

DESIGN REPORT

Temporary Sedimentation Structure

J7-R

Black Mesa Mine

Navajo County, Arizona

For

PEABODY WESTERN COAL COMPANY

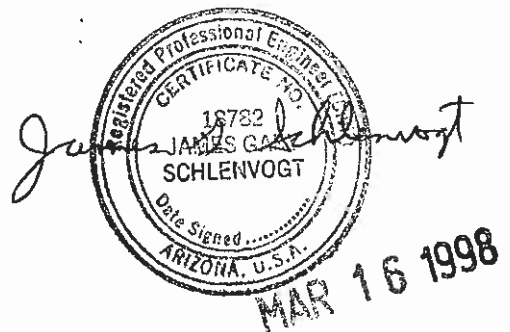


TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
INSPECTION	1
SITE DESCRIPTION	2
LAND USE	2
DESIGN ANALYSES	2
GENERAL	2
STABILITY	2
HYDROLOGY	3
HYDRAULICS	4
EMERGENCY SPILLWAY AND OUTLET CHANNEL	6
STORAGE CAPACITY	6
 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	-Proposed J7-R and J7-R1 Sedimentation Pond Design

INTRODUCTION

Sedimentation Structure J7-R will be an earthen embankment, designed and constructed by Peabody Western Coal Company as a temporary sedimentation structure designed to control runoff and sediment from portions of J7 disturbed surface mining area at the Black Mesa Mine. The location of Structure J7-R and its watershed boundary are shown on Drawing No. 85400 (Sheet K-11) and Drawing No. 85405. The site-specific general construction plans are shown on the attached Exhibit 1.

This design report contains information specific to Structure J7-R that is in series with sedimentation structure J7-R1. 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 the proposed Structure J7-R was inspected in August, 1997 by a Registered Professional Engineer from Peabody Western Coal Company, to assure that the site is suitable and no adverse conditions exist to prevent the successful construction of this structure. A detailed geotechnical investigation was not performed, rather, the information in Chapter 6, Attachment D was utilized for embankment design and will be utilized during construction to construct a stable embankment.

SITE DESCRIPTION

LAND USE

The J7-R1 and J7-R Structures have a combined watershed of 260.1 acres and are located on a tributary upstream of Yucca Flat Wash at the Black Mesa Mine. Approximately 244.6 acres of the watershed is upstream of the J7-R1 structure and the remaining 15.5-acre watershed is between the J7-R1 and J7-R Structures. The 15.5-acre watershed, which contributes directly to structure J7-R is classified as 65% spoil and 35%, disturbed.

DESIGN ANALYSES

GENERAL

Structure J7-R was designed under the 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 1992 for Peabody Western Coal Company and was used in the analyses of the structure.

STABILITY

Structure J7-R is a Category A-3 embankment. A homogeneous earthen embankment, compacted in lifts to design specifications, and approximately 15 feet wide on top will be constructed. An upstream slope of 3:1 (horizontal to vertical) and a downstream slope of 4:1 were assumed. Based on the total embankment height of approximately 14 feet, these slopes are equal to or flatter than the recommended "worst case" embankment/foundation condition slopes in Table 3-6, Attachment D, Chapter 6; therefore, the embankment will be stable. The emergency spillway will be a minimum 30-foot wide riprap-lined trapezoidal channel.

HYDROLOGY

The hydrologic analysis was completed using the computer program SEDCAD+ (see Appendices A, B, and C). Structure J7-R will be constructed in series with proposed Structure J7-R1. Structure J7-R is classified as a low hazard structure (see Drawing No. 85408). In addition, the mine area is sparsely populated with no one living in the downstream floodplain. The structure will impound less than 20 acre-feet and be less than 20 vertical feet in height from the upstream toe of the embankment of the natural stream elevation to the emergency spillway invert elevation. The two 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 J7-R and J7-R1 were conservatively assumed to be full to the emergency spillway at the time of 100-year storm event. The storage capacity of structure J7-R 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 into the Yucca Flat Wash.

