

Aquifer Protection Permit P-101449  
Place ID 4477, LTF 65943  
Significant Amendment  
**SRP - Coronado Generating Station**

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an aquifer protection permit for the subject facility that covers the life of the facility, including operational, closure, and post closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. This document gives pertinent information concerning the issuance of the permit. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards (AWQS) at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

## I. FACILITY INFORMATION

### Name and Location

Permittee's Name:	Salt River Project Agricultural Improvement and Power District
Mailing Address:	Coronado Generating Station P.O. Box 1018 St. Johns, Arizona 85936
Facility Name and Location:	SRP- Coronado Generating Station 6 miles NE of St. Johns, Arizona U.S. Highway 91 St. Johns, Arizona 85936

### Regulatory Status

This is an existing facility. An application for this significant permit amendment was received on July 25, 2017. The following table includes APP amendments issued to SRP - Coronado Generating Station by the Arizona Department of Environmental Quality (ADEQ):

<b>Amendment Type</b>	<b>Effective date</b>
Notice of Disposal	January 18, 1985
Individual Aquifer Protection	May 30, 2003
Other Amendment	August 17, 2004
Other Amendment	May 15, 2009
Other Amendment	May 26, 2011
Significant Amendment	September 24, 2013
Significant Amendment	Withdrawn on May 2, 2017

**Facility Description**

The Coronado Generating Station (CGS) is located on two sites; the northern area site (Plant Site) and the southern area site which is located approximately 1.5 mile southwest of the plant site.

The northern area site (Main Plant Site) is located within 640 fenced acres. This facility consists of two pulverized coal-fired, steam electric generating units designed to produce a maximum rated generating capacity for the entire plant of approximately 912 megawatts. Commercial operations began in 1979. The operating units consist of a main power building, sulfur dioxide absorbers and limestone handling equipment, a railroad spur, coal and ash handling facilities, coal mixing facilities, a combined administration and service building, water and wastewater storage reservoirs, water treatment building, mechanical draft cooling towers operating at approximately 17 cycles of concentration, 500-kilovolt (kV) and 69-kV switchyards, and water supply from satellite well fields.

The southern area site is a 969-acre area Coal Combustion Residual (CCR) management complex. This site includes the Evaporation Pond, the Ash Disposal Landfill, the Inactive Ash Slurry Settling Ponds and the Solid Waste Landfill.

The site consists of the following discharging facilities:

<b>Facility</b>	<b>Latitude North</b>	<b>Longitude West</b>	<b>Location</b>
West Recoverable Water Reservoir	34° 34' 47.02"	109° 16' 21.91"	Plant Site
East Recoverable Water Reservoir	34° 34' 47.05"	109° 16' 20.25"	Plant Site
Cooling Tower Blowdown Reservoir	34° 34' 50.48"	109° 16' 21.22"	Plant Site
Wastewater Reservoir	34° 34' 48.70"	109° 16' 21.17"	Plant Site
Yard Ditch	34° 34' 42.80"	109° 16' 16.11"	Plant Site
Evaporation Pond	34° 33' 20.37"	109° 17' 53.64"	CCR Complex
Northeast Retention Pond	34° 35' 03.07"	109° 15' 41.15"	Plant Site
Ash Disposal Landfill	34° 33' 16.2"	109° 16' 59.13"	CCR Complex

Solid Waste Landfill	34° 34' 5.1"	109° 16' 57.2"	Plant Site
Fire Training Area	34° 34' 53.81"	109° 16' 22.24"	Southwest of Plant
Coal Yard Retention Pond	34° 34' 35.50"	109° 16' 09.70"	Plant Site
Concrete Lined Overflow Containment Area	34° 34' 50.05"	109° 16' 18.95"	Plant Site
Ash Slurry Settling Ponds (Inactive )	34° 33' 0.88"	109° 17' 24.28"	CCR Complex
Scrubber Area Units 1 and 2	34° 34' 51.52"	109° 16' 21.93"	Plant Site

There are six facilities associated with the Coronado Generating Station that are eligible for either exemptions or general permits, and therefore are not included as discharging facilities in this Aquifer Protection Permit. A summary of the facilities and their regulatory status is provided below:

Facility	Regulatory Status	Description
Reservoir A	Exempt – A.R.S. § 49-250(B)(6)	Facilities solely used for storage of groundwater.
Reservoir B	Exempt – A.R.S. § 49-250(B)(6)	Facilities solely used for storage of groundwater.
Reservoir C	Exempt – A.R.S. § 49-250(B)(6)	Facilities solely used for storage of groundwater.
Northwest Retention Pond	Exempt – A.R.S. 49-250(B)(10)	Surface impoundments used solely to contain storm runoff.
Southeast Retention Pond	Exempt – A.R.S. § 49-250(B)(10)	Surface impoundments used solely to contain storm runoff.
Sewage Pond	Exempt - General Permit – A.A.C. R18-9-A301(A) and A.A.C. R18-9-B301(I)	Type 1.09 - Sewage treatment facility with flows less than 20,000 gpd, if operated and maintained in compliance with general permit conditions.

