CCR Unit Closure and Post-Closure Plan

CPS Energy
Calaveras Power Station

San Antonio, Texas

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Calaveras Power Station
Project No. 0352436

Jeffery L. Bauguss, P.E.
Partner-in-Charge

Wally Zverina
Project Manager

Chris Cunningham, P.E.
Project Consultant

Environmental Resources Management
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024
281-600-1000
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1.0 INTRODUCTION

CPS Energy owns and operates the Calaveras Power Station located in San Antonio, Texas. The Station generates coal combustion residuals (CCR) that are subject to regulation under Title 40, Code of Federal Regulations, Part 257 (40 CFR §257).

This document is the Closure Plan and Post-Closure Plan (CPC Plan) for the following five CCR surface impoundments and one CCR landfill at the Calaveras Power Station:

- (1) North Sludge Recycle Holding (SRH) Pond;
- (2) South SRH Pond;
- (3) North Bottom Ash Pond (BAP);
- (4) South BAP;
- (5) Evaporation Pond (EP); and
- (6) Fly Ash Landfill (FAL).

This CPC Plan describes the steps necessary to close all CCR surface impoundments at any point during the active life of the surface impoundments by removal of CCR in accordance with 40 CFR §257.102(b).

This CPC Plan describes the steps necessary to close the CCR landfill at any point during the active life of the landfill with CCR left in place in accordance with 40 CFR §257.102(b).

This CPC Plan also describes post-closure inspection, maintenance and monitoring required for the CCR landfill closed with CCR left in place in accordance with 40 CFR Part §257.102(b).

According to 40 CFR §257.102 (b)(3)(i), CPS Energy may amend this initial or any subsequent written closure plan at any time.

Per 40 CFR §257.102 (b)(3)(ii), CPS Energy must amend this closure plan whenever:

- (A) There is a change in operation of the CCR unit that would substantially affect the written closure plan in effect; or
- (B) Before or after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan.

1.1 REQUIREMENTS

Regulations in 40 CFR §257.102 et seq. require the preparation, certification, posting on an internet site accessible by the public, and, on closure, implementation of a CPC Plan for each existing active CCR unit. A completed, certified copy of this CPC Plan must be placed maintained indefinitely in the Calaveras Power Station Operating Record by October 17, 2016. CPS Energy will
issue notifications and implement recordkeeping in accordance with 40 CFR §257.105 and 40 CFR §257.106 (see Section 6).

The requirement to prepare and implement the Plan(s) is applicable to owners and operators of CCR units covered under the rule, including:

- New and existing landfills;
- New and existing surface impoundments;
- CCR units located off-site of the electric utilities’ or independent power producers’ facilities that receive CCR for disposal; and
- Certain inactive CCR surface impoundments if the CCR unit still contains CCR and liquids.

1.2 DEFINITIONS

This CPC Plan includes terms defined consistent with parts of 40 CFR §257.53 (re: 80 FR 21468, April 17, 2015; 80 FR 37988, July 2, 2015) and associated editions of the Federal Register as noted below.

- **Active life or in operation** means the period of operation beginning with the initial placement of CCR in the CCR unit and ending at completion of closure activities in accordance with 40 CFR §257.102.

- **Closed** means placement of CCR in a CCR unit has ceased, and the owner or operator has completed closure of the CCR unit in accordance with 40 CFR §257.102 and has initiated post-closure care in accordance with §257.104.

- **Coal combustion residuals (CCR)** means fly ash, bottom ash, boiler slag and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

- **CCR landfill** means an area of land or an excavation that receives CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. For purposes of this subpart, a CCR landfill also includes sand and gravel pits and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

- **CCR surface impoundment** means a natural topographic depression, manmade excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.

- **CCR unit** means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.
- **Facility** means all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, disposing, or otherwise conducting solid waste management of CCR. A facility may consist of several treatment, storage, or disposal operational units (e.g. one or more landfills, surface impoundments, or combinations of them).

- **Qualified professional engineer** means an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located.
2.0 **CCR UNIT DESCRIPTION**

CPS Energy owns and operates the Calaveras Power Station which consists of two power plants (J.T. Deely and J.K. Spruce) that are subject to the CCR Rule. The Calaveras Power Station is located in unincorporated Bexar County, Texas, approximately 13 miles southeast of San Antonio. The J.T. Deely Plant began operation in 1977. The J.K. Spruce Plant Unit 1 began operation in 1992 and Unit 2 began operation in 2011. Currently, CPS Energy operates six CCR units at the Calaveras Power Station which are subject to the CCR Rule:

- North Sludge Recycle Holding (SRH) Pond;
- South SRH Pond;
- North Bottom Ash Pond (BAP);
- South BAP;
- Evaporation Pond (EP); and
- Fly Ash Landfill (FAL).

The location of each CCR unit is shown on Figure 1.

2.1 **SLUDGE RECYCLE HOLDING PONDS**

The SRH Ponds contain CCR sludge from the air pollution control equipment from both plants. The SRH Ponds were constructed as a single impoundment with a divider wall that separates the impoundment into the North and South Ponds. A gate present in the divider wall is closed during normal operating procedures, but can be opened. Each pond is approximately 1.5 acres in area and are located east of the plants, adjacent to the BAPs. The SRH Ponds began receiving CCR before October 14, 2015 and is still in service. Hence, in accordance with 40 CFR §257.53, the SRH Ponds are classified as an active existing CCR surface impoundment.