The following parameters were used in the hydrologic analysis:

	<u>10yr-24hr Storm</u>
1. Water Course length, L	0.303 mi.
2. Elevation Difference, H	190 ft
3. Time of Concentration, T _c	0.087 hr
4. SCS Curve Number	88
5. Rainfall Depth, 10-year, 24-hour storm	2.1 in
100-year, 6-hour storm	2.4 in
6. Drainage Area, 10-year, 24-hour storm	15.5 acres
100-year, 6-hour storm	260.1 acres

Pond J7-R is designed in series with Pond J7-R1 (see Appendices B and C of the Design Report). The 15.5 acres is only the drainage area between Pond J7-R and Pond J7-R1: whereas, the 260.1-acre figure is the total combined watershed for both ponds. For both the 10-year and 100-year storms, the total combined watershed is routed through both ponds. The 10-year, 24-hour storm inflow is utilized on page 7 of the Design Report to determine the storage requirement. Values reported represent the watershed, which drains directly to Pond J7-R. Hydrologic input parameters for upstream structure

J7-R1 is presented in the Design Report for J7-R1.

Muskingum routing parameters were utilized to route the 10-year and 100-year hydrographs between the J7-R and J7-R1 structures. The routing parameters are presented in Appendices A, B, and C, and are shown on a sub-watershed 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 Appendices A, B, and C).

J7-R 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	16.9	277.3
Volume	ac-ft	1.4	22.9
Storage			
Peak Stage	msl	N/A	6319.0
Emerg. Spillway Elev.	msl	6317	6317
Peak Storage	ac-ft	N/A	18.9
Storage Capacity	ac-ft	14.9	14.9
Outflow			
Peak Flow	cfs	N/A	234.9
Spillway Elevation	msl	6317	6317
Embankment Crest Elev.	msl	6320	6320
Peak Stage	msl	--	6319.0
Freeboard	ft	--	1.0
Emergency Spillway Channel			
Flow Depth	ft	--	2.0
Critical Velocity	fps	--	5.9
Mannings "n"	--	--	.031
Width	ft	--	30
Outflow Channel			
Slope	%	--	25
Normal Velocity	fps	--	9.1
Normal Depth	ft	--	0.8
Mannings "n"	--	--	.067
Riprap D ₅₀	in	--	9

EMERGENCY SPILLWAY AND OUTLET CHANNEL

The emergency spillway and outlet channel for J7-R will be a trapezoidal channel with dimensions listed below. The alignment and dimensions are shown on Exhibit 1.

Minimum Channel Depth	(Spillway)	3.0	ft
	(Outflow)	2.0	ft
Channel Width		30	ft
Channel Length	(Spillway)	30	ft
	(Outflow)	60	ft
Sideslopes (Horizontal to Vertical)		3:1	or flatter
Average Slope	(Spillway)	0	%
Maximum Slope	(Outflow)	25	%
Spillway Elevation		6317.0	ft

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

STORAGE CAPACITY

The impoundment stage-capacity table (see Exhibit 1) is based on the 1992 aerial topographic mapping conducted for Peabody Western Coal Company. Structure J7-R is designed to contain approximately 14.9 acre-feet.

The calculations for the sediment load entering structure J7-R were made utilizing the Revised Universal Soil Loss Equation with the following parameters:

1.	Rainfall Factor, R	40
2.	Soil Erodibility Factor, K	0.16
3.	Slope Factor, LS	4.65
4.	Cover Factor, C	1.0
5.	Erosion Control Factor, P	0.87

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 J7-R has sufficient storage to contain the 10-year, 24-hour storm and has excess capacity to store additional flow from J7-R1. The combined sediment storage capacity was determined for the two structures in series and the results of the analysis are presented in the following table.

Combined Storage for Structures J7-R1 and J7-R

	<u>J7-R1</u>	<u>J7-R</u>	<u>Combined</u>
Total Storage Capacity	8.1	14.9	23.0 acre-ft
10-Year, 24-Hour Storm Inflow	16.6	1.4	18.0 acre-ft
Available Sediment Storage Capacity	-----	-----	5.0 acre-ft
Sediment Inflow Rate/Year	0.80	0.17	0.97 acre-ft
Sediment Storage Life	-----	-----	5.2 years

*

*

*

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- Proposed J7-R and J7-R1 Sedimentation Pond Design

APPENDIX A

Hydrology, Hydraulic, and Sedimentation Calculations

**PEABODY WESTERN COAL COMPANY
CALCULATED HYDROLOGIC DATA**

PROJECT: J7-R

TIME OF CONCENTRATION (Haul Road):

