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October 7, 2016

Tennessee Valley Authority
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Initial Inflow Design Flood Control System Plan
Middle Pond A
EPA Final CCR Rule
TVA Gallatin Fossil Plant
Sumner County, Tennessee

1.0 PURPOSE

This letter documents AECOM's certification of the initial inflow design flood control system plan for the TVA Gallatin Fossil (GAF) Plant's Middle Pond A. Based on the assessment, the Middle Pond A complies with the inflow design flood control requirements in the Final CCR Rule 40 CFR 257.82.

2.0 INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

As described in 40 CFR 257.82(c), an inflow design flood control system plan must be prepared to document how the inflow design flood control system has been designed and constructed to manage the design storm required by the hazard classification. Based on Hazard Potential Classification the Middle Pond A has been assigned a low hazard potential classification rating. Thus, the 100 year storm event was selected from §257.82(a)(3) as the inflow design storm flood event based upon a hazard potential classification.

3.0 SUMMARY OF FINDINGS

The attached plan presents the analysis of the inflow design flood control system for the Middle Pond A. The resulting water surface elevations are shown in the following table. The plan and results show that the impoundment meets the requirements set forth in 40 CFR 257.82(a) and (b).

Plant	Facility	Inflow Design Storm	Water Surface Elevation (feet)	Minimum Embankment Elevation (feet)
GAF	Middle Pond A	100 year	473.0	474.0

AECOM

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Gabriel W. Lang, PE, being a Professional Engineer in good standing in the State of Tennessee do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;
2. that the information contained herein is accurate as of the date of my signature below; and
3. that the inflow design flood control system plan for the TVA Gallatin Fossil Plant's Middle Pond A meets the requirements specified in 40 CFR 257.82(a), (b), and (c)(1).

SIGNATURE ________________________________ DATE __10/7/2016_____

ADDRESS: AECOM
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ATTACHMENTS: Initial Inflow Design Flood Control System Plan (40 CFR 257.8) For Coal Combustion Residuals (CCR) - Existing Surface Impoundments
TVA - Middle Pond A, Gallatin Fossil Plant, Sumner County, Tennessee

COAL COMBUSTION PRODUCT DISPOSAL PROGRAM

TENNESSEE VALLEY AUTHORITY – MIDDLE POND A
GALLATIN FOSSIL PLANT
SUMNER COUNTY, TENNESSEE

INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN (40 CFR §257.82) FOR COAL COMBUSTION RESIDUALS (CCR)

EXISTING SURFACE IMPOUNDMENTS

Prepared for

Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

October 7, 2016 - Rev0

Prepared by

AECOM

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FIGURES

APPENDICES

1. BACKGROUND

This plan outlines compliance to Rule **§ 257.82** of the EPA Final CCR Rule.

The owner or operator of an existing CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in Rule **§257.82 (a)**, which is directly stated below for clarity.

Rule **§257.82(a)(1)**: 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.

Rule **§257.82(a)(2)**: 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.

Rule **§257.82(a)(3)**: The inflow design flood is:

(i): For a high hazard potential CCR surface impoundment, the probable 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; or

(iv): For an incised CCR surface impoundment, the 25-year flood.

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

Section **§257.82(c)(1)** states that the owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4). The plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of the section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operation record.

Section **§257.82(c)(2)** allows amendments to the written inflow design flood control system plan at any time and requires amendments to the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect. The revised plan must be placed in the facility's operating record.

Section **§257.82(c)(3)** requires that the initial inflow design flood control system plan be completed no later than October 17, 2016.

Section **§257.82(c)(4)** states that the owner or operator must prepare periodic inflow design flood control system plans every five years.

Section **§257.82(c)(5)** requires a certification from a qualified professional engineer stating that the initial and periodic inflow design flood controls system plans meet the requirements of Rule **§257.82**.

According to Rule **§257.82(d)**, the owner or operator must comply with recordkeeping, notification, and internet requirements specified elsewhere in the Rule.

1.1 SITE LOCATION

TVA owns and operates the Gallatin Fossil Plant (GAF) facility. The plant is located at 1499 Steam Plant Road in Sumner County, Tennessee on the north bank of the Cumberland River, approximately four miles southeast of the center of the City of Gallatin.

The property occupies approximately 1,730 acres of land along the Cumberland River (Old Hickory Lake). Plant facilities are located on the south portion of the peninsula. The Ash Pond Complex is located north of the fossil plant facilities. The Ash Pond Complex is comprised of Ash Pond A, Middle Pond A, Bottom Ash Pond, and Ash Pond E. The Stilling Ponds B, C, and D are part of the GAF's stormwater conveyance system and wastewater treatment. Refer to Figure 1: Site Location Map.

Figure 1: Site Location Map

1.2 SITE HISTORY

Middle Pond A is located to the east of Ash Pond E, to the south of Ash Pond A, to the west of railroad tracks, and to the north of Bottom Ash Pond. Middle Pond A is hydraulically connected to Bottom Ash Pond and Ash Pond A via sluice ditch and attenuated stormwater flows. The sluice ditch alignment starts at the Bottom Ash Pond, then flows through Middle Pond A and discharges in Pond A. Under normal operating conditions the slice ditch receives continuous process flow.

2. EXISTING CONDITIONS - § 257.82(a)(1)

Based on the 2015 aerial survey, Middle Pond A covers an area of approximately 32 acres. The haul road splits Middle Pond A into two separate drainage areas. The smaller triangular area is located in the southeast corner and covers an area of approximately 2 acres, while the main impoundment area covers approximately 30 acres. Middle Pond A receives offsite drainage from Bottom Ash Pond that covers an area of approximately 25 acres. As shown on Figure 2, offsite drainage from Bottom Ash Pond (Sub-Basin 1) drains via a sluice ditch and then triple culverts into Middle Pond A (Sub-Basin 4). The eastern section of Bottom Ash Pond (Sub-Basin 2) drains via two culverts to the southeast corner of Middle Pond A (Sub-Basin 3) and then drains via a single culvert to the main section of Middle Pond A (Sub-Basin 4). All culvert structures are listed in more detail in Section 3 – Methodology/Design Criteria.

