AECOM

CHOLLA POWER PLANT FLY ASH POND

Periodic Inflow Design Flood Control System Plan

October 2021
AECOM Project 60664605

Delivering a better world

Prepared for:

Arizona Public Service
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Attachment

1. Introduction

This Periodic Inflow Design Flood Control System Plan for the Fly Ash Pond at Cholla Power Plant, operated by Arizona Public Service (APS), has been prepared in accordance with the requirements of Title 40 of the Code of Federal Regulations Part 257 (40 CFR 257) ("the Coal Combustion Residuals [CCR] Rule", or "the Rule") and the specific requirement of 40 CFR § 257.82(c)(4) that "(t)he owner or operator of the CCR unit must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years."

2. Methodology

The methodology used to prepare this 2021 Periodic Inflow Design Flood Control System Plan for the Fly Ash Pond (FAP) at the Cholla Power Plant is for the certifying Qualified Professional Engineer (QPE) to:

1. Identify and review the hydrologic design basis references used for the 2016 Plan and verify applicability for use in 2021.
2. Perform a documented review of each major component of the contributing technical information from:
    a. AECOM, 2016, Cholla Power Plant, Fly Ash Pond, Inflow Design Flood Control System Plan, CH_InflowFlood_002_20161017, August 31, 2016 (hereafter referred to as the "2016 Plan" and incorporated and referenced directly as Attachment A to this document).
3. Consider and document whether the 2016 Plan and its conclusions:
    a. Meet the current reporting requirements of the Rule;
    b. Reflect the current condition of the structure, as known to the QPE and documented in the annual inspections;
    c. Are compromised by any identified issues of concern; and
    d. Are consistent with the standard of care of professionals performing similar evaluations in this region of the country; and
4. Identify any additional analyses, investigations, inspections, and/or repairs that should be completed in order to complete this 2021 Recertification.

This plan documents the results of these considerations, incorporates the 2016 Plan as an Appendix, identifies any additional technical investigation or evaluations (if needed), and presents an updated certification by the QPE.

3. Applicability of 2016 Plan Hydrologic Design Basis

The 2016 Plan reported flood routing for an inflow design flood runoff volume from a Probable Maximum Precipitation (PMP) thunderstorm depth of 10.1 inches based on "Flood Routing Studies for Bottom Ash and Fly Ash Ponds" (Ebasco, 1976). The 2016 Plan concluded that the 10.1-inch PMP would produce 964.4 acre-feet of runoff that could be stored easily within the 7,400 acre-feet of storage available between the 2016 average operating level (Elevation 5,097 feet) and the maximum flood level (Elevation 5,116 feet), four feet below the crest elevation.

The 2016 Plan also reported that the 10.1-inches depth exceeds estimates of Probable Maximum Precipitation (PMP) depth using methods prescribed at that time by the Arizona Department of Water Resources (ADWR) and developed by Applied Weather Associates (AWA 2013). The AWA PMP tool evaluates precipitation for the 72-hour general, 72-hour tropical, and the 6-hour local distribution; at the FAP site, the 6-hour local storm yields the largest runoff volume of the three distributions, a rainfall depth of 7.75 inches.

The relevant page of the ADWR website (https://new.azwater.gov/dam-safety/az-pmp) provides hyperlinks to the technical studies supporting the PMP tool, and the PMP tool itself, and includes a statement that "(t)he most recent version of the Statewide Probable Maximum Precipitation Study was published in 2013."

AECOM concludes that the hydrologic design basis provided by Ebasco (1976) provides PMP depths that are significantly higher than produced by more current PMP depth estimation tools (AWA 2013) and therefore this section of the 2016 Plan adequately represent current conditions and satisfy the requirements of the Rule.

4. 2016 Plan – Review by Section

Other than as described in the remainder of this section, the details presented in this section of the 2016 Plan adequately represent current conditions and satisfy the requirements of the Rule.

4.1 "§257.82 Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The details presented in this section of the 2016 Plan accurately describe the requirements of the Rule.

4.2 "Overview"

The details presented in this section of the 2016 Plan adequately represent current conditions and satisfy the requirements of the Rule.

4.3 "§257.82 (a)(1)(2)(3) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

A separate 2021 Periodic Hazard Potential Study confirms the assignment of the most severe classification, High Hazard, to the FAP. Therefore, this aspect of the 2016 Plan adequately represents current conditions and satisfies the requirements of the Rule.

