APPENDIX 10-1 A

PASTURE SEDIMENT POND

Permit Term Reclamation Plan Supplement

UPDES DISCHARGE 009
Reference Drawings 10-5, 7-1G, 7-9

Hydrologic and Sediment Parameters

10 year 6 hour storm
10 year 24 hour storm
25 year 6 hour storm
100 year 6 hour storm

Diversion and culvert design criteria.

This appendix segment is a replacement for prior hydrologic calculations for the Pasture Pond and the Clear Water Pond and Slurry Ponds 1 and 2. The watersheds which have hitherto drained into these ponds are proposed to be combined together and the storm water is to be processed through an enlarged Pasture Pond. Clear Water and Slurry Ponds are approved for use as the Excess Spoil Disposal Area #2.

FILE IN Expandable 09052006
Refer to Record No. 0021
in C0070035, 2006, Incoming
for additional information

PASTURE SEDIMENT POND - Hydrologic Calculations

INTRODUCTION

The Pasture Sediment Pond (UPDES 009) is located north of the West Slurry Cell (see Plate 10-5). The pond is an off channel, temporary sediment control structure, with a total as-built volume of 3.08 acre-feet (top of bank). Surface water runoff and sediment runoff from a 109.25 acre watershed is captured by the pond.

The Pasture Pond has been in service for a number of decades. In 2006, SCA proposed to enlarge this pond and use it to treat runoff from the area formerly served by the Clear Water Pond and Slurry Ponds 1 and 2. These former ponds are now the site of the Excess Spoil Disposal Area #2. The new hydrologic modeling accompanying this appendix section includes the entire combined watershed and the proposed design size of the pond. These calculations supersede those previously presented in the Final Reclamation Plan for the Clear Water Pond and the Pasture Pond drainages.

The drainage area contributing to the Pasture Pond would be reclaimed in Phase 1 with the pond remaining in place until reclamation in Phase 2 as shown on Plate 10-4. The phases of reclamation would occur as described in the approved permit.

The structure is a temporary pond as addressed in R645-301-732.200. The structure does not meet the size or other qualifying criteria of the MSHA of 30 CPR 77.216(a). Therefore, it provides a combination of principal and emergency spillways that will safely discharge a 25 year, 6 hour event.

The pond contains a 2 inch drain pipe. This 2 inch pipe is normally closed but can be opened to discharge the pond after major storm events after appropriate settling times. The pond is modeled in Sedimot-II with the 2 inch drain pipe closed, however, the pond is considered empty above the level of the drain pipe when the storm begins. The maximum sediment level allowed in the pond is therefore set at the elevation of the inlet to the 2-inch drain pipe.

The pond can discharge through an 18 inch culvert when the water level reaches the stage elevation of 6490.6 (6.1 feet deep). The 18 inch pipe spillway is capable of passing the 25 year, 6 hour peak flow. The pond treats the 10 year, 24 hour storm such that effluent is well within the UPDES limits.

Culverts and diversion ditches were designed for these watersheds previously under a very conservative storm (100 yr 6 hr) and under the operational condition. With the combined watersheds now proposed, many of the ditches and culverts will experience a different flow rate for a given storm since upper sub watersheds will now be routed

through these lower ditches. Nonetheless, we have compared the previous design flows with the current modeled flows for the10 year 6 hour storm under the temporary phase one peak runoff conditions. Diversions carrying runoff from areas on the excess spoil disposal area are designed to pass a 100 year, 6 hour storm under the phase two peak runoff conditions. We have used the higher of the previous design flow or the current modeled design flow from these storms. Natural drainages outside of the permit area are considered adequate to meet the conditions that have occurred throughout their developmental history and will not be disturbed by SCA.

SUBWATERSHEDS

The Pasture Pond drainage area is divided into eighteen sub watersheds for routing analysis. These are labeled in keeping with former naming convention as follows: CW-SWS1, CW-SWS2, CW-SWS3, CW-SWS4, CW-SWS6, CW-SWS7, CW-SWS8, CW-SWS9, CW-SWS10, CW-SWS11, PAST-SWSl, PAST-SWS2, PAST-SWS3, PAST-SWS4, PAST-SWS5, PAST-SWS6, PAST-SWS7, and PAST-SWS8 (see Plate 10-5).

SOIL TYPE

According to the SCS Soil Survey of Carbon Area, Utah, the soil type found in this drainage area is predominantly SCS # 114, Strych. Three soil samples from the adjacent Reclamation Borrow Area were analyzed by Huntingdon/Chen-Northern in the early 1990s. The particle size distribution from these samples was plotted and averaged as shown in Figure One. Due to the nature of the reclamation process, the Erosion Control Practice (CP) factors are higher when the site is first covered and reseeded in Phase One and lower in Phase Two when the vegetation is more established. Other soil characteristics are as follows:

SCS Soil Name	Strych
Submerged Specific Gravity	1.75
Specific Gravity	2.75
Erosion K value	0.20
Bulk Density	1.4
CP Factor (phase 1)	0.85
CP Factor (phase 2)	0.25

CURVE NUMBERS

The Pasture Pond curve numbers are based on the Soil Conservation Service graph included as Figure Two. The soil types found on the site correspond to SCS hydrologic Class B as indicated in the SCS Soil Survey for Carbon Area, Utah. Due to the nature of

the reclamation process, the percent vegetation cover will be negligible when the site is covered and reseeded.

A curve number of 84 (corresponding to zero percent of vegetation cover density) is used for the areas covered with borrow material during phase one. A curve number of 69 (corresponding to 30 percent vegetation cover density) is used for the phase two calculations. These proposed curve numbers are considered to be potentially very conservative given the plans concerning surface roughening which could dramatically reduce the percent of runoff from the sub watersheds. Appropriate curve numbers are used for undisturbed or previously reclaimed areas and area identified in the Sedimot output data.

TIME OF CONCENTRATION

Each sub watershed requires a certain time for the water to reach the outlet following the longest path. The runoff from these sub watersheds is approximated by Sedimot-II unit "Disturbed" unit hydrograph for areas with poor vegetative cover. The overland flow velocity was estimated using the Soil Conservation Service Upland Curves (SCS 1972) corresponding to the slope and vegetation of the drainage areas. Time of concentration was calculated by dividing the average velocity into the distance to the sub watershed outlet.

ROUTING COEFFICIENTS

"Sedimot-II" uses Muskingum routing methods. Flows must be routed between structures or from a subwatershed outlet to the corresponding structure (if the outlet is not at the structure). No routing is used through sub watersheds that do not have inflow from a previous watershed, or structure (this water flow is accounted for with the time of concentration and the unit hydrograph). Areas requiring routing coefficients are indicated in the program output data. Muskingum coefficients K and X are used as follows:

K = Travel time through diversion.

$$X = \frac{0.5 * \text{Velocity}}{1.7 + \text{Velocity}}$$

SUB WATERSHED CHARACTERISTICS

Drainage Area	SCS Hydro Class	Ph 1 Vegetation Cover Density	**Phase 1 Curve N0.**	Ph 2 Vegetation Cover Density	**Phase 2 Curve No.**	Area acres	Distance to Outlet (ft)	Average Velocity (ft/s)	**Time of Concentration (hrs)**
CW-SWS1	B	50%	**65**	50%	**65**	27.7	1800	2.8	**0.18**
CW-SWS2	B	40%	**70**	40%	**69**	14	1000	1.4	**0.20**
CW-SWS3	B	40%	**70**	40%	**69**	8.6	800	1.1	**0.20**
CW-SWS4	B	40%	**70**	40%	**69**	5.5	600	1.2	**0.14**
CW-SWS6	B	40%	**70**	40%	**69**	3.1	900	1.3	**0.19**
CW-SWS7	B	20%	**75**	30%	**69**	7.4	800	1.1	**0.20**
CW-SWS8	B	20%	**75**	30%	**69**	4.1	500	1.3	**0.11**
CW-SWS9	B	10%	**80**	30%	**69**	10.3	400	1.1	**0.10**
CW-SWS10	B	0%	**84**	30%	**69**	7.9	250	1.9	**0.04**
CW-SWS11	B	0%	**84**	30%	**69**	3.4	100	1.3	**0.02**
Past-SWS1	B	0%	**84**	30%	**69**	3.9	900	1.79	**0.14**
Past-SWS2	B	0%	**84**	30%	**69**	1.2	300	2.08	**0.04**
Past-SWS3	B	0%	**84**	30%	**69**	2	950	1.76	**0.15**
Past-SWS4	B	0%	**84**	30%	**69**	1.9	800	1.85	**0.12**
Past-SWS5	B	0%	**84**	30%	**69**	3.6	700	0.78	**0.25**
Past-SWS6	B	0%	**84**	30%	**69**	2.4	900	1	**0.25**
Past-SWS7	B	0%	**84**	30%	**69**	1.7	400	1.59	**0.07**
Past-SWS8	B	15%	**90**	30%	**69**	0.55	40	1.11	**0.01**

RIPRAP SIZING

Riprap is placed along steep channel slopes and at select culvert outlets to control erosion. The size of the stones is based on the expected maximum velocity of water flowing. When peak velocities in the smooth channel are expected to reach 5 ft/s, riprap is required. Figure Three is used to determine the median stone diameter (D_{50}). The riprap mixture should approximate the following gradation:

Stone Size	% Finer
$2*D_{50}$	100
D_{50}	50
$0.5*D_{50}$	20
$0.2*D_{50}$	0

In areas where the increased roughness from riprap does not reduce the velocity below 5 ft/s, a filter blanket (or gravel bedding in a layer $3*D_{50}$) will be used.

STORM RUNOFF VOLUMES AND DESIGN FLOWS

Storm Event	Total Runoff (acft)	Pond Stage Elevation	CW RD1 cfs	CW RD2 cfs	CW RD3 cfs	CW RD4 cfs	CW RD5 cfs	CW RD6 cfs	CW RD7 cfs	CW RD8 cfs	Past RD1 cfs	Past RD2 cfs	Past RD3 /C1 cfs	Past RD4/C 2 cfs	Past RD5/ C3 cfs	Past RD6/ C4 cfs	Past RD8/ C5 cfs	Past RD9 outlet cfs
PH 1 10yr 6 hr	1.14	6488.7	0.20	0.62	0.07	0.90	1.21	0.71	3.84	4.25	2.20	0.65	3.69	6.74	1.33	1.74	0.92	0.00
PH 1 10yr 24 hr	2.91	6490.8	0.93	2.54	0.34	2.14	4.34	1.37	7.04	5.48	3.50	0.83	5.50	10.85	1.98	2.80	1.18	1.49
PH 1 25yr 6 hr	2.09	6490.7	0.93	2.53	0.34	2.25	4.31	1.57	7.56	6.60	4.00	1.00	6.11	11.94	2.18	2.93	1.42	0.27
PH 2 10yr 6 hr	0.28	6486.7	0.15	0.47	0.06	0.22	0.67	0.09	0.80	0.16	0.12	0.06	0.17	0.94	0.06	0.09	0.04	0.00
PH 2 100yr 6 hr	1.98	6490.5	2.31	6.95	0.85	2.60	9.17	1.73	10.29	3.32	2.00	0.51	2.38	11.24	0.88	1.11	0.72	0.00
Design flow rate			**2.40**	**7.80**	**2.50**	**4.80**	**10.10**	**5.00**	**14.50**	**4.25**	**2.20**	**1.20**	**3.69**	**6.74**	**2.50**	**3.60**	**1.70**	**3.98**

The Sedimot model predicts that the Phase 1 reclamation 10 year 24 hour storm peak discharge of Settleable solids will be 0.0 ml/l with a detention time of 5.35 hours.

DIVERSION DESIGN

Diversions and culverts for these miscellaneous flows are required to be designed to pass the phase one 10 year, 6 hour storm (R645-301-742.333). Diversions on the Excess Spoil Disposal Area were modeled using the phase two 100 year 6 hour storm. The operational hydrology plan designed for greater storms. The reclamation modeled flow rates were compared with the operational flow rates and the design was based on the greater of the operational or reclamation storms. Permit term reclamation hydrology modeling predicts the various storm peak flow rates for each ditch. The design flow rate is also listed in the table above.

Design summaries are given in the tables below. The diversions were designed to fit within a range of expected field values. The minimum design channel depth is conservatively calculated by using a minimum channel slope and a maximum expected Mannings N. Additional freeboard is not required in the regulations, but the operator may construct the diversions larger than required to reduce the risk of overflow from storms greater than the required design precipitation event.

The Maximum velocity expected in the channel is calculated by using minimum Manning's N values and maximum channel slopes. Manning's N for a channel bed with riprap is estimated by the equation $N=0.0395*(D_{50})^{1/6}$ with D_{50} in feet (Applied Hydrology and Sedimentology for Disturbed Areas page 188). If the normal depth of flow is less than twice D_{50} then N is estimated by the equation $N=0.456*(D_{50}$ *Slope)0.159 with D_{50} in inches and slope in feet/feet (*Development of Riprap Design*

Criteria by Riprap Testing in Flumes: Phase 1 May 1987, Colorado State University, prepared for Uranium Recovery Field Office and Division of Waste Management).

While the slopes and N values are expected to be near the middle of the range provided, these values provide the maximum variance accepted without additional rip rap or lining through the channel. The cross sections may vary but must always be sufficient to provide the maximum required flow area.

DIVERSION DESIGN CRITERIA

Ditch No.	Manning N		Side Slope	Min Bottom Width	Design Flow	Channel Slope (%)		Flow Depth (ft)		Flow Area (ft^2)		Maximum Velocity	Minimum Channel Depth	Comments
	Min	Max	minH/1V	(ft)	(cfs)	Min	Max	Min	Max	Min	Max	(ft/s)	(ft)	No lining required
CW-RD1	0.03	0.05	2	0	**2.40**	1.6	5	0.53	0.8	0.60	1.30	4.3	0.80	No lining required
CW-RD2	0.03	0.05	2	0	**7.80**	3	4	0.89	1.1	1.58	2.40	4.9	1.10	No lining required
CW-RD3	0.03	0.05	2	0	**2.50**	2	6	0.52	0.8	0.54	1.30	4.62	0.80	No lining required
CW-RD4	0.03	0.05	2	0	**4.80**	2	5	0.70	1.0	0.98	2.10	4.9	1.00	No lining required
CW-RD5	0.03	0.05	2	0	**10.10**	1	2.5	1.04	1.5	2.16	4.70	4.7	1.50	No lining required
CW-RD6	0.03	0.05	2	1	**5.00**	1	6	0.56	0.9	1.19	2.50	4.2	0.90	No lining required
CW-RD7	0.03	0.05	2	1	**14.50**	1	2.3	0.98	1.5	2.90	6.00	5	1.50	No lining required
CW-RD8	0.03	0.05	2	0	**4.25**	2	5	0.70	1.0	0.98	2.10	4.9	1.00	No lining required
Past-RD1	0.012	0.03	2	2	**2.20**	0.2	1.5	0.20	0.6	0.48	1.92	4.58	0.60	No lining required
Past-RD2	0.025	0.05	2	0	**1.20**	1	4	0.40	0.7	0.32	0.98	3.75	0.70	No lining required
Past-RD3	0.025	0.05	2	0	**3.69**	1	4	0.56	0.9	1.19	2.50	4.2	1.00	No lining required
Past-RD4	0.025	0.05	2	1	**6.74**	2	5	0.89	1.1	1.58	2.40	4.9	1.10	No lining required
Past-RD5	0.025	0.05	2	1	**2.50**	0.5	2.5	0.38	0.8	0.67	2.08	3.73	0.80	No lining required
Past-RD6	0.03	0.05	2	1	**3.60**	2	5	0.42	0.7	0.77	1.68	4.68	0.70	No lining required
Past-RD8	0.025	0.05	2	0	**1.70**	1	5	0.44	0.8	0.39	1.28	4.36	0.80	No lining required
Past-RD9	0.025	0.05	2	1	**3.98**	0.8	5	0.46	1.0	0.82	2.20	4.85	1.00	No lining required

CULVERT DESIGN CRITERIA

Culvert No	Minimum Pipe Diameter (in)	Pipe Length (ft)	Pipe Slope %	Controlling Head Water (Ft)	Design Flow (cfs)	Design Velocity (ft/s)	Inlet / Outlet Conditions
Past-RC1	18	40	1	1.2	**3.69**	3	No lining req'd
Past-RC2	24	115	3	1.4	**6.74**	4	No lining req'd
Past-RC3	18	80	0.3	0.9	**2.5**	2	No lining req'd
Past-RC4	12	75	3	1.65	**3.6**	4.6	Submerged inlet outlet Riprap D50=6"
Past-RC5	18	100	1	0.8	**1.7**	1.9	No lining req'd
CW-RC1	12	60	3.7	1.9	**4**	5	No lining req'd
CW-RC2	18	20	2.5	1.9	**7.8**	4.4	No lining req'd
CW-RC3	4@8"	10	6	0.67	**6.8**	5	No lining req'd
CW-RC4	36	60	1.7	1.9	**14.5**	4.2	No lining req'd
CW-RC5	18	30	2	1.3	**4.25**	4.9	No lining req'd
CW-RC6	18	20	2	1.1	**3.82**	4	No lining req'd
CW-RC7	24	160	3	1.4	**6.74**	4	No lining req'd

Culverts were designed for these watersheds previously under a very conservative storm (100 yr 6 hr) and under an operational condition. With the combined watersheds now proposed and under the permit term reclamation scenario, we have checked to make sure that the designs are still at least as conservative as the required 10 year 6 hour storm. See the table above for the design flow rates used.

PASTURE SEDIMENT POND

10 Year 6 Hour Storm Hydrologic Model
Phase 1

1

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      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
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*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
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     watershed identification code
     -----------------------------
     Pasture Pond 10 year 6 hour Final Recl Phase 1 June 2006

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1

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input particle size-percent finer distributions
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size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =       6.00   hours
precipation depth                 =       1.31   inches
specific gravity                  =       2.75
load rate exponent factor         =       1.50
submerged bulk specific gravity   =       1.40
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1

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   junction  1, branch  1, structure  1
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*************************************************************************

        beta is negative which inherently indicates that the
        stream system transport capacity exceeds the sediment
        load, as evaluated by williams' technique. SEDIMOT II
        does not consider erodible channels so beta is set
        equal to .01. if the user wishes to evaluate the trans-
        port capacity of the stream directly he/she should use
        subroutine sloss.

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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.12	.01	.33	.078	.922	.999
2	.33	.04	.19	.051	.693	1.000
3	.20	.04	.11	.051	.693	1.000
4	.13	.04	.03	.052	.706	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1237	acre-ft
peak discharge	=	.6182	cfs
area	=	55.8000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	8728.93	mg/l
peak settleable concentration	=	4.96	ml/l
peak settleable concentration	=	6946.12	mg/l
total sediment yield	=	.6558	tons
representative particle size	=	.0615	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.20	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.20	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.46	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.53	ml/l

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   null structure
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	75.00	.200	.100	.100	.35	1.0
3	4.10	75.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.600	1.0	.0
3	1	.20	150.0	5.00	.600	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.07	.04	.02	.052	.697	.552
2	.76	.10	1.78	.051	.693	.744
3	.71	.10	.95	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1109	acre-ft
peak discharge	=	.8955	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	13.0762	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	28083.88	mg/l
peak settleable concentration	=	15.08	ml/l
peak settleable concentration	=	21113.45	mg/l
total sediment yield	=	2.2810	tons
representative particle size	=	.0445	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.10	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.10	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.61	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.99	ml/l

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* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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1

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* * * * * * * * * * * * * * * * * * * * * *
   junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * *
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	80.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.700	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	3.70	.20	5.47	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1701	acre-ft
peak discharge	=	3.1704	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	41304.42	mg/l
peak settleable concentration	=	24.68	ml/l
peak settleable concentration	=	34549.71	mg/l
total sediment yield	=	5.4740	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	14.51	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.51	ml/l
arithmetic average settleable concentration during period of significant concentration	=	10.36	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.34	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	1.21	cfs
time of routed peak discharge	=	3.60	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.4047	ac-ft
peak runoff discharge	=	3.84	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1500	hrs
total sediment yield	=	8.4098	tons
peak sediment concentration	=	38709.05	mg/l
peak settleable concentration	=	22.3902	ml/l
peak settleable concentration	=	31346.26	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.90	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.90	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.84	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.27	ml/l

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     null structure
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    junction  2, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	84.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	4.25	.30	42.21	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2005	acre-ft
peak discharge	=	4.2544	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	244045.50	mg/l
peak settleable concentration	=	145.81	ml/l
peak settleable concentration	=	204135.50	mg/l
total sediment yield	=	42.2094	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	88.25	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	88.25	ml/l
arithmetic average settleable concentration during period of significant concentration	=	59.48	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.68	ml/l

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    null structure
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    junction  3, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	84.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.02	.30	.42	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0482	acre-ft
peak discharge	=	1.0232	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	10973.31	mg/l
peak settleable concentration	=	6.56	ml/l
peak settleable concentration	=	9178.79	mg/l
total sediment yield	=	.4176	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.87	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.87	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.55	ml/l

arithmetic average settleable concentration during peak 24 hour period	=	.33	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	6.53	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	90.50	acres
total runoff volume	=	.6535	ac-ft
peak runoff discharge	=	6.74	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.97	
previous structure travel time	=	.1000	hrs
total sediment yield	=	49.5843	tons
peak sediment concentration	=	158096.10	mg/l
peak settleable concentration	=	93.4136	ml/l
peak settleable concentration	=	130779.00	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	32.35	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	32.35	ml/l
arithmetic average settleable concentration during period of significant concentration	=	16.03	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.54	ml/l

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    null structure
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    junction  3, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	84.00	.020	.300	.300	.35	.0
2	3.90	84.00	.140	.200	.200	.35	1.0
3	1.20	84.00	.040	.200	.200	.35	.0
4	2.00	84.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.850	1.0	.0
2	1	.20	40.0	10.00	.850	1.0	.0
3	1	.20	30.0	10.00	.850	1.0	.0
4	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.83	.30	1.37	.088	1.000	.973
2	1.69	.30	5.15	.070	.863	.984
3	.65	.30	1.35	.088	1.000	.982
4	.87	.30	.35	.070	.863	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2665	acre-ft
peak discharge	=	3.6894	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	.3041	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	35116.70	mg/l
peak settleable concentration	=	20.48	ml/l
peak settleable concentration	=	28674.11	mg/l
total sediment yield	=	8.0702	tons
representative particle size	=	.0734	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	13.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	13.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.20	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.42	ml/l

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    null structure
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    junction  4, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	84.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.92	.30	.33	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0431	acre-ft
peak discharge	=	.9155	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	9592.52	mg/l
peak settleable concentration	=	5.73	ml/l
peak settleable concentration	=	8023.81	mg/l
total sediment yield	=	.3265	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.38	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	2.23	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.29	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	9.84	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	.9631	ac-ft
peak runoff discharge	=	10.03	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	57.1725	tons
peak sediment concentration	=	114246.30	mg/l
peak settleable concentration	=	67.1922	ml/l
peak settleable concentration	=	94069.02	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	25.43	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	25.43	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.94	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.86	ml/l

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     null structure
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    junction  4, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	84.00	.250	.200	.200	.35	1.0
2	2.40	84.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.850	1.0	.0
2	1	.20	50.0	10.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.33	.30	.81	.061	.790	.910
2	.89	.30	3.06	.061	.790	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1523	acre-ft
peak discharge	=	1.7393	cfs
area	=	6.0000	acres
time of peak discharge	=	3.20	hrs
beta	=	1.8979	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	38249.73	mg/l
peak settleable concentration	=	21.62	ml/l
peak settleable concentration	=	30271.57	mg/l
total sediment yield	=	3.7978	tons
representative particle size	=	.0596	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	10.16	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	10.16	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.16	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.16	ml/l

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    null structure
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   junction  5, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.750	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.48	.54	1.97	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0248	acre-ft
peak discharge	=	.4822	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	.2065	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	89642.02	mg/l
peak settleable concentration	=	53.56	ml/l
peak settleable concentration	=	74982.42	mg/l
total sediment yield	=	1.9718	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	34.57	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	34.57	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	21.19	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.83	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	11.61	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	1.1403	ac-ft
peak runoff discharge	=	11.71	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	62.7681	tons
peak sediment concentration	=	102936.80	mg/l
peak settleable concentration	=	60.3911	ml/l
peak settleable concentration	=	84547.50	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	23.49	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	23.49	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.51	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.82	ml/l

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                pond results

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```

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

```
*********************************************************
*********************************************************

     caution: the stage of your principal spillway
     may cause bed scour. SEDIMOT II does not consider
     possible bed scour; hence, your observed effluent
     may not meet the desired effluent standard. increase
     the stage of your principal spillway.
*********************************************************
*********************************************************
```

