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Birmingham Coal & Coke Company, Inc.
Knight Mine, P-3970
Detailed Design Plan Basin 038

4.7 Inches, 25 Year - 6 Hour,

SCS 6 Hour

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General Information

Storm Information:

Storm Type:	SCS 6 Hour
Design Storm:	25 yr - 6 hr
Rainfall Depth:	4.700 inches

Particle Size Distribution:

Size (mm)	Topsoil	Spoil
3.0000	100.000%	100.000%
2.0000	98.000%	92.000%
1.0000	96.000%	78.000%
0.5000	94.000%	54.000%
0.3000	88.000%	43.000%
0.2000	80.000%	34.000%
0.1000	68.000%	22.000%
0.0500	49.000%	15.000%
0.0300	36.000%	9.000%
0.0200	28.000%	5.000%
0.0100	14.000%	4.000%
0.0050	5.000%	3.000%
0.0030	4.000%	2.500%
0.0010	2.000%	2.000%
0.0001	0.001%	0.001%

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Basin 038

#1
Pond

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#1	In	18.400	18.400	43.73	4.21	2,370.1	551,555	421.01	265.25
	Out			9.65	4.21	63.0	12,774	0.00	0.00

Particle Size Distribution(s) at Each Structure

Structure #1:

Size (mm)	In	Out
3.0000	100.000%	100.000%
2.0000	98.946%	100.000%
1.0000	83.889%	100.000%
0.5000	58.077%	100.000%
0.3000	46.247%	100.000%
0.2000	36.567%	100.000%
0.1000	23.661%	100.000%
0.0500	16.133%	100.000%
0.0300	9.680%	100.000%
0.0200	5.378%	100.000%
0.0100	4.302%	100.000%
0.0050	3.227%	100.000%
0.0030	2.689%	100.000%
0.0010	2.151%	80.910%
0.0001	0.001%	0.040%

Structure Detail:

Structure #1 (Pond)

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Pond Inputs:

Initial Pool Elev:	841.90 ft
Initial Pool:	1.24 ac-ft
*Sediment Storage:	1.30 ac-ft
Dead Space:	20.00 %

**Sediment capacity calculated from 0.075 times disturbed area*

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
18.00	130.00	2.00	0.0240	841.90	0.90	0.00

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
844.20	20.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	844.40 ft
H'graph Detention Time:	2.83 hrs
Pond Model:	CSTRS
Dewater Time:	1.23 days
Trap Efficiency:	97.34 %

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
839.83	0.498	0.000	0.000		Top of Sed. Storage
840.00	0.520	0.088	0.000		
840.20	0.538	0.193	0.000		
840.70	0.583	0.473	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
841.20	0.631	0.777	0.000		
841.70	0.680	1.105	0.000		
841.90	0.700	1.243	0.000		Spillway #1
842.20	0.731	1.457	0.594	20.90	
842.70	0.784	1.836	2.251	3.65	
843.20	0.839	2.242	4.630	1.50	
843.70	0.896	2.675	6.703	0.95	
844.00	0.930	2.949	8.127	0.45	
844.20	0.954	3.137	8.514	0.70	Spillway #2
844.40	0.979	3.338	9.646	1.35	Peak Stage
844.70	1.014	3.629	11.294		
845.00	1.051	3.939	29.282		

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
839.83	0.000	0.000	0.000
840.00	0.000	0.000	0.000
840.20	0.000	0.000	0.000
840.70	0.000	0.000	0.000
841.20	0.000	0.000	0.000
841.70	0.000	0.000	0.000
841.90	0.000	0.000	0.000
842.20	(3)>0.594	0.000	0.594
842.70	(3)>2.251	0.000	2.251
843.20	(3)>4.630	0.000	4.630
843.70	(1)>6.703	0.000	6.703
844.00	(6)>8.127	0.000	8.127
844.20	(6)>8.514	0.000	8.514
844.70	(6)>9.104	2.189	11.294
845.00	(6)>9.436	19.846	29.282

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	17.300	0.133	0.000	0.000	81.000	F	41.68	3.781
	2	1.100	0.001	0.000	0.000	100.000	F	4.01	0.429
	Σ	**18.400**						**43.73**	**4.210**

Subwatershed Sedimentology Detail:

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#1	1	0.240	200.00	25.00	0.9000	1.0000	2	2,370.1	562,668	429.50	291.57
	2	0.001	50.00	0.01	0.0010	1.0000	1	0.0	0	0.00	0.00
	Σ							**2,370.1**	**551,555**	**421.01**	**265.25**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	4.61	25.00	542.00	2.140	0.070
		8. Large gullies, diversions, and low flowing streams	2.38	25.00	1,052.01	4.620	0.063
#1	**1**	**Time of Concentration:**					**0.133**