The interior slopes of the SRH Ponds are reportedly constructed with a 10-oz. Geotextile and a 30-mil High Density Polyethylene (HDPE) geomembrane over prepared subgrade. The North SRH Pond bottom liner consists of a six-inch layer of 4,000 psi concrete over one-foot of compacted sand overlying a 30-mil HDPE geomembrane. The South SRH Pond bottom liner also has a six-inch layer of 4,000 psi concrete. Under the concrete is one-foot of compacted fill overlaying a 10-oz. Geotextile, a 30-mil HDPE geomembrane and another 10-oz. Geotextile. The SRH Ponds are separated by a concrete divider wall with a sluice gate that allows the North SRH Pond and South SRH Pond to be isolated from each other. Water is pumped from the SRH Ponds to clarifiers via two 18-inch steel pipes. Both SRH Ponds have eight-foot-wide concrete overflow chutes that discharge to the South BAP. These overflow chutes are at an approximate elevation of 499.5 feet MSL.

It is estimated that approximately 7 acre-feet is the maximum inventory of CCR to be on-site at one time over the active life of each SRH Pond. This estimate is based on a worst-case assumption of both SRH Ponds being completely full of
CCR up to the limits of the freeboard as allowed by the Inflow Flood Control Plan.

### 2.2 Bottom Ash Ponds

The North and South BAPs contain sluiced CCR from the wet feed process at the J.T. Deely Plant. The BAPs were constructed by CPS Energy in 1977 as part of the original plant construction. The North BAP is approximately 6.1 acres in area, while the South BAP is approximately 6.8 acres. They are located east of the plants, adjacent to the SRH Pond.

The BAPs began receiving CCR before October 14, 2015 and currently receive CCR. Hence, in accordance with 40 CFR §257.53, the BAPs are classified as active existing CCR surface impoundments.

The BAPs share a common embankment that separates the ponds. The ponds are reportedly lined with clay, but the thickness and hydraulic conductivity of the clay are unknown. One 24-inch steel pipe in each pond allows water to be returned to the plant for reuse. Additionally, both ponds have two discharge points. The discharge points consist of an outlet structure with a horizontal 12-inch steel discharge pipe at an approximate elevation of 489 feet MSL (bottom drain used to empty the pond), and a vertical 12-inch steel overflow pipe at an approximate of elevation 499 feet MSL (normal operation level pool drain).

The outfall structure is in one corner of each pond (northeast for North BAP and southeast for South BAP) and is partially surrounded by steel sheet piling. The sheet piling and pond berms create an opening for water to reach the discharge pipes. This opening is typically protected by floating sorbent booms. Water from these outlets discharge to Calaveras Lake through a TPDES permitted outfall.

It is estimated that approximately 118 acre-feet is the maximum inventory of CCR to be on-site over the active life of the North and South BAPs. This estimate is based on a worst-case assumption of the BAPs being completely full of CCR up to the limits of the freeboard as allowed by the Inflow Flood Control Plan.

### 2.3 Evaporation Pond

The EP is located generally northeast of the plants. The EP side and bottom liner consist of a one-foot layer of cohesive soil overlying a 30-mil Polyvinylchloride geomembrane and an additional one-foot of cohesive soil when constructed as a landfill in 1990. The subgrade consists of two-feet of soil, with all large rock removed, and compacted to 50% density. The EP was converted to a fly ash impoundment in 1996.

The EP is a surface impoundment that was constructed and received CCR before October 14, 2015. In addition, the EP currently receives CCR. Hence, in accordance with 40 CFR §257.53, the EP is classified as an active existing CCR surface impoundment.
The EP receives ash washdown water from washing of the air pollution control system and other miscellaneous CCR washdown sources. That waste contains CCR as defined in 40 CFR §257.52.

There are no inlet or outlet structures to the EP. Liquid from ash washdown, boiler chemical cleanouts, and other authorized liquid wastes is trucked to the pond, where it is allowed to evaporate.

It is estimated that approximately 83 acre-feet is the maximum inventory of CCR to be on-site over the active life of the EP. This estimate is based on a worst-case assumption of the EP being completely full of CCR up to the limits of the freeboard as allowed by the Inflow Flood Control Plan.

2.4 FLY ASH LANDFILL

The Fly Ash Landfill (FAL) is a Class 2 landfill constructed by CPS Energy in 1990 to increase the on-site disposal storage capacity of CCR wastes, prior to construction of the J.K. Spruce Plant. The FAL is located generally northeast of the plant.

It receives CCR wastes consisting of bottom ash, fly ash, scrubber solids, coal dust, gypsum, fly ash dust bags, and ion exchange resin waste generated by plant operations. Those wastes contain CCR as defined in 40 CFR §257.52.

The FAL has an approximate total area of 23 acres. According to as-built drawings provided by CPS Energy, the bottom of the landfill is lined with a 30-mil High Density Polyethylene (HDPE) with a geotextile cushion and sand drainage layer. A geocomposite drainage net covered by two feet of coarse CCR provides the drainage layer over the liner on the interior embankments of the landfill.

The FAL is a landfill that was constructed and received CCR before October 14, 2015. In addition, the FAL currently receives CCR. Hence, in accordance with 40 CFR §257.53, the FAL is classified as an active existing CCR landfill.

It is estimated that approximately 550 acre-feet is the maximum inventory of CCR to be on-site over the active life of the FAL. This estimate is based on a worst-case assumption of the FAL being completely full of CCR up to the limits of the freeboard as allowed by the Run-on/Run-off Control Plan.
3.0 CCR UNIT CLOSURE PLAN

The closure concept for this initial closure plan is to close the five surface impoundments by removal of CCR. The closure procedures will comply with requirements in 40 CFR §257.102(c).

The closure concept for this initial closure plan is to close the landfill by leaving CCR in place. The closure procedures will comply with requirements in 40 CFR §257.102(d).

This section describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices and in accordance with 40 CFR §257.102(b). A written closure plan for each CCR unit is required by 40 CFR §256.102(b).

Each closure plan for CCR units to be closed by removal of CCR is required to include the following:

- Closure performance standard;
- Narrative description of the closure;
- Description of the procedures to remove the CCR and decontaminate the CCR unit;
- Maximum CCR inventory; and
- Closure schedule.