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	1.140	acre-ft
outflow routed volume	=	.004	acre-ft
storm volume discharged (plug flow)	=	.004	acre-ft
pond volume at peak stage	=	1.463	acre-ft
peak stage	=	4.234	ft
peak inflow rate	=	11.711	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	102936.80	mg/l
peak effluent sediment concentration	=	8285.10	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.01	mg/l
storm average effluent concentration	=	3428.95	mg/l
average effluent sediment concentration	=	3428.95	mg/l
basin trap efficiency	=	99.97	percent
detention time of flow with sediment	=	22.70	hrs
detention time from hydrograph centers	=	22.70	hrs
detention time including stored flow	=	22.70	hrs
sediment load discharged	=	.02	tons
period of significant concentration	=	47.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	115.216	*	3.00	.000	3295.060
3.20	.000	8285.103	*	3.40	.000	8153.978
3.60	.001	7435.903	*	3.80	.001	6837.079
4.00	.001	6377.177	*	4.20	.001	6030.756
4.40	.001	5745.261	*	4.60	.001	5513.357
4.80	.001	5307.341	*	5.00	.001	5129.242
5.20	.001	4970.868	*	5.40	.001	4827.453
5.60	.001	4704.104	*	5.80	.001	4595.527
6.00	.001	4480.771	*	6.20	.001	4384.201
6.40	.001	4307.656	*	6.60	.001	4236.042
6.80	.001	4175.692	*	7.00	.001	4125.971
7.20	.001	4083.555	*	7.40	.001	4045.667
7.60	.001	4011.099	*	7.80	.001	3979.185
8.00	.001	3949.455	*	8.20	.001	3921.569
8.40	.001	3895.225	*	8.60	.001	3870.288
8.80	.001	3846.604	*	9.00	.001	3823.999
9.20	.001	3802.432	*	9.40	.001	3782.133
9.60	.001	3763.212	*	9.80	.001	3745.403
10.00	.001	3728.463	*	10.20	.001	3712.256
10.40	.001	3696.756	*	10.60	.001	3682.013
10.80	.001	3667.956	*	11.00	.001	3654.454
11.20	.001	3641.441	*	11.40	.001	3628.875
11.60	.001	3616.792	*	11.80	.001	3605.229
12.00	.001	3594.207	*	12.20	.001	3583.752
12.40	.001	3573.774	*	12.60	.001	3564.162
12.80	.001	3554.858	*	13.00	.001	3545.824
13.20	.001	3537.031	*	13.40	.001	3528.462
13.60	.001	3520.100	*	13.80	.001	3511.933
14.00	.001	3503.948	*	14.20	.001	3496.136
14.40	.001	3488.504	*	14.60	.001	3481.127
14.80	.001	3474.054	*	15.00	.001	3467.226
15.20	.001	3460.587	*	15.40	.001	3454.108
15.60	.001	3447.766	*	15.80	.001	3441.551
16.00	.001	3435.453	*	16.20	.001	3429.467
16.40	.001	3423.587	*	16.60	.001	3417.811
16.80	.001	3412.133	*	17.00	.001	3406.564
17.20	.001	3401.183	*	17.40	.001	3396.022
17.60	.001	3391.021	*	17.80	.001	3386.143
18.00	.001	3381.367	*	18.20	.001	3376.667
18.40	.001	3371.982	*	18.60	.001	3367.230
18.80	.001	3362.425	*	19.00	.001	3357.625
19.20	.001	3352.849	*	19.40	.001	3348.113
19.60	.001	3343.435	*	19.80	.001	3338.883
20.00	.001	3334.473	*	20.20	.001	3330.157

20.40	.001	3325.915	*	20.60	.001	3321.737
20.80	.001	3317.613	*	21.00	.001	3313.541
21.20	.001	3309.518	*	21.40	.001	3305.542
21.60	.001	3301.615	*	21.80	.001	3297.736
22.00	.001	3293.906	*	22.20	.001	3290.135
22.40	.001	3286.459	*	22.60	.001	3282.882
22.80	.001	3279.373	*	23.00	.001	3275.921
23.20	.001	3272.518	*	23.40	.001	3269.158
23.60	.001	3265.838	*	23.80	.001	3262.557
24.00	.001	3259.313	*	24.20	.001	3256.104
24.40	.001	3252.930	*	24.60	.001	3249.790
24.80	.001	3246.682	*	25.00	.001	3243.605
25.20	.001	3240.559	*	25.40	.001	3237.543
25.60	.001	3234.555	*	25.80	.001	3231.594
26.00	.001	3228.660	*	26.20	.001	3225.752
26.40	.001	3222.869	*	26.60	.001	3220.011
26.80	.001	3217.178	*	27.00	.001	3214.370
27.20	.001	3211.585	*	27.40	.001	3208.824
27.60	.001	3206.086	*	27.80	.001	3203.371
28.00	.001	3200.677	*	28.20	.001	3198.005
28.40	.001	3195.353	*	28.60	.001	3192.708
28.80	.001	3190.015	*	29.00	.001	3187.261
29.20	.001	3184.486	*	29.40	.001	3181.706
29.60	.001	3178.928	*	29.80	.001	3176.159
30.00	.001	3173.402	*	30.20	.001	3170.659
30.40	.001	3167.929	*	30.60	.001	3165.213
30.80	.001	3162.512	*	31.00	.001	3159.827
31.20	.001	3157.157	*	31.40	.001	3154.503
31.60	.001	3151.864	*	31.80	.001	3149.242
32.00	.001	3146.638	*	32.20	.001	3144.052
32.40	.001	3141.483	*	32.60	.001	3138.931
32.80	.001	3136.398	*	33.00	.001	3133.881
33.20	.001	3131.381	*	33.40	.001	3128.899
33.60	.001	3126.433	*	33.80	.001	3123.982
34.00	.001	3121.549	*	34.20	.001	3119.131
34.40	.001	3116.729	*	34.60	.001	3114.341
34.80	.001	3111.970	*	35.00	.001	3109.614
35.20	.001	3107.273	*	35.40	.001	3104.946
35.60	.001	3102.635	*	35.80	.001	3100.337
36.00	.001	3098.052	*	36.20	.001	3095.782
36.40	.001	3093.527	*	36.60	.001	3091.285
36.80	.001	3089.057	*	37.00	.001	3086.842
37.20	.001	3084.640	*	37.40	.001	3082.451
37.60	.001	3080.275	*	37.80	.001	3078.111
38.00	.001	3075.960	*	38.20	.001	3073.822
38.40	.001	3071.697	*	38.60	.001	3069.582
38.80	.001	3067.473	*	39.00	.001	3065.343
39.20	.001	3063.168	*	39.40	.001	3060.967
39.60	.001	3058.755	*	39.80	.001	3056.539
40.00	.001	3054.325	*	40.20	.001	3052.118
40.40	.001	3049.916	*	40.60	.001	3047.721
40.80	.001	3045.534	*	41.00	.001	3043.354
41.20	.001	3041.183	*	41.40	.001	3039.020
41.60	.001	3036.866	*	41.80	.001	3034.722
42.00	.001	3032.586	*	42.20	.001	3030.461
42.40	.001	3028.346	*	42.60	.001	3026.242
42.80	.001	3024.148	*	43.00	.001	3022.065
43.20	.001	3019.993	*	43.40	.001	3017.931

43.60	.001	3015.880	*	43.80	.001	3013.837
44.00	.001	3011.805	*	44.20	.001	3009.784
44.40	.001	3007.773	*	44.60	.001	3005.771
44.80	.001	3003.779	*	45.00	.001	3001.797
45.20	.001	2999.824	*	45.40	.001	2997.860
45.60	.001	2995.906	*	45.80	.001	2993.962
46.00	.001	2992.027	*	46.20	.001	2990.099
46.40	.001	2988.182	*	46.60	.001	2986.273
46.80	.001	2984.374	*	47.00	.001	2982.483
47.20	.001	2980.600	*	47.40	.001	2978.727
47.60	.001	2976.862	*	47.80	.001	2975.005
48.00	.001	2973.156	*	48.20	.001	2971.316
48.40	.001	2969.484	*	48.60	.001	2967.660
48.80	.001	2965.844	*	49.00	.001	2964.033
49.20	.001	2962.216	*	49.40	.001	2960.368
49.60	.001	2958.487	*	49.80	.001	2956.594

*** run completed ****

```
Pasture Pond 10 year 6 hour Final Recl Phase 1 June 2006                    X
     2       0
  1.31    6.00     .10     .00
     5       2
     2       2       2       2       1
  2.75    1.50    1.40
     1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
  .0080   .0060   .0040   .0020   .0001
 94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
 13.80   12.30   11.00   10.00     .00
     1       1
  .100    .100    .400
  .000    .000    .000
     1       1
  .150    .150    .400
  .000    .000    .000
     1       1
  .100    .100    .400
  .000    .000    .000
     1       1       1
  .050    .050    .350
  .000    .000    .000
     1
  .050    .050    .350
     4       1       1       1       1
27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
 .2000200.0000 10.0000   .2500  1.0000
14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
 .2000500.0000  2.5000   .2500  1.0000
 8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
 .2000400.0000  2.8000   .2500  1.0000
 5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
 .2000200.0000  1.0000   .2500  1.0000
     3       1       1       1       1
 3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
 .2000 80.0000  2.0000   .2500  1.0000
 7.400  75.000    .200    .100    .100    .350   1.000   1.000    .000
 .2000250.0000  5.0000   .6000  1.0000
 4.100  75.000    .110    .000    .000    .300   1.000   1.000    .000
 .2000150.0000  5.0000   .6000  1.0000
     1       1       1       1       1
10.300  80.000    .100    .000    .100    .350   1.000   1.000    .000
 .2000100.0000  5.0000   .7000  1.0000
     1       1       1       1       1
 7.900  84.000    .040    .000    .000    .000   1.000   1.000    .000
 .2000 50.0000 20.0000   .8500  1.0000
     1       1       1       1       1
 1.900  84.000    .120    .000    .000    .000   1.000   1.000    .000
 .2000 30.0000  2.0000   .8500  1.0000
     4       1       1       1       1
 3.400  84.000    .020    .300    .300    .350   1.000   1.000    .000
 .2000 20.0000  5.0000   .8500  1.0000
 3.900  84.000    .140    .200    .200    .350   1.000   1.000    .000
 .2000 40.0000 10.0000   .8500  1.0000
 1.200  84.000    .040    .200    .200    .350   1.000   1.000    .000
 .2000 30.0000 10.0000   .8500  1.0000
 2.000  84.000    .150    .000    .000    .000   1.000   1.000    .000
 .2000 20.0000  2.0000   .8500  1.0000
     1       1       1       1       1
 1.700  84.000    .070    .000    .000    .000   1.000   1.000    .000
 .2000 20.0000  2.0000   .8500  1.0000
     2       1       1       1       1
 3.600  84.000    .250    .200    .200    .350   1.000   1.000    .000
 .2000 50.0000  2.0000   .8500  1.0000
 2.400  84.000    .250    .000    .000    .000   1.000   1.000    .000
 .2000 50.0000 10.0000   .8500  1.0000
     1       2       1       1       1
  .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .7500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

10 Year 24 Hour Storm Hydrologic Model
Phase 1

1

```
*****************************************************************
*****************************************************************

       University of Kentucky computer model
       of surface mine hydrology and sedimentology
       for more information contact the Agricultural
       Engineering Department

       the UK model is a design model developed to predict
       the hydraulic and sediment response from surface
       mined lands for a specified rainfall event (single storm)

       version date 9-23-83

       disclaimer: neither the University nor any of its employees
       accept any responsibility or legal liability for the
       conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*     the following values are now predicted by SEDIMOT II.     *
*     they can be found in summary tables.                      *
*      1. period of significant concentration                   *
*      2. volume weighted average settleable concentration      *
*         during period of significant concentration            *
*      3. volume weighted average settleable concentration      *
*         during peak 24 hour period                            *
*      4. arithmetic average settleable concentration during    *
*         period of significant concentration                   *
*      5. arithmetic average settleable concentration           *
*         during peak 24 hour period                            *
*                                                               *
*     all concentrations are in ml/l.                           *
*                                                               *
*****************************************************************
```



```
*********************************************
     watershed identification code
     -----------------------------
     Pasture Pond 10 year 24 hour Final Recl Phase 1 June 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      24.00   hours
precipation depth                 =       1.84   inches
specific gravity                  =       2.75
load rate exponent factor         =       1.50
submerged bulk specific gravity   =       1.40
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.41	.09	2.37	.025	.477	1.000
2	1.51	.18	.99	.054	.723	1.000
3	.93	.18	.59	.054	.723	1.000
4	.65	.18	.15	.058	.757	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.6480	acre-ft
peak discharge	=	2.5380	cfs
area	=	55.8000	acres
time of peak discharge	=	12.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	5899.08	mg/l
peak settleable concentration	=	3.02	ml/l
peak settleable concentration	=	4222.98	mg/l
total sediment yield	=	4.0996	tons
representative particle size	=	.0333	mm
time of peak concentration	=	12.30	hrs
period of significant concentration	=	14.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.36	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.36	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.03	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.23	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	75.00	.200	.100	.100	.35	1.0
3	4.10	75.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.600	1.0	.0
3	1	.20	150.0	5.00	.600	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.34	.18	.09	.055	.733	.661
2	1.80	.31	5.24	.064	.811	.801
3	1.37	.31	2.51	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3401	acre-ft
peak discharge	=	2.1430	cfs
area	=	14.6000	acres
time of peak discharge	=	12.00	hrs
beta	=	8.8128	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	31478.24	mg/l
peak settleable concentration	=	17.60	ml/l
peak settleable concentration	=	24645.06	mg/l
total sediment yield	=	6.7633	tons
representative particle size	=	.0562	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.10	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.10	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.96	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.64	ml/l

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* * * * * * * * * * * *
   null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	80.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.700	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	5.37	.47	10.90	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4014	acre-ft
peak discharge	=	4.6978	cfs
area	=	10.3000	acres
time of peak discharge	=	12.10	hrs
beta	=	2.9418	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	40203.09	mg/l
peak settleable concentration	=	24.02	ml/l
peak settleable concentration	=	33628.48	mg/l
total sediment yield	=	10.9041	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.10	hrs
period of significant concentration	=	12.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.91	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.91	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.07	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.11	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	4.34	cfs
time of routed peak discharge	=	12.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	1.3895	ac-ft
peak runoff discharge	=	7.04	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.91	
previous structure travel time	=	.1500	hrs
total sediment yield	=	20.7775	tons
peak sediment concentration	=	35882.54	mg/l
peak settleable concentration	=	20.1782	ml/l
peak settleable concentration	=	28249.54	mg/l
time to peak concentration	=	12.00	hrs
period of significant concentration	=	14.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.13	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	6.13	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.65	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.21	ml/l

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    null structure
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    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	84.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	5.48	.63	73.27	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4166	acre-ft
peak discharge	=	5.4814	cfs
area	=	7.9000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	235904.50	mg/l
peak settleable concentration	=	140.95	ml/l
peak settleable concentration	=	197325.90	mg/l
total sediment yield	=	73.2653	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	72.82	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	72.82	ml/l
arithmetic average settleable concentration during period of significant concentration	=	33.20	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	18.12	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * *
   junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	84.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.32	.63	.72	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1002	acre-ft
peak discharge	=	1.3183	cfs
area	=	1.9000	acres
time of peak discharge	=	12.00	hrs
beta	=	.5937	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	10576.20	mg/l
peak settleable concentration	=	6.32	ml/l
peak settleable concentration	=	8846.62	mg/l
total sediment yield	=	.7248	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.19	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.19	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	1.43	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.76	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	10.58	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.9063	ac-ft
peak runoff discharge	=	10.85	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.98	
previous structure travel time	=	.1000	hrs
total sediment yield	=	93.2057	tons
peak sediment concentration	=	133665.00	mg/l
peak settleable concentration	=	78.5382	ml/l
peak settleable concentration	=	109953.40	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	20.50	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	20.50	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.38	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	6.02	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  3, branch  2, structure  1
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	84.00	.020	.300	.300	.35	.0
2	3.90	84.00	.140	.200	.200	.35	1.0
3	1.20	84.00	.040	.200	.200	.35	.0
4	2.00	84.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.850	1.0	.0
2	1	.20	40.0	10.00	.850	1.0	.0
3	1	.20	30.0	10.00	.850	1.0	.0
4	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.36	.63	2.38	.088	1.000	.999
2	2.39	.63	9.41	.077	.918	.999
3	.83	.63	2.33	.088	1.000	.999
4	1.22	.63	.63	.077	.918	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.5538	acre-ft
peak discharge	=	5.5038	cfs
area	=	10.5000	acres
time of peak discharge	=	12.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	37344.47	mg/l
peak settleable concentration	=	22.05	ml/l
peak settleable concentration	=	30874.45	mg/l
total sediment yield	=	14.7465	tons
representative particle size	=	.0804	mm
time of peak concentration	=	12.30	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.38	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.51	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.08	ml/l

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* * * * * * * * * * * *
   null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	84.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.18	.63	.57	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0897	acre-ft
peak discharge	=	1.1795	cfs
area	=	1.7000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	9246.56	mg/l
peak settleable concentration	=	5.52	ml/l
peak settleable concentration	=	7734.43	mg/l
total sediment yield	=	.5666	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.79	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.79	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	1.25	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.66	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	16.19	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	2.5497	ac-ft
peak runoff discharge	=	16.43	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	107.0223	tons
peak sediment concentration	=	98192.45	mg/l
peak settleable concentration	=	57.5730	ml/l
peak settleable concentration	=	80602.24	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	17.69	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	17.69	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.94	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	5.09	ml/l

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    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	84.00	.250	.200	.200	.35	1.0
2	2.40	84.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.850	1.0	.0
2	1	.20	50.0	10.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.98	.63	1.52	.070	.864	.985
2	1.32	.63	5.75	.070	.864	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3164	acre-ft
peak discharge	=	2.8047	cfs
area	=	6.0000	acres
time of peak discharge	=	12.20	hrs
beta	=	.2884	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	36377.02	mg/l
peak settleable concentration	=	21.08	ml/l
peak settleable concentration	=	29507.70	mg/l
total sediment yield	=	7.2380	tons
representative particle size	=	.0698	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.53	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.53	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.74	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.64	ml/l

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* * * * * * * * * * * *
    null structure
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   junction  5, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.750	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.55	.96	2.93	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0443	acre-ft
peak discharge	=	.5488	cfs
area	=	.5540	acres
time of peak discharge	=	12.00	hrs
beta	=	.1055	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	88246.70	mg/l
peak settleable concentration	=	52.73	ml/l
peak settleable concentration	=	73815.28	mg/l
total sediment yield	=	2.9300	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	28.91	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	28.91	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.85	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	6.61	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	19.00	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	2.9104	ac-ft
peak runoff discharge	=	19.11	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	117.0243	tons
peak sediment concentration	=	89594.46	mg/l
peak settleable concentration	=	52.5021	ml/l
peak settleable concentration	=	73503.01	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	16.95	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	16.95	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.69	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	5.03	ml/l

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                pond results

* * * * * * * * * * * * * * * * * * * * * * * * * * * * *


        ***** control variables options *****

    flow     fractn     isdo     nrhp     nsp     ncstr
  -------------------------------------------------------
     3         0         1      500      10       2

*********************************************************
*********************************************************

    caution: the stage of your principal spillway
    may cause bed scour. SEDIMOT II does not consider
    possible bed scour; hence, your observed effluent
    may not meet the desired effluent standard. increase
    the stage of your principal spillway.
*********************************************************
*********************************************************
```

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	2.910	acre-ft
outflow routed volume	=	.865	acre-ft
storm volume discharged (plug flow)	=	.865	acre-ft
pond volume at peak stage	=	2.435	acre-ft
peak stage	=	6.293	ft
peak inflow rate	=	19.107	cfs
peak discharge rate	=	1.494	cfs
peak inflow sediment concentration	=	89594.46	mg/l
peak effluent sediment concentration	=	13947.82	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.02	mg/l
storm average effluent concentration	=	3912.24	mg/l
average effluent sediment concentration	=	3912.24	mg/l
basin trap efficiency	=	96.07	percent
detention time of flow with sediment	=	5.35	hrs
detention time from hydrograph centers	=	5.35	hrs
detention time including stored flow	=	5.35	hrs
sediment load discharged	=	4.60	tons
period of significant concentration	=	39.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	.000	*	3.00	.000	.000
3.20	.000	.000	*	3.40	.000	.000
3.60	.000	.000	*	3.80	.000	.000
4.00	.000	.000	*	4.20	.000	.000
4.40	.000	.000	*	4.60	.000	.000
4.80	.000	.000	*	5.00	.000	.000
5.20	.000	.000	*	5.40	.000	.000
5.60	.000	.000	*	5.80	.000	.000
6.00	.000	.000	*	6.20	.000	.000
6.40	.000	.000	*	6.60	.000	.000
6.80	.000	.000	*	7.00	.000	.000
7.20	.000	.000	*	7.40	.000	.000
7.60	.000	.000	*	7.80	.000	.000
8.00	.000	.000	*	8.20	.000	.000
8.40	.000	.000	*	8.60	.000	.000
8.80	.000	.000	*	9.00	.000	.000
9.20	.000	.000	*	9.40	.000	.000
9.60	.000	.000	*	9.80	.000	.000
10.00	.000	.000	*	10.20	.000	.000
10.40	.000	.000	*	10.60	.000	.003
10.80	.000	.017	*	11.00	.000	.090
11.20	.000	.771	*	11.40	.000	4.874
11.60	.000	55.121	*	11.80	.000	2102.347
12.00	.000	10269.600	*	12.20	.001	13947.820
12.40	.001	12055.300	*	12.60	.001	10458.100
12.80	.001	9285.165	*	13.00	.001	8485.018
13.20	.001	7914.720	*	13.40	.001	7472.341
13.60	.001	7119.483	*	13.80	.001	6816.754
14.00	.001	6558.434	*	14.20	.001	6332.588
14.40	.001	6133.834	*	14.60	.001	5962.611
14.80	.001	5811.189	*	15.00	.001	5674.866
15.20	.001	5549.455	*	15.40	.001	5432.494
15.60	.001	5322.972	*	15.80	.001	5219.953
16.00	.001	5122.467	*	16.20	.001	5027.142
16.40	.474	4936.161	*	16.60	1.014	4852.235
16.80	1.253	4774.691	*	17.00	1.351	4703.228
17.20	1.394	4636.335	*	17.40	1.416	4572.566
17.60	1.429	4511.109	*	17.80	1.437	4451.553
18.00	1.443	4393.645	*	18.20	1.447	4337.208
18.40	1.450	4282.100	*	18.60	1.454	4228.197
18.80	1.458	4175.402	*	19.00	1.463	4123.636
19.20	1.468	4072.824	*	19.40	1.474	4022.908
19.60	1.479	3973.849	*	19.80	1.485	3925.688

20.00	1.491	3878.606	*	20.20	1.493	3831.774
20.40	1.451	3786.481	*	20.60	1.367	3745.046
20.80	1.272	3706.860	*	21.00	1.190	3671.300
21.20	1.133	3637.500	*	21.40	1.096	3604.951
21.60	1.073	3573.391	*	21.80	1.060	3542.602
22.00	1.051	3512.443	*	22.20	1.046	3482.825
22.40	1.044	3453.686	*	22.60	1.043	3424.996
22.80	1.042	3396.761	*	23.00	1.043	3368.979
23.20	1.045	3341.631	*	23.40	1.047	3314.744
23.60	1.049	3288.298	*	23.80	1.051	3262.211
24.00	1.036	3233.879	*	24.20	.910	3209.292
24.40	.787	3188.745	*	24.60	.658	3169.321
24.80	.492	3152.976	*	25.00	.334	3139.931
25.20	.221	3128.909	*	25.40	.148	3118.988
25.60	.101	3109.834	*	25.80	.069	3101.276
26.00	.048	3093.204	*	26.20	.033	3085.545
26.40	.022	3078.243	*	26.60	.014	3071.334
26.80	.008	3064.788	*	27.00	.005	3058.516
27.20	.003	3052.470	*	27.40	.002	3046.619
27.60	.001	3040.940	*	27.80	.001	3035.415
28.00	.001	3030.031	*	28.20	.001	3024.780
28.40	.001	3019.650	*	28.60	.001	3014.635
28.80	.001	3009.729	*	29.00	.001	3004.924
29.20	.001	3000.215	*	29.40	.001	2995.597
29.60	.001	2991.079	*	29.80	.001	2986.688
30.00	.001	2982.448	*	30.20	.001	2978.337
30.40	.001	2974.326	*	30.60	.001	2970.402
30.80	.001	2966.556	*	31.00	.001	2962.780
31.20	.001	2959.059	*	31.40	.001	2955.355
31.60	.001	2951.630	*	31.80	.001	2947.898
32.00	.001	2944.191	*	32.20	.001	2940.518
32.40	.001	2936.885	*	32.60	.001	2933.295
32.80	.001	2929.756	*	33.00	.001	2926.290
33.20	.001	2922.927	*	33.40	.001	2919.656
33.60	.001	2916.451	*	33.80	.001	2913.300
34.00	.001	2910.197	*	34.20	.001	2907.137
34.40	.001	2904.116	*	34.60	.001	2901.134
34.80	.001	2898.188	*	35.00	.001	2895.277
35.20	.001	2892.398	*	35.40	.001	2889.552
35.60	.001	2886.736	*	35.80	.001	2883.950
36.00	.001	2881.194	*	36.20	.001	2878.478
36.40	.001	2875.823	*	36.60	.001	2873.225
36.80	.001	2870.669	*	37.00	.001	2868.149
37.20	.001	2865.658	*	37.40	.001	2863.196
37.60	.001	2860.760	*	37.80	.001	2858.351
38.00	.001	2855.965	*	38.20	.001	2853.604
38.40	.001	2851.265	*	38.60	.001	2848.949
38.80	.001	2846.653	*	39.00	.001	2844.377
39.20	.001	2842.122	*	39.40	.001	2839.887
39.60	.001	2837.670	*	39.80	.001	2835.473
40.00	.001	2833.295	*	40.20	.001	2831.136
40.40	.001	2828.996	*	40.60	.001	2826.874
40.80	.001	2824.770	*	41.00	.001	2822.683
41.20	.001	2820.614	*	41.40	.001	2818.561
41.60	.001	2816.525	*	41.80	.001	2814.504
42.00	.001	2812.500	*	42.20	.001	2810.510
42.40	.001	2808.535	*	42.60	.001	2806.574

42.80	.001	2804.628	*	43.00	.001	2802.695
43.20	.001	2800.775	*	43.40	.001	2798.869
43.60	.001	2796.978	*	43.80	.001	2795.099
44.00	.001	2793.234	*	44.20	.001	2791.371
44.40	.001	2789.486	*	44.60	.001	2787.564
44.80	.001	2785.621	*	45.00	.001	2783.673
45.20	.001	2781.727	*	45.40	.001	2779.787
45.60	.001	2777.855	*	45.80	.001	2775.932
46.00	.001	2774.019	*	46.20	.001	2772.114
46.40	.001	2770.219	*	46.60	.001	2768.334
46.80	.001	2766.458	*	47.00	.001	2764.593
47.20	.001	2762.738	*	47.40	.001	2760.892
47.60	.001	2759.057	*	47.80	.001	2757.231
48.00	.001	2755.415	*	48.20	.001	2753.608
48.40	.001	2751.810	*	48.60	.001	2750.021
48.80	.001	2748.241	*	49.00	.001	2746.471
49.20	.001	2744.709	*	49.40	.001	2742.957
49.60	.001	2741.214	*	49.80	.001	2739.479

*** run completed ****

