Section 12

Design Features Relevant to NPDES Permit

DESIGN FEATURES
(Which are relevant to NPDES Application)

Morgan Lake Dam has an internal water collection system designed to protect the dam. The water from the collection system is discharge to an unnamed wash and enters the Morgan Lake Blowdown wash, downstream of the parshall flume. The toe drain flows approximately five gpm into the Morgan Lake Blowdown wash, which typically flows from 3,500 to 10,000 gallons/minute.

The Morgan Lake Dam has a spillway, which is necessary for dam safety. Occasionally, wind may cause water to lap over the spillway. This water does not typically flow to the Morgan Lake Blowdown wash, but this could possibly happen. The spillway does not overflow other than occasionally due to wave action in the wind.

Morgan Lake is recharged from the San Juan River. Arizona Public Service operates a river station, which pumps water from the river two miles to Morgan Lake. In the river station, there are sumps that catch pump packing leaks. The pump packing water is potable water supplied by the Navajo Tribal Utility Authority. The water caught in the sump is passed through an oil separator, in case oil is spilled in the building, and then pumped into the piping going to Morgan Lake.

Periodically, the river station pumps are started and stopped. When they are stopped, high pressures exist. A check valve is impractical due to safety considerations. Thus, when the pumps are stopped, a relief valve and line returns water from the pipeline to the San Juan River.

The intake in the river is equipped with screens that catch debris to prevent damage to the pump system. Periodically, the screens must be cleaned of accumulated debris. One screen is lifted and cleaned, while the other remains in place. River water is pumped through hoses to wash the debris off the screens and is returned to the river where it originated.

Water is drawn from Morgan Lake via an intake canal. There are two intake structures located in the intake canal. Units 1-2-3 intake structure is equipped with traveling screens to remove debris from the intake water. When the screens are cleaned, the debris is returned to the intake canal. The canal then flows to the Units 4-5 intake, which is also equipped with traveling screens. When the Unit 4-5 intake screens are cleaned, the debris is captured and disposed of onsite.

The function of the River station to provide makeup water to the man-made lake, pass1 the lake water through main condensers in cooling canals back to the lake for removing heat and then passed again through the system, except for blow down to prevent TDS build-up functions exactly like *recirculated cooling water* definition.

Please refer to Section 14 for a discussion of impacts from the closure of Units 1-2-3 when it occurs.

Section 13

Copy of Current NPDES Permit – Administratively Extended

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et seq.; the "Act"),

Arizona Public Service Company
P.O. Box 53999
Phoenix, Arizona 85072-3999

is authorized to discharge from the APS Four Corners Power Plant, located in San Juan County, approximately 20 miles southwest of Farmington, New Mexico,

Latitude: 36° 42' 27" N
Longitude: 108° 28' 07" W

to receiving waters named Morgan Lake, a tributary to the No Name Wash, a tributary to the Chaco River, and then to Segment 2-401 of the San Juan River basin, in accordance with effluent limitations, monitoring requirements and in the attached 14 pages of EPA Region 9 "Standard Federal NPDES Permit Conditions," dated May 10, 1990.

This permit shall become effective on April 7, 2001.

This permit and the authorization to discharge shall expire at midnight, April 6, 2006.

Signed this 3rd day of April 2001.

For the Regional Administrator

Alexis Strauss, Director
Water Division
EPA, Region 9

SECTION A. EFFLUENT LIMITATION AND MONITORING REQUIREMENTS

I. OUTFALL 001 - Cooling Pond Discharge

During the period beginning on the effective date of this permit and lasting through the date of expiration, the permittee is authorized to discharge from Outfall Number 001.

Such discharge shall be limited and monitored by the permittee as specified below. Samples shall be collected and flow measurements taken at the point where Morgan Lake blowdown water discharges through the existing parshall flume.

Effluent Parameter	Units	Monthly Average	Weekly Average	Daily Maximum(1)	Monitoring Frequency	Sampling Type
Flow(2)	MGD	–	--	14.7	Once/Week	Calculated
TDS(3)	mg/l	--	--	--	Once/Month	Discrete
pH	std. units	between 6.0 to 9.0			Once/Month	Discrete
Temp	deg F	32.2°C	--	35.0°C	Continuous	Recorded

NOTES:
(1) Instantaneous maximum.
(2) Report both average and maximum daily flows.
(3) During Periods of Discharge. Total Dissolved Solids shall be determined by the "calculation method" (sum of constituents) as described in the 1979 edition of "Techniques of Water Resources Investigations of the United States Geological Survey - Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," or any subsequent editions.