**Amendment Description**

ADEQ has reviewed and approved this significant permit amendment to incorporate facility changes needed to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule and other permit change requests.

- Add a new Point of Compliance (POC) well, MW-78, based upon recent investigations associated with the USEPA CCR Rule. The current POC well, MW-51, was determined to be up-gradient of the Evaporation Pond and therefore unsuitably located to be a POC well.
- Incorporate alert levels (ALs) and aquifer quality limits (AQLs) for the new POC well MW-78.
- Incorporate facility changes needed at the Evaporation Pond, Ash Disposal

Landfill, and Inactive Ash Slurry Settling Ponds which collectively are discharging facilities within the CCR Rule management complex.

- Submit the final Inactive Ash Slurry Settling Pond Closure design, narrative description, closure cost estimate closure timeline, and post-closure care and monitoring plan.
- Approve replacement POC well MW-67R.
- Approve edits to the current APP including:
  - Add a Compliance Schedule Item (CSI) to conduct closure and begin post-closure care of the Inactive Ash Slurry Settling Ponds not requiring an amendment.
  - Remove Cooling Tower Canals and Scrubber Area be removed from Section 2.1.12 and the list of permitted discharging facilities table in Section 2.1.
  - Characterization of the Inactive Ash Slurry Settling Ponds material.
  - Clarification of the following sections of the APP:
    - Remove average daily flow rate from Sections 2.1.2, 2.1.3, 2.1.7, and 2.1.8.
    - Clarify deadline requirements in Sections 2.6.3.4 and 2.7.3.
    - Add a BADCT narrative for the Coal Yard Retention Pond from Section 2.1.4 to Section 2.2.1 BADCT engineering design.
    - Change Table 4 Discharge Monitoring Sampling Points point 8 from Coal Storage Retention Pond to Coal Yard Retention Pond.
    - Change Table 4A listing for Coal Yard Retention Pond to Coal Yard Retention Pond with the corresponding latitude and longitude:  
34° 34' 35.50" North, 109° 16' 9.70" West
    - Define PQL as Practical Quantification Limit in Section 2.5.3.1.1.
    - Incorporate updated Revised Self-Monitoring Report Forms and Logbook requirements per ADEQ's April 30, 2014 letter from Lucy Ruiz.
  - Update permit language based upon the most recent framework

**II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY**

The BADCT designs for the discharging facilities are based on the existing construction design, operation and maintenance procedures, and site characteristics. BADCT also includes water conservation through recycling, recovery, and reuse of industrial wastewater to decrease raw water needs. Below summarizes the general design of the permitted facilities:

Facility	BADCT Description
Recoverable Water Reservoir (RWR)	<p>The liner system consists of a 60-mil HDPE liner underlain by geotextile fabric over the existing 4-inch-thick rubberized asphalt installed in 2-inch layers. Joints of the second lift overlap the joints of the first lift by at least 4 feet. The asphalt shall be coated with a rubberized asphalt chip seal. The maximum permeability of the liner system shall be no greater than 0.01 ft/yr (<math>10^{-8}</math> cm/sec). Each cell is constructed with a weir that directly connects to the Wastewater Reservoir. The purpose of this overflow system shall be to immediately drain any wastewater out of the Recoverable Water Reservoir and into the Wastewater Reservoir in the event that the water level reaches 2 feet below the top of each cell.</p>
Cooling Tower Blowdown Reservoir	<p>The liner system consists of a 60-mil HDPE liner underlain by geotextile fabric over the existing 4-inch-thick rubberized asphalt installed in 2-inch layers. Joints of the second lift overlap the joints of the first lift by at least 4 feet. The asphalt is coated with a rubberized asphalt chip seal. The maximum permeability of the liner system shall be no greater than 0.01 ft/yr (<math>10^{-8}</math> cm/sec). A 2-inch perforated PVC collection pipe runs underneath the geotextile fabric above the asphalt liner, along the centerline of the reservoir. Collection lines terminate into a 30”L x 6”W x 6”D PVC collection sump. Any accumulated water shall be pumped back to the surface. The integrity of the pneumatic pumping system shall be monitored on a monthly basis. This reservoir was constructed with a weir that directly connects to the Wastewater Reservoir. The purpose of this overflow system is to immediately drain any wastewater out of the CTBR in the event that the water level reaches 6 inches below the top of the reservoir.</p>
Wastewater Reservoir	<p>Liner system from top to bottom is as follows: an 80-mil high-density polyethylene (HDPE) liner, 4-inch-thick layer of rubberized asphalt concrete that has a maximum permeability of 0.01 feet per year (ft/yr) or <math>10^{-8}</math> centimeters per second (cm/sec); 12-inch-thick layer of compacted limestone; a layer of geotextile fabric; drainage system of 3-inch perforated pipe within an aggregate fill that drains into a collection sump; and, 12-inch layer of compacted clay (Chinle Frm.).</p>
Coal Yard Retention Pond (CYRP)	<p>The pond is double-lined with 60 mil HDPE liners separated by a 3/8 inch HDPE geogrid. The liner is underlain by compacted native soil. A 1 foot long by 1 foot wide by 1 foot</p>

Facility	BADCT Description
	deep concrete basin is located in the approximate center of the pond.
Concrete Lined Overflow Containment Area (CLOC)	Constructed adjacent to the east side of the Wastewater Reservoir and is designed to contain overflow from the Wastewater Reservoir. The dimensions of the CLOC area are approximately 350 ft long, 34 ft wide and 7 ft deep. In the event of a discharge in the CLOC area, the captured water in the CLOC area shall be pumped back into the Wastewater Reservoir as soon as practicable.
Yard Collection Ditches	Lined with concrete that conveys discharge to a common sump.
Evaporation Pond	Unlined and has a compacted, engineered earth-fill dam 60 ft high, 2,300 ft long, and 60 ft wide at the crest along the lower end of the valley. Site-specific characteristics are the primary BADCT for this facility. The reservoir is located on the Chinle Formation, which consists of a 150 to 200 ft thick sequence of claystone and siltstone. The clay contained within the Chinle has a permeability of approximately 0.001 to 0.1 ft/yr and the depth to groundwater is more than 700 ft. The dam has filter drain zones and two toe drains. Seepage is collected in a sump located along the toe of the dam and is pumped back into the pond.
Ash Slurry Settling Ponds (Inactive)	The ponds are situated within the Evaporation Pond BADCT area and are no longer active discharging facilities. The total drainage is approximately 2.98 square miles.
Northeast Retention Pond	Lined with 4 inch thick rubberized asphalt coated with a rubberized asphalt chip seal. The maximum permeability of the liner system is 0.01 ft/yr ( $10^{-8}$ cm/sec).
Ash Disposal Landfill	Unlined and is located in the same drainage area as the Evaporation Pond. This area is also underlain by the Chinle Formation, which consists of a 150 to 200 ft thick sequence of claystone and siltstone. The clay contained within the Chinle has a permeability of approximately 0.001 to 0.1 ft/yr and the depth to groundwater is more than 700 ft.
Solid Waste Landfill	An earth-fill landfill approximately 20 acres in area.
Fire Training Area	Lined with a concrete pad that is approximately 150 ft by 80 ft and approximately 6 inches in thickness. It is inspected on a regular basis to maintain the pad free of cracks.
Coal Yard Retention Pond (CYRP)	The CYRP is double-lined with 60 mil HDPE liners separated by a 3/8 inch HDPE geogrid. The liner is underlain by compacted native soil. A 1 foot long by 1 foot wide by 1 foot deep concrete basin is located in the approximate center



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	of the pond.
Concrete Lined Overflow Containment Area (CLOC)	Constructed adjacent to the east side of the Wastewater Reservoir and is designed to contain overflow from the Wastewater Reservoir. The dimensions of the CLOC area are approximately 350 ft long, 34 ft wide and 7 ft deep. In the event of a discharge in the CLOC area, the captured water in the CLOC area shall be pumped back into the Wastewater Reservoir as soon as practicable.