Figure 2: Drainage Area Map

The downstream end of Middle Pond A has two identical 48-inch diameter CMP culverts and a single 48-inch diameter HDPE culvert. The CMP culverts have inlet inverts at 468.3 feet (all elevations refer to NAVD88, vertical datum) while the HDPE culvert is located higher with an inlet invert elevation of 471.4 feet. The CMP culvers have outlet invert at 467.4 feet and 467.5 feet while HDPE culvert outlet is at 470.7 feet. All three (3) culverts discharge into Ash Pond A that has a normal water surface elevation of 463.0 feet. The smaller triangular section of Middle Pond A has a single 48-inch diameter RCP culvert. The inlet invert of the RCP culvert is set at elevation 477.8 feet with outlet invert at 475.4 feet.

3. Methodology/Design Criteria

The purpose of the analysis was to examine the adequacy of Middle Pond A to safely store and pass stormwater flows resulting from the IDF. Based on Hazard Potential Classification Assessment (Reference 3), Middle Pond A is considered a low hazard potential CCR surface impoundment. Therefore the 100-year, 24-hr flood is selected for the IDF.

The 24-hour, 100-year precipitation depth was obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 2, Version 3. Table 1 summarizes the storm events and temporal distribution used for the analysis.

Table 1: IDF Characteristics

Reoccurrence Interval	Storm Duration	Rainfall	Storm Distribution
100 year	24 hours	7.36 inches	SCS Type II

An H&H computer model (SWMM, version 5.1) was developed to examine the hydraulic behavior of Middle Pond A during the IDF. SWMM model with Dynamic Wave routing option was selected for modeling to include dynamic tailwater calculations between Ash Pond A, Middle Pond A, and Bottom Ash Pond. The model inputs included (1) a stage-storage relationship for Middle Pond A, (2) offsite drainage area culverts and outlet structure data, (3) watershed characteristics, (4) inflow hydrographs, (5) tailwater condition, and (6) base flow conditions. These hydrologic inputs are described as follows:

(1) Stage-storage curves used in SWMM are included in Appendix B1. Pond storage capacity was developed based upon:

- Lidar, aerial mapping performed by Tuck Mapping Solutions, Inc. dated July, 2015;
- Bathymetric survey and plans and reports provided by TVA field data dated collected by TVA surveying personnel dated 2016; and
- Observations made during site visits by AECOM personnel.

(2) As-built survey, as well as field observations, were used to gather information on the existing culverts and outlet structures and are summarized in Table 2.

Table 2: Culvert Structure Data

HMS Node	Type	Description
Sub-basin 1	Culvert	3 x 48" RCP
Sub-basin 2	Culvert	48" CMP & 36" RCP
Sub-basin 3	Culvert	48" RCP
Sub-basin 4	Culvert	2x48" CMP and 48" HDPE (44.5" ID)

(3) Runoff characteristics for the drainage areas are listed in Table 3 below.

Table 3: Middle Pond A Watershed Characteristics for HMS

Description	HMS node	Area (acres)	Curve Number (CN)	Lag Time (min)
Bottom Ash Pond (western side)	Sub-basin 1	4	90	12
Bottom Ash Pond (eastern side)	Sub-basin 2	21	80	12
Middle Pond A (southeast corner)	Sub-basin 3	2	90	3
Middle Pond A (main portion)	Sub-basin 4	30	90	11

(4) The inflow hydrographs were developed using HEC-HMS (Version 4.1) program. The HEC-HMS model was developed for the IDF analysis of the Ash Pond A (Reference 6). The 100-year, 24-hr storm inflow hydrographs developed with the HEC-HMS model were used in the SWMM model. The HEC-HMS model generated inflow hydrographs for all four drainage areas are presented in Appendix B2.

(5) The tailwater condition was also calculated using HEC-HMS Ash Pond A model (Reference 6). The peak tailwater elevation for the IDF is shown in Table 4.

Table 4: Tailwater Elevation for Middle Pond A Outlet

Storm Event	Temporal Distribution	Tailwater Elevation (TW)	Tailwater Depth (TW-467.4)
100 yr, 24 hr	Type II	467.5'	0.1'

(6) Total base process flows entering Bottom Ash Pond from the coal yard runoff ditch and the bottom ash sluice stream were estimated to be 30.21 cfs based on the NPDES permit schematic provided in Appendix B3. The coal yard runoff ditch process flows may also be diverted away from Bottom Ash Pond and discharged instead to Pond E. However, this analysis assumes that these wastewater flows enter Bottom Ash Pond in order to model the most conservative flow scenario.

4. Calculation Results - §257.82(a)(2)

The hydrologic modeling results were reviewed to determine the performance of Middle Pond A during the 100-year, 24-hour storm. Since Middle Pond A has two separate diked areas, the southeast corner and the main area, two sets of results are presented. For the southeast corner of the pond, the single outlet culvert passes the design storm flows with the maximum water surface elevation being 479.0 feet, approximately 1.5-feet below the top of divider dike separating Middle Pond A from the Rail Loop Area. For the main portion of Middle Pond A, the three (3) outlet culverts pass the design storm flow with the maximum water surface elevation at 473.0 feet, approximately 1.0-feet below the top of divider dike separating Middle Pond A from Ash Pond A and Rail Loop Area. The model schematic layout and output results are included in Appendix A.

