7.0 RULE 6.4.7: EXHIBIT G–WATER INFORMATION

7.1 NOT AFFECTING SURFACE OR GROUNDWATER SYSTEMS

7.1.1 CONTRIBUTING SURFACE WATER & CONTROL SYSTEMS

The Leadville Mill property is not located in a flood hazard area according to the FEMA Food Insurance Rate Map: Community Panel No. 080282-0004 A, dated March 1, 1998. Therefore, no further reference to risk analysis, mitigation or surface control features related to flood hazard are included in this section.

Mill processing and associated activities will not affect the surface water system as they have been designed with both primary and secondary containment structures that result in "zero-discharge" conditions from the perspective of discharge of any process pollutants off site. Process water and chemicals used in the milling process, as well as storm water, snowmelt, seepage that infiltrates through the filtered tailings deposit, and sediment generated by surface water action within the FTD (i.e., "contact waters") are contained within lined structures and returned to the milling circuit for reuse. Flows from other disturbed areas surrounding industrial or heavy equipment operations outside of the controlled FTD site or mill building structures are managed and routed through engineered structures (ditches, berms and detention ponds). Flows from non-impacted existing ground surfaces are also routed around disturbed areas, are collected, and may discharge offsite at the two designated Outfalls (Nos. 1 and 2) where engineered structures provide access for sampling following event-based flows as described further in this Section.

The general surface water management strategy that has been adopted for the operation is based on isolation of the disturbed areas where industrial operations or ancillary facilities are constructed, from those undisturbed areas using both run-on and run-off controls. **Figure 7-1** and **Figure 7-2** illustrate the basic components of the surface water management system and catchment delineations in schematic form. Accumulated non-contact runoff exits the property via a sediment control pond and through Outfall 1 as the final surface water sampling structure. Detailed modeling results for the individual catchments and conveyances are provided in **Appendix 7-1**. Disturbed or potentially disturbed areas are identified as all or part of Subcatchments 4, 5 and 6 (and their respective internal subdivisions). The ECS has been designated as Subcatchment 7, but only collects direct precipitation and snowmelt and is not delineated on **Figure 7-1**. Calculated estimates of typical cannula snowmelt and direct precipitation that may accumulate in the ECS are provided separately.

The surface water modeling results presented below assume a worst-case operating condition (during Phase 1- with FTD Cell 1 in operation only) as undisturbed flows from Subcatchment 5B are routed around the FTD via the west side external ditch (**Figure 7-1**) and are added to the site totals entering the terminal sediment detention pond located just upstream form Outfall 1. The FTD areas shown at full filling capacity are designated collectively as Subcatchments 5A & 5B are modeled separately for pond sizing for the 100-yr/24-hr. event design basis as these flows are considered contact process water and are contained completely by the FTD liner and fluid collection systems with separate storage in the Collection Pond for mill recycle. See **Section 4.4.4** for details on the specifics of the FTD surface water and seepage management strategy for 2-stage implementation.

The Overburden Stockpile areas that are located directly east and adjacent to the FTD and directly north of the main access roadway (Subcatchments 4A and 4B), have been further subdivided to reflect two distinct flows that are collected on the north and south sides of the main access road. Any undisturbed drainage areas within the permit boundary are identified collectively as Subcatchment 6 and have been further subdivided and shown on **Figure 7-1** to include the small contributing area on the adjacent property to the North of the main access road and west of the FTD (6N), as well as a very small area south of the main access road and east of the Water Treatment Plant property boundary.

Small control berms and/or ditches have been located strategically in certain spots on the property - reference these proposed feature locations on **Figure 7-1** - based on preliminary determinations using the 1-ft topo contours. The final locations of these sheet-flow control features are designated after detailed reconnaissance and survey prior to plant commissioning. The general control strategy for the operation takes maximum advantage of the very favorable native topography, and these small additional control features act to maximize routing of all minor surface sheet flows toward the terminal detention pond near Outfall 1 area prior to any off-site discharge.

Environmental Control Feature	Description	Function	Figure Reference Location	Section Narrative Reference	Notes
1	FTD Exterior Stormwater Channel	Routes non-contact stormwater and snowmelt around FTD perimeter	Location and details provided on Figures 4-20 and 4-21	Section 4.4.4 Section 7.0	designed to provide adequate performance under a design 100-yr/24/hr. storm event
2	FTD Exterior Stormwater and Sediment Detention Basin	Collects and detains non-contact stormwater, snowmelt and sediment	Location and details provided on Figures 4-20 and 4-21	Section 4.4.4 Section 7.0	small feature designed to add additional sediment control and reduce load on the main ditch running on the north side of the main access road
3	FTD Cell 1 Stormwater Control Berm (Temporary)	Routes offsite noncontact stormwater and snowmelt into Control Feature 1	Location and details provided on Figures 4-20 and 4-21	Section 4.4.4 Section 7.0	Temporary structure with integral synthetic liner flap to prevent infiltration and cross flow into FTD during Cell 1 operations prior to construction of Cell 2.
4	Overburden Stockpile Stormwater Control Berm	Collects and detains non-contact stormwater, snowmelt and sediment	Location and details provided on Figures 4-17	Section 4.4.4 Section 7.0	provides additional control and containment of sediment generated during placement and management of overburden stockpile areas.
5	Overburden Stockpile Stormwater and Sediment Detention Basin	Collects and detains non-contact stormwater, snowmelt and sediment	Location and details provided on Figures 4-17	Section 4.4.4 Section 7.0	small structure designed to reduce sediment loading in Rach 5 Bypass channel
6	Reach 5 Bypass Ditch	Routes non-contact stormwater from Control Feature 2 along north side of main access road into south portion of Control Feature 1	Engineering details provided in Section 7.0 and Figure 7-1	Section 4.4.4 Section 7.0	designed to provide integrated exterior surface water control without duplication though south portion of Control Feature 2
7	FTD Liner and Seepage Collection System	provides a double synthetic liner and seepage collection layer for permanent compliant storage of tailings filter cake	Engineering details provided in Section 4.4 and Figures 4-18 through 4-21	Section 4.4.4	design includes a prepared subgrade, followed by a GCL, 60-mil textured HDPE, geocomposite seepage collection later and 1-foot protective cover soil
8	FDT Seepage Sump and Transfer Pipeline	Collects seepage and contact runoff from FTD tailings stack in protected, aggregate-filled structure and drains by gravity to Collection pond	Engineering details provided in Section 4.4 and Figures 4-20 and 4-21	Section 4.4.4	sump is part of the FTD liner system design. Transfer pipeline is 18-in.-dia. , SDR 17 HDPE solid wall pipe with welded boots. Control via in line ball valve with surface access
9	Seepage Collection Pond and Discharge Pipeline	Provides a gravity conduit for collected filtrate and seepage to be routed to the plant for reuse	Engineering details provided in Section 4.4 and 7.0 and Figures 7-1, 4-20 and 4-21	Section 4.4.4	pond is double-lined 60-mil HDPE with integrated geonet leak detection layer. Gravity discharge pipe to plant is 18-in.-dia. rubber lined steel. Control via in line ball valve with surface access.

LEGEND

- PERMIT BOUNDARY
- AVS BOUNDARY
- AFFECTED AREA BOUNDARY
- SURFACE WATER DRAINAGE DITCH
- WATERSHED SUBCATCHMENT BOUNDARY
- (1) ENVIRONMENTAL CONTROL FEATURE CALLOUT

N

0 60' 120' 240'

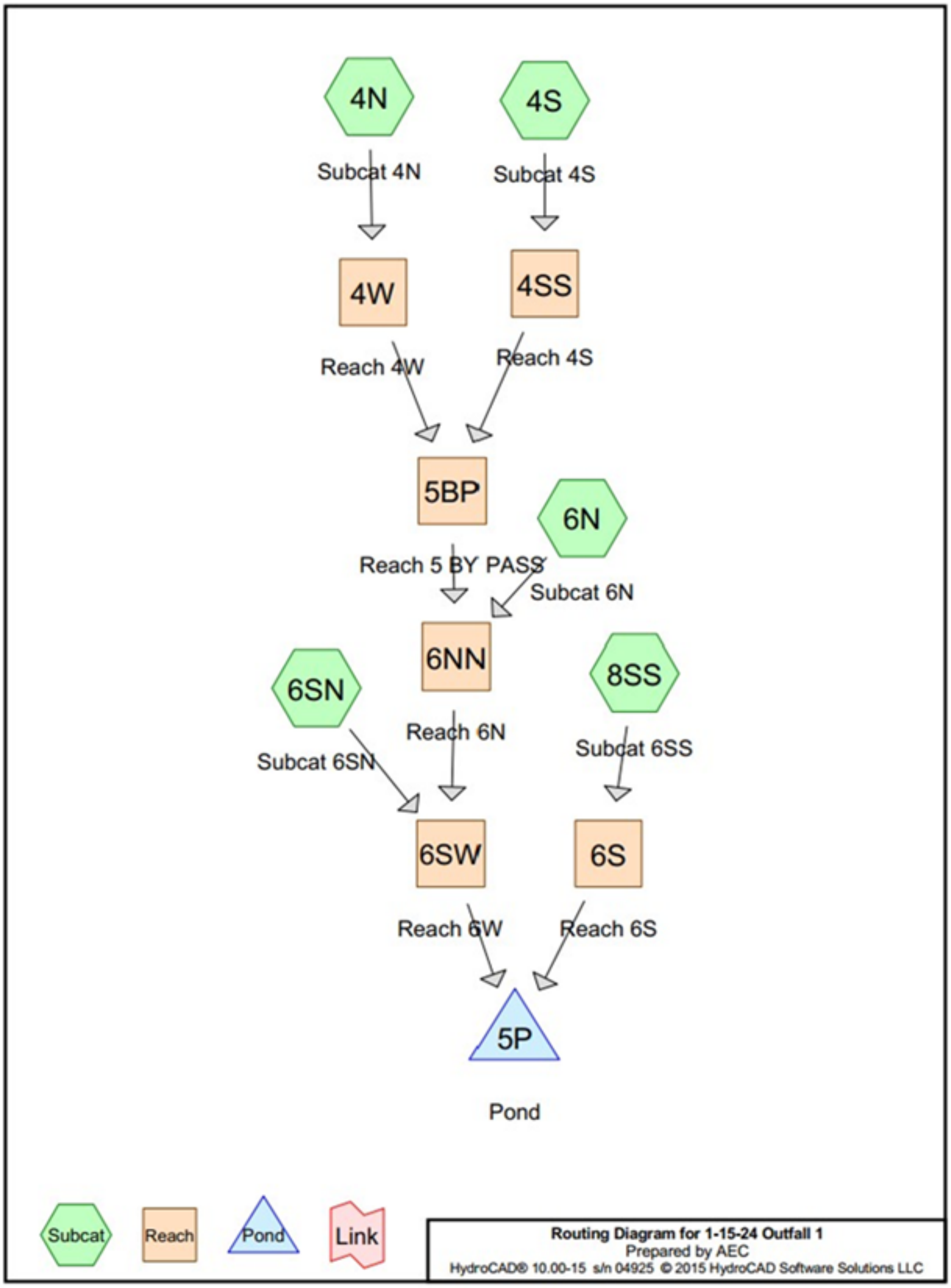
AERIAL IMAGERY 10/25/2021

FIGURE 7-1
SURFACE WATER CATCHMENT BOUNDARIES AND FEATURES
CJK MILLING COMPANY
LEADVILLE, COLORADO

CLIENT: UNION MILLING	
PROJECT: --	
PROJECT NO: --	DATE COMPLETED: 1/2024
DESIGNED BY: AEC	APPROVED BY: WC
DRAWN BY: MBT	DWG NAME: POSTER 2 – LEADVILLE MILL GENERAL ARRANGEMENT.dwg
REVISION:	REVISED BY: DATE:
0 ISSUED TO CLIENT	

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.

