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SANTEE COOPER
CROSS GENERATING STATION

Bottom Ash Pond Inflow Design Flood Control System Plan

Document: CROSS-0-LI-044-0008

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CROSS GENERATING STATION
BOTTOM ASH POND INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Disclaimer

REV	DESCRIPTION	ORIGINATOR	REVIEWER	APPROVER	DATE
0	Issued for Use	L Lavoie L Lavoie	Digitally signed by: Fletcher Wood Date: 2016.10.13 16:13:00 -06'00' F Wood	Digitally signed by: Fletcher Wood Date: 2016.10.14 11:03:32 -05'00' F Wood	14 Oct 2016

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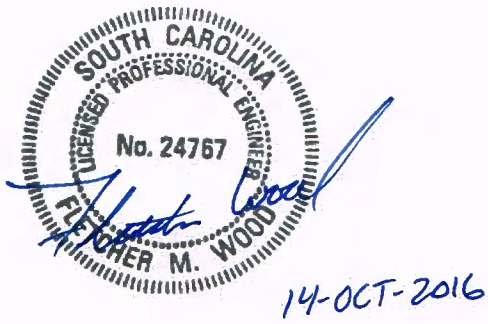


1. INTRODUCTION

The United States Environmental Protection Agency (EPA) promulgated new regulations regarding Coal Combustion Residuals (CCRs). These regulations (40 CFR Part 257) were published in the Federal Register on April 17, 2015. One of the requirements (§257.82) of the new regulations is to prepare a written inflow design flood control system plan. This plan must be placed in the facility's operating record no later than October 17, 2016, as required by §257.82(c)(3).

This report presents the inflow design control system plan for the existing Bottom Ash pond CCR impoundment area at Cross Generating Station in Pineville, South Carolina.

2. DISCUSSION

The bottom ash pond at Cross Generating Station consists of two interconnected ponds separated by a broad-crested weir. The south pond no longer receives CCR waste streams, and has been re-classified as a wastewater decant pond. The north pond remains classified as a CCR surface impoundment, and is herein referred to as the bottom ash pond. The bottom ash pond receives sluiced bottom ash as well as wastewater streams from powerblock area sumps, the coal pile runoff pond, industrial stormwater ponds, the leachate pond, and the gypsum plant area. A pump structure located within the decant pond recycles sluice and seal water for plant use. Water discharged from the pond system passes through the pH trim facility at a rate of approximately 3000 gpm. An emergency-overflow structure is located within the decant pond for safely discharging water during larger storm events. Available flood controls include the available water storage volume above the normal operating water level, the outfall to pH trim, and the emergency overflow structure.

The applicable requirements for the inflow design flood control system plan are listed below, with a description of how the systems are designed and constructed to satisfy each requirement. Appendix A includes the appropriate supporting engineering calculation, CROSS-0-DC-044-CE-0002.

Title 40 CFR §257.82(c) requires that the inflow design flood control system plan *must document how the inflow design control system has been designed and constructed to meet the applicable requirements of this section. Each plan must be supported by appropriate engineering calculations.*

§257.82(a)(3) states that the inflow design flood is determined, based on classification under §257.73(a)(2) or §257.74(a)(2), as:

(i) For a high hazard potential CCR surface impoundment, the probably maximum flood;

(ii) For a significant hazard potential CCR surface impoundment, the 1,000-year flood;

(iii) For a low hazard potential CCR surface impoundment, the 100-year flood.

Per Reference 1, the bottom ash pond is classified as a low hazard potential CCR surface impoundment. Therefore, the inflow design flood is the 100-year flood.

§257.82(a)(1) states that *the inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood.*

Stormwater flow into the CCR unit includes direct rainfall from within the bottom ash pond area itself (and decant pond). The impoundment is not incised, and is surrounded on all sides by a

raised perimeter berm, limiting stormwater run-on to the footprint of the pond area. In addition to direct rainfall, the various wastewater streams pumped to the bottom ash pond are rainfall-dependent, and therefore are generally assumed to occur at their rated pump capacity during the design storm event. Calculation CROSS-0-DC-044-CE-0002 in Appendix A models the pond system as a whole during the design storm event, including all inflows, outflows, storage capacity, pH trim system, and the emergency overflow structure. The Pond will adequately manage flow into the CCR unit during and following the peak discharge of the 100-year design flood.

§257.82(a)(2) states that *the inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood.*

The peak discharge out of the pond system resulting from the inflow design flood is controlled through a combination of storage capacity within the bottom ash pond, pumping through the pH trim facility, and if needed, the emergency outfall structure located within the wastewater decant pond. Calculation CROSS-0-DC-044-CE-0002 in Appendix A shows that the bottom ash pond system will adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the 100-year design flood. During and immediately following the design flood, all stormwater and wastewater flows will be controlled within the pond system.

§257.82(b) states that *discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.*

The outflow from the bottom ash pond and wastewater decant pond through the pH trim facility is conveyed to permitted outfall NPDES 002. All discharge from the CCR unit is handled in accordance with the surface water requirements under §257.3-3.

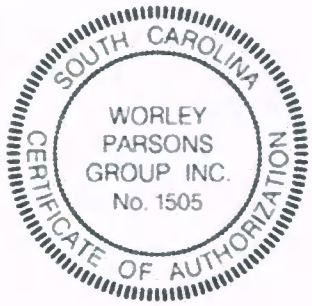
This report satisfies the requirements of §257.82(c) by providing an inflow design flood control system plan that documents how the flood control systems for the existing impoundments at Cross Generating Station have been designed and constructed to meet the applicable requirments of this section, including supporting engineering calculations.

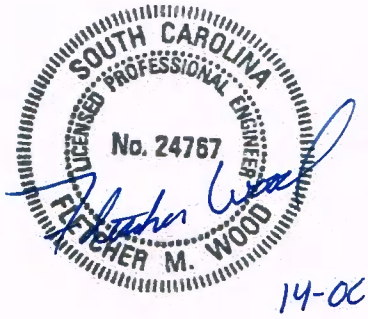
3. CONCLUSIONS

This report presents the inflow design flood control system plan for the existing Bottom Ash Pond CCR impoundment at Cross Generating Station in Pineville, South Carolina. The inflow design flood control system plan contained herein is in accordance with the requirements of Title 40 CFR §257.82.

4. CERTIFICATION

I, the undersigned Professional Engineer registered in good standing in the State of South Carolina, do hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I certify, for the above-referenced CCR Unit, that the inflow design flood control system plan contained herein is in accordance with the requirements of Title 40 CFR §257.82.





14-OCT-2016

Fletcher Wood
Printed Name of Professional Engineer

Signature of Professional Engineer

24767
South Carolina License #

5. REFERENCES

1. WorleyParsons Document CROSS-0-LI-044-0006, Bottom Ash Pond Initial Hazard Potential Classification Assessment

Attachment A - Calculation CROSS-0-DC-044-CE-0002

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Calculation Cover Sheet

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
Calculation Title	Bottom Ash Pond Inflow Design Flood Control	**Phase/CTR**	N/A
Elec File Location	M:\Cross\CCR Rule Demonstrations\0008 BA Pond Inflow Design Flood\Rev 0\CROSS-0-DC-044-CE-0002\CROSS-0-DC-044-CE-0002.docm		

Calculation Objective

The calculation objectives are to perform a hydraulic analysis to evaluate water surface elevations in the bottom ash pond during various storm events and to evaluate the ability of the existing emergency overflow structure weir to convey larger storm events while maintaining a minimum 1-foot freeboard during a 100-year storm event, and to verify the water surface level remains below the emergency overflow weir during the 10-year, 24-hour storm event.

Calculation Method

Bentley PondPack was used for the stormwater calculations.

Assumptions

None that require further verification.

Software Used

Title	Version	Validation (Y / N / N/A)
Bentley PondPack	V8i	N/A

References

1. SCDHEC Storm Water Management BMP Handbook, August 2005
2. Lockwood Greene Drawing 2-CV-601
3. Gilbert/Commonwealth Drawing BA-117-S0001
4. Gilbert/Commonwealth Drawing BA-117-S0003
5. Email from Santee Cooper to WorleyParsons dated June 6, 2013.

Conclusions

The bottom ash pond, with the normal operating level at EL 88.0' and existing emergency overflow structure weir at EL 89.5', will maintain a water level below the emergency overflow structure weir during the 10-year, 24-hour storm event, and will safely pass the 100 year storm event while maintaining a minimum 1-foot freeboard, as required.

Related to a Safety Critical System?	**No**	Status of Supplier Data used	**N/A**

HOLDS

None

Rev	Date	Description	By	Checked	Approved
0	14-10-16	Issued for Use	L. Lavoie	S. Velugubantla	F. Wood

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
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Elec File Location	M:\Cross\CCR Rule Demonstrations\0008 BA Pond Inflow Design Flood\Rev 0\CROSS-0-DC-044-CE-0002\CROSS-0-DC-044-CE-0002.docm		

Please check boxes for all applicable items checked or mark as "N/A" if not appropriate:

Calculations:

Originator	Checker	
☒	☒	Calculation number assigned and registered (refer to project numbering system or Document Number Standard (DPP-031-COR-EN for format).
☒	☒	All required information on Cover Sheet provided
☒	☒	Revision history box complete and signed. (Typed names (minimum of first initial and surname e.g. A. Wood) of Originator, Checker, Approver to be initialed beside at sign-off) (Dates in standard format (DD-MMM-YY))
☒	☒	Table of Contents.
☒	☒	Source of input data stated (with revision number and date if relevant).
☒	☒	Customer's requirements included/addressed.
☒	☒	Approach used is appropriate for problem being solved.
☒	☒	Method clear and easy to follow.
☒	☒	Input data correct.
☒	☒	Calculation is arithmetically correct OR software previously verified and reference to verification checked.
☒	☒	Calculation result within expected limits.
☒	☒	Calculation tolerances stated if significant.
☒	☒	Units used as required by customer. Unit conversions correctly performed.
☒	☒	Appropriate cross-references.
☒	☒	Sketches included and clearly labeled, where required.
☒	☒	Appendices included and referenced, as required.
☒	☒	Considered design reviews, Hazop actions, Customer input, safety and environmental issues, etc.
☒	☒	Safety in Design (SID) and Sustainable Design are addressed. Refer relevant SID Discipline Standard.
☒	☒	Conclusions and recommendations are appropriate.

Checking records:

☒	☒	Checked and annotated copy of calculation filed (use "Doc Check Print" stamp).
☒	☒	Corrections made as required and calculation dated and signed on cover sheet by checker.

