forms supplied by ADEQ, to the extent that the results may be entered on the forms. The permittee shall submit results of all monitoring required by this permit in a format that will allow direct comparison with the limitations and requirements of this permit. If no discharge occurs during a reporting period, the permittee shall specify “No discharge” on the DMR. The results of all discharge analyses conducted during the monitoring period shall be included in determinations of the monthly average and daily maximums reported on the DMRs if the analyses were by methods specified in Part II.A above, as applicable.
2. DMRs and attachments are to be submitted by the 28th day of the month following the end of a monitoring period. For example, if the monitoring period ends January 31<sup>st</sup>, the permittee shall submit the DMR by February 28<sup>th</sup>. The permittee shall electronically submit all compliance monitoring data and reports using the myDEQ electronic portal provided by ADEQ. The reports required to be electronically submitted include, but are not limited to, the following:
  - Discharge Monitoring Reports
  - Whole Effluent Toxicity (WET) reports
  - Original copies of laboratory results
  - Ammonia data logs (if applicable)
  - AZPDES discharge flow records (if applicable)
  - Method detection limit studies (if applicable)
  - Bench sheets or similar documentation for field testing parameters (if applicable)
3. If requested to participate, the permittee shall submit the results of the annual NPDES DMR/QA Study to ADEQ and ADHS for all laboratories used in monitoring compliance with this permit by December 31<sup>st</sup> of each year. The permittee shall also conduct any proficiency testing required by the NPDES DMR-QA Study for those parameters listed in the study that the permittee analyzes in house or tests in the field at the time of sampling (these parameters may include pH and total residual chlorine). All results of the NPDES DMR-QA Study shall be submitted to the email and addresses listed below, or submit by any other alternative mode as specified by ADEQ:

Arizona Department of Environmental Quality  
Email: AZPDES@azdeq.gov

Arizona Department of Health Services  
Attn: Office of Laboratory Licensure and  
Certification  
250 N 17th Avenue  
Phoenix, AZ 85007

4. For the purposes of reporting, the permittee shall use the Limit of Quantitation.

5. For parameters with Daily Maximum Limits or Daily Maximum Assessment Levels in this permit, the permittee shall review the results of all samples collected during the reporting period and report as follows:

For Daily Maximum Limits/Assessment Levels	The Permittee shall Report on the DMR
When the maximum value of any analytical result is greater than or equal to the LOQ	The maximum value of all analytical results
When the maximum value detected is greater than or equal to the laboratory's LOD but less than the LOQ (1)	NODI (Q)
When the maximum value is less than the laboratory's LOD (2)	NODI (B)

Footnotes:

(1) Not Quantifiable

(2) Below Detection

6. For parameters with Monthly Average Limits or Monthly Average Assessment Levels in this permit, the permittee shall review the results of all samples collected during the reporting period and report:

For Monthly Average Limits/Assessment Levels	The Permittee shall Report on the DMR	
If only one sample is collected during the reporting period (monthly, quarterly, annually, etc.)  (In this case, the sample result is the monthly average.)	When the value detected is greater than or equal to the LOQ	The analytical result
	When the value detected is greater than or equal to the laboratory's LOD, but less than the LOQ	NODI (Q)
	When the value is less than the laboratory's LOD	NODI (B)
If more than one sample is collected during the reporting period	All samples collected in the same calendar month must be averaged. <ul style="list-style-type: none"> <li>When all results are greater than or equal to the LOQ, all values are averaged</li> <li>If some results are less than the LOQ, use the LOD value in the averaging</li> <li>Use '0' for values less than the LOD</li> </ul>	The highest monthly average which occurred during the reporting period

7. For all field testing, or if the information below is not included on the laboratory reports required by Part II.B.2, the permittee shall attach a bench sheet or similar documentation to each DMR that includes, for all analytical results during the reporting period:

- a. the analytical result,
- b. the number or title of the approved analytical method, preparation and analytical procedure utilized by the field personnel or laboratory, and the LOD and LOQ for the analytical method for the parameter, and
- c. any applicable data qualifiers using the most current revision of the Arizona Data Qualifiers (available on line at <http://www.azdhs.gov/lab/license/resources/resources.htm>).