Figure 7-2:Surface Water Catchment and Features Schematic

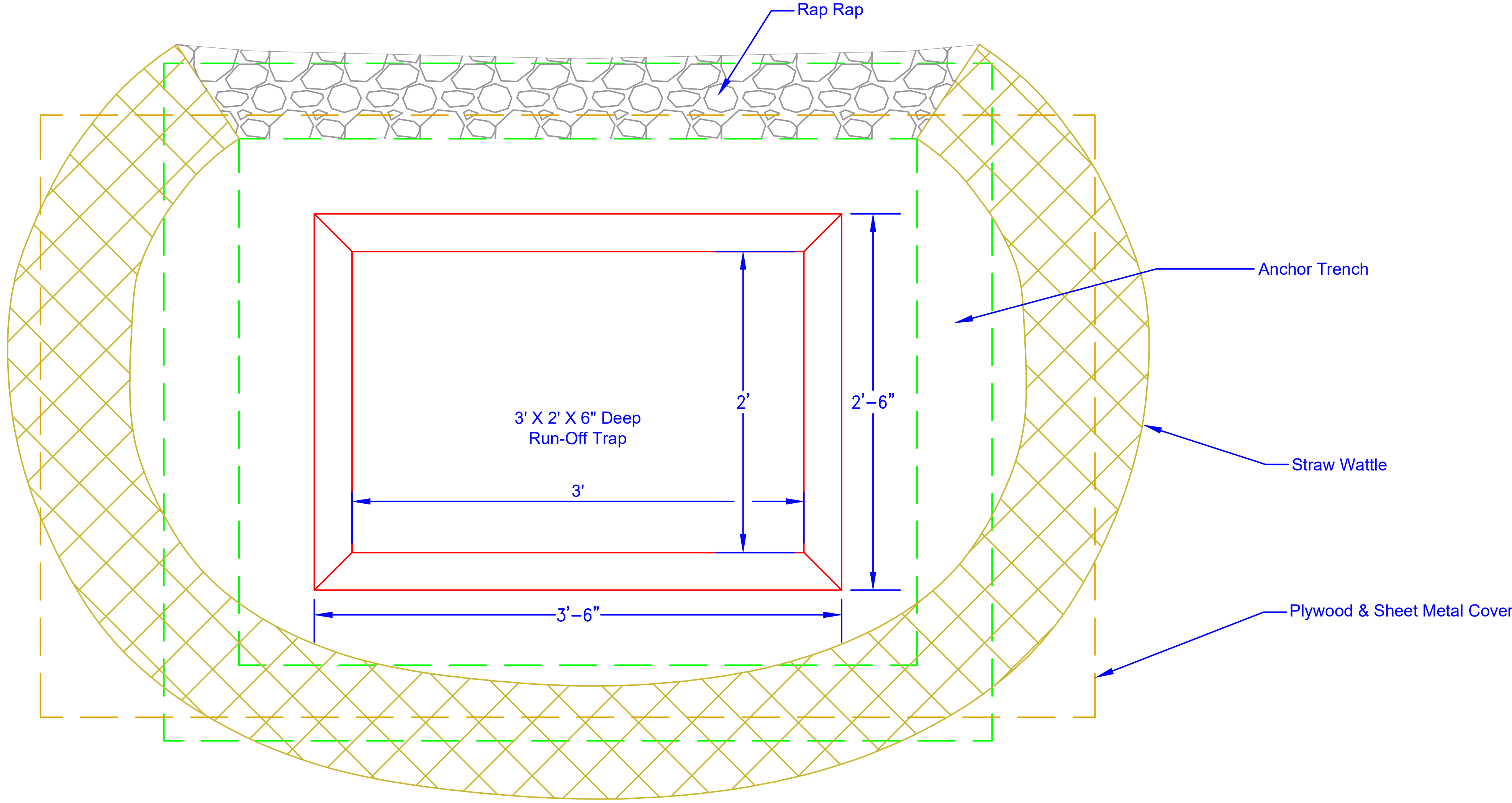


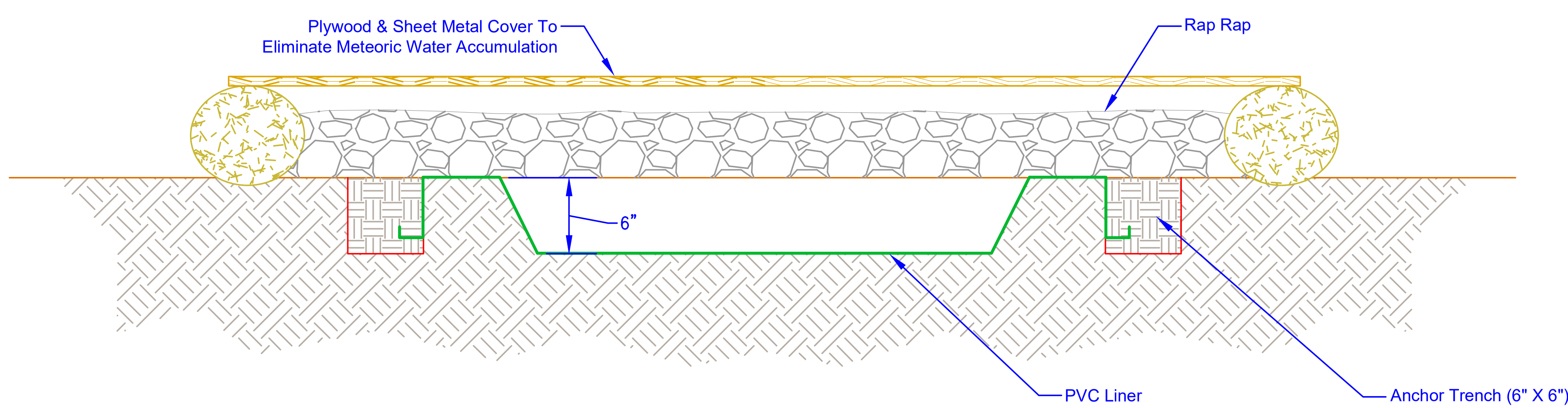
Minor volumes are expected to report to Outfall 2 based on the small contributing catchment. Westerly flows from Subcatchment 4 (east-offsite) are intercepted by a berm that runs parallel to the gas pipeline corridor that straddles the north-south Subcatchment 4 boundary, or from small control berms and silt fences to be installed on the western side of the proposed Overburden and Topsoil Stockpile (OVB) area.

These flows are diverted via a ditch (4S as shown) that is continuous along the North side of the access roadway and into the lower portion of the FTD external ditch system (5SB-bypass) and eventually westward around the north side of the plant site as shown via the major flow lines that are illustrated on **Figure 7-1**. These control features provide for routing of any surface storm water or snowmelt within the permit boundary area toward Outfall No. 1, which is located at the extreme southwest corner of the site. Outfall No. 2 (located in the southeast section of Subcatchment 4B) represents the single discharge point out of the permit boundary area into Subcatchment 3 and eventually to Outfall No.3 that is located on the Slag Aggregate Operations property to the east. As mentioned previously, event-based flows at Outfall No. 2 are anticipated to be very small, and only large storm events (more than the 100-yr./24-hr. storm) will generate flows volumes that could be available in quantity collection in the engineered structure that is identical to that to be constructed at Outfall No. 1. See **Figure 7-3** for details. These structures are designed as sheet-flow sampling basins.

To provide an assessment of the anticipated volumes of surface waters that will emanate from and be controlled within Subcatchments 4, 5, 6, and 7, an analysis of surface flows from the design 100-yr., 24-hr. storm was applied as a worst-case example for illustration. Based on the hydraulic modeling carried out for site-specific conditions and soil types, only storms generating volumes larger than those from the 10-yr/24-hr. events will likely produce visible concentrated flows. This conclusion is also based on anecdotal evidence from operator experience at the site since 2008. Under typical and more frequently observed conditions, most of the snowmelt and direct precipitation received at the site are absorbed by the native soils and produce very limited visual runoff.

The following provides a summary of the findings of the more conservative 100-yr/24-hr., with detail provided in **Appendix 7-1** that also includes individual catchment hydrographs and ditch geometries.





DRAWING NOT TO SCALE

CKJ MILLING –LEADVILLE MILL PROJECT		**AEC** American Environmental Consulting, LLC	**Figure 7-3 SURFACE SHEET FLOW WATER SAMPLING BASIN**
SCALE: NA	DESIGNED BY:WAC		
FILE NO: CJK LEADVILLE – SURFACE WATER			
DATE: 12/12/2023			

7.1.2 SUMMARY MODELING RESULTS

The following presents a summary of the surface water modeling results. Detailed output can be found in **Appendix 7-1** which also includes hydrographs for individual catchments as well as conveyance geometry information.

For representative purposes, 100-year storm events were modeled to provide base case design and estimates of anticipated flows for an extreme event. Due to the nature of the site, topography, spoil types and relative areas of disturbance, under typical average conditions, sheet flow dominates and is difficult to characterize in terms of engineering of control structures and outfall volumes. Refer to **Figure 7-1** and **Figure 7-2**, which illustrate specific details of the surface water system, routing, and modeling methodology.

INPUT PARAMETERS

- 100-year storm 2.48 from facility SWMP
- Undisturbed Area Runoff Curve Number 69 from facility SWMP
- Disturbed Area Runoff Curve Number 87 from Hydrocad: Dirt roads, HSG C (soil class from SWMP)
- Control ditches modeled as 2-foot deep, 3-foot bottom width, 3:1 side slopes
- Manning's number 0.035 for the control ditches

Drainage Summary

Drainage Area	Area Feet^2	Average Land Slope Ft/Ft	Hydraulic Length Feet	Curve Number	Discharges to
Subcatchment 4N	423,918	0.0296	1545	69	Ditch 4W
Subcatchment 4S	311,690	0.0393	1194	69	Ditch 4S
Subcatchment 6N	55,808	0.0271	556	69	Ditch 6N
Subcatchment 6SN	516,277	0.946	1438	0.4*87, 0.6*69	Ditch 6W
Subcatchment 6SS	293,633	0.000	1438	0.4*87, 0.6*69	Ditch 6S

Control ditches

	Length	Inlet Elevation	Outlet Elevation	Slope
Reach	Feet	Feet	Feet	Ft/Ft
4W	858	9763	9755	0.009
4S	1524	9789	9755	0.022
5BP	543	9755	9742	0.024
6N	450	9742	9731	0.024
6W	808	9731	9664	0.083
6S	1027	9690	9664	0.025

MODEL OUTPUT

Modeling was completed using the HydroCad model with the above input parameters. The modeling run is attached.