Revisions:

☐	☐	Changes clouded, tracked or highlighted.
☐	☐	Revision history block updated.
☐	☐	Calculation re-checked if required.

Rev	Date	Description	By	Checked	Approved
0	14-10-16	Issued for Use	L. Lavoie	S. Velugubantla	F. Wood

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
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Rev	Date	By	Checked	Rev	Date	By	Checked	Rev	Date	By	Checked
0	14-10-16	L. Lavoie	S. Velugubantla								

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SOUTH CAROLINA
WORLEY PARSONS GROUP INC.
No. 1505
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 24767
FLETCHER M. WOOD
14-OCT-2016

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
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Rev	Date	By	Checked	Rev	Date	By	Checked	Rev	Date	By	Checked
0	14-10-16	L. Lavoie	S. Velugubantla								

1 INTRODUCTION

The Cross Generating Station is located in the northern part of Berkeley County, in Pineville, South Carolina. The station area consists of four coal-powered electric generating units and ancillary facilities including a coal yard, a bottom ash pond, a closed Class Two solid waste landfill, and an operating Class Three solid waste landfill.

The bottom ash pond consists of two interconnected ponds separated by a broad-crested weir. The southern portion of the pond ("south pond") was constructed during the original Unit 2 plant construction, while the larger northern portion ("north pond") was constructed as an expansion to the south pond during Unit 1 plant construction. The south pond no longer is used to manage CCR waste, and has been re-classified as a wastewater decant pond. The north pond remains classified as a CCR surface impoundment, and is generally referred to as the bottom ash pond. However, the two ponds are hydraulically interconnected via the aforementioned broad-crested weir, with the emergency overflow structure for the pond system residing in the south pond. For this reason, this calculation considers the pond system as a whole in order to ensure that the pond system, and therefore the bottom ash pond, satisfies the hydrologic and hydraulic capacity requirements for CCR surface impoundments.

In addition to providing bottom ash storage for Units 1-4, the bottom ash pond is used to help treat, manage, and balance numerous water/wastewater inflows and outflows, as shown on the Plant Water Balance chart (Appendix B). The normal operating level in the pond generally is maintained using the pH Trim, with temporary fluctuations in response to weather variations and plant demand. The emergency overflow structure is used to convey excess water associated with larger storms in excess of the 10-year, 24-hour storm event.

The emergency overflow structure in the decant pond is set at EL 89.5'. The purpose of this calculation is to evaluate the water surface elevations across the pond system in response to various storm events, verify the 10-year storm event does not overtop the existing emergency overflow structure, and to verify that the emergency overflow structure will convey larger storm events, including maintaining a minimum 1-foot of freeboard during a 100-year storm event.

2 METHODOLOGY

Bentley's PondPack program is used to design the bottom ash pond and analyze the water surface elevations during the storm events.

Design Criteria/ Assumptions:

- The top of pond dike (at lowest surveyed spot elevation) is EL 90.46'.
- The emergency overflow box weir is at EL 89.5'.
- The bottom ash pond normal operating level is EL 88.0'.
- Approximately 80 percent of the overall pond surface area is available for water storage above the normal operating level (total for both ponds).
- The two stormwater ponds serving Units 1-4 will be contributing 4,800 gpm during the design storm event. This is equal to all four 1,200 gpm pumps running at full capacity.
- The inflows from Sumps, Return Water, Gypsum Pond, Gypsum Plant during a storm event will be constant and equal to the flows listed on the Water Balance Chart (Appendix B).
- The Curve Number for the Bottom Ash Pond is 98.

- Flow from the leachate collection pond associated with the Class Three CCR landfill will be manually controlled and will not be coincident with a design storm event. It therefore is not included as an inflow to the bottom ash pond in this analysis.
- The Coal Pile Runoff Pond (CPRP) will be contributing 1,000 gpm to the bottom ash pond during the design storm event. This is equal to both existing 500 gpm pumps running at full capacity.
- The pH Trim system has a normal flow capacity of 3,050 gpm +/- 150 gpm under normal flow conditions, per Reference 5. Conservatively, the outflow value of 3,000 gpm was used.

The flows listed on the Water Balance Chart are average daily flows on the basis of annual data. However, during a storm event (particularly large storm events), the CPRP and stormwater ponds contribute water at a higher rate to the bottom ash pond because the pumps generally run continuously. Therefore, the maximum pump discharge rate for CPRP and stormwater ponds is used in the analysis. See the table below summarizing the bottom ash pond inflows and outflows.

Table 1: Summary of Flows (during large storm event)

Source		Rate(MGD)	Rate(GPM)	Rate(CFS)
Inflow	(excludes LCP – non-coincident with storm)			
	Coal Pile Runoff Pond	1.440	1,000	2.228
	Sumps	3.091	2,147	4.782
	Return water	4.440	3,083	6.870
	Stormwater Ponds	6.912	4,800	10.694
	Gypsum Pond	0.680	472	1.052
	Gypsum Plant	0.451	313	0.698
Outflow				
	Makeup water	5.000	3,472	7.736
	pH Trim Facility	4.320	3,000	6.684
Net Inflow	(excluding direct rainfall)	7.694	5,343	11.904

As shown in Table 1, during a given storm event, there is a temporary positive net inflow to the bottom ash pond. This net inflow is managed throughout the storm duration using the storage volume located above the normal operating level and below the emergency overflow structure weir (or below the top of dike for large storms). All inflows enter the north pond and are modeled using sub-basins with user defined hydrographs. The direct rainfall on each pond is modeled using a unit hydrograph with a SCS Curve Number 98. Rainfall data for the site is obtained from NOAA website (Appendix C). Table -2 below summarizes the rainfall data. The north and south ponds are modeled using the interconnected pond routing method. The top and bottom elevation of the ponds are EL. 90.46' and EL. 72.0' respectively. Since the normal water elevation of the pond is EL. 88.0', the pond volume below the EL.88.0' is not accounted for in the storage calculations. The calculation assumes that 20% of the pond areas above the normal operating level will not be available for the storage. This reflects current operations where

numerous finger dikes are built of CCR waste into the bottom ash pond, but the majority is available for water storage above the normal operating level. See the PondPack report in Appendix A for the pond volumes.

A broad-crested weir with a bottom width of 10 feet and 3:1 side slopes is modeled to connect the two ponds. The invert elevation of this weir is 85.0'. A pond discharge structure, with a user-defined outflow and an emergency overflow box, is modeled in the south pond. The outflow includes the flow to makeup water and the pH Trim facility. See Table 1 for the outflow rates. These outflows are modeled as constant flows throughout the storm event. The emergency overflow has a weir length 4'-4" and an 18-inch reinforced concrete culvert pipe. The emergency weir overflow elevation is modeled at EL. 89.5'. See the References section for the bottom ash pond drawings.

3 RESULTS

The results from the hydraulic analysis demonstrate that the bottom ash pond is capable of safely handling several large storms, including a 100-year storm. The table below shows the maximum water surface elevations in the bottom ash pond during these storm events. See Appendix A for detailed calculations.

Table 2: Summary of Water Surface Elevations (WSE)

Storm Event	Rainfall (in)	North pond WSE	South pond WSE	Minimum Freeboard (ft)
2-yr	3.90	88.70	88.69	1.76
5-yr	5.03	88.82	88.81	1.64
10-yr	5.96	88.92	88.91	1.54
25-yr	7.30	89.06	89.05	1.40
50-yr	8.41	89.18	89.17	1.28
100-yr	9.60	89.31	89.30	1.15
200-yr	10.90	89.44	89.44	1.02
500-yr	12.70	89.63	89.63	0.83
1000-yr	14.20	89.79	89.78	0.67

According to the SCDHEC Storm Water Management BMP Handbook (Reference 1), a minimum 1-foot freeboard is recommended for stormwater ponds during a 100-year storm. It can be noted from Table 2, the bottom ash pond will meet the freeboard requirement.

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
Calculation Title	Bottom Ash Pond Inflow Design Flood Control	**Phase/CTR**	N/A
Elec File Location	M:\Cross\CCR Rule Demonstrations\0008 BA Pond Inflow Design Flood\Rev 0\CROSS-0-DC-044-CE-0002\CROSS-0-DC-044-CE-0002.docm		
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0	14-10-16	L. Lavoie	S. Velugubantla								

4 CONCLUSION

The emergency overflow structure comprises the inflow design flood control system for the existing Bottom Ash Pond CCR Impoundment and the Wastewater Decant Pond. The emergency overflow structure is capable of safely handling the 100-year design storm event. The water surface elevation will remain below the emergency overflow weir during the 100-year, 24-hour design storm event.

Customer	Santee Cooper	**Project No.**	108008-01330
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Rev	Date	By	Checked	Rev	Date	By	Checked	Rev	Date	By	Checked
0	14-10-16	L. Lavoie	S. Velugubantla								

Appendix A – PondPack Report

(40 total pages)

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Bottom Ash Pond Analysis

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
CPRP	2-Year	2	4.423	0.000	2.23
CPRP	5-Year	5	4.423	0.000	2.23
CPRP	10-Year	10	4.423	0.000	2.23
CPRP	25-Year	25	4.423	0.000	2.23
CPRP	50-Year	50	4.423	0.000	2.23
CPRP	100-Year	100	4.423	0.000	2.23
CPRP	200-Year	200	4.423	0.000	2.23
CPRP	500-Year	500	4.423	0.000	2.23
CPRP	1000-Year	1,000	4.423	0.000	2.23
Sumps	2-Year	2	9.481	0.000	4.78
Sumps	5-Year	5	9.481	0.000	4.78
Sumps	10-Year	10	9.481	0.000	4.78
Sumps	25-Year	25	9.481	0.000	4.78
Sumps	50-Year	50	9.481	0.000	4.78
Sumps	100-Year	100	9.481	0.000	4.78
Sumps	200-Year	200	9.481	0.000	4.78
Sumps	500-Year	500	9.481	0.000	4.78
Sumps	1000-Year	1,000	9.481	0.000	4.78
Return Water	2-Year	2	13.626	0.000	6.87
Return Water	5-Year	5	13.626	0.000	6.87
Return Water	10-Year	10	13.626	0.000	6.87
Return Water	25-Year	25	13.626	0.000	6.87
Return Water	50-Year	50	13.626	0.000	6.87
Return Water	100-Year	100	13.626	0.000	6.87
Return Water	200-Year	200	13.626	0.000	6.87
Return Water	500-Year	500	13.626	0.000	6.87
Return Water	1000-Year	1,000	13.626	0.000	6.87
Stormwater Ponds	2-Year	2	17.244	5.000	10.70
Stormwater Ponds	5-Year	5	17.244	5.000	10.70
Stormwater Ponds	10-Year	10	17.244	5.000	10.70
Stormwater Ponds	25-Year	25	17.244	5.000	10.70
Stormwater Ponds	50-Year	50	17.244	5.000	10.70
Stormwater Ponds	100-Year	100	17.244	5.000	10.70
Stormwater Ponds	200-Year	200	17.244	5.000	10.70
Stormwater Ponds	500-Year	500	17.244	5.000	10.70
Stormwater Ponds	1000-Year	1,000	17.244	5.000	10.70
Gypsum Pond	2-Year	2	2.083	0.000	1.05
Gypsum Pond	5-Year	5	2.083	0.000	1.05
Gypsum Pond	10-Year	10	2.083	0.000	1.05
Gypsum Pond	25-Year	25	2.083	0.000	1.05
Gypsum Pond	50-Year	50	2.083	0.000	1.05
Gypsum Pond	100-Year	100	2.083	0.000	1.05
Gypsum Pond	200-Year	200	2.083	0.000	1.05

