INSPECTION REPORT

Temporary Sedimentation Structure

N6-K1

Black Mesa Mine

Navajo County, Arizona

for

PEABODY WESTERN COAL COMPANY

TABLE OF CONTENTS

INTRODUCTION

Sedimentation structure N6-K1 is a partially incised structure with an earthen embankment, designed and constructed by Peabody Western Coal Company in 1990 as a temporary sedimentation structure to control runoff and sediment from the proposed N-6 mining areas at the Black Mesa Mine. Originally mining disturbance only occurred in the upper portion of the N6-K1 watershed; however, as mining in the N-6 pit progresses, it is necessary to construct the N6-K and N6-L Structures in series with the existing N6-K1 Structure. The existing N6-K1 Structure is adequate, and no additional remedial work is required other than normal periodic inspections and maintenance. The location of structure N6-K1 and its watershed boundary is shown on Drawing No. 85400 (Sheets K-7, L-7, K-8, and L-8) and Drawing No. 85405. The existing As-Built plans are shown on the attached Exhibit 1.

This inspection report contains information specific to existing structure N6-K1, which is located in series with proposed sedimentation structures N6-K and N6-L. Mine-wide design, construction, and reclamation information is presented in the "General Report, Kayenta and Black Mesa Mines, Navajo County, Arizona for Peabody Western Coal Company", December, 1985 (PAP), Chapter 6, Attachment D, Volume 2, along with the methods and results of analyses used for slope stability, hydrology, and hydraulics, and in Chapter 6, Pages 11 to 42, "Sediment and Water Control Facility Plan".

INSPECTION

The construction site of existing structure N6-K1 was inspected by a Registered Professional Engineer from Peabody Western Coal Company, to ensure that the location was suitable and no adverse conditions existed to prevent the successful construction of the structure. A detailed geotechnical investigation was not performed, rather, the information in Chapter 6, Attachment D was utilized for embankment design.

SITE DESCRIPTION

Land Use

The N6-K1, N6-K, and N6-L structures have a 402.6 acre combined drainage area and are located on a tributary to Coal Mine Wash. The 247.0 acre watershed contributing directly to the N6-K1 structure is classified as 30% disturbed spoil, and 70% reclaimed. Based on the mine plan, the N-6 pit will intercept a significant portion of the N6-K1 watershed. As the mining and reclamation activities progress closer to the pond, the above "worst case" assumptions will apply.

Embankment

A homogeneous earthen embankment, a minimum of 15 feet wide was assumed for the hydraulic analysis. The embankment has an upstream slope of 3.5H:1V and a downstream slope of 7.5H:1V. The embankment material is a category A-1 material (see Attachment D).

DESIGN ANALYSES

General

Structure N6-K1 was designed under the direct supervision of a Registered Professional Engineer from Peabody Western Coal Company. The design was performed in accordance with applicable 30 CFR 780 and 816 regulations of the United States Department of Interior, Office of Surface Mining (OSM) and included a review of available project files. The most current information contained in the Peabody Western Coal Company files includes topographic maps developed from aerial photography flown in 1990 for Peabody Western Coal Company and was used in the analyses of the structure.

Stability

Structure N6-K1 is a category A-1 embankment. A standard category A-1 embankment has static and seismic factors of safety equal to or greater than 1.5 and 1.3, respectively, under the following conditions:

1. Maximum height = 30 ft

2. Maximum upstream slope = 2.0H:1V

3. Maximum downstream slope = 4.25H:1V

4. Normal pool with steady seepage saturation conditions

The N6-K1 embankment is lower in height and has a downstream and upstream slopes flatter than the category standard; therefore, the embankment has factors of safety greater than the design minimum.

Hydrology

The hydrologic analysis was completed using the computer program SEDCAD+ (see Appendices A, B, and C). Structure N6-K1 is located in series with proposed structures N6-K and N6-L. Structure N6-K1 is classified as a low hazard structure (see Drawing No. 85408). The mine area is sparsely populated with no one living in the downstream flood plain. The earthen embankment structure impounds less than 20 acre-feet and is less than 20 vertical feet in height from the upstream toe of embankment of the natural stream elevation to the emergency spillway elevation. The three structures have a combined capacity greater than 20 acre-feet; therefore, the spillway was analyzed using the 100-year, 6-hour storm event in lieu of the 25-year, 6-hour storm. Structures N6-K1, N6-K, and N6-L were conservatively assumed to be full to the emergency spillway at the time of 100-year storm event. The storage capacity of structure N6-K1 was analyzed using the 10-year, 24-hour storm event. The combined ponds in series were verified to completely contain the 10-year, 24-hour storm event, and provide adequate sediment storage volume, without discharging downstream into Coal Mine Wash.