II. INTERNAL OUTFALL 01A - Condenser Cooling Water Discharge

A. During the period beginning on the effective date of this permit and lasting through date of expiration, the permittee is authorized to discharge from Internal Outfall 01A.

Such discharge shall be limited and monitored by the permittee as specified below. Stormwater runoff is included in this discharge. Samples shall be collected at the point where condenser cooling water from units 1, 2, 3, 4 and 5 is discharged from the circulating water canal to Morgan Lake.

Effluent Parameter	Units	Monthly Average	Weekly Average	Daily Maximum (1)	Monitoring Frequency	Sampling Type
Flow	MGD	--	--	--	Once/Week	Calculated(2)
TRC(3,4)	lb/day	--	--	954	Once/Week	Discrete
	mg/l	--	--	0.2	Once/Week	Discrete
Oil & Grease	mg/l	15.0	--	20.0	Once/Week	Discrete
pH	std. units	between 6.0 to 9.0			Once/Week	Discrete

NOTES:

(1) Instantaneous maximum.

(2) Based upon pumping records. Report both average and maximum daily flows.

(3) As defined in 40 CFR 423.11. Limits for total residual chlorine are set in accordance with 40 CFR 423.13(b)(1) for once through cooling water. Internal Outfall 01A discharge is further restricted by 40 CFR 423.13(2) in that total residual chlorine may not be discharged from any single generating unit for more than two hours per day. Simultaneous multi-unit chlorination is permitted.

(4) Samples shall be collected during periods of chlorination. Permittee shall report both concentration and mass loading values.

B. Effluent Toxicity Testing:

Effluent toxicity shall be monitored and defined as follows. The permittee shall only be required to conduct chronic toxicity testing if discharges from Internal Outfall 01A are known to occur during at least five (5) consecutive days. The permittee shall conduct monthly toxicity tests on 24-hour composite effluent samples. Samples shall be taken at the NPDES sampling location. If, during the first year of toxicity testing, there is no chronic toxicity (as defined in Section 2), then the permittee may request a reduction in the frequency of chronic toxicity monitoring required by this permit, in accordance with 40 CFR 122.62. This request for permit modification should be submitted in writing to U.S. EPA, Region 9.

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATION	MONITORING REQUIREMENTS	
	Daily Maximum	Measurement Frequency	Sample Type
Chronic Toxicity Testing	(1)	Once/Month	Composite

NOTES:

(1) There is no discharge limitation for chronic toxicity at this time. Monitoring and reporting for chronic toxicity are specified in Sections 1 and 2 below.

1. Chronic Toxicity Test Species and Methods:

(a) The permittee shall conduct short-term tests with the cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test), the fathead minnow, *Pimephales promelas* (larval survival and growth test) and the green alga, *Selanastrum capricornatum* (growth test) for the first three suites of tests. After this screening period, monitoring shall be conducted using the most sensitive species.

(b) Every calendar year, the permittee shall re-screen for one month at different times from the prior year and continue to monitor with the most sensitive species.

(c) The presence of chronic toxicity shall be estimated as specified by the methods listed in the most recent edition of Table IA, Parameter 8, 40 CFR Part 136.3(a), as clarified by final EPA guidance.

2. Definition of Chronic Toxicity

(a) Chronic toxicity measures a sublethal effect (e.g., reduced growth, reproduction) to experimental test organisms exposed to an effluent or ambient waters compared to that of the control organisms. Chronic toxicity is defined as: 1) greater than 1.0 TUc based on any monthly median of test results, and 2) any one test result with a daily maximum value (MD) greater than 2.0 TUc.

(b) Results shall be reported in TUc, where TUc = 100/NOEC. The no observed effect concentration (NOEC) is the highest concentration of toxicant to which organisms are exposed in a chronic test, that causes no observable adverse effect on the test organisms (e.g., the highest concentration of toxicant to which the values for the observed responses are not statistically significantly different from the controls).

3. Chronic Toxicity Quality Assurance

(a) A series of at least five dilutions and a control will be tested. Effluent concentrations for the tests will be 100%, 75%, 50%, 25%, and 12.5% unless written permission from EPA to use other effluent concentrations is provided.

(b) If organisms are not cultured in-house, concurrent testing with

reference toxicants shall be conducted. Where organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicants shall also be conducted using the same test conditions as the effluent toxicity tests (e.g., same test duration, etc).

(c) If either of the reference toxicant test or the effluent tests do not meet all test acceptability criteria as specified in the manual, then the permittee must re-sample and re-test within 14 days.

(d) Control and dilution water should be lab water, as described in the manual. If the dilution water used is different from the culture water, a second control, using culture water shall also be used.