Bottom Ash Pond Analysis

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Gypsum Pond	500-Year	500	2.083	0.000	1.05
Gypsum Pond	1000-Year	1,000	2.083	0.000	1.05
Gypsum Plant	2-Year	2	1.388	0.000	0.70
Gypsum Plant	5-Year	5	1.388	0.000	0.70
Gypsum Plant	10-Year	10	1.388	0.000	0.70
Gypsum Plant	25-Year	25	1.388	0.000	0.70
Gypsum Plant	50-Year	50	1.388	0.000	0.70
Gypsum Plant	100-Year	100	1.388	0.000	0.70
Gypsum Plant	200-Year	200	1.388	0.000	0.70
Gypsum Plant	500-Year	500	1.388	0.000	0.70
Gypsum Plant	1000-Year	1,000	1.388	0.000	0.70
Rainfall-N	2-Year	2	25.398	12.100	271.58
Rainfall-N	5-Year	5	33.212	12.100	351.40
Rainfall-N	10-Year	10	39.648	12.100	416.98
Rainfall-N	25-Year	25	48.925	12.100	511.36
Rainfall-N	50-Year	50	56.612	12.100	589.48
Rainfall-N	100-Year	100	64.854	12.100	673.19
Rainfall-N	200-Year	200	73.858	12.100	764.61
Rainfall-N	500-Year	500	86.328	12.100	891.15
Rainfall-N	1000-Year	1,000	96.719	12.100	996.57
Rainfall-S	2-Year	2	4.548	12.100	48.64
Rainfall-S	5-Year	5	5.948	12.100	62.93
Rainfall-S	10-Year	10	7.100	12.100	74.68
Rainfall-S	25-Year	25	8.762	12.100	91.58
Rainfall-S	50-Year	50	10.138	12.100	105.57
Rainfall-S	100-Year	100	11.614	12.100	120.56
Rainfall-S	200-Year	200	13.227	12.100	136.93
Rainfall-S	500-Year	500	15.460	12.100	159.59
Rainfall-S	1000-Year	1,000	17.321	12.100	178.47

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
Outfall	2-Year	2	25.519	5.200	14.42
Outfall	5-Year	5	25.653	5.000	14.42
Outfall	10-Year	10	25.767	4.800	14.42
Outfall	25-Year	25	25.926	4.550	14.42
Outfall	50-Year	50	26.050	4.350	14.42
Outfall	100-Year	100	26.176	4.100	14.42
Outfall	200-Year	200	26.300	3.850	14.42
Outfall	500-Year	500	26.536	24.000	14.94
Outfall	1000-Year	1,000	27.096	24.000	16.10

Bottom Ash Pond Analysis

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
BA North Pond (IN)	2-Year	2	73.643	12.100	297.91	(N/A)	(N/A)
BA North Pond (OUT)	2-Year	2	28.120	12.050	19.90	88.70	490.991
BA North Pond (IN)	5-Year	5	81.458	12.100	377.73	(N/A)	(N/A)
BA North Pond (OUT)	5-Year	5	28.116	12.000	20.31	88.82	498.810
BA North Pond (IN)	10-Year	10	87.894	12.100	443.31	(N/A)	(N/A)
BA North Pond (OUT)	10-Year	10	28.111	12.050	21.61	88.92	505.252
BA North Pond (IN)	25-Year	25	97.171	12.100	537.69	(N/A)	(N/A)
BA North Pond (OUT)	25-Year	25	28.109	12.000	22.56	89.06	514.537
BA North Pond (Reverse)	25-Year	25	-0.003	12.250	-2.39	(N/A)	(N/A)
BA North Pond (IN)	50-Year	50	104.857	12.100	615.81	(N/A)	(N/A)
BA North Pond (OUT)	50-Year	50	28.119	12.050	23.55	89.18	522.227
BA North Pond (Reverse)	50-Year	50	-0.032	12.250	-5.53	(N/A)	(N/A)
BA North Pond (IN)	100-Year	100	113.099	12.100	699.52	(N/A)	(N/A)
BA North Pond (OUT)	100-Year	100	28.150	12.000	24.93	89.31	530.480
BA North Pond (Reverse)	100-Year	100	-0.063	12.250	-9.10	(N/A)	(N/A)
BA North Pond (IN)	200-Year	200	122.104	12.100	790.94	(N/A)	(N/A)
BA North Pond (OUT)	200-Year	200	28.183	12.000	26.72	89.44	539.505
BA North Pond (Reverse)	200-Year	200	-0.103	12.250	-13.34	(N/A)	(N/A)
BA North Pond (IN)	500-Year	500	134.573	12.100	917.48	(N/A)	(N/A)
BA North Pond (OUT)	500-Year	500	28.278	12.000	27.74	89.63	551.951

Bottom Ash Pond Analysis

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
BA North Pond (Reverse)	500-Year	500	-0.159	12.250	-19.09	(N/A)	(N/A)
BA North Pond (IN)	1000-Year	1,000	144.965	12.100	1,022.90	(N/A)	(N/A)
BA North Pond (OUT)	1000-Year	1,000	28.626	12.000	29.86	89.79	562.015
BA North Pond (Reverse)	1000-Year	1,000	-0.242	12.250	-23.02	(N/A)	(N/A)
BA South Pond (IN)	2-Year	2	32.669	12.050	67.81	(N/A)	(N/A)
BA South Pond (OUT)	2-Year	2	25.519	5.200	14.42	88.69	79.417
BA South Pond (IN)	5-Year	5	34.064	12.050	81.96	(N/A)	(N/A)
BA South Pond (OUT)	5-Year	5	25.653	5.000	14.42	88.81	80.677
BA South Pond (IN)	10-Year	10	35.211	12.050	95.22	(N/A)	(N/A)
BA South Pond (OUT)	10-Year	10	25.767	4.800	14.42	88.91	81.712
BA South Pond (IN)	25-Year	25	36.864	12.050	112.17	(N/A)	(N/A)
BA South Pond (OUT)	25-Year	25	25.926	4.550	14.42	89.05	83.205
BA South Pond (IN)	50-Year	50	38.237	12.050	127.64	(N/A)	(N/A)
BA South Pond (OUT)	50-Year	50	26.050	4.350	14.42	89.17	84.454
BA South Pond (IN)	100-Year	100	39.702	12.050	142.66	(N/A)	(N/A)
BA South Pond (OUT)	100-Year	100	26.176	4.100	14.42	89.30	85.793
BA South Pond (IN)	200-Year	200	41.294	12.050	160.54	(N/A)	(N/A)
BA South Pond (OUT)	200-Year	200	26.300	3.850	14.42	89.44	87.262
BA South Pond (IN)	500-Year	500	43.549	12.050	184.96	(N/A)	(N/A)
BA South Pond (OUT)	500-Year	500	26.536	24.000	14.94	89.63	89.279
BA South Pond (IN)	1000-Year	1,000	45.736	12.050	205.20	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
BA South Pond (OUT)	1000-Year	1,000	27.096	24.000	16.10	89.78	90.904

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 1,000 years
Storm Event: 1000-Year, 24-Hour

Time-Depth Curve: 1000-Year, 24-Hour	
Label	1000-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1,000 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.1
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.1	0.2	0.2	0.2	0.2
1.500	0.2	0.2	0.2	0.3	0.3
2.000	0.3	0.3	0.3	0.3	0.3
2.500	0.4	0.4	0.4	0.4	0.4
3.000	0.4	0.5	0.5	0.5	0.5
3.500	0.5	0.5	0.6	0.6	0.6
4.000	0.6	0.6	0.6	0.7	0.7
4.500	0.7	0.7	0.7	0.8	0.8
5.000	0.8	0.8	0.8	0.9	0.9
5.500	0.9	0.9	1.0	1.0	1.0
6.000	1.0	1.0	1.1	1.1	1.1
6.500	1.1	1.2	1.2	1.2	1.3
7.000	1.3	1.3	1.3	1.4	1.4
7.500	1.4	1.5	1.5	1.5	1.6
8.000	1.6	1.7	1.7	1.7	1.8
8.500	1.8	1.9	1.9	2.0	2.0
9.000	2.1	2.1	2.2	2.2	2.3
9.500	2.4	2.4	2.5	2.5	2.6
10.000	2.7	2.8	2.8	2.9	3.0
10.500	3.1	3.2	3.3	3.3	3.4
11.000	3.5	3.7	3.8	3.9	4.1
11.500	4.2	4.5	4.8	5.3	5.9
12.000	7.1	8.3	8.9	9.4	9.7
12.500	10.0	10.1	10.3	10.4	10.5
13.000	10.7	10.8	10.9	10.9	11.0
13.500	11.1	11.2	11.3	11.4	11.4
14.000	11.5	11.6	11.7	11.7	11.8
14.500	11.8	11.9	12.0	12.0	12.1
15.000	12.1	12.2	12.2	12.3	12.3
15.500	12.4	12.4	12.5	12.5	12.5
16.000	12.6	12.6	12.7	12.7	12.7

