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October 7, 2016

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

Initial Inflow Design Flood Control System Plan
Ash Pond E
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 Ash Pond E. Based on the assessment, the Ash Pond E 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 Ash Pond E has been assigned a significant hazard potential classification rating. Thus, the 1,000 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 Ash Pond E. 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	Ash Pond E	1,000 year	461.6	475.0

AECOM

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

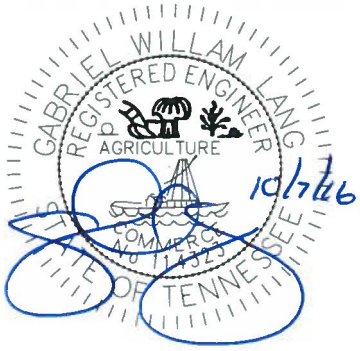
I, Gabriel W. Lang, PE, being a Professional Engineer in good standing in the State of Tennessee do hereby certify, to the best of my knowledge, information, and belief:

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 Ash Pond E meets the requirements specified in 40 CFR 257.82(a), (b), and (c)(1).

SIGNATURE _____ DATE ___10/7/2016___

ADDRESS: AECOM
1600 Perimeter Park Drive
Morrisville, NC 27560
TELEPHONE: (919) 461-1100

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



COAL COMBUSTION PRODUCT DISPOSAL PROGRAM

TENNESSEE VALLEY AUTHORITY – ASH POND E
GALLATIN FOSSIL PLANT
SUMNER COUNTY, TENNESSEE

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

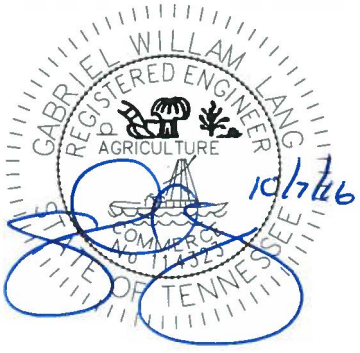
EXISTING SURFACE IMPOUNDMENTS

Prepared for

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

October 7, 2016 - Rev0

Prepared by



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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 in Gallatin, Tennessee. 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

Ash Pond E (Pond E), formerly identified as Fly Ash Pond E is located in the northwest corner of the GAF complex. Historically the pond received sluiced fly ash from the GAF Plant. Currently, Pond E receives storm water runoff from the Coal Yard, the Coal Yard Runoff Ditch, area around Coal Conveyor, area east of Chemical Pond, and non-ash process flow from the GAF Plant.

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

Based on the 2015 aerial survey, the Ash Pond E covers 142 acres. Two offsite drainage areas drain to Pond E. See Figure 2 for layout. First offsite drainage area (labeled as Sub-Basin 1 on Figure 2) consists of the Coal Yard and the Coal Yard Runoff Ditch runoff ditch and covers 48 acres. This offsite drainage area, including the process flow, is conveyed to Pond E via a 42" diameter HDPE piping system. Second offsite drainage area (labeled as Sub-Basin 2) consists of area around the Coal Conveyor and covers 17 acres. This offsite drainage area is collected and pumped from the coal sump to Pond E. As shown on Figure 2, Pond E was broken down into four sub basins (Sub-basins 3, 4, 5, and 6) to reflect the drainage characteristics of the topography and land use.

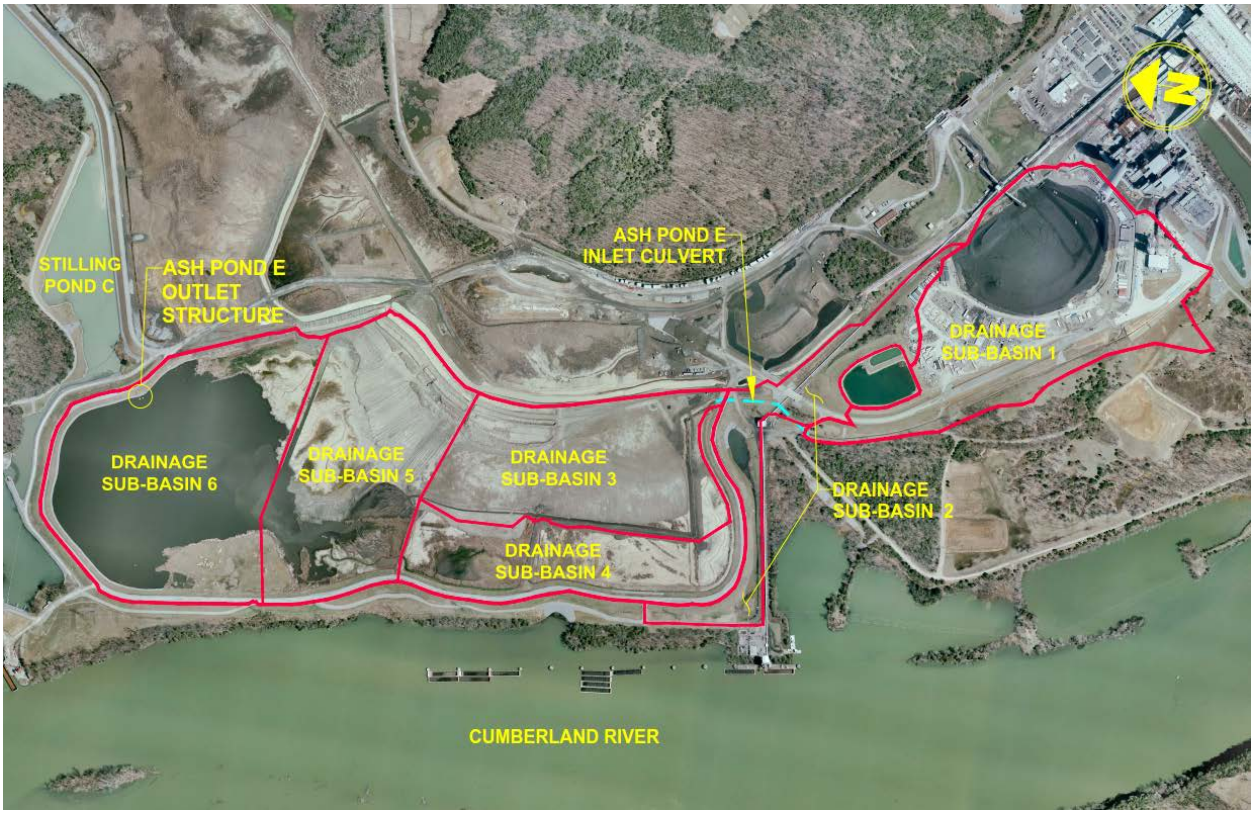

Figure 2: Drainage Area Map

Pond E impoundment has twin spillway outlet structures located in the northeast corner of the pond comprised of a 48-inch RCP riser set on top of 4-foot square concrete box. The primary spillway is a concrete box with a 24-inch wide and 12-inch tall opening set by a steel stop log plate. The openings are equipped with 60-inch diameter steel skimmers. The sharp-crested weirs created by the stop logs are set at elevation 456.50 ft. (all elevations refer to NAVD88, vertical datum). The top of the openings is at elevation 457.50 ft. The 48-inch RCP risers have a flat top with an open grate manhole cover set at elevation 464.16 ft. The flat top open grate serves as the emergency spillway. The twin spillways discharge through 30-inch diameter, smooth interior, steel pipes. The 30-inch pipes discharge to the Stilling Pond C and have same inlet and outlet inverts, elevation 455.00 ft. The normal water surface elevation of Stilling Pond C is 456.50 ft.

3. METHODOLOGY/DESIGN CRITERIA

The purpose of the analysis was to examine the adequacy of Pond E to safely store and pass stormwater flows resulting from the Inflow Design Flood (IDF). Based on Hazard Potential Classification Assessment (Reference 3), Pond E is considered a significant hazard unit. Therefore the 1000-year, 6-hr flood is selected for the IDF.

The 6-hour, 1000-year precipitation depth was obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 2, Version 3. In addition to the typical SCS Type II temporal distribution, “Early Peak” and “Late Peak” distributions were analyzed as first presented in the GAF Complex Breach Analysis (Reference 5). Table 1 summarizes the storm events and temporal distributions used for the analysis.

Table 1: IDF Characteristics

Reoccurrence Interval	Storm Duration	Rainfall	Storm Distribution
1,000 year	6 hours	7.11 inches	SCS Type II
1,000 year	6 hours	7.11 inches	Early Peak
1,000 year	6 hours	7.11 inches	Late Peak

An H&H computer model (HEC-HMS, version 4.1) was developed to examine the hydraulic behavior of Pond E during all three storm events. The model inputs included (1) a stage-storage relationship for Pond E, (2) watershed characteristics, (3) a stage-discharge curve for Pond E outlet structure, and (4) base flow conditions. These hydrologic inputs are described as follows:

(1) Stage-storage curves used in the HEC-HMS are included in Appendix B1. Pond E 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) Runoff characteristics for the drainage areas are listed in Table 2 below.

Table 2: Pond E Watershed Characteristics for HMS

Description	HMS node	Area (acres)	Curve Number (CN)	Lag Time (min)
Coal Pile	Sub-basin 1	48	90	14
Coal Conveyor	Sub-basin 2	17	90	30
Pond E, Southeast	Sub-basin 3	32	90	27
Pond E, Southwest	Sub-basin 4	24	90	30
Pond E, Middle	Sub-basin 5	36	90	18
Pond E, North	Sub-basin 6	49	90	18

(3) The stage-discharge curve for the Pond E outlet was developed using U.S. EPA SWMM (Version 5.1) program. A SWMM model included modeling twin structure's weir, grate, and 30-inch outlet pipes into Stilling Pond C. Since Pond E outlet discharges into Stilling Pond C, Dynamic Wave routing method was selected in order to accurately calculate backwater effect. The input parameters included tailwater conditions for all three modeled storm events as shown in Table 3. The tailwater conditions were calculated using the GAF HydroCAD model (Reference 7). The SWMM model layout and output results are presented in Appendix B2.

Table 3: Tailwater Elevation for Pond E Outlet

Storm Event	Temporal Distribution	Tailwater Elevation TW (NAV83, ft)	Tailwater Depth TW-455.0' (ft)
1000-yr, 6-hr	Type II	458.3	3.3
1000-yr, 6-hr	Early Peak	458.2	3.2
1000-yr, 6-hr	Late Peak	458.2	3.2

(4) The base process flows entering Pond E from the coal yard runoff ditch were estimated to be 9.78 cfs based on the NPDES permit schematic provided in Appendix B3. These process flows may also be diverted away from Pond E and discharged instead to Bottom Ash Pond. However, this analysis assumes that these wastewater flows enter Pond E in order to model the most conservative flow scenario for the unit.