4. Preparation of Initial Investigation TRE Workplan

The permittee shall submit to EPA a copy of the permittee's initial investigation Toxicity Reduction Evaluation (TRE) workplan (1-2 pages) within 90 days of the effective date of this permit. This plan shall describe the steps the permittee intends to follow if toxicity is detected, and should include, at a minimum:

(a) A description of the investigation and evaluation techniques that would be used to identify potential causes/sources of toxicity, effluent variability, and treatment system efficiency.

(b) A description of the facility's methods of maximizing in-house treatment efficiency and good housekeeping practices.

(c) If a toxicity identification evaluation (TIE) is necessary, who will conduct it (including whether in-house expertise, or the study will be sent out to contractors.)

5. Accelerated Testing

(a) If chronic toxicity, as defined in Section 2, is detected above the specified triggers, then the permittee shall conduct six more tests, approximately every two weeks, over a twelve-week period. Testing shall commence within two weeks of receipt of the sample results of the exceedance of the WET monitoring trigger.

(b) If initial investigation indicates the source of toxicity (for instance, a temporary plant upset), then only one additional test is necessary. If

toxicity as defined above is detected in this test, then Section 6 below shall apply.

(c) If none of the six tests indicate toxicity as defined above, then the permittee may return to the normal testing frequency (i.e., monthly testing).

6. Toxicity Reduction Evaluation (TRE) and Toxicity Identification Evaluation (TIE)

(a) If chronic toxicity, as defined in Section 2, is detected in any of the six (6) additional tests, then, in accordance with the facility's TRE workplan and, at a minimum, using as guidance EPA manuals EPA/600/2-88/070, the permittee shall initiate a TRE within thirty (30) days of the exceedance to reduce the cause(s) of toxicity. The permittee will expeditiously develop a more detailed TRE workplan, which includes:

(i) Further actions to investigate and identify the cause of toxicity;

(ii) Actions the permittee will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity;

(iii) A schedule for these actions.

(b) The permittee may initiate a TIE as part of the TRE process using as guidance EPA acute and chronic manuals, EPA/600/6-91/005F (Phase I), EPA/600/R-92/080 (Phase II), and EPA-600/R-92/081 (Phase III) to identify the cause(s) of toxicity.

7. Toxicity Reporting

(a) The permittee shall submit the results of the toxicity tests, including any accelerated testing conducted during the month, in TUs with the discharge monitoring reports (DMR) for the month in which the test is conducted, if possible, or the following month's DMR if results are not available (in which case the permittee shall notify EPA.) If an initial investigation indicates the source of toxicity and accelerated testing is unnecessary, pursuant to Section 5, then those results shall also be submitted with the DMR for the quarter in which the investigation occurred.

(b) The full report shall be submitted by the end of the month in which the DMR is submitted. Results from retesting required due to failure of a previous test to achieve test acceptability criteria shall be submitted as soon as validated retest results are available.

(c) The full report shall consist of: (1) the results of routine monthly and any accelerated monitoring conducted; (2) the dates of sample collection and initiation of each toxicity test; (3) the applicable chronic toxicity trigger as described in Section 2 above.

(d) Test results for chronic tests shall also be reported according to the chronic manual chapter on Report Preparation, and shall be attached to the DMR.

(e) The permittee shall notify EPA in writing within fifteen (15) days of receipt of the results which exceed a trigger as described in Section 2 above. The notification will describe actions the permittee has taken or will take to investigate and correct the cause(s) of toxicity. It may also include a status report on any actions required by the permit, with a schedule for actions not yet completed. Where no actions have been taken, the reasons for not taking action will be given.

III. INTERNAL OUTFALL 01E - Combined Waste Treatment Pond Discharge

During the period beginning on the effective date of this permit and lasting through date of expiration, the permittee is authorized to discharge from Internal Outfall 01E.

Such discharges shall be limited and monitored by the permittee as specified below. Samples shall be collected prior to mixing with any other waste source stream and/or release to the circulating water canal.

Effluent Parameter	Units	Monthly Average	Weekly Average	Daily Maximum[1]	Monitoring Frequency	Sampling Type
Flow[2]	MGD	--	--	--	Daily	Estimated
TSS	mg/l	--	30	100	Once/Week	Discrete
Oil & Grease	mg/l	--	15	20	Once/Week	Discrete
pH	std. units	between 6.0 to 9.0			Once/Week	Discrete

NOTES:
(1) Instantaneous maximum.
(2) Report both average and maximum daily flows.

IV. INTERNAL OUTFALL 01B - Chemical Metal Cleaning Wastewater

During the period beginning on the effective date of this permit and lasting through date of expiration, the permittee is authorized to discharge from Internal Outfall 01B.