Each closure plan for CCR units to be closed with CCR in-place is required to include:

- Closure performance standard;
- Narrative description of the closure;
- Description of the final cover system;
- Maximum CCR inventory;
- Maximum area covered; and
- Closure schedule.

3.1 CLOSURE PERFORMANCE STANDARDS

The performance standards for closure of the CCR units in this initial closure plan are:

1. For North and South SRH Ponds, North and South BAPs, and EP: Removing CCR and decontaminating each area affected by CCR releases for the CCR unit in accordance with 40 CFR §257.102(c)(closure by removal); and
2. For FAL: Leaving CCR in place in accordance with 40 CFR §257.102(d)(closure in place).
3.1.1 Performance Standards for Closure by Removal - All Surface Impoundments

CPS Energy may close any of the CCR units by removing CCR and decontaminating each area affected by releases (if any occurred) from that CCR unit in accordance with 40 CFR §257.102(c) (closure by removal).

CCR removal and decontamination of the CCR unit will be considered completed in accordance with 40 CFR §257.102(c) when each constituent concentration throughout the CCR unit and each area affected by releases from that CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established in 40 CFR §257.95(h) for each constituent listed in 40 CFR §257, Appendix IV.

In addition, requirements for closure of the CCR unit by removal of CCR will also include using Texas Risk Reduction Program (TRRP) Remedy Standard A in accordance with 30 Texas Administrative Code (TAC) §350.

3.1.2 Performance Standards for Closure in Place – Landfill

CPS Energy will close the FAL by leaving CCR in place and constructing a final cover system in accordance with the performance standards stated in 40 CFR §257.102(d)(1):

(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;
(ii) Preclude the probability of future impoundment of water, sediment, or slurry;
(iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;
(iv) Minimize the need for further maintenance of the CCR unit; and
(v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

In addition, requirements for closure of the FAL are contained in the existing Texas Commission on Environmental Quality (TCEQ) permit for the unit. Permit requirements for landfills and waste piles in the State of Texas are to follow the considerations provided in Technical Guideline No. 3 (Texas TG-3) published by the TCEQ. This document provides the general design approaches for landfill covers. In addition, if a potential release is determined to have occurred, from the CCR landfill, then the release will be addressed under TRRP Remedy Standard B in accordance with 30 TAC §350.
3.2  NARRATIVE DESCRIPTION OF THE CLOSURE

Closure of a CCR unit will be accomplished in steps related to the closure performance standard, the characteristics of the bottom liner, the CCR contained in the CCR unit, and the surrounding area.

This section describes a narrative description of closure of the CCR units by either:

1. Closure by removal in accordance with 40 CFR §257.102(c); or
2. Closure in place in accordance with 40 CFR §257.102(d).

In addition, requirements for closure of the CCR unit using TRRP Remedy Standard A for closure by removal or Remedy Standard B for closure in place in accordance (if a release from the unit is determined to have occurred) with 30 TAC §350 will also be implemented for the selected closure.

3.2.1  Description of Closure by Removal – SRH Ponds

The SRH Ponds will be closed by removing and decontaminating each area affected by releases from the CCR units in accordance with 40 CFR §257.102(c) (closure by removal). The closure will be accomplished in steps as follows:

1. **TRRP Permitting:** Since a Remedy Standard A approach will be used, CPS Energy will prepare and submit to the TCEQ a Self-Implementation Notice (SIN) ten days prior to beginning closure activities.

2. **Dewater Impoundment:** Free liquid in the impoundment will be drained and/or pumped through the permitted outfall until all free liquids have been removed.

3. **Remove CCR:** CCR and CCR-affected soil will be removed from the CCR unit and from each area affected by release of CCR from that CCR unit. Wet materials will be placed in windrows on an impermeable liner to drain. After free liquids have drained such that the material will pass the paint filter test, recyclable material will be sent off-site for reuse.

4. **Demolition and Disposal:** Non-recyclable material and the HDPE liner will be excavated and placed in the FAL. The concrete liner, overflow chute, and dividing wall will be demolished and disposed in the FAL.

5. **Confirm CCR Removal and Decontamination:** CCR removal and decontamination of the CCR unit will be confirmed complete by sampling and analytical testing of representative samples of potentially affected soil and ground water for CCR-related constituents throughout the CCR unit, and each area affected by release from that CCR unit. Completion will be achieved when the analytical results indicate all constituents have removed to the corresponding background concentration or applicable TRRP standards in effect at the time of closure, and ground water monitoring concentrations do not exceed the ground water protection standard established by CPS Energy in...
accordance with §257.95(h) for each constituent listed in 40 CFR §257, Appendix IV.

6. **Site Restoration**: CPS Energy anticipates utilizing the SRH Pond as impoundments for storm water following removal of CCR. As a result, the impoundments will not be backfilled or graded to prevent ponding of water. New liners, inflow, and outfall structures will be constructed as necessary to facilitate reuse of the impoundments. The design criteria for this reuse will be determined by CPS Energy based on regulatory requirements and engineering practices.

7. **TRRP Completion Deliverables**: CPS Energy will prepare, submit to the TCEQ, and obtain TCEQ approval of an Affected Property Assessment Report (APAR) and Response Action Completion Report (RACR) for closure of the CCR unit in accordance with Remedy Standard A and related rules in 30 TAC §350.

### 3.2.2 Description of Closure by Removal – North and South BAPs

The BAPs will be closed by removing and decontaminating each area affected by releases from the CCR units in accordance with 40 CFR §257.102(c) (closure by removal). The closure will be accomplished in steps as follows:

1. **TRRP Permitting**: Since a Remedy Standard A approach will be used, CPS Energy will prepare and submit to the TCEQ a SIN ten days prior to beginning closure activities.

2. **Dewater Impoundment**: Free liquid in the impoundment will be drained and/or pumped through the permitted outfall until all free liquids have been removed.