4. CALCULATION RESULTS- §257.82(a)(2)

The hydrologic modeling results were reviewed to determine the performance of Pond E during the 1000-year, 6-hour storm. Table 4 contains the estimated peak inflow and estimated peak water surface elevations. The outlet structure safely passes the design storm flows with the maximum water surface elevation being 461.6 ft, approximately 2.6-feet below the emergency spillway grates at elevation 464.2 ft. The top of the divider dike separating Pond E from Pond A and the Stilling Ponds is at an elevation of approximately 475.0 ft, providing 13.4-feet of freeboard. The model output results are provided in Appendix A.

Table 4: Estimated Peak Inflow and Peak Pool Elevation

Storm Event	Peak Inflow (cfs)	Pool Elevation (msl)	Freeboard to Top of Divider Dike (ft)
1000-yr, 6-hr, Type II	929	461.6	13.4
1000-yr, 6-hr, Early Peak	978	461.5	13.5
1000-yr, 6-hr, Late Peak	863	460.0	15.0

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, Ash Pond E, 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. Stantec Consulting Services Inc., “Report of Breach Analysis, Ash Pond Complex, Gallatin Fossil Plant, Sumner County, Tennessee”, September 25, 2013.
6. U.S. Environmental Protection Agency, Storm Water Management Model (SWMM), Version 5.1, September 30, 2015.
7. AECOM Inc., HydroCAD Version 10 electronic files, “100% Design of Ash Pond Lowering and Flow Diversion Project”, January 21, 2016.
8. AECOM Inc., Construction Drawings, “Ash Pond Lowering and Flow Diversion, Spillway Modification Details”, Drawing No. 10WB10-9, June 13, 2016.
9. Tennessee Valley Authority, Gallatin Fossil Plant Flow Schematic Diagram, NPDES Permit No. TN0005428, May 2009 and updated June 2016.

APPENDIX A

HEC-HMS OUTPUT RESULTS

HEC-HMS

Project : POND E

Basin Model : Pond E Watershed

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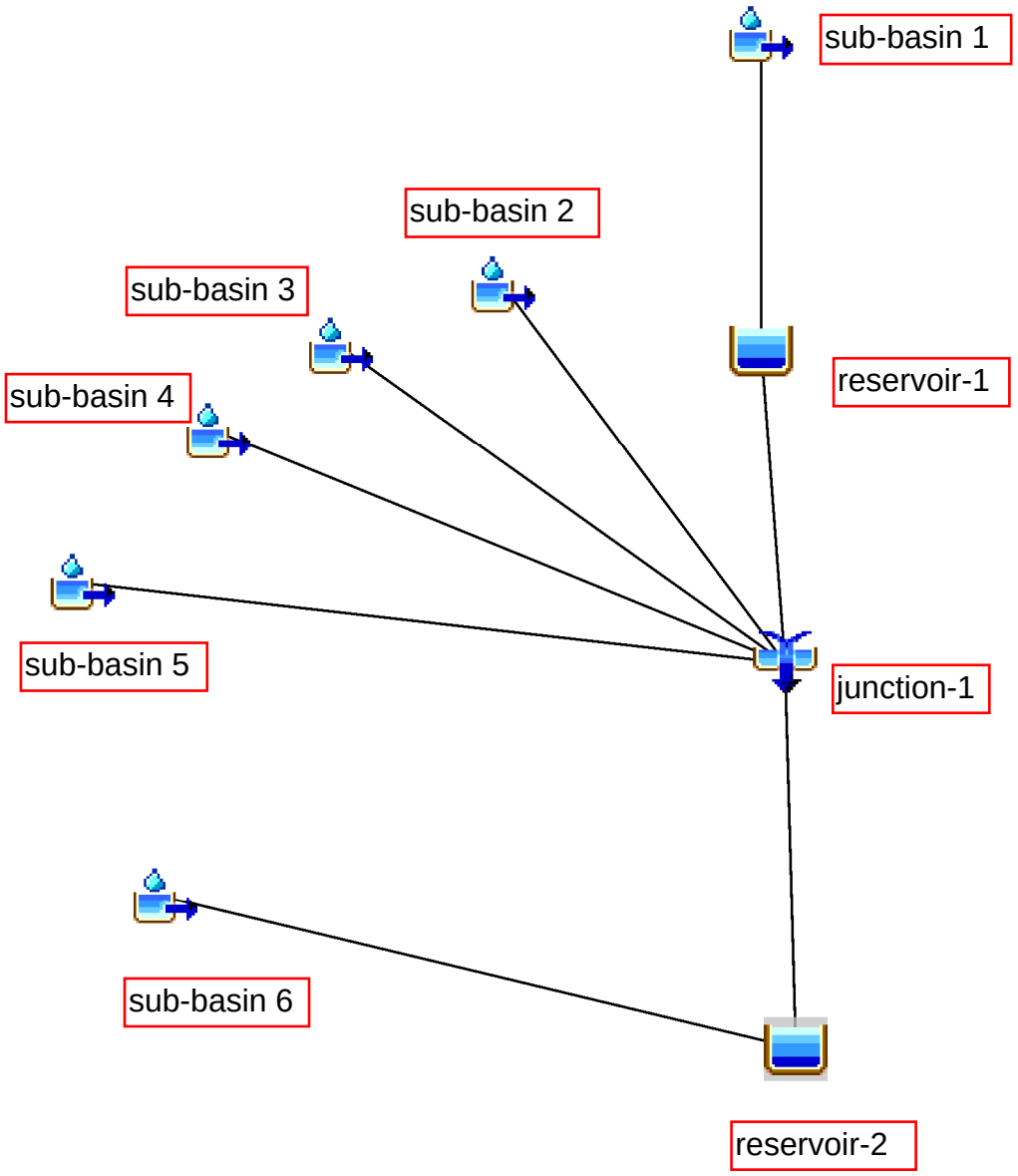


Project: POND E Simulation Run: 1000 yr 6 hr - Type II

Start of Run: 23May2016, 00:00
End of Run: 23May2016, 06:00
Compute Time: 21Sep2016, 23:23:43

Basin Model: Pond E Watershed
Meteorologic Model: 1000 yr 6 hr - Type
Control Specifications: 6 hr

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Sub-basin 1	0.075	270.5	23May2016, 02:37	28.0
Reservoir-1	0.075	261.6	23May2016, 02:40	27.9
Sub-basin 3	0.050	126.0	23May2016, 02:50	15.0
Sub-basin 4	0.038	90.2	23May2016, 02:53	11.4
Sub-basin 5	0.057	178.3	23May2016, 02:41	17.4
Sub-basin 2	0.027	64.3	23May2016, 02:53	8.1
Junction-1	0.247	678.2	23May2016, 02:42	79.9
Sub-basin 6	0.077	252.6	23May2016, 02:40	25.9
Reservoir-2	0.324	34.7	23May2016, 06:00	11.3

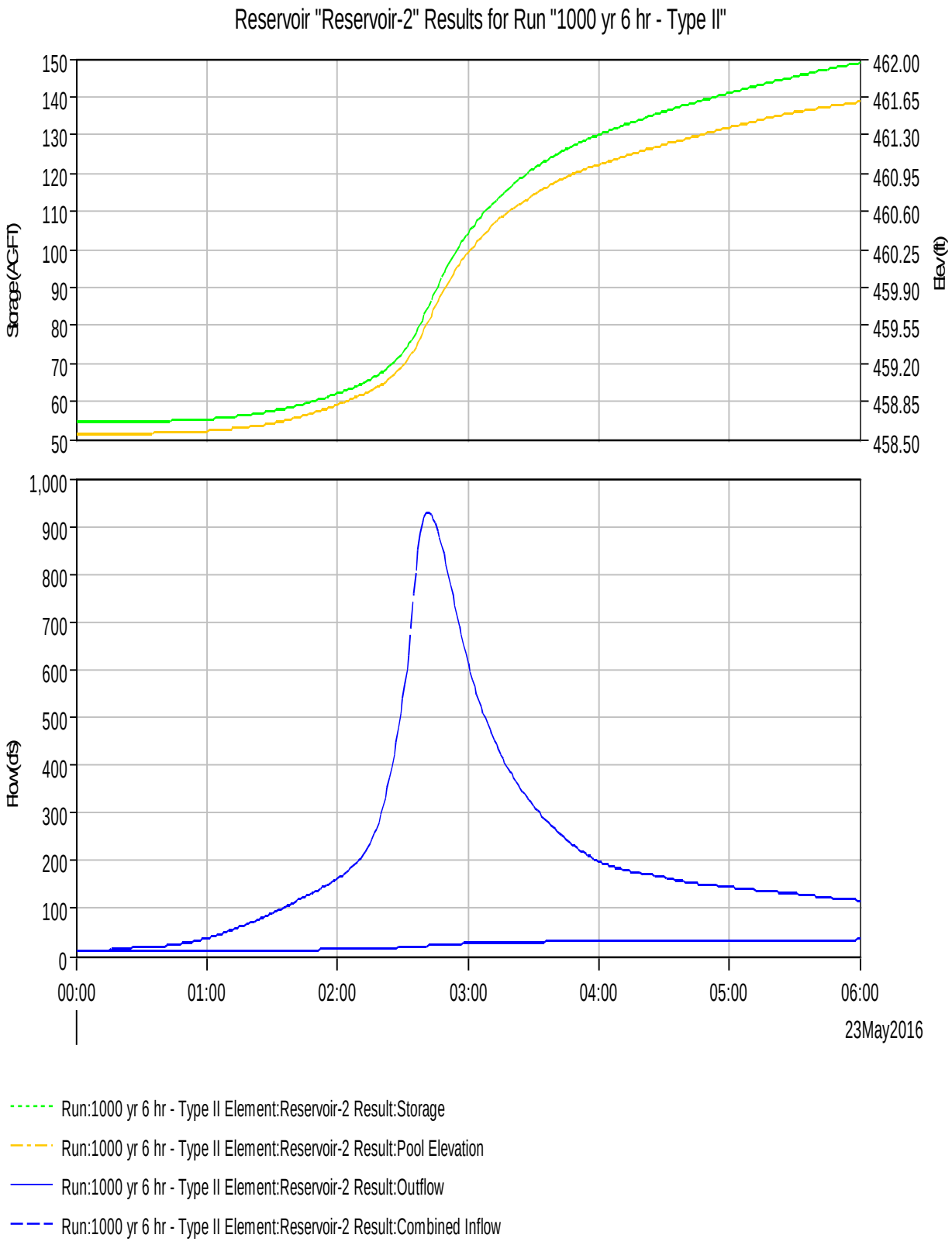
Project: POND E Simulation Run: 1000 yr 6 hr - Type II
Reservoir: Reservoir-2

Start of Run:	23May2016, 00:00	Basin Model:	Pond E Watershed
End of Run:	23May2016, 06:00	Meteorologic Model:	1000 yr 6 hr - Type II
Compute Time:	21Sep2016, 23:24:25	Control Specifications:	6 hr