Such discharges shall be limited and monitored by the permittee as specified below. Samples shall be collected prior to mixing with any other waste source stream and/or discharge to the circulating water canal.

Effluent Parameter	Units	Monthly Average	Weekly Average	Daily Maximum(1)	Monitoring Frequency	Sampling Type
Flow(2)	MGD	--	--	--	Once/Day	Estimated
TSS	mg/l	--	30	100	1/occurrence	Discrete
Oil & Grease	mg/l	--	15	20	1/occurrence	Discrete
Iron	mg/l	--	1.0	1.0	1/occurrence	Discrete
Copper, total	mg/l	--	1.0	1.0	1/occurrence	Discrete
pH	std. units	between 6.0 to 9.0			1/occurrence	Discrete

NOTES:
(1) Instantaneous maximum.
(2) Defined in 40 CFR 423.11.

SECTION B. GENERAL DISCHARGE SPECIFICATIONS

1. PCB Fluids - There shall be no discharge of polychlorinated biphenyl (PCB) fluids.

2. Floating Solids - Discharge waters shall be free of scum and other floating materials in other than trace amounts.

3. Surface Seepage - Surface seepage intercept systems shall be constructed and operated for existing and future unlined ash ponds. Water collected by these intercept systems shall be returned to the ash ponds, or evaporation ponds.

SECTION C. PERMIT REOPENER

Should any of the monitoring indicate that the discharge causes, has the reasonable potential to cause, or contributes to excursion above applicable water quality criteria, the permit may be reopened for the imposition of water quality based limits and/or whole effluent toxicity limits. Also, this permit may be modified in accordance with the requirements set forth at 40 CFR Parts 122 and 124.

SECTION D. MONITORING AND REPORTING

I. Reporting of Monitoring Results

A. Monitoring results shall be reported on Discharge Monitoring Report (DMR) forms (EPA No. 3320-1) to be supplied by the EPA Regional Administrator, to the extent that the information reported may be entered on the forms. The results of all monitoring required by this permit shall be submitted in such a format as to allow direct comparison with the limitations and requirements of the permit.

Unless otherwise specified, discharge flows shall be summarized and reported in terms of the average flow over each monthly period and the maximum daily flow over that monthly period. Each monthly report is due by the 28th of the following month (i.e. the January report is due by February 28.) Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator at the following address:

Regional Administrator
Environmental Protection Agency
Region IX, Attn: WTR-7
75 Hawthorne Street
San Francisco, CA 94105

B. For effluent analyses, the permittee shall utilize an EPA-approved analytical method with a Method Detection Limit (MDL) that is lower than the effluent limitations (or lower than applicable water quality criteria for trace substances where monitoring is required but no effluent limitations have been established.) MDL is the minimum concentration of an analyte that can be detected with 99% confidence that the analyte concentration is greater than zero, as defined by the specific laboratory method listed in 40 CFR Part 136. The procedure for determination of a laboratory MDL is in 40 CFR Part 136, Appendix B.

C. If all published MDLs are higher than the effluent limitations (or applicable criteria concentrations), the permittee shall utilize the EPA-approved analytical method with the lowest published MDL.

D. The permittee shall develop a Quality Assurance (QA) Manual/QA Plan. The purpose of the QA Manual is to assist in planning for the collection and analysis of samples and explaining data anomalies if they occur. As appropriate and applicable, the QA Manual shall include the details enumerated below. The QA Manual shall be retained on the permittee's premises and be available for review upon request by EPA or an authorized representative. The permittee shall review its QA Manual annually and revise it when appropriate. Throughout all field sampling and laboratory analyses, the permittee shall use quality assurance/quality control (QA/QC) procedures as documented in its QA Manual.

1. Project Management including roles and responsibilities of the participants; purpose of sample collection; matrix to be sampled; the analytes or compounds being measured; applicable technical, regulatory, or program-specific action criteria; personnel qualification requirements for collecting samples.

2. Sample collection procedures; equipment used; the type and number of samples to be collected including QA/QC samples (i.e., background samples, duplicatives, and equipment or field blanks); preservatives and holding times for the samples (see 40 CFR Part 136.3).

3. Identification of the laboratory to be used to analyze the samples; provisions for any proficiency demonstration that will be required by the laboratory before or after contract award such as passing a performance evaluation sample; analytical method to be used; required 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.

4. Discussion of how the permittee will perform data review and requirements for reporting of results to EPA to include resolving of data quality issues and identifying limitations on the use of the data.