```
Pasture Pond 10 year 24 hour Final Recl Phase 1 June 2006                    X
       2       0
    1.84   24.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .2500  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .2500  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .2500  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .2500  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .2500  1.0000
   7.400  75.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .6000  1.0000
   4.100  75.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .6000  1.0000
       1       1       1       1       1
  10.300  80.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .7000  1.0000
       1       1       1       1       1
   7.900  84.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8500  1.0000
       1       1       1       1       1
   1.900  84.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .8500  1.0000
       4       1       1       1       1
   3.400  84.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .8500  1.0000
   3.900  84.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .8500  1.0000
   1.200  84.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8500  1.0000
   2.000  84.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .8500  1.0000
       1       1       1       1       1
   1.700  84.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .8500  1.0000
       2       1       1       1       1
   3.600  84.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .8500  1.0000
   2.400  84.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8500  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .7500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

25 Year 6 Hour Storm Hydrologic Model
Phase 1

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************
                 -
     watershed identification code
     -----------------------------
     Pasture Pond 25 year 6 hour Final Recl Phase 1 June 2006

*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------


size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      1.62   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.47	.05	1.80	.037	.589	.985
2	1.51	.12	.76	.050	.680	.987
3	.93	.12	.46	.050	.680	.991
4	.65	.12	.11	.053	.716	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3848	acre-ft
peak discharge	=	2.5272	cfs
area	=	55.8000	acres
time of peak discharge	=	3.20	hrs
beta	=	.3854	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	7888.96	mg/l
peak settleable concentration	=	4.18	ml/l
peak settleable concentration	=	5849.97	mg/l
total sediment yield	=	3.0949	tons
representative particle size	=	.0406	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.09	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.09	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.88	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.65	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	75.00	.200	.100	.100	.35	1.0
3	4.10	75.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.600	1.0	.0
3	1	.20	150.0	5.00	.600	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.34	.12	.07	.051	.690	.625
2	1.88	.21	4.37	.058	.758	.778
3	1.57	.21	2.21	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2330	acre-ft
peak discharge	=	2.2517	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	10.4191	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	31347.11	mg/l
peak settleable concentration	=	17.25	ml/l
peak settleable concentration	=	24145.41	mg/l
total sediment yield	=	5.6538	tons
representative particle size	=	.0519	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.78	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.78	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.50	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.16	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * *
   junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	80.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.700	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	6.36	.35	10.14	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2974	acre-ft
peak discharge	=	5.5120	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	3.6991	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	41939.09	mg/l
peak settleable concentration	=	25.06	ml/l
peak settleable concentration	=	35080.59	mg/l
total sediment yield	=	10.1369	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	15.28	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	15.28	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	10.50	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.36	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	4.31	cfs
time of routed peak discharge	=	3.30	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.9152	ac-ft
peak runoff discharge	=	7.56	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.89	
previous structure travel time	=	.1500	hrs
total sediment yield	=	17.8828	tons
peak sediment concentration	=	36960.79	mg/l
peak settleable concentration	=	20.8573	ml/l
peak settleable concentration	=	29200.16	mg/l
time to peak concentration	=	3.00	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.13	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.13	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.44	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.22	ml/l

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* * * * * * * * * * * *
     null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	84.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	6.60	.49	70.30	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3215	acre-ft
peak discharge	=	6.5984	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	244459.00	mg/l
peak settleable concentration	=	146.06	ml/l
peak settleable concentration	=	204481.40	mg/l
total sediment yield	=	70.3004	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	91.24	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	91.24	ml/l
arithmetic average settleable concentration during period of significant concentration	=	58.80	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.84	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * *
   junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	84.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.59	.49	.70	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0773	acre-ft
peak discharge	=	1.5870	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	10993.64	mg/l
peak settleable concentration	=	6.57	ml/l
peak settleable concentration	=	9195.79	mg/l
total sediment yield	=	.6955	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	4.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	4.01	ml/l
arithmetic average settleable			

concentration during period of significant concentration	=	2.52	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.34	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	11.61	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.3140	ac-ft
peak runoff discharge	=	11.94	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.97	
previous structure travel time	=	.1000	hrs
total sediment yield	=	86.4088	tons
peak sediment concentration	=	145309.50	mg/l
peak settleable concentration	=	85.3302	ml/l
peak settleable concentration	=	119462.30	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	27.75	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	27.75	ml/l
arithmetic average settleable concentration during period of significant concentration	=	13.64	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.24	ml/l

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* * * * * * * * * * * *
     null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	84.00	.020	.300	.300	.35	.0
2	3.90	84.00	.140	.200	.200	.35	1.0
3	1.20	84.00	.040	.200	.200	.35	.0
4	2.00	84.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.850	1.0	.0
2	1	.20	40.0	10.00	.850	1.0	.0
3	1	.20	30.0	10.00	.850	1.0	.0
4	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.84	.49	2.28	.088	1.000	.999
2	2.74	.49	8.78	.073	.889	.999
3	1.00	.49	2.24	.088	1.000	.999
4	1.40	.49	.59	.073	.889	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4273	acre-ft
peak discharge	=	6.1148	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	37338.45	mg/l
peak settleable concentration	=	21.95	ml/l
peak settleable concentration	=	30728.12	mg/l
total sediment yield	=	13.8910	tons
representative particle size	=	.0777	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	14.02	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.02	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.39	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.49	ml/l

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* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	84.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.42	.49	.54	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0692	acre-ft
peak discharge	=	1.4199	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	9610.30	mg/l
peak settleable concentration	=	5.74	ml/l
peak settleable concentration	=	8038.68	mg/l
total sediment yield	=	.5437	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.51	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.51	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	2.21	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.29	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	17.42	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	1.8105	ac-ft
peak runoff discharge	=	17.71	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	99.4589	tons
peak sediment concentration	=	106759.60	mg/l
peak settleable concentration	=	62.5260	ml/l
peak settleable concentration	=	87536.34	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	23.34	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	23.34	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.62	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.71	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	84.00	.250	.200	.200	.35	1.0
2	2.40	84.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.850	1.0	.0
2	1	.20	50.0	10.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.18	.49	1.38	.064	.818	.950
2	1.45	.49	5.25	.064	.818	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2442	acre-ft
peak discharge	=	2.9252	cfs
area	=	6.0000	acres
time of peak discharge	=	3.20	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	38715.48	mg/l
peak settleable concentration	=	22.12	ml/l
peak settleable concentration	=	30966.92	mg/l
total sediment yield	=	6.5649	tons
representative particle size	=	.0635	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.07	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.07	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.52	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.22	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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1

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* * * * * * * * * * * * * * * * * * * * * * *
   junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.750	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.67	.78	2.92	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0360	acre-ft
peak discharge	=	.6728	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	.1358	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	89446.95	mg/l
peak settleable concentration	=	53.44	ml/l
peak settleable concentration	=	74819.25	mg/l
total sediment yield	=	2.9225	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	35.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	35.38	ml/l
arithmetic average settleable concentration during period of significant concentration	=	20.46	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.90	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	20.49	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	2.0906	ac-ft
peak runoff discharge	=	20.63	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	108.7496	tons
peak sediment concentration	=	96745.18	mg/l
peak settleable concentration	=	56.5843	ml/l
peak settleable concentration	=	79218.00	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	22.06	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	22.06	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.18	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.70	ml/l

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    pond results

* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	2.091	acre-ft
outflow routed volume	=	.027	acre-ft
storm volume discharged (plug flow)	=	.027	acre-ft
pond volume at peak stage	=	2.396	acre-ft
peak stage	=	6.217	ft
peak inflow rate	=	20.628	cfs
peak discharge rate	=	.273	cfs
peak inflow sediment concentration	=	96745.18	mg/l
peak effluent sediment concentration	=	16602.77	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.02	mg/l
storm average effluent concentration	=	5050.37	mg/l
average effluent sediment concentration	=	5050.37	mg/l
basin trap efficiency	=	99.83	percent
detention time of flow with sediment	=	6.14	hrs
detention time from hydrograph centers	=	6.14	hrs
detention time including stored flow	=	6.14	hrs
sediment load discharged	=	.19	tons
period of significant concentration	=	47.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	1.735
2.80	.000	916.741	*	3.00	.000	10360.480
3.20	.001	16602.770	*	3.40	.001	13965.230
3.60	.001	11823.940	*	3.80	.001	10325.260
4.00	.001	9301.426	*	4.20	.001	8582.696
4.40	.001	8031.358	*	4.60	.001	7596.477
4.80	.001	7226.615	*	5.00	.001	6912.021
5.20	.001	6638.507	*	5.40	.001	6397.887
5.60	.001	6191.727	*	5.80	.001	6011.364
6.00	.001	5835.438	*	6.20	.001	5689.946
6.40	.001	5571.193	*	6.60	.026	5463.840
6.80	.258	5374.339	*	7.00	.260	5299.951
7.20	.214	5236.180	*	7.40	.170	5179.696
7.60	.133	5128.912	*	7.80	.103	5082.689
8.00	.078	5040.160	*	8.20	.058	5000.617
8.40	.041	4963.539	*	8.60	.026	4928.817
8.80	.015	4896.400	*	9.00	.009	4866.289
9.20	.005	4838.259	*	9.40	.003	4811.888
9.60	.002	4786.854	*	9.80	.001	4762.941
10.00	.001	4740.007	*	10.20	.001	4717.950
10.40	.001	4696.697	*	10.60	.001	4676.178
10.80	.001	4656.332	*	11.00	.001	4637.107
11.20	.001	4618.454	*	11.40	.001	4600.332
11.60	.001	4582.708	*	11.80	.001	4565.550
12.00	.001	4548.830	*	12.20	.001	4532.554
12.40	.001	4516.869	*	12.60	.001	4501.952
12.80	.001	4487.781	*	13.00	.001	4474.188
13.20	.001	4461.041	*	13.40	.001	4448.267
13.60	.001	4435.818	*	13.80	.001	4423.675
14.00	.001	4411.880	*	14.20	.001	4400.543
14.40	.001	4389.648	*	14.60	.001	4379.082
14.80	.001	4368.791	*	15.00	.001	4358.743
15.20	.001	4348.914	*	15.40	.001	4339.288
15.60	.001	4329.869	*	15.80	.001	4320.713
16.00	.001	4311.852	*	16.20	.001	4303.250
16.40	.001	4294.942	*	16.60	.001	4286.976
16.80	.001	4279.299	*	17.00	.001	4271.834
17.20	.001	4264.542	*	17.40	.001	4257.399
17.60	.001	4250.390	*	17.80	.001	4243.505
18.00	.001	4236.737	*	18.20	.001	4230.079
18.40	.001	4223.528	*	18.60	.001	4217.080
18.80	.001	4210.727	*	19.00	.001	4204.464
19.20	.001	4198.290	*	19.40	.001	4192.199

19.60	.001	4186.188	*	19.80	.001	4180.254
20.00	.001	4174.404	*	20.20	.001	4168.681
20.40	.001	4163.146	*	20.60	.001	4157.787
20.80	.001	4152.547	*	21.00	.001	4147.403
21.20	.001	4142.340	*	21.40	.001	4137.351
21.60	.001	4132.429	*	21.80	.001	4127.571
22.00	.001	4122.775	*	22.20	.001	4118.038
22.40	.001	4113.358	*	22.60	.001	4108.734
22.80	.001	4104.163	*	23.00	.001	4099.643
23.20	.001	4095.172	*	23.40	.001	4090.749
23.60	.001	4086.372	*	23.80	.001	4082.043
24.00	.001	4077.791	*	24.20	.001	4073.671
24.40	.001	4069.683	*	24.60	.001	4065.779
24.80	.001	4061.942	*	25.00	.001	4058.159
25.20	.001	4054.425	*	25.40	.001	4050.733
25.60	.001	4047.083	*	25.80	.001	4043.458
26.00	.001	4039.795	*	26.20	.001	4036.053
26.40	.001	4032.263	*	26.60	.001	4028.463
26.80	.001	4024.669	*	27.00	.001	4020.892
27.20	.001	4017.135	*	27.40	.001	4013.401
27.60	.001	4009.689	*	27.80	.001	4006.020
28.00	.001	4002.448	*	28.20	.001	3998.985
28.40	.001	3995.586	*	28.60	.001	3992.237
28.80	.001	3988.926	*	29.00	.001	3985.649
29.20	.001	3982.405	*	29.40	.001	3979.191
29.60	.001	3976.007	*	29.80	.001	3972.851
30.00	.001	3969.724	*	30.20	.001	3966.625
30.40	.001	3963.552	*	30.60	.001	3960.505
30.80	.001	3957.482	*	31.00	.001	3954.484
31.20	.001	3951.509	*	31.40	.001	3948.555
31.60	.001	3945.633	*	31.80	.001	3942.772
32.00	.001	3939.983	*	32.20	.001	3937.241
32.40	.001	3934.536	*	32.60	.001	3931.861
32.80	.001	3929.210	*	33.00	.001	3926.583
33.20	.001	3923.978	*	33.40	.001	3921.393
33.60	.001	3918.830	*	33.80	.001	3916.285
34.00	.001	3913.760	*	34.20	.001	3911.254
34.40	.001	3908.767	*	34.60	.001	3906.297
34.80	.001	3903.844	*	35.00	.001	3901.407
35.20	.001	3898.986	*	35.40	.001	3896.580
35.60	.001	3894.189	*	35.80	.001	3891.813
36.00	.001	3889.452	*	36.20	.001	3887.106
36.40	.001	3884.774	*	36.60	.001	3882.456
36.80	.001	3880.152	*	37.00	.001	3877.862
37.20	.001	3875.585	*	37.40	.001	3873.322
37.60	.001	3871.072	*	37.80	.001	3868.835
38.00	.001	3866.611	*	38.20	.001	3864.399
38.40	.001	3862.200	*	38.60	.001	3860.014
38.80	.001	3857.839	*	39.00	.001	3855.678
39.20	.001	3853.528	*	39.40	.001	3851.391
39.60	.001	3849.266	*	39.80	.001	3847.152
40.00	.001	3845.050	*	40.20	.001	3842.959
40.40	.001	3840.879	*	40.60	.001	3838.810
40.80	.001	3836.753	*	41.00	.001	3834.706
41.20	.001	3832.656	*	41.40	.001	3830.555
41.60	.001	3828.394	*	41.80	.001	3826.210
42.00	.001	3824.015	*	42.20	.001	3821.818

42.40	.001	3819.624	*	42.60	.001	3817.433
42.80	.001	3815.248	*	43.00	.001	3813.069
43.20	.001	3810.896	*	43.40	.001	3808.730
43.60	.001	3806.573	*	43.80	.001	3804.423
44.00	.001	3802.281	*	44.20	.001	3800.147
44.40	.001	3798.022	*	44.60	.001	3795.907
44.80	.001	3793.802	*	45.00	.001	3791.706
45.20	.001	3789.619	*	45.40	.001	3787.543
45.60	.001	3785.476	*	45.80	.001	3783.419
46.00	.001	3781.372	*	46.20	.001	3779.335
46.40	.001	3777.307	*	46.60	.001	3775.288
46.80	.001	3773.278	*	47.00	.001	3771.278
47.20	.001	3769.287	*	47.40	.001	3767.305
47.60	.001	3765.332	*	47.80	.001	3763.368
48.00	.001	3761.413	*	48.20	.001	3759.467
48.40	.001	3757.529	*	48.60	.001	3755.599
48.80	.001	3753.679	*	49.00	.001	3751.766
49.20	.001	3749.862	*	49.40	.001	3747.968
49.60	.001	3746.080	*	49.80	.001	3744.200

*** run completed ****

```
Pasture Pond 25 year 6 hour Final Recl Phase 1 June 2006                    X
       2       0
    1.62    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .2500  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .2500  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .2500  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .2500  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .2500  1.0000
   7.400  75.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .6000  1.0000
   4.100  75.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .6000  1.0000
       1       1       1       1       1
  10.300  80.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .7000  1.0000
       1       1       1       1       1
   7.900  84.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8500  1.0000
       1       1       1       1       1
   1.900  84.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .8500  1.0000
       4       1       1       1       1
   3.400  84.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .8500  1.0000
   3.900  84.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .8500  1.0000
   1.200  84.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8500  1.0000
   2.000  84.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .8500  1.0000
       1       1       1       1       1
   1.700  84.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .8500  1.0000
       2       1       1       1       1
   3.600  84.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .8500  1.0000
   2.400  84.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8500  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .7500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

10 Year 6 Hour Storm Hydrologic Model
Phase 2

1

```
*****************************************************************
*****************************************************************

       University of Kentucky computer model
       of surface mine hydrology and sedimentology
       for more information contact the Agricultural
       Engineering Department

       the UK model is a design model developed to predict
       the hydraulic and sediment response from surface
       mined lands for a specified rainfall event (single storm)

       version date 9-23-83

       disclaimer: neither the University nor any of its employees
       accept any responsibility or legal liability for the
       conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*     the following values are now predicted by SEDIMOT II.     *
*     they can be found in summary tables.                      *
*      1. period of significant concentration                   *
*      2. volume weighted average settleable concentration      *
*         during period of significant concentration            *
*      3. volume weighted average settleable concentration      *
*         during peak 24 hour period                            *
*      4. arithmetic average settleable concentration during    *
*         period of significant concentration                   *
*      5. arithmetic average settleable concentration           *
*         during peak 24 hour period                            *
*                                                               *
*     all concentrations are in ml/l.                           *
*                                                               *
*****************************************************************
```



```
*********************************************

     watershed identification code
     -----------------------------
     Pasture Pond 10 year 6 hour Final Recl Phase 2 June 2006

*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      1.31   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	69.00	.200	.150	.150	.35	1.0
3	8.60	69.00	.200	.100	.100	.35	1.0
4	5.50	69.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.12	.01	.33	.078	.922	.999
2	.25	.03	.14	.075	.900	1.000
3	.15	.03	.09	.075	.900	1.000
4	.10	.03	.02	.078	.922	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1032	acre-ft
peak discharge	=	.4713	cfs
area	=	55.8000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	8767.06	mg/l
peak settleable concentration	=	5.14	ml/l
peak settleable concentration	=	7200.95	mg/l
total sediment yield	=	.5779	tons
representative particle size	=	.0766	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.40	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.40	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.57	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.56	ml/l