The following parameters were used in the hydrologic analysis:

		10-Year 24-Hour Storm*	100-Year 6-Hour Storm
1.	Water Course length, L	1.004 mi	1.004 mi
2.	Elevation Difference, H	260 ft	260 ft
3.	Time of Concentration, T_c	0.306 hr	0.306 hr
4.	SCS Curve Number	83	83
5.	Rainfall Depth	2.1 in	2.4 in
6.	Drainage Area	247.0 acres	247.0 acres

*Values reported for the 10-year, 24-hour storm event represent the watershed which drains directly to Pond N6-K1. Hydrologic input parameters for additional tributaries routed through downstream structures are presented in Appendix A.

Muskingum routing parameters were utilized to route hydrographs between the N6-K1, N6-K, and N6-L structures. The routing parameters are presented in Appendices A, B, and C, and are shown on a subwatershed basis.

Hydraulics

The SEDCAD+ and Flow Master computer programs were used to evaluate inflow to the sedimentation structure, outflow from the structure and the resulting water surface elevations. The initial conditions and results of the analysis are summarized in the following table (supporting calculations are presented in Appendix A, B, and C).

N6-K1 SEDIMENTATION POND HYDRAULICS TABLE

	Units	10-Yr, 24-Hr Storm	100-Yr, 6-Hr Storm
Initial Reservoir Volume Condition		Empty	Full to emergency spillway
Inflow			
Peak Flow	cfs	153.55	280.5
Volume	ac-ft	15.7	20.2
Storage			
Peak Stage	msl	N/A	6573.6
Emerg. Spillway Elev.	msl	6571.4	6571.4
Peak Storage	ac-ft	N/A	30.2
Storage Capacity	ac-ft	24.9	24.9
Outflow			
Peak Flow	cfs	N/A	195.7
Spillway Elevation	msl	6571.4	6571.4
Embankment Crest Elev.	msl	6576.0	6576.0
Peak Stage	msl	--	6573.6
Freeboard	ft	--	2.4
Emergency Spillway Channel			
Flow Depth	ft	--	2.2
Critical Velocity	fps	--	6.2
Mannings "n"	—	--	.035
Width	ft	--	20
Outflow Channel			
Average Slope	%	--	5.5
Normal Velocity	fps	--	7.4
Normal Depth	ft	--	1.2
Mannings "n"	--	--	.048
Riprap D_{50}	in	--	6

Emergency Spillway and Outlet Channel

The emergency spillway and outlet channel for N6-K1 are a trapezoidal channel, the alignment and dimensions are shown on Exhibit 1 and includes the following dimensions:

Minimum Channel Depth	(Spillway)	3.2	ft
	(Outflow)	2.2	ft
Channel Width		20	ft
Channel Length	(Spillway)	30	ft
	(Outflow)	220	ft
Side Slopes (Horizontal to Vertical)		2.5:1	or flatter
Average Slope	(Spillway)	0	%
Average Slope	(Outflow)	5.5	%
Spillway Elevation		6571.4 ft	

A minimum 15-foot long riprap lined channel has been constructed beyond the toe of the embankment as a transition into the downstream natural channel.

Storage Capacity

The impoundment stage-capacity table (see Exhibit 1) is based on previously reported capacities and design topography. The total storage capacity of structure N6-K1 is designed to contain approximately 24.85 acre-feet. The structure is incised approximately 6.14 acre-feet.

The calculations for the sediment load entering structure N6-K1 were made utilizing the Revised Universal Soil Loss Equation with the following parameters:

1.	Rainfall Factor, R	40
2.	Soil Erodibility Factor, K	0.30
3.	Slope Factor, LS	3.35
4.	Cover Factor, C	0.81
5.	Erosion Control Factor, P	0.54

The hydrologic analysis gives the storage volume required to contain the 10-year, 24-hour storm, and the remaining storage volume available for storing sediment. Structure N6-K1 does not have sufficient storage to contain the 10-year, 24 hour storm by itself; however, in series with structures N6-K and N6-L, sufficient storage is achieved. The combined sediment storage capacity was determined for the three structures in series and the results of the analysis are presented in the following table.