Volume Units: AC-FT

Computed Results

Peak Inflow:	928.9 (CFS)	Date/Time of Peak Inflow:	23May2016, 02:42
Peak Discharge:	34.7 (CFS)	Date/Time of Peak Discharge	23May2016, 06:00
Inflow Volume:	105.8 (AC-FT)	Peak Storage:	149.0 (AC-FT)
Discharge Volume	11.3 (AC-FT)	Peak Elevation:	461.6 (FT)


Reservoir "Reservoir-2" Results for Run "1000 yr 6 hr - Type II"
Storage(ACFT)
Elev(ft)
Flow(cfs)
150
140
130
120
110
100
90
80
70
60
50
462.00
461.65
461.30
460.95
460.60
460.25
459.90
459.55
459.20
458.85
458.50
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900
800
700
600
500
400
300
200
100
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
23May2016
Run:1000 yr 6 hr - Type II Element:Reservoir-2 Result:Storage
Run:1000 yr 6 hr - Type II Element:Reservoir-2 Result:Pool Elevation
Run:1000 yr 6 hr - Type II Element:Reservoir-2 Result:Outflow
Run:1000 yr 6 hr - Type II Element:Reservoir-2 Result:Combined Inflow

Project: POND E Simulation Run: 1000 yr 6 hr - Early

Start of Run: 23May2016, 00:00
End of Run: 23May2016, 06:00
Compute Time: 21Sep2016, 23:26:35

Basin Model: Pond E Watershed
Meteorologic Model: 1000 yr 6 hr - Early
Control Specifications: 6 hr

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Sub-basin 1	0.075	284.7	23May2016, 00:27	28.2
Reservoir-1	0.075	273.5	23May2016, 00:31	28.1
Sub-basin 3	0.050	130.3	23May2016, 00:42	15.3
Sub-basin 4	0.038	92.5	23May2016, 00:46	11.6
Sub-basin 5	0.057	188.2	23May2016, 00:32	17.7
Sub-basin 2	0.027	66.6	23May2016, 00:46	8.3
Junction-1	0.247	691.2	23May2016, 00:34	81.1
Sub-basin 6	0.077	296.1	23May2016, 00:30	26.2
Reservoir-2	0.324	34.5	23May2016, 06:00	14.6

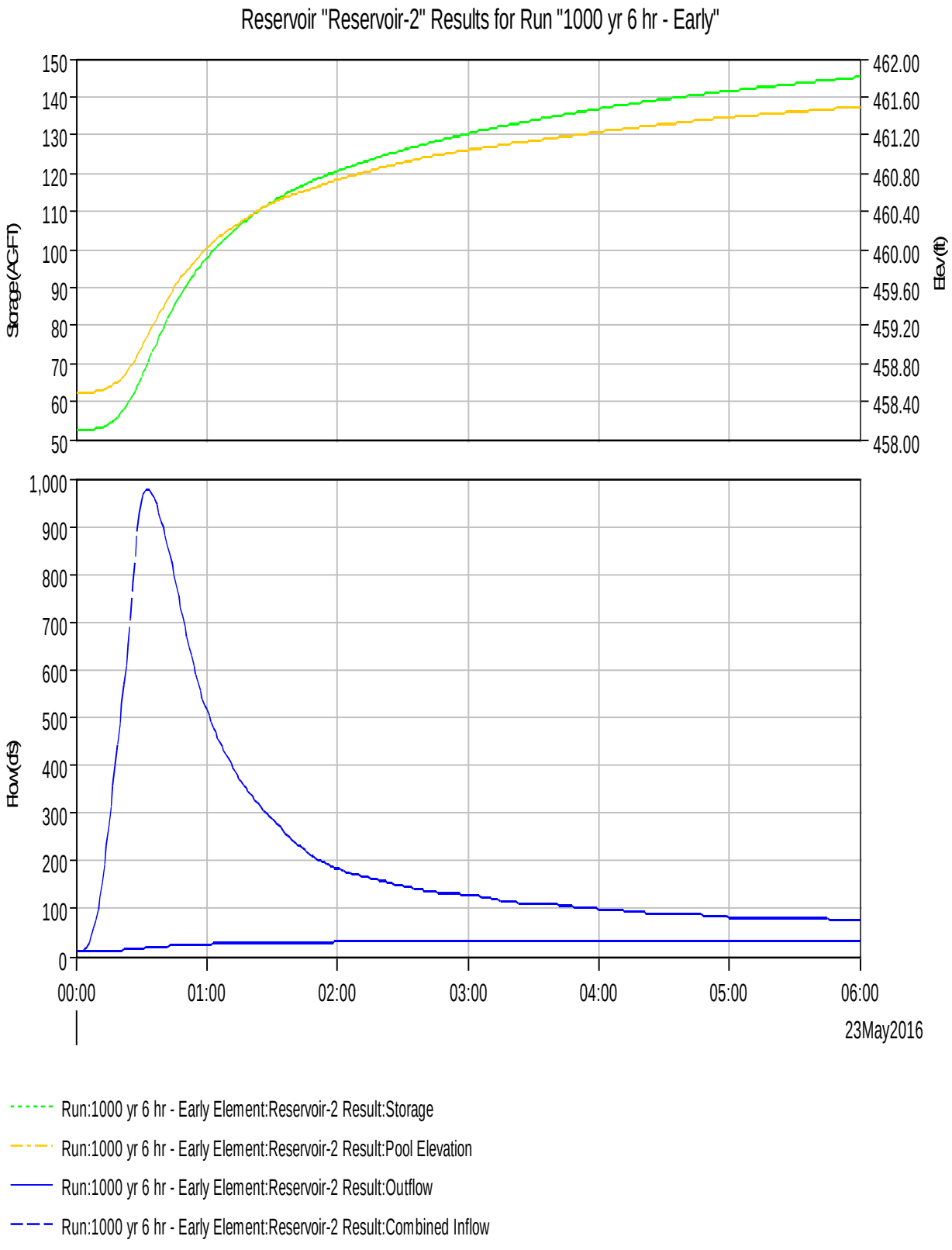
Project: POND E Simulation Run: 1000 yr 6 hr - Early
Reservoir: Reservoir-2

Start of Run:	23May2016, 00:00	Basin Model:	Pond E Watershed
End of Run:	23May2016, 06:00	Meteorologic Model:	1000 yr 6 hr - Early
Compute Time:	21Sep2016, 23:26:35	Control Specifications:	6 hr

Volume Units: AC-FT

Computed Results

Peak Inflow:	978.3 (CFS)	Date/Time of Peak Inflow:	23May2016, 00:33
Peak Discharge:	34.5 (CFS)	Date/Time of Peak Discharge	23May2016, 06:00
Inflow Volume:	107.3 (AC-FT)	Peak Storage:	145.2 (AC-FT)
Discharge Volume	14.6 (AC-FT)	Peak Elevation:	461.5 (FT)


Reservoir "Reservoir-2" Results for Run "1000 yr 6 hr - Early"
Storage(ACFT)
Elev(ft)
Flow(cfs)
150
140
130
120
110
100
90
80
70
60
50
462.00
461.60
461.20
460.80
460.40
460.00
459.60
459.20
458.80
458.40
458.00
1,000
900
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600
500
400
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0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
23May2016
Run:1000 yr 6 hr - Early Element:Reservoir-2 Result:Storage
Run:1000 yr 6 hr - Early Element:Reservoir-2 Result:Pool Elevation
Run:1000 yr 6 hr - Early Element:Reservoir-2 Result:Outflow
Run:1000 yr 6 hr - Early Element:Reservoir-2 Result:Combined Inflow

Project: POND E Simulation Run: 1000 yr 6 hr - Late

Start of Run: 23May2016, 00:00
End of Run: 23May2016, 06:00
Compute Time: 21Sep2016, 23:29:09

Basin Model: Pond E Watershed
Meteorologic Model: 1000 yr 6 hr - Late
Control Specifications: 6 hr

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Sub-basin 1	0.075	306.5	23May2016, 06:00	17.5
Reservoir-1	0.075	229.7	23May2016, 06:00	15.1
Sub-basin 3	0.050	96.0	23May2016, 06:00	6.2
Sub-basin 4	0.038	63.7	23May2016, 06:00	4.4
Sub-basin 5	0.057	179.8	23May2016, 06:00	8.6
Sub-basin 2	0.027	45.3	23May2016, 06:00	3.2
Junction-1	0.247	614.6	23May2016, 06:00	37.5
Sub-basin 6	0.077	248.9	23May2016, 06:00	13.8
Reservoir-2	0.324	25.2	23May2016, 06:00	7.0

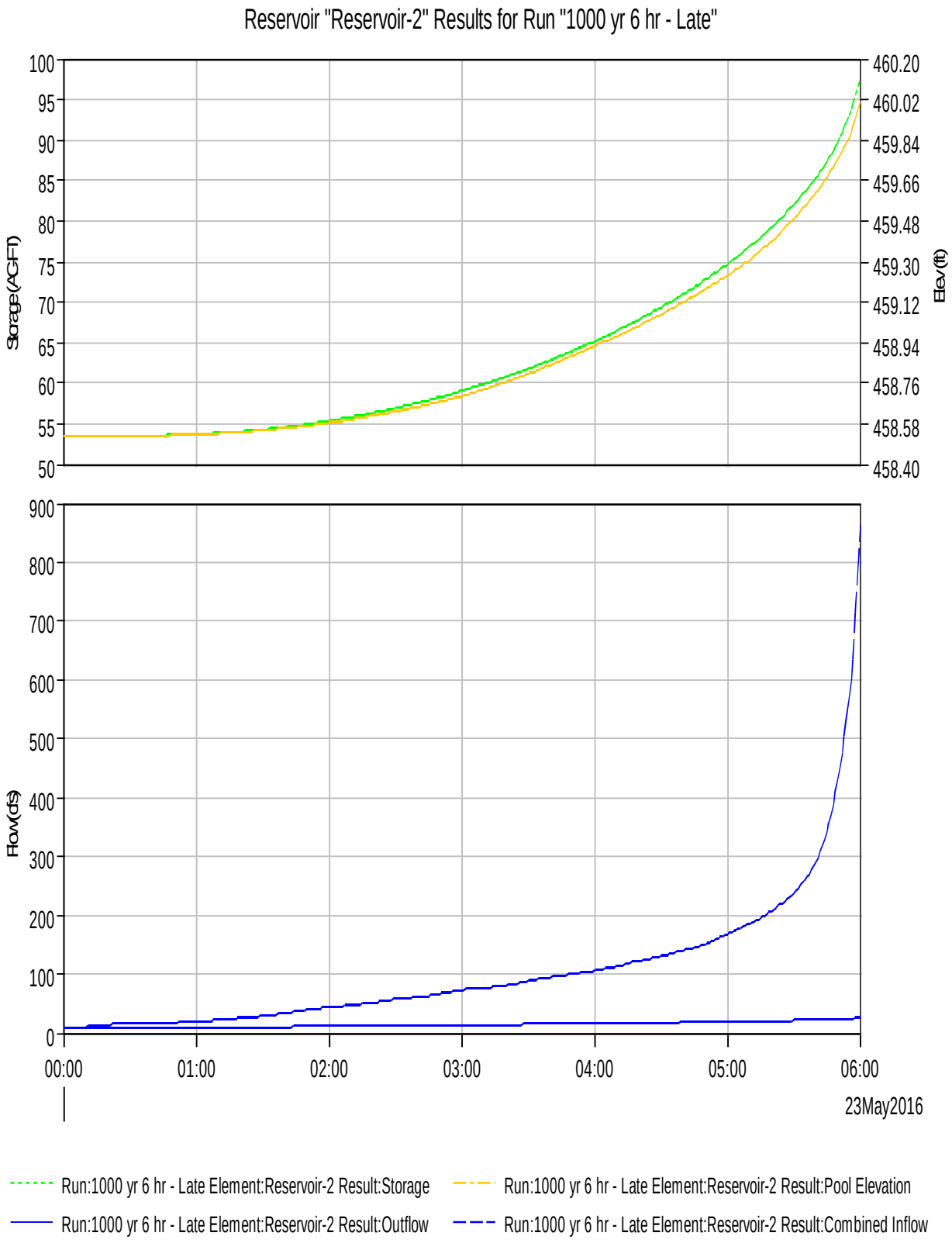
Project: POND E Simulation Run: 1000 yr 6 hr - Late
Reservoir: Reservoir-2