Table 5: Estimated Peak Inflow and Peak Pool Elevation

Pond Area	Peak Inflow (cfs)	Max. Pool Elevation (NAV83, ft)	Top of Divider Dike (NAV83, ft)	Freeboard to Top of Divider Dike (ft)
Sub-Basin 3 (SE Corner)	50	479.0	480.5	1.5
Sub-Basin 4 (Main Pond)	289	473.0	474.0	1.0

5. Conclusions

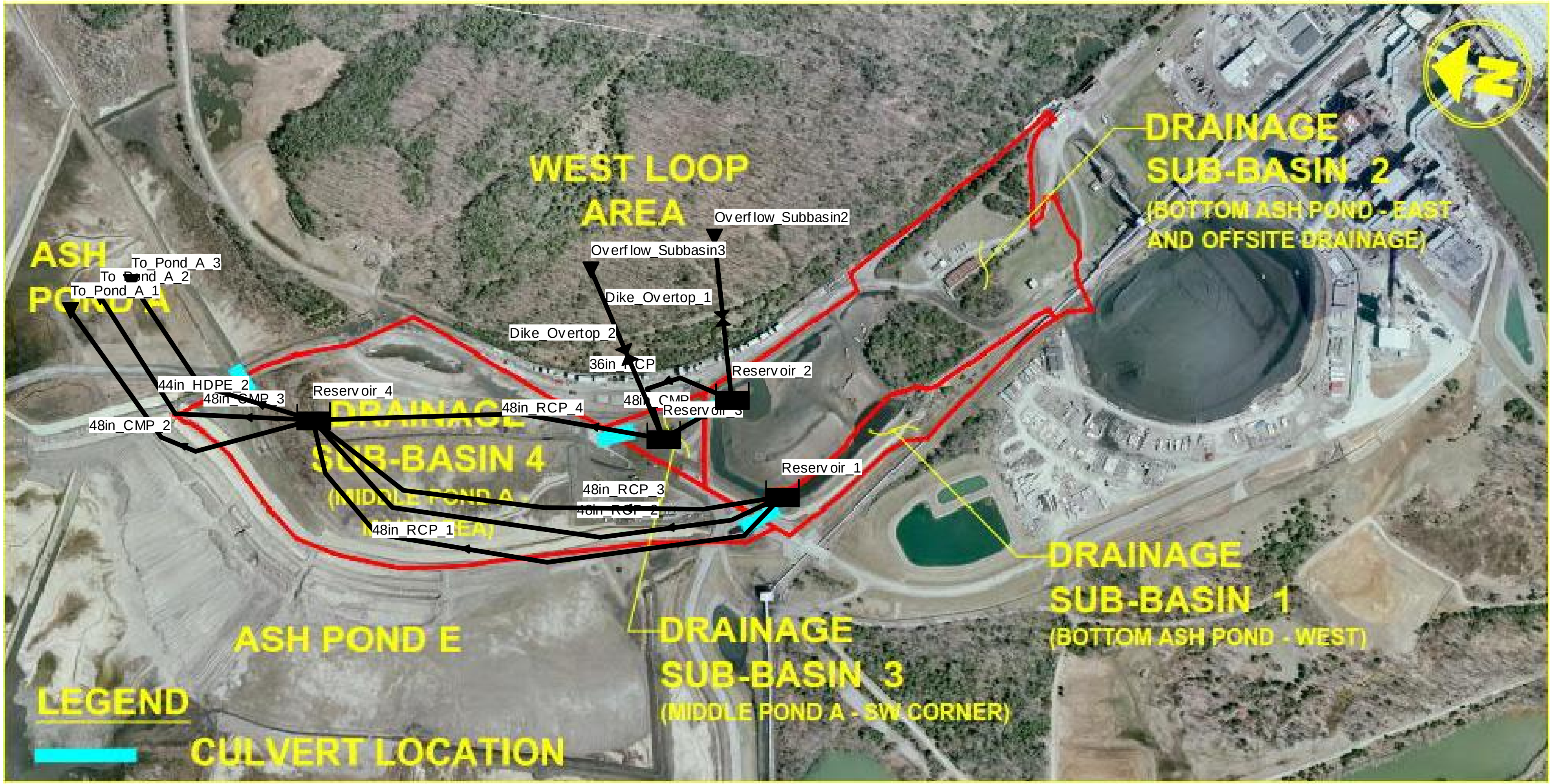
The inflow design flood control system adequately manages flow into the CCR unit during and following the peak discharge of the inflow design flood. Discharge is handled in accordance with the surface water requirements under § 257.82.

6. References

1. Environmental Protection Agency, “Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities”, Federal Register, April 17, 2015.
2. Bonnin G. M. et all, NOAA Atlas 14, Precipitation Frequency Atlas of the United States, Volume 2, Version 3, 2006.
3. Stantec Consulting Services Inc., “Hazard Potential Classification Assessment, Middle Pond A, Gallatin Fossil Plant, Sumner County, Tennessee”, October 5, 2015.
4. United States Army Corps of Engineers, Hydrologic Modeling System (HEC-HMS), Version 4.1, July 31, 2015.
5. U.S. Environmental Protection Agency, Storm Water Management Model (SWMM), Version 5.1, September 30, 2015.
6. AECOM Inc., HEC-HMS Version 4.1 electronic files, “Engineer’s Certificate of Inflow Design Flood Control Plan for Ash Pond A”, September 23, 2016.
7. OHM Advisors Inc., As-Built Drawings, ”Ash Haul Road A, 57 Stone Subgrade, TVA Project ID 604756”, September 18, 2015.
8. Tennessee Valley Authority, Gallatin Fossil Plant Flow Schematic Diagram, NPDES Permit No. TN0005428, May 2009 and updated June 2016.

