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Birmingham Coal & Coke Company, Inc.
Knight Mine, P-3970
Detailed Design Plan Basin 056

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 056

#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	15.830	15.830	43.73	3.62	431.1	132,521	101.50	64.37
	Out			12.15	3.62	10.8	2,714	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	92.000%	100.000%
1.0000	78.000%	100.000%
0.5000	54.000%	100.000%
0.3000	43.000%	100.000%
0.2000	34.000%	100.000%
0.1000	22.000%	100.000%
0.0500	15.000%	100.000%
0.0300	9.000%	100.000%
0.0200	5.000%	100.000%
0.0100	4.000%	100.000%
0.0050	3.000%	100.000%
0.0030	2.500%	99.711%
0.0010	2.000%	79.769%
0.0001	0.001%	0.040%

Structure Detail:

Structure #1 (Pond)

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Pond Inputs:

Initial Pool Elev:	895.00 ft
Initial Pool:	1.61 ac-ft
*Sediment Storage:	1.55 ac-ft
Dead Space:	20.00 %

**Sediment capacity calculated from 0.100 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)
24.00	120.00	2.00	0.0240	895.00	0.90	0.00

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
897.10	20.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	897.04 ft
H'graph Detention Time:	1.71 hrs
Pond Model:	CSTRS
Dewater Time:	0.81 days
Trap Efficiency:	97.49 %

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)	
891.85	0.410	0.000	0.000		Top of Sed. Storage
892.00	0.419	0.061	0.000		
892.50	0.449	0.278	0.000		
893.00	0.481	0.511	0.000		
893.50	0.514	0.759	0.000		
894.00	0.548	1.025	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
894.50	0.583	1.308	0.000		
895.00	0.619	1.608	0.000		Spillway #1
895.50	0.665	1.929	1.486	14.90	
896.00	0.712	2.273	4.189	1.60	
896.50	0.761	2.641	7.695	1.10	
897.00	0.812	3.035	11.847	1.75	
897.04	0.816	3.066	12.148	0.20	Peak Stage
897.10	0.822	3.116	12.645		Spillway #2
897.50	0.864	3.454	25.111		
898.00	0.918	3.899	42.701		
898.50	0.974	4.372	75.171		
899.00	1.031	4.873	118.746		
899.50	1.090	5.403	173.154		
900.00	1.150	5.963	238.298		
900.50	1.252	6.564	314.358		
901.00	1.359	7.216	401.694		
901.50	1.470	7.923	500.566		
902.00	1.585	8.686	611.377		
902.50	1.704	9.509	734.410		
903.00	1.828	10.391	870.052		
903.50	1.956	11.337	1,018.624		
904.00	2.089	12.349	1,180.451		
904.50	2.226	13.427	1,355.891		
905.00	2.367	14.575	1,545.227		

Detailed Discharge Table

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
891.85	0.000	0.000	0.000
892.00	0.000	0.000	0.000
892.50	0.000	0.000	0.000
893.00	0.000	0.000	0.000
893.50	0.000	0.000	0.000
894.00	0.000	0.000	0.000
894.50	0.000	0.000	0.000
895.00	0.000	0.000	0.000
895.50	(3)>1.486	0.000	1.486
896.00	(3)>4.189	0.000	4.189
896.50	(3)>7.695	0.000	7.695

Elevation (ft)	Straight Pipe (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
897.00	(3)>11.847	0.000	11.847
897.10	(3)>12.645	0.000	12.645
897.50	(1)>14.231	10.880	25.111
898.00	(6)>18.223	24.478	42.701
898.50	(6)>19.528	55.643	75.171
899.00	(6)>20.681	98.065	118.746
899.50	(6)>21.734	151.420	173.154
900.00	(6)>22.772	215.526	238.298
900.50	(6)>23.736	290.622	314.358
901.00	(6)>24.693	377.001	401.694
901.50	(6)>25.582	474.984	500.566
902.00	(6)>26.471	584.906	611.377
902.50	(6)>27.305	707.106	734.410
903.00	(6)>28.129	841.922	870.052
903.50	(6)>28.930	989.694	1,018.624
904.00	(6)>29.699	1,150.752	1,180.451
904.50	(6)>30.468	1,325.424	1,355.891
905.00	(6)>31.196	1,514.031	1,545.227

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	15.500	0.124	0.000	0.000	81.000	F	42.52	3.495
	2	0.330	0.001	0.000	0.000	100.000	F	1.20	0.129
	Σ	**15.830**						**43.73**	**3.624**

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	300.00	6.00	0.9000	1.0000	2	431.1	136,065	104.21	66.66
	2	0.001	50.00	0.01	0.0010	1.0000	1	0.0	0	0.00	0.00
	Σ							**431.1**	**132,521**	**101.50**	**64.37**

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	3.46	25.00	723.00	1.850	0.108
		8. Large gullies, diversions, and low flowing streams	3.16	10.00	316.00	5.330	0.016
#1	**1**	**Time of Concentration:**					**0.124**
#1	2	3. Short grass pasture	5.90	20.00	339.00	1.940	0.048
#1	**2**	**Time of Concentration:**					**0.001**