### **C. Twenty-four Hour Reporting of Noncompliance**

The permittee shall orally report any noncompliance which may endanger the environment or human health within 24 hours from the time the permittee becomes aware of the event to:

ADEQ 24 hour hotline at (602) 771-2330

by phone call or voice mail by 9 a.m. on the first business day following the noncompliance. The permittee shall also notify the ADEQ Water Quality Compliance Section in writing within 5 days of the noncompliance event. The permittee shall include in the written notification: a description of the noncompliance and its cause; the period of noncompliance, including dates and times, and, if the noncompliance has not been corrected, the time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

### **D. Monitoring Records**

The permittee shall retain records of the following monitoring information:

1. Date, exact location and time of sampling or measurements performed, preservatives used;
2. Individual(s) who performed the sampling or measurements;
3. Date(s) the analyses were performed;
4. Laboratory(s) which performed the analyses;
5. Analytical techniques or methods used;
6. Chain of custody forms;
7. Any comments, case narrative or summary of results produced by the laboratory. These comments should identify and discuss QA/QC analyses performed concurrently during sample analyses and should specify whether analyses met project requirements and 40 CFR 136. If results include information on initial and continuing calibration, surrogate analyses, blanks, duplicates, laboratory control samples, matrix spike and matrix spike duplicate results, sample receipt condition, or holding times and preservation, these records must also be retained.
8. Summary of data interpretation and any corrective action taken by the permittee.

## **PART III. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS**

### **A. General Conditions**

1. The permittee shall conduct chronic toxicity tests on an 24-hour composite samples of the final effluent at the frequencies specified in Part I.

2. Final effluent samples must be taken following all treatment processes, including chlorination and dechlorination, and prior to mixing with the receiving water. The required WET tests must be performed on unmodified samples of final effluent. **WET tests conducted on samples that are dechlorinated after collection are not acceptable for compliance with this permit.**
3. Chemical testing for all the parameters listed in Parts I.A and B of this permit whose required sample type is a composite shall be performed on a split of at least one of the three composite samples taken for one chronic WET test. For those parameters listed in Parts I.A and B of this permit whose required sample type is discrete, the testing shall be performed on a discrete sample collected concurrently with one sample, discrete or composite, collected for an acute or chronic WET test.
4. Definitions related to toxicity are found in Appendix A.

## **B. Chronic Toxicity**

1. The permittee shall conduct short-term chronic toxicity tests on three species: the waterflea, *Ceriodaphnia dubia* (survival and reproduction test); the fathead minnow, *Pimephales promelas* (larval survival and growth test); and the green alga, *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum* or *Raphidocelis subcapitata*) (growth test).
2. The permittee must follow the USEPA 4th edition manual, “*Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821-R-02-013) for all chronic compliance toxicity testing.
3. The chronic toxicity action levels are any one test result greater than 1.6 TUc or any calculated monthly median value greater than 1.0 TUc. If chronic toxicity is detected above these values, follow-up testing is required per Part IV, Section E. A chronic toxicity unit (TUc) shall be calculated as  $TUc = 100/NOEC$ .
4. The chronic WET test shall be conducted using a series of five dilutions and a control. The following dilution series must be used: 12.5, 25, 50, 75, and 100% effluent.

## **C. Quality Assurance**

1. Effluent samples must be maintained between 0 and 6°C from collection until utilized in the toxicity testing procedure. When a composite sample is required, each aliquot making up the composite must be chilled after collection and throughout the compositing period. The single allowable exception is when a grab sample is delivered to the performing laboratory for test initiation no later than 4 hours following the time of collection.
2. Control and dilution water should be receiving water or lab water as appropriate, as described in the 40 CFR Part 136.3 approved method. If the dilution water used is different from the culture water, a second control, using culture water shall also be used.
3. Reference toxicity tests, (a check of the laboratory and test organisms’ performance), shall be conducted at least 1 time in a calendar month for each toxicity test method conducted in the laboratory during that month. Additionally, any time the laboratory changes its source of test

organisms, a reference toxicity test must be conducted before or in conjunction with the first WET test performed using the organisms from the newer source. Reference toxicant testing must be conducted using the same test conditions as the effluent toxicity tests (ie., same test duration, etc.).