Start Elevation (ft) = 6500
End Elevation (ft) = 6310
Elevation Difference, E (ft) = 190

Watercourse Length (ft) = 1600
Watercourse Length, L (mi) = 0.303

$T_c = (11.9L^{0.3}/E)^{0.385} =$ 0.087 hours

SCS CURVE NUMBER:

Cover Type	Soil Group	Curve Number	Area (acres)	CN*Area
Spoil	B	86	10	860
Disturbed	D	91	5.5	500.5
TOTAL:			15.5	1360.5

Weighted CN = Total CN*Area/ Total Area = 88

DRAINAGE BASIN AREA:

15.50 Acres

Company Name: ACZ, INC.

Filename: J:\861\0350\SEDCAD\J7R25 User: TEL

Date: 10-18-1997 Time: 12:02:38

PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (100-YR, 6-HR)

Storm: 2.40 inches, 100 year- 6 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

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

Detailed Between Structure Routing:

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

**PEABODY WESTERN COAL COMPANY
CALCULATED SEDIMENTOLOGY DATA**

PROJECT: J7-R

SOIL ERODIBILITY FACTOR:

Soil Type	Soil Group	Erodibility Factor, K	Area (acres)	K * Area
Spoil	B	0.12	10	1.2
Disturbed	D	0.22	5.5	1.21
TOTAL:			15.5	2.41
Erodibility factor average of spoil to reclaimed condition to simulate various stages of reclamation.				

Weighted K = Total K * Area / Total Area = 0.155

SLOPE FACTOR:

Length (ft)	Elevation Change (ft)	Slope (%)	m	Slope Angle (deg)	LS Factor
1150	70	6.1%	0.5	3.5	2.73
200	50	25.0%	0.6	14.0	6.57

Average LS = 4.65

The LS Factor was calculated by:

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

$LS = (Slope\ Length / 72.6) * m * (16.0 * \sin(slope\ angle) + 0.5)$ for Slopes > or = 9%

Where:

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

PROJECT: J7-R POND

COVER AND PRACTICE FACTORS:

Cover Type	Cover (%)	Canopy (%)	Area (acres)	Cover Factor, C	C*Area	Practice Factor, P	P*Area
Spoil	0%	0%	10	1	10	0.80	8
Disturbed	0%	0%	5.5	1.00	5.5	1.00	5.5
TOTAL:			15.5		15.5		13.5

$$\text{Weighted C} = \text{Total C*Area} / \text{Total Area} = \underline{\underline{1.00}}$$

$$\text{Weighted P} = \text{Total P*Area} / \text{Total Area} = \underline{\underline{0.87}}$$

RAINFALL FACTOR:

$$R = 40$$

PEABODY WESTERN COAL COMPANY
CALCULATED SEDIMENT YIELD

PROJECT: J7-R

The following spreadsheet calculates the predicted sediment yield for the project area. The gross sediment yield is determined according to the Revised Universal Soil Loss Equation.

PARAMETER DESCRIPTION	VALUE
Annual Rainfall Factor	40.00
Soil Erodibility Factor	0.16
Length Slope Factor	4.65
Cover Factor	1.00
Practice Factor	0.87
Gross Annual Sediment Yield	25.18 tons/acre/year
Sediment Density	94.00 pcf
Gross Annual Sediment Yield	0.0123 acre-feet/acre/year
Sediment Delivery Ratio	90%
Estimated Annual Sediment Yield	0.0111 acre-feet/acre/year
Watershed Area	15.5 acres
Watershed Annual Sediment Yield	0.1716 acre-feet/year
Number of years	1 years
Required Pond Sediment Storage	0.172 acre-feet

SEDCAD+ RIPRAP CHANNEL DESIGN

J7-R OUTFLOW

INPUT VALUES:

Shape	TRAPEZOIDAL	
Discharge	234.90 cfs	
Slope	25.00 %	
Sideslopes (L and R)	3.00:1	3.00:1
Bottom Width	30.00 feet	
Freeboard	.3 ft	

RESULTS:

Steep Slope Design - PADER Method

Depth	0.80 ft
with Freeboard	1.10 ft
Top Width	34.79 ft
with Freeboard	36.59 ft
Velocity	9.08 fps
Cross Sectional Area	25.87 sq ft
Hydraulic Radius	0.74 ft
Manning's n	0.067
Froude Number	1.86
Dmax	0.938 ft (11.25 in)
D50	0.750 ft (9.00 in)
D10	0.250 ft (3.00 in)

J7-R SPILLWAY
Worksheet for Trapezoidal Channel

Project Description	
Project File	untitled.fm2
Worksheet	j7
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.031	
Channel Slope	0.013858 ft/ft	
Left Side Slope	3.000000 H : V	
Right Side Slope	3.000000 H : V	
Bottom Width	30.00	ft
Discharge	234.90	cfs

Results		
Depth	1.19	ft
Flow Area	39.94	ft ²
Wetted Perimeter	37.52	ft
Top Width	37.14	ft
Critical Depth	1.19	ft
Critical Slope	0.013859 ft/ft	
Velocity	5.88	ft/s
Velocity Head	0.54	ft
Specific Energy	1.73	ft
Froude Number	1.00	
Flow is subcritical.		

APPENDIX B

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

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (10-YR, 24-HR)

by

Name: TEL

Company Name: ACZ, INC.

File Name: J:\861\0350\SEDCAD\J7R-R1

Date: 10-18-1997

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

Company Name: ACZ, INC.

Filename: J:\861\0350\SEDCAD\J7R-R1 User: TEL

Date: 10-18-1997 Time: 08:58:58

PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (10-YR, 24-HR)

Storm: 2.10 inches, 10 year-24 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

=====

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

=====

-Hydrology-

JBS	SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)	
111	1	244.60	84	F	0.307	0.000	0.000	0.0	16.62	163.15	
					Type: Null		Label: POND J7-R1				
111	Structure	244.60								16.62	

111	Total IN/OUT	244.60								16.62	163.15
=====											
112	1	15.50	88	F	0.087	0.000	0.000	0.0	1.35	16.90	
					Type: Null		Label: POND J7-R				
112	Structure	15.50								17.97	

112	Total IN/OUT	260.10								17.97	166.47
=====											
111 to 112 Routing					0.015	0.381					
=====											

APPENDIX C

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

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (100-YR, 6-HR)

by

Name: TEL

Company Name: ACZ, INC.
File Name: J:\861\0350\SEDCAD\J7R25

Date: 10-18-1997

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

Company Name: ACZ, INC.
 Filename: J:\861\0350\SEDCAD\J7R25 User: TEL
 Date: 10-18-1997 Time: 12:02:38
 PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (100-YR, 6-HR)
 Storm: 2.40 inches, 100 year- 6 hour, SCS Type II
 Hydrograph Convolution Interval: 0.1 hr

=====

SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE

=====

-Hydrology-

JBS SWS	Area (ac)	CN UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	244.60	84 F	0.307	0.000	0.000	0.0	21.18	294.73
		Type: Pond	Label: POND J7-R1					
111 Structure	244.60						21.18	
111 Total IN	244.60						21.18	294.73
111 Total OUT							21.18	271.33
112 1	15.50	88 F	0.087	0.000	0.000	0.0	1.67	30.12
		Type: Pond	Label: POND J7-R					
112 Structure	15.50						22.85	
112 Total IN	260.10						22.85	277.30
112 Total OUT							22.85	234.90
111 to 112 Routing			0.015	0.381				

Company Name: ACZ, INC.

Filename: J:\861\0350\SEDCAD\J7R25 User: TEL

Date: 10-18-1997 Time: 12:02:38

PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (100-YR, 6-HR)

Storm: 2.40 inches, 100 year- 6 hour, SCS Type II

Hydrograph Convolution Interval: 0.1 hr

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

J1, B1, S1

POND J7-R1

Drainage Area from J1, B1, S1, SWS(s)1: 244.6 acres

Total Contributing Drainage Area: 244.6 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 6319.5
Crest Length (ft) 30.0
Z:1 (Left and Right) 3 3
Bottom Width (ft) 22.0

) RESULTS:

Permanent
Pool
(ac-ft)