Start of Run:	23May2016, 00:00	Basin Model:	Pond E Watershed
End of Run:	23May2016, 06:00	Meteorologic Model:	1000 yr 6 hr - Late
Compute Time:	21Sep2016, 23:29:09	Control Specifications:	6 hr

Volume Units: AC-FT

Computed Results

Peak Inflow:	863.5 (CFS)	Date/Time of Peak Inflow:	23May2016, 06:00
Peak Discharge:	25.2 (CFS)	Date/Time of Peak Discharge	23May2016, 06:00
Inflow Volume:	51.3 (AC-FT)	Peak Storage:	97.6 (AC-FT)
Discharge Volume	7.0 (AC-FT)	Peak Elevation:	460.0 (FT)


Reservoir "Reservoir-2" Results for Run "1000 yr 6 hr - Late"
Storage(ACFT)
Elev(ft)
100
95
90
85
80
75
70
65
60
55
50
460.20
460.02
459.84
459.66
459.48
459.30
459.12
458.94
458.76
458.58
458.40
Flow(cfs)
900
800
700
600
500
400
300
200
100
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
23May2016
Run:1000 yr 6 hr - Late Element:Reservoir-2 Result:Storage
Run:1000 yr 6 hr - Late Element:Reservoir-2 Result:Pool Elevation
Run:1000 yr 6 hr - Late Element:Reservoir-2 Result:Outflow
Run:1000 yr 6 hr - Late Element:Reservoir-2 Result:Combined Inflow

APPENDIX B

REFERENCES

APPENDIX B1:
STAGE/STORAGE DATA

Stage/Storage/Discharge for Coal Pile Area based on Aerial Survey

Reservoir 1					
Elevation (msl)	Depth (ft)	Area (ac)	Average Volume (ac-ft)	Cumulative Storage (ac-ft)	Discharge (cfs)
477	0	0	0.01	0.00	0
478	1	0.0121	0.03	0.01	6
479	2	0.0432	0.07	0.03	22.5
480	3	0.1021	0.17	0.11	40
481	4	0.2295	0.29	0.27	63
482	5	0.3545	0.43	0.56	80
483	6	0.4994	0.59	0.99	93
484	7	0.675	0.37	1.58	104.67
484.5	7.5	0.7972	0.42	1.95	104.67
485	8	0.869	0.95	2.36	104.67
486	9	1.037		3.32	104.67
		Total Volume=	3.32	ac-ft	

Stage/Storage for Pond E based on Aerial and Bathymetric Survey

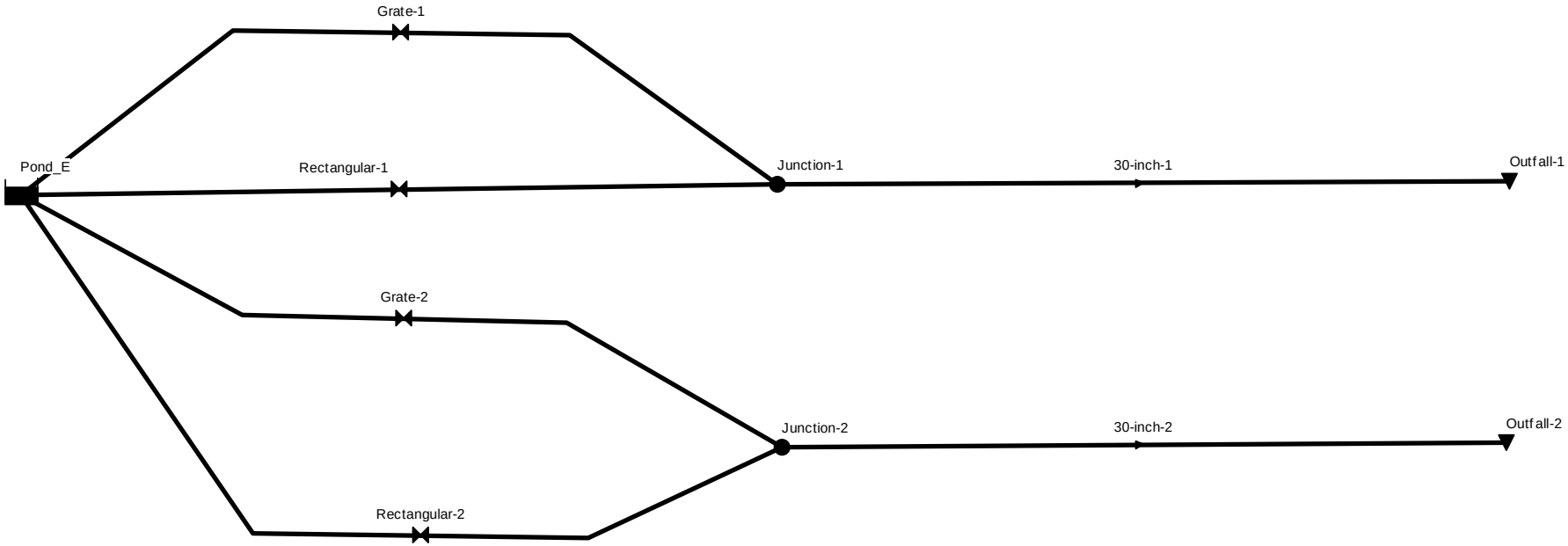
Reservoir 2				
Elevation* (msl)	Depth (ft)	Area (acres)	Average Volume (ac-ft)	Cumulative Volume (ac-ft)
456.5	0	23.94	0.00	0.00
457	0.5	25.63	12.39	12.39
458	1.5	27.72	26.68	39.07
459	2.5	29.24	28.48	67.55
460	3.5	30.55	29.89	97.45
461	4.5	32.70	31.62	129.07
462	5.5	33.34	33.02	162.10
463	6.5	36.54	34.94	197.04
464	7.5	58.48	47.51	244.54
465	8.5	62.69	60.58	305.13
		Total Volume=	305.13	ac-ft

*Starting Elevation = 456.5 (Pond E Normal Pool Elevation)

APPENDIX B2:
SWMM MODEL STORAGE/DISCHARGE RESULTS FOR POND E OUTLET STRUCTURE

Pond E Outlet

06/16/2016 02:15:00



SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Type II with Tailwater Elevation =458.26

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
0:05:00	456.76	278280.8	6	0:05:00	458.26	0	0:05:00	458.26	0	0.0
0:10:00	457.01	556573.8	13	0:10:00	458.26	0	0:10:00	458.26	0	0.0
0:15:00	457.26	834996.1	19	0:15:00	458.26	0	0:15:00	458.26	0	0.0
0:20:00	457.5	1113247	26	0:20:00	458.26	0	0:20:00	458.26	0	0.0
0:25:00	457.74	1391522	32	0:25:00	458.26	0	0:25:00	458.26	0	0.0
0:30:00	457.97	1669822	38	0:30:00	458.26	0	0:30:00	458.26	0	0.0
0:35:00	458.2	1948176	45	0:35:00	458.26	0	0:35:00	458.26	0	0.0
0:40:00	458.43	2225795	51	0:40:00	458.26	3.69	0:40:00	458.26	3.65	7.3
0:45:00	458.65	2501605	57	0:45:00	458.26	5.77	0:45:00	458.26	5.72	11.5
0:50:00	458.87	2776346	64	0:50:00	458.26	7.31	0:50:00	458.26	7.25	14.6
0:55:00	459.08	3050267	70	0:55:00	458.26	8.55	0:55:00	458.26	8.48	17.0
1:00:00	459.3	3323498	76	1:00:00	458.26	9.62	1:00:00	458.26	9.55	19.2
1:05:00	459.51	3596128	83	1:05:00	458.26	10.57	1:05:00	458.26	10.49	21.1
1:10:00	459.72	3868216	89	1:10:00	458.26	11.44	1:10:00	458.26	11.35	22.8
1:15:00	459.92	4139809	95	1:15:00	458.26	12.23	1:15:00	458.26	12.14	24.4
1:20:00	460.12	4410944	101	1:20:00	458.26	12.97	1:20:00	458.26	12.87	25.8
1:25:00	460.32	4681654	107	1:25:00	458.26	13.66	1:25:00	458.26	13.56	27.2
1:30:00	460.52	4951966	114	1:30:00	458.26	14.3	1:30:00	458.26	14.2	28.5
1:35:00	460.72	5221904	120	1:35:00	458.26	14.91	1:35:00	458.26	14.8	29.7
1:40:00	460.91	5491488	126	1:40:00	458.26	15.49	1:40:00	458.26	15.37	30.9
1:45:00	461.1	5760738	132	1:45:00	458.26	16.04	1:45:00	458.26	15.92	32.0
1:50:00	461.29	6029665	138	1:50:00	458.26	16.57	1:50:00	458.26	16.44	33.0
1:55:00	461.47	6298282	145	1:55:00	458.26	17.07	1:55:00	458.26	16.95	34.0
2:00:00	461.66	6566601	151	2:00:00	458.26	17.57	2:00:00	458.26	17.44	35.0
2:05:00	461.84	6834631	157	2:05:00	458.26	18.04	2:05:00	458.26	17.91	36.0
2:10:00	462.03	7102375	163	2:10:00	458.26	18.5	2:10:00	458.26	18.37	36.9
2:15:00	462.21	7369854	169	2:15:00	458.26	18.95	2:15:00	458.26	18.81	37.8
2:20:00	462.39	7637072	175	2:20:00	458.26	19.38	2:20:00	458.26	19.23	38.6
2:25:00	462.57	7904040	181	2:25:00	458.26	19.79	2:25:00	458.26	19.64	39.4
2:30:00	462.74	8170767	188	2:30:00	458.26	20.18	2:30:00	458.26	20.04	40.2
2:35:00	462.91	8437261	194	2:35:00	458.26	20.57	2:35:00	458.26	20.41	41.0
2:40:00	463.07	8703504	200	2:40:00	458.26	20.93	2:40:00	458.26	20.78	41.7
2:45:00	463.23	8969565	206	2:45:00	458.26	21.27	2:45:00	458.26	21.11	42.4
2:50:00	463.37	9235436	212	2:50:00	458.26	21.58	2:50:00	458.26	21.42	43.0
2:55:00	463.5	9501133	218	2:55:00	458.26	21.86	2:55:00	458.26	21.7	43.6
3:00:00	463.63	9766670	224	3:00:00	458.26	22.12	3:00:00	458.26	21.96	44.1
3:05:00	463.74	10032060	230	3:05:00	458.26	22.36	3:05:00	458.26	22.2	44.6
3:10:00	463.86	10297300	236	3:10:00	458.26	22.59	3:10:00	458.26	22.43	45.0
3:15:00	463.96	10562410	242	3:15:00	458.26	22.81	3:15:00	458.26	22.65	45.5
3:20:00	464.07	10827410	249	3:20:00	458.26	23.02	3:20:00	458.26	22.85	45.9
3:25:00	464.17	11092270	255	3:25:00	458.26	23.22	3:25:00	458.26	23.06	46.3
3:30:00	464.27	11356910	261	3:30:00	458.26	23.75	3:30:00	458.26	23.57	47.3
3:35:00	464.38	11621120	267	3:35:00	458.26	24.56	3:35:00	458.26	24.37	48.9
3:40:00	464.48	11884780	273	3:40:00	458.26	25.54	3:40:00	458.26	25.34	50.9
3:45:00	464.58	12147800	279	3:45:00	458.26	26.65	3:45:00	458.26	26.43	53.1
3:50:00	464.67	12410130	285	3:50:00	458.26	27.73	3:50:00	458.26	27.5	55.2
3:55:00	464.77	12672070	291	3:55:00	458.26	28.24	3:55:00	458.26	28	56.2
4:00:00	464.87	12933710	297	4:00:00	458.26	28.72	4:00:00	458.26	28.47	57.2
4:05:00	464.96	13195080	303	4:05:00	458.26	29.17	4:05:00	458.26	28.92	58.1
4:10:00	465	13291250	305	4:10:00	458.26	29.41	4:10:00	458.26	29.16	58.6
4:15:00	465	13291250	305	4:15:00	458.26	29.41	4:15:00	458.26	29.16	58.6
4:20:00	465	13291250	305	4:20:00	458.26	29.41	4:20:00	458.26	29.16	58.6
4:25:00	465	13291250	305	4:25:00	458.26	29.41	4:25:00	458.26	29.16	58.6
4:30:00	465	13291250	305	4:30:00	458.26	29.41	4:30:00	458.26	29.16	58.6
4:35:00	465	13291250	305	4:35:00	458.26	29.41	4:35:00	458.26	29.16	58.6