4. If either the reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the 40 CFR Part 136.3 approved WET methods, then the permittee must re-sample and re-test within 14 days of receipt of the test results. The re-sampling and re-testing requirements include laboratory induced error in performing the test method.
5. The chronic reference toxicant and effluent tests must meet the upper and lower bounds on test sensitivity as determined by calculating the percent minimum significant difference (PMSD) for each test result. The test sensitivity bound is specified for each test method (see Section 10, Table 6 in EPA/821-R-02-013). There are five possible outcomes based on the PMSD result.
  - a. *Unqualified Pass*- The test's PMSD is within bounds and there is no significant difference between the means for the control and the effluent. The regulatory authority would conclude that there is no toxicity.
  - b. *Unqualified Fail*- The test's PMSD is larger than the lower bound (but not greater than the upper bound) in Table 6 and there is a significant difference between the means for the control and the effluent. The regulatory authority would conclude that there is toxicity.
  - c. *Lacks Test Sensitivity*- The test's PMSD exceeds the upper bound in Table 6 and there is no significant difference between the means for the control and the effluent. The test is considered invalid. An effluent sample must be collected and another toxicity test must be conducted within 14 days of receipt of the test results.
  - d. *Lacks Test Sensitivity*- The test's PMSD exceeds the upper bound in Table 6 and there is a significant difference between the means for the control and the effluent. The test is considered valid. The regulatory authority will conclude that there is toxicity.
  - e. *Very Small but Significant Difference*- The relative difference between the means for the control and effluent is smaller than the lower bound in Table 6 and this difference is statistically significant. The test is acceptable and the NOEC should be determined.

#### **D. Toxicity Identification Evaluation (TIE)/Toxicity Reduction Evaluation (TRE) Processes**

1. If toxicity is detected above a WET action level or Limit specified in this permit and the source of toxicity is known (for instance, a temporary plant upset), the permittee shall conduct one follow-up test within two weeks of receipt of the sample results that exceeded the action level. The permittee shall use the same test and species as the failed toxicity test. For intermittent discharges, the follow-up test shall be conducted whether discharging or not. If toxicity is detected in the follow-up, the permittee shall immediately begin developing a TRE plan and submit the plan to ADEQ for review and approval within 30 days after receipt of the toxic result. Requirements for the development of a TRE are listed in paragraph 3 below. The permittee must implement the TRE plan as approved and directed by ADEQ.

2. If toxicity is detected above an action level or Limit specified in this permit and the source of toxicity is unknown, the permittee shall begin additional toxicity monitoring within two weeks of receipt of the sample results that exceeded the action level. The permittee shall conduct one WET test approximately every other week until either a test exceeds an action level (or limit) or four tests have been completed. The follow-up tests must use the same test and species as the failed toxicity test. For intermittent discharges, the first follow-up test shall be conducted whether discharging or not; the subsequent three follow-up tests shall be conducted during the next three discharge events.
  - a. If none of the four tests exceed a WET action level or limit, then the permittee may return to the routine WET testing frequency specified in this permit.
  - b. If a WET action level or limit is exceeded in any of the additional tests, the permittee shall immediately begin developing a TRE plan and submit the plan to ADEQ for review and approval within 30 days after receipt of the toxic result. Requirements for the development of a TRE are listed in subsection 3, below. The permittee must implement the TRE plan as approved and directed by ADEQ.
3. The permittee shall use the EPA guidance manual *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*, 1999 (EPA/833/B-99/002) in preparing a TRE plan. The TRE plan shall include, at a minimum, the following:
  - a. Further actions to investigate and identify the causes of toxicity, if unknown. The permittee may initiate a TIE as part of the TRE process using the following EPA manuals as guidance: *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, 1992 (EPA/600/6-91/005F); *Methods for Aquatic Toxicity Identification Evaluations: Phase I, Toxicity Characterization Procedures*, 2<sup>nd</sup> Edition, 1991 (EPA/600/6-91/003); *Methods for Aquatic Toxicity Identification Evaluations: Phase II, Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*, 1993 (EPA/600/R-92/080); and *Methods for Aquatic Toxicity Identification Evaluations: Phase III, Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*, 1993 (EPA/600/R-92/081).
  - b. Action the permittee will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity; and
  - c. A schedule for implementing these actions.