3. **Remove CCR**: CCR and CCR-affected soil will be removed from the CCR unit and from each area affected by release of CCR from that CCR unit. Wet materials will be placed in windrows on an impermeable liner to drain. After free liquids have drained such that the material will pass the paint filter test, recyclable material will be sent off-site for reuse.

4. **Demolition and Disposal**: Non-recyclable material will be excavated and placed in the FAL. All inlet and outfall structures will be demolished, with piping and sheet piling cut off at least six inches below ground surface, and capped or filled with concrete. Demolished materials will be placed in the FAL.

5. **Confirm CCR Removal and Decontamination**: CCR removal and decontamination of the CCR unit will be confirmed complete by sampling and analytical testing of representative samples of potentially affected soil and ground water for CCR related constituents throughout the CCR unit, and each area affected by release from that CCR unit. Completion will be achieved when the analytical results indicate all constituents have removed to the corresponding background concentration or applicable TRRP standards in effect at the time of closure, and ground water monitoring concentrations do not exceed the ground water protection standard established by CPS Energy in
accordance with §257.95(h) for each constituent listed in 40 CFR §257, Appendix IV.

6. **Site Restoration**: CPS Energy anticipates utilizing the BAPs as impoundments for storm water following removal of CCR. As a result, the impoundments will not be backfilled or graded to prevent ponding of water. New liners, inflow, and outfall structures will be constructed as necessary to facilitate reuse of the impoundments. The design criteria for this reuse will be determined by CPS Energy based on regulatory requirements and engineering practices.

7. **TRRP Completion Deliverables**: CPS Energy will prepare, submit to the TCEQ, and obtain TCEQ approval of an APAR and RACR for closure of the CCR unit in accordance with Remedy Standard A and related rules in 30 TAC §350.

### 3.2.3 Description of Closure by Removal – Evaporation Pond

The EP will be closed by removing and decontaminating each area affected by releases from that CCR unit in accordance with 40 CFR §257.102(c) (closure by removal). The closure will be accomplished in steps as follows:

1. **TRRP Permitting**: Since a Remedy Standard A approach will be used, CPS Energy will prepare and submit to the TCEQ a SIN ten days prior to beginning closure activities.

2. **Dewater Impoundment**: Free liquid in the EP will be sampled, added to the TPDES permit, and discharged via an existing permitted outfall if authorized. If the constituent concentrations do not allow on-site discharge, the water will be allowed to evaporate to reduce the volume, and then disposed off-site at a permitted disposal facility, or treated and discharged under a separate TPDES permit.

3. **Remove CCR**: CCR and CCR-affected soil will be removed from the CCR unit and from each area affected by release of CCR from that CCR unit. Wet materials will be placed in windrows on an impermeable liner to drain. After free liquids have drained such that the material will pass the paint filter test, recyclable material will be sent off-site for reuse.

4. **Demolition and Disposal**: Non-recyclable material and the HDPE liner will be excavated and placed in the FAL.

5. **Confirm CCR Removal and Decontamination**: CCR removal and decontamination of the CCR unit will be confirmed complete by sampling and analytical testing of representative samples of potentially affected soil and ground water for CCR-related constituents throughout the CCR unit, and each area affected by release from that CCR unit. Completion will be achieved when the analytical results indicate all constituents have removed to the corresponding background concentration or applicable TRRP standards in effect at the time of closure, and ground water monitoring concentrations do not exceed the ground water protection standard established by CPS Energy in
accordance with §257.95(h) for each constituent listed in 40 CFR §257, Appendix IV.

6. **Site Restoration:** The excavated surface will be graded to drain without ponding and native grasses will be established to control erosion. If necessary to achieve positive drainage, clay rich soil, suitable for structural backfill and free of constituent concentrations above corresponding background concentration or applicable TRRP Protective Concentration Level (PCL), whichever is higher, will be placed in lifts and compacted. If necessary, 6-inches of soil capable of sustaining native plant growth will be placed on the top of the excavation or backfilled surface. The disturbed soil over the EP will be revegetated with a seed mixture appropriate to the season.

7. **TRRP Completion Deliverables:** CPS Energy will prepare, submit to the TCEQ, and obtain TCEQ approval of an APAR and RACR for closure of the CCR unit in accordance with Remedy Standard A and related rules in 30 TAC §350.

### 3.2.4 Description of Closure in Place – Fly Ash Landfill

The FAL will be closed by leaving CCR in place (closure in place). The closure will be accomplished in steps as follows:

1. **TRRP Planning Deliverables:** CPS Energy will prepare, submit to the TCEQ, and obtain TCEQ approval of a unit specific closure plan per the requirements of the FAL permit. In addition, if a release from the unit is determined to have occurred, then an APAR and Response Action Plan (RAP) to address the release in accordance with Remedy Standard B and related rules in 30 TAC §350 will be submitted to the TCEQ.

2. **Remove Liquids:** Free liquids will be eliminated by removing liquid wastes and/or solidifying the remaining CCR and CCR residues in the CCR unit.

3. **Prepare Final Cover System Subgrade:** The remaining CCR will be solidified, if necessary, sufficient to support the final cover system, and the surface will be graded and compacted as necessary to support the final cover system. Additional soil fill (i.e., attic fill) will be added if required to achieve subgrade elevations. If excess berm height exists, the extra berm soil may be used (i.e., berms reduced in height) as fill material to achieve the design slopes.

4. **Final Cover System:** The final cover system will be constructed in place over the prepared subgrade to achieve the final cover system criteria in 40 CFR §257.102(d)(3) and the requirements of Texas TG-3.

5. **TRRP Completion Report:** CPS Energy will prepare and submit to the TCEQ a closure report per the requirements of the FAL permit. If a release is addressed under TRRP, then after completing response actions to the release, CPS Energy will obtain TCEQ approval of a RACR.
3.3 FINAL COVER SYSTEM - FLY ASH LANDFILL

The final cover system for the FAL will be as generally described in Section 3.3.1.