=====
8.0

	Runoff Volume (ac-ft)	Peak Discharge (cfs)
IN	21.18	294.73
OUT	21.18	271.33

Peak Elevation	Hydrograph Detention Time (hrs)
6322.0	0.16

J1, B1, S2
POND J7-R

Drainage Area from J1, B1, S2, SWS(s)1:	15.5 acres
Total Contributing Drainage Area:	260.1 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	6317.0
Crest Length (ft)	30.0
Z:1 (Left and Right)	3 3
Bottom Width (ft)	30.0

POND RESULTS:

Permanent
Pool
(ac-ft)

=====

14.9

	Runoff Volume (ac-ft)	Peak Discharge (cfs)
IN	22.85	277.30
OUT	22.85	234.90

Peak Elevation	Hydrograph Detention Time (hrs)
6319.0	0.16

Company Name: ACZ, INC.

Filename: J:\861\0350\SEDCAD\J7R25 User: TEL

Date: 10-18-1997 Time: 12:02:38

PEABODY WESTERN COAL COMPANY: POND J7-R AND R1 (100-YR, 6-HR)

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
 POND J7-R1

Drainage Area from J1, B1, S1, SWS(s)1: 244.6 acres
 Total Contributing Drainage Area: 244.6 acres

SW#1: Emergency Spillway

Elev	Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	
6302.00	0.00	0.02	0.00	0.00	
6303.00	1.00	0.04	0.03	0.00	
6304.00	2.00	0.07	0.08	0.00	
6305.00	3.00	0.11	0.17	0.00	
6306.00	4.00	0.15	0.30	0.00	
6307.00	5.00	0.20	0.48	0.00	
6308.00	6.00	0.24	0.70	0.00	
6309.00	7.00	0.32	0.98	0.00	
6310.00	8.00	0.40	1.34	0.00	
6311.00	9.00	0.45	1.77	0.00	
6312.00	10.00	0.51	2.25	0.00	
6313.00	11.00	0.57	2.78	0.00	
6314.00	12.00	0.63	3.38	0.00	
6315.00	13.00	0.72	4.06	0.00	
6316.00	14.00	0.81	4.82	0.00	
6317.00	15.00	0.87	5.66	0.00	
6318.00	16.00	0.94	6.56	0.00	
6319.00	17.00	1.01	7.53	0.00	
6319.50	17.50	1.05	8.05	0.00	Stage of SW#1
6320.00	18.00	1.09	8.58	17.95	
6320.20	18.20	1.10	8.80	25.13	
6320.30	18.30	1.11	8.91	32.46	
6320.40	18.40	1.12	9.02	40.48	
6320.50	18.50	1.13	9.14	49.16	
6321.00	19.00	1.17	9.71	108.67	
6321.50	19.50	1.21	10.30	177.77	
6322.00	20.00	1.25	10.92	267.25	
6322.02	20.02	1.26	10.94	271.33	Peak Stage
6322.50	20.50	1.30	11.55	377.75	
6323.00	21.00	1.36	12.22	506.08	

J1, B1, S2
 POND J7-R

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

15.5 acres
260.1 acres

SW#1: Emergency Spillway

	Stage (ft)	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	
6306.00	0.00	0.90	0.00	0.00	
6307.00	1.00	1.01	0.96	0.00	
6308.00	2.00	1.13	2.03	0.00	
6309.00	3.00	1.15	3.17	0.00	
6310.00	4.00	1.18	4.34	0.00	
6311.00	5.00	1.27	5.56	0.00	
6312.00	6.00	1.36	6.87	0.00	
6313.00	7.00	1.45	8.28	0.00	
6314.00	8.00	1.55	9.78	0.00	
6315.00	9.00	1.65	11.38	0.00	
6316.00	10.00	1.75	13.08	0.00	
6317.00	11.00	1.86	14.88	0.00	Stage of SW#1
6317.70	11.70	1.94	16.21	33.86	
6317.80	11.80	1.95	16.41	43.66	
6317.90	11.90	1.96	16.60	54.33	
6318.00	12.00	1.97	16.80	65.85	
6318.50	12.50	2.04	17.80	143.99	
6319.00	13.00	2.11	18.84	233.39	
6319.01	13.01	2.11	18.85	234.90	Peak Stage
6319.50	13.50	2.18	19.91	347.63	
6320.00	14.00	2.26	21.02	486.90	