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Type II with Tailwater Elevation =458.26

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
4:40:00	465	13291250	305	4:40:00	458.26	29.41	4:40:00	458.26	29.16	58.6
4:45:00	465	13291250	305	4:45:00	458.26	29.41	4:45:00	458.26	29.16	58.6
4:50:00	465	13291250	305	4:50:00	458.26	29.41	4:50:00	458.26	29.16	58.6
4:55:00	465	13291250	305	4:55:00	458.26	29.41	4:55:00	458.26	29.16	58.6
5:00:00	465	13291250	305	5:00:00	458.26	29.41	5:00:00	458.26	29.16	58.6
5:05:00	465	13291250	305	5:05:00	458.26	29.41	5:05:00	458.26	29.16	58.6
5:10:00	465	13291250	305	5:10:00	458.26	29.41	5:10:00	458.26	29.16	58.6
5:15:00	465	13291250	305	5:15:00	458.26	29.41	5:15:00	458.26	29.16	58.6
5:20:00	465	13291250	305	5:20:00	458.26	29.41	5:20:00	458.26	29.16	58.6
5:25:00	465	13291250	305	5:25:00	458.26	29.41	5:25:00	458.26	29.16	58.6
5:30:00	465	13291250	305	5:30:00	458.26	29.41	5:30:00	458.26	29.16	58.6
5:35:00	465	13291250	305	5:35:00	458.26	29.41	5:35:00	458.26	29.16	58.6
5:40:00	465	13291250	305	5:40:00	458.26	29.41	5:40:00	458.26	29.16	58.6
5:45:00	465	13291250	305	5:45:00	458.26	29.41	5:45:00	458.26	29.16	58.6
5:50:00	465	13291250	305	5:50:00	458.26	29.41	5:50:00	458.26	29.16	58.6
5:55:00	465	1.33E+07	305	5:55:00	458.26	29.41	5:55:00	458.26	29.16	58.6
6:00:00	465	1.33E+07	305	6:00:00	458.26	29.41	6:00:00	458.26	29.16	58.6
6:05:00	465	1.33E+07	305	6:05:00	458.26	29.41	6:05:00	458.26	29.16	58.6
6:10:00	465	1.33E+07	305	6:10:00	458.26	29.41	6:10:00	458.26	29.16	58.6
6:15:00	465	1.33E+07	305	6:15:00	458.26	29.41	6:15:00	458.26	29.16	58.6
6:20:00	465	1.33E+07	305	6:20:00	458.26	29.41	6:20:00	458.26	29.16	58.6
6:25:00	465	1.33E+07	305	6:25:00	458.26	29.41	6:25:00	458.26	29.16	58.6
6:30:00	465	1.33E+07	305	6:30:00	458.26	29.41	6:30:00	458.26	29.16	58.6
6:35:00	465	1.33E+07	305	6:35:00	458.26	29.41	6:35:00	458.26	29.16	58.6
6:40:00	465	1.33E+07	305	6:40:00	458.26	29.41	6:40:00	458.26	29.16	58.6
6:45:00	465	1.33E+07	305	6:45:00	458.26	29.41	6:45:00	458.26	29.16	58.6
6:50:00	465	1.33E+07	305	6:50:00	458.26	29.41	6:50:00	458.26	29.16	58.6
6:55:00	465	1.33E+07	305	6:55:00	458.26	29.41	6:55:00	458.26	29.16	58.6
7:00:00	465	1.33E+07	305	7:00:00	458.26	29.41	7:00:00	458.26	29.16	58.6
7:05:00	465	1.33E+07	305	7:05:00	458.26	29.41	7:05:00	458.26	29.16	58.6
7:10:00	465	1.33E+07	305	7:10:00	458.26	29.41	7:10:00	458.26	29.16	58.6
7:15:00	465	1.33E+07	305	7:15:00	458.26	29.41	7:15:00	458.26	29.16	58.6
7:20:00	465	1.33E+07	305	7:20:00	458.26	29.41	7:20:00	458.26	29.16	58.6
7:25:00	465	1.33E+07	305	7:25:00	458.26	29.41	7:25:00	458.26	29.16	58.6
7:30:00	465	1.33E+07	305	7:30:00	458.26	29.41	7:30:00	458.26	29.16	58.6
7:35:00	465	1.33E+07	305	7:35:00	458.26	29.41	7:35:00	458.26	29.16	58.6
7:40:00	465	1.33E+07	305	7:40:00	458.26	29.41	7:40:00	458.26	29.16	58.6
7:45:00	465	1.33E+07	305	7:45:00	458.26	29.41	7:45:00	458.26	29.16	58.6
7:50:00	465	1.33E+07	305	7:50:00	458.26	29.41	7:50:00	458.26	29.16	58.6
7:55:00	465	1.33E+07	305	7:55:00	458.26	29.41	7:55:00	458.26	29.16	58.6
8:00:00	465	1.33E+07	305	8:00:00	458.26	29.41	8:00:00	458.26	29.16	58.6
8:05:00	465	1.33E+07	305	8:05:00	458.26	29.41	8:05:00	458.26	29.16	58.6
8:10:00	465	1.33E+07	305	8:10:00	458.26	29.41	8:10:00	458.26	29.16	58.6
8:15:00	465	1.33E+07	305	8:15:00	458.26	29.41	8:15:00	458.26	29.16	58.6
8:20:00	465	1.33E+07	305	8:20:00	458.26	29.41	8:20:00	458.26	29.16	58.6
8:25:00	465	1.33E+07	305	8:25:00	458.26	29.41	8:25:00	458.26	29.16	58.6
8:30:00	465	1.33E+07	305	8:30:00	458.26	29.41	8:30:00	458.26	29.16	58.6
8:35:00	465	1.33E+07	305	8:35:00	458.26	29.41	8:35:00	458.26	29.16	58.6
8:40:00	465	1.33E+07	305	8:40:00	458.26	29.41	8:40:00	458.26	29.16	58.6
8:45:00	465	1.33E+07	305	8:45:00	458.26	29.41	8:45:00	458.26	29.16	58.6
8:50:00	465	1.33E+07	305	8:50:00	458.26	29.41	8:50:00	458.26	29.16	58.6
8:55:00	465	1.33E+07	305	8:55:00	458.26	29.41	8:55:00	458.26	29.16	58.6
9:00:00	465	1.33E+07	305	9:00:00	458.26	29.41	9:00:00	458.26	29.16	58.6
9:05:00	465	1.33E+07	305	9:05:00	458.26	29.41	9:05:00	458.26	29.16	58.6
9:10:00	465	1.33E+07	305	9:10:00	458.26	29.41	9:10:00	458.26	29.16	58.6

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Type II with Tailwater Elevation =458.26

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
9:15:00	465	1.33E+07	305	9:15:00	458.26	29.41	9:15:00	458.26	29.16	58.6
9:20:00	465	1.33E+07	305	9:20:00	458.26	29.41	9:20:00	458.26	29.16	58.6
9:25:00	465	1.33E+07	305	9:25:00	458.26	29.41	9:25:00	458.26	29.16	58.6
9:30:00	465	1.33E+07	305	9:30:00	458.26	29.41	9:30:00	458.26	29.16	58.6
9:35:00	465	1.33E+07	305	9:35:00	458.26	29.41	9:35:00	458.26	29.16	58.6
9:40:00	465	1.33E+07	305	9:40:00	458.26	29.41	9:40:00	458.26	29.16	58.6
9:45:00	465	1.33E+07	305	9:45:00	458.26	29.41	9:45:00	458.26	29.16	58.6
9:50:00	465	1.33E+07	305	9:50:00	458.26	29.41	9:50:00	458.26	29.16	58.6
9:55:00	465	1.33E+07	305	9:55:00	458.26	29.41	9:55:00	458.26	29.16	58.6
10:00:00	465	1.33E+07	305	10:00:00	458.26	29.41	10:00:00	458.26	29.16	58.6

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Early Peak with Tailwater Elevation =458.19