As described in Section "3. Applicability of 2016 Plan Hydrologic Design Basis" of this 2021 Plan, the methodology of the 2016 Plan for PMP depth estimation, based on Ebasco (1976), is significantly more conservative (10.1 inches) than the equivalent result (7.75 inches) from the PMP depth estimation tool that ADWR recommends for use in 2021. Therefore, this aspect of the 2016 Plan adequately represents current conditions and satisfies the requirements of the Rule.

The FAP free water level has continued to lower, from approximate Elevations 5,095 feet in mid-2016 to 5,085 feet in mid-2021. The lowering is believed primarily to be a response to ongoing Plant operational improvements to decrease discharge volumes, the closure of Unit 4 at the end of 2020, and a more limited seasonal Plant operating schedule.

The characterization of the flood storage volume capacity available within the FAP that was reported in the 2016 Plan is unchanged and therefore adequately represents current conditions and satisfies the requirements of the Rule.

4.4 "§257.82 (b) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The details presented in this section of the 2016 Plan adequately represent current conditions and satisfy the requirements of the Rule.

4.5 "§257.82 (c)(1)(2)(3)(4)(5) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The owner or operator continues to acknowledge and will comply with these requirements.

Per the requirement of §257.82 (c)(4), this document constitutes the "every five years" Periodic Inflow Design Flood Control System Plan.

A certification of this Periodic Inflow Design Flood Control System Plan by a QPE is included in this document per the requirement of §257.82(c)(5).

4.6 "§257.82 (d) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The owner or operator continues to acknowledge and will comply with these requirements.

5. Recommended Additional Technical Investigations or Evaluations

None identified and none recommended.

6. Limitations

This document is for the sole use of APS on this project only and is not to be used for other projects. In the event that conclusions based upon the data presented in this document are made by others, such conclusions are the responsibility of others.

The Periodic Inflow Design Flood Control System Plan presented in this report is based on the 2016 Plan and relies and incorporates any Limitations expressed in that document.

The Certification of Professional Opinion in this report is limited to the information available to AECOM at the time this Assessment was performed in accordance with current practice and the standard of care. Standard of care is defined as the ordinary diligence exercised by fellow practitioners in this area performing the same services under similar circumstances during the same period. Professional judgments presented herein are primarily based on information from previous reports that have been assumed to be accurate, knowledge of the site, and partly on our general experience with dam safety evaluations performed on other dams.

No warranty or guarantee, either written or implied, is applicable to this work. The use of the word “certification” and/or “certify” in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not be interpreted or construed as a guarantee, warranty, or legal opinion.

7. Conclusion

The 2016 Plan and its conclusions meet the current reporting requirements of the Rule, reflect the current condition of the structure as known to the QPE and documented in the annual inspections, are not compromised by any identified issues of concern, and are consistent with the standard of care of professionals performing similar evaluations in this region of the country.

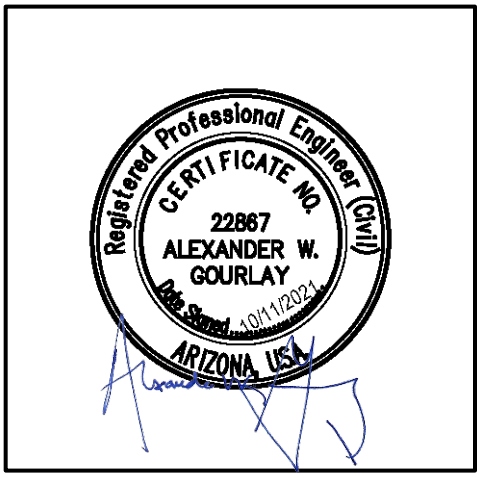
8. Certification Statement

Certification Statement for:

- Certification Statement 40 CFR § 257.82(c)(5) – Periodic Inflow Design Flood Control System Plan for an Existing CCR Surface Impoundment.
- CCR Unit: Arizona Public Service; Cholla Power Plant; Fly Ash Pond

I, Alexander W. Gourlay, being a Registered Professional Engineer in good standing in the State of Arizona, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the information contained in this Periodic Inflow Design Flood Control System Plan dated October 2021, including the technical content in Attachment A, meets the requirements of 40 CFR § 257.81.

Alexander W. Gourlay, P.E.
Printed Name



October 11, 2021
Date

Attachment A:

AECOM, 2016, *Cholla Power Plant, Fly Ash Pond, Inflow Design Flood Control System Plan, CH_InflowFlood_002_20161017,* August 31, 2016.

ATTACHMENT A

AECOM, 2016. *Cholla Power Plant, Fly Ash Pond, Inflow Design Flood Control System Plan, CH_InflowFlood_002_20161017,* August 31, 2016.

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