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 1,000 years
Storm Event: 1000-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	12.8	12.8	12.8	12.9	12.9
17.000	12.9	12.9	13.0	13.0	13.0
17.500	13.1	13.1	13.1	13.1	13.2
18.000	13.2	13.2	13.2	13.2	13.3
18.500	13.3	13.3	13.3	13.4	13.4
19.000	13.4	13.4	13.4	13.5	13.5
19.500	13.5	13.5	13.5	13.6	13.6
20.000	13.6	13.6	13.6	13.6	13.7
20.500	13.7	13.7	13.7	13.7	13.7
21.000	13.8	13.8	13.8	13.8	13.8
21.500	13.8	13.9	13.9	13.9	13.9
22.000	13.9	13.9	14.0	14.0	14.0
22.500	14.0	14.0	14.0	14.0	14.1
23.000	14.1	14.1	14.1	14.1	14.1
23.500	14.1	14.2	14.2	14.2	14.2
24.000	14.2	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time-Depth Curve: 100-Year, 24-Hour	
Label	100-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.2	0.2	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.3	0.3	0.3	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.4	0.4	0.4	0.4	0.4
4.000	0.4	0.4	0.4	0.5	0.5
4.500	0.5	0.5	0.5	0.5	0.5
5.000	0.5	0.6	0.6	0.6	0.6
5.500	0.6	0.6	0.6	0.7	0.7
6.000	0.7	0.7	0.7	0.7	0.8
6.500	0.8	0.8	0.8	0.8	0.8
7.000	0.9	0.9	0.9	0.9	1.0
7.500	1.0	1.0	1.0	1.0	1.1
8.000	1.1	1.1	1.1	1.2	1.2
8.500	1.2	1.3	1.3	1.3	1.4
9.000	1.4	1.4	1.5	1.5	1.6
9.500	1.6	1.6	1.7	1.7	1.8
10.000	1.8	1.9	1.9	2.0	2.0
10.500	2.1	2.1	2.2	2.3	2.3
11.000	2.4	2.5	2.6	2.6	2.8
11.500	2.9	3.0	3.3	3.6	4.0
12.000	4.8	5.6	6.0	6.3	6.6
12.500	6.7	6.8	7.0	7.0	7.1
13.000	7.2	7.3	7.3	7.4	7.5
13.500	7.5	7.6	7.6	7.7	7.7
14.000	7.8	7.8	7.9	7.9	8.0
14.500	8.0	8.0	8.1	8.1	8.2
15.000	8.2	8.2	8.3	8.3	8.3
15.500	8.4	8.4	8.4	8.5	8.5
16.000	8.5	8.5	8.6	8.6	8.6
16.500	8.6	8.6	8.7	8.7	8.7

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	8.7	8.8	8.8	8.8	8.8
17.500	8.8	8.8	8.9	8.9	8.9
18.000	8.9	8.9	8.9	9.0	9.0
18.500	9.0	9.0	9.0	9.0	9.0
19.000	9.1	9.1	9.1	9.1	9.1
19.500	9.1	9.1	9.1	9.2	9.2
20.000	9.2	9.2	9.2	9.2	9.2
20.500	9.2	9.3	9.3	9.3	9.3
21.000	9.3	9.3	9.3	9.3	9.4
21.500	9.4	9.4	9.4	9.4	9.4
22.000	9.4	9.4	9.4	9.4	9.5
22.500	9.5	9.5	9.5	9.5	9.5
23.000	9.5	9.5	9.5	9.5	9.5
23.500	9.6	9.6	9.6	9.6	9.6
24.000	9.6	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 10 years
Storm Event: 10-Year, 24-Hour

Time-Depth Curve: 10-Year, 24-Hour	
Label	10-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.4	0.4	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.5	0.5
6.500	0.5	0.5	0.5	0.5	0.5
7.000	0.5	0.6	0.6	0.6	0.6
7.500	0.6	0.6	0.6	0.6	0.7
8.000	0.7	0.7	0.7	0.7	0.7
8.500	0.8	0.8	0.8	0.8	0.8
9.000	0.9	0.9	0.9	0.9	1.0
9.500	1.0	1.0	1.0	1.1	1.1
10.000	1.1	1.2	1.2	1.2	1.3
10.500	1.3	1.3	1.4	1.4	1.4
11.000	1.5	1.5	1.6	1.6	1.7
11.500	1.8	1.9	2.0	2.2	2.5
12.000	3.0	3.5	3.7	3.9	4.1
12.500	4.2	4.3	4.3	4.4	4.4
13.000	4.5	4.5	4.6	4.6	4.6
13.500	4.7	4.7	4.7	4.8	4.8
14.000	4.8	4.9	4.9	4.9	4.9
14.500	5.0	5.0	5.0	5.0	5.1
15.000	5.1	5.1	5.1	5.2	5.2
15.500	5.2	5.2	5.2	5.2	5.3
16.000	5.3	5.3	5.3	5.3	5.3
16.500	5.4	5.4	5.4	5.4	5.4

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 10 years
Storm Event: 10-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	5.4	5.4	5.4	5.5	5.5
17.500	5.5	5.5	5.5	5.5	5.5
18.000	5.5	5.5	5.5	5.6	5.6
18.500	5.6	5.6	5.6	5.6	5.6
19.000	5.6	5.6	5.6	5.6	5.7
19.500	5.7	5.7	5.7	5.7	5.7
20.000	5.7	5.7	5.7	5.7	5.7
20.500	5.7	5.7	5.8	5.8	5.8
21.000	5.8	5.8	5.8	5.8	5.8
21.500	5.8	5.8	5.8	5.8	5.8
22.000	5.8	5.9	5.9	5.9	5.9
22.500	5.9	5.9	5.9	5.9	5.9
23.000	5.9	5.9	5.9	5.9	5.9
23.500	5.9	5.9	5.9	5.9	6.0
24.000	6.0	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 200 years
Storm Event: 200-Year, 24-Hour

Time-Depth Curve: 200-Year, 24-Hour	
Label	200-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	200 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.2
1.500	0.2	0.2	0.2	0.2	0.2
2.000	0.2	0.2	0.2	0.3	0.3
2.500	0.3	0.3	0.3	0.3	0.3
3.000	0.3	0.3	0.4	0.4	0.4
3.500	0.4	0.4	0.4	0.4	0.5
4.000	0.5	0.5	0.5	0.5	0.5
4.500	0.5	0.6	0.6	0.6	0.6
5.000	0.6	0.6	0.7	0.7	0.7
5.500	0.7	0.7	0.7	0.8	0.8
6.000	0.8	0.8	0.8	0.8	0.9
6.500	0.9	0.9	0.9	0.9	1.0
7.000	1.0	1.0	1.0	1.1	1.1
7.500	1.1	1.1	1.2	1.2	1.2
8.000	1.2	1.3	1.3	1.3	1.4
8.500	1.4	1.4	1.5	1.5	1.5
9.000	1.6	1.6	1.7	1.7	1.8
9.500	1.8	1.9	1.9	2.0	2.0
10.000	2.1	2.1	2.2	2.2	2.3
10.500	2.4	2.4	2.5	2.6	2.6
11.000	2.7	2.8	2.9	3.0	3.1
11.500	3.2	3.4	3.7	4.1	4.5
12.000	5.4	6.4	6.8	7.2	7.5
12.500	7.7	7.8	7.9	8.0	8.1
13.000	8.2	8.3	8.3	8.4	8.5
13.500	8.5	8.6	8.7	8.7	8.8
14.000	8.8	8.9	8.9	9.0	9.0
14.500	9.1	9.1	9.2	9.2	9.3
15.000	9.3	9.4	9.4	9.4	9.5
15.500	9.5	9.5	9.6	9.6	9.6
16.000	9.7	9.7	9.7	9.7	9.8
16.500	9.8	9.8	9.8	9.9	9.9

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 200 years
Storm Event: 200-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	9.9	9.9	10.0	10.0	10.0
17.500	10.0	10.0	10.1	10.1	10.1
18.000	10.1	10.1	10.1	10.2	10.2
18.500	10.2	10.2	10.2	10.2	10.3
19.000	10.3	10.3	10.3	10.3	10.3
19.500	10.4	10.4	10.4	10.4	10.4
20.000	10.4	10.4	10.5	10.5	10.5
20.500	10.5	10.5	10.5	10.5	10.6
21.000	10.6	10.6	10.6	10.6	10.6
21.500	10.6	10.6	10.7	10.7	10.7
22.000	10.7	10.7	10.7	10.7	10.7
22.500	10.7	10.8	10.8	10.8	10.8
23.000	10.8	10.8	10.8	10.8	10.8
23.500	10.9	10.9	10.9	10.9	10.9
24.000	10.9	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 25 years
Storm Event: 25-Year, 24-Hour

Time-Depth Curve: 25-Year, 24-Hour	
Label	25-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.4
4.500	0.4	0.4	0.4	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.5
5.500	0.5	0.5	0.5	0.5	0.5
6.000	0.5	0.5	0.5	0.6	0.6
6.500	0.6	0.6	0.6	0.6	0.6
7.000	0.7	0.7	0.7	0.7	0.7
7.500	0.7	0.8	0.8	0.8	0.8
8.000	0.8	0.9	0.9	0.9	0.9
8.500	0.9	1.0	1.0	1.0	1.0
9.000	1.1	1.1	1.1	1.1	1.2
9.500	1.2	1.2	1.3	1.3	1.3
10.000	1.4	1.4	1.5	1.5	1.5
10.500	1.6	1.6	1.7	1.7	1.8
11.000	1.8	1.9	1.9	2.0	2.1
11.500	2.2	2.3	2.5	2.7	3.0
12.000	3.6	4.3	4.6	4.8	5.0
12.500	5.1	5.2	5.3	5.4	5.4
13.000	5.5	5.5	5.6	5.6	5.7
13.500	5.7	5.8	5.8	5.8	5.9
14.000	5.9	6.0	6.0	6.0	6.1
14.500	6.1	6.1	6.2	6.2	6.2
15.000	6.2	6.3	6.3	6.3	6.3
15.500	6.4	6.4	6.4	6.4	6.4
16.000	6.5	6.5	6.5	6.5	6.5
16.500	6.6	6.6	6.6	6.6	6.6

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 25 years
Storm Event: 25-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	6.6	6.7	6.7	6.7	6.7
17.500	6.7	6.7	6.7	6.8	6.8
18.000	6.8	6.8	6.8	6.8	6.8
18.500	6.8	6.8	6.9	6.9	6.9
19.000	6.9	6.9	6.9	6.9	6.9
19.500	6.9	6.9	7.0	7.0	7.0
20.000	7.0	7.0	7.0	7.0	7.0
20.500	7.0	7.0	7.1	7.1	7.1
21.000	7.1	7.1	7.1	7.1	7.1
21.500	7.1	7.1	7.1	7.1	7.2
22.000	7.2	7.2	7.2	7.2	7.2
22.500	7.2	7.2	7.2	7.2	7.2
23.000	7.2	7.2	7.2	7.3	7.3
23.500	7.3	7.3	7.3	7.3	7.3
24.000	7.3	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 2 years
Storm Event: 2-Year, 24-Hour