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* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	69.00	.190	.200	.250	.30	1.0
2	7.40	69.00	.200	.100	.100	.35	1.0
3	4.10	69.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.250	1.0	.0
3	1	.20	150.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.06	.03	.01	.076	.907	.999
2	.13	.03	.15	.075	.900	1.000
3	.09	.03	.07	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0420	acre-ft
peak discharge	=	.2243	cfs
area	=	14.6000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	4976.88	mg/l
peak settleable concentration	=	2.93	ml/l
peak settleable concentration	=	4100.72	mg/l
total sediment yield	=	.2271	tons
representative particle size	=	.0784	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	3.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.36	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.36	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.27	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.33	ml/l

```
* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	69.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.21	.03	.15	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0296	acre-ft
peak discharge	=	.1986	cfs
area	=	10.3000	acres
time of peak discharge	=	3.60	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	5092.76	mg/l
peak settleable concentration	=	3.04	ml/l
peak settleable concentration	=	4259.91	mg/l
total sediment yield	=	.1491	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.60	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.39	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.39	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.35	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.27	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	.67	cfs
time of routed peak discharge	=	3.80	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.1748	ac-ft
peak runoff discharge	=	.80	cfs
time to peak discharge	=	3.80	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1500	hrs
total sediment yield	=	.9537	tons
peak sediment concentration	=	8470.97	mg/l
peak settleable concentration	=	4.9873	ml/l
peak settleable concentration	=	6982.29	mg/l
time to peak concentration	=	6.80	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.39	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.39	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.60	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.57	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	69.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.16	.03	.59	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0227	acre-ft
peak discharge	=	.1646	cfs
area	=	7.9000	acres
time of peak discharge	=	3.50	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	26467.17	mg/l
peak settleable concentration	=	15.81	ml/l
peak settleable concentration	=	22138.87	mg/l
total sediment yield	=	.5936	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	12.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	12.01	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.04	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.40	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	69.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.04	.03	.01	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0055	acre-ft
peak discharge	=	.0396	cfs
area	=	1.9000	acres
time of peak discharge	=	3.50	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	1098.88	mg/l
peak settleable concentration	=	.66	ml/l
peak settleable concentration	=	919.17	mg/l
total sediment yield	=	.0059	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	.50	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.50	ml/l

arithmetic average settleable concentration during period of significant concentration	=	.50	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.06	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	.91	cfs
time of routed peak discharge	=	4.00	hrs
total drainage area	=	90.50	acres
total runoff volume	=	.2030	ac-ft
peak runoff discharge	=	.94	cfs
time to peak discharge	=	4.00	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1000	hrs
total sediment yield	=	1.5528	tons
peak sediment concentration	=	11973.85	mg/l
peak settleable concentration	=	7.0894	ml/l
peak settleable concentration	=	9925.12	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.39	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.39	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.47	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.77	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	69.00	.020	.300	.300	.35	.0
2	3.90	69.00	.140	.200	.200	.35	1.0
3	1.20	69.00	.040	.200	.200	.35	.0
4	2.00	69.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.250	1.0	.0
2	1	.20	40.0	10.00	.250	1.0	.0
3	1	.20	30.0	10.00	.250	1.0	.0
4	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.07	.03	.02	.088	1.000	.999
2	.07	.03	.08	.078	.922	.999
3	.03	.03	.02	.088	1.000	.999
4	.04	.03	.01	.078	.922	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0302	acre-ft
peak discharge	=	.1760	cfs
area	=	10.5000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	3709.76	mg/l
peak settleable concentration	=	2.19	ml/l
peak settleable concentration	=	3068.39	mg/l
total sediment yield	=	.1201	tons
representative particle size	=	.0806	mm
time of peak concentration	=	3.80	hrs
period of significant concentration	=	3.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	1.82	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	1.82	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.80	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.25	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	69.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.04	.03	.00	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0049	acre-ft
peak discharge	=	.0354	cfs
area	=	1.7000	acres
time of peak discharge	=	3.50	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	960.17	mg/l
peak settleable concentration	=	.57	ml/l
peak settleable concentration	=	803.15	mg/l
total sediment yield	=	.0046	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	.43	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.43	ml/l

arithmetic average settleable concentration during period of significant concentration	=	.44	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.05	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	1.08	cfs
time of routed peak discharge	=	4.00	hrs
total drainage area	=	102.70	acres
total runoff volume	=	.2381	ac-ft
peak runoff discharge	=	1.11	cfs
time to peak discharge	=	4.00	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	1.6772	tons
peak sediment concentration	=	10190.51	mg/l
peak settleable concentration	=	6.0326	ml/l
peak settleable concentration	=	8445.57	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.13	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.13	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.24	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.72	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

****

beta is negative which inherently indicates that the stream system transport capacity exceeds the sediment load, as evaluated by williams' technique. SEDIMOT II does not consider erodible channels so beta is set equal to .01. if the user wishes to evaluate the transport capacity of the stream directly he/she should use subroutine sloss.

****

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	69.00	.250	.200	.200	.35	1.0
2	2.40	69.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.250	1.0	.0
2	1	.20	50.0	10.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.06	.03	.01	.072	.881	.999
2	.04	.03	.05	.072	.881	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0173	acre-ft
peak discharge	=	.0925	cfs
area	=	6.0000	acres
time of peak discharge	=	3.80	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	3593.61	mg/l
peak settleable concentration	=	2.09	ml/l
peak settleable concentration	=	2929.40	mg/l
total sediment yield	=	.0602	tons
representative particle size	=	.0724	mm
time of peak concentration	=	3.20	hrs
period of significant concentration	=	3.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	1.49	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	1.49	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.41	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.20	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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    junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.48	.54	.66	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0248	acre-ft
peak discharge	=	.4822	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	5.9078	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	30544.99	mg/l
peak settleable concentration	=	18.25	ml/l
peak settleable concentration	=	25549.82	mg/l
total sediment yield	=	.6573	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.72	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.72	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.14	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.95	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	1.19	cfs
time of routed peak discharge	=	3.90	hrs
total drainage area	=	109.25	acres
total runoff volume	=	.2802	ac-ft
peak runoff discharge	=	1.25	cfs
time to peak discharge	=	3.90	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.0500	hrs
total sediment yield	=	2.2542	tons
peak sediment concentration	=	28743.14	mg/l
peak settleable concentration	=	16.8419	ml/l
peak settleable concentration	=	23578.66	mg/l
time to peak concentration	=	2.90	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.56	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.56	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.11	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.98	ml/l

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                    pond results

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***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	.280	acre-ft
outflow routed volume	=	.001	acre-ft
storm volume discharged (plug flow)	=	.001	acre-ft
pond volume at peak stage	=	.611	acre-ft
peak stage	=	2.193	ft
peak inflow rate	=	1.247	cfs
peak discharge rate	=	.000	cfs
peak inflow sediment concentration	=	28743.14	mg/l
peak effluent sediment concentration	=	213.99	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.00	mg/l
storm average effluent concentration	=	155.76	mg/l
average effluent sediment concentration	=	155.76	mg/l
basin trap efficiency	=	99.99	percent
detention time of flow with sediment	=	20.39	hrs
detention time from hydrograph centers	=	20.39	hrs
detention time including stored flow	=	20.39	hrs
sediment load discharged	=	.00	tons
period of significant concentration	=	42.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	1.424	*	3.00	.000	10.001
3.20	.000	18.816	*	3.40	.000	34.734
3.60	.000	63.177	*	3.80	.000	95.023
4.00	.000	123.274	*	4.20	.000	145.021
4.40	.000	161.452	*	4.60	.000	175.009
4.80	.000	185.570	*	5.00	.000	194.338
5.20	.000	201.206	*	5.40	.000	206.074
5.60	.000	209.945	*	5.80	.000	213.229
6.00	.000	213.989	*	6.20	.000	213.241
6.40	.000	212.745	*	6.60	.000	210.038
6.80	.000	205.700	*	7.00	.000	201.625
7.20	.000	198.386	*	7.40	.000	195.688
7.60	.000	193.363	*	7.80	.000	191.315
8.00	.000	189.486	*	8.20	.000	187.834
8.40	.000	186.318	*	8.60	.000	184.922
8.80	.000	183.658	*	9.00	.000	182.494
9.20	.000	181.414	*	9.40	.000	180.410
9.60	.000	179.473	*	9.80	.000	178.598
10.00	.000	177.775	*	10.20	.000	176.997
10.40	.000	176.254	*	10.60	.000	175.542
10.80	.000	174.861	*	11.00	.000	174.209
11.20	.000	173.585	*	11.40	.000	172.983
11.60	.000	172.402	*	11.80	.000	171.840
12.00	.000	171.298	*	12.20	.000	170.775
12.40	.000	170.270	*	12.60	.000	169.781
12.80	.000	169.307	*	13.00	.000	168.846
13.20	.000	168.399	*	13.40	.000	167.964
13.60	.000	167.540	*	13.80	.000	167.128
14.00	.000	166.726	*	14.20	.000	166.335
14.40	.000	165.953	*	14.60	.000	165.581
14.80	.000	165.218	*	15.00	.000	164.863
15.20	.000	164.513	*	15.40	.000	164.168
15.60	.000	163.825	*	15.80	.000	163.488
16.00	.000	163.154	*	16.20	.000	162.825
16.40	.000	162.498	*	16.60	.000	162.176
16.80	.000	161.856	*	17.00	.000	161.540
17.20	.000	161.227	*	17.40	.000	160.916
17.60	.000	160.609	*	17.80	.000	160.305
18.00	.000	160.004	*	18.20	.000	159.706
18.40	.000	159.411	*	18.60	.000	159.119
18.80	.000	158.830	*	19.00	.000	158.544
19.20	.000	158.262	*	19.40	.000	157.983
19.60	.000	157.708	*	19.80	.000	157.437

20.00	.000	157.168	*	20.20	.000	156.901
20.40	.000	156.634	*	20.60	.000	156.369
20.80	.000	156.105	*	21.00	.000	155.843
21.20	.000	155.583	*	21.40	.000	155.324
21.60	.000	155.067	*	21.80	.000	154.811
22.00	.000	154.557	*	22.20	.000	154.305
22.40	.000	154.054	*	22.60	.000	153.805
22.80	.000	153.557	*	23.00	.000	153.311
23.20	.000	153.067	*	23.40	.000	152.824
23.60	.000	152.583	*	23.80	.000	152.345
24.00	.000	152.108	*	24.20	.000	151.873
24.40	.000	151.641	*	24.60	.000	151.410
24.80	.000	151.182	*	25.00	.000	150.956
25.20	.000	150.730	*	25.40	.000	150.506
25.60	.000	150.282	*	25.80	.000	150.059
26.00	.000	149.838	*	26.20	.000	149.618
26.40	.000	149.399	*	26.60	.000	149.181
26.80	.000	148.964	*	27.00	.000	148.748
27.20	.000	148.534	*	27.40	.000	148.321
27.60	.000	148.109	*	27.80	.000	147.898
28.00	.000	147.689	*	28.20	.000	147.480
28.40	.000	147.273	*	28.60	.000	147.068
28.80	.000	146.863	*	29.00	.000	146.660
29.20	.000	146.459	*	29.40	.000	146.259
29.60	.000	146.061	*	29.80	.000	145.864
30.00	.000	145.668	*	30.20	.000	145.473
30.40	.000	145.278	*	30.60	.000	145.083
30.80	.000	144.890	*	31.00	.000	144.697
31.20	.000	144.505	*	31.40	.000	144.313
31.60	.000	144.123	*	31.80	.000	143.933
32.00	.000	143.744	*	32.20	.000	143.556
32.40	.000	143.368	*	32.60	.000	143.181
32.80	.000	142.996	*	33.00	.000	142.811
33.20	.000	142.627	*	33.40	.000	142.443
33.60	.000	142.261	*	33.80	.000	142.080
34.00	.000	141.900	*	34.20	.000	141.721
34.40	.000	141.543	*	34.60	.000	141.366
34.80	.000	141.190	*	35.00	.000	141.015
35.20	.000	140.840	*	35.40	.000	140.666
35.60	.000	140.491	*	35.80	.000	140.318
36.00	.000	140.144	*	36.20	.000	139.972
36.40	.000	139.800	*	36.60	.000	139.628
36.80	.000	139.457	*	37.00	.000	139.287
37.20	.000	139.117	*	37.40	.000	138.947
37.60	.000	138.779	*	37.80	.000	138.611
38.00	.000	138.443	*	38.20	.000	138.276
38.40	.000	138.110	*	38.60	.000	137.945
38.80	.000	137.780	*	39.00	.000	137.617
39.20	.000	137.454	*	39.40	.000	137.292
39.60	.000	137.131	*	39.80	.000	136.970
40.00	.000	136.810	*	40.20	.000	136.650
40.40	.000	136.491	*	40.60	.000	136.331
40.80	.000	136.172	*	41.00	.000	136.014
41.20	.000	135.856	*	41.40	.000	135.698
41.60	.000	135.540	*	41.80	.000	135.384
42.00	.000	135.227	*	42.20	.000	135.071
42.40	.000	134.915	*	42.60	.000	134.760

42.80	.000	134.606	*	43.00	.000	134.452
43.20	.000	134.298	*	43.40	.000	134.145
43.60	.000	133.993	*	43.80	.000	133.841
44.00	.000	133.690	*	44.20	.000	133.539
44.40	.000	133.389	*	44.60	.000	133.240
44.80	.000	133.092	*	45.00	.000	132.945
45.20	.000	132.798	*	45.40	.000	132.652

*** run completed ****

```
Pasture Pond 10 year 6 hour Final Recl Phase 2 June 2006                    X
      2       0
   1.31    6.00     .10     .00
      5       2
      2       2       2       2       1
   2.75    1.50    1.40
      1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
  .0080   .0060   .0040   .0020   .0001
  94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
  13.80   12.30   11.00   10.00     .00
      1       1
   .100    .100    .400
   .000    .000    .000
      1       1
   .150    .150    .400
   .000    .000    .000
      1       1
   .100    .100    .400
   .000    .000    .000
      1       1       1
   .050    .050    .350
   .000    .000    .000
      1
   .050    .050    .350
      4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
  .2000200.0000 10.0000   .2500  1.0000
  14.000  69.000    .200    .150    .150    .350   1.000   1.000    .000
  .2000500.0000  2.5000   .2500  1.0000
   8.600  69.000    .200    .100    .100    .350   1.000   1.000    .000
  .2000400.0000  2.8000   .2500  1.0000
   5.500  69.000    .140    .000    .050    .350   1.000   1.000    .000
  .2000200.0000  1.0000   .2500  1.0000
      3       1       1       1       1
   3.100  69.000    .190    .200    .250    .300   1.000   1.000    .000
  .2000 80.0000  2.0000   .2500  1.0000
   7.400  69.000    .200    .100    .100    .350   1.000   1.000    .000
  .2000250.0000  5.0000   .2500  1.0000
   4.100  69.000    .110    .000    .000    .300   1.000   1.000    .000
  .2000150.0000  5.0000   .2500  1.0000
      1       1       1       1       1
  10.300  69.000    .100    .000    .100    .350   1.000   1.000    .000
  .2000100.0000  5.0000   .2500  1.0000
      1       1       1       1       1
   7.900  69.000    .040    .000    .000    .000   1.000   1.000    .000
  .2000 50.0000 20.0000   .2500  1.0000
      1       1       1       1       1
   1.900  69.000    .120    .000    .000    .000   1.000   1.000    .000
  .2000 30.0000  2.0000   .2500  1.0000
      4       1       1       1       1
   3.400  69.000    .020    .300    .300    .350   1.000   1.000    .000
  .2000 20.0000  5.0000   .2500  1.0000
   3.900  69.000    .140    .200    .200    .350   1.000   1.000    .000
  .2000 40.0000 10.0000   .2500  1.0000
   1.200  69.000    .040    .200    .200    .350   1.000   1.000    .000
  .2000 30.0000 10.0000   .2500  1.0000
   2.000  69.000    .150    .000    .000    .000   1.000   1.000    .000
  .2000 20.0000  2.0000   .2500  1.0000
      1       1       1       1       1
   1.700  69.000    .070    .000    .000    .000   1.000   1.000    .000
  .2000 20.0000  2.0000   .2500  1.0000
      2       1      .1       1       1
   3.600  69.000    .250    .200    .200    .350   1.000   1.000    .000
  .2000 50.0000  2.0000   .2500  1.0000
   2.400  69.000    .250    .000    .000    .000   1.000   1.000    .000
  .2000 50.0000 10.0000   .2500  1.0000
      1       2       1       1       1
   .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .2500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

100 Year 6 Hour Storm Hydrologic Model
Phase 2

1

```
*****************************************************************
*****************************************************************

        University of Kentucky computer model
        of surface mine hydrology and sedimentology
        for more information contact the Agricultural
        Engineering Department

        the UK model is a design model developed to predict
        the hydraulic and sediment response from surface
        mined lands for a specified rainfall event (single storm)

        version date 9-23-83

        disclaimer: neither the University nor any of its employees
        accept any responsibility or legal liability for the
        conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*     the following values are now predicted by SEDIMOT II.     *
*     they can be found in summary tables.                      *
*      1. period of significant concentration                   *
*      2. volume weighted average settleable concentration      *
*         during period of significant concentration            *
*      3. volume weighted average settleable concentration      *
*         during peak 24 hour period                            *
*      4. arithmetic average settleable concentration during    *
*         period of significant concentration                   *
*      5. arithmetic average settleable concentration           *
*         during peak 24 hour period                            *
*                                                               *
*     all concentrations are in ml/l.                           *
*                                                               *
*****************************************************************
```



```
*********************************************
     watershed identification code
     -----------------------------
     Pasture Pond 100 year 6 hour Final Recl Phase 2 June 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      2.05   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

```
*************************************************************************

        beta is negative which inherently indicates that the
        stream system transport capacity exceeds the sediment
        load, as evaluated by williams' technique. SEDIMOT II
        does not consider erodible channels so beta is set
        equal to .01. if the user wishes to evaluate the trans-
        port capacity of the stream directly he/she should use
        subroutine sloss.

*************************************************************************
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	69.00	.200	.150	.150	.35	1.0
3	8.60	69.00	.200	.100	.100	.35	1.0
4	5.50	69.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.77	.15	6.97	.022	.437	1.000
2	3.76	.23	1.89	.056	.739	1.000
3	2.31	.23	1.13	.056	.739	1.000
4	1.60	.23	.28	.059	.773	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.8939	acre-ft
peak discharge	=	6.9469	cfs
area	=	55.8000	acres
time of peak discharge	=	3.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	9593.07	mg/l
peak settleable concentration	=	4.71	ml/l
peak settleable concentration	=	6599.94	mg/l
total sediment yield	=	10.2734	tons
representative particle size	=	.0278	mm
time of peak concentration	=	3.90	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	4.12	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	4.12	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.47	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.78	ml/l

```
* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	69.00	.190	.200	.250	.30	1.0
2	7.40	69.00	.200	.100	.100	.35	1.0
3	4.10	69.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.250	1.0	.0
3	1	.20	150.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.85	.23	.17	.057	.749	.636
2	1.99	.23	1.99	.056	.739	.799
3	1.73	.23	1.03	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2858	acre-ft
peak discharge	=	2.6021	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	9.4943	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	13632.32	mg/l
peak settleable concentration	=	7.47	ml/l
peak settleable concentration	=	10457.75	mg/l
total sediment yield	=	2.7272	tons
representative particle size	=	.0510	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.85	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.85	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.06	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.47	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	69.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	4.33	.23	2.35	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2016	acre-ft
peak discharge	=	3.6684	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	3.0717	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	15535.21	mg/l
peak settleable concentration	=	9.28	ml/l
peak settleable concentration	=	12994.66	mg/l
total sediment yield	=	2.3492	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	5.31	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	5.31	ml/l
arithmetic average settleable			

concentration during period of significant concentration	=	4.07	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.51	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	9.17	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	1.3813	ac-ft
peak runoff discharge	=	10.29	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.1500	hrs
total sediment yield	=	14.3400	tons
peak sediment concentration	=	12496.97	mg/l
peak settleable concentration	=	6.3015	ml/l
peak settleable concentration	=	8822.13	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.88	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.88	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.37	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.77	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	69.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	3.32	.23	9.35	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1546	acre-ft
peak discharge	=	3.3248	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	81332.63	mg/l
peak settleable concentration	=	48.59	ml/l
peak settleable concentration	=	68031.91	mg/l
total sediment yield	=	9.3497	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	26.76	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	26.76	ml/l
arithmetic average settleable concentration during period of significant concentration	=	19.97	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.50	ml/l


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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	69.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.80	.23	.09	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0372	acre-ft
peak discharge	=	.7996	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	.1687	
rainfall erosivity factor	=	40.00	ei unit
peak concentration	=	3443.34	mg/l
peak settleable concentration	=	2.06	ml/l
peak settleable concentration	=	2880.24	mg/l
total sediment yield	=	.0925	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	1.12	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	1.12	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	.83	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.10	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	11.02	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.5731	ac-ft
peak runoff discharge	=	11.24	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1000	hrs
total sediment yield	=	23.6963	tons
peak sediment concentration	=	45243.07	mg/l
peak settleable concentration	=	24.4186	ml/l
peak settleable concentration	=	34186.05	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	6.01	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.92	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.13	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	69.00	.020	.300	.300	.35	.0
2	3.90	69.00	.140	.200	.200	.35	1.0
3	1.20	69.00	.040	.200	.200	.35	.0
4	2.00	69.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.250	1.0	.0
2	1	.20	40.0	10.00	.250	1.0	.0
3	1	.20	30.0	10.00	.250	1.0	.0
4	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.43	.23	.30	.088	1.000	.881
2	1.13	.23	1.05	.059	.773	.933
3	.51	.23	.30	.088	1.000	.919
4	.58	.23	.07	.059	.773	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2055	acre-ft
peak discharge	=	2.3793	cfs
area	=	10.5000	acres
time of peak discharge	=	3.30	hrs
beta	=	1.4172	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	8866.82	mg/l
peak settleable concentration	=	5.01	ml/l
peak settleable concentration	=	7018.81	mg/l
total sediment yield	=	1.5897	tons
representative particle size	=	.0597	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.27	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.27	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.60	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.39	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	69.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.72	.23	.07	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0333	acre-ft
peak discharge	=	.7155	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erosivity factor	=	40.00	ei unit
peak concentration	=	3009.02	mg/l
peak settleable concentration	=	1.80	ml/l
peak settleable concentration	=	2516.94	mg/l
total sediment yield	=	.0723	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	.98	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.98	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	.73	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.09	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	12.62	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	102.70	acres
total runoff volume	=	1.8119	ac-ft
peak runoff discharge	=	12.83	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	25.0854	tons
peak sediment concentration	=	37013.64	mg/l
peak settleable concentration	=	19.9767	ml/l
peak settleable concentration	=	27967.36	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	5.54	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	5.54	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.48	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.03	ml/l

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    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	69.00	.250	.200	.200	.35	1.0
2	2.40	69.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.250	1.0	.0
2	1	.20	50.0	10.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.88	.23	.16	.052	.699	.888
2	.58	.23	.62	.052	.699	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1175	acre-ft
peak discharge	=	1.1105	cfs
area	=	6.0000	acres
time of peak discharge	=	3.30	hrs
beta	=	2.6145	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	11043.62	mg/l
peak settleable concentration	=	6.03	ml/l
peak settleable concentration	=	8446.51	mg/l
total sediment yield	=	.7596	tons
representative particle size	=	.0503	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.56	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.56	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.03	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.32	ml/l

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* * * * * * * * * * * *
    null structure
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    junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.94	1.14	1.46	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0525	acre-ft
peak discharge	=	.9439	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	30462.68	mg/l
peak settleable concentration	=	18.20	ml/l
peak settleable concentration	=	25480.97	mg/l
total sediment yield	=	1.4554	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	12.25	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	12.25	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.61	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.02	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	13.68	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	109.25	acres
total runoff volume	=	1.9819	ac-ft
peak runoff discharge	=	13.87	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	27.0240	tons
peak sediment concentration	=	33901.00	mg/l
peak settleable concentration	=	18.3492	ml/l
peak settleable concentration	=	25688.81	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	6.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	5.47	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	5.47	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.65	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.20	ml/l

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                    pond results

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***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	1.982	acre-ft
outflow routed volume	=	.004	acre-ft
storm volume discharged (plug flow)	=	.004	acre-ft
pond volume at peak stage	=	2.303	acre-ft
peak stage	=	6.029	ft
peak inflow rate	=	13.875	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	33901.00	mg/l
peak effluent sediment concentration	=	3672.24	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.01	mg/l
storm average effluent concentration	=	1230.48	mg/l
average effluent sediment concentration	=	1230.48	mg/l
basin trap efficiency	=	99.98	percent
detention time of flow with sediment	=	22.36	hrs
detention time from hydrograph centers	=	22.36	hrs
detention time including stored flow	=	22.36	hrs
sediment load discharged	=	.01	tons
period of significant concentration	=	47.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.001
2.40	.000	.011	*	2.60	.000	1.390
2.80	.000	33.155	*	3.00	.000	654.193
3.20	.000	2780.758	*	3.40	.000	3672.240
3.60	.001	3596.798	*	3.80	.001	3212.343
4.00	.001	2887.779	*	4.20	.001	2642.593
4.40	.001	2456.082	*	4.60	.001	2312.779
4.80	.001	2193.708	*	5.00	.001	2094.255
5.20	.001	2007.701	*	5.40	.001	1930.875
5.60	.001	1864.047	*	5.80	.001	1805.464
6.00	.001	1748.253	*	6.20	.001	1697.888
6.40	.001	1655.812	*	6.60	.001	1613.425
6.80	.001	1573.603	*	7.00	.001	1540.479
7.20	.001	1513.674	*	7.40	.001	1490.983
7.60	.001	1471.231	*	7.80	.001	1453.727
8.00	.001	1438.003	*	8.20	.001	1423.723
8.40	.001	1410.576	*	8.60	.001	1398.493
8.80	.001	1387.438	*	9.00	.001	1377.211
9.20	.001	1367.701	*	9.40	.001	1358.814
9.60	.001	1350.465	*	9.80	.001	1342.584
10.00	.001	1335.113	*	10.20	.001	1328.005
10.40	.001	1321.222	*	10.60	.001	1314.731
10.80	.001	1308.503	*	11.00	.001	1302.513
11.20	.001	1296.739	*	11.40	.001	1291.161
11.60	.001	1285.766	*	11.80	.001	1280.538
12.00	.001	1275.477	*	12.20	.001	1270.596
12.40	.001	1265.911	*	12.60	.001	1261.414
12.80	.001	1257.089	*	13.00	.001	1252.920
13.20	.001	1248.890	*	13.40	.001	1244.987
13.60	.001	1241.202	*	13.80	.001	1237.544
14.00	.001	1234.018	*	14.20	.001	1230.610
14.40	.001	1227.313	*	14.60	.001	1224.120
14.80	.001	1221.017	*	15.00	.001	1218.000
15.20	.001	1215.062	*	15.40	.001	1212.206
15.60	.001	1209.435	*	15.80	.001	1206.744
16.00	.001	1204.140	*	16.20	.001	1201.627
16.40	.001	1199.197	*	16.60	.001	1196.842
16.80	.001	1194.556	*	17.00	.001	1192.331
17.20	.001	1190.161	*	17.40	.001	1188.042
17.60	.001	1185.969	*	17.80	.001	1183.939
18.00	.001	1181.950	*	18.20	.001	1179.999
18.40	.001	1178.085	*	18.60	.001	1176.204
18.80	.001	1174.355	*	19.00	.001	1172.536
19.20	.001	1170.746	*	19.40	.001	1168.983
19.60	.001	1167.250	*	19.80	.001	1165.555

20.00	.001	1163.900	*	20.20	.001	1162.282
20.40	.001	1160.699	*	20.60	.001	1159.147
20.80	.001	1157.624	*	21.00	.001	1156.127
21.20	.001	1154.654	*	21.40	.001	1153.204
21.60	.001	1151.776	*	21.80	.001	1150.369
22.00	.001	1148.982	*	22.20	.001	1147.614
22.40	.001	1146.265	*	22.60	.001	1144.932
22.80	.001	1143.617	*	23.00	.001	1142.318
23.20	.001	1141.035	*	23.40	.001	1139.775
23.60	.001	1138.543	*	23.80	.001	1137.336
24.00	.001	1136.154	*	24.20	.001	1134.995
24.40	.001	1133.855	*	24.60	.001	1132.733
24.80	.001	1131.628	*	25.00	.001	1130.536
25.20	.001	1129.453	*	25.40	.001	1128.369
25.60	.001	1127.282	*	25.80	.001	1126.194
26.00	.001	1125.106	*	26.20	.001	1124.020
26.40	.001	1122.937	*	26.60	.001	1121.859
26.80	.001	1120.786	*	27.00	.001	1119.723
27.20	.001	1118.673	*	27.40	.001	1117.641
27.60	.001	1116.625	*	27.80	.001	1115.623
28.00	.001	1114.635	*	28.20	.001	1113.660
28.40	.001	1112.695	*	28.60	.001	1111.742
28.80	.001	1110.798	*	29.00	.001	1109.865
29.20	.001	1108.942	*	29.40	.001	1108.029
29.60	.001	1107.125	*	29.80	.001	1106.231
30.00	.001	1105.345	*	30.20	.001	1104.468
30.40	.001	1103.598	*	30.60	.001	1102.737
30.80	.001	1101.887	*	31.00	.001	1101.051
31.20	.001	1100.227	*	31.40	.001	1099.416
31.60	.001	1098.616	*	31.80	.001	1097.826
32.00	.001	1097.045	*	32.20	.001	1096.273
32.40	.001	1095.508	*	32.60	.001	1094.751
32.80	.001	1094.001	*	33.00	.001	1093.258
33.20	.001	1092.521	*	33.40	.001	1091.792
33.60	.001	1091.068	*	33.80	.001	1090.350
34.00	.001	1089.638	*	34.20	.001	1088.931
34.40	.001	1088.229	*	34.60	.001	1087.532
34.80	.001	1086.841	*	35.00	.001	1086.153
35.20	.001	1085.470	*	35.40	.001	1084.792
35.60	.001	1084.118	*	35.80	.001	1083.448
36.00	.001	1082.782	*	36.20	.001	1082.121
36.40	.001	1081.464	*	36.60	.001	1080.811
36.80	.001	1080.161	*	37.00	.001	1079.516
37.20	.001	1078.875	*	37.40	.001	1078.237
37.60	.001	1077.604	*	37.80	.001	1076.974
38.00	.001	1076.348	*	38.20	.001	1075.726
38.40	.001	1075.107	*	38.60	.001	1074.492
38.80	.001	1073.880	*	39.00	.001	1073.272
39.20	.001	1072.667	*	39.40	.001	1072.066
39.60	.001	1071.468	*	39.80	.001	1070.873
40.00	.001	1070.277	*	40.20	.001	1069.675
40.40	.001	1069.067	*	40.60	.001	1068.454
40.80	.001	1067.836	*	41.00	.001	1067.216
41.20	.001	1066.595	*	41.40	.001	1065.973
41.60	.001	1065.350	*	41.80	.001	1064.728
42.00	.001	1064.106	*	42.20	.001	1063.486
42.40	.001	1062.866	*	42.60	.001	1062.247

42.80	.001	1061.630	*	43.00	.001	1061.015
43.20	.001	1060.401	*	43.40	.001	1059.790
43.60	.001	1059.182	*	43.80	.001	1058.575
44.00	.001	1057.972	*	44.20	.001	1057.371
44.40	.001	1056.773	*	44.60	.001	1056.179
44.80	.001	1055.587	*	45.00	.001	1054.998
45.20	.001	1054.411	*	45.40	.001	1053.828
45.60	.001	1053.248	*	45.80	.001	1052.670
46.00	.001	1052.095	*	46.20	.001	1051.523
46.40	.001	1050.953	*	46.60	.001	1050.386
46.80	.001	1049.822	*	47.00	.001	1049.261
47.20	.001	1048.702	*	47.40	.001	1048.146
47.60	.001	1047.592	*	47.80	.001	1047.041
48.00	.001	1046.492	*	48.20	.001	1045.946
48.40	.001	1045.402	*	48.60	.001	1044.861
48.80	.001	1044.322	*	49.00	.001	1043.786
49.20	.001	1043.252	*	49.40	.001	1042.720
49.60	.001	1042.191	*	49.80	.001	1041.664

*** run completed ****