APPENDIX A

SWMM OUTPUT RESULTS


WEST LOOP
AREA
DRAINAGE
SUB-BASIN 2
(BOTTOM ASH POND - EAST
AND OFFSITE DRAINAGE)
ASH
POND A
DRAINAGE
SUB-BASIN 4
DRAINAGE
SUB-BASIN 1
(BOTTOM ASH POND - WEST)
ASH POND E
DRAINAGE
SUB-BASIN 3
(MIDDLE POND A - SW CORNER)
LEGEND
CULVERT LOCATION
Overflow_Subbasin2
Overflow_Subbasin3
Dike_Overtop_1
Dike_Overtop_2
To_Pond_A_3
To_Pond_A_1
44in_HDPE_2
48in_CMP_2
Reservoir_4
Reservoir_2
Reservoir_1
48in_RCP_4
48in_RCP_3
48in_RCP_1

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Day of Maximum Depth	Hour of Maximum Depth	Maximum Reported Depth Feet
Overflow_Subbasin2	OUTFALL	0.00	0.00	479.00	0	00:00	0.00
Overflow_Subbasin3	OUTFALL	0.00	0.00	479.00	0	00:00	0.00
To_Pond_A_2	OUTFALL	1.60	2.58	470.14	0	12:15	2.58
To_Pond_A_3	OUTFALL	0.17	1.62	472.32	0	12:15	1.62
To_Pond_A_1	OUTFALL	1.60	2.61	470.04	0	12:15	2.61
Reservoir_3	STORAGE	0.43	1.18	478.97	0	12:21	1.18
Reservoir_2	STORAGE	1.14	2.35	480.35	0	12:19	2.35
Reservoir_4	STORAGE	2.29	4.79	473.05	0	12:15	4.79
Reservoir_1	STORAGE	0.77	0.97	479.47	0	12:08	0.97

MIDDLE POND A (SE) PEAK ELEVATION

MIDDLE POND A (MAIN POND) PEAK ELEVATION

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Day of Maximum Inflow	Hour of Maximum Inflow	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
Overflow_Subbasin2	OUTFALL	0.00	0.00	0	00:00	0	0	0.000
Overflow_Subbasin3	OUTFALL	0.00	0.00	0	00:00	0	0	0.000
To_Pond_A_2	OUTFALL	0.00	66.84	0	12:15	0	13.5	0.000
To_Pond_A_3	OUTFALL	0.00	62.33	0	12:15	0	0.833	0.000
To_Pond_A_1	OUTFALL	0.00	68.13	0	12:15	0	13.5	0.000
Reservoir_3	STORAGE	17.80	50.05	0	12:19	0.324	2.86	0.005
Reservoir_2	STORAGE	125.49	125.49	0	12:05	3.12	3.12	0.004
Reservoir_4	STORAGE	210.90	289.20	0	12:04	5.08	28	0.018
Reservoir_1	STORAGE	57.41	57.41	0	12:05	20.2	20.2	0.064

MIDDLE POND A (SE) PEAK INFLOW

MIDDLE POND A (MAIN POND) PEAK INFLOW

APPENDIX B

REFERENCES

APPENDIX B1:
STAGE/STORAGE DATA

Stage/Storage for Bottom Ash Pond - West

HEC-HMS Model Reservoir 1				
Elevation (msl)	Depth (ft)	Area (ac)	Average Volume (ac-ft)	Cumulative Storage (ac-ft)
478.5	0	0.00		0.00
			0.18	
479	0.5	0.72		0.18
			0.76	
480	1.5	0.80		0.94
			0.41	
480.5	2	0.83		1.35
		Total Volume=	1.35	ac-ft

Notes:
Information based on 2015 aerial survey.

Stage/Storage for Bottom Ash Pond - East

HEC-HMS Model Reservoir 2				
Elevation (msl)	Depth (ft)	Area (ac)	Average Volume (ac-ft)	Cumulative Storage (ac-ft)
478	0	1.21	0.00	0.00
479	1	1.51	1.36	1.36
480	2	1.87	1.69	3.04
481	3	3.48	2.67	5.72
482	4	6.63	5.05	10.77

Total Volume= 10.77 ac-ft

Notes:
Information based on 2015 aerial survey.

Stage/Storage for Middle Pond A - Southeast Corner

HEC-HMS Model Reservoir 3				
Elevation (msl)	Depth (ft)	Area (ac)	Average Volume (ac-ft)	Cumulative Storage (ac-ft)
477.79	0	0.06		0.00
			0.01	
478	0.21	0.07		0.01
			0.14	
479	1.21	0.21		0.16
			0.25	
480	2.21	0.29		0.40
			0.68	
481	3.21	1.07		1.08
			0.61	
481.5	3.71	1.38		1.70
		Total Volume=	1.70	ac-ft

Notes:
Information based on 2015 aerial survey.