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
0:05:00	456.66	167469.6	4	0:05:00	458.19	0	0:05:00	458.19	0	0
0:10:00	456.81	334892.3	8	0:10:00	458.19	0	0:10:00	458.19	0	0
0:15:00	456.97	502413.7	12	0:15:00	458.19	0	0:15:00	458.19	0	0
0:20:00	457.12	669954	15	0:20:00	458.19	0	0:20:00	458.19	0	0
0:25:00	457.26	837437.4	19	0:25:00	458.19	0	0:25:00	458.19	0	0
0:30:00	457.41	1004903	23	0:30:00	458.19	0	0:30:00	458.19	0	0
0:35:00	457.55	1172387	27	0:35:00	458.19	0	0:35:00	458.19	0	0
0:40:00	457.7	1339885	31	0:40:00	458.19	0	0:40:00	458.19	0	0
0:45:00	457.84	1507387	35	0:45:00	458.19	0	0:45:00	458.19	0	0
0:50:00	457.98	1674895	38	0:50:00	458.19	0	0:50:00	458.19	0	0
0:55:00	458.12	1842406	42	0:55:00	458.19	0	0:55:00	458.19	0	0
1:00:00	458.25	2009772	46	1:00:00	458.19	1.69	1:00:00	458.19	1.68	3.37
1:05:00	458.39	2175586	50	1:05:00	458.19	4.07	1:05:00	458.19	4.03	8.1
1:10:00	458.52	2340428	54	1:10:00	458.19	5.37	1:10:00	458.19	5.33	10.7
1:15:00	458.65	2504583	57	1:15:00	458.19	6.4	1:15:00	458.19	6.35	12.75
1:20:00	458.78	2668173	61	1:20:00	458.19	7.27	1:20:00	458.19	7.22	14.49
1:25:00	458.91	2831272	65	1:25:00	458.19	8.04	1:25:00	458.19	7.98	16.02
1:30:00	459.04	2993934	69	1:30:00	458.19	8.74	1:30:00	458.19	8.68	17.42
1:35:00	459.17	3156196	72	1:35:00	458.19	9.38	1:35:00	458.19	9.31	18.69
1:40:00	459.29	3318090	76	1:40:00	458.19	9.98	1:40:00	458.19	9.9	19.88
1:45:00	459.42	3479640	80	1:45:00	458.19	10.53	1:45:00	458.19	10.45	20.98
1:50:00	459.54	3640868	84	1:50:00	458.19	11.06	1:50:00	458.19	10.98	22.04
1:55:00	459.66	3801789	87	1:55:00	458.19	11.56	1:55:00	458.19	11.47	23.03
2:00:00	459.79	3962421	91	2:00:00	458.19	12.03	2:00:00	458.19	11.94	23.97
2:05:00	459.91	4122776	95	2:05:00	458.19	12.48	2:05:00	458.19	12.39	24.87
2:10:00	460.03	4282866	98	2:10:00	458.19	12.92	2:10:00	458.19	12.82	25.74
2:15:00	460.15	4442702	102	2:15:00	458.19	13.33	2:15:00	458.19	13.23	26.56
2:20:00	460.27	4602295	106	2:20:00	458.19	13.73	2:20:00	458.19	13.63	27.36
2:25:00	460.38	4761653	109	2:25:00	458.19	14.12	2:25:00	458.19	14.01	28.13
2:30:00	460.5	4920786	113	2:30:00	458.19	14.49	2:30:00	458.19	14.38	28.87
2:35:00	460.61	5079701	117	2:35:00	458.19	14.85	2:35:00	458.19	14.74	29.59
2:40:00	460.73	5238405	120	2:40:00	458.19	15.19	2:40:00	458.19	15.08	30.27
2:45:00	460.84	5396905	124	2:45:00	458.19	15.53	2:45:00	458.19	15.42	30.95
2:50:00	460.95	5555207	128	2:50:00	458.19	15.86	2:50:00	458.19	15.74	31.6
2:55:00	461.06	5713318	131	2:55:00	458.19	16.17	2:55:00	458.19	16.05	32.22
3:00:00	461.17	5871241	135	3:00:00	458.19	16.48	3:00:00	458.19	16.36	32.84
3:05:00	461.28	6028981	138	3:05:00	458.19	16.79	3:05:00	458.19	16.66	33.45
3:10:00	461.39	6186542	142	3:10:00	458.19	17.08	3:10:00	458.19	16.96	34.04
3:15:00	461.5	6343927	146	3:15:00	458.19	17.37	3:15:00	458.19	17.25	34.62
3:20:00	461.61	6501140	149	3:20:00	458.19	17.66	3:20:00	458.19	17.53	35.19
3:25:00	461.72	6658184	153	3:25:00	458.19	17.94	3:25:00	458.19	17.81	35.75
3:30:00	461.83	6815063	156	3:30:00	458.19	18.21	3:30:00	458.19	18.08	36.29
3:35:00	461.94	6971779	160	3:35:00	458.19	18.48	3:35:00	458.19	18.35	36.83
3:40:00	462.05	7128334	164	3:40:00	458.19	18.75	3:40:00	458.19	18.61	37.36
3:45:00	462.15	7284734	167	3:45:00	458.19	19	3:45:00	458.19	18.87	37.87
3:50:00	462.26	7440982	171	3:50:00	458.19	19.26	3:50:00	458.19	19.12	38.38
3:55:00	462.36	7597080	174	3:55:00	458.19	19.5	3:55:00	458.19	19.36	38.86
4:00:00	462.47	7753033	178	4:00:00	458.19	19.74	4:00:00	458.19	19.6	39.34
4:05:00	462.57	7908844	182	4:05:00	458.19	19.98	4:05:00	458.19	19.84	39.82
4:10:00	462.67	8064515	185	4:10:00	458.19	20.21	4:10:00	458.19	20.06	40.27
4:15:00	462.77	8220051	189	4:15:00	458.19	20.44	4:15:00	458.19	20.29	40.73
4:20:00	462.87	8375453	192	4:20:00	458.19	20.66	4:20:00	458.19	20.51	41.17
4:25:00	462.97	8530724	196	4:25:00	458.19	20.87	4:25:00	458.19	20.72	41.59
4:30:00	463.06	8685858	199	4:30:00	458.19	21.09	4:30:00	458.19	20.93	42.02
4:35:00	463.15	8840879	203	4:35:00	458.19	21.28	4:35:00	458.19	21.13	42.41

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Early Peak with Tailwater Elevation =458.19

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
4:40:00	463.24	8995786	207	4:40:00	458.19	21.47	4:40:00	458.19	21.32	42.79
4:45:00	463.32	9150584	210	4:45:00	458.19	21.65	4:45:00	458.19	21.49	43.14
4:50:00	463.4	9305279	214	4:50:00	458.19	21.82	4:50:00	458.19	21.66	43.48
4:55:00	463.48	9459877	217	4:55:00	458.19	21.98	4:55:00	458.19	21.82	43.8
5:00:00	463.56	9614380	221	5:00:00	458.19	22.13	5:00:00	458.19	21.97	44.1
5:05:00	463.63	9768793	224	5:05:00	458.19	22.28	5:05:00	458.19	22.12	44.4
5:10:00	463.7	9923119	228	5:10:00	458.19	22.42	5:10:00	458.19	22.26	44.68
5:15:00	463.76	10077360	231	5:15:00	458.19	22.56	5:15:00	458.19	22.4	44.96
5:20:00	463.83	10231530	235	5:20:00	458.19	22.69	5:20:00	458.19	22.53	45.22
5:25:00	463.89	10385610	238	5:25:00	458.19	22.82	5:25:00	458.19	22.66	45.48
5:30:00	463.96	10539620	242	5:30:00	458.19	22.95	5:30:00	458.19	22.78	45.73
5:35:00	464.02	10693560	245	5:35:00	458.19	23.07	5:35:00	458.19	22.9	45.97
5:40:00	464.08	10847420	249	5:40:00	458.19	23.19	5:40:00	458.19	23.02	46.21
5:45:00	464.14	11001210	253	5:45:00	458.19	23.31	5:45:00	458.19	23.14	46.45
5:50:00	464.2	11154930	256	5:50:00	458.19	23.47	5:50:00	458.19	23.3	46.77
5:55:00	464.26	1.13E+07	260	5:55:00	458.19	23.8	5:55:00	458.19	23.63	47.43
6:00:00	464.31	1.15E+07	263	6:00:00	458.19	24.24	6:00:00	458.19	24.05	48.29
6:05:00	464.37	1.16E+07	267	6:05:00	458.19	24.74	6:05:00	458.19	24.55	49.29
6:10:00	464.43	1.18E+07	270	6:10:00	458.19	25.29	6:10:00	458.19	25.1	50.39
6:15:00	464.49	1.19E+07	274	6:15:00	458.19	25.9	6:15:00	458.19	25.69	51.59
6:20:00	464.55	1.21E+07	277	6:20:00	458.19	26.54	6:20:00	458.19	26.32	52.86
6:25:00	464.6	1.22E+07	281	6:25:00	458.19	27.21	6:25:00	458.19	26.99	54.2
6:30:00	464.66	1.24E+07	284	6:30:00	458.19	27.83	6:30:00	458.19	27.6	55.43
6:35:00	464.72	1.25E+07	288	6:35:00	458.19	28.12	6:35:00	458.19	27.89	56.01
6:40:00	464.77	1.27E+07	291	6:40:00	458.19	28.41	6:40:00	458.19	28.17	56.58
6:45:00	464.83	1.28E+07	294	6:45:00	458.19	28.69	6:45:00	458.19	28.45	57.14
6:50:00	464.88	1.30E+07	298	6:50:00	458.19	28.96	6:50:00	458.19	28.71	57.67
6:55:00	464.94	1.31E+07	301	6:55:00	458.19	29.22	6:55:00	458.19	28.97	58.19
7:00:00	465	1.33E+07	305	7:00:00	458.19	29.47	7:00:00	458.19	29.22	58.69
7:05:00	465	1.33E+07	305	7:05:00	458.19	29.54	7:05:00	458.19	29.29	58.83
7:10:00	465	1.33E+07	305	7:10:00	458.19	29.54	7:10:00	458.19	29.29	58.83
7:15:00	465	1.33E+07	305	7:15:00	458.19	29.54	7:15:00	458.19	29.29	58.83
7:20:00	465	1.33E+07	305	7:20:00	458.19	29.54	7:20:00	458.19	29.29	58.83
7:25:00	465	1.33E+07	305	7:25:00	458.19	29.54	7:25:00	458.19	29.29	58.83
7:30:00	465	1.33E+07	305	7:30:00	458.19	29.54	7:30:00	458.19	29.29	58.83
7:35:00	465	1.33E+07	305	7:35:00	458.19	29.54	7:35:00	458.19	29.29	58.83
7:40:00	465	1.33E+07	305	7:40:00	458.19	29.54	7:40:00	458.19	29.29	58.83
7:45:00	465	1.33E+07	305	7:45:00	458.19	29.54	7:45:00	458.19	29.29	58.83
7:50:00	465	1.33E+07	305	7:50:00	458.19	29.54	7:50:00	458.19	29.29	58.83
7:55:00	465	1.33E+07	305	7:55:00	458.19	29.54	7:55:00	458.19	29.29	58.83
8:00:00	465	1.33E+07	305	8:00:00	458.19	29.54	8:00:00	458.19	29.29	58.83
8:05:00	465	1.33E+07	305	8:05:00	458.19	29.54	8:05:00	458.19	29.29	58.83
8:10:00	465	1.33E+07	305	8:10:00	458.19	29.54	8:10:00	458.19	29.29	58.83
8:15:00	465	1.33E+07	305	8:15:00	458.19	29.54	8:15:00	458.19	29.29	58.83
8:20:00	465	1.33E+07	305	8:20:00	458.19	29.54	8:20:00	458.19	29.29	58.83
8:25:00	465	1.33E+07	305	8:25:00	458.19	29.54	8:25:00	458.19	29.29	58.83
8:30:00	465	1.33E+07	305	8:30:00	458.19	29.54	8:30:00	458.19	29.29	58.83
8:35:00	465	1.33E+07	305	8:35:00	458.19	29.54	8:35:00	458.19	29.29	58.83
8:40:00	465	1.33E+07	305	8:40:00	458.19	29.54	8:40:00	458.19	29.29	58.83
8:45:00	465	1.33E+07	305	8:45:00	458.19	29.54	8:45:00	458.19	29.29	58.83
8:50:00	465	1.33E+07	305	8:50:00	458.19	29.54	8:50:00	458.19	29.29	58.83
8:55:00	465	1.33E+07	305	8:55:00	458.19	29.54	8:55:00	458.19	29.29	58.83
9:00:00	465	1.33E+07	305	9:00:00	458.19	29.54	9:00:00	458.19	29.29	58.83
9:05:00	465	1.33E+07	305	9:05:00	458.19	29.54	9:05:00	458.19	29.29	58.83
9:10:00	465	1.33E+07	305	9:10:00	458.19	29.54	9:10:00	458.19	29.29	58.83