### III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

The main Plant Site is underlain by a thin layer of Quaternary sediments up to 20 feet thick. The sediments overlie the older Bidahochi Formation. The Bidahochi Formation consists of unconsolidated to semi-consolidated sands, silts and clays ranging from 0 to 320 feet thick. The Chinle and Moenkopi Formations underlie the Bidahochi Formation at the main Plant Site. The Chinle Formation is composed of claystone, mudstone, volcanic ash and siltstone with local beds of sandstone and conglomerate. The Chinle Formation varies in thickness approximately 160 to 300 feet. The Kaibab and Coconino Formations underlie the Chinle and Moenkopi Formations.

There are two distinct water bearing systems that occur beneath the main Plant Site. A local groundwater system exists under unconfined conditions within the Bidahochi Formation and a deeper regional confined aquifer system exists within the Kaibab-Coconino Formations, known as the C-Aquifer, at depths exceeding 700 feet below ground surface (ft bgs).

The depth to water, based on 2015 data, at the main Plant Site ranges from approximately 118 to 162 ft bgs. The groundwater flow direction in the Bidahochi aquifer is generally to the northwest.

The CCR Management Complex is underlain by exposed Chinle Formation, localized colluvium and a discontinuous thin horizon of silty, clayey, unconsolidated sand. The Chinle, Moenkopi, Kaibab and Coconino Formations all underlie the CCR Management Complex. The Bidahochi Formation is not present.

The Chinle Formation at the CCR Management Complex is composed of claystone, mudstone, volcanic ash, siltstone with local beds of sandstone, conglomerate and evaporites. The Chinle varies in thickness from approximately 160 to 240 feet. The underlying Moenkopi Formation is at least 75 feet thick.

The Chinle/Moenkopi constitutes the uppermost aquifer beneath the CCR Management Complex although the occurrence of groundwater is limited and can

occur in thin, discontinuous sand and conglomerate lenses, principally near the Chinle/Moenkopi contact.

Groundwater occurring in the C-Aquifer is not in hydrologic connection locally with groundwater in the Chinle/Moenkopi.

At the Ash Landfill, groundwater flow in the Chinle/Moenkopi is to the north at the southern part of the landfill and to the northwest. Groundwater from the Evaporation Pond and the Ash Landfill appear to flow together and exit the CCR Management Complex to the north.

### **Pollutant Management Area (PMA)/Discharge Impact Area (DIA)**

There are three PMAs associated with the SRP CGS. One PMA is at the main Plant Site, the second at the Solid Waste Landfill and the third circumscribing the CCR Management Complex. The DIAs of the main Plant Site, Solid Waste Landfill and the CCR Management Complex are the same as their respective PMAs.

### **Monitoring and Reporting Requirements**

#### **Methane Gas Monitoring**

Routine methane monitoring shall include monitoring the gas probes installed around the Solid Waste Landfill footprint as shown on Figure F-1 of the Gas Monitoring Plan to ensure that the concentrations of methane gas does not exceed twenty-five percent (25%) of the lower explosive limit for the gases in facility structures and the lower explosive limit for the gases at the property boundary.

#### **Discharge Monitoring**

Routine monitoring of the discharge is required every 5 years. Constituents of concern in the discharges are pH, chloride, fluoride, metals, sulfate, radionuclides, and TDS.

#### **Groundwater Monitoring**

Routine monitoring of the groundwater in the uppermost aquifer beneath the plant area is required on a semi-annual basis unless the results of monitoring show an exceedance of an AL. In the event of such an exceedance, the groundwater monitoring frequency shall increase to monthly. Constituents of concern in the groundwater include arsenic, barium, cadmium, chromium, lead, fluoride, selenium, sulfate, radionuclides, and TDS. SRP has opted to continuously pump the perched aquifer and sample semi-annually from wells MW-36 and MW-65 to monitor and control the migration of the selenium contamination until levels are consistently below the AWQS. With the submittal of the 2013-2017 Triennial Groundwater Evaluation Report, it was determined that mitigation pumping was no longer needed, therefore pumping will be suspended, however the wells will continue to be monitored.



**Seepage Monitoring**

Routine monitoring for presence of water at seepage well OMW-1 is required on a semi-annually basis. If water is detected the permittee shall sample the fluid in the well for electrical conductivity (EC) and TDS.

**Points of Compliance**

There are four installed, and one pending, POC wells for the site and one theoretical POC established in the regional Kaibab/Coconino aquifer downgradient of the Solid Waste Landfill. There are two monitoring points, MW-36 and MW-65, which require groundwater monitoring under the permit, but are not considered POC wells.