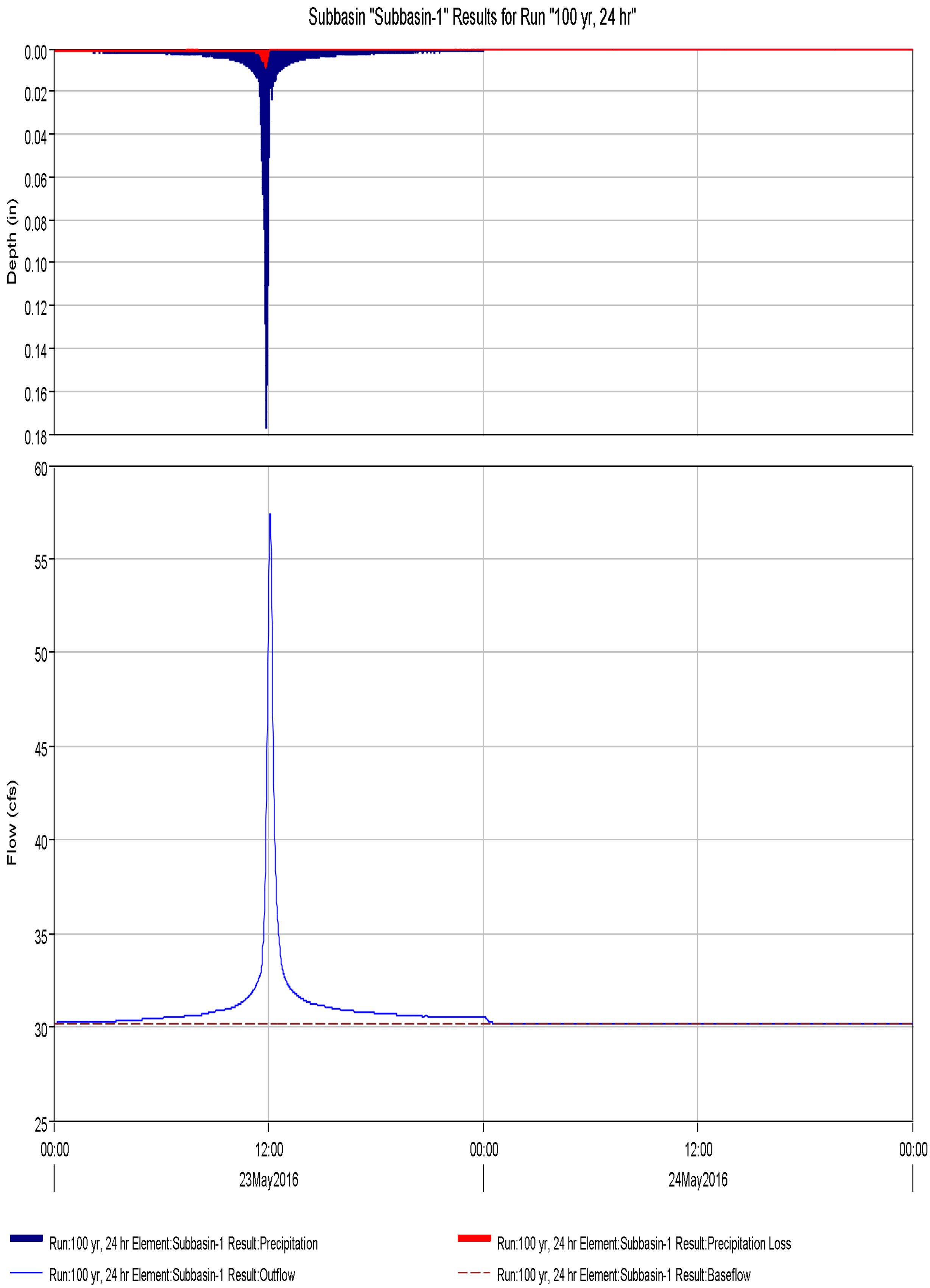
Stage/Storage for Middle Pond A

HEC-HMS Model Reservoir 4				
Elevation (msl)	Depth (ft)	Area (ac)	Average Volume (ac-ft)	Cumulative Storage (ac-ft)
468.21	0	0.00	0.08	0.00
469	0.79	0.20	0.52	0.08
470	1.79	0.85	1.04	0.60
471	2.79	1.23	1.39	1.64
472	3.79	1.56	1.64	3.03
473	4.79	1.73	1.97	4.67
474	5.79	2.22	2.54	6.64
475	6.79	2.86	3.53	9.18
476	7.79	4.21		12.72
		Total Volume=	12.72	ac-ft

Notes:
Information based on 2015 aerial survey.

APPENDIX B2:

HEC-HMS INFLOW HYDROGRAPHS



Subbasin "Subbasin-1" Results for Run "100 yr, 24 hr"
Depth (in)
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.18
Flow (cfs)
60
55
50
45
40
35
30
25
00:00
12:00
00:00
12:00
00:00
23May2016
24May2016
Run:100 yr, 24 hr Element:Subbasin-1 Result:Precipitation
Run:100 yr, 24 hr Element:Subbasin-1 Result:Precipitation Loss
Run:100 yr, 24 hr Element:Subbasin-1 Result:Outflow
Run:100 yr, 24 hr Element:Subbasin-1 Result:Baseflow

Project: Pond A   Simulation Run: 100 yr, 24 hr
Subbasin: Subbasin-1

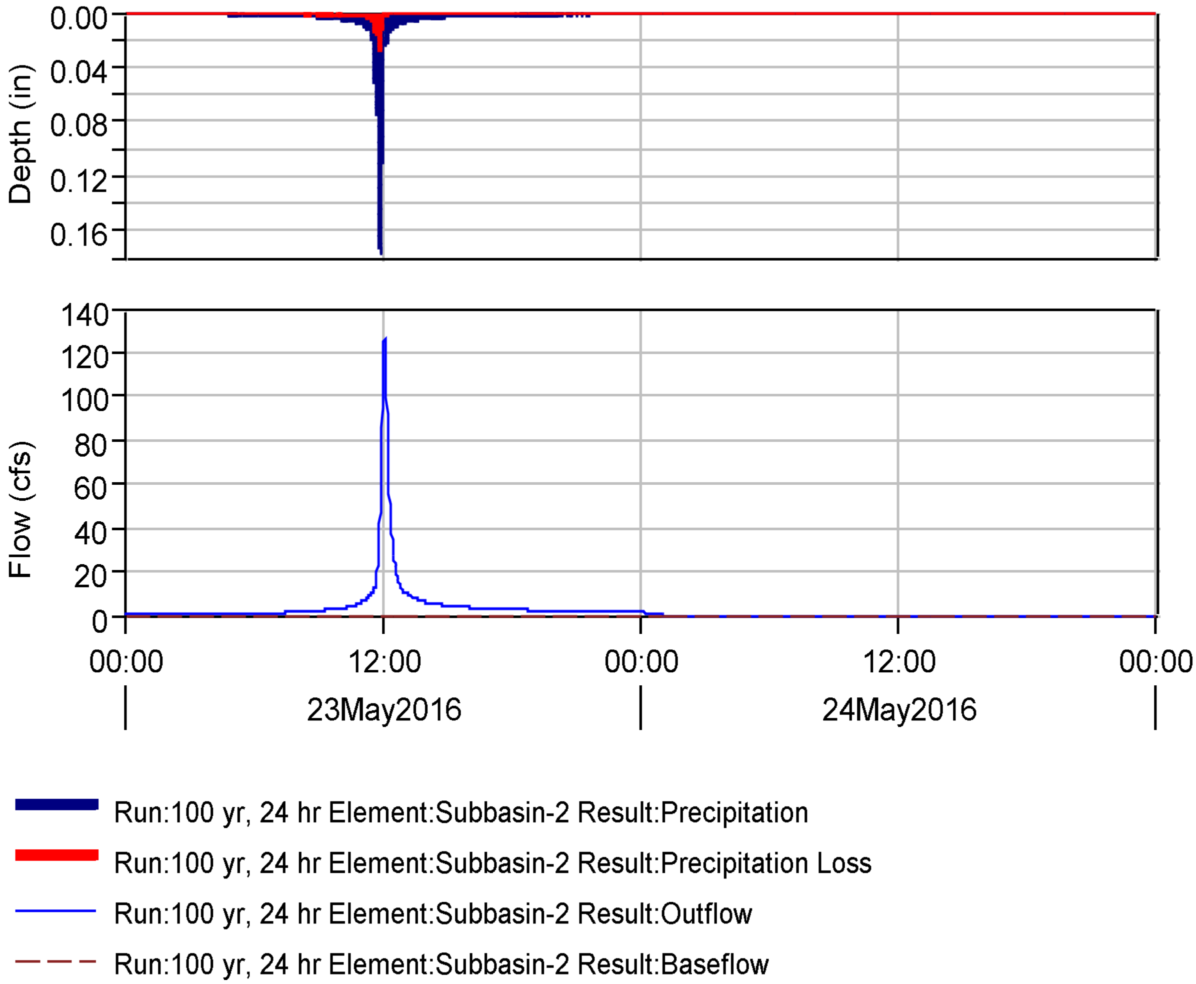
Start of Run:	23May2016, 00:00	Basin Model:	Pond A watershed
End of Run:	25May2016, 00:00	Meteorologic Model:	100 yr, 24 hr
Compute Time:	29Sep2016, 13:14:17	Control Specifications:	3-day