```
Pasture Pond 100 year 6 hour Final Recl Phase 2 June 2006                    X
       2       0
    2.05    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .2500  1.0000
  14.000  69.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .2500  1.0000
   8.600  69.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .2500  1.0000
   5.500  69.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .2500  1.0000
       3       1       1       1       1
   3.100  69.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .2500  1.0000
   7.400  69.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .2500  1.0000
   4.100  69.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .2500  1.0000
       1       1       1       1       1
  10.300  69.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .2500  1.0000
       1       1       1       1       1
   7.900  69.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .2500  1.0000
       1       1       1       1       1
   1.900  69.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .2500  1.0000
       4       1       1       1       1
   3.400  69.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .2500  1.0000
   3.900  69.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .2500  1.0000
   1.200  69.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .2500  1.0000
   2.000  69.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .2500  1.0000
       1       1       1       1       1
   1.700  69.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .2500  1.0000
       2       1       1       1       1
   3.600  69.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .2500  1.0000
   2.400  69.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .2500  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .2500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

APPENDIX 8-1 A

PASTURE SEDIMENT POND

Permit Term Reclamation Plan Supplement

UPDES DISCHARGE 009
Reference Drawings 8-3, 7-1G, 7-9

Hydrologic and Sediment Parameters

10 year 6 hour storm
10 year 24 hour storm
25 year 6 hour storm
100 year 6 hour storm

Diversion and culvert design criteria.

This appendix segment is a replacement for prior hydrologic calculations for the Pasture Pond and the Clear Water Pond and Slurry Ponds 1 and 2. The watersheds which have hitherto drained into these ponds are proposed to be combined together and the storm water is to be processed through an enlarged Pasture Pond. Clear Water and Slurry Ponds are approved for use as the Excess Spoil Disposal Area #2.

PASTURE SEDIMENT POND - Hydrologic Calculations

INTRODUCTION

The Pasture Sediment Pond (UPDES 009) is located north of the West Slurry Cell (see Plate 8-3). The pond is an off channel, temporary sediment control structure, with a total as-built volume of 3.08 acre-feet (top of bank). Surface water runoff and sediment runoff from a 109.25 acre watershed is captured by the pond.

The Pasture Pond has been in service for a number of decades. In 2006, SCA proposed to enlarge this pond and use it to treat runoff from the area formerly served by the Clear Water Pond and Slurry Ponds 1 and 2. These former ponds are now the site of the Excess Spoil Disposal Area #2. The new hydrologic modeling accompanying this appendix section includes the entire combined watershed and the proposed design size of the pond. These calculations supersede those previously presented in the Permit Term Reclamation Plan for the Clear Water Pond and the Pasture Pond drainages.

The drainage area contributing to the Pasture Pond would be reclaimed in Phase 1 with the pond remaining in place until reclamation in Phase 2 as shown on Plate 8-1. The phases of reclamation would occur as described in the approved permit.

The structure is a temporary pond as addressed in R645-301-732.200. The structure does not meet the size or other qualifying criteria of the MSHA of 30 CPR 77.216(a). Therefore, it provides a combination of principal and emergency spillways that will safely discharge a 25 year, 6 hour event.

The pond contains a 2 inch drain pipe. This 2 inch pipe is normally closed but can be opened to discharge the pond after major storm events after appropriate settling times. The pond is modeled in Sedimot-II with the 2 inch drain pipe closed, however, the pond is considered empty above the level of the drain pipe when the storm begins. The maximum sediment level allowed in the pond is therefore set at the elevation of the inlet to the 2-inch drain pipe.

The pond can discharge through an 18 inch culvert when the water level reaches the stage elevation of 6490.6 (6.1 feet deep). The 18 inch pipe spillway is capable of passing the 25 year, 6 hour peak flow. The pond treats the 10 year, 24 hour storm such that effluent is well within the UPDES limits.

Culverts and diversion ditches were designed for these watersheds previously under a very conservative storm (100 yr 6 hr) and under the operational condition. With the combined watersheds now proposed, many of the ditches and culverts will experience a different flow rate for a given storm since upper sub watersheds will now be routed

through these lower ditches. Nonetheless, we have compared the previous design flows with the current modeled flows for the10 year 6 hour storm under the temporary phase one peak runoff conditions. Diversions carrying runoff from areas on the excess spoil disposal area are designed to pass a 100 year, 6 hour storm under the phase two peak runoff conditions. We have used the higher of the previous design flow or the current modeled design flow from these storms. Natural drainages outside of the permit area are considered adequate to meet the conditions that have occurred throughout their developmental history and will not be disturbed by SCA.

SUBWATERSHEDS

The Pasture Pond drainage area is divided into eighteen sub watersheds for routing analysis. These are labeled in keeping with former naming convention as follows: CW-SWS1, CW-SWS2, CW-SWS3, CW-SWS4, CW-SWS6, CW-SWS7, CW-SWS8, CW-SWS9, CW-SWS10, CW-SWS11, PAST-SWSl, PAST-SWS2, PAST-SWS3, PAST-SWS4, PAST-SWS5, PAST-SWS6, PAST-SWS7, and PAST-SWS8 (see Plate 8-3).

SOIL TYPE

According to the SCS Soil Survey of Carbon Area, Utah, the soil type found in this drainage area is predominantly SCS # 114, Strych. Three soil samples from the adjacent Reclamation Borrow Area were analyzed by Huntingdon/Chen-Northern in the early 1990s. The particle size distribution from these samples was plotted and averaged as shown in Figure One. Due to the nature of the reclamation process, the Erosion Control Practice (CP) factors are higher when the site is first covered and reseeded in Phase One and lower in Phase Two when the vegetation is more established. Other soil characteristics are as follows:

SCS Soil Name	Strych
Submerged Specific Gravity	1.75
Specific Gravity	2.75
Erosion K value	0.20
Bulk Density	1.4
CP Factor (phase 1)	0.85
CP Factor (phase 2)	0.25

CURVE NUMBERS

The Pasture Pond curve numbers are based on the Soil Conservation Service graph included as Figure Two. The soil types found on the site correspond to SCS hydrologic Class B as indicated in the SCS Soil Survey for Carbon Area, Utah. Due to the nature of

the reclamation process, the percent vegetation cover will be negligible when the site is covered and reseeded.

A curve number of 84 (corresponding to zero percent of vegetation cover density) is used for the areas covered with borrow material during phase one. A curve number of 69 (corresponding to 30 percent vegetation cover density) is used for the phase two calculations. These proposed curve numbers are considered to be potentially very conservative given the plans concerning surface roughening which could dramatically reduce the percent of runoff from the sub watersheds. Appropriate curve numbers are used for undisturbed or previously reclaimed areas and area identified in the Sedimot output data.

TIME OF CONCENTRATION

Each sub watershed requires a certain time for the water to reach the outlet following the longest path. The runoff from these sub watersheds is approximated by Sedimot-II unit "Disturbed" unit hydrograph for areas with poor vegetative cover. The overland flow velocity was estimated using the Soil Conservation Service Upland Curves (SCS 1972) corresponding to the slope and vegetation of the drainage areas. Time of concentration was calculated by dividing the average velocity into the distance to the sub watershed outlet.

ROUTING COEFFICIENTS

"Sedimot-II" uses Muskingum routing methods. Flows must be routed between structures or from a subwatershed outlet to the corresponding structure (if the outlet is not at the structure). No routing is used through sub watersheds that do not have inflow from a previous watershed, or structure (this water flow is accounted for with the time of concentration and the unit hydrograph). Areas requiring routing coefficients are indicated in the program output data. Muskingum coefficients K and X are used as follows:

K = Travel time through diversion.

$$X = \frac{0.5^* \text{ Velocity}}{1.7 + \text{Velocity}}$$

SUB WATERSHED CHARACTERISTICS

Drainage Area	SCS Hydro Class	Ph 1 Vegetation Cover Density	**Phase 1 Curve N0.**	Ph 2 Vegetation Cover Density	**Phase 2 Curve No.**	Area acres	Distance to Outlet (ft)	Average Velocity (ft/s)	**Time of Concentration (hrs)**
CW-SWS1	B	50%	**65**	50%	**65**	27.7	1800	2.8	**0.18**
CW-SWS2	B	40%	**70**	40%	**69**	14	1000	1.4	**0.20**
CW-SWS3	B	40%	**70**	40%	**69**	8.6	800	1.1	**0.20**
CW-SWS4	B	40%	**70**	40%	**69**	5.5	600	1.2	**0.14**
CW-SWS6	B	40%	**70**	40%	**69**	3.1	900	1.3	**0.19**
CW-SWS7	B	20%	**75**	30%	**69**	7.4	800	1.1	**0.20**
CW-SWS8	B	20%	**75**	30%	**69**	4.1	500	1.3	**0.11**
CW-SWS9	B	10%	**80**	30%	**69**	10.3	400	1.1	**0.10**
CW-SWS10	B	0%	**84**	30%	**69**	7.9	250	1.9	**0.04**
CW-SWS11	B	0%	**84**	30%	**69**	3.4	100	1.3	**0.02**
Past-SWS1	B	0%	**84**	30%	**69**	3.9	900	1.79	**0.14**
Past-SWS2	B	0%	**84**	30%	**69**	1.2	300	2.08	**0.04**
Past-SWS3	B	0%	**84**	30%	**69**	2	950	1.76	**0.15**
Past-SWS4	B	0%	**84**	30%	**69**	1.9	800	1.85	**0.12**
Past-SWS5	B	0%	**84**	30%	**69**	3.6	700	0.78	**0.25**
Past-SWS6	B	0%	**84**	30%	**69**	2.4	900	1	**0.25**
Past-SWS7	B	0%	**84**	30%	**69**	1.7	400	1.59	**0.07**
Past-SWS8	B	15%	**90**	30%	**69**	0.55	40	1.11	**0.01**

RIPRAP SIZING

Riprap is placed along steep channel slopes and at select culvert outlets to control erosion. The size of the stones is based on the expected maximum velocity of water flowing. When peak velocities in the smooth channel are expected to reach 5 ft/s, riprap is required. Figure Three is used to determine the median stone diameter (D_{50}). The riprap mixture should approximate the following gradation:

Stone Size	% Finer
$2*D_{50}$	100
D_{50}	50
$0.5*D_{50}$	20
$0.2*D_{50}$	0

In areas where the increased roughness from riprap does not reduce the velocity below 5 ft/s, a filter blanket (or gravel bedding in a layer $3*D_{50}$) will be used.

STORM RUNOFF VOLUMES AND DESIGN FLOWS

Storm Event	Total Runoff (acft)	Pond Stage Elevation	CW RD1 cfs	CW RD2 cfs	CW RD3 cfs	CW RD4 cfs	CW RD5 cfs	CW RD6 cfs	CW RD7 cfs	CW RD8 cfs	Past RD1 cfs	Past RD2 cfs	Past RD3 /C1 cfs	Past RD4/C 2 cfs	Past RD5/ C3 cfs	Past RD6/ C4 cfs	Past RD8/ C5 cfs	Past RD9 outlet cfs
PH 1 10yr 6 hr	**1.14**	6488.7	0.20	0.62	0.07	0.90	1.21	0.71	3.84	4.25	2.20	0.65	3.69	6.74	1.33	1.74	0.92	0.00
PH 1 10yr 24 hr	**2.91**	6490.8	0.93	2.54	0.34	2.14	4.34	1.37	7.04	5.48	3.50	0.83	5.50	10.85	1.98	2.80	1.18	1.49
PH 1 25yr 6 hr	**2.09**	6490.7	0.93	2.53	0.34	2.25	4.31	1.57	7.56	6.60	4.00	1.00	6.11	11.94	2.18	2.93	1.42	0.27
PH 2 10yr 6 hr	**0.28**	6486.7	0.15	0.47	0.06	0.22	0.67	0.09	0.80	0.16	0.12	0.06	0.17	0.94	0.06	0.09	0.04	0.00
PH 2 100yr 6 hr	**1.98**	6490.5	2.31	6.95	0.85	2.60	9.17	1.73	10.29	3.32	2.00	0.51	2.38	11.24	0.88	1.11	0.72	0.00
Design flow rate			**2.40**	**7.80**	**2.50**	**4.80**	**10.10**	**5.00**	**14.50**	**4.25**	**2.20**	**1.20**	**3.69**	**6.74**	**2.50**	**3.60**	**1.70**	**3.98**

The Sedimot model predicts that the Phase 1 reclamation 10 year 24 hour storm peak discharge of Settleable solids will be 0.0 ml/l with a detention time of 5.35 hours.

DIVERSION DESIGN

Diversions and culverts for these miscellaneous flows are required to be designed to pass the phase one 10 year, 6 hour storm (R645-301-742.333). Diversions on the Excess Spoil Disposal Area were modeled using the phase two 100 year 6 hour storm. The operational hydrology plan designed for greater storms. The reclamation modeled flow rates were compared with the operational flow rates and the design was based on the greater of the operational or reclamation storms. Permit term reclamation hydrology modeling predicts the various storm peak flow rates for each ditch. The design flow rate is also listed in the table above.

Design summaries are given in the tables below. The diversions were designed to fit within a range of expected field values. The minimum design channel depth is conservatively calculated by using a minimum channel slope and a maximum expected Mannings N. Additional freeboard is not required in the regulations, but the operator may construct the diversions larger than required to reduce the risk of overflow from storms greater than the required design precipitation event.

The Maximum velocity expected in the channel is calculated by using minimum Manning's N values and maximum channel slopes. Manning's N for a channel bed with riprap is estimated by the equation $N=0.0395*(D_{50})^{1/6}$ with D_{50} in feet (Applied Hydrology and Sedimentology for Disturbed Areas page 188). If the normal depth of flow is less than twice D_{50} then N is estimated by the equation $N=0.456*(D_{50}$ *Slope)0.159 with D_{50} in inches and slope in feet/feet (*Development of Riprap Design*

Criteria by Riprap Testing in Flumes: Phase 1 May 1987, Colorado State University, prepared for Uranium Recovery Field Office and Division of Waste Management).

While the slopes and N values are expected to be near the middle of the range provided, these values provide the maximum variance accepted without additional rip rap or lining through the channel. The cross sections may vary but must always be sufficient to provide the maximum required flow area.

DIVERSION DESIGN CRITERIA

Ditch No.	Manning N		Side Slope	Min Bottom Width	Design Flow	Channel Slope (%)		Flow Depth (ft)		Flow Area (ft^2)		Maximum Velocity	Minimum Channel Depth	Comments
	Min	Max	minH/1V	(ft)	(cfs)	Min	Max	Min	Max	Min	Max	(ft/s)	(ft)	No lining required
CW-RD1	0.03	0.05	2	0	**2.40**	1.6	5	0.53	0.8	0.60	1.30	4.3	0.80	No lining required
CW-RD2	0.03	0.05	2	0	**7.80**	3	4	0.89	1.1	1.58	2.40	4.9	1.10	No lining required
CW-RD3	0.03	0.05	2	0	**2.50**	2	6	0.52	0.8	0.54	1.30	4.62	0.80	No lining required
CW-RD4	0.03	0.05	2	0	**4.80**	2	5	0.70	1.0	0.98	2.10	4.9	1.00	No lining required
CW-RD5	0.03	0.05	2	0	**10.10**	1	2.5	1.04	1.5	2.16	4.70	4.7	1.50	No lining required
CW-RD6	0.03	0.05	2	1	**5.00**	1	6	0.56	0.9	1.19	2.50	4.2	0.90	No lining required
CW-RD7	0.03	0.05	2	1	**14.50**	1	2.3	0.98	1.5	2.90	6.00	5	1.50	No lining required
CW-RD8	0.03	0.05	2	0	**4.25**	2	5	0.70	1.0	0.98	2.10	4.9	1.00	No lining required
Past-RD1	0.012	0.03	2	2	**2.20**	0.2	1.5	0.20	0.6	0.48	1.92	4.58	0.60	No lining required
Past-RD2	0.025	0.05	2	0	**1.20**	1	4	0.40	0.7	0.32	0.98	3.75	0.70	No lining required
Past-RD3	0.025	0.05	2	0	**3.69**	1	4	0.56	0.9	1.19	2.50	4.2	1.00	No lining required
Past-RD4	0.025	0.05	2	1	**6.74**	2	5	0.89	1.1	1.58	2.40	4.9	1.10	No lining required
Past-RD5	0.025	0.05	2	1	**2.50**	0.5	2.5	0.38	0.8	0.67	2.08	3.73	0.80	No lining required
Past-RD6	0.03	0.05	2	1	**3.60**	2	5	0.42	0.7	0.77	1.68	4.68	0.70	No lining required
Past-RD8	0.025	0.05	2	0	**1.70**	1	5	0.44	0.8	0.39	1.28	4.36	0.80	No lining required
Past-RD9	0.025	0.05	2	1	**3.98**	0.8	5	0.46	1.0	0.82	2.20	4.85	1.00	No lining required

CULVERT DESIGN CRITERIA

Culvert No	Minimum Pipe Diameter (in)	Pipe Length (ft)	Pipe Slope %	Controlling Head Water (Ft)	Design Flow (cfs)	Design Velocity (ft/s)	Inlet / Outlet Conditions
Past-RC1	18	40	1	1.2	**3.69**	3	No lining req'd
Past-RC2	24	115	3	1.4	**6.74**	4	No lining req'd
Past-RC3	18	80	0.3	0.9	**2.5**	2	No lining req'd
Past-RC4	12	75	3	1.65	**3.6**	4.6	Submerged inlet outlet Riprap D50=6"
Past-RC5	18	100	1	0.8	**1.7**	1.9	No lining req'd
CW-RC1	12	60	3.7	1.9	**4**	5	No lining req'd
CW-RC2	18	20	2.5	1.9	**7.8**	4.4	No lining req'd
CW-RC3	4@8"	10	6	0.67	**6.8**	5	No lining req'd
CW-RC4	36	60	1.7	1.9	**14.5**	4.2	No lining req'd
CW-RC5	18	30	2	1.3	**4.25**	4.9	No lining req'd
CW-RC6	18	20	2	1.1	**3.82**	4	No lining req'd
CW-RC7	24	160	3	1.4	**6.74**	4	No lining req'd

Culverts were designed for these watersheds previously under a very conservative storm (100 yr 6 hr) and under an operational condition. With the combined watersheds now proposed and under the permit term reclamation scenario, we have checked to make sure that the designs are still at least as conservative as the required 10 year 6 hour storm. See the table above for the design flow rates used.

PASTURE SEDIMENT POND

10 Year 6 Hour Storm Hydrologic Model
Phase 1

1

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*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



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*********************************************

     watershed identification code
     -----------------------------
     Pasture Pond 10 year 6 hour Permit Term Phase 1 June 2006

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```
input particle size-percent finer distributions
-----------------------------------------------


size,mm            13.000  2.000   .425   .250   .150   .075
                     .050   .030   .020   .010   .008   .006
                     .004   .002   .000
pct finer no. 1    94.300 83.700 78.000 73.300 66.300 45.000
                   34.000 26.300 20.300 15.000 13.800 12.300
                   11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      1.31   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
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    junction  1, branch  1, structure  1
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```

****

beta is negative which inherently indicates that the stream system transport capacity exceeds the sediment load, as evaluated by williams' technique. SEDIMOT II does not consider erodible channels so beta is set equal to .01. if the user wishes to evaluate the transport capacity of the stream directly he/she should use subroutine sloss.