Combined Storage for Structures N6-K1, N6-K, and N6-L

	N6-K1	N6-K	N6-L	Combined
Total Storage Capacity	24.85	19.91	19.74	64.50 acre-ft
10-Year, 24-Hour Storm Inflow	15.73	8.62	1.56	25.91 acre-ft
Available Sediment Storage Capacity	—	—	—	38.59 acre-ft
Sediment Inflow Rate/Year	1.92	1.39	0.17	3.48 acre-ft
Sediment Storage Life	—	—	—	11.1 years

Remedial Compliance Plan

The inspection of Structure N6-K1 indicates that no geotechnical or hydraulic problems exist. The existing slopes are as flat or flatter than required in Chapter 6, Attachment D, Table 3-6. The embankment top width is 15 feet wide or wider. The storage capacity when combined with the downstream structures, the spillway width and riprap-lining is adequate; therefore, the existing structure is adequate and no additional remedial work is required other than normal periodic inspections and maintenance.

The following appendices and drawing are attached and complete this design report.

Appendix A   - Hydrology, Hydraulic, and Sedimentation Calculations
Appendix B   - SEDCAD+ (Input and Output) 10-Year, 24-Hour Storm Event
Appendix C   - SEDCAD+ (Input and Output) 100-Year, 6-Hour Storm Event

Exhibit 1   - N6-K1 Pond (As-Built)

APPENDIX A
Hydrology, Hydraulic, and Sedimentation Calculations

PEABODY WESTERN COAL COMPANY
CALCULATED HYDROLOGIC DATA

PROJECT: N6-K1 Pond

TIME OF CONCENTRATION:

Start Elevation (ft) =	6813
End Elevation (ft) =	6553
Elevation Difference, E (ft) =	260
Watercourse Length (ft) =	5300
Watercourse Length, L (mi) =	1.004

$Tc = (11.9L^3/E)^{0.385} =$ ___0.306 hours___

ROUTING PARAMETERS:

Between structure routing parameters were calculated using the SCS Upland Method in SEDCAD+.
Input and output parameters are shown on the SEDCAD+ printouts in Appendices B and C.

SCS CURVE NUMBER:

Cover Type	Soil Group	Curve Number	Area (acres)	CN*Area
Reclaimed	C	81	172.9	14004.9
Spoil	B	86	74.1	6372.6
TOTAL:			247.0	20377.5

Weighted CN = Total CN*Area/ Total Area = ___83___

DRAINAGE BASIN AREA:

247.0 Acres

PEABODY WESTERN COAL COMPANY
CALCULATED SEDIMENTOLOGY DATA

PROJECT: N6-K1 Pond

SOIL ERODIBILITY FACTOR:

Soil Type	Erodibility Factor, K	Area (acres)	K*Area
Reclaimed	0.38	172.9	65.70
Spoil	0.12	74.1	8.89
TOTAL:		247.0	74.59

Weighted K = Total K*Area/ Total Area =   0.30

SLOPE FACTOR:

Length (ft)	Elevation Change (ft)	Slope (%)	m	Slope Angle (deg)	LS Factor
250	20	8.0%	0.5	4.6	1.65
200	30	15.0%	0.6	8.5	3.66
150	30	20.0%	0.6	11.3	4.32
220	45	20.5%	0.6	11.6	5.58
550	50	9.1%	0.5	5.2	2.81
350	30	8.6%	0.5	4.9	2.09

Average LS =   3.35

The LS Factor was calculated by:

LS = (Slope Length/72.6)^m(10.8*sin(slope angle) + 0.03) for Slopes < 9%*

LS = (Slope Length/72.6)^m(16.8*sin(slope angle) - 0.5) for Slopes > 9%*

Where:

Slope < 3%   m = 0.3
Slope = 4%   m = 0.4
5% > Slope < 10%   m = 0.5
Slope > 10%   m = 0.6

COVER AND PRACTICE FACTORS:

Cover Type	Cover (%)	Canopy (%)	Area (acres)	Cover Factor, C	C*Area	Practice Factor, P	P*Area
Reclaimed	--	--	172.9	0.73	126.22	0.34	58.79
Spoil	0%	0%	74.1	1.00	74.10	1.00	74.10
TOTAL:			247.0		200.32		132.89

Weighted C = Total C*Area/ Total Area =   0.81

Weighted P = Total P*Area/ Total Area =   0.54

RAINFALL FACTOR:

R = 40

Project Description

Project File	c:\808\n6-l\n6.fm2
Worksheet	N6-K1 Spillway
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.035	
Channel Slope	0.017314	ft/ft
Left Side Slope	2.500000	H : V
Right Side Slope	2.500000	H : V
Bottom Width	20.00	ft
Discharge	195.66	cfs

Results

Depth	1.36	ft
Flow Area	31.70	ft²
Wetted Perimeter	27.30	ft
Top Width	26.78	ft
Critical Depth	1.36	ft
Critical Slope	0.017314	ft/ft
Velocity	6.17	ft/s
Velocity Head	0.59	ft
Specific Energy	1.95	ft
Froude Number	1.00	
Flow is supercritical.		

Notes:

Spillway Channel set to critical slope to determine critical velocity

SEDCAD+ RIPRAP CHANNEL DESIGN

    N6-K1 Spillway Outslope

        INPUT VALUES:

Shape   TRAPEZOIDAL
Discharge   195.66 cfs
Slope   5.50 %
Sideslopes (L and R)   2.50:1   2.50:1
Bottom Width   20.00 feet
Freeboard   1 ft

        RESULTS:

Steep Slope Design - PADER Method

Depth   1.16 ft
   with Freeboard   2.16 ft
Top Width   25.81 ft
   with Freeboard   30.81 ft
Velocity   7.35 fps
Cross Sectional Area   26.63 sq ft
Hydraulic Radius   1.01 ft
Manning's n   0.048
Froude Number   1.27
Dmax   0.625 ft (7.50 in)
D50   0.500 ft (6.00 in)
D10   0.167 ft (2.00 in)

APPENDIX B
SEDCAD+ (Input and Output) 10-Year, 24-Hour Storm Event

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

BLACK MESA MINE - TEMPORARY SEDIMENTATION PONDS N6-K1, N6-K, N6-L

by

Name: K. Kammerzell

Company Name: ACZ, INC.
File Name: C:\808\N6-L\N6-L

Date: 01-14-1997

Civil Software Design -- SEDCAD+ Version 3.1
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

Company Name: ACZ, INC.
Filename: C:\808\N6-L\N6-L   User: K. Kammerzell
Date: 01-14-1997 Time: 09:32:33
Black Mesa Mine - Temporary Sedimentation Ponds N6-K1, N6-K, N6-L
Storm: 2.10 inches, 10 year-24 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

========================
GENERAL INPUT TABLE
========================

Detailed Between Structure Routing:

	To	Seg.	Land Flow				Segment	Muskingum	
J B S		#	Condition	Distance	Slope	Velocity	Time	K	X
				(ft)	(%)	(fps)	(hr)	(hr)	
1 1 2	1		8	1400.32	2.14	4.39	0.09		
	2		8	300.17	3.33	5.48	0.02	0.103	0.364
1 1 3	1		8	300.17	3.33	5.48	0.02	0.015	0.381

Company Name: ACZ, INC.
Filename: C:\808\N6-L\N6-L   User: K. Kammerzell
Date: 01-14-1997 Time: 09:32:33
Black Mesa Mine - Temporary Sedimentation Ponds N6-K1, N6-K, N6-L
Storm: 2.10 inches, 10 year-24 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

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    SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
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```

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111	1	247.00	83	F	0.306	0.000	0.000	0.0	15.73	153.55
				Type: Pond Label: N6-K1						
111	Structure	247.00							15.73	
111	Total IN	247.00							15.73	153.55
111	Total OUT								15.73	98.65
112	1	135.40	83	F	0.238	0.000	0.000	0.0	8.62	91.62
				Type: Pond Label: N6-K						
	Structure	135.40							24.36	
112	Total IN	382.40							24.36	144.30
112	Total OUT	.		.					24.35	132.40
111 to 112 Routing					0.103	0.364				
113	1	20.20	86	F	0.080	0.000	0.000	0.0	1.56	19.89
				Type: Pond Label: N6-L						
113	Structure	20.20							25.91	
113	Total IN	402.60							25.91	136.48
113	Total OUT								25.91	128.91
112 to 113 Routing					0.015	0.381				