#### **E. WET Reporting**

1. The permittee shall report chronic toxicity results on DMRs in Chronic Toxicity Units (TU<sub>c</sub>). The TU<sub>c</sub> for DMR reporting shall be calculated as  $TU_c = 100/NOEC$ .
2. In addition to reporting WET results on DMRs, the permittee shall submit a copy of the full lab report(s) for all WET testing conducted during the monitoring period covered by the DMR. The lab report should report TU<sub>c</sub> as 100/NOEC **and** as 100/IC<sub>25</sub>. If the lab report does not contain any of the following items, then these must also be supplied in a separate attachment to the report: 1) sample collection and test initiation dates, 2) the results of the effluent analyses for all

parameters required to be tested concurrently with WET testing as defined in Part I.A and B, Tables 1 and 2, and Part IV.A.3 of this permit.

3. WET lab reports and any required additional attachments shall be submitted to ADEQ by the 28<sup>th</sup> day of the month following the end of the WET monitoring period, or upon request.

#### **PART IV. SPECIAL CONDITIONS**

##### **A. REOPENER**

This permit may be modified per the provisions of A.A.C. R18-9-B906, and R18-9-A905 which incorporates 40 CFR Part 122. This permit may be reopened based on newly available information; to add conditions or limits to address demonstrated effluent toxicity; to implement any EPA-approved new Arizona water quality standard; or to re-evaluate reasonable potential (RP), if Assessment Levels in this permit are exceeded.



**APPENDIX A PART A: ACRONYMS**

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
EQ	Exceptional Quality (biosolids)
AZPDES	Arizona Pollutant Discharge Elimination System
A.R.S.	Arizona Revised Statutes
CFR	Code of Federal Regulations
CFU	Colony Forming Units
Director	The Director of ADEQ or any authorized representative thereof
DMR	Discharge Monitoring Report
EPA	The U.S. Environmental Protection Agency
kg/day	kilograms per day
MGD	Million Gallons per Day
mg/L	milligrams per Liter, also equal to parts per million (ppm)
MPN	Most Probable Number
NPDES	National Pollutant Discharge Elimination System
PFU	Plaque-Forming Unit
QA	Quality Assurance
SSU	Sewage Sludge Unit
TBEL	Technology-based effluent limitation
µg/L	micrograms per Liter, also equal to parts per billion (ppb)
WQBEL	Water quality-based effluent limitation

**APPENDIX A PART B: DEFINITIONS**

*ACTIVE SEWAGE SLUDGE UNIT* means a sewage sludge unit that has not closed.

*ACUTE TOXICITY TEST* is a test used to determine the concentration of effluent or ambient waters that produces an adverse effect (lethality) on a group of test organisms during a short-term exposure (e.g., 24, 48, or 96 hours). Acute toxicity is measured using statistical procedures (e.g., point estimate techniques or hypothesis testing) and is reported as PASS/FAIL or in TUs, where  $TU_a = 100/LC_{50}$ .

*ACUTE-to-CHRONIC RATIO (ACR)* is the ratio of the acute toxicity of an effluent or a toxicant to its chronic toxicity. It is used as a factor for estimating chronic toxicity on the basis of acute toxicity data, or for estimating acute toxicity on the basis of chronic toxicity data.

*AGRONOMIC RATE* means the whole biosolids application rate on a dry-weight basis that meets the following conditions: a.) The amount of nitrogen needed by existing vegetation or a planned or actual crop has been provided, and b.) The amount of nitrogen that passes below the root zone of the crop or vegetation is minimized.

*AMMONIA IMPACT RATIO (AIR)* is the ratio of the concentration of ammonia in the effluent and the calculated ammonia standard as determined by the use of effluent/receiving water pH and temperature.

*ANNUAL POLLUTANT LOADING RATE* means the maximum amount of a pollutant that can be applied to an acre or hectare of land during a 365-day period.

*APPLICATOR* means a person who arranges for and controls the site-specific land application of biosolids in Arizona.

*BASE FLOOD* means a flood that has a one percent chance of occurring in any given year (or a flood that is likely to occur once in 100 years).

**BULK BIOSOLIDS** means biosolids that are transported and land-applied in a manner other than in a bag or other container holding biosolids of 1.102 short tons or 1 metric ton or less.

**CHRONIC TOXICITY TEST** is a test in which sublethal effects (e.g., reduced growth or reproduction) are measured in addition to lethality. Chronic toxicity is measured as  $TUc = 100/NOEC$  or  $TUc = 100/Ecp$  or  $100/ICp$ . The  $ICp$  and  $ECp$  value should be the approximate equivalent of the  $NOEC$  calculated by hypothesis testing for each test method.