Volume Units: IN

Computed Results

Peak Discharge:	57.4 (CFS)	Date/Time of Peak Discharge:	23May2016, 12:05
Precipitation Volume:	7.36 (IN)	Direct Runoff Volume:	6.41 (IN)
Loss Volume:	0.95 (IN)	Baseflow Volume:	358.14 (IN)
Excess Volume:	6.41 (IN)	Discharge Volume:	364.56 (IN)

Subbasin "Subbasin-2" Results for Run "100 yr, 24 hr"



Project: Pond A   Simulation Run: 100 yr, 24 hr
Subbasin: Subbasin-2

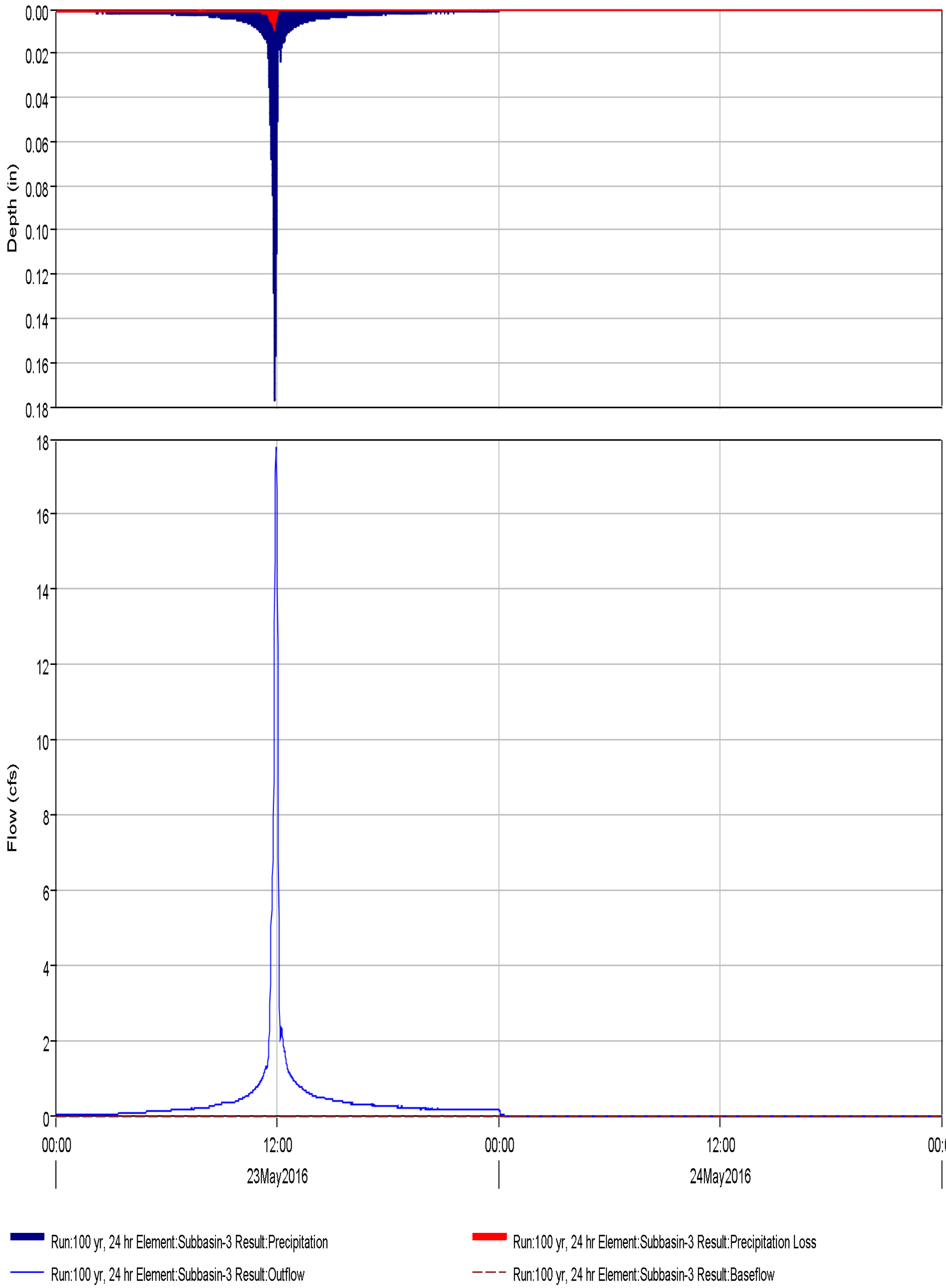
Start of Run:	23May2016, 00:00	Basin Model:	Pond A watershed
End of Run:	25May2016, 00:00	Meteorologic Model:	100 yr, 24 hr
Compute Time:	08Aug2016, 08:49:46	Control Specifications:	3-day