****

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.12	.01	.33	.078	.922	.999
2	.33	.04	.19	.051	.693	1.000
3	.20	.04	.11	.051	.693	1.000
4	.13	.04	.03	.052	.706	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1237	acre-ft
peak discharge	=	.6182	cfs
area	=	55.8000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	8728.93	mg/l
peak settleable concentration	=	4.96	ml/l
peak settleable concentration	=	6946.12	mg/l
total sediment yield	=	.6558	tons
representative particle size	=	.0615	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.20	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.20	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.46	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.53	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	75.00	.200	.100	.100	.35	1.0
3	4.10	75.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.600	1.0	.0
3	1	.20	150.0	5.00	.600	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.07 *	.04	.02	.052	.697	.552
2	.76	.10	1.78	.051	.693	.744
3	.71	.10	.95	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1109	acre-ft
peak discharge	=	.8955	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	13.0762	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	28083.88	mg/l
peak settleable concentration	=	15.08	ml/l
peak settleable concentration	=	21113.45	mg/l
total sediment yield	=	2.2810	tons
representative particle size	=	.0445	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.10	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.10	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.61	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.99	ml/l

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   null structure
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* * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	80.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.700	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	3.70	.20	5.47	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1701	acre-ft
peak discharge	=	3.1704	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	41304.42	mg/l
peak settleable concentration	=	24.68	ml/l
peak settleable concentration	=	34549.71	mg/l
total sediment yield	=	5.4740	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	14.51	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.51	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	10.36	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.34	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	1.21	cfs
time of routed peak discharge	=	3.60	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.4047	ac-ft
peak runoff discharge	=	3.84	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1500	hrs
total sediment yield	=	8.4098	tons
peak sediment concentration	=	38709.05	mg/l
peak settleable concentration	=	22.3902	ml/l
peak settleable concentration	=	31346.26	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.90	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.90	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.84	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.27	ml/l

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    null structure
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   junction  2, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	84.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	4.25	.30	42.21	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2005	acre-ft
peak discharge	=	4.2544	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	244045.50	mg/l
peak settleable concentration	=	145.81	ml/l
peak settleable concentration	=	204135.50	mg/l
total sediment yield	=	42.2094	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	88.25	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	88.25	ml/l
arithmetic average settleable concentration during period of significant concentration	=	59.48	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.68	ml/l

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   null structure
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    junction  3, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	84.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.02	.30	.42	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0482	acre-ft
peak discharge	=	1.0232	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	10973.31	mg/l
peak settleable concentration	=	6.56	ml/l
peak settleable concentration	=	9178.79	mg/l
total sediment yield	=	.4176	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.87	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.87	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.55	ml/l

arithmetic average settleable concentration during peak 24 hour period	=	.33	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	6.53	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	90.50	acres
total runoff volume	=	.6535	ac-ft
peak runoff discharge	=	6.74	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.97	
previous structure travel time	=	.1000	hrs
total sediment yield	=	49.5843	tons
peak sediment concentration	=	158096.10	mg/l
peak settleable concentration	=	93.4136	ml/l
peak settleable concentration	=	130779.00	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	32.35	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	32.35	ml/l
arithmetic average settleable concentration during period of significant concentration	=	16.03	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.54	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	84.00	.020	.300	.300	.35	.0
2	3.90	84.00	.140	.200	.200	.35	1.0
3	1.20	84.00	.040	.200	.200	.35	.0
4	2.00	84.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.850	1.0	.0
2	1	.20	40.0	10.00	.850	1.0	.0
3	1	.20	30.0	10.00	.850	1.0	.0
4	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.83	.30	1.37	.088	1.000	.973
2	1.69	.30	5.15	.070	.863	.984
3	.65	.30	1.35	.088	1.000	.982
4	.87	.30	.35	.070	.863	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2665	acre-ft
peak discharge	=	3.6894	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	.3041	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	35116.70	mg/l
peak settleable concentration	=	20.48	ml/l
peak settleable concentration	=	28674.11	mg/l
total sediment yield	=	8.0702	tons
representative particle size	=	.0734	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	13.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	13.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.20	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.42	ml/l

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    null structure
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    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	84.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.92	.30	.33	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0431	acre-ft
peak discharge	=	.9155	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	9592.52	mg/l
peak settleable concentration	=	5.73	ml/l
peak settleable concentration	=	8023.81	mg/l
total sediment yield	=	.3265	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.38	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	2.23	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.29	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	9.84	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	.9631	ac-ft
peak runoff discharge	=	10.03	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	57.1725	tons
peak sediment concentration	=	114246.30	mg/l
peak settleable concentration	=	67.1922	ml/l
peak settleable concentration	=	94069.02	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	25.43	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	25.43	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.94	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.86	ml/l

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    null structure
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    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	84.00	.250	.200	.200	.35	1.0
2	2.40	84.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.850	1.0	.0
2	1	.20	50.0	10.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.33	.30	.81	.061	.790	.910
2	.89	.30	3.06	.061	.790	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1523	acre-ft
peak discharge	=	1.7393	cfs
area	=	6.0000	acres
time of peak discharge	=	3.20	hrs
beta	=	1.8979	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	38249.73	mg/l
peak settleable concentration	=	21.62	ml/l
peak settleable concentration	=	30271.57	mg/l
total sediment yield	=	3.7978	tons
representative particle size	=	.0596	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	10.16	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	10.16	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.16	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.16	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.750	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.48	.54	1.97	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0248	acre-ft
peak discharge	=	.4822	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	.2065	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	89642.02	mg/l
peak settleable concentration	=	53.56	ml/l
peak settleable concentration	=	74982.42	mg/l
total sediment yield	=	1.9718	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	34.57	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	34.57	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	21.19	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.83	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	11.61	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	1.1403	ac-ft
peak runoff discharge	=	11.71	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	62.7681	tons
peak sediment concentration	=	102936.80	mg/l
peak settleable concentration	=	60.3911	ml/l
peak settleable concentration	=	84547.50	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	23.49	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	23.49	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.51	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.82	ml/l

* *

pond results

* *

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

****
****

caution: the stage of your principal spillway
may cause bed scour. SEDIMOT II does not consider
possible bed scour; hence, your observed effluent
may not meet the desired effluent standard. increase
the stage of your principal spillway.

****
****

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	1.140	acre-ft
outflow routed volume	=	.004	acre-ft
storm volume discharged (plug flow)	=	.004	acre-ft
pond volume at peak stage	=	1.463	acre-ft
peak stage	=	4.234	ft
peak inflow rate	=	11.711	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	102936.80	mg/l
peak effluent sediment concentration	=	8285.10	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.01	mg/l
storm average effluent concentration	=	3428.95	mg/l
average effluent sediment concentration	=	3428.95	mg/l
basin trap efficiency	=	99.97	percent
detention time of flow with sediment	=	22.70	hrs
detention time from hydrograph centers	=	22.70	hrs
detention time including stored flow	=	22.70	hrs
sediment load discharged	=	.02	tons
period of significant concentration	=	47.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	115.216	*	3.00	.000	3295.060
3.20	.000	8285.103	*	3.40	.000	8153.978
3.60	.001	7435.903	*	3.80	.001	6837.079
4.00	.001	6377.177	*	4.20	.001	6030.756
4.40	.001	5745.261	*	4.60	.001	5513.357
4.80	.001	5307.341	*	5.00	.001	5129.242
5.20	.001	4970.868	*	5.40	.001	4827.453
5.60	.001	4704.104	*	5.80	.001	4595.527
6.00	.001	4480.771	*	6.20	.001	4384.201
6.40	.001	4307.656	*	6.60	.001	4236.042
6.80	.001	4175.692	*	7.00	.001	4125.971
7.20	.001	4083.555	*	7.40	.001	4045.667
7.60	.001	4011.099	*	7.80	.001	3979.185
8.00	.001	3949.455	*	8.20	.001	3921.569
8.40	.001	3895.225	*	8.60	.001	3870.288
8.80	.001	3846.604	*	9.00	.001	3823.999
9.20	.001	3802.432	*	9.40	.001	3782.133
9.60	.001	3763.212	*	9.80	.001	3745.403
10.00	.001	3728.463	*	10.20	.001	3712.256
10.40	.001	3696.756	*	10.60	.001	3682.013
10.80	.001	3667.956	*	11.00	.001	3654.454
11.20	.001	3641.441	*	11.40	.001	3628.875
11.60	.001	3616.792	*	11.80	.001	3605.229
12.00	.001	3594.207	*	12.20	.001	3583.752
12.40	.001	3573.774	*	12.60	.001	3564.162
12.80	.001	3554.858	*	13.00	.001	3545.824
13.20	.001	3537.031	*	13.40	.001	3528.462
13.60	.001	3520.100	*	13.80	.001	3511.933
14.00	.001	3503.948	*	14.20	.001	3496.136
14.40	.001	3488.504	*	14.60	.001	3481.127
14.80	.001	3474.054	*	15.00	.001	3467.226
15.20	.001	3460.587	*	15.40	.001	3454.108
15.60	.001	3447.766	*	15.80	.001	3441.551
16.00	.001	3435.453	*	16.20	.001	3429.467
16.40	.001	3423.587	*	16.60	.001	3417.811
16.80	.001	3412.133	*	17.00	.001	3406.564
17.20	.001	3401.183	*	17.40	.001	3396.022
17.60	.001	3391.021	*	17.80	.001	3386.143
18.00	.001	3381.367	*	18.20	.001	3376.667
18.40	.001	3371.982	*	18.60	.001	3367.230
18.80	.001	3362.425	*	19.00	.001	3357.625
19.20	.001	3352.849	*	19.40	.001	3348.113
19.60	.001	3343.435	*	19.80	.001	3338.883
20.00	.001	3334.473	*	20.20	.001	3330.157

20.40	.001	3325.915	*	20.60	.001	3321.737
20.80	.001	3317.613	*	21.00	.001	3313.541
21.20	.001	3309.518	*	21.40	.001	3305.542
21.60	.001	3301.615	*	21.80	.001	3297.736
22.00	.001	3293.906	*	22.20	.001	3290.135
22.40	.001	3286.459	*	22.60	.001	3282.882
22.80	.001	3279.373	*	23.00	.001	3275.921
23.20	.001	3272.518	*	23.40	.001	3269.158
23.60	.001	3265.838	*	23.80	.001	3262.557
24.00	.001	3259.313	*	24.20	.001	3256.104
24.40	.001	3252.930	*	24.60	.001	3249.790
24.80	.001	3246.682	*	25.00	.001	3243.605
25.20	.001	3240.559	*	25.40	.001	3237.543
25.60	.001	3234.555	*	25.80	.001	3231.594
26.00	.001	3228.660	*	26.20	.001	3225.752
26.40	.001	3222.869	*	26.60	.001	3220.011
26.80	.001	3217.178	*	27.00	.001	3214.370
27.20	.001	3211.585	*	27.40	.001	3208.824
27.60	.001	3206.086	*	27.80	.001	3203.371
28.00	.001	3200.677	*	28.20	.001	3198.005
28.40	.001	3195.353	*	28.60	.001	3192.708
28.80	.001	3190.015	*	29.00	.001	3187.261
29.20	.001	3184.486	*	29.40	.001	3181.706
29.60	.001	3178.928	*	29.80	.001	3176.159
30.00	.001	3173.402	*	30.20	.001	3170.659
30.40	.001	3167.929	*	30.60	.001	3165.213
30.80	.001	3162.512	*	31.00	.001	3159.827
31.20	.001	3157.157	*	31.40	.001	3154.503
31.60	.001	3151.864	*	31.80	.001	3149.242
32.00	.001	3146.638	*	32.20	.001	3144.052
32.40	.001	3141.483	*	32.60	.001	3138.931
32.80	.001	3136.398	*	33.00	.001	3133.881
33.20	.001	3131.381	*	33.40	.001	3128.899
33.60	.001	3126.433	*	33.80	.001	3123.982
34.00	.001	3121.549	*	34.20	.001	3119.131
34.40	.001	3116.729	*	34.60	.001	3114.341
34.80	.001	3111.970	*	35.00	.001	3109.614
35.20	.001	3107.273	*	35.40	.001	3104.946
35.60	.001	3102.635	*	35.80	.001	3100.337
36.00	.001	3098.052	*	36.20	.001	3095.782
36.40	.001	3093.527	*	36.60	.001	3091.285
36.80	.001	3089.057	*	37.00	.001	3086.842
37.20	.001	3084.640	*	37.40	.001	3082.451
37.60	.001	3080.275	*	37.80	.001	3078.111
38.00	.001	3075.960	*	38.20	.001	3073.822
38.40	.001	3071.697	*	38.60	.001	3069.582
38.80	.001	3067.473	*	39.00	.001	3065.343
39.20	.001	3063.168	*	39.40	.001	3060.967
39.60	.001	3058.755	*	39.80	.001	3056.539
40.00	.001	3054.325	*	40.20	.001	3052.118
40.40	.001	3049.916	*	40.60	.001	3047.721
40.80	.001	3045.534	*	41.00	.001	3043.354
41.20	.001	3041.183	*	41.40	.001	3039.020
41.60	.001	3036.866	*	41.80	.001	3034.722
42.00	.001	3032.586	*	42.20	.001	3030.461
42.40	.001	3028.346	*	42.60	.001	3026.242
42.80	.001	3024.148	*	43.00	.001	3022.065
43.20	.001	3019.993	*	43.40	.001	3017.931

43.60	.001	3015.880	*	43.80	.001	3013.837
44.00	.001	3011.805	*	44.20	.001	3009.784
44.40	.001	3007.773	*	44.60	.001	3005.771
44.80	.001	3003.779	*	45.00	.001	3001.797
45.20	.001	2999.824	*	45.40	.001	2997.860
45.60	.001	2995.906	*	45.80	.001	2993.962
46.00	.001	2992.027	*	46.20	.001	2990.099
46.40	.001	2988.182	*	46.60	.001	2986.273
46.80	.001	2984.374	*	47.00	.001	2982.483
47.20	.001	2980.600	*	47.40	.001	2978.727
47.60	.001	2976.862	*	47.80	.001	2975.005
48.00	.001	2973.156	*	48.20	.001	2971.316
48.40	.001	2969.484	*	48.60	.001	2967.660
48.80	.001	2965.844	*	49.00	.001	2964.033
49.20	.001	2962.216	*	49.40	.001	2960.368
49.60	.001	2958.487	*	49.80	.001	2956.594

*** run completed ****

```
Pasture Pond 10 year 6 hour Permit Term Phase 1 June 2006                    X
      2       0
   1.31    6.00     .10     .00
      5       2
      2       2       2       2       1
   2.75    1.50    1.40
      1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
  .0080   .0060   .0040   .0020   .0001
  94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
  13.80   12.30   11.00   10.00     .00
      1       1
   .100    .100    .400
   .000    .000    .000
      1       1
   .150    .150    .400
   .000    .000    .000
      1       1
   .100    .100    .400
   .000    .000    .000
      1       1       1
   .050    .050    .350
   .000    .000    .000
      1
   .050    .050    .350
      4       1       1       1       1
 27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
  .2000200.0000 10.0000   .2500  1.0000
 14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
  .2000500.0000  2.5000   .2500  1.0000
  8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
  .2000400.0000  2.8000   .2500  1.0000
  5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
  .2000200.0000  1.0000   .2500  1.0000
      3       1       1       1       1
  3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
  .2000 80.0000  2.0000   .2500  1.0000
  7.400  75.000    .200    .100    .100    .350   1.000   1.000    .000
  .2000250.0000  5.0000   .6000  1.0000
  4.100  75.000    .110    .000    .000    .300   1.000   1.000    .000
  .2000150.0000  5.0000   .6000  1.0000
      1       1       1       1       1
 10.300  80.000    .100    .000    .100    .350   1.000   1.000    .000
  .2000100.0000  5.0000   .7000  1.0000
      1       1       1       1       1
  7.900  84.000    .040    .000    .000    .000   1.000   1.000    .000
  .2000 50.0000 20.0000   .8500  1.0000
      1       1       1       1       1
  1.900  84.000    .120    .000    .000    .000   1.000   1.000    .000
  .2000 30.0000  2.0000   .8500  1.0000
      4       1       1       1       1
  3.400  84.000    .020    .300    .300    .350   1.000   1.000    .000
  .2000 20.0000  5.0000   .8500  1.0000
  3.900  84.000    .140    .200    .200    .350   1.000   1.000    .000
  .2000 40.0000 10.0000   .8500  1.0000
  1.200  84.000    .040    .200    .200    .350   1.000   1.000    .000
  .2000 30.0000 10.0000   .8500  1.0000
  2.000  84.000    .150    .000    .000    .000   1.000   1.000    .000
  .2000 20.0000  2.0000   .8500  1.0000
      1       1       1       1       1
  1.700  84.000    .070    .000    .000    .000   1.000   1.000    .000
  .2000 20.0000  2.0000   .8500  1.0000
      2       1       1       1       1
  3.600  84.000    .250    .200    .200    .350   1.000   1.000    .000
  .2000 50.0000  2.0000   .8500  1.0000
  2.400  84.000    .250    .000    .000    .000   1.000   1.000    .000
  .2000 50.0000 10.0000   .8500  1.0000
      1       2       1       1       1
   .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .7500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

10 Year 24 Hour Storm Hydrologic Model
Phase 1

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************

    watershed identification code
    -----------------------------
    Pasture Pond 10 year 24 hour Permit Term Phase 1 June 2006

*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      24.00   hours
precipation depth                 =       1.84   inches
specific gravity                  =       2.75
load rate exponent factor         =       1.50
submerged bulk specific gravity   =       1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.41	.09	2.37	.025	.477	1.000
2	1.51	.18	.99	.054	.723	1.000
3	.93	.18	.59	.054	.723	1.000
4	.65	.18	.15	.058	.757	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.6480	acre-ft
peak discharge	=	2.5380	cfs
area	=	55.8000	acres
time of peak discharge	=	12.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	5899.08	mg/l
peak settleable concentration	=	3.02	ml/l
peak settleable concentration	=	4222.98	mg/l
total sediment yield	=	4.0996	tons
representative particle size	=	.0333	mm
time of peak concentration	=	12.30	hrs
period of significant concentration	=	14.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.36	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.36	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.03	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.23	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	75.00	.200	.100	.100	.35	1.0
3	4.10	75.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.600	1.0	.0
3	1	.20	150.0	5.00	.600	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.34*	.18	.09	.055	.733	.661
2	1.80	.31	5.24	.064	.811	.801
3	1.37*	.31	2.51	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3401	acre-ft
peak discharge	=	2.1430*	cfs
area	=	14.6000	acres
time of peak discharge	=	12.00	hrs
beta	=	8.8128	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	31478.24	mg/l
peak settleable concentration	=	17.60	ml/l
peak settleable concentration	=	24645.06	mg/l
total sediment yield	=	6.7633	tons
representative particle size	=	.0562	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.10	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.10	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.96	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.64	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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1

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* * * * * * * * * * * * * * * * * * * * * * *
   junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	80.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.700	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	5.37	.47	10.90	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4014	acre-ft
peak discharge	=	4.6978	cfs
area	=	10.3000	acres
time of peak discharge	=	12.10	hrs
beta	=	2.9418	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	40203.09	mg/l
peak settleable concentration	=	24.02	ml/l
peak settleable concentration	=	33628.48	mg/l
total sediment yield	=	10.9041	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.10	hrs
period of significant concentration	=	12.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.91	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.91	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.07	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.11	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	4.34	cfs
time of routed peak discharge	=	12.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	1.3895	ac-ft
peak runoff discharge	=	7.04	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.91	
previous structure travel time	=	.1500	hrs
total sediment yield	=	20.7775	tons
peak sediment concentration	=	35882.54	mg/l
peak settleable concentration	=	20.1782	ml/l
peak settleable concentration	=	28249.54	mg/l
time to peak concentration	=	12.00	hrs
period of significant concentration	=	14.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.13	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	6.13	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.65	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.21	ml/l

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* * * * * * * * * * * *
     null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	84.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	5.48	.63	73.27	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4166	acre-ft
peak discharge	=	5.4814	cfs
area	=	7.9000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	235904.50	mg/l
peak settleable concentration	=	140.95	ml/l
peak settleable concentration	=	197325.90	mg/l
total sediment yield	=	73.2653	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	72.82	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	72.82	ml/l
arithmetic average settleable concentration during period of significant concentration	=	33.20	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	18.12	ml/l

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    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	84.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.32	.63	.72	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1002	acre-ft
peak discharge	=	1.3183	cfs
area	=	1.9000	acres
time of peak discharge	=	12.00	hrs
beta	=	.5937	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	10576.20	mg/l
peak settleable concentration	=	6.32	ml/l
peak settleable concentration	=	8846.62	mg/l
total sediment yield	=	.7248	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.19	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.19	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.43	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.76	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	10.58	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.9063	ac-ft
peak runoff discharge	=	10.85	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.98	
previous structure travel time	=	.1000	hrs
total sediment yield	=	93.2057	tons
peak sediment concentration	=	133665.00	mg/l
peak settleable concentration	=	78.5382	ml/l
peak settleable concentration	=	109953.40	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	20.50	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	20.50	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.38	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	6.02	ml/l

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    null structure
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* *
junction 3, branch 2, structure 1
* *

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	84.00	.020	.300	.300	.35	.0
2	3.90	84.00	.140	.200	.200	.35	1.0
3	1.20	84.00	.040	.200	.200	.35	.0
4	2.00	84.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.850	1.0	.0
2	1	.20	40.0	10.00	.850	1.0	.0
3	1	.20	30.0	10.00	.850	1.0	.0
4	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.36	.63	2.38	.088	1.000	.999
2	2.39	.63	9.41	.077	.918	.999
3	.83	.63	2.33	.088	1.000	.999
4	1.22	.63	.63	.077	.918	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.5538	acre-ft
peak discharge	=	5.5038	cfs
area	=	10.5000	acres
time of peak discharge	=	12.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	37344.47	mg/l
peak settleable concentration	=	22.05	ml/l
peak settleable concentration	=	30874.45	mg/l
total sediment yield	=	14.7465	tons
representative particle size	=	.0804	mm
time of peak concentration	=	12.30	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.38	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.51	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.08	ml/l

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null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	84.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.18	.63	.57	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0897	acre-ft
peak discharge	=	1.1795	cfs
area	=	1.7000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	9246.56	mg/l
peak settleable concentration	=	5.52	ml/l
peak settleable concentration	=	7734.43	mg/l
total sediment yield	=	.5666	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.79	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.79	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	1.25	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.66	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	16.19	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	2.5497	ac-ft
peak runoff discharge	=	16.43	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	107.0223	tons
peak sediment concentration	=	98192.45	mg/l
peak settleable concentration	=	57.5730	ml/l
peak settleable concentration	=	80602.24	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	17.69	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	17.69	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.94	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	5.09	ml/l

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* * * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	84.00	.250	.200	.200	.35	1.0
2	2.40	84.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.850	1.0	.0
2	1	.20	50.0	10.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.98	.63	1.52	.070	.864	.985
2	1.32	.63	5.75	.070	.864	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3164	acre-ft
peak discharge	=	2.8047	cfs
area	=	6.0000	acres
time of peak discharge	=	12.20	hrs
beta	=	.2884	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	36377.02	mg/l
peak settleable concentration	=	21.08	ml/l
peak settleable concentration	=	29507.70	mg/l
total sediment yield	=	7.2380	tons
representative particle size	=	.0698	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.53	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.53	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.74	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.64	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.750	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.55	.96	2.93	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0443	acre-ft
peak discharge	=	.5488	cfs
area	=	.5540	acres
time of peak discharge	=	12.00	hrs
beta	=	.1055	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	88246.70	mg/l
peak settleable concentration	=	52.73	ml/l
peak settleable concentration	=	73815.28	mg/l
total sediment yield	=	2.9300	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	28.91	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	28.91	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.85	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	6.61	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	19.00	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	2.9104	ac-ft
peak runoff discharge	=	19.11	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	117.0243	tons
peak sediment concentration	=	89594.46	mg/l
peak settleable concentration	=	52.5021	ml/l
peak settleable concentration	=	73503.01	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	16.95	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	16.95	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.69	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	5.03	ml/l

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* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                    pond results

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *


          ***** control variables options *****

     flow     fractn     isdo     nrhp     nsp     ncstr
    ---------------------------------------------------
       3         0         1      500      10       2

*********************************************************
*********************************************************

     caution: the stage of your principal spillway
     may cause bed scour. SEDIMOT II does not consider
     possible bed scour; hence, your observed effluent
     may not meet the desired effluent standard. increase
     the stage of your principal spillway.
*********************************************************
*********************************************************
```