Drainage Area Results

Drainage Area	Concentration Time Minutes	Runoff Volume Acre-Ft	Flow
Subcatchment 4N	28.8	0.334	2.54
Subcatchment 4S	14.5	0.179	2.17
Subcatchment 6N	14.6	0.044	0.53
Subcatchment 6SN	13.8	0.864	13.53
Subcatchment 6SS	24.5	0.492	5.54

Reach	Inflow cfs	Outflow cfs	Maximum Velocity fps	Average Velocity fps	Avg Storage At Peak Storage feet
4S	2.17	1.68	2.18	.080	0.21
4W	2.54	2.23	1.68	0.64	0.33
5BP	3.21	3.17	2.58	1.02	0.31
6N	3.29	3.26	2.63	1.04	0.31
6S	5.54	5.14	3.06	0.99	0.40
6W	13.67	13.04	6.15	2.02	0.49

ROUTING

Runoff from the above Subcatchment is routed per the schematic overview provided on **Figure 7-2**.

- Outfall No. 1 – Receives waters from Subcatchment 6 and as well as undisturbed and non-contact disturbed flows from the FTD and Subcatchment 4A as well as small down-gradient areas below and adjacent to the Emergency Containment Sump (ECS).
- Outfall No. 2 -Receives waters from Subcatchment 4B only.
- FTD Collection Pond – Receives contact water from Subcatchment 5. Design dimensions are 132x42 (bottom), 75x10 (top), 8 feet deep. Top elevation 9745, bottom elevation 9737 (see **Figure 4-22** for design details).
- ECS – Isolated from all other surface waters on the site receives only direct precipitation and snowmelt. Modeled as ***zero- discharge*** because all the

retained water in the ECS will be confined and recycled to the milling process or subject to the general strategies discussed in **Section 7.2**.

POND CAPACITIES

- The FTD Collection Pond dimensions of 132x42, by 75x10, by 8 feet deep with 2H:1V side slopes (approximately 500,000 USG capacity plus 2-ft freeboard).
- The ECS was modeled in HydroCad on five-foot intervals from 9660 to 9685 feet using surface areas and perimeter lengths from each contour.
- Direct discharge from Subcatchment 5 to the Pond, no diversions

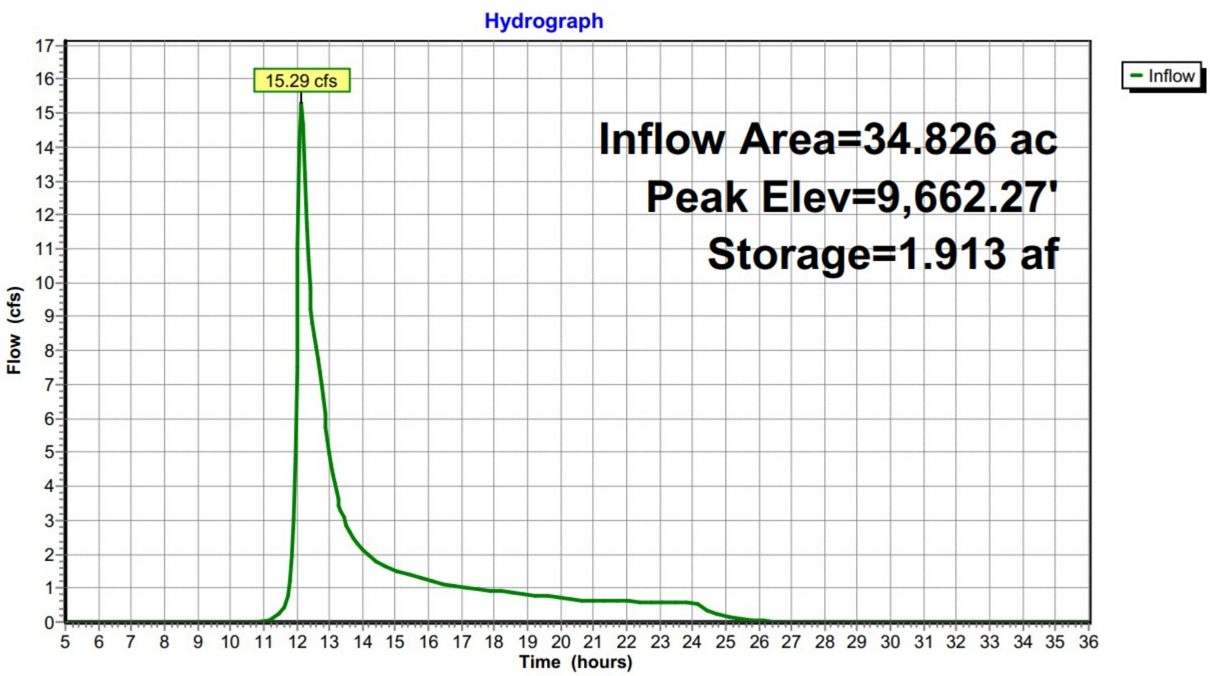
RESULTS

Modeling was completed using the HydroCad model with the above input parameters. Modeling run details and individual catchment hydrographs are provided in **Appendix 7-1**.

Outfall 1 Flow Summary

Outfall 1, the direct discharge from Subcatchment 6, will flow offsite at a maximum flow rate of 5.29cfs for a very-limited time. Discharge will then decrease to approximately 1.0cfs for approximately 13 hours. The hydrograph for the terminal sediment detention pond (Outfall 1 exit and Subcatchment 6 collector) is provided for reference on **Figure 7-4**.

Figure 7-4: Design Storm Hydrograph – Terminal Sedimentation Retention Pond (5P)



Surface water flows from the disturbed areas are isolated using run on and run off surface water control structures as needed. The disturbed areas will also be graded so that all surface flow contributions for designated facilities drain around the ECS and collect in the terminal sediment detention pond (5P) as shown on **Figure 7-1**. The ECS, in addition to acting as a fresh water holding pond for operations, also serves as an emergency reservoir to safely and temporarily store any spillage that might occur from the milling process as it has been constructed with double synthetic liners with an integrated inter-liner leak detection and collection layer. The mill and processing facilities include specific components that are designed to handle such contingency events as summarized below. Details of these systems are also discussed in detail in **Section 4.1** through **Section 4.3**.

- Mill building sump. Any excessive spillage will migrate via gravity on the sealed concrete floor to the sump located at the lowest point within the building. In the event of sump overflow, any spillage that exits the building will flow to the ECS.
- Leach tank area sump. The leach tanks will be in a concrete containment area immediately adjacent to the ECS. Any leaks from the leach tanks will be confined
- within concrete lined areas. In the event of concrete containment overflow, spillage will flow by gravity via contiguous lined areas to the ECS.
- Emergency containment sump. The existing ECS was originally designed and constructed for use as a permanent tailings facility. It is double-lined (60-mil HDPE) with leak detection between liners and has the capacity to hold well in excess of all process water and collected runoff for the design storm and still maintain more than 10 feet of freeboard.

All emergency spillage that exceeds operating secondary containment capacities in their respective areas of the plant will migrate to the ECS. The Mill will shut down and treat all ECS water in the event any process water reports to the ECS. Process water will be treated through the cyanide detoxification system and be recycled as process water. Runoff collecting in the sump with be pumped into the recycle water tank inside the Mill building.

- FTD Filter building sump and sediment trap. The FTD filter building will house a drum filter that will recover liquid from the slurry delivered via a slurry pipeline from the mill. The filter building is constructed with a concrete floor as primary containment, and includes a sump and sediment trap. The sump feeds by gravity to the adjacent Collection Pond. Wash-down water and spillage within the Filter building runs to the sump prior to discharge into the Collection Pond. Filtrate (separated liquid) from the drum filter is pumped to a holding tank for settlement prior to gravity discharge into the Collection Pond. From the Collection Pond, filtrate as well as seepage and surface contact water collected from the FTD flow via gravity to the plant for reuse. Ultimately, the

ECS continues to function as the overall emergency collection for all liquids being managed within the mill and the tailings dewatering (filtration) process.

Pipes carrying tailings to the filter building and reclaim water back to the plant from the FTD Collection Pond will be double lined and buried where practical.

The disturbed surface water control system design is included for reference as **Appendix 7-1** for the Facility Surface Water Management Plan (SWMP). Important elements of this plan include:

- Runoff estimates that were generated using the criteria set forth by Urban Hydrology/or Small Watersheds, TR-55 by the USDA, NRCS, Conservation Engineering Division, dated June 1986. The Mill site 10-yr 24hr storm is 1.58-in for the 24hr event. The 100yr storm event is 2.48-in for the 24-hr event.
- NRCS mapping and classification for the study area soil as a Leadville Sandy Loam, with 3% to 35% slopes. The soils are well drained and consist of stony and cobbly, medium-textured alluvium; and stony and medium cobbly, medium textured till. The soils are assigned a Hydrologic Group C rating. A Runoff Curve Number (RCN) of 0.035 was used for the undisturbed drainage channels.
- Channel areas are designed to carry the 100-yr flows with at least a 0.5-ft freeboard. Channels are designed with 3:1 or 2.5: 1 side slopes at specified depths. Channels within disturbed areas may be seeded and lined with fiber mats and staked, as necessary.
- Surface flows from all disturbed areas will be directed to the terminal sediment retention pond. Small sedimentation traps have been installed to contain runoff and potential sediment migration from the ECS embankment and also report to the terminal pond. While revegetation is being established rock berms have been placed at the corners and South face of the ECS to control flows and sediment migration.
- Section 3 of the Drainage Report contains the design specifies that will be used to construct the disturbed area structures. The FTD catchment pond is constructed in the south end of the FTD area. The FTD is constructed in stages from south to north; however, the catchment pond will be constructed to include the entire proposed area (see **Section 4.4** for design details and capacities).
- The undisturbed surface water drainage system will primarily be constructed to minimize run-on to the disturbed area by using control channels or berms. Routed flows will be directed to undisturbed channels to minimize erosion while minimizing differences in original verses post-construction peak flows.

Model conclusions for stormwater conditions applied in the model:

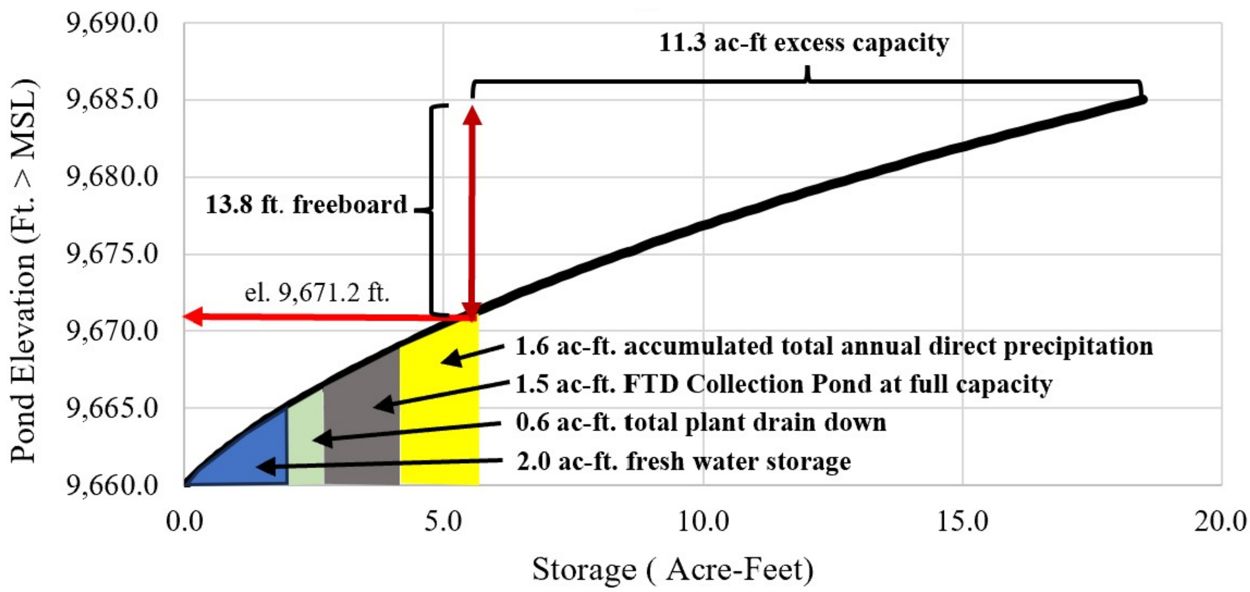
1. The FTD Collection Pond will retain the water from a 24-hour, 100-year discharge from the tailings disposal area under worst-case conditions of storm occurrence prior to the placement of any filtered tailings (see **Section 4.4**. for details). The model results indicate that at the maximum storage elevation of 9743.06-ft, or 6.06-ft of pond depth, will allow for maintenance of 1.9-ft of

operating freeboard. Once the design pond capacity has been reached, any excess collected fluids are routed via gravity to the Process Water Head Tanks and into the plant receiving water system. These flows then become part of the plant water system that is managed via the system of sumps as described above for the plant area facilities.