3.3.1 Final Cover System Design Criteria

The final cover system constructed for closure of the CCR unit will achieve the final cover system design criteria specified in 40 CFR §102(d)(3)(i) and the requirements of the existing FAL permit:

(A) The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1 \times 10^{-5}$ cm/sec, whichever is less.

(B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.

(C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

(D) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

Additional final cover system design criteria will also apply as specified in a closure plan to be submitted to the TCEQ in accordance with the existing FAL permit.

3.4 ALTERNATIVE FINAL COVER SYSTEM DESIGN CRITERIA

If CPS Energy chooses to construct an alternative final cover system for closure of a CCR unit, the final cover system will achieve the alternative final cover system design criteria specified in 40 CFR §257.102(d)(3)(ii):

(A) The design of the final cover system must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in [40 CFR §257.102(d)(3)(i)(A) and (B)] [i.e. the permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1 \times 10^{-5}$ cm/sec, whichever is less; and the infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material].

(B) The design of the final cover system must include an erosion layer that provides equivalent protection from wind or water erosion as the erosion layer specified in [40 CFR §257.102(d)(3)(i)(C)] [i.e. the erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth].

(C) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.
Additional final cover system design criteria will also apply as specified in a closure plan to be submitted to the TCEQ in accordance with the existing FAL permit.

### 3.4.1 Methods and Procedures Used to Install the Final Cover System

If CPS Energy chooses to implement the final cover system design criteria in 40 CFR §257.102(d)(3)(i) for closure of a CCR unit, the final cover system is anticipated to be as generally described below:

- **Cap Topsoil Layer:** The Cap Topsoil layer will be a 6-inch thick layer of topsoil suitable for seeding and establishment of cover vegetation and support of each stage of related cap construction and maintenance equipment and materials, with a surface slope of 3% to 5% graded to drain to relief, and with a substantially continuous stand of erosion-resistant native or adapted perennial shortgrass cover vegetation in accordance with 40 CFR §257.102(d)(3)(i)(C).

- **Cap Soil Fill Layer:** The Cap Soil Fill layer will be an 18-inch thick layer of soil fill suitable for supporting the Cap Topsoil layer and related cap construction and maintenance equipment and materials in accordance with 40 CFR §257.102(d)(3)(i)(B).

- **Cap Barrier:** The Cap Barrier will be either a 36-inch thick layer of compacted clay, or a 40-mil or thicker linear low density polyethylene (LLDPE) flexible membrane liner (FML) with a permeability equal to or less than the permeability of 3-feet of clay with a hydraulic conductivity of $1 \times 10^{-7}$ cm/sec supported on a 12-inch thick layer of compacted soil or stable CCR if approved by the designing engineer; has a top surface slope of 3% to 5% that is graded to drain to perimeter relief; is suitable for supporting each stage of overlying cap layers and related cap construction and maintenance equipment and materials in accordance with 40 CFR §257.102(d)(3)(i)(A); and is supported by stable CCR, which is solidified if necessary, and stable compacted soil fill in accordance with 40 CFR §257.102(d)(3)(i)(D).

Alternate final cover systems that achieve the alternate final cover system performance requirements in 40 CFR §257.102(d)(3)(ii) may be substituted for the final cover systems described above.

Additional final cover system design criteria will also apply as specified in a closure plan to be submitted to the TCEQ in accordance with the existing FAL permit.
3.5 **CCR VOLUME ESTIMATE**

As required in 40 CFR §257.102(b)(1)(iv), the following are estimates of the maximum volume of CCR on-site during the active life of each of the CCR units.

- **North SRH Pond**: 11,800 cubic yards of CCR, based on the maximum capacity of the pond while maintaining the freeboard required by the Inflow Flood Control Plan.

- **South SRH Pond**: 11,800 cubic yards of CCR, based on the maximum capacity of the pond while maintaining the freeboard required by the Inflow Flood Control Plan.

- **North BAP**: 89,600 cubic yards of CCR, based on the maximum capacity of the pond while maintaining the freeboard required by the Inflow Flood Control Plan.

- **South BAP**: 99,900 cubic yards of CCR, based on the maximum capacity of the pond while maintaining the freeboard required by the Inflow Flood Control Plan.

- **EP**: 133,700 cubic yards of CCR, based on the maximum capacity of the pond while maintaining the freeboard required by the Inflow Flood Control Plan.

- **FAL**: 887,300 cubic yards of CCR, based on the maximum capacity of the landfill while maintaining the freeboard required by the Run-on/Run-off Control Plan.

3.6 **FINAL COVER AREA**

As required in 40 CFR §257.102(b)(1)(v), the largest area requiring a final cover in accordance with 40 CFR §257.102(d) (i.e. closure in place) at any time during the active life of a CCR unit is stated below:

- **FAL**: 23 acres, based on the total area inside of the interior top of bank.

3.7 **CLOSURE SCHEDULE**

As required in 40 CFR §257.102(b)(1)(vi), the estimated schedules for closure of the SRH Ponds, BAPs, EP, and FAL are shown in Tables 1 through 4, respectively. In accordance with 40 CFR§ 257.102(b)(1)(vi), each of the schedules includes the sequential steps necessary to close the CCR unit, major milestones, and an estimate of the year in which closure activities will be completed.

Due to the anticipated permitting and construction schedule, CPS Energy expects to extend the closure period beyond the six month timeframe for completing closure of the FAL specified in 40 CFR §257.102(f) (1)(i). At the time of closure, CPS Energy will submit extension(s) when and if appropriate.