APPENDIX C
SEDCAD+ (Input and Output) 100-Year, 6-Hour Storm Event

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

BLACK MESA MINE - TEMPORARY SEDIMENTATION PONDS N6-K1, N6-K, N6-L

by

Name: K. Kammerzell

Company Name: ACZ, INC.
File Name: C:\808\N6-L\N6-L

Date: 01-14-1997

Company Name: ACZ, INC.
Filename: C:\808\N6-L\N6-L   User: K. Kammerzell
                Date: 01-14-1997 Time: 09:32:36
Black Mesa Mine - Temporary Sedimentation Ponds N6-K1, N6-K, N6-L
Storm: 2.40 inches, 100 year- 6 hour, SCS Type II
            Hydrograph Convolution Interval: 0.1 hr

=======================
GENERAL INPUT TABLE
=======================

Detailed Between Structure Routing:

	To	Seg.	Land Flow				Segment	Muskingum	
J B S		#	Condition	Distance	Slope	Velocity	Time	K	X
				(ft)	(%)	(fps)	(hr)	(hr)	
1 1 2		1	8	1400.32	2.14	4.39	0.09		
		2	8	300.17	3.33	5.48	0.02	0.103	0.364
1 1 3		1	8	300.17	3.33	5.48	0.02	0.015	0.381

Company Name: ACZ, INC.
Filename: C:\808\N6-L\N6-L   User: K. Kammerzell
Date: 01-14-1997 Time: 09:32:36
Black Mesa Mine - Temporary Sedimentation Ponds N6-K1, N6-K, N6-L
Storm: 2.40 inches, 100 year- 6 hour, SCS Type II
Hydrograph Convolution Interval: 0.1 hr

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SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE
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-Hydrology-

JBS SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base-Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	247.00	83	F	0.306	0.000	0.000	0.0	20.19	280.51
			Type: Pond Label: N6-K1						
111 Structure	247.00							20.19	
111 Total IN	247.00							20.19	280.51
111 Total OUT								20.19	195.66
112 1	135.40	83	F	0.238	0.000	0.000	0.0	11.07	168.06
			Type: Pond Label: N6-K						
Structure	135.40							31.26	
112 Total IN	382.40							31.26	281.21
112 Total OUT								31.26	263.54
111 to 112 Routing					0.103	0.364			
113 1	20.20	86	F	0.080	0.000	0.000	0.0	1.96	36.24
			Type: Pond Label: N6-L						
113 Structure	20.20							33.22	
113 Total IN	402.60							33.22	270.96
113 Total OUT								33.22	261.14
112 to 113 Routing					0.015	0.381			

Company Name: ACZ, INC.
Filename: C:\808\N6-L\N6-L   User: K. Kammerzell
                    Date: 01-14-1997 Time: 09:32:36
Black Mesa Mine - Temporary Sedimentation Ponds N6-K1, N6-K, N6-L
Storm: 2.40 inches, 100 year- 6 hour, SCS Type II
                Hydrograph Convolution Interval: 0.1 hr

============================
POND INPUT/OUTPUT TABLE
============================

J1, B1, S1
N6-K1

Drainage Area from J1, B1, S1, SWS(s)1:   247.0 acres
        Total Contributing Drainage Area: 247.0 acres

DISCHARGE OPTIONS:

                                Emergency
                                Spillway
===
Riser Diameter (in)   ----
   Riser Height (ft)   ----
Barrel Diameter (in)   ----
   Barrel Length (ft)   ----
   Barrel Slope (%)   ----
Manning's n of Pipe   ----
Spillway Elevation   ----

Lowest Elevation of Holes   ----
# of Holes/Elevation   ----

Entrance Loss Coefficient   ----
Tailwater Depth (ft)   ·   ----

Notch Angle (degrees)   ----
Weir Width (ft)   ----

Siphon Crest Elevation   ----
Siphon Tube Diameter (in)   ----
Siphon Tube Length (ft)   ----
Manning's n of Siphon   ----
Siphon Inlet Elevation   ----
Siphon Outlet Elevation   ----

Emergency Spillway Elevation   6571.4
Crest Length (ft)   30.0
Z:1 (Left and Right)   3   3
Bottom Width (ft)   20.0

POND RESULTS:
                                Permanent
                                Pool
                                (ac-ft)
                                ========
                                24.8

```
                        Runoff    Peak
                        Volume  Discharge
                        (ac-ft)   (cfs)
                   ===========================
              IN      20.19    280.51
              OUT     20.19    195.66


                    Peak        Hydrograph
                 Elevation    Detention Time
                                  (hrs)
                 ===========================
                 6573.6           0.01
```