2. The ECS pond will retain the water from a 24-hour, 100-year discharge. The model results indicate that at the maximum storage elevation of 9662.74-ft, or 2.74-ft of pond depth, approximately 22.25-ft of freeboard will be maintained. **Figure 7-5** is a stage/storage/area curve for the ECS that also illustrates the relative contributions from annual direct precipitation and snowmelt, 2.0 acre-feet of freshwater storage, and the equivalent capacity reserved for a catastrophic failure event that assumes complete drain-down of all fluids contained within the process circuit of the mill including the tailings filtration plant and Collection Pond volumes. The ECS maintains capacity to store all these volumes and still maintain a freeboard of 13.8-ft. This conclusion validates that status of the facility as being zero discharge from the perspective of off-site release of potential process pollutants from active operations. The only expected offsite flows from non-contact water sources on the site will pass through the terminal sediment and detention basin and through sampling Outfall No. 1 prior to entering the California Gulch drainage system.

3. In terms of sediment management, the peak flow that is expected under the 100-yr./24-hr. storm event scenario (refer to **Figure 7-4**, and **Appendix 7-1** - summary for Pond 5P), approximately 1.9 ac-ft of runoff is generated. The current management philosophy is to provide adequate pond depth (10-ft is being considered) and capacity (possibly greater than 0.5 ac-ft) to maximize settling of any suspended solids and to reduce discharge velocities over the planned armored weir of the pond spillway to less than 3 fps. If these design measures are implemented, we believe that the potential for any offsite discharge at Outfall 1 of carried sediment is minimal. In addition, numerous upgradient control structures such as check dams, aggregate waddles, and other flow dissipation features in the contributing Subcatchments will increase the effectiveness of the sediment detention pond functionality.

Figure 7-5: ECS Storage Curve with Accumulated Input



7.1.3 GROUNDWATER CONTROL MEASURES

The containment design and surface-water control system discussed above effectively prevent spills from affecting the underlying groundwater. The proposed detection-level groundwater monitoring program provides a mechanism to validate this conclusion.

The proposed additional operating measures also prevent impacts to site existing hydrogeological and geochemical characteristics as follows:

- The operation complies with the commitments outlined in the approved CDPHE storm water permit as detailed under Exhibit U. This plan prevents any long-term surface ponding that would result in percolation to the water table.
- The proposed standard operating procedures (SOPs) emphasize the immediate detection and removal of potential spillage or leakage at de minimis volumes. These are also detailed in Exhibit U.
- Chemical releases will be reported, monitored and remediated as presented in Exhibit U.

The proposed detection level groundwater monitoring system includes the wells summarized in **Table 7-1**, and shown below.

TABLE 7-1: MONITORING WELLS

Well	Well Completion Depth (ft.)	Water Table Elevation (ft.)	Gradient Position
BMW-1	1,244	9979	Regional Up Gradient
PZ-4	137	9897	Regional Up Gradient
MA1TMW-4	85	9718	FTD Up Gradient
LM-MW-2	56	9651	ECS Down Gradient
LM-MW-3	71	9684	FTD Down Gradient ECS Up Gradient
MW13	100	9594	Regional Down Gradient
MW13A	25	9600	Regional Down Gradient

These wells are monitored quarterly using the sample collection and statistical analyses protocols included in the Groundwater Monitoring Plan. The plan was designed to detect changes in regional groundwater chemistry as well as detect the presence of compounds specific to the Mill that might be related to a site release.

7.2 AFFECTING SURFACE OR GROUNDWATER SYSTEMS

As detailed under **Section 7.1**, the planned operation will not affect surface or groundwater systems. No on-going water treatment exists or is anticipated as the Mill process circuit is closed loop and zero discharge. The groundwater beneath the site is within an unnamed alluvial aquifer. Depth to groundwater exceeds 80-ft with the footprint of the mill site, and therefore no dewatering activities are anticipated for construction activities or during operations.

7.3 PROJECT WATER REQUIREMENTS

The project water requirement is based on metallurgical test work which in turn was used to develop the process flow sheet (**Figure 4-2**). This is discussed in **Exhibit D**, **Section 4.3** of this report. **Table 7-2** summarizes the water requirements.

TABLE 7-2: PROCESS MATERIAL BALANCE

Stream	PFD	Description	Solids %	Flow Rate			Capacity			Contained Reagents @ Steady State (lbs)							
				Solids	Water	Slurry (gpm)	Solids (tons)	Water (tons)	Water (gallons)	Lime	Flocculent	Caustic Soda	Sodium Cyanide	Zinc Oxide	Lead Nitrate	Diatomaceous Earth	Ferrous Sulfate
Area 100 - Crusher																	
1	1	MDM Bunker	96%	-	-	-	800.0	8.3	1,989	-	-	-	-	-	-	-	-
2	1	Feed Hopper	96%	54.3	2.3	-	9.6	0.4	96	-	-	-	-	-	-	-	-
3	1	Jaw Crusher (provision)	96%	54.3	2.3	-	-	-	-	-	-	-	-	-	-	-	-
4	1	feed to Screen	96%	54.3	2.3	-	0.0	0.0	0	-	-	-	-	-	-	-	-
5	1	to Cone Crusher	96%	10.9	0.5	-	0.0	0.0	0	-	-	-	-	-	-	-	-
6	1	to Screen	96%	10.9	0.5	-	0.0	0.0	0	-	-	-	-	-	-	-	-
Area 200 - Grinding																	
7	2	Screen to Fine MDM Bin	96%	54.3	2.3	-	268.8	11.2	2,684	2,150	-	-	-	-	-	-	-
8	2	feed to Ball Mill	57%	18.6	13.8	81	-	-	-	-	-	-	-	-	-	-	-
9	2	to Sump	26%	25.6	136.4	610	1.4	1.1	264	11	-	-	-	-	-	-	-
10	2	to Cyclone	26%	45.7	136.4	610	-	-	-	-	-	-	-	-	-	-	-
11	2	Cyclone U/F to Ball Mill	50%	18.6	13.8	74	-	-	-	-	-	-	-	-	-	-	-
12	2	O/F to PLT	18%	20.0	30.0	536	13.2	19.8	4,745	106	-	-	-	-	-	-	-
Area 300 - Leaching																	
13	3	PLT U/F to ALTs	40%	20.0	30.0	150	370.0	550.0	131,808	2,960	-	37	1,480	-	-	-	-
14	3	ALTs to Leach Holding Tank	40%	20.0	30.0	150	44.0	66.0	15,817	352	-	4.4	176	-	-	-	-
Area 400 - Merill-Crowe Circuit																	
15	4	Leach Head Tank	40%	20.0	30.0	150	0.8	1.3	400	6.4	0.11	0.08	3.2	-	-	-	-
16	4	Leach Filter	40%	20.0	30.0	150	3.5	5.5	1,650	28	0.07	0.4	14	-	-	-	-
17		to PLS Tank	0%	0.0	30.0	94	0.0	46	11,000	-	-	-	0.0	-	-	-	-
18	4	to Clarifier	0%	0.0	30.0	94	0.0	"	"	-	-	-	-	-	-	-	-
19	4	to Deareation (Vaccum)	0%	0.0	30.0	94	0.0	"	"	-	-	-	-	-	-	-	-
20	4	Air Vent to atmosphere	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Precipitate Preparation for Refinery																	
21	4	to Precipitate Filter Press	trace	0.0	30.0	94	0.0	0.0	0	-	-	-	-	-	-	-	-
I	4	Add Zinc	100%	100.0	0.0	0	3.0	-	-	-	-	-	-	308	-	-	-
J	4	Add Diatomaceous Earth	100%	100.0	0.0	0	3.0	-	-	-	-	-	-	-	-	28	-
K	4	Add Lead Nitrate (Optional)	0%	0.0	100.0	trace	0.0	-	-	-	-	-	-	-	0	-	-
L	4	Zinc Cone Mixer (lb/wk)	-	-	-	-	-	336.0	-	-	-	-	-	-	-	-	-
M	4	PLS Bleed to Cone Mixer	-	-	-	trace	-	-	-	-	-	-	-	-	-	-	-
N	4	Precip. Bleed to Lead Nitrate Tank		-	-	trace											
	4	**Zn Filter Cake to furnace**	**80%**	**336**	**trace**	**-**	**-**	**-**	**-**	**0**	**0**	**0**	**0**	**308**	**0**	**28**	**0**
T	4	Barren Solution to Reclaim Water	0.00%	0.000	23.5	94	0.0	0.0	0	-	-	-	-	-	-	-	-
Area 500 - Cyanide Detox Circuit																	
22	5	Detox Repulp Tank	50%	20.00	20.00	109	11.8	11.8	3,800	94	0	1.2	13	-	-	-	-
23	5	Detox Tanks	50%	20.00	20.00	109	23.6	23.6	7,600	189	0	2.4	26	-	-	-	11.8
Area 850 - FTD Filter Circuit			50%			109											
24	5	to FTD Head Tank	50%	20.00	20.00	109	2.3	2.3	3,000	18	0.0	0.23	10	-	-	-	1
25	5	to FTD Filter	50%	20.00	20.00	109	5.0	5.0	1,650	40	0	0.50	6	-	-	-	3
26	**5**	**Tailings to FTD**	**75%**	**20.00**	**6.67**	**82**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
U	5	FTD Filter Water to Reclaim	0%	0.00	13.33	53	0.0	0.0	0								

Water requirements are a function of process plant operating rate. **Table 7-3** below shows water requirements at the maximum plant capacity of 400 tons per day.

Development and reclamation water requirements are de minimis.

TABLE 7-3: WATER REQUIREMENT

Consumption Rate	Tons Water	Gallons Water(1)	Acre-ft(1)
Hourly (unit/hr)	3.5	840	0.002578
Daily (unit/day @ 24-hr/day)	84	20,160	0.06187
Monthly (unit/mo. @30.42day/mo.)	2,555	613,267	1.88
Annual (unit/yr. @ 365-day/yr.)	30,660	7,358,400	22.6

The ECS volume, excluding freeboard, is 5.6 million gallons.

Based on the anticipated consumptive use of water in the process, the facility will operate under a significant deficit and therefore all direct collected precipitation and snowmelt could be consumed or could be re-applied as infiltration in defined controlled basin within the operation, or for revegetation irrigation and dust control water. This approach could virtually eliminate accumulation and/or evaporative losses and therefore eliminate the need for augmentation plans for consumptive industrial uses.