Owners/operators must commence closure within 30 days of either 1) final receipt of CCR or non-CCR waste or 2) removes the known final volume of CCR for beneficial use. According to 40 CFR §257.102(e)(3) closure activities have
commenced if the CCR unit has ceased receiving waste and owners/operators have:

(i) Taken any steps necessary to implement the written closure plan required by paragraph (b) of [40 CFR§ 257.102];

(ii) Submitted a completed application for any required state or agency permit or permit modification; or

(iii) Taken any steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure of a CCR unit.
4.0 CCR UNIT POST-CLOSURE CARE

CPS Energy will implement post-closure care of each CCR unit closed under the existing FAL permit requirements, and if applicable, TRRP Remedy Standard B in accordance with 40 CFR §257 and 30 TAC §350. Post-closure care activities will be implemented in accordance with 40 CFR §257.104. Goals of the post-closure care are as follows:

- Maintain the integrity and effectiveness of the CCR unit final cover system, including making repairs as necessary to correct the effects of settling, subsidence, erosion, or other events (40 CFR §257.104(b));
- Maintain the ground water monitoring system and implement each applicable monitoring requirements in 40 CFR §257.90 through 98; and
- Prevent storm water run-on and run-off from eroding or otherwise damaging the final cover (40 CFR §257.104(b)).

CPS Energy will implement the following CCR unit post-closure activities:

- Inspection and maintenance of the CCR unit final cover system and associated groundwater monitoring wells;
- Ground water monitoring sampling, analysis, and reporting;
- Facility Operating Record recordkeeping and reporting posted on the internet site available to the public; and
- Deed recordation.

Additional post-closure care specified in the closure plan prepared by CPS Energy per the requirements of the existing FAL permit will also be implemented.

According to 40 CFR §257.104 (d)(3)(i), CPS Energy may amend this initial or any subsequent written post-closure plan at any time.

Per 40 CFR §257.102 (d)(3)(ii), CPS Energy must amend the post-closure plan whenever:

(A) There is a change in operation of the CCR unit that would substantially affect the written post-closure plan in effect; or

(B) After post-closure activities have commenced, unanticipated events necessitate a revision of the written post-closure plan.

4.1 POST-CLOSURE PERIOD

In accordance with 40 CFR §257.104(c), the post-closure care period for each CCR unit must be for a period of 30 years following CPS Energy certification of completion of closure of the CCR unit. If at the end of the post-closure care period the CCR unit is operating under assessment monitoring in accordance with 40 CFR §257.95, CPS Energy will continue post-closure care until the CCR unit returns to detection monitoring.
Additional post-closure period specified in a TCEQ approved closure plan submitted under the requirements of the existing FAL permit will also be implemented.

4.2 POST CLOSURE INSPECTION AND MAINTENANCE

CPS Energy will inspect and maintain the final cover system at each CCR unit, each associated ground water monitoring well, and each associated permanent benchmark throughout the post-closure period. The CCR unit post-closure care inspection and maintenance requirements are described below:

- Final cover system will be inspected for damage resulting from natural or unnatural causes. Maintenance activities may include repairing damage caused by settling or erosion; draining and filling areas collecting ponded water; and re-seeding areas with inadequate or inappropriate erosion-resistant cover vegetation as necessary to maintain the effectiveness of the final cover system.

- Storm water run-on and run-off control systems will be inspected for damage resulting from natural causes and non-routine facility operations. Storm water run-on and run-off control berms and drainage channels that drain the CCR unit will be maintained and, as necessary to maintain effectiveness, repaired.

- Ground water monitoring wells that are part of the CCR unit monitor well network will be inspected for condition necessary to provide adequate and representative ground water samples. Maintenance may include the repair or replacement of damaged, degraded, or missing well caps, identification signs, locking devices, perimeter grading, protective barriers, surface casing, surface pads, and, if necessary, the entire well.

CPS Energy will implement ground water monitoring during the CCR unit post-closure care period in accordance with 40 CFR §257.90 through §257.98.

Additional post-closure inspection and maintenance specified in a TCEQ approved closure plan submitted per the requirements of the existing FAL permit will also be implemented.
4.3 CONTACT INFORMATION

The name, address, telephone number, and email address of the person to contact about the CCR units at the Calaveras Power Station during the post-closure care period is:

Michael Malone
CPS Energy
145 Navarro, Mail Drop 100406
San Antonio, Texas 78296
210-353-3625
mmalone@cpsenergy.com

4.4 PLANNED CCR UNIT POST-CLOSURE PROPERTY USE

CPS Energy plans to use the closed SRH Ponds, BAPs, and EP areas as storm water retention/storage ponds, restoration of native plant life, or redevelopment. The area will be limited to commercial or industrial use if closed under TRRP Remedy Standard A, Commercial/Industrial standards.

During the post-closure care period, CPS Energy plans to limit access to the CCR unit to reduce potential for damage of the final cover system and the associated ground water monitoring wells.

If the post-closure period of a CCR unit extends past the date the Calaveras Power Station is decommissioned, the CCR unit will remain closed to the public or limited to compatible commercial or industrial use.
5.0  

**CCR UNIT CLOSURE AND POST-CLOSURE PLAN AMENDMENT**

CPS Energy may amend this CPC Plan at any time.

As specified in 40 CFR §257.102(b)(3)(ii), CPS Energy must amend this CPC Plan for any of the following reasons:

- When there is a change in operation of the CCR unit that would substantially affect the written CPC Plan then in effect; or
- When an unanticipated event necessitates revision of the CPC Plan before or during CCR unit closure activities, or after the CCR unit post-closure care period has commenced.

In addition, as specified in 40 CFR §257.102(b)(3)(iii), CPS Energy must amend this CPC Plan within 60 days prior to a CPS Energy planned change in CCR unit operation or within 60 days after an unplanned CCR unit event (if the change occurs after CCR unit closure activities have been initiated, the CPC Plan must be amended within 30 days following the triggering event).

CPS Energy will provide written certification by a professional engineer that states that the amended CPC Plan meets the requirements of closure and post-closure care required in 40 CFR §257.102(b)(4).
6.0 "NOTIFICATION AND RECORD KEEPING"

CPS Energy will issue notifications and implement recordkeeping in accordance with 40 CFR §257.105 and 40 CFR §257.106.