Volume Units: IN

Computed Results

Peak Discharge:	125.5 (CFS)	Date/Time of Peak Discharge	23May2016, 12:05
Precipitation Volume:	7.36 (IN)	Direct Runoff Volume:	5.47 (IN)
Loss Volume:	1.89 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	5.47 (IN)	Discharge Volume:	5.47 (IN)

Subbasin "Subbasin-3" Results for Run "100 yr, 24 hr"



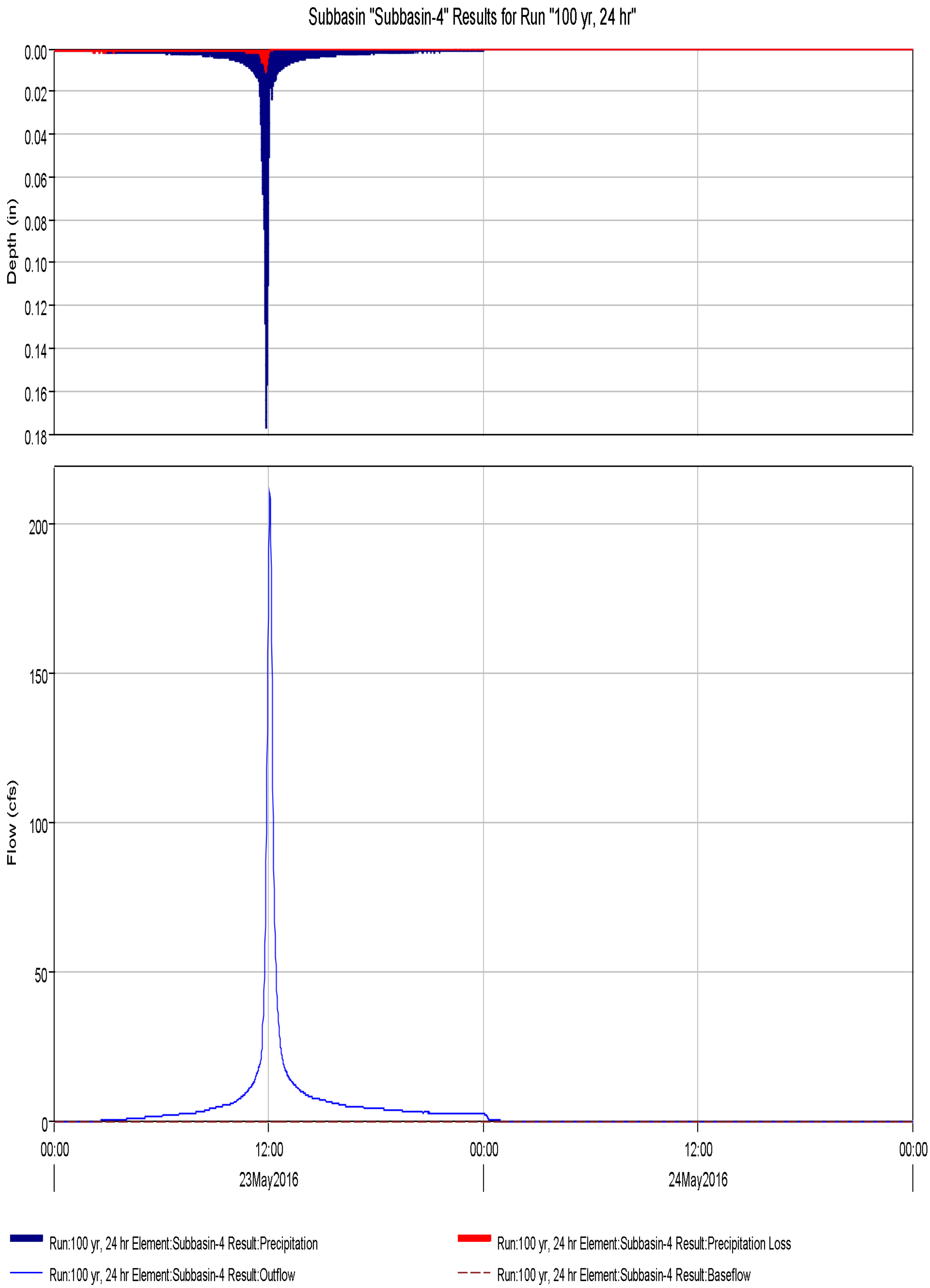
Project: Pond A Simulation Run: 100 yr, 24 hr
Subbasin: Subbasin-3

Start of Run:	23May2016, 00:00	Basin Model:	Pond A watershed
End of Run:	25May2016, 00:00	Meteorologic Model:	100 yr, 24 hr
Compute Time:	29Sep2016, 13:14:17	Control Specifications:	3-day

Volume Units: IN

Computed Results

Peak Discharge:	17.8 (CFS)	Date/Time of Peak Discharge:	23May2016, 11:56
Precipitation Volume:	7.36 (IN)	Direct Runoff Volume:	6.36 (IN)
Loss Volume:	1.00 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	6.36 (IN)	Discharge Volume:	6.36 (IN)