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Early Peak with Tailwater Elevation =458.19

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
9:15:00	465	1.33E+07	305	9:15:00	458.19	29.54	9:15:00	458.19	29.29	58.83
9:20:00	465	1.33E+07	305	9:20:00	458.19	29.54	9:20:00	458.19	29.29	58.83
9:25:00	465	1.33E+07	305	9:25:00	458.19	29.54	9:25:00	458.19	29.29	58.83
9:30:00	465	1.33E+07	305	9:30:00	458.19	29.54	9:30:00	458.19	29.29	58.83
9:35:00	465	1.33E+07	305	9:35:00	458.19	29.54	9:35:00	458.19	29.29	58.83
9:40:00	465	1.33E+07	305	9:40:00	458.19	29.54	9:40:00	458.19	29.29	58.83
9:45:00	465	1.33E+07	305	9:45:00	458.19	29.54	9:45:00	458.19	29.29	58.83
9:50:00	465	1.33E+07	305	9:50:00	458.19	29.54	9:50:00	458.19	29.29	58.83
9:55:00	465	1.33E+07	305	9:55:00	458.19	29.54	9:55:00	458.19	29.29	58.83
10:00:00	465	1.33E+07	305	10:00:00	458.19	29.54	10:00:00	458.19	29.29	58.83

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Late Peak with Tailwater Elevation =458.23

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
0:05:00	456.74	258815.2	6	0:05:00	458.23	0	0:05:00	458.23	0	0.0
0:10:00	456.98	517625.1	12	0:10:00	458.23	0	0:10:00	458.23	0	0.0
0:15:00	457.21	776576.4	18	0:15:00	458.23	0	0:15:00	458.23	0	0.0
0:20:00	457.44	1035441	24	0:20:00	458.23	0	0:20:00	458.23	0	0.0
0:25:00	457.66	1294259	30	0:25:00	458.23	0	0:25:00	458.23	0	0.0
0:30:00	457.88	1553095	36	0:30:00	458.23	0	0:30:00	458.23	0	0.0
0:35:00	458.09	1811958	42	0:35:00	458.23	0	0:35:00	458.23	0	0.0
0:40:00	458.3	2070712	48	0:40:00	458.23	1.84	0:40:00	458.23	1.76	3.6
0:45:00	458.51	2327696	53	0:45:00	458.23	4.84	0:45:00	458.23	4.79	9.6
0:50:00	458.72	2583454	59	0:50:00	458.23	6.5	0:50:00	458.23	6.45	13.0
0:55:00	458.92	2838340	65	0:55:00	458.23	7.8	0:55:00	458.23	7.74	15.5
1:00:00	459.12	3092517	71	1:00:00	458.23	8.89	1:00:00	458.23	8.82	17.7
1:05:00	459.31	3346082	77	1:05:00	458.23	9.85	1:05:00	458.23	9.78	19.6
1:10:00	459.51	3599101	83	1:10:00	458.23	10.72	1:10:00	458.23	10.64	21.4
1:15:00	459.7	3851625	88	1:15:00	458.23	11.51	1:15:00	458.23	11.43	22.9
1:20:00	459.89	4103693	94	1:20:00	458.23	12.25	1:20:00	458.23	12.16	24.4
1:25:00	460.08	4355335	100	1:25:00	458.23	12.94	1:25:00	458.23	12.84	25.8
1:30:00	460.27	4606581	106	1:30:00	458.23	13.58	1:30:00	458.23	13.48	27.1
1:35:00	460.45	4857454	112	1:35:00	458.23	14.19	1:35:00	458.23	14.08	28.3
1:40:00	460.63	5107975	117	1:40:00	458.23	14.76	1:40:00	458.23	14.65	29.4
1:45:00	460.81	5358163	123	1:45:00	458.23	15.3	1:45:00	458.23	15.19	30.5
1:50:00	460.99	5608033	129	1:50:00	458.23	15.82	1:50:00	458.23	15.71	31.5
1:55:00	461.16	5857603	134	1:55:00	458.23	16.32	1:55:00	458.23	16.2	32.5
2:00:00	461.34	6106877	140	2:00:00	458.23	16.8	2:00:00	458.23	16.68	33.5
2:05:00	461.51	6355869	146	2:05:00	458.23	17.27	2:05:00	458.23	17.14	34.4
2:10:00	461.68	6604588	152	2:10:00	458.23	17.72	2:10:00	458.23	17.59	35.3
2:15:00	461.86	6853041	157	2:15:00	458.23	18.15	2:15:00	458.23	18.02	36.2
2:20:00	462.03	7101232	163	2:20:00	458.23	18.58	2:20:00	458.23	18.44	37.0
2:25:00	462.2	7349176	169	2:25:00	458.23	18.99	2:25:00	458.23	18.85	37.8
2:30:00	462.36	7596880	174	2:30:00	458.23	19.39	2:30:00	458.23	19.25	38.6
2:35:00	462.53	7844351	180	2:35:00	458.23	19.77	2:35:00	458.23	19.63	39.4
2:40:00	462.69	8091597	186	2:40:00	458.23	20.14	2:40:00	458.23	19.99	40.1
2:45:00	462.85	8338628	191	2:45:00	458.23	20.5	2:45:00	458.23	20.35	40.9
2:50:00	463	8585437	197	2:50:00	458.23	20.84	2:50:00	458.23	20.69	41.5
2:55:00	463.15	8832056	203	2:55:00	458.23	21.17	2:55:00	458.23	21.01	42.2
3:00:00	463.29	9078491	208	3:00:00	458.23	21.47	3:00:00	458.23	21.31	42.8
3:05:00	463.41	9324757	214	3:05:00	458.23	21.74	3:05:00	458.23	21.58	43.3
3:10:00	463.53	9570867	220	3:10:00	458.23	21.99	3:10:00	458.23	21.83	43.8
3:15:00	463.65	9816831	225	3:15:00	458.23	22.23	3:15:00	458.23	22.07	44.3
3:20:00	463.76	10062660	231	3:20:00	458.23	22.45	3:20:00	458.23	22.29	44.7
3:25:00	463.86	10308360	237	3:25:00	458.23	22.67	3:25:00	458.23	22.5	45.2
3:30:00	463.96	10553930	242	3:30:00	458.23	22.87	3:30:00	458.23	22.7	45.6
3:35:00	464.06	10799390	248	3:35:00	458.23	23.06	3:35:00	458.23	22.89	46.0
3:40:00	464.15	11044730	254	3:40:00	458.23	23.25	3:40:00	458.23	23.08	46.3
3:45:00	464.25	11289910	259	3:45:00	458.23	23.64	3:45:00	458.23	23.47	47.1
3:50:00	464.34	11534720	265	3:50:00	458.23	24.34	3:50:00	458.23	24.15	48.5
3:55:00	464.44	11779050	270	3:55:00	458.23	25.2	3:55:00	458.23	25	50.2
4:00:00	464.53	12022830	276	4:00:00	458.23	26.18	4:00:00	458.23	25.97	52.2
4:05:00	464.62	12265970	282	4:05:00	458.23	27.26	4:05:00	458.23	27.03	54.3
4:10:00	464.71	12508560	287	4:10:00	458.23	27.98	4:10:00	458.23	27.75	55.7
4:15:00	464.8	12750860	293	4:15:00	458.23	28.45	4:15:00	458.23	28.2	56.7
4:20:00	464.89	12992900	298	4:20:00	458.23	28.88	4:20:00	458.23	28.63	57.5
4:25:00	464.98	13234680	304	4:25:00	458.23	29.3	4:25:00	458.23	29.05	58.4
4:30:00	465	13291250	305	4:30:00	458.23	29.47	4:30:00	458.23	29.22	58.7
4:35:00	465	13291250	305	4:35:00	458.23	29.47	4:35:00	458.23	29.22	58.7