6.1 "NOTIFICATIONS"

CPS Energy will notify the Executive Director of TCEQ, the State Director as defined in 40 CFR §257.105(d), and in accordance with 40 CFR §257.106(g)(1) and (2), when the following documents are made available in the CPS Energy Facility Operating Record:

- Initial CPC Plan;
- Each amendment to the CPC Plan;
- Written demonstration for a time extension for initiating closure;
- Each notice of intent to initiate CCR unit closure;
- Each notice of completion of CCR unit closure;
- Intent to comply with alternative closure requirements;
- Annual progress reports under alternative closure requirements;
- Each notification of completion of the CCR unit post-closure care period; and
- Each CCR unit deed notation.

In accordance with TCEQ instructions related to CCR units in Texas, CPS Energy will send each notification to the TCEQ via internet electronic mail to:

CCRNotify@tceq.texas.gov

6.2 "CPS ENERGY CCR WEB SITE"

CPS Energy will post the following documents on the CPS Energy internet site accessible to the public in accordance with 40 CFR §257.107(g)(1) and (2) within 30 days of placing the document in the Operating Record and for a period of five years thereafter:

- Initial CPC Plan;
- Each amendment to the CPC Plan;
- Written demonstration for a time extension for initiating closure;
- Each notice of intent to initiate CCR unit closure;
- Each notice of completion of CCR unit closure;
- Intent to comply with alternative closure requirements;
- Annual progress reports under alternative closure requirements;
- Each notification of completion of the CCR unit post-closure care period; and
Each CCR unit deed notation.

6.3 DEED NOTATION

For CCR units closed under TRRP Remedy Standard B (closure with CCR left in place) or Remedy Standard A (closure by removal of CCR) for commercial or industrial land use, in accordance with requirements specified in 30 TAC §350.111, Institutional Controls, and in 40 CFR §257.102(i), Deed Notations, CPS Energy will record in the permanent deed records of Bexar County, Texas the following information regarding each CCR unit closure:

Remedy Standard A, closure by removal to residential standards:
- No deed notice/institutional controls required.

Remedy Standard A, closure by removal to commercial/industrial standards:
- A deed notice that if any person desires to use the property for residential purposes, they must first notify the TCEQ at least 60 days in advance. Additional response action may be necessary before the property is to be approved for residential use.

Remedy Standard B (or TCEQ approved closure plan per the existing permit requirements), closure with CCR left in place:
- A metes and bounds description and a plat map sealed by Registered Professional Land Surveyor licensed by the Texas Board of Professional Land Surveyors of the portion(s) of the tract(s) of land on which a CCR unit has been closed in place;
- A statement describing the appropriate future land use and documenting any property use limitations;
- The class(es) of waste that was disposed and the corresponding waste description(s); and
- The name or permanent address of the person or persons operating the facility where more specific information on the wastes can be obtained.

Within 30 days of recording each deed notation, CPS Energy will place a corresponding notification that the notation has been recorded in the CPS Energy Facility Operating Record and the CPS Energy CCR Web Site.
7.0 PROFESSIONAL ENGINEER CERTIFICATION

40 CFR Part 257.102 and 40 CFR Part 257.104 require that this CPC Plan meet those requirements. In addition, a professional engineer must certify that any amendments to the CPC Plan meet requirements of those rules, and that closure of the CCR unit has been achieved in accordance with those rules. Certification for this initial CPC Plan is provided below.

"I hereby certify that I have reviewed the CCR unit management practices for the Calaveras Power Station in Bexar County, Texas, and being familiar with the provisions of 40 CFR Part 257.102 and 40 CFR Part 257.104, attest that this CPC Plan has been prepared in accordance with good engineering practices."

Seal:

[Seal Image]

CHRIS CUNNINGHAM
Printed Name of Licensed Professional Engineer

[Signature Image]

Signature of Licensed Professional Engineer

Date: 10/14/16

94591
TBPE P.E. License No.
8.0 REFERENCES

Sources of information used in the preparation of this CPC Plan ae listed below:


Figure

October 2016
Project No. 0352436
FIGURE 1
CCR Unit Locations
J.T. Deely & J.K. Spruce Power Plants
San Antonio, Texas
Tables

October 2016
Project No. 0352436
### TABLE 1

Estimated Closure Schedule

North and South SRH Ponds
CCR Unit Closure and Post-Closure Plan
Calaveras Power Station
Bexar County, Texas

<table>
<thead>
<tr>
<th>Event/Activity</th>
<th>Estimated Schedule&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of intent to initiate closure of CCR Unit, per 40 CFR 257.106</td>
<td>2Q 2018</td>
</tr>
<tr>
<td>Obtain necessary local and state permits / site logistics&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>10 days</td>
</tr>
<tr>
<td>Procurement process for construction</td>
<td>45 days</td>
</tr>
<tr>
<td>Review and approval of contractor submittals</td>
<td>15 days</td>
</tr>
<tr>
<td>Contractor mobilization</td>
<td>5 days</td>
</tr>
<tr>
<td>Dewatering and CCR Removal&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>90 days</td>
</tr>
<tr>
<td>Demolition and Decontamination&lt;sup&gt;(4)&lt;/sup&gt;</td>
<td>20 days</td>
</tr>
<tr>
<td>Demobilization</td>
<td>10 days</td>
</tr>
<tr>
<td>Prepare and submit closure certification report internet site</td>
<td>90 days</td>
</tr>
<tr>
<td><strong>Estimated Completion of Closure</strong></td>
<td><strong>1Q 2019</strong></td>
</tr>
</tbody>
</table>

**NOTES:**

1) Except for estimated start and end dates, the closure schedule is provided in days from notification of intent to close.

2) Closure activities have commenced when owners/operators have submitted applications for state or local permits per 40 CFR 257.102(e)(3). Schedule assumes a Self-Implementation Notice will be utilized.

3) Includes dewatering of pond, excavation and dewatering of CCR, and placement of dewatered CCR into Fly Ash Landfill.