Time-Depth Curve: 2-Year, 24-Hour	
Label	2-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.3	0.3	0.3	0.3	0.3
6.000	0.3	0.3	0.3	0.3	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.4	0.4	0.4	0.4	0.4
7.500	0.4	0.4	0.4	0.4	0.4
8.000	0.4	0.5	0.5	0.5	0.5
8.500	0.5	0.5	0.5	0.5	0.6
9.000	0.6	0.6	0.6	0.6	0.6
9.500	0.6	0.7	0.7	0.7	0.7
10.000	0.7	0.8	0.8	0.8	0.8
10.500	0.8	0.9	0.9	0.9	0.9
11.000	1.0	1.0	1.0	1.1	1.1
11.500	1.2	1.2	1.3	1.5	1.6
12.000	1.9	2.3	2.4	2.6	2.7
12.500	2.7	2.8	2.8	2.9	2.9
13.000	2.9	3.0	3.0	3.0	3.0
13.500	3.1	3.1	3.1	3.1	3.1
14.000	3.2	3.2	3.2	3.2	3.2
14.500	3.3	3.3	3.3	3.3	3.3
15.000	3.3	3.3	3.4	3.4	3.4
15.500	3.4	3.4	3.4	3.4	3.4
16.000	3.5	3.5	3.5	3.5	3.5
16.500	3.5	3.5	3.5	3.5	3.5

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 2 years
Storm Event: 2-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	3.5	3.6	3.6	3.6	3.6
17.500	3.6	3.6	3.6	3.6	3.6
18.000	3.6	3.6	3.6	3.6	3.6
18.500	3.6	3.7	3.7	3.7	3.7
19.000	3.7	3.7	3.7	3.7	3.7
19.500	3.7	3.7	3.7	3.7	3.7
20.000	3.7	3.7	3.7	3.7	3.8
20.500	3.8	3.8	3.8	3.8	3.8
21.000	3.8	3.8	3.8	3.8	3.8
21.500	3.8	3.8	3.8	3.8	3.8
22.000	3.8	3.8	3.8	3.8	3.8
22.500	3.8	3.8	3.9	3.9	3.9
23.000	3.9	3.9	3.9	3.9	3.9
23.500	3.9	3.9	3.9	3.9	3.9
24.000	3.9	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 500 years
Storm Event: 500-Year, 24-Hour

Time-Depth Curve: 500-Year, 24-Hour	
Label	500-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	500 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.1
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.2	0.2	0.2
1.500	0.2	0.2	0.2	0.2	0.2
2.000	0.3	0.3	0.3	0.3	0.3
2.500	0.3	0.3	0.3	0.4	0.4
3.000	0.4	0.4	0.4	0.4	0.5
3.500	0.5	0.5	0.5	0.5	0.5
4.000	0.5	0.6	0.6	0.6	0.6
4.500	0.6	0.6	0.7	0.7	0.7
5.000	0.7	0.7	0.8	0.8	0.8
5.500	0.8	0.8	0.9	0.9	0.9
6.000	0.9	0.9	1.0	1.0	1.0
6.500	1.0	1.0	1.1	1.1	1.1
7.000	1.1	1.2	1.2	1.2	1.3
7.500	1.3	1.3	1.4	1.4	1.4
8.000	1.4	1.5	1.5	1.6	1.6
8.500	1.6	1.7	1.7	1.8	1.8
9.000	1.9	1.9	1.9	2.0	2.1
9.500	2.1	2.2	2.2	2.3	2.3
10.000	2.4	2.5	2.5	2.6	2.7
10.500	2.7	2.8	2.9	3.0	3.1
11.000	3.2	3.3	3.4	3.5	3.6
11.500	3.8	4.0	4.3	4.7	5.3
12.000	6.3	7.4	8.0	8.4	8.7
12.500	8.9	9.1	9.2	9.3	9.4
13.000	9.5	9.6	9.7	9.8	9.9
13.500	10.0	10.0	10.1	10.2	10.2
14.000	10.3	10.4	10.4	10.5	10.5
14.500	10.6	10.6	10.7	10.8	10.8
15.000	10.8	10.9	10.9	11.0	11.0
15.500	11.1	11.1	11.1	11.2	11.2
16.000	11.3	11.3	11.3	11.3	11.4
16.500	11.4	11.4	11.5	11.5	11.5

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 500 years
Storm Event: 500-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	11.6	11.6	11.6	11.6	11.7
17.500	11.7	11.7	11.7	11.7	11.8
18.000	11.8	11.8	11.8	11.8	11.9
18.500	11.9	11.9	11.9	11.9	12.0
19.000	12.0	12.0	12.0	12.0	12.1
19.500	12.1	12.1	12.1	12.1	12.1
20.000	12.2	12.2	12.2	12.2	12.2
20.500	12.2	12.3	12.3	12.3	12.3
21.000	12.3	12.3	12.3	12.4	12.4
21.500	12.4	12.4	12.4	12.4	12.4
22.000	12.5	12.5	12.5	12.5	12.5
22.500	12.5	12.5	12.5	12.6	12.6
23.000	12.6	12.6	12.6	12.6	12.6
23.500	12.6	12.7	12.7	12.7	12.7
24.000	12.7	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 50 years
Storm Event: 50-Year, 24-Hour

Time-Depth Curve: 50-Year, 24-Hour	
Label	50-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	50 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.5	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.6	0.6	0.7
6.500	0.7	0.7	0.7	0.7	0.7
7.000	0.8	0.8	0.8	0.8	0.8
7.500	0.9	0.9	0.9	0.9	0.9
8.000	1.0	1.0	1.0	1.0	1.1
8.500	1.1	1.1	1.1	1.2	1.2
9.000	1.2	1.3	1.3	1.3	1.4
9.500	1.4	1.4	1.5	1.5	1.5
10.000	1.6	1.6	1.7	1.7	1.8
10.500	1.8	1.9	1.9	2.0	2.0
11.000	2.1	2.2	2.2	2.3	2.4
11.500	2.5	2.6	2.9	3.1	3.5
12.000	4.2	4.9	5.3	5.6	5.8
12.500	5.9	6.0	6.1	6.2	6.2
13.000	6.3	6.4	6.4	6.5	6.5
13.500	6.6	6.6	6.7	6.7	6.8
14.000	6.8	6.9	6.9	6.9	7.0
14.500	7.0	7.1	7.1	7.1	7.2
15.000	7.2	7.2	7.2	7.3	7.3
15.500	7.3	7.4	7.4	7.4	7.4
16.000	7.5	7.5	7.5	7.5	7.5
16.500	7.6	7.6	7.6	7.6	7.6

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 50 years
Storm Event: 50-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	7.6	7.7	7.7	7.7	7.7
17.500	7.7	7.7	7.8	7.8	7.8
18.000	7.8	7.8	7.8	7.8	7.9
18.500	7.9	7.9	7.9	7.9	7.9
19.000	7.9	7.9	8.0	8.0	8.0
19.500	8.0	8.0	8.0	8.0	8.0
20.000	8.0	8.1	8.1	8.1	8.1
20.500	8.1	8.1	8.1	8.1	8.1
21.000	8.2	8.2	8.2	8.2	8.2
21.500	8.2	8.2	8.2	8.2	8.2
22.000	8.2	8.3	8.3	8.3	8.3
22.500	8.3	8.3	8.3	8.3	8.3
23.000	8.3	8.3	8.3	8.4	8.4
23.500	8.4	8.4	8.4	8.4	8.4
24.000	8.4	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 5 years
Storm Event: 5-Year, 24-Hour

Time-Depth Curve: 5-Year, 24-Hour	
Label	5-Year, 24-Hour
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	5 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.6
8.000	0.6	0.6	0.6	0.6	0.6
8.500	0.6	0.7	0.7	0.7	0.7
9.000	0.7	0.8	0.8	0.8	0.8
9.500	0.8	0.9	0.9	0.9	0.9
10.000	1.0	1.0	1.0	1.0	1.1
10.500	1.1	1.1	1.2	1.2	1.2
11.000	1.3	1.3	1.3	1.4	1.4
11.500	1.5	1.6	1.7	1.9	2.1
12.000	2.5	2.9	3.2	3.3	3.4
12.500	3.5	3.6	3.6	3.7	3.7
13.000	3.8	3.8	3.8	3.9	3.9
13.500	3.9	4.0	4.0	4.0	4.1
14.000	4.1	4.1	4.1	4.2	4.2
14.500	4.2	4.2	4.2	4.3	4.3
15.000	4.3	4.3	4.3	4.4	4.4
15.500	4.4	4.4	4.4	4.4	4.4
16.000	4.5	4.5	4.5	4.5	4.5
16.500	4.5	4.5	4.5	4.6	4.6

Bottom Ash Pond Analysis

Subsection: Time-Depth Curve
Label: Time-Depth - 1

Return Event: 5 years
Storm Event: 5-Year, 24-Hour

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	4.6	4.6	4.6	4.6	4.6
17.500	4.6	4.6	4.6	4.7	4.7
18.000	4.7	4.7	4.7	4.7	4.7
18.500	4.7	4.7	4.7	4.7	4.7
19.000	4.7	4.8	4.8	4.8	4.8
19.500	4.8	4.8	4.8	4.8	4.8
20.000	4.8	4.8	4.8	4.8	4.8
20.500	4.8	4.9	4.9	4.9	4.9
21.000	4.9	4.9	4.9	4.9	4.9
21.500	4.9	4.9	4.9	4.9	4.9
22.000	4.9	4.9	4.9	4.9	5.0
22.500	5.0	5.0	5.0	5.0	5.0
23.000	5.0	5.0	5.0	5.0	5.0
23.500	5.0	5.0	5.0	5.0	5.0
24.000	5.0	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time vs. Volume
Label: BA North Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	445.502	445.563	445.622	445.679	445.734
0.250	445.789	445.844	445.897	445.950	446.002
0.500	446.054	446.106	446.159	446.212	446.266
0.750	446.321	446.376	446.431	446.487	446.543
1.000	446.599	446.656	446.712	446.769	446.825
1.250	446.882	446.938	446.995	447.051	447.107
1.500	447.163	447.219	447.274	447.330	447.385
1.750	447.440	447.494	447.549	447.603	447.656
2.000	447.710	447.763	447.816	447.868	447.921
2.250	447.973	448.025	448.077	448.128	448.180
2.500	448.231	448.282	448.333	448.383	448.434
2.750	448.484	448.534	448.584	448.634	448.683
3.000	448.732	448.781	448.830	448.879	448.927
3.250	448.975	449.023	449.071	449.118	449.166
3.500	449.213	449.260	449.306	449.353	449.399
3.750	449.445	449.491	449.536	449.582	449.627
4.000	449.672	449.718	449.766	449.815	449.866
4.250	449.919	449.974	450.031	450.091	450.153
4.500	450.217	450.283	450.351	450.422	450.495
4.750	450.570	450.647	450.727	450.809	450.893
5.000	450.979	451.066	451.154	451.242	451.330
5.250	451.418	451.507	451.596	451.685	451.775
5.500	451.865	451.955	452.045	452.137	452.228
5.750	452.320	452.412	452.504	452.596	452.689
6.000	452.781	452.873	452.966	453.059	453.152
6.250	453.246	453.342	453.440	453.538	453.638
6.500	453.738	453.839	453.941	454.044	454.148
6.750	454.253	454.358	454.465	454.572	454.680
7.000	454.789	454.899	455.010	455.121	455.234
7.250	455.347	455.461	455.577	455.693	455.809
7.500	455.927	456.046	456.165	456.285	456.406
7.750	456.528	456.651	456.775	456.900	457.025
8.000	457.152	457.279	457.408	457.538	457.670
8.250	457.804	457.940	458.078	458.218	458.359
8.500	458.503	458.649	458.797	458.947	459.099
8.750	459.251	459.405	459.560	459.718	459.878
9.000	460.040	460.205	460.372	460.542	460.713
9.250	460.886	461.061	461.238	461.417	461.598
9.500	461.781	461.966	462.153	462.341	462.532
9.750	462.725	462.920	463.116	463.315	463.516
10.000	463.718	463.923	464.131	464.342	464.556