****

                         J1, B1, S2
                           N6-K

        Drainage Area from J1, B1, S2, SWS(s)1:   135.4 acres
              Total Contributing Drainage Area: 382.4 acres

DISCHARGE OPTIONS:

                               Emergency
                               Spillway
==
Riser Diameter (in)   ----
   'ser Height (ft)   ----
   al Diameter (in)   ----
   arrel Length (ft)   ----
  Barrel Slope (%)   ----
Manning's n of Pipe   ----
Spillway Elevation   ----

Lowest Elevation of Holes   ----
# of Holes/Elevation   ----

Entrance Loss Coefficient   ----
Tailwater Depth (ft)   ----

Notch Angle (degrees)   ----
Weir Width (ft)   ----

Siphon Crest Elevation   ----
Siphon Tube Diameter (in)   ----
Siphon Tube Length (ft)   ----
Manning's n of Siphon   ----
Siphon Inlet Elevation   ----
Siphon Outlet Elevation   ----

Emergency Spillway Elevation   6513.0
Crest Length (ft)   40.0
~ ┐ (Left and Right)   3   3
   :om Width (ft)   40.0

POND RESULTS:
                               Permanent
                                 Pool
                               (ac-ft)

```
                       =========
                         19.9

                       Runoff      Peak
                       Volume   Discharge
                       (ac-ft)     (cfs)
                   =======================
              IN     31.26     281.21
              OUT    31.26     263.54


           Peak          Hydrograph
        Elevation     Detention Time
.                          (hrs)
                   ==========================
          6514.9            0.13
```

****

```
                        J1, B1, S3
                          N6-L
                           •.
        Drainage Area from J1, B1, S3, SWS(s)1:          20.2 acres
                Total Contributing Drainage Area:     402.6 acres
```

DISCHARGE OPTIONS:

```
                           Emergency
                           Spillway
===================================================================================
Riser Diameter (in)           ----
  Riser Height (ft)           ----
Barrel Diameter (in)          ----
- Barrel Length (ft)          ----
  Barrel Slope (%)            ----
Manning's n of Pipe           ----
Spillway Elevation            ----

Lowest Elevation of Holes     ----
# of Holes/Elevation          ----

Entrance Loss Coefficient     ----
Tailwater Depth (ft)          ----

Notch Angle (degrees)         ----
Weir Width (ft)               ----

Siphon Crest Elevation        ----
Siphon Tube Diameter (in)     ----
Siphon Tube Length (ft)       ----
Manning's n of Siphon         ----
Siphon Inlet Elevation        ----
Siphon Outlet Elevation       ----

Emergency Spillway Elevation  6512.0
Crest Length (ft)               40.0
Z:1 (Left and Right)           3   3
Bottom Width (ft)               40.0
```

POND RESULTS:
```
                        Permanent
```

```
                Pool
               (ac-ft)
              =========
                 19.7

                Runoff     Peak
                Volume   Discharge
               (ac-ft)    (cfs)
         ========================
          IN     33.22   270.96
          OUT    33.22   261.14

        Peak          Hydrograph
      Elevation     Detention Time
                        (hrs)
      ==========================
       6513.8           0.13
```

****

Company Name: ACZ, INC.
Filename: C:\808\N6-L\N6-L   User: K. Kammerzell
                    Date: 01-14-1997 Time: 09:32:36
Black Mesa Mine - Temporary Sedimentation Ponds N6-K1, N6-K, N6-L
Storm: 2.40 inches, 100 year- 6 hour, SCS Type II
                Hydrograph Convolution Interval: 0.1 hr

==
ELEVATION-AREA-CAPACITY-DISCHARGE TABLE
==

J1, B1, S1
N6-K1

Drainage Area from J1, B1, S1, SWS(s)1:   247.0 acres
        Total Contributing Drainage Area: 247.0 acres