**COMPOSITE SAMPLE** means a sample that is formed by combining a series of individual, discrete samples of specific volumes at specified intervals. Composite samples characterize the quality of a discharge over a given period of time. Although, composite samples can be time-weighted or flow-weighted, this permit requires the collection of flow-proportional composite samples. This means that samples are collected and combined using aliquots in proportion to flow rather than time. Also see Flow-Proportional Composite.

**CUMULATIVE POLLUTANT LOADING RATE** means the maximum amount of a pollutant applied to land application site.

**DAILY MAXIMUM CONCENTRATION LIMIT** means the maximum allowable discharge of a pollutant in a calendar day as measured on any single discrete sample or composite sample.

**DAILY MAXIMUM MASS LIMIT** means the maximum allowable total mass of a pollutant discharged in a calendar day.

**DISCRETE or GRAB SAMPLE** means an individual **sample of at least 100 mL** collected from a single location, or over a period of time not exceeding 15 minutes.

**DRY-WEIGHT BASIS** means the weight of biosolids calculated after the material has been dried at 105 °C until reaching a constant mass.

**EFFECT CONCENTRATION POINT (ECP)** is a point estimate of the toxicant (or effluent) concentration that would cause an observable adverse effect (e.g., survival or fertilization) in a given percent of the test organisms, calculated from a continuous model (e.g., USEPA Probit Model).

**EXCEPTIONAL QUALITY BIOSOLIDS** means biosolids certified under R18-9-1013(A)(6) as meeting the pollutant concentrations in R18-9-1005 Table 2, Class A pathogen reduction in R18-9-1006, and one of the vector attraction reduction requirements in subsections R-18-9-1010(A)(1) through R18-9-1010(A)(8).

**FLOW PROPORTIONAL COMPOSITE SAMPLE** means a sample that combines discrete samples collected over time, based on the flow of the discharge being sampled. There are two methods used to collect this type of sample. One collects a constant sample volume at time intervals that vary based on stream flow. The other collects discrete samples that are proportioned into aliquots of varying volumes based on stream flow, at constant time intervals (i.e. flow-weighted composite sample).

**HARDNESS** means the sum of the calcium and magnesium concentrations, expressed as calcium carbonate ( $CaCO_3$ ) in milligrams per liter.

**HYPOTHESIS TESTING** is a statistical technique (e.g., Dunnetts test) that determines what concentration is statistically different from the control. Endpoints determined from hypothesis testing are  $NOEC$  and  $LOEC$ . The two hypotheses commonly tested in WET are:

- Null hypothesis ( $H_0$ ): The effluent is not toxic.
- Alternative hypothesis ( $H_a$ ): The effluent is toxic.

**INHIBITION CONCENTRATION (IC)** is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal biological measurement (e.g., reproduction or growth) calculated from a continuous model (e.g., USEPA Interpolation Method).  $IC_{25}$  is a point estimate of the toxicant concentration that would cause a 25% reduction in a non-lethal biological measurement.

**LAND APPLICATION or LAND APPLY** means spraying or spreading biosolids on the surface of the land, injecting biosolids below the land's surface, or incorporating biosolids into the soil to amend, condition, or fertilize the soil.

**LAND TREATMENT FACILITY** means an operation designed to treat and improve the quality of waste, wastewater, or both, by placement wholly or in part on the land surface to perform part or all of the treatment. A land treatment facility includes a facility that performs biosolids drying, processing, or composting, but not land application performed in compliance with 18 A.A.C. 9, Article 10.

*LC50* is the toxicant (or effluent) concentration that would cause death in 50 percent of the test organisms.

*LIMIT OF QUANTITATION (LOQ)* means the minimum levels, concentrations, or quantities of a target variable such as an analyte that can be reported with a specific degree of confidence. The calibration point shall be at or below the LOQ. The LOQ is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all of the method-specified sample weights, volumes, and processing steps have been followed.

*LIMIT OF DETECTION (LOD)* means an analyte and matrix-specific estimate of the minimum amount of a substance that the analytical process can reliably detect with a 99% confidence level. This may be laboratory dependent and is developed according to R9014-615(C)(7).

*METHOD DETECTION LIMIT (MDL)* - See LOD.

*MIXING ZONE* is an area where an effluent discharge undergoes initial dilution and may be extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.

*MONTHLY OR WEEKLY AVERAGE CONCENTRATION LIMIT*, other than for bacteriological testing, means the highest allowable average calculated as an arithmetic mean of consecutive measurements made during calendar month or week, respectively. The "monthly or weekly average concentration limit" for *E. coli* bacteria means the highest allowable average calculated as the geometric mean of a minimum of four (4) measurements made during a calendar month or week, respectively. The geometric mean is the *n*th root of the product of *n* numbers. For either method (CFU or MPN), when data are reported as "0" or non-detect then input a "1" into the calculation for the geometric mean.

*MONTHLY OR WEEKLY AVERAGE MASS LIMITATION* means the highest allowable value that shall be obtained by taking the total mass discharged during a calendar month or week, respectively, divided by the number of days in the period that the facility was discharging. Where less than daily sampling is required by this permit, the monthly or weekly average value shall be determined by the summation of all the measured discharges by mass divided by the number of days during the month or week, respectively, when the measurements were made.

*NO OBSERVED EFFECT CONCENTRATION (NOEC)* is the highest tested concentration of effluent or toxicant, that causes no observable adverse effect on the test organisms (i.e., the highest concentration of toxicant at which the values for the observed responses are not statistically significant different from the controls).

*PATHOGEN* means a disease-causing organism.

*POINT ESTIMATE TECHNIQUES* such as Probit, Interpolation Method, Spearman-Kärber are used to determine the effluent concentration at which adverse effects (e.g., fertilization, growth or survival) occurred. For example, concentration at which a 25 percent reduction in fertilization occurred.

*REFERENCE TOXICANT TEST* is a toxicity test conducted with the addition of a known toxicant to indicate the sensitivity of the organisms being used and demonstrate a laboratory's ability to obtain consistent results with the test method. Reference toxicant data are part of the routine QA/QC program to evaluate the performance of laboratory personnel and test organisms.

*RUNOFF* means rainwater, leachate, or other liquid that drains over any part of a land surface and runs off of the land surface.

*SEWAGE SLUDGE UNIT* means land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include navigable waters.

*SIGNIFICANT DIFFERENCE* is defined as statistically significant difference (e.g., 95% confidence level) in the means of two distributions of sampling results.

*SINGLE CONCENTRATION ACUTE TEST* is a statistical analysis comparing only two sets of replicate observations. In the case of WET, comparing only two test concentrations (e.g., a control and 100% effluent). The purpose of this test is to determine if the 100% effluent concentration differs from the control (i.e., the test passes or fails).

*SOURCE WATER* is defined as untreated water from streams, rivers, lakes or underground aquifers that is used to provide public drinking water as well as to supply private wells used for human consumption.

*STORE BIOSOLIDS* or *STORAGE OF BIOSOLIDS* means the temporary holding or placement of biosolids on land before land application.

*SURFACE DISPOSAL SITE* means an area of land that contains one or more active sewage sludge units.

*SUBMIT*, as used in this permit, means post-marked, documented by other mailing receipt, or hand-delivered to ADEQ.

*TEST ACCEPTABILITY CRITERIA (TAC)* are specific criteria for determining whether toxicity tests results are acceptable. The effluent and reference toxicant must meet specific criteria as defined in the test method.

*TON* means a net weight of 2000 pounds and is known as a short ton.

*TOTAL SOLIDS* means the biosolids material that remains when sewage sludge is dried at 103° C to 105° C.

*TOXIC UNIT (TU)* is a measure of toxicity in an effluent as determined by the acute toxicity units or chronic toxicity units measured. Higher the TUs indicate greater toxicity.

*TOXIC UNIT ACUTE (TU<sub>a</sub>)* is the reciprocal of the effluent concentration that causes 50 percent of the organisms to die by the end of an acute toxicity test (i.e.,  $TU_a = 100/LC50$ ).

*TOXIC UNIT CHRONIC (TU<sub>c</sub>)* is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of a chronic toxicity test (i.e.,  $TU_c = 100/NOEC$ ).

*TOXICITY IDENTIFICATION EVALUATION (TIE)* is a set of procedures used to identify the specific chemical(s) causing effluent toxicity.

*TOXICITY REDUCTION EVALUATION (TRE)* is a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

*TOXICITY TEST* is a procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect of a specific chemical or effluent on exposed test organisms.

*VECTORS* means rodents, flies, mosquitoes, or other organisms capable of transporting pathogens.

*WHOLE EFFLUENT TOXICITY* is the total toxic effect of an effluent measured directly with a toxicity test.