E. Sample collection shall be performed as stated in the QA Manual. The QA Manual shall include a discussion on the preservation and handling, preparation and analysis of samples as described in the most recent edition of 40 CFR 136.3, unless otherwise specified in this permit.

II. Monitoring and Records

Records of monitoring information shall include:

A. Date, exact location, and time of sampling or measurements performed, preservatives used;
B. Individual(s) who performed the sampling or measurements;
C. Date(s) analyses were performed;
D. Laboratory(ies) which performed the analyses;
E. Analytical techniques or methods used;
F. Any comments, case narrative or summary of results produced by the laboratory. These should identify and discuss QA/QC analyses performed concurrently during sample analyses and should specify whether they met project and 40 CFR Part 136 requirements. The summary of results must include information on inititial and continuing calibration, surrogate analyses, blanks, duplicates, laboratory control samples, matrix spike and matrix spike duplicate results, sample receipt condition, holding times, and preservation.
G. Summary of data interpretation and any corrective action taken by the permittee.
H. Effluent limitations for analytes/compounds being analyzed.

III. Twenty-Four-Hour Reporting of Noncompliance

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances to the following person or office:

CWA Compliance Office Chief
U.S. EPA
(415) 744-1905

If the permittee is unsuccessful in contacting the person above, the permittee shall report by 9 a.m. on the first business day following the noncompliance. A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain 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 or plans to reduce, eliminate, and prevent reoccurence of the noncompliance.

SECTION E. INSPECTION AND ENTRY

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and such other documents as may be required by law, to perform inspections under authority of Section 10: Inspection and Entry of the "EPA Region 9 Standard Federal NPDES Permit Conditions," dated May 10, 1990, as attached.

SECTION F. DEFINITIONS

The following definitions shall apply unless otherwise specified in this permit:

1. "Discrete sample" means any individual sample collected in less than 15 minutes.

2. "Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the sampling day. "Daily discharge" determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the "daily discharge" determination of concentration shall be the arithmetic average (weighted by flow value) of all samples collected during that sampling day.

3. "Daily average" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

6. "Daily maximum" concentration means the measurement made on any single discrete sample or composite sample.

7. "Daily maximum" mass limit means the highest allowable "daily discharge"

by mass during any calendar day.

8. A "composite sample" means, for flow rate measurements, the arithmetic mean of no fewer than 8 individual measurements taken at equal intervals for eight (8) hours or for the duration of discharge, whichever is shorter. A composite sample means, for other than flow rate measurement, a combination of eight (8) individual portions obtained at equal time intervals for eight (8) hours or for the duration of the discharge, whichever is shorter. The volume of each individual portion shall be directly proportional to the discharge flow rate at the time of sampling. The sampling period shall coincide with the period of maximum discharge flow.

9. A "monthly or weekly average" concentration limitation means the arithmetic mean of consecutive measurements made during a calendar monthly or weekly period, respectively. The "monthly or weekly average" concentration for fecal or total coliform bacteria means the geometric mean of measurements made during a monthly or weekly period, respectively. The geometric mean is the "nth" root of the product of "n" numbers.

10. A "monthly or weekly average" mass limitation means the total discharge by mass during a calendar monthly or weekly period, 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 monthly or weekly period when the measurements were made.

Section 14

Impacts of Units 1-2-3 Shutdown

Impacts of Units 1-2-3 Shutdown

It is estimated that the shutdown of units 1-2-3 will occur about mid-year 2013. The shutdown of these three units will impact some of the water and wastewater discharges. These include:

1. The closed cycle recirculating cooling water volume will decrease by about 30%.
2. The biweekly chlorination will stop for the three units.
3. The addition of scale chemicals for the cooling water on the units will stop.
4. The addition of corrosion chemicals for the small cooling water systems on the units will stop.
5. The fly ash and scrubber sludge wet handling for the venturi scrubbers will cease eliminating a wastewater stream to lined ponds
6. The bottom ash sluicing to hydrobins will cease and decrease another wastewater stream to the Combined Waste Treatment Pond (CWTP) reducing the TSS loading.
7. Intermittent Flue Gas Desulfurization wastewater will not discharge to the Combined Waste Treatment Pond.
8. Boiler blowdown from the units would cease to the CWTP eliminating the use and discharge of hydrazine, ammonia and phosphate buffering chemicals.
9. Hydrazine, ammonia and phosphate buffering use would cease on the drum boilers
10. Acid cleaning and co-disposal of the wastewater to the lined ash ponds would cease on these three units.
11. There will be less water treatment blowdown from the Reverse Osmosis operations.
12. There should be a reduced thermal loading on Morgan Lake.

In general, the units account for about 30% of the water and wastewater flows, chemical use and waste generation.