Subbasin "Subbasin-4" Results for Run "100 yr, 24 hr"
Depth (in)
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.18
Flow (cfs)
200
150
100
50
0
00:00
12:00
00:00
12:00
00:00
23May2016
24May2016
Run:100 yr, 24 hr Element:Subbasin-4 Result:Precipitation
Run:100 yr, 24 hr Element:Subbasin-4 Result:Precipitation Loss
Run:100 yr, 24 hr Element:Subbasin-4 Result:Outflow
Run:100 yr, 24 hr Element:Subbasin-4 Result:Baseflow

Project: Pond A Simulation Run: 100 yr, 24 hr
Subbasin: Subbasin-4

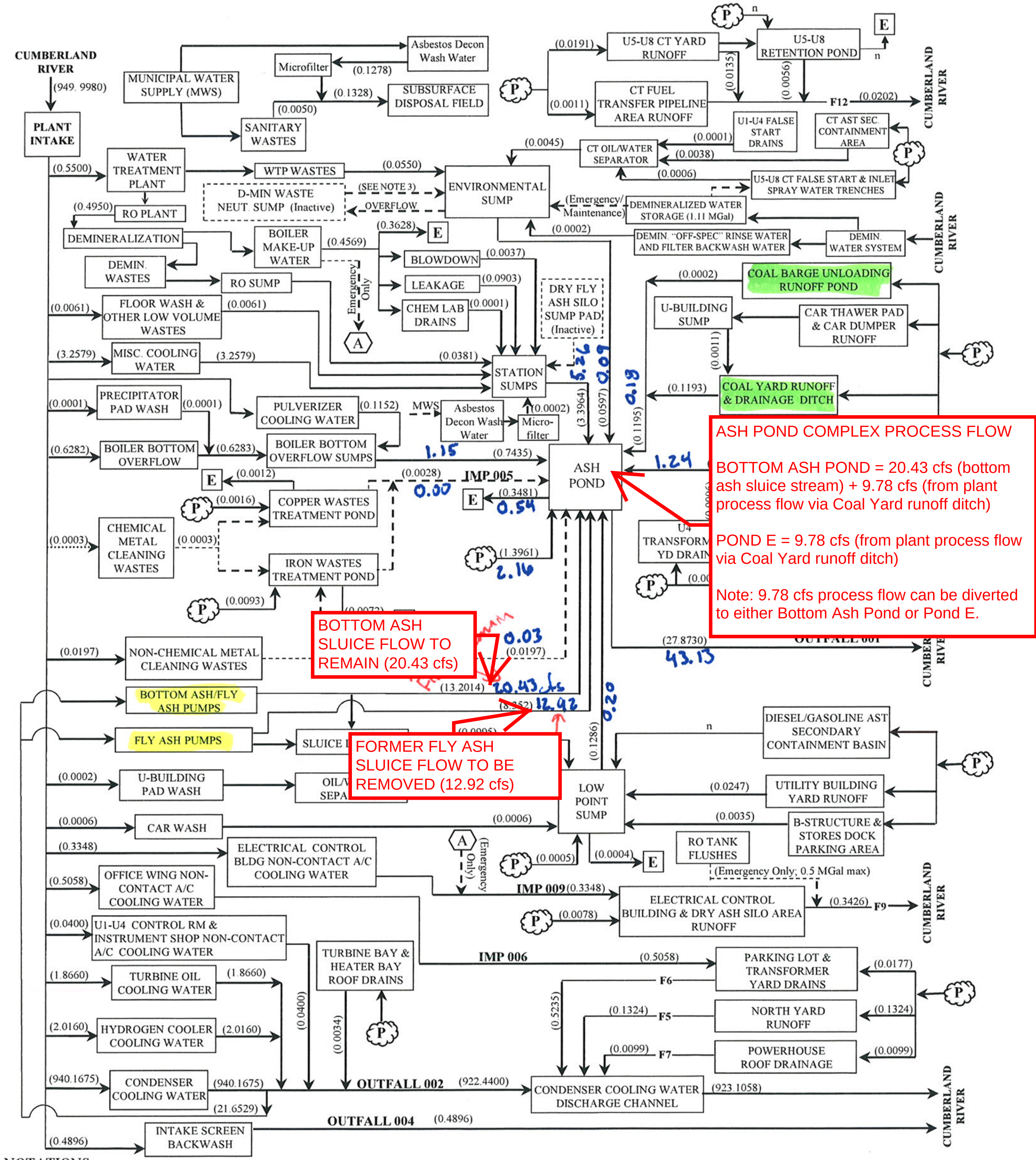
Start of Run:	23May2016, 00:00	Basin Model:	Pond A watershed
End of Run:	25May2016, 00:00	Meteorologic Model:	100 yr, 24 hr
Compute Time:	29Sep2016, 13:14:17	Control Specifications:	3-day

Volume Units: IN

Computed Results

Peak Discharge:	210.9 (CFS)	Date/Time of Peak Discharge	23May2016, 12:04
Precipitation Volume:	7.36 (IN)	Direct Runoff Volume:	6.18 (IN)
Loss Volume:	1.18 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	6.18 (IN)	Discharge Volume:	6.18 (IN)

APPENDIX B3:
GALLATIN FOSSIL PLANT WASTEWATER FLOW SCHEMATIC



NOTATIONS:

1. All flows are annualized & in millions of gallons per day (MGD)
2. The Demineralizer Waste Neutralization Sump has been removed from service. If necessary, accumulated rainwater will be pumped to the Environmental Sump.
3. GAF's 21 fire hydrants receive raw water and are flushed twice each year. Hydrant flushes discharge to F6, F7, F10-F12, the Powerhouse Extension (unwatering) Sump, the Low Point Sump, the Environmental Sump, and/or the Ash Pond.
4. - - ➤ Represents intermittent flows
5. Precipitation (P) Evaporation [E] Ground Water ◇G Municipal Water Supply – MWS n – negligible Internal Monitoring Point - IMP

GALLATIN FOSSIL PLANT
FLOW SCHEMATIC DIAGRAM
NPDES Permit No. TN0005428
May 2009

Process flow updated based on year 2016 conditions