The driving philosophy of this approach is to simulate direct precipitation and snowmelt in the small areas of the lined ponds (ECS and Filtrate and Seepage Collection Pond) assuming that original native ground conditions and vegetative cover existed. Under typical annual precipitation years, approximately 1.8 acre-feet of excess impounded waters could be subject to his general mitigation methodology.

7.4 PROJECT WATER SOURCE

3 sourcing options for water supply are under consideration:

- On-site water well;
- Leadville Sanitation;
- Parkville Water District, industrial user purchase

The selected water source will be provided prior to commencement of plant operation.

7.5 NPDES PERMIT

As the planned facility has been demonstrated to be a zero-discharge operation in terms of process pollutant discharge, it is exempt from the requirement to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Water Quality Control Division at the Colorado Department of Health and Environment.

7.6 GROUNDWATER POINT OF COMPLIANCE

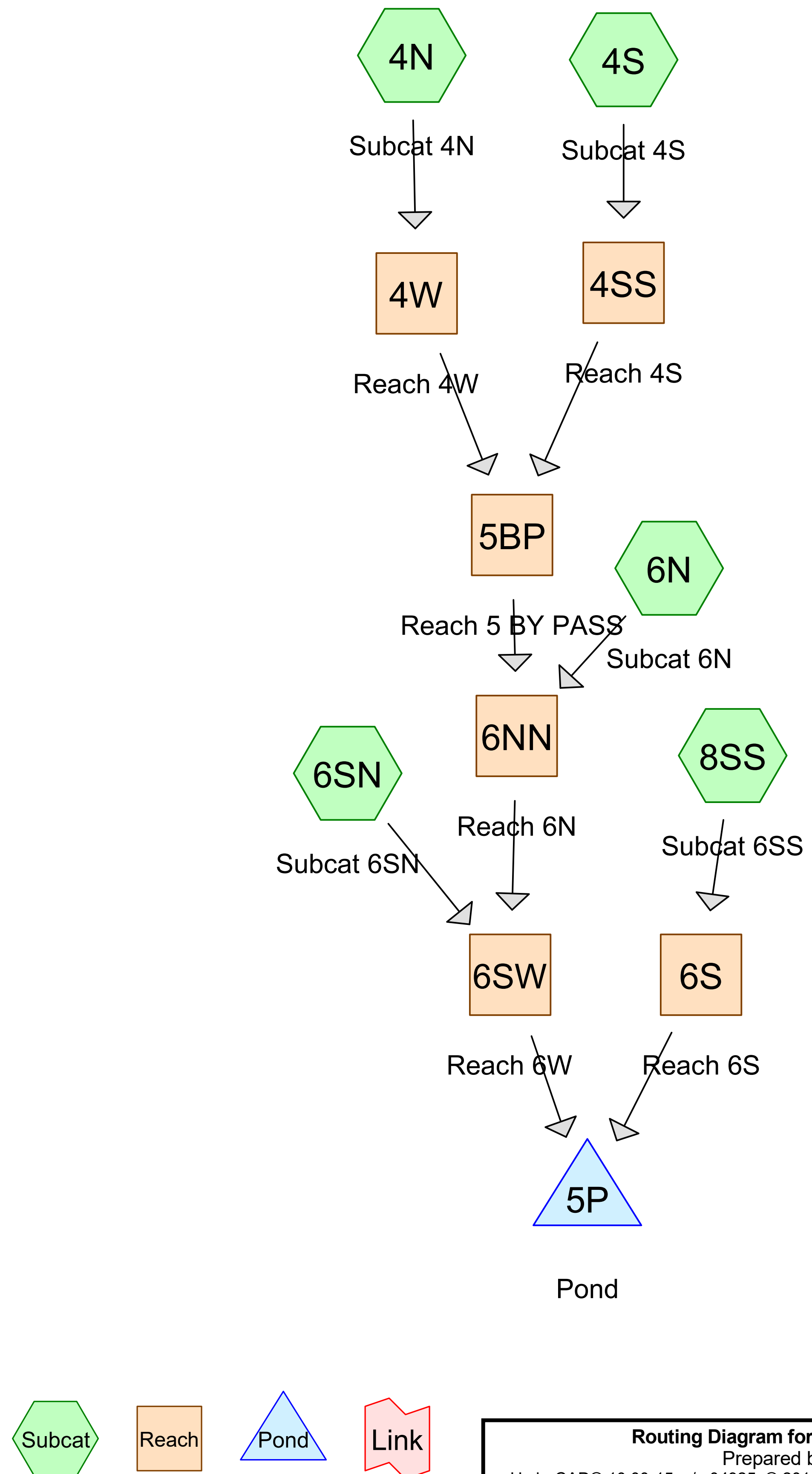
Groundwater monitoring is discussed in **Section 7.2** above and in the Groundwater Monitoring Plan. The Mill site groundwater flows generally from the northeast to the southwest. This flow direction establishes wells as follows:

Well	Gradient
BMW -1	Regional – Up Gradient
PZ-4	Regional – Up Gradient
MA1TMW-4	FTD – Up Gradient
LM-MW-2	ECS – Down Gradient
LM-MW-3	FTD – Down Gradient, and ECS – Up Gradient
MW-13	Regional – Down Gradient
MW-13A	Regional – Down Gradient

LM-MW-3 is down-gradient of all process facilities and infrastructure making it the point of compliance.

APPENDIX 7-1

SURFACE WATER MODEL OUTPUT



Routing Diagram for 1-15-24 Outfall 1
Prepared by AEC
HydroCAD® 10.00-15 s/n 04925 © 2015 HydroCAD Software Solutions LLC

Summary for Subcatchment 4N: Subcat 4N

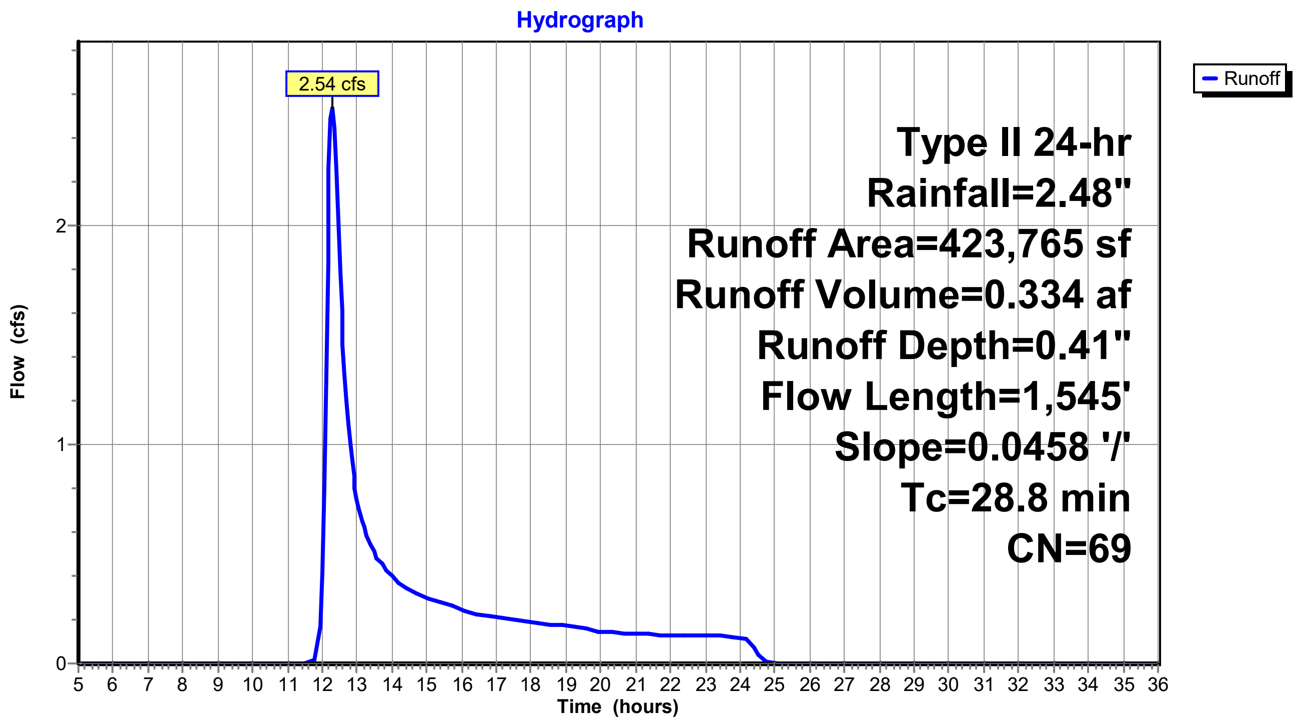
Runoff = 2.54 cfs @ 12.29 hrs, Volume= 0.334 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=2.48"

	Area (sf)	CN	Description
*	423,765	69	
	423,765		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	1,545	0.0458	0.89		**Lag/CN Method, 4N**

Subcatchment 4N: Subcat 4N



Summary for Subcatchment 4S: Subcat 4S

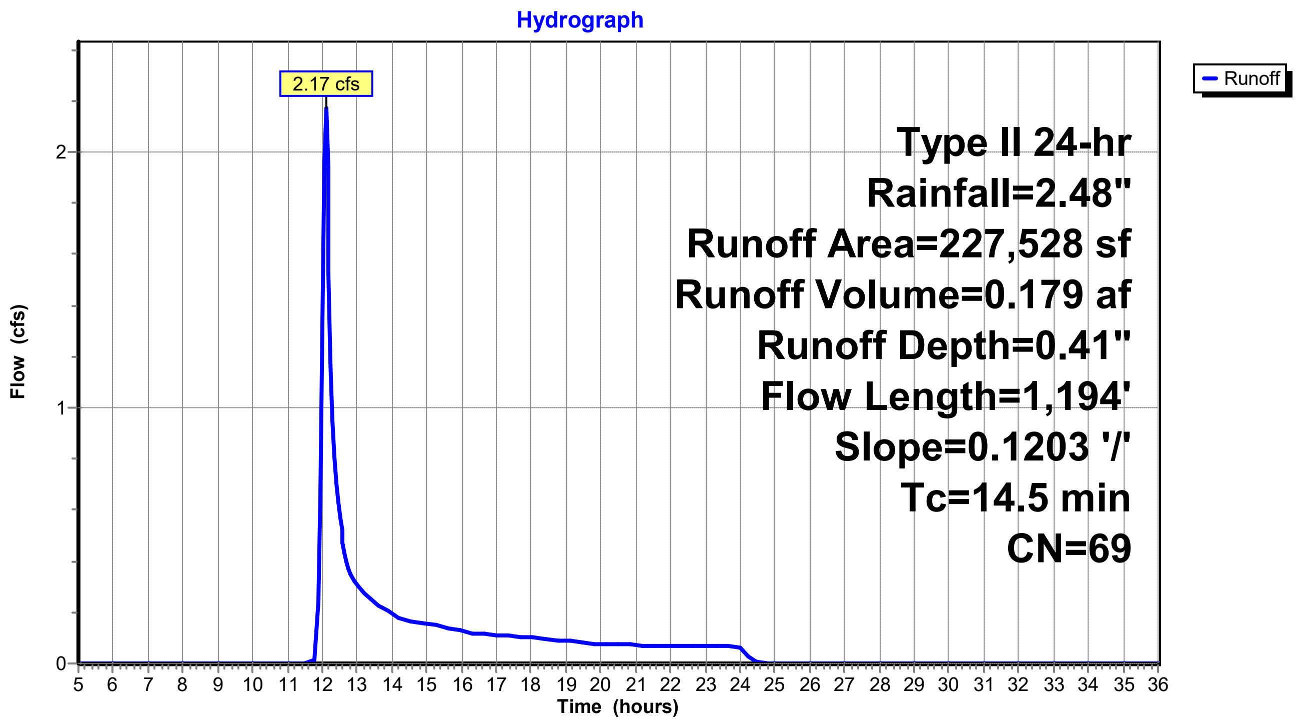
Runoff = 2.17 cfs @ 12.10 hrs, Volume= 0.179 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=2.48"