Bottom Ash Pond Analysis

Subsection: Time vs. Volume
Label: BA North Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.250	464.775	464.998	465.226	465.457	465.691
10.500	465.928	466.169	466.414	466.665	466.920
10.750	467.179	467.443	467.710	467.982	468.258
11.000	468.538	468.824	469.118	469.424	469.744
11.250	470.079	470.429	470.795	471.176	471.573
11.500	471.986	472.434	472.951	473.569	474.320
11.750	475.213	476.254	477.442	478.778	480.451
12.000	482.708	485.380	488.179	490.791	492.876
12.250	494.514	495.908	497.114	498.153	499.040
12.500	499.777	500.389	500.906	501.358	501.778
12.750	502.177	502.559	502.926	503.277	503.612
13.000	503.932	504.239	504.533	504.818	505.099
13.250	505.375	505.648	505.917	506.182	506.443
13.500	506.700	506.953	507.201	507.446	507.686
13.750	507.923	508.155	508.383	508.608	508.828
14.000	509.044	509.257	509.466	509.672	509.877
14.250	510.079	510.279	510.478	510.675	510.869
14.500	511.060	511.249	511.436	511.623	511.807
14.750	511.990	512.170	512.349	512.526	512.700
15.000	512.873	513.044	513.213	513.380	513.545
15.250	513.708	513.869	514.028	514.186	514.341
15.500	514.494	514.646	514.795	514.943	515.089
15.750	515.232	515.374	515.514	515.652	515.788
16.000	515.922	516.054	516.185	516.314	516.443
16.250	516.570	516.697	516.823	516.948	517.072
16.500	517.196	517.319	517.440	517.559	517.677
16.750	517.796	517.914	518.031	518.148	518.264
17.000	518.379	518.493	518.606	518.718	518.830
17.250	518.941	519.050	519.160	519.268	519.375
17.500	519.482	519.587	519.692	519.796	519.899
17.750	520.001	520.103	520.203	520.303	520.402
18.000	520.500	520.597	520.694	520.790	520.886
18.250	520.982	521.077	521.172	521.267	521.362
18.500	521.456	521.550	521.644	521.737	521.831
18.750	521.924	522.017	522.109	522.202	522.294
19.000	522.385	522.477	522.568	522.659	522.750
19.250	522.841	522.931	523.021	523.111	523.201
19.500	523.290	523.379	523.467	523.556	523.645
19.750	523.733	523.821	523.908	523.995	524.081
20.000	524.166	524.252	524.337	524.423	524.509
20.250	524.595	524.681	524.766	524.851	524.936

Bottom Ash Pond Analysis

Subsection: Time vs. Volume
Label: BA North Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
20.500	525.021	525.105	525.190	525.274	525.358
20.750	525.441	525.525	525.609	525.692	525.775
21.000	525.858	525.940	526.023	526.105	526.187
21.250	526.269	526.351	526.432	526.514	526.595
21.500	526.676	526.756	526.837	526.917	526.997
21.750	527.077	527.157	527.237	527.316	527.396
22.000	527.475	527.553	527.632	527.711	527.789
22.250	527.867	527.945	528.022	528.100	528.177
22.500	528.254	528.331	528.408	528.485	528.561
22.750	528.637	528.713	528.789	528.865	528.940
23.000	529.016	529.091	529.165	529.240	529.314
23.250	529.389	529.463	529.537	529.610	529.684
23.500	529.757	529.831	529.904	529.976	530.049
23.750	530.121	530.194	530.266	530.338	530.409
24.000	530.480	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Time vs. Volume
Label: BA South Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	72.297	72.298	72.302	72.308	72.314
0.250	72.321	72.327	72.334	72.340	72.346
0.500	72.353	72.359	72.366	72.372	72.379
0.750	72.386	72.393	72.400	72.407	72.414
1.000	72.421	72.428	72.435	72.442	72.449
1.250	72.456	72.463	72.470	72.477	72.483
1.500	72.490	72.497	72.504	72.511	72.518
1.750	72.524	72.531	72.538	72.544	72.551
2.000	72.557	72.564	72.570	72.577	72.583
2.250	72.590	72.596	72.602	72.609	72.615
2.500	72.621	72.628	72.634	72.640	72.646
2.750	72.653	72.659	72.665	72.671	72.677
3.000	72.683	72.689	72.695	72.701	72.707
3.250	72.713	72.719	72.725	72.730	72.736
3.500	72.742	72.748	72.753	72.759	72.765
3.750	72.770	72.776	72.782	72.787	72.793
4.000	72.798	72.804	72.809	72.815	72.821
4.250	72.829	72.837	72.845	72.854	72.864
4.500	72.873	72.883	72.894	72.904	72.916
4.750	72.927	72.939	72.951	72.964	72.976
5.000	72.990	73.003	73.017	73.031	73.045
5.250	73.059	73.073	73.088	73.102	73.116
5.500	73.131	73.145	73.160	73.174	73.188
5.750	73.202	73.217	73.231	73.246	73.261
6.000	73.277	73.292	73.309	73.325	73.342
6.250	73.360	73.376	73.393	73.409	73.425
6.500	73.441	73.458	73.474	73.491	73.508
6.750	73.524	73.541	73.559	73.576	73.593
7.000	73.611	73.629	73.647	73.665	73.683
7.250	73.701	73.719	73.738	73.757	73.775
7.500	73.794	73.813	73.833	73.852	73.872
7.750	73.891	73.911	73.931	73.951	73.971
8.000	73.992	74.012	74.033	74.054	74.075
8.250	74.097	74.119	74.141	74.164	74.187
8.500	74.210	74.234	74.257	74.281	74.306
8.750	74.331	74.358	74.385	74.413	74.441
9.000	74.468	74.495	74.522	74.550	74.578
9.250	74.606	74.634	74.663	74.692	74.721
9.500	74.751	74.780	74.811	74.841	74.872
9.750	74.903	74.935	74.966	74.999	75.031
10.000	75.064	75.097	75.130	75.165	75.200

Bottom Ash Pond Analysis

Subsection: Time vs. Volume
Label: BA South Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
10.250	75.235	75.272	75.308	75.346	75.384
10.500	75.425	75.466	75.509	75.551	75.593
10.750	75.635	75.678	75.722	75.766	75.811
11.000	75.856	75.903	75.951	76.001	76.055
11.250	76.111	76.170	76.231	76.295	76.362
11.500	76.430	76.508	76.602	76.716	76.856
11.750	77.024	77.219	77.437	77.681	77.993
12.000	78.429	78.947	79.467	79.909	80.200
12.250	80.377	80.517	80.651	80.778	80.890
12.500	80.981	81.053	81.113	81.168	81.224
12.750	81.282	81.340	81.396	81.449	81.500
13.000	81.548	81.594	81.639	81.684	81.729
13.250	81.773	81.816	81.858	81.900	81.941
13.500	81.981	82.020	82.059	82.098	82.135
13.750	82.172	82.208	82.244	82.279	82.313
14.000	82.347	82.380	82.413	82.445	82.477
14.250	82.509	82.541	82.572	82.603	82.633
14.500	82.664	82.696	82.727	82.758	82.787
14.750	82.816	82.845	82.873	82.902	82.929
15.000	82.957	82.984	83.011	83.038	83.064
15.250	83.090	83.116	83.141	83.166	83.191
15.500	83.215	83.239	83.263	83.287	83.310
15.750	83.333	83.355	83.378	83.399	83.421
16.000	83.442	83.463	83.484	83.505	83.525
16.250	83.546	83.566	83.586	83.606	83.626
16.500	83.646	83.665	83.685	83.705	83.726
16.750	83.747	83.766	83.785	83.804	83.822
17.000	83.841	83.859	83.877	83.895	83.913
17.250	83.931	83.948	83.966	83.983	84.000
17.500	84.017	84.034	84.051	84.068	84.084
17.750	84.101	84.117	84.133	84.149	84.165
18.000	84.180	84.196	84.212	84.227	84.242
18.250	84.258	84.273	84.288	84.304	84.319
18.500	84.334	84.349	84.365	84.380	84.395
18.750	84.410	84.425	84.440	84.454	84.469
19.000	84.484	84.499	84.513	84.528	84.543
19.250	84.557	84.572	84.586	84.601	84.615
19.500	84.630	84.644	84.658	84.673	84.687
19.750	84.701	84.715	84.729	84.744	84.758
20.000	84.773	84.788	84.803	84.817	84.831
20.250	84.845	84.859	84.872	84.886	84.900

Bottom Ash Pond Analysis

Subsection: Time vs. Volume
Label: BA South Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Time vs. Volume (ac-ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
20.500	84.913	84.927	84.941	84.954	84.968
20.750	84.981	84.995	85.008	85.022	85.035
21.000	85.048	85.062	85.075	85.088	85.101
21.250	85.115	85.128	85.141	85.154	85.167
21.500	85.180	85.193	85.206	85.219	85.232
21.750	85.245	85.258	85.271	85.283	85.296
22.000	85.309	85.322	85.334	85.347	85.360
22.250	85.372	85.385	85.397	85.410	85.422
22.500	85.435	85.447	85.459	85.472	85.484
22.750	85.496	85.509	85.521	85.533	85.545
23.000	85.557	85.569	85.581	85.593	85.605
23.250	85.617	85.629	85.641	85.653	85.665
23.500	85.677	85.689	85.700	85.712	85.724
23.750	85.735	85.747	85.758	85.770	85.782
24.000	85.793	(N/A)	(N/A)	(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Outlet Input Data
Label: Intermediate Weir