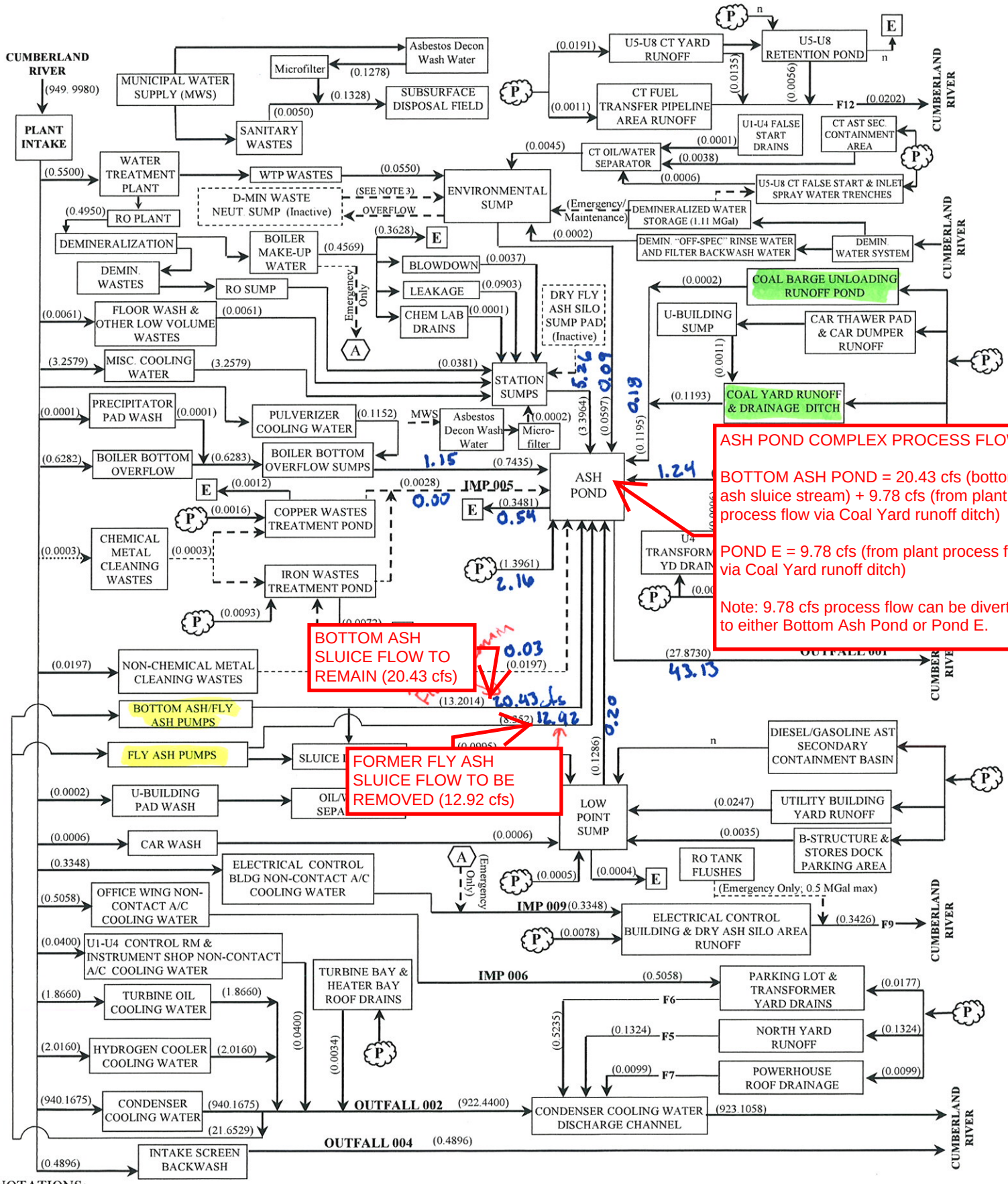
SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Late Peak with Tailwater Elevation =458.23

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
4:40:00	465	13291250	305	4:40:00	458.23	29.47	4:40:00	458.23	29.22	58.7
4:45:00	465	13291250	305	4:45:00	458.23	29.47	4:45:00	458.23	29.22	58.7
4:50:00	465	13291250	305	4:50:00	458.23	29.47	4:50:00	458.23	29.22	58.7
4:55:00	465	13291250	305	4:55:00	458.23	29.47	4:55:00	458.23	29.22	58.7
5:00:00	465	13291250	305	5:00:00	458.23	29.47	5:00:00	458.23	29.22	58.7
5:05:00	465	13291250	305	5:05:00	458.23	29.47	5:05:00	458.23	29.22	58.7
5:10:00	465	13291250	305	5:10:00	458.23	29.47	5:10:00	458.23	29.22	58.7
5:15:00	465	13291250	305	5:15:00	458.23	29.47	5:15:00	458.23	29.22	58.7
5:20:00	465	13291250	305	5:20:00	458.23	29.47	5:20:00	458.23	29.22	58.7
5:25:00	465	13291250	305	5:25:00	458.23	29.47	5:25:00	458.23	29.22	58.7
5:30:00	465	13291250	305	5:30:00	458.23	29.47	5:30:00	458.23	29.22	58.7
5:35:00	465	13291250	305	5:35:00	458.23	29.47	5:35:00	458.23	29.22	58.7
5:40:00	465	13291250	305	5:40:00	458.23	29.47	5:40:00	458.23	29.22	58.7
5:45:00	465	13291250	305	5:45:00	458.23	29.47	5:45:00	458.23	29.22	58.7
5:50:00	465	13291250	305	5:50:00	458.23	29.47	5:50:00	458.23	29.22	58.7
5:55:00	465	1.33E+07	305	5:55:00	458.23	29.47	5:55:00	458.23	29.22	58.7
6:00:00	465	1.33E+07	305	6:00:00	458.23	29.47	6:00:00	458.23	29.22	58.7
6:05:00	465	1.33E+07	305	6:05:00	458.23	29.47	6:05:00	458.23	29.22	58.7
6:10:00	465	1.33E+07	305	6:10:00	458.23	29.47	6:10:00	458.23	29.22	58.7
6:15:00	465	1.33E+07	305	6:15:00	458.23	29.47	6:15:00	458.23	29.22	58.7
6:20:00	465	1.33E+07	305	6:20:00	458.23	29.47	6:20:00	458.23	29.22	58.7
6:25:00	465	1.33E+07	305	6:25:00	458.23	29.47	6:25:00	458.23	29.22	58.7
6:30:00	465	1.33E+07	305	6:30:00	458.23	29.47	6:30:00	458.23	29.22	58.7
6:35:00	465	1.33E+07	305	6:35:00	458.23	29.47	6:35:00	458.23	29.22	58.7
6:40:00	465	1.33E+07	305	6:40:00	458.23	29.47	6:40:00	458.23	29.22	58.7
6:45:00	465	1.33E+07	305	6:45:00	458.23	29.47	6:45:00	458.23	29.22	58.7
6:50:00	465	1.33E+07	305	6:50:00	458.23	29.47	6:50:00	458.23	29.22	58.7
6:55:00	465	1.33E+07	305	6:55:00	458.23	29.47	6:55:00	458.23	29.22	58.7
7:00:00	465	1.33E+07	305	7:00:00	458.23	29.47	7:00:00	458.23	29.22	58.7
7:05:00	465	1.33E+07	305	7:05:00	458.23	29.47	7:05:00	458.23	29.22	58.7
7:10:00	465	1.33E+07	305	7:10:00	458.23	29.47	7:10:00	458.23	29.22	58.7
7:15:00	465	1.33E+07	305	7:15:00	458.23	29.47	7:15:00	458.23	29.22	58.7
7:20:00	465	1.33E+07	305	7:20:00	458.23	29.47	7:20:00	458.23	29.22	58.7
7:25:00	465	1.33E+07	305	7:25:00	458.23	29.47	7:25:00	458.23	29.22	58.7
7:30:00	465	1.33E+07	305	7:30:00	458.23	29.47	7:30:00	458.23	29.22	58.7
7:35:00	465	1.33E+07	305	7:35:00	458.23	29.47	7:35:00	458.23	29.22	58.7
7:40:00	465	1.33E+07	305	7:40:00	458.23	29.47	7:40:00	458.23	29.22	58.7
7:45:00	465	1.33E+07	305	7:45:00	458.23	29.47	7:45:00	458.23	29.22	58.7
7:50:00	465	1.33E+07	305	7:50:00	458.23	29.47	7:50:00	458.23	29.22	58.7
7:55:00	465	1.33E+07	305	7:55:00	458.23	29.47	7:55:00	458.23	29.22	58.7
8:00:00	465	1.33E+07	305	8:00:00	458.23	29.47	8:00:00	458.23	29.22	58.7
8:05:00	465	1.33E+07	305	8:05:00	458.23	29.47	8:05:00	458.23	29.22	58.7
8:10:00	465	1.33E+07	305	8:10:00	458.23	29.47	8:10:00	458.23	29.22	58.7
8:15:00	465	1.33E+07	305	8:15:00	458.23	29.47	8:15:00	458.23	29.22	58.7
8:20:00	465	1.33E+07	305	8:20:00	458.23	29.47	8:20:00	458.23	29.22	58.7
8:25:00	465	1.33E+07	305	8:25:00	458.23	29.47	8:25:00	458.23	29.22	58.7
8:30:00	465	1.33E+07	305	8:30:00	458.23	29.47	8:30:00	458.23	29.22	58.7
8:35:00	465	1.33E+07	305	8:35:00	458.23	29.47	8:35:00	458.23	29.22	58.7
8:40:00	465	1.33E+07	305	8:40:00	458.23	29.47	8:40:00	458.23	29.22	58.7
8:45:00	465	1.33E+07	305	8:45:00	458.23	29.47	8:45:00	458.23	29.22	58.7
8:50:00	465	1.33E+07	305	8:50:00	458.23	29.47	8:50:00	458.23	29.22	58.7
8:55:00	465	1.33E+07	305	8:55:00	458.23	29.47	8:55:00	458.23	29.22	58.7
9:00:00	465	1.33E+07	305	9:00:00	458.23	29.47	9:00:00	458.23	29.22	58.7
9:05:00	465	1.33E+07	305	9:05:00	458.23	29.47	9:05:00	458.23	29.22	58.7
9:10:00	465	1.33E+07	305	9:10:00	458.23	29.47	9:10:00	458.23	29.22	58.7

SWMM 5 Results - Stage/Storage/Discharge for 1000 yr, 6 hr, Late Peak with Tailwater Elevation =458.23

Table - Node Pond_E				Table - Node Outfall-1			Table - Node Outfall-2			Both Outfalls
Hours	WSE (ft)	Volume (ft3)	Volume (ac-ft)	Hours	WSE (ft)	Discharge (CFS)	Hours	WSE (ft)	Discharge (CFS)	Discharge (CFS)
9:15:00	465	1.33E+07	305	9:15:00	458.23	29.47	9:15:00	458.23	29.22	58.7
9:20:00	465	1.33E+07	305	9:20:00	458.23	29.47	9:20:00	458.23	29.22	58.7
9:25:00	465	1.33E+07	305	9:25:00	458.23	29.47	9:25:00	458.23	29.22	58.7
9:30:00	465	1.33E+07	305	9:30:00	458.23	29.47	9:30:00	458.23	29.22	58.7
9:35:00	465	1.33E+07	305	9:35:00	458.23	29.47	9:35:00	458.23	29.22	58.7
9:40:00	465	1.33E+07	305	9:40:00	458.23	29.47	9:40:00	458.23	29.22	58.7
9:45:00	465	1.33E+07	305	9:45:00	458.23	29.47	9:45:00	458.23	29.22	58.7
9:50:00	465	1.33E+07	305	9:50:00	458.23	29.47	9:50:00	458.23	29.22	58.7
9:55:00	465	1.33E+07	305	9:55:00	458.23	29.47	9:55:00	458.23	29.22	58.7
10:00:00	465	1.33E+07	305	10:00:00	458.23	29.47	10:00:00	458.23	29.22	58.7

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