	Area (sf)	CN	Description
*	227,528	69	
	227,528		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	1,194	0.1203	1.37		**Lag/CN Method, 4S**

Subcatchment 4S: Subcat 4S



Summary for Subcatchment 6N: Subcat 6N

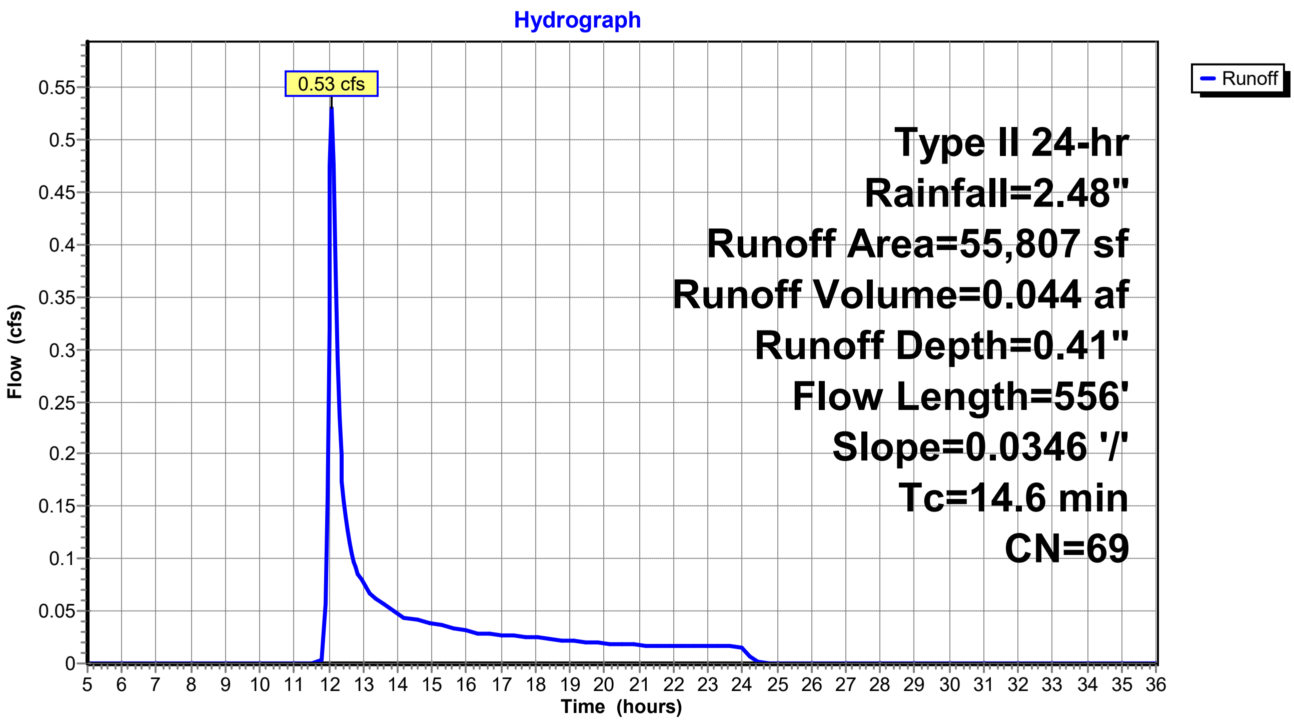
Runoff = 0.53 cfs @ 12.10 hrs, Volume= 0.044 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=2.48"

	Area (sf)	CN	Description
*	55,807	69	
	55,807		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	556	0.0346	0.63		**Lag/CN Method, Subcat 6n**

Subcatchment 6N: Subcat 6N



Summary for Subcatchment 6SN: Subcat 6SN

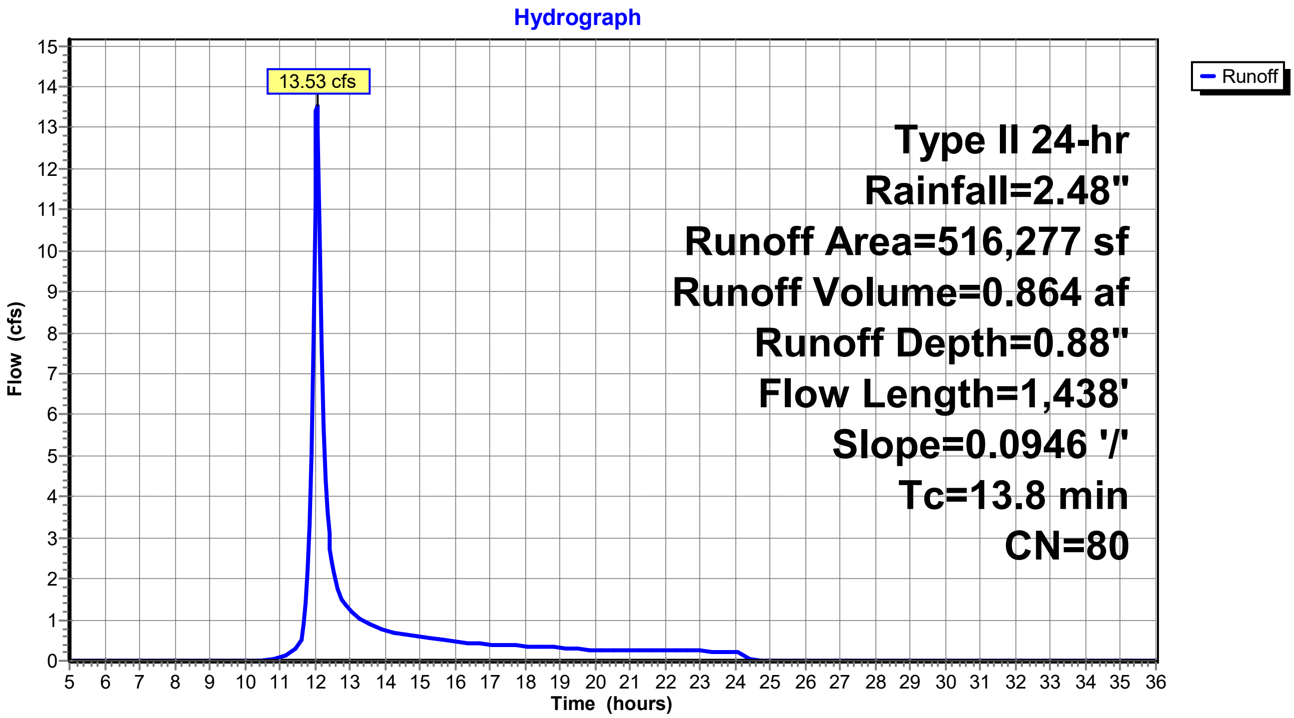
Runoff = 13.53 cfs @ 12.07 hrs, Volume= 0.864 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=2.48"

	Area (sf)	CN	Description
*	206,511	69	
*	309,766	87	
	516,277	80	Weighted Average
	516,277		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	1,438	0.0946	1.73		**Lag/CN Method, Subcat 6SN**

Subcatchment 6SN: Subcat 6SN



Summary for Subcatchment 8SS: Subcat 6SS

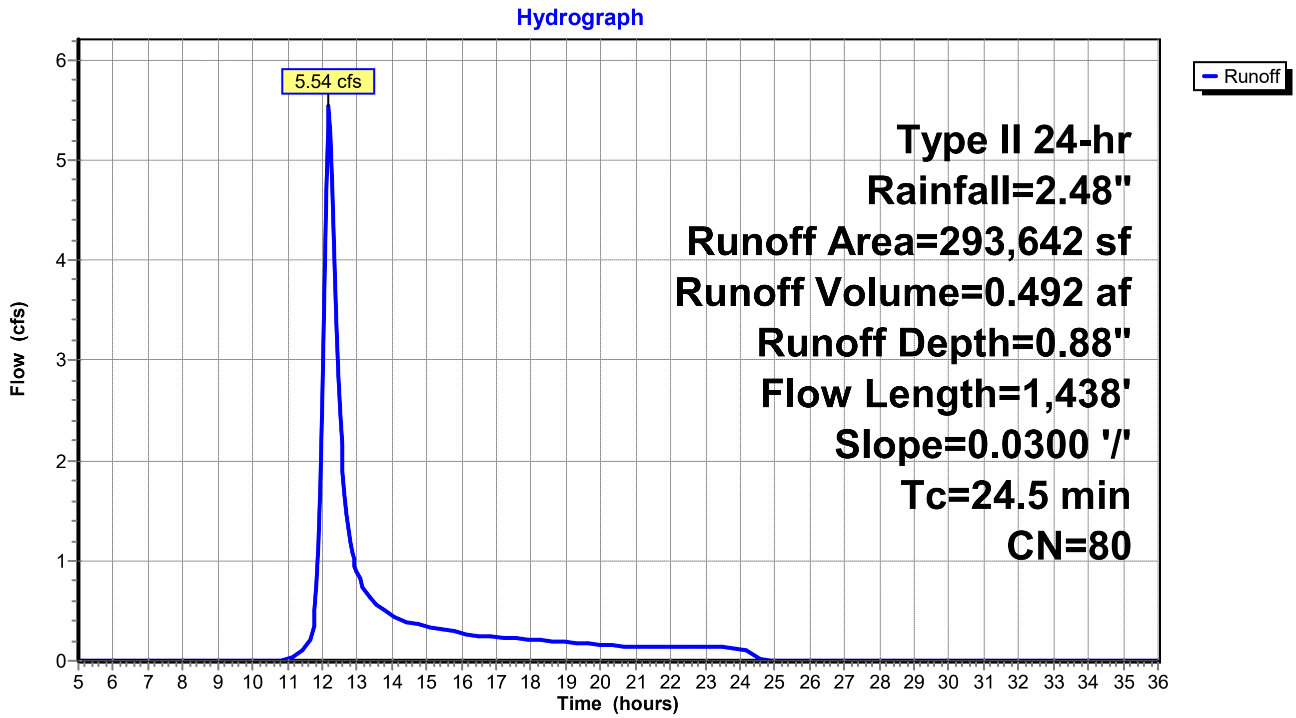
Runoff = 5.54 cfs @ 12.19 hrs, Volume= 0.492 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr Rainfall=2.48"

	Area (sf)	CN	Description
*	117,453	69	
*	176,189	87	
	293,642	80	Weighted Average
	293,642		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	1,438	0.0300	0.98		**Lag/CN Method, Subcat 6SS**

Subcatchment 8SS: Subcat 6SS



Summary for Reach 4SS: Reach 4S

Inflow Area = 5.223 ac, 0.00% Impervious, Inflow Depth = 0.41"
Inflow = 2.17 cfs @ 12.10 hrs, Volume= 0.179 af
Outflow = 1.68 cfs @ 12.31 hrs, Volume= 0.179 af, Atten= 23%, Lag= 12.6 min