<b>POC Locations</b>	<b>Description</b>	<b>Latitude (N)</b>	<b>Longitude (W)</b>
MW-78	Downgradient of Evaporation Pond, Ash Disposal Landfill and the Inactive Ash Slurry Settling Pond.	34° 33' 29.3984"	109° 17' 08.3643"
MW-59	Center of the Northern edge of the 640 acre Plant Site (existing)	34° 35' 07.05"	109° 16' 20.5"
MW-62	Northeast Corner of the 640 acre Plant Site (existing)	34° 35' 07.09"	109° 15' 40.0"
MW-66	Northwest Corner of the 640 acre Plant site (existing)	34° 35' 08"	109° 16' 46"
MW-67R	Near the west edge of the process water impoundments Between the Cooling Towers and northwest of the Fire Training Area	34° 34' 52.87173"	109° 16' 25.31976"
Solid Waste Landfill	Conceptual location at the center of the dam on the downgradient edge for the Solid Waste Landfill	34° 34' 5.01"	109° 16' 57.02"

**IV. STORM WATER AND SURFACE WATER CONSIDERATIONS**

Stormwater/surface water considerations include whether discharging facilities are located within the 100-year flood plain and whether the discharges have the potential to impact surface water drainages down-stream of the facility. All discharging facilities at SRP CGS are not located within or near a 100-year floodplain.

**V. COMPLIANCE SCHEDULE**

The following items are required in accordance with the Compliance Schedule in Section 3.0 of the APP:

No.	Description	Due by:	Permit Amendment Required?
1	For the life of the facility every five (5) years all impoundments shall be inspected or tested using electrical testing procedures (HDPE liners) and other appropriate methods of leak testing (clean out and conduct a visual inspection for each impoundment with an asphalt liner) to assess leaks per Section 2.2.3.1 and report the results per Section 2.7.4.1. Annual Report Leak Detection Inspections.	No Later than March 30 of the following years: 2018, 2023, 2028, etc.	No
2	The permittee shall submit Post-closure Plans for the solid waste landfill. The Plans shall include components required under Section 2.10.2 of this permit.	Within 60 days from the date of permit signature.	No
3	The permittee shall submit a demonstration that the financial assurance mechanism listed in Section 2.1, Financial Capability, is being maintained as per A.R.S. 49-243.N.4 and A.A.C. R18-9-A203(H) for all estimated closure and post-closure costs including updated costs submitted under Section 3.0, No. 4 below. The demonstration shall include a statement that the closure and post-closure strategy has not changed, the discharging facilities listed in the permit have not been altered in a manner that would affect the closure and post-closure costs, and discharging facilities have not been added. The demonstration shall also include information in support of the self-assurance demonstration as required in A.A.C. R18-9-A203(C)(1).	Every two (2) years from the date of permit signature, for the duration of the permit.	No
4	The permittee shall submit updated cost estimates for facility closure and post-closure, as per A.A.C. R18-9-A201(B)(5) and A.R.S. 49-243.N.2.a.	Every six (6) years from the last facility closure and post-closure cost estimates submitted.	Yes

**VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT**

**Technical Capability**

SRP has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B).

ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an ongoing demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

### **Financial Capability**

The permittee has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The permittee shall maintain financial capability throughout the life of the facility. The estimated closure and post-closure cost is \$16,631,918.26. The financial assurance mechanism was demonstrated through A.A.C. R18-9-A203C(1).

### **Zoning Requirements**

SRP is a political subdivision of the state, and therefore, not subject to county ordinances. According to a letter from Apache County Planning and Zoning Department, CGS property is zoned "Agriculture General" in which utilities are permitted.

## **VII. ADMINISTRATIVE INFORMATION**

### **Public Notice (A.A.C. R18-9-108(A))**

This is a Significant Amendment to an APP that ADEQ issued previously, in accordance with A.A.C. R18-9-A211(D). The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

### **Public Comment Period (A.A.C. R18-9-109(A))**

The Department shall accept written comments from the public before a new permit is issued or a significant permit amendment is made. The written public comment period begins on the publication date of the public notice and extends for 30 calendar days. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

### **Public Hearing (A.A.C. R18-9-109(B))**

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

## **VIII. ADDITIONAL INFORMATION**

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality

Water Quality Division – Groundwater Protection Value Stream – APP and Reuse  
Unit 1

Attn: Monica Phillips

1110 W. Washington Street, Mail Code 5560D-3

Phoenix, Arizona 85007

Phone: (602) 771-2253

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