4) Includes excavation and disposal of concrete slab and one foot of subgrade liner, and confirmation sampling.
### TABLE 2

Estimated Closure Schedule

North and South Bottom Ash Ponds  
CCR Unit Closure and Post-Closure Plan  
Calaveras Power Station  
Bexar County, Texas

<table>
<thead>
<tr>
<th>Event/Activity</th>
<th>Estimated Schedule&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of intent to initiate closure of CCR Unit, per 40 CFR 257.106</td>
<td>2Q 2018</td>
</tr>
<tr>
<td>Obtain necessary local and state permits / site logistics&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>10 days</td>
</tr>
<tr>
<td>Procurement process for construction</td>
<td>45 days</td>
</tr>
<tr>
<td>Review and approval of contractor submittals</td>
<td>15 days</td>
</tr>
<tr>
<td>Contractor mobilization</td>
<td>5 days</td>
</tr>
<tr>
<td>Dewatering and CCR Removal&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>140 days</td>
</tr>
<tr>
<td>Demolition and Decontamination&lt;sup&gt;(4)&lt;/sup&gt;</td>
<td>40 days</td>
</tr>
<tr>
<td>Demobilization</td>
<td>10 days</td>
</tr>
<tr>
<td>Prepare and submit closure certification report internet site</td>
<td>90 days</td>
</tr>
<tr>
<td><strong>Estimated Completion of Closure</strong></td>
<td><strong>2Q 2019</strong></td>
</tr>
</tbody>
</table>

**NOTES:**

1) Except for estimated start and end dates, the closure schedule is provided in days from notification of intent to close.

2) Closure activities have commenced when owners/operators have submitted applications for state or local permits per 40 CFR 257.102(e)(3). Schedule assumes a Self-Implementation Notice will be utilized.

3) Includes dewatering of pond, excavation and dewatering of CCR, and placement of dewatered CCR into Fly Ash Landfill.

4) Includes excavation and disposal of one foot of subgrade liner, and confirmation sampling.
TABLE 3
Estimated Closure Schedule
Evaporation Pond
CCR Unit Closure and Post-Closure Plan
Calaveras Power Station
Bexar County, Texas

<table>
<thead>
<tr>
<th>Event/Activity</th>
<th>Estimated Schedule(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of intent to initiate closure of CCR Unit, per 40 CFR 257.106</td>
<td>When decision is finalized</td>
</tr>
<tr>
<td>Obtain necessary local and state permits / site logistics(2)</td>
<td>10 days</td>
</tr>
<tr>
<td>Procurement process for construction</td>
<td>45 days</td>
</tr>
<tr>
<td>Review and approval of contractor submittals</td>
<td>15 days</td>
</tr>
<tr>
<td>Contractor mobilization</td>
<td>5 days</td>
</tr>
<tr>
<td>Dewatering and CCR Removal(3)</td>
<td>120 days</td>
</tr>
<tr>
<td>Decontamination(4)</td>
<td>20 days</td>
</tr>
<tr>
<td>Demobilization</td>
<td>10 days</td>
</tr>
<tr>
<td>Prepare and submit closure certification report internet site</td>
<td>90 days</td>
</tr>
<tr>
<td><strong>Estimated Completion of Closure</strong></td>
<td><strong>(plus 1 year)</strong></td>
</tr>
</tbody>
</table>

**NOTES:**
1) Except for estimated start and end dates, the closure schedule is provided in days from notification of intent to close.
2) Closure activities have commenced when owners/operators have submitted applications for state or local permits per 40 CFR 257.102(e)(3). Schedule assumes a Self-Implementation Notice will be utilized.
3) Includes dewatering of pond, excavation and dewatering of CCR, and placement of dewatered CCR into Fly Ash Landfill. If water in pond cannot be discharged via a TPDES permit, it will be allowed to evaporate, which will increase duration of this step by up to two years.
4) Includes excavation and disposal of one foot of subgrade liner, and confirmation sampling.
## TABLE 4

Estimated Closure Schedule

Fly Ash Landfill
CCR Unit Closure and Post-Closure Plan
Calaveras Power Station
Bexar County, Texas

<table>
<thead>
<tr>
<th>Event/Activity</th>
<th>Estimated Schedule$^{(1)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of intent to initiate closure of CCR Unit, per 40 CFR 257.106</td>
<td>When decision is finalized</td>
</tr>
<tr>
<td>Obtain necessary local and state permits / site logistics$^{(2)}$</td>
<td>270 days</td>
</tr>
<tr>
<td>Procurement process for construction</td>
<td>45 days</td>
</tr>
<tr>
<td>Review and approval of contractor submittals</td>
<td>15 days</td>
</tr>
<tr>
<td>Contractor mobilization</td>
<td>5 days</td>
</tr>
<tr>
<td>Prepare Subgrade$^{(3)}$</td>
<td>90 days</td>
</tr>
<tr>
<td>Construct Landfill Cap$^{(4)}$</td>
<td>120 days</td>
</tr>
<tr>
<td>Demobilization</td>
<td>10 days</td>
</tr>
<tr>
<td>Prepare and submit closure certification report internet site</td>
<td>90 days</td>
</tr>
<tr>
<td><strong>Estimated Completion of Closure</strong></td>
<td><strong>(plus 2 years)</strong></td>
</tr>
</tbody>
</table>

**NOTES:**

1) Except for estimated start and end dates, the closure schedule is provided in days from notification of intent to close.

2) Closure activities have commenced when owners/operators have submitted applications for state or local permits per 40 CFR 257.102(e)(3). Schedule is based on anticipated approval time for APAR and RAP through the TCEQ.

3) Includes regrading waste, placing borrow fill as required to achieve design grades, and shaping perimeter drainage features.

4) Includes cap components, seeding, and final drainage component installation. Does not include time required for self-sustaining vegetative cover to be established.