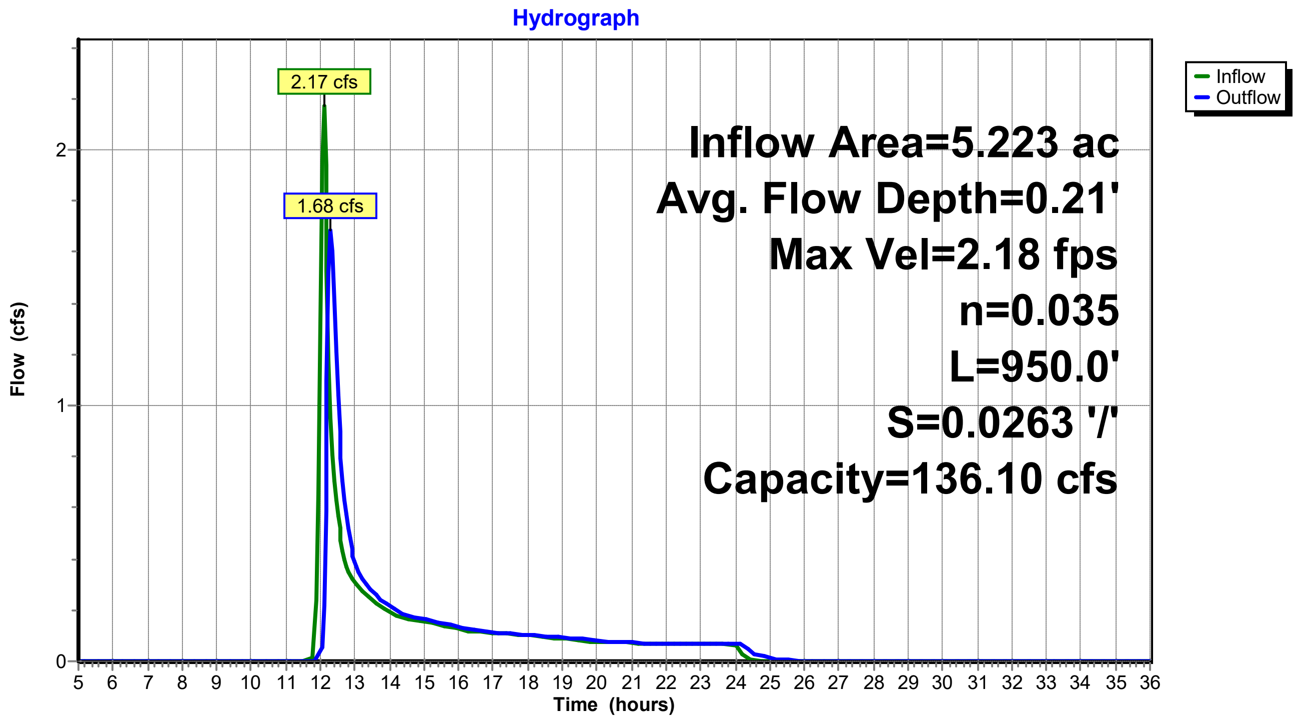
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.18 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 19.7 min

Peak Storage= 740 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 136.10 cfs

3.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 950.0' Slope= 0.0263 '/'
Inlet Invert= 9,780.00', Outlet Invert= 9,755.00'

‡

Reach 4SS: Reach 4S



Summary for Reach 4W: Reach 4W

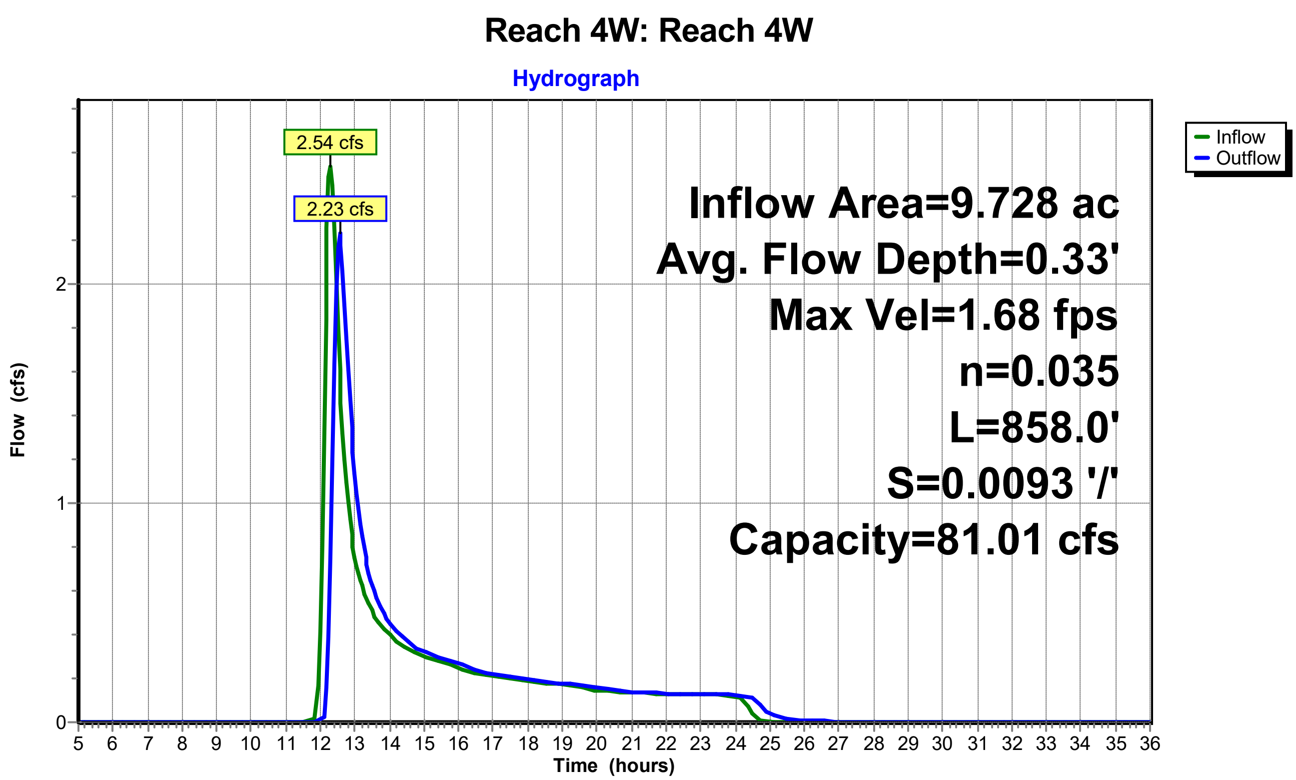
Inflow Area = 9.728 ac, 0.00% Impervious, Inflow Depth = 0.41"
Inflow = 2.54 cfs @ 12.29 hrs, Volume= 0.334 af
Outflow = 2.23 cfs @ 12.55 hrs, Volume= 0.334 af, Atten= 12%, Lag= 15.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.68 fps, Min. Travel Time= 8.5 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 22.3 min

Peak Storage= 1,146 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 81.01 cfs

3.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 858.0' Slope= 0.0093 '/'
Inlet Invert= 9,763.00', Outlet Invert= 9,755.00'

‡



Summary for Reach 5BP: Reach 5 BY PASS

[62] Hint: Exceeded Reach 4SS OUTLET depth by 0.19' @ 12.60 hrs
[62] Hint: Exceeded Reach 4W OUTLET depth by 0.02' @ 12.75 hrs

Inflow Area = 14.952 ac, 0.00% Impervious, Inflow Depth = 0.41"
Inflow = 3.21 cfs @ 12.49 hrs, Volume= 0.513 af
Outflow = 3.17 cfs @ 12.59 hrs, Volume= 0.513 af, Atten= 1%, Lag= 6.1 min

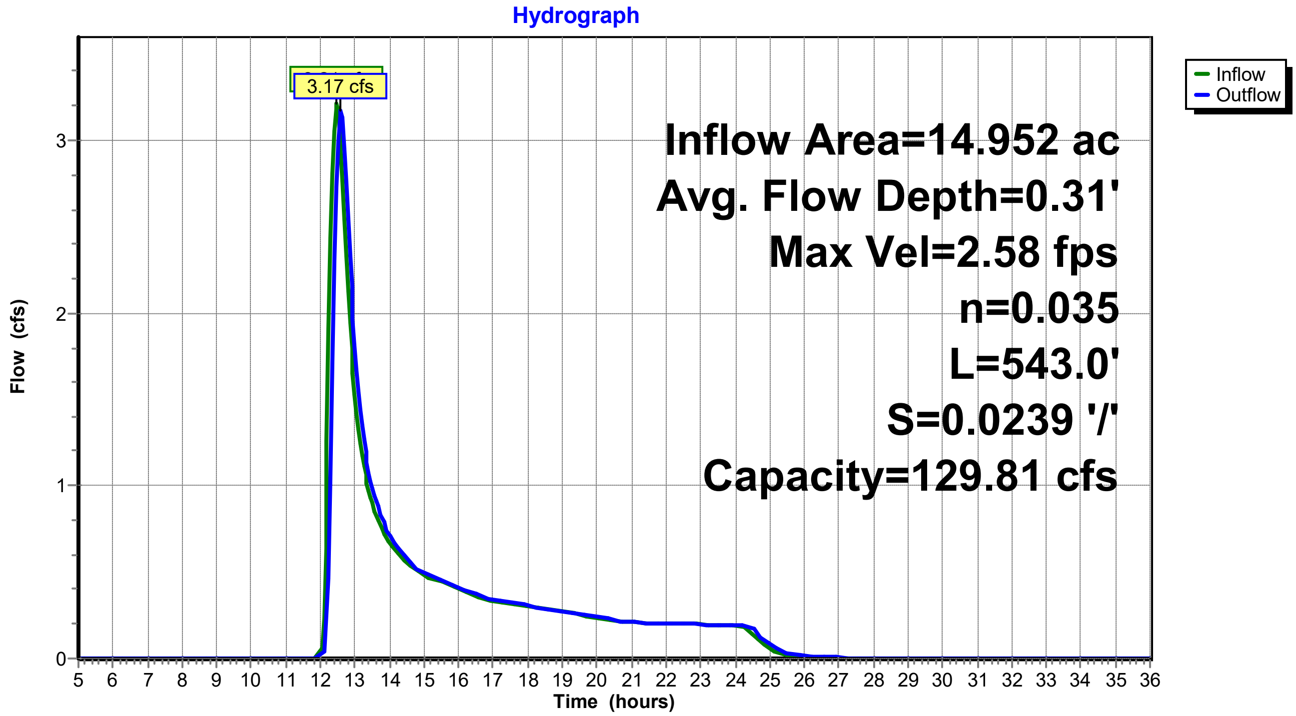
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.58 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 8.9 min

Peak Storage= 667 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 129.81 cfs

3.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 543.0' Slope= 0.0239 '/'
Inlet Invert= 9,755.00', Outlet Invert= 9,742.00'

‡

Reach 5BP: Reach 5 BY PASS



Summary for Reach 6NN: Reach 6N

[62] Hint: Exceeded Reach 5BP OUTLET depth by 0.07' @ 12.10 hrs

Inflow Area = 16.233 ac, 0.00% Impervious, Inflow Depth = 0.41"
Inflow = 3.29 cfs @ 12.58 hrs, Volume= 0.557 af
Outflow = 3.26 cfs @ 12.67 hrs, Volume= 0.557 af, Atten= 1%, Lag= 5.0 min