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	2.910	acre-ft
outflow routed volume	=	.865	acre-ft
storm volume discharged (plug flow)	=	.865	acre-ft
pond volume at peak stage	=	2.435	acre-ft
peak stage	=	6.293	ft
peak inflow rate	=	19.107	cfs
peak discharge rate	=	1.494	cfs
peak inflow sediment concentration	=	89594.46	mg/l
peak effluent sediment concentration	=	13947.82	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.02	mg/l
storm average effluent concentration	=	3912.24	mg/l
average effluent sediment concentration	=	3912.24	mg/l
basin trap efficiency	=	96.07	percent
detention time of flow with sediment	=	5.35	hrs
detention time from hydrograph centers	=	5.35	hrs
detention time including stored flow	=	5.35	hrs
sediment load discharged	=	4.60	tons
period of significant concentration	=	39.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	.000	*	3.00	.000	.000
3.20	.000	.000	*	3.40	.000	.000
3.60	.000	.000	*	3.80	.000	.000
4.00	.000	.000	*	4.20	.000	.000
4.40	.000	.000	*	4.60	.000	.000
4.80	.000	.000	*	5.00	.000	.000
5.20	.000	.000	*	5.40	.000	.000
5.60	.000	.000	*	5.80	.000	.000
6.00	.000	.000	*	6.20	.000	.000
6.40	.000	.000	*	6.60	.000	.000
6.80	.000	.000	*	7.00	.000	.000
7.20	.000	.000	*	7.40	.000	.000
7.60	.000	.000	*	7.80	.000	.000
8.00	.000	.000	*	8.20	.000	.000
8.40	.000	.000	*	8.60	.000	.000
8.80	.000	.000	*	9.00	.000	.000
9.20	.000	.000	*	9.40	.000	.000
9.60	.000	.000	*	9.80	.000	.000
10.00	.000	.000	*	10.20	.000	.000
10.40	.000	.000	*	10.60	.000	.003
10.80	.000	.017	*	11.00	.000	.090
11.20	.000	.771	*	11.40	.000	4.874
11.60	.000	55.121	*	11.80	.000	2102.347
12.00	.000	10269.600	*	12.20	.001	13947.820
12.40	.001	12055.300	*	12.60	.001	10458.100
12.80	.001	9285.165	*	13.00	.001	8485.018
13.20	.001	7914.720	*	13.40	.001	7472.341
13.60	.001	7119.483	*	13.80	.001	6816.754
14.00	.001	6558.434	*	14.20	.001	6332.588
14.40	.001	6133.834	*	14.60	.001	5962.611
14.80	.001	5811.189	*	15.00	.001	5674.866
15.20	.001	5549.455	*	15.40	.001	5432.494
15.60	.001	5322.972	*	15.80	.001	5219.953
16.00	.001	5122.467	*	16.20	.001	5027.142
16.40	.474	4936.161	*	16.60	1.014	4852.235
16.80	1.253	4774.691	*	17.00	1.351	4703.228
17.20	1.394	4636.335	*	17.40	1.416	4572.566
17.60	1.429	4511.109	*	17.80	1.437	4451.553
18.00	1.443	4393.645	*	18.20	1.447	4337.208
18.40	1.450	4282.100	*	18.60	1.454	4228.197
18.80	1.458	4175.402	*	19.00	1.463	4123.636
19.20	1.468	4072.824	*	19.40	1.474	4022.908
19.60	1.479	3973.849	*	19.80	1.485	3925.688

20.00	1.491	3878.606	*	20.20	1.493	3831.774
20.40	1.451	3786.481	*	20.60	1.367	3745.046
20.80	1.272	3706.860	*	21.00	1.190	3671.300
21.20	1.133	3637.500	*	21.40	1.096	3604.951
21.60	1.073	3573.391	*	21.80	1.060	3542.602
22.00	1.051	3512.443	*	22.20	1.046	3482.825
22.40	1.044	3453.686	*	22.60	1.043	3424.996
22.80	1.042	3396.761	*	23.00	1.043	3368.979
23.20	1.045	3341.631	*	23.40	1.047	3314.744
23.60	1.049	3288.298	*	23.80	1.051	3262.211
24.00	1.036	3233.879	*	24.20	.910	3209.292
24.40	.787	3188.745	*	24.60	.658	3169.321
24.80	.492	3152.976	*	25.00	.334	3139.931
25.20	.221	3128.909	*	25.40	.148	3118.988
25.60	.101	3109.834	*	25.80	.069	3101.276
26.00	.048	3093.204	*	26.20	.033	3085.545
26.40	.022	3078.243	*	26.60	.014	3071.334
26.80	.008	3064.788	*	27.00	.005	3058.516
27.20	.003	3052.470	*	27.40	.002	3046.619
27.60	.001	3040.940	*	27.80	.001	3035.415
28.00	.001	3030.031	*	28.20	.001	3024.780
28.40	.001	3019.650	*	28.60	.001	3014.635
28.80	.001	3009.729	*	29.00	.001	3004.924
29.20	.001	3000.215	*	29.40	.001	2995.597
29.60	.001	2991.079	*	29.80	.001	2986.688
30.00	.001	2982.448	*	30.20	.001	2978.337
30.40	.001	2974.326	*	30.60	.001	2970.402
30.80	.001	2966.556	*	31.00	.001	2962.780
31.20	.001	2959.059	*	31.40	.001	2955.355
31.60	.001	2951.630	*	31.80	.001	2947.898
32.00	.001	2944.191	*	32.20	.001	2940.518
32.40	.001	2936.885	*	32.60	.001	2933.295
32.80	.001	2929.756	*	33.00	.001	2926.290
33.20	.001	2922.927	*	33.40	.001	2919.656
33.60	.001	2916.451	*	33.80	.001	2913.300
34.00	.001	2910.197	*	34.20	.001	2907.137
34.40	.001	2904.116	*	34.60	.001	2901.134
34.80	.001	2898.188	*	35.00	.001	2895.277
35.20	.001	2892.398	*	35.40	.001	2889.552
35.60	.001	2886.736	*	35.80	.001	2883.950
36.00	.001	2881.194	*	36.20	.001	2878.478
36.40	.001	2875.823	*	36.60	.001	2873.225
36.80	.001	2870.669	*	37.00	.001	2868.149
37.20	.001	2865.658	*	37.40	.001	2863.196
37.60	.001	2860.760	*	37.80	.001	2858.351
38.00	.001	2855.965	*	38.20	.001	2853.604
38.40	.001	2851.265	*	38.60	.001	2848.949
38.80	.001	2846.653	*	39.00	.001	2844.377
39.20	.001	2842.122	*	39.40	.001	2839.887
39.60	.001	2837.670	*	39.80	.001	2835.473
40.00	.001	2833.295	*	40.20	.001	2831.136
40.40	.001	2828.996	*	40.60	.001	2826.874
40.80	.001	2824.770	*	41.00	.001	2822.683
41.20	.001	2820.614	*	41.40	.001	2818.561
41.60	.001	2816.525	*	41.80	.001	2814.504
42.00	.001	2812.500	*	42.20	.001	2810.510
42.40	.001	2808.535	*	42.60	.001	2806.574

42.80	.001	2804.628	*	43.00	.001	2802.695
43.20	.001	2800.775	*	43.40	.001	2798.869
43.60	.001	2796.978	*	43.80	.001	2795.099
44.00	.001	2793.234	*	44.20	.001	2791.371
44.40	.001	2789.486	*	44.60	.001	2787.564
44.80	.001	2785.621	*	45.00	.001	2783.673
45.20	.001	2781.727	*	45.40	.001	2779.787
45.60	.001	2777.855	*	45.80	.001	2775.932
46.00	.001	2774.019	*	46.20	.001	2772.114
46.40	.001	2770.219	*	46.60	.001	2768.334
46.80	.001	2766.458	*	47.00	.001	2764.593
47.20	.001	2762.738	*	47.40	.001	2760.892
47.60	.001	2759.057	*	47.80	.001	2757.231
48.00	.001	2755.415	*	48.20	.001	2753.608
48.40	.001	2751.810	*	48.60	.001	2750.021
48.80	.001	2748.241	*	49.00	.001	2746.471
49.20	.001	2744.709	*	49.40	.001	2742.957
49.60	.001	2741.214	*	49.80	.001	2739.479

*** run completed ****

```
Pasture Pond 10 year 24 hour Permit Term Phase 1 June 2006                    X
       2       0
    1.84   24.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .2500  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .2500  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .2500  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .2500  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .2500  1.0000
   7.400  75.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .6000  1.0000
   4.100  75.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .6000  1.0000
       1       1       1       1       1
  10.300  80.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .7000  1.0000
       1       1       1       1       1
   7.900  84.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8500  1.0000
       1       1       1       1       1
   1.900  84.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .8500  1.0000
       4       1       1       1       1
   3.400  84.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .8500  1.0000
   3.900  84.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .8500  1.0000
   1.200  84.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8500  1.0000
   2.000  84.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .8500  1.0000
       1       1       1       1       1
   1.700  84.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .8500  1.0000
       2       1       1       1       1
   3.600  84.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .8500  1.0000
   2.400  84.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8500  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .7500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

25 Year 6 Hour Storm Hydrologic Model
Phase 1

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************

     watershed identification code
     -----------------------------
     Pasture Pond 25 year 6 hour Permit Term Phase 1 June 2006

*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      1.62   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.47	.05	1.80	.037	.589	.985
2	1.51	.12	.76	.050	.680	.987
3	.93	.12	.46	.050	.680	.991
4	.65	.12	.11	.053	.716	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3848	acre-ft
peak discharge	=	2.5272	cfs
area	=	55.8000	acres
time of peak discharge	=	3.20	hrs
beta	=	.3854	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	7888.96	mg/l
peak settleable concentration	=	4.18	ml/l
peak settleable concentration	=	5849.97	mg/l
total sediment yield	=	3.0949	tons
representative particle size	=	.0406	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.09	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.09	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.88	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.65	ml/l

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* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	75.00	.200	.100	.100	.35	1.0
3	4.10	75.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.600	1.0	.0
3	1	.20	150.0	5.00	.600	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.34 *	.12	.07	.051	.690	.625
2	1.88	.21	4.37	.058	.758	.778
3	1.57 *	.21	2.21	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2330	acre-ft
peak discharge	=	2.2517 *	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	10.4191	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	31347.11	mg/l
peak settleable concentration	=	17.25	ml/l
peak settleable concentration	=	24145.41	mg/l
total sediment yield	=	5.6538	tons
representative particle size	=	.0519	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.78	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.78	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.50	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.16	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	80.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.700	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	6.36	.35	10.14	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2974	acre-ft
peak discharge	=	5.5120	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	3.6991	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	41939.09	mg/l
peak settleable concentration	=	25.06	ml/l
peak settleable concentration	=	35080.59	mg/l
total sediment yield	=	10.1369	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	15.28	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	15.28	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	10.50	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.36	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	4.31	cfs
time of routed peak discharge	=	3.30	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.9152	ac-ft
peak runoff discharge	=	7.56	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.89	
previous structure travel time	=	.1500	hrs
total sediment yield	=	17.8828	tons
peak sediment concentration	=	36960.79	mg/l
peak settleable concentration	=	20.8573	ml/l
peak settleable concentration	=	29200.16	mg/l
time to peak concentration	=	3.00	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.13	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.13	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.44	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.22	ml/l

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* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
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1

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* * * * * * * * * * * * * * * * * * * * * * *
   junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	84.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	6.60	.49	70.30	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3215	acre-ft
peak discharge	=	6.5984	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	244459.00	mg/l
peak settleable concentration	=	146.06	ml/l
peak settleable concentration	=	204481.40	mg/l
total sediment yield	=	70.3004	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	91.24	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	91.24	ml/l
arithmetic average settleable concentration during period of significant concentration	=	58.80	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.84	ml/l

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   null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	84.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.59	.49	.70	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0773	acre-ft
peak discharge	=	1.5870	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	10993.64	mg/l
peak settleable concentration	=	6.57	ml/l
peak settleable concentration	=	9195.79	mg/l
total sediment yield	=	.6955	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	4.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	4.01	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.52	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.34	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	11.61	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.3140	ac-ft
peak runoff discharge	=	11.94	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.97	
previous structure travel time	=	.1000	hrs
total sediment yield	=	86.4088	tons
peak sediment concentration	=	145309.50	mg/l
peak settleable concentration	=	85.3302	ml/l
peak settleable concentration	=	119462.30	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	27.75	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	27.75	ml/l
arithmetic average settleable concentration during period of significant concentration	=	13.64	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.24	ml/l

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    null structure
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    junction  3, branch  2, structure  1
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	84.00	.020	.300	.300	.35	.0
2	3.90	84.00	.140	.200	.200	.35	1.0
3	1.20	84.00	.040	.200	.200	.35	.0
4	2.00	84.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.850	1.0	.0
2	1	.20	40.0	10.00	.850	1.0	.0
3	1	.20	30.0	10.00	.850	1.0	.0
4	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.84	.49	2.28	.088	1.000	.999
2	2.74	.49	8.78	.073	.889	.999
3	1.00	.49	2.24	.088	1.000	.999
4	1.40	.49	.59	.073	.889	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4273	acre-ft
peak discharge	=	6.1148	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	37338.45	mg/l
peak settleable concentration	=	21.95	ml/l
peak settleable concentration	=	30728.12	mg/l
total sediment yield	=	13.8910	tons
representative particle size	=	.0777	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	14.02	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.02	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.39	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.49	ml/l

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    null structure
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    junction  4, branch  1, structure  1
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	84.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.42	.49	.54	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0692	acre-ft
peak discharge	=	1.4199	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	9610.30	mg/l
peak settleable concentration	=	5.74	ml/l
peak settleable concentration	=	8038.68	mg/l
total sediment yield	=	.5437	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.51	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.51	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	2.21	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.29	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	17.42	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	1.8105	ac-ft
peak runoff discharge	=	17.71	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	99.4589	tons
peak sediment concentration	=	106759.60	mg/l
peak settleable concentration	=	62.5260	ml/l
peak settleable concentration	=	87536.34	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	23.34	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	23.34	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.62	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.71	ml/l

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     null structure
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    junction  4, branch  2, structure  1
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	84.00	.250	.200	.200	.35	1.0
2	2.40	84.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.850	1.0	.0
2	1	.20	50.0	10.00	.850	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.18 *	.49	1.38	.064	.818	.950
2	1.45	.49	5.25	.064	.818	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2442	acre-ft
peak discharge	=	2.9252*	cfs
area	=	6.0000	acres
time of peak discharge	=	3.20	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	38715.48	mg/l
peak settleable concentration	=	22.12	ml/l
peak settleable concentration	=	30966.92	mg/l
total sediment yield	=	6.5649	tons
representative particle size	=	.0635	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.07	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.07	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.52	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.22	ml/l

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    null structure
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   junction  5, branch  1, structure  1
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*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.750	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.67	.78	2.92	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0360	acre-ft
peak discharge	=	.6728	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	.1358	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	89446.95	mg/l
peak settleable concentration	=	53.44	ml/l
peak settleable concentration	=	74819.25	mg/l
total sediment yield	=	2.9225	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	35.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	35.38	ml/l
arithmetic average settleable concentration during period of significant concentration	=	20.46	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.90	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	20.49	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	2.0906	ac-ft
peak runoff discharge	=	20.63	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	108.7496	tons
peak sediment concentration	=	96745.18	mg/l
peak settleable concentration	=	56.5843	ml/l
peak settleable concentration	=	79218.00	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	22.06	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	22.06	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.18	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.70	ml/l

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pond results

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***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	2.091	acre-ft
outflow routed volume	=	.027	acre-ft
storm volume discharged (plug flow)	=	.027	acre-ft
pond volume at peak stage	=	2.396	acre-ft
peak stage	=	6.217	ft
peak inflow rate	=	20.628	cfs
peak discharge rate	=	.273	cfs
peak inflow sediment concentration	=	96745.18	mg/l
peak effluent sediment concentration	=	16602.77	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.02	mg/l
storm average effluent concentration	=	5050.37	mg/l
average effluent sediment concentration	=	5050.37	mg/l
basin trap efficiency	=	99.83	percent
detention time of flow with sediment	=	6.14	hrs
detention time from hydrograph centers	=	6.14	hrs
detention time including stored flow	=	6.14	hrs
sediment load discharged	=	.19	tons
period of significant concentration	=	47.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	1.735
2.80	.000	916.741	*	3.00	.000	10360.480
3.20	.001	16602.770	*	3.40	.001	13965.230
3.60	.001	11823.940	*	3.80	.001	10325.260
4.00	.001	9301.426	*	4.20	.001	8582.696
4.40	.001	8031.358	*	4.60	.001	7596.477
4.80	.001	7226.615	*	5.00	.001	6912.021
5.20	.001	6638.507	*	5.40	.001	6397.887
5.60	.001	6191.727	*	5.80	.001	6011.364
6.00	.001	5835.438	*	6.20	.001	5689.946
6.40	.001	5571.193	*	6.60	.026	5463.840
6.80	.258	5374.339	*	7.00	.260	5299.951
7.20	.214	5236.180	*	7.40	.170	5179.696
7.60	.133	5128.912	*	7.80	.103	5082.689
8.00	.078	5040.160	*	8.20	.058	5000.617
8.40	.041	4963.539	*	8.60	.026	4928.817
8.80	.015	4896.400	*	9.00	.009	4866.289
9.20	.005	4838.259	*	9.40	.003	4811.888
9.60	.002	4786.854	*	9.80	.001	4762.941
10.00	.001	4740.007	*	10.20	.001	4717.950
10.40	.001	4696.697	*	10.60	.001	4676.178
10.80	.001	4656.332	*	11.00	.001	4637.107
11.20	.001	4618.454	*	11.40	.001	4600.332
11.60	.001	4582.708	*	11.80	.001	4565.550
12.00	.001	4548.830	*	12.20	.001	4532.554
12.40	.001	4516.869	*	12.60	.001	4501.952
12.80	.001	4487.781	*	13.00	.001	4474.188
13.20	.001	4461.041	*	13.40	.001	4448.267
13.60	.001	4435.818	*	13.80	.001	4423.675
14.00	.001	4411.880	*	14.20	.001	4400.543
14.40	.001	4389.648	*	14.60	.001	4379.082
14.80	.001	4368.791	*	15.00	.001	4358.743
15.20	.001	4348.914	*	15.40	.001	4339.288
15.60	.001	4329.869	*	15.80	.001	4320.713
16.00	.001	4311.852	*	16.20	.001	4303.250
16.40	.001	4294.942	*	16.60	.001	4286.976
16.80	.001	4279.299	*	17.00	.001	4271.834
17.20	.001	4264.542	*	17.40	.001	4257.399
17.60	.001	4250.390	*	17.80	.001	4243.505
18.00	.001	4236.737	*	18.20	.001	4230.079
18.40	.001	4223.528	*	18.60	.001	4217.080
18.80	.001	4210.727	*	19.00	.001	4204.464
19.20	.001	4198.290	*	19.40	.001	4192.199

19.60	.001	4186.188	*	19.80	.001	4180.254
20.00	.001	4174.404	*	20.20	.001	4168.681
20.40	.001	4163.146	*	20.60	.001	4157.787
20.80	.001	4152.547	*	21.00	.001	4147.403
21.20	.001	4142.340	*	21.40	.001	4137.351
21.60	.001	4132.429	*	21.80	.001	4127.571
22.00	.001	4122.775	*	22.20	.001	4118.038
22.40	.001	4113.358	*	22.60	.001	4108.734
22.80	.001	4104.163	*	23.00	.001	4099.643
23.20	.001	4095.172	*	23.40	.001	4090.749
23.60	.001	4086.372	*	23.80	.001	4082.043
24.00	.001	4077.791	*	24.20	.001	4073.671
24.40	.001	4069.683	*	24.60	.001	4065.779
24.80	.001	4061.942	*	25.00	.001	4058.159
25.20	.001	4054.425	*	25.40	.001	4050.733
25.60	.001	4047.083	*	25.80	.001	4043.458
26.00	.001	4039.795	*	26.20	.001	4036.053
26.40	.001	4032.263	*	26.60	.001	4028.463
26.80	.001	4024.669	*	27.00	.001	4020.892
27.20	.001	4017.135	*	27.40	.001	4013.401
27.60	.001	4009.689	*	27.80	.001	4006.020
28.00	.001	4002.448	*	28.20	.001	3998.985
28.40	.001	3995.586	*	28.60	.001	3992.237
28.80	.001	3988.926	*	29.00	.001	3985.649
29.20	.001	3982.405	*	29.40	.001	3979.191
29.60	.001	3976.007	*	29.80	.001	3972.851
30.00	.001	3969.724	*	30.20	.001	3966.625
30.40	.001	3963.552	*	30.60	.001	3960.505
30.80	.001	3957.482	*	31.00	.001	3954.484
31.20	.001	3951.509	*	31.40	.001	3948.555
31.60	.001	3945.633	*	31.80	.001	3942.772
32.00	.001	3939.983	*	32.20	.001	3937.241
32.40	.001	3934.536	*	32.60	.001	3931.861
32.80	.001	3929.210	*	33.00	.001	3926.583
33.20	.001	3923.978	*	33.40	.001	3921.393
33.60	.001	3918.830	*	33.80	.001	3916.285
34.00	.001	3913.760	*	34.20	.001	3911.254
34.40	.001	3908.767	*	34.60	.001	3906.297
34.80	.001	3903.844	*	35.00	.001	3901.407
35.20	.001	3898.986	*	35.40	.001	3896.580
35.60	.001	3894.189	*	35.80	.001	3891.813
36.00	.001	3889.452	*	36.20	.001	3887.106
36.40	.001	3884.774	*	36.60	.001	3882.456
36.80	.001	3880.152	*	37.00	.001	3877.862
37.20	.001	3875.585	*	37.40	.001	3873.322
37.60	.001	3871.072	*	37.80	.001	3868.835
38.00	.001	3866.611	*	38.20	.001	3864.399
38.40	.001	3862.200	*	38.60	.001	3860.014
38.80	.001	3857.839	*	39.00	.001	3855.678
39.20	.001	3853.528	*	39.40	.001	3851.391
39.60	.001	3849.266	*	39.80	.001	3847.152
40.00	.001	3845.050	*	40.20	.001	3842.959
40.40	.001	3840.879	*	40.60	.001	3838.810
40.80	.001	3836.753	*	41.00	.001	3834.706
41.20	.001	3832.656	*	41.40	.001	3830.555
41.60	.001	3828.394	*	41.80	.001	3826.210
42.00	.001	3824.015	*	42.20	.001	3821.818

42.40	.001	3819.624	*	42.60	.001	3817.433
42.80	.001	3815.248	*	43.00	.001	3813.069
43.20	.001	3810.896	*	43.40	.001	3808.730
43.60	.001	3806.573	*	43.80	.001	3804.423
44.00	.001	3802.281	*	44.20	.001	3800.147
44.40	.001	3798.022	*	44.60	.001	3795.907
44.80	.001	3793.802	*	45.00	.001	3791.706
45.20	.001	3789.619	*	45.40	.001	3787.543
45.60	.001	3785.476	*	45.80	.001	3783.419
46.00	.001	3781.372	*	46.20	.001	3779.335
46.40	.001	3777.307	*	46.60	.001	3775.288
46.80	.001	3773.278	*	47.00	.001	3771.278
47.20	.001	3769.287	*	47.40	.001	3767.305
47.60	.001	3765.332	*	47.80	.001	3763.368
48.00	.001	3761.413	*	48.20	.001	3759.467
48.40	.001	3757.529	*	48.60	.001	3755.599
48.80	.001	3753.679	*	49.00	.001	3751.766
49.20	.001	3749.862	*	49.40	.001	3747.968
49.60	.001	3746.080	*	49.80	.001	3744.200

*** run completed ****

```
Pasture Pond 25 year 6 hour Permit Term Phase 1 June 2006                    X
      2       0
   1.62    6.00     .10     .00
      5       2
      2       2       2       2       1
   2.75    1.50    1.40
      1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
  .0080   .0060   .0040   .0020   .0001
  94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
  13.80   12.30   11.00   10.00     .00
      1       1
   .100    .100    .400
   .000    .000    .000
      1       1
   .150    .150    .400
   .000    .000    .000
      1       1
   .100    .100    .400
   .000    .000    .000
      1       1       1
   .050    .050    .350
   .000    .000    .000
      1
   .050    .050    .350
      4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
  .2000200.0000 10.0000   .2500  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
  .2000500.0000  2.5000   .2500  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
  .2000400.0000  2.8000   .2500  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
  .2000200.0000  1.0000   .2500  1.0000
      3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
  .2000 80.0000  2.0000   .2500  1.0000
   7.400  75.000    .200    .100    .100    .350   1.000   1.000    .000
  .2000250.0000  5.0000   .6000  1.0000
   4.100  75.000    .110    .000    .000    .300   1.000   1.000    .000
  .2000150.0000  5.0000   .6000  1.0000
      1       1       1       1       1
  10.300  80.000    .100    .000    .100    .350   1.000   1.000    .000
  .2000100.0000  5.0000   .7000  1.0000
      1       1       1       1       1
   7.900  84.000    .040    .000    .000    .000   1.000   1.000    .000
  .2000 50.0000 20.0000   .8500  1.0000
      1       1       1       1       1
   1.900  84.000    .120    .000    .000    .000   1.000   1.000    .000
  .2000 30.0000  2.0000   .8500  1.0000
      4       1       1       1       1
   3.400  84.000    .020    .300    .300    .350   1.000   1.000    .000
  .2000 20.0000  5.0000   .8500  1.0000
   3.900  84.000    .140    .200    .200    .350   1.000   1.000    .000
  .2000 40.0000 10.0000   .8500  1.0000
   1.200  84.000    .040    .200    .200    .350   1.000   1.000    .000
  .2000 30.0000 10.0000   .8500  1.0000
   2.000  84.000    .150    .000    .000    .000   1.000   1.000    .000
  .2000 20.0000  2.0000   .8500  1.0000
      1       1       1       1       1
   1.700  84.000    .070    .000    .000    .000   1.000   1.000    .000
  .2000 20.0000  2.0000   .8500  1.0000
      2       1       1       1       1
   3.600  84.000    .250    .200    .200    .350   1.000   1.000    .000
  .2000 50.0000  2.0000   .8500  1.0000
   2.400  84.000    .250    .000    .000    .000   1.000   1.000    .000
  .2000 50.0000 10.0000   .8500  1.0000
      1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .7500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