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Requested Pond Water Surface Elevations	
Minimum (Headwater)	74.00 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	90.46 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Irregular Weir	Weir - 1	Forward + Reverse	TW	85.00	90.46
Tailwater Settings	Tailwater			(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Outlet Input Data
Label: Intermediate Weir

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Structure ID: Weir - 1
Structure Type: Irregular Weir

Station (ft)	Elevation (ft)
0.00	5.46
1.38	5.00
4.38	4.00
7.38	3.00
10.38	2.00
13.38	1.00
16.38	0.00
26.38	0.00
29.38	1.00
32.38	2.00
35.38	3.00
38.38	4.00
41.38	5.00
42.76	5.46

Lowest Elevation	85.00 ft
Weir Coefficient	2.64 (ft^0.5)/s

Bottom Ash Pond Analysis

Subsection: Outlet Input Data
Label: Overflow Box

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Requested Pond Water Surface Elevations	
Minimum (Headwater)	74.00 ft
Increment (Headwater)	0.05 ft
Maximum (Headwater)	90.46 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
User Defined Table	Outflows	Forward	TW	0.00	90.46
Rectangular Weir	Weir - 1	Forward	Culvert - 1	89.50	90.46
Culvert-Circular	Culvert - 1	Forward	TW	78.50	90.46
Tailwater Settings	Tailwater			(N/A)	(N/A)

Bottom Ash Pond Analysis

Subsection: Outlet Input Data
Label: Overflow Box

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	18.0 in
Length	140.00 ft
Length (Computed Barrel)	140.00 ft
Slope (Computed)	0.004 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.094
T2 ratio (HW/D)	1.195
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	80.14 ft	T1 Flow	7.58 ft³/s
T2 Elevation	80.29 ft	T2 Flow	8.66 ft³/s

Bottom Ash Pond Analysis

Subsection: Outlet Input Data
Label: Overflow Box

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Structure ID: Weir - 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	89.50 ft
Weir Length	4.33 ft
Weir Coefficient	2.65 (ft^0.5)/s

Structure ID: Outflows
Structure Type: User Defined Table

Elevation (ft)	Flow (ft³/s)
74.00	0.00
88.00	0.00
88.01	14.42
90.46	14.42

Structure ID: TW
Structure Type: TW Setup, DS Channel

Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Bottom Ash Pond Analysis

Subsection: Interconnected Pond Routing Summary
Label: BA North Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	88.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	445.502	ac-ft	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	0.050	hours

	Maximum Storage		
	Time to Peak (hours)	Elevation (ft)	Volume (ac-ft)
	24.000	89.31	530.480

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (hours)	Flow (Peak) (ft³/s)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Pond Inflow....	12.050	142.66	0.003	0.00
Pond Outflow...	4.100	14.42	0.000	0.00

	Total Volume In		Total Volume Out	
	Volume (ac-ft)	Direction	Volume (ac-ft)	Direction
Pond Inflow....	39.702	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	26.176	Forward

Mass Balance (ac-ft)	
Volume (Initial ICPM)	445.502 ac-ft
Volume (Total In ICPM)	113.162 ac-ft
Volume (Total Out ICPM)	28.150 ac-ft
Volume (Ending)	530.480 ac-ft
Elevation (Ending)	89.31 ft
Difference	0.034 ac-ft
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.0 %

Bottom Ash Pond Analysis

Subsection: Detention Time
Label: BA North Pond (IN)

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Infiltration	
Infiltration Method (Computed)	No Infiltration

Approximate Detention Times	
Time to Peak (Outflow + Infiltration, Peak to Peak Detention Time)	12.000 hours
Time to Peak (Inflow, Peak to Peak Detention Time)	12.100 hours
Detention Time (Peak to Peak)	0.000 hours
Time to Centroid (Outflow)	13.008 hours
Time to Centroid (Inflow)	12.506 hours
Detention Time (Centroid to Centroid)	0.502 hours
Weighted Average Plug Time	8.757 hours
Maximum Plug Volume Plug Time	11.900 hours
Maximum Inflow Plug Volume	2.871 ac-ft
Time (Maximum Plug Volume, Start)	12.050 hours
Time (Maximum Plug Volume, End)	12.100 hours

Bottom Ash Pond Analysis

Subsection: Interconnected Pond Routing Summary
Label: BA South Pond

Return Event: 100 years
Storm Event: 100-Year, 24-Hour

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions			Calculation Tolerances		
Elevation (Starting Water Surface Computed)	88.00	ft	Flow Tolerance (Minimum)	0.000	ft³/s
Volume (Starting)	72.297	ac-ft	Maximum Iterations	35	
Outflow (Starting)	0.00	ft³/s	ICPM Time Step	0.050	hours

	Maximum Storage		
	Time to Peak (hours)	Elevation (ft)	Volume (ac-ft)
	24.000	89.30	85.793

	Forward Flow Peaks		Reverse Flow Peaks	
	Time to Peak (hours)	Flow (Peak) (ft³/s)	Time to Peak (hours)	Flow (Peak) (ft³/s)
Pond Inflow....	12.050	142.66	0.003	0.00
Pond Outflow...	4.100	14.42	0.000	0.00

	Total Volume In		Total Volume Out	
	Volume (ac-ft)	Direction	Volume (ac-ft)	Direction
Pond Inflow....	39.702	Forward	0.000	Reverse
Pond Outflow...	0.000	Reverse	26.176	Forward

Mass Balance (ac-ft)	
Volume (Initial ICPM)	72.297 ac-ft
Volume (Total In ICPM)	39.702 ac-ft
Volume (Total Out ICPM)	26.176 ac-ft
Volume (Ending)	85.793 ac-ft
Elevation (Ending)	89.30 ft
Difference	0.030 ac-ft
Percent of Inflow Volume (Interconnected Pond Mass Balance)	0.1 %

Bottom Ash Pond Analysis

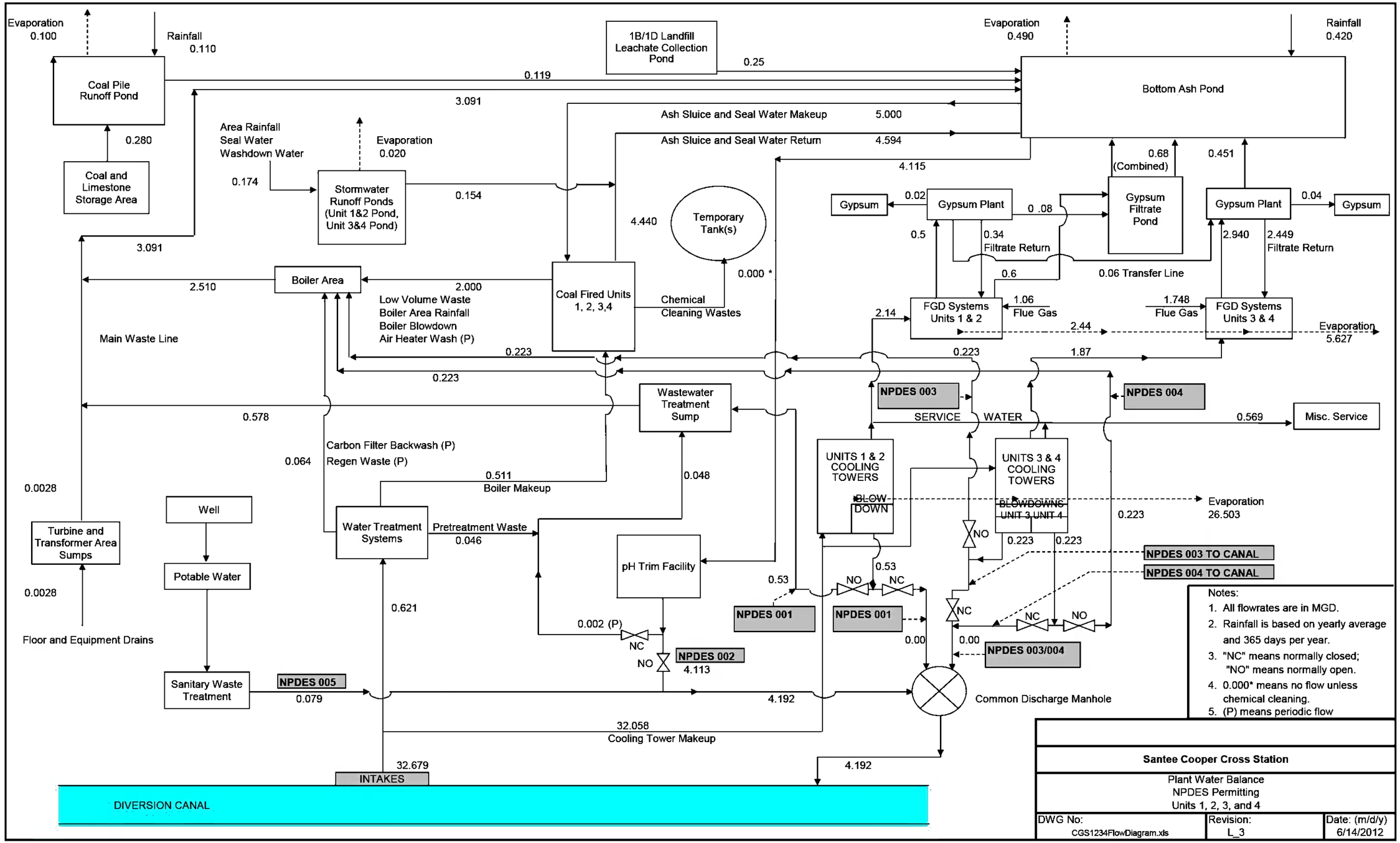
Index

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
Calculation Title	Bottom Ash Pond Inflow Design Flood Control	**Phase/CTR**	N/A
Elec File Location	M:\Cross\CCR Rule Demonstrations\0008 BA Pond Inflow Design Flood\Rev 0\CROSS-0-DC-044-CE-0002\CROSS-0-DC-044-CE-0002.docm		

Rev	Date	By	Checked	Rev	Date	By	Checked	Rev	Date	By	Checked
0	14-10-16	L. Lavoie	S. Velugubantla								

Appendix B – Water Balance Flow Diagram

(2 total pages)