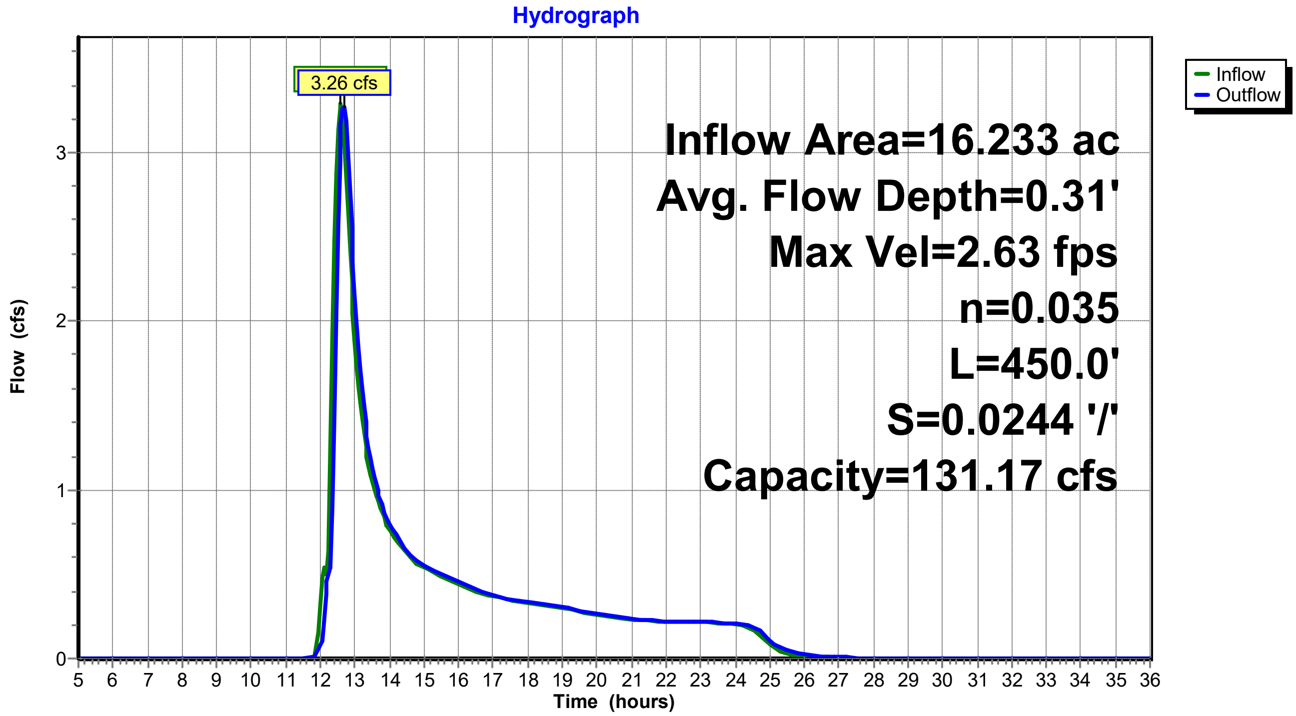
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.63 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 7.2 min

Peak Storage= 559 cf @ 12.62 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 131.17 cfs

3.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 450.0' Slope= 0.0244 '/'
Inlet Invert= 9,742.00', Outlet Invert= 9,731.00'

‡

Reach 6NN: Reach 6N



Summary for Reach 6S: Reach 6S

Inflow Area = 6.741 ac, 0.00% Impervious, Inflow Depth = 0.88"
Inflow = 5.54 cfs @ 12.19 hrs, Volume= 0.492 af
Outflow = 5.14 cfs @ 12.36 hrs, Volume= 0.492 af, Atten= 7%, Lag= 9.9 min

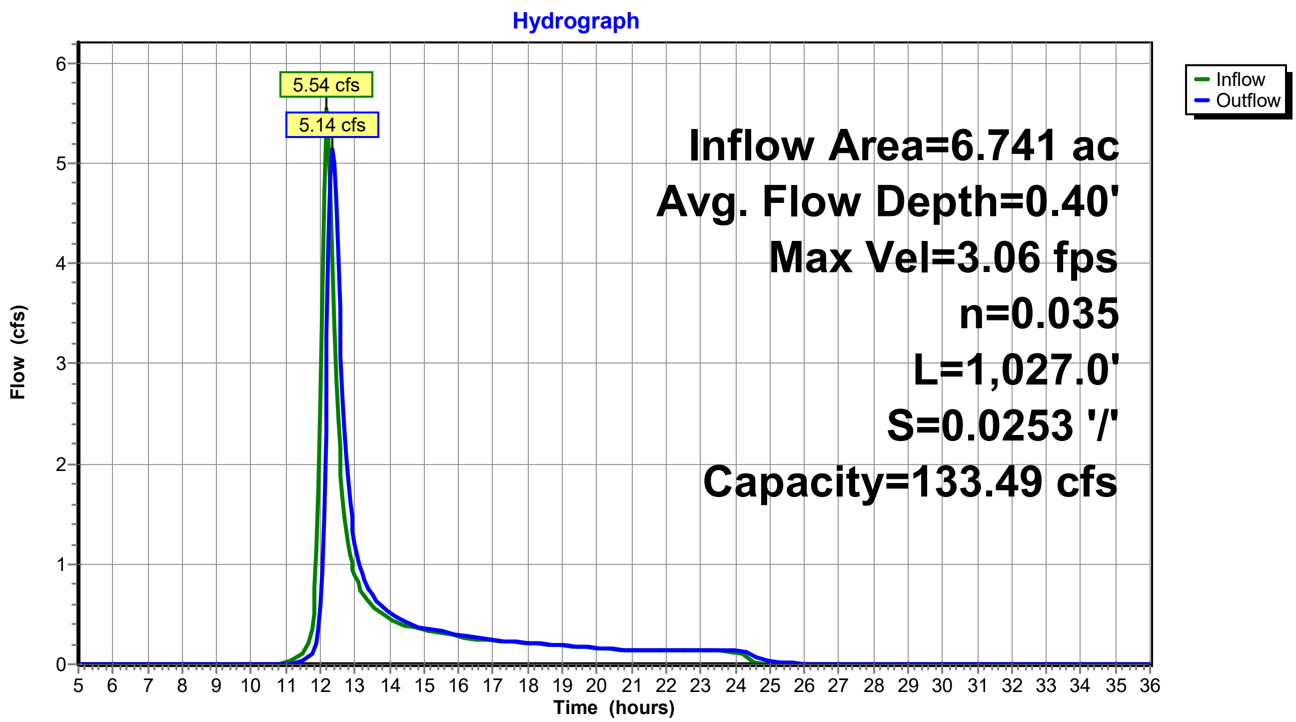
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.06 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 17.3 min

Peak Storage= 1,733 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 133.49 cfs

3.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 1,027.0' Slope= 0.0253 '/'
Inlet Invert= 9,690.00', Outlet Invert= 9,664.00'

‡

Reach 6S: Reach 6S



Summary for Reach 6SW: Reach 6W

[62] Hint: Exceeded Reach 6NN OUTLET depth by 0.40' @ 12.05 hrs

Inflow Area = 28.085 ac, 0.00% Impervious, Inflow Depth = 0.61"
Inflow = 13.67 cfs @ 12.07 hrs, Volume= 1.421 af
Outflow = 13.04 cfs @ 12.14 hrs, Volume= 1.421 af, Atten= 5%, Lag= 4.0 min

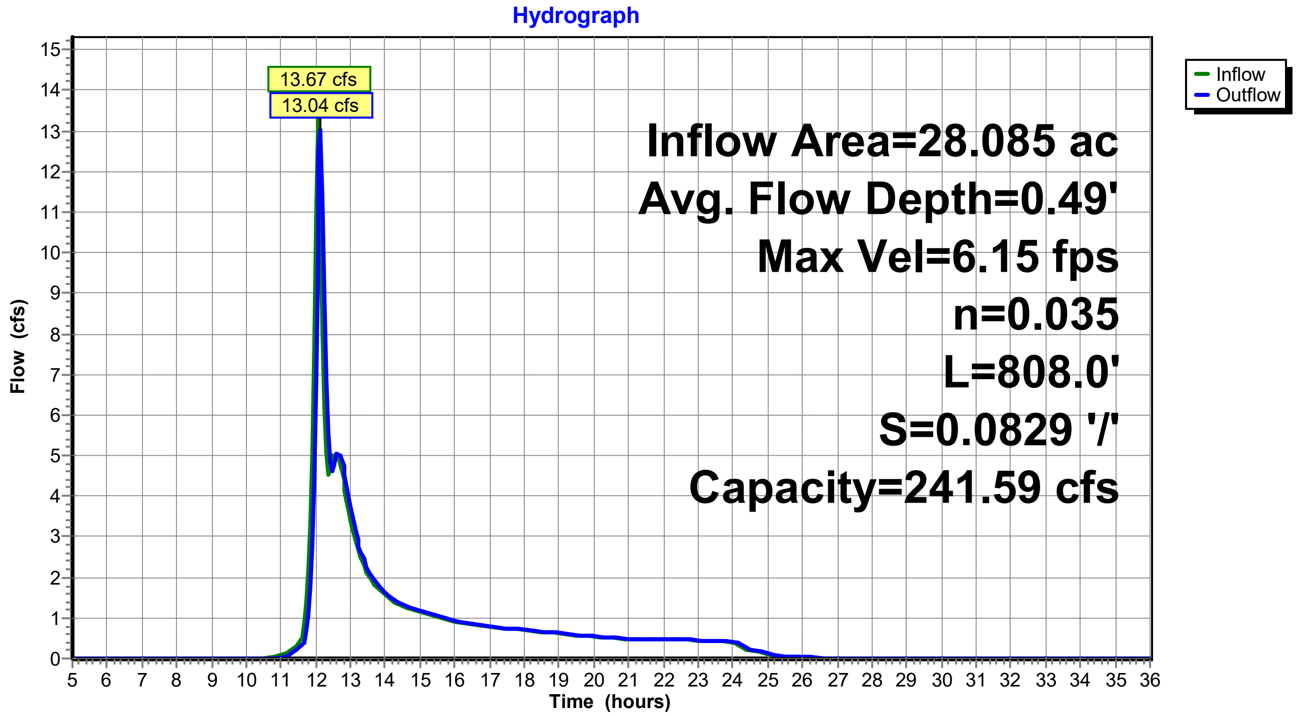
Routing by Stor-Ind+Trans method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.15 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 6.7 min

Peak Storage= 1,749 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 241.59 cfs

3.00' x 2.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 808.0' Slope= 0.0829 '/'
Inlet Invert= 9,731.00', Outlet Invert= 9,664.00'

‡

Reach 6SW: Reach 6W



Summary for Pond 5P: Pond

Inflow Area = 34.826 ac, 0.00% Impervious, Inflow Depth = 0.66"
Inflow = 15.29 cfs @ 12.16 hrs, Volume= 1.913 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 9,662.27' @ 36.00 hrs Surf.Area= 0.410 ac Storage= 1.913 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	9,656.00'	2.680 af	**96.00'W x 96.00'L x 8.00'H Prismatoid Z=3.0**

Pond 5P: Pond