SW#1: Emergency Spillway

Elev	Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	
6552.60	0.00	0.00	0.00	0.00	
6554.60	2.00	0.29	0.20	0.00	
6556.60	4.00	0.74	1.20	0.00	
6558.60	6.00	1.08	3.01	0.00	
6560.60	8.00	1.30	5.39	0.00	
6562.60	10.00	1.49	8.18	0.00	
6564.60	12.00	1.67	11.33	0.00	
6566.60	14.00	1.85	14.84	0.00	
6568.60	16.00	2.06	18.74	0.00	
6570.60	18.00	2.23	23.04	0.00	
6571.40	18.80	2.29	24.85	0.00	Stage of SW#1
6572.10	19.50	2.35	26.47	22.76	
6572.20	19.60	2.35	26.70	29.38	
6572.30	19.70	2.36	26.94	36.62	
6572.40	19.80	2.37	27.18	44.45	
6572.60	20.00	2.38	27.65	63.85	
6572.90	20.30	2.42	28.37	97.92	
6573.40	20.80	2.47	29.59	159.73	
6573.63	21.03	2.49	30.16	195.66	Peak Stage
6573.90	21.30	2.52	30.84	239.45	
6574.40	21.80	2.58	32.12	337.51	
6574.60	22.00	2.60	32.63	381.05	
6574.90	22.30	2.62	33.42	451.00	
6575.40	22.80	2.65	34.73	580.13	
6575.90	23.30	2.68	36.07	725.18	
6576.00	23.40	2.69	36.34	756.12	

****

J1, B1, S2
N6-K

Drainage Area from J1, B1, S2, SWS(s)1:   135.4 acres
        Total Contributing Drainage Area: 382.4 acres

SW#1: Emergency Spillway

```
Elev     Stage  Area   Capacity  Discharge
         (ft)   (ac)   (ac-ft)   (cfs)
 :      |=====================================================================
6495.00   0.00   0.57     0.00       0.00
6497.00   2.00   0.67     1.24       0.00
6499.00   4.00   0.78     2.68       0.00
6501.00   6.00   0.89     4.36       0.00
6503.00   8.00   1.01     6.26       0.00
6505.00  10.00   1.14     8.42       0.00
6507.00  12.00   1.28    10.85       0.00
6509.00  14.00   1.43    13.56       0.00
6511.00  16.00   1.59    16.58       0.00
6513.00  18.00   1.74    19.91       0.00     Stage of SW#1
6513.70  18.70   1.80    21.15      40.75
6513.80  18.80   1.81    21.33      53.23
6513.90  18.90   1.82    21.51      66.86
6514.00  19.00   1.83    21.70      81.58
6514.50  19.50   1.87    22.62     179.01
6514.86  19.86   1.91    23.30     263.54     Peak Stage
6515.00  20.00   1.92    23.57     297.43
6515.50  20.50   1.97    24.54     432.03
6516.00  21.00   2.01    25.54     604.94
6516.50  21.50   2.06    26.55     801.89
6517.00  22.00   2.10    27.59    1036.65
6517.50  22.50   2.15    28.66    1267.13
6518.00  23.00   2.20    29.75    1535.41
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                              J1, B1, S3
                                N6-L

        Drainage Area from J1, B1, S3, SWS(s)1:   20.2 acres
              Total Contributing Drainage Area: 402.6 acres

                      SW#1:   Emergency Spillway

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Elev     Stage  Area   Capacity  Discharge
         (ft)   (ac)   (ac-ft)   (cfs)
========================================================================
6490.00   0.00   0.34     0.00       0.00
6492.00   2.00   0.42     0.76       0.00
6494.00   4.00   0.51     1.69       0.00
6496.00   6.00   0.61     2.81       0.00
6498.00   8.00   0.71     4.12       0.00
6500.00  10.00   0.82     5.65       0.00
6502.00  12.00   0.90     7.37       0.00
6504.00  14.00   0.98     9.25       0.00
6506.00  16.00   1.12    11.35       0.00
6508.00  18.00   1.31    13.78       0.00
6510.00  20.00   1.50    16.58       0.00
6512.00  22.00   1.67    19.74       0.00     Stage of SW#1
6512.70  22.70   1.73    20.93      40.75
   2.80  22.80   1.74    21.11      53.23
    .90  22.90   1.75    21.28      66.86
6513.00  23.00   1.75    21.46      81.58
6513.50  23.50   1.80    22.34     179.01
6513.85  23.85   1.83    22.98     261.14     Peak Stage
6514.00  24.00   1.84    23.25     297.43
6514.50  24.50   1.92    24.19     432.03
```

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6515.00 25.00    2.00     25.17       604.94
6515.50 25.50    2.08     26.19       801.89
6516.00 26.00    2.16     27.25      1036.65
6516.50 26.50    2.29     28.36      1267.13
6517.00 27.00    2.41     29.54      1535.41
**********************************************************************
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