Evaporation 0.100
Rainfall 0.110
Coal Pile Runoff Pond
0.280
Coal and Limestone Storage Area
0.119
3.091
1B/1D Landfill Leachate Collection Pond
0.25
Evaporation 0.490
Rainfall 0.420
Bottom Ash Pond
Ash Sluice and Seal Water Makeup 5.000
Ash Sluice and Seal Water Return 4.594
4.115
Area Rainfall
Seal Water
Washdown Water
0.174
Stormwater Runoff Ponds (Unit 1&2 Pond, Unit 3&4 Pond)
Evaporation 0.020
0.154
4.440
Temporary Tank(s)
0.000 *
3.091
2.510
Boiler Area
2.000
Low Volume Waste
Boiler Area Rainfall
Boiler Blowdown
Air Heater Wash (P)
Coal Fired Units 1, 2, 3,4
Chemical Cleaning Wastes
Main Waste Line
0.223
0.223
Gypsum
0.02
Gypsum Plant
0 .08
0.68 (Combined)
Gypsum Filtrate Pond
0.451
Gypsum Plant
0.04
Gypsum
0.5
0.34
Filtrate Return
2.940
2.449
Filtrate Return
0.6
0.06 Transfer Line
2.14
FGD Systems Units 1 & 2
1.06
Flue Gas
1.748
Flue Gas
FGD Systems Units 3 & 4
2.44
Evaporation 5.627
0.223
1.87
Wastewater Treatment Sump
NPDES 003
NPDES 004
SERVICE WATER
0.569
Misc. Service
0.578
Carbon Filter Backwash (P)
0.064
Regen Waste (P)
0.511
Boiler Makeup
0.048
UNITS 1 & 2 COOLING TOWERS
BLOW DOWN
UNITS 3 & 4 COOLING TOWERS
BLOWDOWNS UNIT 3 UNIT 4
Evaporation 26.503
0.223
0.0028
Turbine and Transformer Area Sumps
0.0028
Floor and Equipment Drains
Well
Potable Water
Water Treatment Systems
Pretreatment Waste 0.046
pH Trim Facility
0.621
0.002 (P)
NC
NO
NPDES 002
4.113
NO
0.223
0.223
NPDES 003 TO CANAL
NPDES 004 TO CANAL
0.53
NO
NC
0.53
NPDES 001
NPDES 001
NC
NC
NO
0.00
0.00
NPDES 003/004
Sanitary Waste Treatment
NPDES 005
0.079
4.192
Common Discharge Manhole
32.058
Cooling Tower Makeup
32.679
INTAKES
4.192
DIVERSION CANAL
Notes:
1. All flowrates are in MGD.
2. Rainfall is based on yearly average and 365 days per year.
3. "NC" means normally closed; "NO" means normally open.
4. 0.000* means no flow unless chemical cleaning.
5. (P) means periodic flow
Santee Cooper Cross Station
Plant Water Balance
NPDES Permitting
Units 1, 2, 3, and 4
DWG No: CGS1234FlowDiagram.xls
Revision: L_3
Date: (m/d/y) 6/14/2012

Customer	Santee Cooper	**Project No.**	108008-01330
Project Title	Cross Generating Station	**Calc No.**	CROSS-0-DC-044-CE-0002
Calculation Title	Bottom Ash Pond Inflow Design Flood Control	**Phase/CTR**	N/A
Elec File Location	M:\Cross\CCR Rule Demonstrations\0008 BA Pond Inflow Design Flood\Rev 0\CROSS-0-DC-044-CE-0002\CROSS-0-DC-044-CE-0002.docm		
		Page	50 **of** 51

Rev	Date	By	Checked	Rev	Date	By	Checked	Rev	Date	By	Checked
0	14-10-16	L. Lavoie	S. Velugubantla								

AppendixC – Rainfall Data

(2 total pages)

NOAA Atlas 14, Volume 2, Version 3
Location name: Pineville, South Carolina, US*
Coordinates: 33.3721, -80.1056
Elevation: 79ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.476 (0.444–0.512)	0.554 (0.516–0.596)	0.637 (0.593–0.686)	0.722 (0.669–0.774)	0.814 (0.751–0.874)	0.893 (0.821–0.957)	0.967 (0.884–1.04)	1.04 (0.944–1.12)	1.13 (1.02–1.22)	1.22 (1.08–1.31)
10-min	0.761 (0.709–0.819)	0.886 (0.826–0.954)	1.02 (0.950–1.10)	1.15 (1.07–1.24)	1.30 (1.20–1.39)	1.42 (1.31–1.52)	1.54 (1.41–1.65)	1.65 (1.50–1.77)	1.79 (1.61–1.93)	1.92 (1.71–2.07)
15-min	0.951 (0.886–1.02)	1.11 (1.04–1.20)	1.29 (1.20–1.39)	1.46 (1.35–1.57)	1.64 (1.52–1.77)	1.80 (1.66–1.93)	1.94 (1.78–2.09)	2.08 (1.89–2.24)	2.26 (2.03–2.43)	2.41 (2.14–2.60)
30-min	1.30 (1.22–1.40)	1.54 (1.43–1.66)	1.84 (1.71–1.97)	2.12 (1.96–2.27)	2.44 (2.25–2.61)	2.71 (2.49–2.91)	2.98 (2.72–3.19)	3.24 (2.94–3.48)	3.59 (3.23–3.86)	3.90 (3.47–4.20)
60-min	1.63 (1.52–1.75)	1.93 (1.80–2.08)	2.35 (2.19–2.53)	2.75 (2.55–2.96)	3.24 (2.99–3.48)	3.67 (3.38–3.94)	4.10 (3.75–4.40)	4.54 (4.12–4.88)	5.15 (4.63–5.54)	5.69 (5.06–6.14)
2-hr	1.91 (1.77–2.06)	2.29 (2.12–2.47)	2.84 (2.63–3.06)	3.38 (3.12–3.63)	4.04 (3.71–4.34)	4.61 (4.21–4.95)	5.18 (4.71–5.56)	5.77 (5.21–6.20)	6.55 (5.85–7.04)	7.23 (6.40–7.80)
3-hr	2.04 (1.88–2.21)	2.44 (2.25–2.66)	3.05 (2.81–3.31)	3.64 (3.35–3.95)	4.40 (4.02–4.77)	5.08 (4.61–5.49)	5.77 (5.20–6.24)	6.50 (5.81–7.03)	7.50 (6.62–8.13)	8.40 (7.33–9.13)
6-hr	2.40 (2.22–2.60)	2.87 (2.66–3.12)	3.59 (3.31–3.89)	4.30 (3.96–4.65)	5.21 (4.77–5.63)	6.04 (5.48–6.52)	6.88 (6.19–7.42)	7.78 (6.95–8.40)	9.01 (7.94–9.75)	10.1 (8.81–11.0)
12-hr	2.79 (2.58–3.05)	3.34 (3.09–3.65)	4.19 (3.86–4.57)	5.05 (4.63–5.49)	6.16 (5.62–6.68)	7.18 (6.50–7.76)	8.23 (7.38–8.89)	9.37 (8.31–10.1)	11.0 (9.55–11.8)	12.4 (10.7–13.4)
24-hr	3.21 (2.97–3.48)	3.90 (3.61–4.23)	5.03 (4.64–5.45)	5.96 (5.49–6.45)	7.30 (6.68–7.89)	8.41 (7.66–9.09)	9.60 (8.69–10.4)	10.9 (9.79–11.8)	12.7 (11.3–13.8)	14.2 (12.6–15.5)
2-day	3.77 (3.46–4.13)	4.57 (4.19–5.00)	5.84 (5.35–6.39)	6.88 (6.28–7.53)	8.39 (7.62–9.16)	9.64 (8.71–10.5)	11.0 (9.86–12.0)	12.4 (11.1–13.6)	14.5 (12.8–15.9)	16.2 (14.1–17.9)
3-day	4.05 (3.72–4.43)	4.89 (4.50–5.35)	6.21 (5.69–6.79)	7.28 (6.66–7.96)	8.82 (8.03–9.63)	10.1 (9.14–11.0)	11.4 (10.3–12.5)	12.9 (11.5–14.1)	14.9 (13.2–16.4)	16.6 (14.6–18.3)
4-day	4.32 (3.98–4.72)	5.21 (4.80–5.70)	6.57 (6.04–7.18)	7.68 (7.04–8.39)	9.25 (8.43–10.1)	10.5 (9.57–11.5)	11.9 (10.7–13.0)	13.3 (12.0–14.6)	15.4 (13.7–16.9)	17.1 (15.1–18.8)
7-day	5.05 (4.67–5.50)	6.09 (5.63–6.62)	7.59 (7.01–8.24)	8.79 (8.10–9.54)	10.5 (9.59–11.3)	11.8 (10.8–12.8)	13.2 (12.0–14.4)	14.7 (13.3–16.0)	16.7 (15.0–18.3)	18.4 (16.4–20.2)
10-day	5.78 (5.36–6.26)	6.92 (6.42–7.49)	8.49 (7.86–9.18)	9.71 (8.98–10.5)	11.4 (10.5–12.3)	12.7 (11.6–13.7)	14.0 (12.8–15.2)	15.4 (14.1–16.8)	17.4 (15.7–18.9)	18.9 (17.0–20.6)
20-day	7.75 (7.24–8.31)	9.24 (8.64–9.90)	11.1 (10.4–11.9)	12.6 (11.8–13.5)	14.7 (13.6–15.7)	16.3 (15.1–17.4)	17.9 (16.5–19.2)	19.5 (18.0–21.0)	21.8 (19.9–23.5)	23.6 (21.4–25.5)
30-day	9.56 (9.00–10.1)	11.3 (10.7–12.0)	13.4 (12.6–14.2)	15.0 (14.1–15.9)	17.1 (16.0–18.1)	18.7 (17.5–19.9)	20.4 (19.0–21.6)	22.0 (20.4–23.4)	24.1 (22.3–25.7)	25.8 (23.8–27.6)
45-day	12.1 (11.4–12.8)	14.3 (13.5–15.1)	16.7 (15.8–17.6)	18.5 (17.4–19.5)	20.8 (19.6–22.0)	22.7 (21.3–24.0)	24.4 (22.9–25.9)	26.2 (24.5–27.8)	28.5 (26.5–30.3)	30.3 (28.0–32.3)
60-day	14.4 (13.6–15.2)	17.0 (16.0–17.9)	19.6 (18.5–20.7)	21.6 (20.4–22.8)	24.2 (22.8–25.6)	26.2 (24.6–27.7)	28.1 (26.3–29.7)	29.9 (28.0–31.7)	32.4 (30.1–34.4)	34.2 (31.7–36.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical