

Inventory No. 101555  
LTF No. 63170

Permit No. AZ0021229  
Place ID No. 9585

## 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,

Arizona Department of Game and Fish  
Canyon Creek Fish Hatchery  
5000 W. Carefree Highway  
Phoenix, Arizona 85086

is authorized to discharge process water from the fish hatchery located on Forest Service Road 33 approximately five miles south of Young Road in Gila County, to Canyon Creek in the Salt River Basin at:

Outfall No.	Latitude	Longitude	Legal
001 – discharge of process water back to Canyon Creek	34° 17' 25"	110° 48' 26"	Township 11 N, Range 14 E Section 36, Quarter W ½ SW

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

This permit shall become effective on \_\_\_\_\_, 2018.

This permit and the authorization to discharge shall expire at midnight, \_\_\_\_\_, 2023.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 2018.

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

**TABLE OF CONTENTS**

**DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS** ..... 3

    Discharge Limitations and Monitoring Requirements ..... 3

    Narrative Water Quality Standards ..... 3

    Sampling Location(s) ..... 4

**MONITORING AND REPORTING** ..... 4

    Sample Collection and Analysis ..... 4

    QA Manual ..... 4

    Collection, Preservation and Handling ..... 5

    Use of Approved Methods ..... 5

    LOQs ..... 5

    Reporting of Monitoring Results ..... 6

    Twenty-four Hour Reporting of Noncompliance ..... 8

    Monitoring Records ..... 9

**BIOSOLIDS REQUIREMENTS** ..... 9

**SPECIAL CONDITIONS** ..... 9

    Mixing Zone ..... 9

    Ambient Monitoring ..... 9

    Best Management Practices ..... 10

    Special Reporting ..... 12

    Reopener ..... 12

**APPENDIX A** ..... 13

    PART A: ACRONYMS ..... 13

    PART B: DEFINITIONS ..... 13

**APPENDIX B** ..... ATTACHED

    STANDARD CONDITIONS

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

**A. Discharge Limitations and Monitoring Requirements**

The permittee shall limit and monitor discharges from Outfall 001 as specified in Table 1. These requirements are based on a maximum daily flow rate of 3,750,000 gallons per day (3.75 mgd).

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

Parameter	Maximum Allowable Discharge Limitations				Monitoring Requirement (3)	
	Mass Limits (1)		Concentration Limits			
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type
Discharge Flow ( MGD)	---	---	REPORT (2)	REPORT (2)	Weekly	Meter
Total Suspended Solids (TSS)	142 kg/day	213 kg/day	10 mg/L	15 mg/L	1x /month	Discrete
pH (4)	Not less than 6.5 standard units (S.U.) nor greater than 9.0 S.U.				1x /month	Discrete
Parameter	Maximum Allowable Discharge Limitations				Monitoring Requirement	
	Mass Limits		Concentration Limits			
	Annual Mean	Daily Maximum	Annual Mean	Single Sample Maximum	Monitoring Frequency	Sample Type
Nitrogen Total (as N) (5) (6)	12.1 kg/day	28.4 kg/day	0.85 mg/L	2.0 mg/L	1x /year (6)	Discrete
Phosphorus Total (as P) (5) (6)	2.1 kg/day	14.2 kg/day	0.15 mg/L	1.0 mg/L	1x /year (6)	Discrete

Footnotes:

- (1) Mass values are to be calculated and reported using the following formula: 1) Mass in kilograms per day = 3.785 x flow in MGD x concentration in mg/L.
- (2) Monitoring and reporting required. No limit set at this time.
- (3) At least one set of samples every three months shall be collected during cleaning operations, and denoted as such on the DMRs.
- (4) pH must be measured at the time of sampling and does not require use of a certified laboratory.
- (5) A mixing zone has been granted for nitrogen and phosphorus. See Part IV. Special Conditions below.
- (6) The annual average, as per R18-11-109.F(3), shall be determined on a calendar year basis. The annual average shall be based on monthly monitoring results. See Part IV for additional monitoring required.

**B. 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-flavor in aquatic organisms;

4. Are toxic to humans, animals, plants or other organisms;
  5. 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;
  6. Change the color of the surface water from natural background levels of color.
- C.** 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.
- D.** The discharge shall not raise the ambient water temperature of the receiving water more than 1.0 degree Celsius.
- E.** The discharge shall not lower the dissolved oxygen concentration of the receiving water to less than 7.0 mg/L unless the percent saturation of oxygen remains equal to or greater than 90%.
- F.** The discharge shall not cause the receiving water to exceed 25 mg/L for suspended sediment concentration. This standard is expressed as a median value determined from a minimum of four samples collected at least seven days apart. This standard applies to a surface water that is at or near base flow and does not apply to a surface water during or 48 hours after a precipitation event.
- G.** Samples taken in compliance with the monitoring requirements specified in Part I.A. Table 1 in this permit shall be taken at Outfall 001 to Canyon Creek.

## **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 A.A.C. 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. (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 discharge 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.

## **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 calculations of the monthly average and daily maximums reported on the DMRs if the analyses were by methods specified in Part II.A above.

2. DMRs and attachments are to be submitted (see Appendix A- definitions) 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
- Original copies of laboratory results

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 address listed below, or submit by any other alternative mode of submittal 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	<p>All samples collected in the same calendar month must be averaged.</p> <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 &lt;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 report any noncompliance which may endanger the environment or human health orally 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 AZPDES Individual Permits Unit in writing within 5 days of the noncompliance event. The permittee shall include in the 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 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. BIOSOLIDS REQUIREMENTS**

Not applicable because fish wastes are not considered biosolids under the 40 CFR 503 provisions.

**PART IV. SPECIAL CONDITIONS**

**A. Mixing Zone**

A mixing zone for nitrogen and phosphorus has been granted for the duration of this permit. ADEQ evaluated the request and approved the establishment of the nitrogen and phosphorus mixing zone. The factors in the Arizona mixing zones rules listed in A.A.C. R18-11-114(D) were considered upon approving the request.

**B. Ambient Surface Water and Additional Outfall 001 Monitoring**

Conducting and reporting ambient monitoring as per the table below is also required. The following events should also be noted in the report: drought, major winter precipitation, snow melt, summer monsoon, and fall precipitation.

Parameter	Reporting Units	Monitoring Frequency	Sample Type	Sample Location (1)(2)
Flow	MGD	Quarterly	Discrete	Downstream
Dissolved oxygen	mg/L	Quarterly	Discrete	Upstream and Downstream
pH	s.u.	Quarterly	Discrete	Upstream and Downstream

Total Nitrogen	mg/L	Quarterly	Discrete	Upstream and Downstream
Total Phosphorus	mg/L	Quarterly	Discrete	Upstream and Downstream
Total Nitrogen	mg/L	Monthly	Discrete	Outfall 001
Total Phosphorus	mg/L	Monthly	Discrete	Outfall 001

Footnotes:

- (1) Upstream sample location shall be collected at a point at least 10 feet but no more than 50 feet upstream of Outfall 001 from the continuously running flow that bypasses the hatchery
- (2) Downstream sample location shall be at a point no more than 500 meters downstream of Outfall 001

**C. Best Management Practices (BMPs)**

The permittee shall perform the following activities and submit an annual progress report to ADEQ by January 31st of each year, which shall include the following:

1. Solids control. The permittee must:
  - a. Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the U.S.
  - b. In order to minimize the discharge of accumulated solids from settling ponds and basins and production systems, identify and implement procedures for routine cleaning of rearing units and off-line settling basins, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting aquatic animals in the production system.
  - c. Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the U.S., except in cases where the permitting authority authorizes such discharge in order to benefit the aquatic environment.
2. Materials storage. The permittee must:
  - a. Insure proper storage of drugs, pesticides, and feed in a manner designed to prevent spills that may result in the discharge of drugs, pesticides or feed to waters of the U.S.
  - b. Implement procedures for properly containing, cleaning, and disposing of any spilled material.

3. Structural maintenance. The permittee must:
  - a. Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.
  - b. Conduct regular maintenance of the production system and the wastewater treatment system in order to ensure that they are properly functioning.
4. Recordkeeping. The permittee must:
  - a. In order to calculate representative feed conversion ratios, maintain records for aquatic animal rearing units documenting the feed amounts and estimates of the numbers and weight of aquatic animals.
  - b. Keep records documenting the frequency of cleaning, inspections, maintenance and repairs.
5. Training. The permittee must:
  - a. In order to ensure the proper clean-up and disposal of spilled material adequately train all relevant facility personnel in spill prevention and how to respond in the event of a spill.
  - b. Train staff on the proper operation and cleaning of production and wastewater treatment systems including training in feeding procedures and proper use of equipment.
6. Chemical Usage. The permittee must:
  - a. Submit annually by January 31<sup>st</sup> each year a list of all chemicals added to water in the fish hatchery during the preceding year.
  - b. The chemical list shall include antibiotics, fungicides, detergents, and other cleaning agents, disinfectants and any other chemicals added to the water. The submittal shall include information on frequency and duration of use, purpose, and amounts.
7. Send this report to the following address:

Arizona Department of Environmental Quality  
AZPDES Individual Permits Unit  
1110 W. Washington St.  
Phoenix, AZ 85007

#### **D. Special Progress Reporting**

The permittee shall submit an annual progress report to ADEQ by January 31st of each year which shall include the following:

- a) a summary of all data collected during the previous calendar year;
- b) a description of all strategic facility upgrades and process improvements initiated and/or completed during the previous calendar year and the date(s) when these improvements were initiated and/or completed;
- c) an evaluation of the effectiveness of the facility upgrades and process improvements initiated and/or completed during the previous calendar year;
- d) an evaluation of the current operation of the settling basins and whether additional modifications to the operation can be made to optimize their efficiency; and
- e) a description of any additional facility upgrades and/or process improvements necessary to accomplish further nutrient reductions and, if appropriate, a proposal to implement these upgrades and improvements.

The report shall be submitted by January 31<sup>st</sup> of each year to the following address.

Arizona Department of Environmental Quality  
AZPDES Individual Permits Unit  
1110 W. Washington  
Phoenix, AZ 85007

#### **E. 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 discharge 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
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)
NPDES	National Pollutant Discharge Elimination System
QA	quality assurance
ug/L	micrograms per Liter, also equal to parts per billion (ppb)

**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 TUas, where  $TUa = 100/LC_{50}$ .

*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). IC25 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).

*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.,  $TU_a = 100/LC_{50}$ ).

*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.