10 Year 6 Hour Storm Hydrologic Model
Phase 2

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************

     watershed identification code
     -----------------------------
     Pasture Pond 10 year 6 hour Permit Term Phase 2 June 2006

*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      1.31   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	69.00	.200	.150	.150	.35	1.0
3	8.60	69.00	.200	.100	.100	.35	1.0
4	5.50	69.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.12	.01	.33	.078	.922	.999
2	.25	.03	.14	.075	.900	1.000
3	.15	.03	.09	.075	.900	1.000
4	.10	.03	.02	.078	.922	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1032	acre-ft
peak discharge	=	.4713	cfs
area	=	55.8000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	8767.06	mg/l
peak settleable concentration	=	5.14	ml/l
peak settleable concentration	=	7200.95	mg/l
total sediment yield	=	.5779	tons
representative particle size	=	.0766	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.40	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.40	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.57	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.56	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	69.00	.190	.200	.250	.30	1.0
2	7.40	69.00	.200	.100	.100	.35	1.0
3	4.10	69.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.250	1.0	.0
3	1	.20	150.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.06 *	.03	.01	.076	.907	.999
2	.13	.03	.15	.075	.900	1.000
3	.09 *	.03	.07	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0420	acre-ft
peak discharge	=	.2243 *	cfs
area	=	14.6000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	4976.88	mg/l
peak settleable concentration	=	2.93	ml/l
peak settleable concentration	=	4100.72	mg/l
total sediment yield	=	.2271	tons
representative particle size	=	.0784	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	3.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.36	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.36	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.27	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.33	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	69.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.21	.03	.15	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0296	acre-ft
peak discharge	=	.1986	cfs
area	=	10.3000	acres
time of peak discharge	=	3.60	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	5092.76	mg/l
peak settleable concentration	=	3.04	ml/l
peak settleable concentration	=	4259.91	mg/l
total sediment yield	=	.1491	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.60	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.39	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.39	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.35	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.27	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	.67 *	cfs
time of routed peak discharge	=	3.80	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.1748	ac-ft
peak runoff discharge	=	.80 *	cfs
time to peak discharge	=	3.80	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1500	hrs
total sediment yield	=	.9537	tons
peak sediment concentration	=	8470.97	mg/l
peak settleable concentration	=	4.9873	ml/l
peak settleable concentration	=	6982.29	mg/l
time to peak concentration	=	6.80	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.39	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.39	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.60	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.57	ml/l

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* * * * * * * * * * * * *
    null structure
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   junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	69.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.16	.03	.59	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0227	acre-ft
peak discharge	=	.1646	cfs
area	=	7.9000	acres
time of peak discharge	=	3.50	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	26467.17	mg/l
peak settleable concentration	=	15.81	ml/l
peak settleable concentration	=	22138.87	mg/l
total sediment yield	=	.5936	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	12.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	12.01	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.04	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.40	ml/l

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* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	69.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.04	.03	.01	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0055	acre-ft
peak discharge	=	.0396	cfs
area	=	1.9000	acres
time of peak discharge	=	3.50	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	1098.88	mg/l
peak settleable concentration	=	.66	ml/l
peak settleable concentration	=	919.17	mg/l
total sediment yield	=	.0059	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	.50	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.50	ml/l

arithmetic average settleable concentration during period of significant concentration	=	.50	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.06	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	.91	cfs
time of routed peak discharge	=	4.00	hrs
total drainage area	=	90.50	acres
total runoff volume	=	.2030	ac-ft
peak runoff discharge	=	.94	cfs
time to peak discharge	=	4.00	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1000	hrs
total sediment yield	=	1.5528	tons
peak sediment concentration	=	11973.85	mg/l
peak settleable concentration	=	7.0894	ml/l
peak settleable concentration	=	9925.12	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.39	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.39	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.47	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.77	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	69.00	.020	.300	.300	.35	.0
2	3.90	69.00	.140	.200	.200	.35	1.0
3	1.20	69.00	.040	.200	.200	.35	.0
4	2.00	69.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.250	1.0	.0
2	1	.20	40.0	10.00	.250	1.0	.0
3	1	.20	30.0	10.00	.250	1.0	.0
4	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.07	.03	.02	.088	1.000	.999
2	.07	.03	.08	.078	.922	.999
3	.03	.03	.02	.088	1.000	.999
4	.04	.03	.01	.078	.922	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0302	acre-ft
peak discharge	=	.1760	cfs
area	=	10.5000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	3709.76	mg/l
peak settleable concentration	=	2.19	ml/l
peak settleable concentration	=	3068.39	mg/l
total sediment yield	=	.1201	tons
representative particle size	=	.0806	mm
time of peak concentration	=	3.80	hrs
period of significant concentration	=	3.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	1.82	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	1.82	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.80	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.25	ml/l

```
* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	69.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.04	.03	.00	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0049	acre-ft
peak discharge	=	.0354	cfs
area	=	1.7000	acres
time of peak discharge	=	3.50	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	960.17	mg/l
peak settleable concentration	=	.57	ml/l
peak settleable concentration	=	803.15	mg/l
total sediment yield	=	.0046	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	2.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	.43	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.43	ml/l

arithmetic average settleable concentration during period of significant concentration	=	.44	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.05	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	1.08	cfs
time of routed peak discharge	=	4.00	hrs
total drainage area	=	102.70	acres
total runoff volume	=	.2381	ac-ft
peak runoff discharge	=	1.11	cfs
time to peak discharge	=	4.00	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.0500	hrs
total sediment yield	=	1.6772	tons
peak sediment concentration	=	10190.51	mg/l
peak settleable concentration	=	6.0326	ml/l
peak settleable concentration	=	8445.57	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.13	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.13	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.24	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.72	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

****

beta is negative which inherently indicates that the stream system transport capacity exceeds the sediment load, as evaluated by williams' technique. SEDIMOT II does not consider erodible channels so beta is set equal to .01. if the user wishes to evaluate the transport capacity of the stream directly he/she should use subroutine sloss.

****

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	69.00	.250	.200	.200	.35	1.0
2	2.40	69.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.250	1.0	.0
2	1	.20	50.0	10.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.06	.03	.01	.072	.881	.999
2	.04	.03	.05	.072	.881	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0173	acre-ft
peak discharge	=	.0925	cfs
area	=	6.0000	acres
time of peak discharge	=	3.80	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	3593.61	mg/l
peak settleable concentration	=	2.09	ml/l
peak settleable concentration	=	2929.40	mg/l
total sediment yield	=	.0602	tons
representative particle size	=	.0724	mm
time of peak concentration	=	3.20	hrs
period of significant concentration	=	3.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	1.49	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	1.49	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.41	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.20	ml/l

```
* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.48	.54	.66	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0248	acre-ft
peak discharge	=	.4822	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	5.9078	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	30544.99	mg/l
peak settleable concentration	=	18.25	ml/l
peak settleable concentration	=	25549.82	mg/l
total sediment yield	=	.6573	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.72	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.72	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.14	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.95	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	1.19	cfs
time of routed peak discharge	=	3.90	hrs
total drainage area	=	109.25	acres
total runoff volume	=	.2802	ac-ft
peak runoff discharge	=	1.25	cfs
time to peak discharge	=	3.90	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.0500	hrs
total sediment yield	=	2.2542	tons
peak sediment concentration	=	28743.14	mg/l
peak settleable concentration	=	16.8419	ml/l
peak settleable concentration	=	23578.66	mg/l
time to peak concentration	=	2.90	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.56	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.56	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.11	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.98	ml/l

* *

pond results

* *

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	.280	acre-ft
outflow routed volume	=	.001	acre-ft
storm volume discharged (plug flow)	=	.001	acre-ft
pond volume at peak stage	=	.611	acre-ft
peak stage	=	2.193	ft
peak inflow rate	=	1.247	cfs
peak discharge rate	=	.000	cfs
peak inflow sediment concentration	=	28743.14	mg/l
peak effluent sediment concentration	=	213.99	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.00	mg/l
storm average effluent concentration	=	155.76	mg/l
average effluent sediment concentration	=	155.76	mg/l
basin trap efficiency	=	99.99	percent
detention time of flow with sediment	=	20.39	hrs
detention time from hydrograph centers	=	20.39	hrs
detention time including stored flow	=	20.39	hrs
sediment load discharged	=	.00	tons
period of significant concentration	=	42.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	1.424	*	3.00	.000	10.001
3.20	.000	18.816	*	3.40	.000	34.734
3.60	.000	63.177	*	3.80	.000	95.023
4.00	.000	123.274	*	4.20	.000	145.021
4.40	.000	161.452	*	4.60	.000	175.009
4.80	.000	185.570	*	5.00	.000	194.338
5.20	.000	201.206	*	5.40	.000	206.074
5.60	.000	209.945	*	5.80	.000	213.229
6.00	.000	213.989	*	6.20	.000	213.241
6.40	.000	212.745	*	6.60	.000	210.038
6.80	.000	205.700	*	7.00	.000	201.625
7.20	.000	198.386	*	7.40	.000	195.688
7.60	.000	193.363	*	7.80	.000	191.315
8.00	.000	189.486	*	8.20	.000	187.834
8.40	.000	186.318	*	8.60	.000	184.922
8.80	.000	183.658	*	9.00	.000	182.494
9.20	.000	181.414	*	9.40	.000	180.410
9.60	.000	179.473	*	9.80	.000	178.598
10.00	.000	177.775	*	10.20	.000	176.997
10.40	.000	176.254	*	10.60	.000	175.542
10.80	.000	174.861	*	11.00	.000	174.209
11.20	.000	173.585	*	11.40	.000	172.983
11.60	.000	172.402	*	11.80	.000	171.840
12.00	.000	171.298	*	12.20	.000	170.775
12.40	.000	170.270	*	12.60	.000	169.781
12.80	.000	169.307	*	13.00	.000	168.846
13.20	.000	168.399	*	13.40	.000	167.964
13.60	.000	167.540	*	13.80	.000	167.128
14.00	.000	166.726	*	14.20	.000	166.335
14.40	.000	165.953	*	14.60	.000	165.581
14.80	.000	165.218	*	15.00	.000	164.863
15.20	.000	164.513	*	15.40	.000	164.168
15.60	.000	163.825	*	15.80	.000	163.488
16.00	.000	163.154	*	16.20	.000	162.825
16.40	.000	162.498	*	16.60	.000	162.176
16.80	.000	161.856	*	17.00	.000	161.540
17.20	.000	161.227	*	17.40	.000	160.916
17.60	.000	160.609	*	17.80	.000	160.305
18.00	.000	160.004	*	18.20	.000	159.706
18.40	.000	159.411	*	18.60	.000	159.119
18.80	.000	158.830	*	19.00	.000	158.544
19.20	.000	158.262	*	19.40	.000	157.983
19.60	.000	157.708	*	19.80	.000	157.437

20.00	.000	157.168	*	20.20	.000	156.901
20.40	.000	156.634	*	20.60	.000	156.369
20.80	.000	156.105	*	21.00	.000	155.843
21.20	.000	155.583	*	21.40	.000	155.324
21.60	.000	155.067	*	21.80	.000	154.811
22.00	.000	154.557	*	22.20	.000	154.305
22.40	.000	154.054	*	22.60	.000	153.805
22.80	.000	153.557	*	23.00	.000	153.311
23.20	.000	153.067	*	23.40	.000	152.824
23.60	.000	152.583	*	23.80	.000	152.345
24.00	.000	152.108	*	24.20	.000	151.873
24.40	.000	151.641	*	24.60	.000	151.410
24.80	.000	151.182	*	25.00	.000	150.956
25.20	.000	150.730	*	25.40	.000	150.506
25.60	.000	150.282	*	25.80	.000	150.059
26.00	.000	149.838	*	26.20	.000	149.618
26.40	.000	149.399	*	26.60	.000	149.181
26.80	.000	148.964	*	27.00	.000	148.748
27.20	.000	148.534	*	27.40	.000	148.321
27.60	.000	148.109	*	27.80	.000	147.898
28.00	.000	147.689	*	28.20	.000	147.480
28.40	.000	147.273	*	28.60	.000	147.068
28.80	.000	146.863	*	29.00	.000	146.660
29.20	.000	146.459	*	29.40	.000	146.259
29.60	.000	146.061	*	29.80	.000	145.864
30.00	.000	145.668	*	30.20	.000	145.473
30.40	.000	145.278	*	30.60	.000	145.083
30.80	.000	144.890	*	31.00	.000	144.697
31.20	.000	144.505	*	31.40	.000	144.313
31.60	.000	144.123	*	31.80	.000	143.933
32.00	.000	143.744	*	32.20	.000	143.556
32.40	.000	143.368	*	32.60	.000	143.181
32.80	.000	142.996	*	33.00	.000	142.811
33.20	.000	142.627	*	33.40	.000	142.443
33.60	.000	142.261	*	33.80	.000	142.080
34.00	.000	141.900	*	34.20	.000	141.721
34.40	.000	141.543	*	34.60	.000	141.366
34.80	.000	141.190	*	35.00	.000	141.015
35.20	.000	140.840	*	35.40	.000	140.666
35.60	.000	140.491	*	35.80	.000	140.318
36.00	.000	140.144	*	36.20	.000	139.972
36.40	.000	139.800	*	36.60	.000	139.628
36.80	.000	139.457	*	37.00	.000	139.287
37.20	.000	139.117	*	37.40	.000	138.947
37.60	.000	138.779	*	37.80	.000	138.611
38.00	.000	138.443	*	38.20	.000	138.276
38.40	.000	138.110	*	38.60	.000	137.945
38.80	.000	137.780	*	39.00	.000	137.617
39.20	.000	137.454	*	39.40	.000	137.292
39.60	.000	137.131	*	39.80	.000	136.970
40.00	.000	136.810	*	40.20	.000	136.650
40.40	.000	136.491	*	40.60	.000	136.331
40.80	.000	136.172	*	41.00	.000	136.014
41.20	.000	135.856	*	41.40	.000	135.698
41.60	.000	135.540	*	41.80	.000	135.384
42.00	.000	135.227	*	42.20	.000	135.071
42.40	.000	134.915	*	42.60	.000	134.760

42.80	.000	134.606	*	43.00	.000	134.452
43.20	.000	134.298	*	43.40	.000	134.145
43.60	.000	133.993	*	43.80	.000	133.841
44.00	.000	133.690	*	44.20	.000	133.539
44.40	.000	133.389	*	44.60	.000	133.240
44.80	.000	133.092	*	45.00	.000	132.945
45.20	.000	132.798	*	45.40	.000	132.652

*** run completed ****

```
Pasture Pond 10 year 6 hour Permit Term Phase 2 June 2006                    X
       2       0
    1.31    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .2500  1.0000
  14.000  69.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .2500  1.0000
   8.600  69.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .2500  1.0000
   5.500  69.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .2500  1.0000
       3       1       1       1       1
   3.100  69.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .2500  1.0000
   7.400  69.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .2500  1.0000
   4.100  69.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .2500  1.0000
       1       1       1       1       1
  10.300  69.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .2500  1.0000
       1       1       1       1       1
   7.900  69.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .2500  1.0000
       1       1       1       1       1
   1.900  69.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .2500  1.0000
       4       1       1       1       1
   3.400  69.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .2500  1.0000
   3.900  69.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .2500  1.0000
   1.200  69.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .2500  1.0000
   2.000  69.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .2500  1.0000
       1       1       1       1       1
   1.700  69.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .2500  1.0000
       2       1       1       1       1
   3.600  69.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .2500  1.0000
   2.400  69.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .2500  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .2500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

100 Year 6 Hour Storm Hydrologic Model
Phase 2

1

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*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************
    watershed identification code
    -----------------------------
    Pasture Pond 100 year 6 hour Permit Term Phase 2 June 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      2.05   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *

*************************************************************************

        beta is negative which inherently indicates that the
        stream system transport capacity exceeds the sediment
        load, as evaluated by williams' technique. SEDIMOT II
        does not consider erodible channels so beta is set
        equal to .01. if the user wishes to evaluate the trans-
        port capacity of the stream directly he/she should use
        subroutine sloss.

*************************************************************************
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	69.00	.200	.150	.150	.35	1.0
3	8.60	69.00	.200	.100	.100	.35	1.0
4	5.50	69.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.250	1.0	.0
2	1	.20	500.0	2.50	.250	1.0	.0
3	1	.20	400.0	2.80	.250	1.0	.0
4	1	.20	200.0	1.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.77	.15	6.97	.022	.437	1.000
2	3.76	.23	1.89	.056	.739	1.000
3	2.31	.23	1.13	.056	.739	1.000
4	1.60	.23	.28	.059	.773	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.8939	acre-ft
peak discharge	=	6.9469	cfs
area	=	55.8000	acres
time of peak discharge	=	3.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	9593.07	mg/l
peak settleable concentration	=	4.71	ml/l
peak settleable concentration	=	6599.94	mg/l
total sediment yield	=	10.2734	tons
representative particle size	=	.0278	mm
time of peak concentration	=	3.90	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	4.12	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	4.12	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.47	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.78	ml/l

```
* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	69.00	.190	.200	.250	.30	1.0
2	7.40	69.00	.200	.100	.100	.35	1.0
3	4.10	69.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.250	1.0	.0
2	1	.20	250.0	5.00	.250	1.0	.0
3	1	.20	150.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.85	.23	.17	.057	.749	.636
2	1.99	.23	1.99	.056	.739	.799
3	1.73	.23	1.03	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2858	acre-ft
peak discharge	=	2.6021	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	9.4943	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	13632.32	mg/l
peak settleable concentration	=	7.47	ml/l
peak settleable concentration	=	10457.75	mg/l
total sediment yield	=	2.7272	tons
representative particle size	=	.0510	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.85	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.85	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.06	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.47	ml/l

```
* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	69.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	4.33	.23	2.35	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2016	acre-ft
peak discharge	=	3.6684	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	3.0717	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	15535.21	mg/l
peak settleable concentration	=	9.28	ml/l
peak settleable concentration	=	12994.66	mg/l
total sediment yield	=	2.3492	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	5.31	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	5.31	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.07	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.51	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	9.17	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	1.3813	ac-ft
peak runoff discharge	=	10.29	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.1500	hrs
total sediment yield	=	14.3400	tons
peak sediment concentration	=	12496.97	mg/l
peak settleable concentration	=	6.3015	ml/l
peak settleable concentration	=	8822.13	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.88	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.88	ml/l
arithmetic average settleable concentration during period of significant concentration	=	3.37	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.77	ml/l

```
* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	69.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	3.32	.23	9.35	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1546	acre-ft
peak discharge	=	3.3248	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	81332.63	mg/l
peak settleable concentration	=	48.59	ml/l
peak settleable concentration	=	68031.91	mg/l
total sediment yield	=	9.3497	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	26.76	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	26.76	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	19.97	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.50	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	69.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.80	.23	.09	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0372	acre-ft
peak discharge	=	.7996	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	.1687	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	3443.34	mg/l
peak settleable concentration	=	2.06	ml/l
peak settleable concentration	=	2880.24	mg/l
total sediment yield	=	.0925	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	1.12	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	1.12	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.83	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.10	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	11.02	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.5731	ac-ft
peak runoff discharge	=	11.24	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1000	hrs
total sediment yield	=	23.6963	tons
peak sediment concentration	=	45243.07	mg/l
peak settleable concentration	=	24.4186	ml/l
peak settleable concentration	=	34186.05	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	6.01	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.92	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.13	ml/l

```
* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	69.00	.020	.300	.300	.35	.0
2	3.90	69.00	.140	.200	.200	.35	1.0
3	1.20	69.00	.040	.200	.200	.35	.0
4	2.00	69.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.250	1.0	.0
2	1	.20	40.0	10.00	.250	1.0	.0
3	1	.20	30.0	10.00	.250	1.0	.0
4	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.43	.23	.30	.088	1.000	.881
2	1.13	.23	1.05	.059	.773	.933
3	.51	.23	.30	.088	1.000	.919
4	.58	.23	.07	.059	.773	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2055	acre-ft
peak discharge	=	2.3793	cfs
area	=	10.5000	acres
time of peak discharge	=	3.30	hrs
beta	=	1.4172	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	8866.82	mg/l
peak settleable concentration	=	5.01	ml/l
peak settleable concentration	=	7018.81	mg/l
total sediment yield	=	1.5897	tons
representative particle size	=	.0597	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.27	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.27	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.60	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.39	ml/l

```
* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	69.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.72	.23	.07	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0333	acre-ft
peak discharge	=	.7155	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	3009.02	mg/l
peak settleable concentration	=	1.80	ml/l
peak settleable concentration	=	2516.94	mg/l
total sediment yield	=	.0723	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	.98	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.98	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	.73	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.09	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	12.62	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	102.70	acres
total runoff volume	=	1.8119	ac-ft
peak runoff discharge	=	12.83	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	25.0854	tons
peak sediment concentration	=	37013.64	mg/l
peak settleable concentration	=	19.9767	ml/l
peak settleable concentration	=	27967.36	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	5.54	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	5.54	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.48	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.03	ml/l

```
* * * * * * * * * * * *
     null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	69.00	.250	.200	.200	.35	1.0
2	2.40	69.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.250	1.0	.0
2	1	.20	50.0	10.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.88	.23	.16	.052	.699	.888
2	.58	.23	.62	.052	.699	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1175	acre-ft
peak discharge	=	1.1105	cfs
area	=	6.0000	acres
time of peak discharge	=	3.30	hrs
beta	=	2.6145	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	11043.62	mg/l
peak settleable concentration	=	6.03	ml/l
peak settleable concentration	=	8446.51	mg/l
total sediment yield	=	.7596	tons
representative particle size	=	.0503	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.56	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	2.56	ml/l
arithmetic average settleable concentration during period of significant concentration	=	2.03	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.32	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.250	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.94	1.14	1.46	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0525	acre-ft
peak discharge	=	.9439	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	30462.68	mg/l
peak settleable concentration	=	18.20	ml/l
peak settleable concentration	=	25480.97	mg/l
total sediment yield	=	1.4554	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	12.25	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	12.25	ml/l
arithmetic average settleable concentration during period of			

significant concentration	=	6.61	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.02	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	13.68	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	109.25	acres
total runoff volume	=	1.9819	ac-ft
peak runoff discharge	=	13.87	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	27.0240	tons
peak sediment concentration	=	33901.00	mg/l
peak settleable concentration	=	18.3492	ml/l
peak settleable concentration	=	25688.81	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	6.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	5.47	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	5.47	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.65	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.20	ml/l

* *

pond results

* *

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

2006 Permit Term Reclamation – Phase 2 Pasture Pond 100 yr 6 hr storm

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	1.982	acre-ft
outflow routed volume	=	.004	acre-ft
storm volume discharged (plug flow)	=	.004	acre-ft
pond volume at peak stage	=	2.303	acre-ft
peak stage	=	6.029	ft
peak inflow rate	=	13.875	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	33901.00	mg/l
peak effluent sediment concentration	=	3672.24	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.01	mg/l
storm average effluent concentration	=	1230.48	mg/l
average effluent sediment concentration	=	1230.48	mg/l
basin trap efficiency	=	99.98	percent
detention time of flow with sediment	=	22.36	hrs
detention time from hydrograph centers	=	22.36	hrs
detention time including stored flow	=	22.36	hrs
sediment load discharged	=	.01	tons
period of significant concentration	=	47.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.001
2.40	.000	.011	*	2.60	.000	1.390
2.80	.000	33.155	*	3.00	.000	654.193
3.20	.000	2780.758	*	3.40	.000	3672.240
3.60	.001	3596.798	*	3.80	.001	3212.343
4.00	.001	2887.779	*	4.20	.001	2642.593
4.40	.001	2456.082	*	4.60	.001	2312.779
4.80	.001	2193.708	*	5.00	.001	2094.255
5.20	.001	2007.701	*	5.40	.001	1930.875
5.60	.001	1864.047	*	5.80	.001	1805.464
6.00	.001	1748.253	*	6.20	.001	1697.888
6.40	.001	1655.812	*	6.60	.001	1613.425
6.80	.001	1573.603	*	7.00	.001	1540.479
7.20	.001	1513.674	*	7.40	.001	1490.983
7.60	.001	1471.231	*	7.80	.001	1453.727
8.00	.001	1438.003	*	8.20	.001	1423.723
8.40	.001	1410.576	*	8.60	.001	1398.493
8.80	.001	1387.438	*	9.00	.001	1377.211
9.20	.001	1367.701	*	9.40	.001	1358.814
9.60	.001	1350.465	*	9.80	.001	1342.584
10.00	.001	1335.113	*	10.20	.001	1328.005
10.40	.001	1321.222	*	10.60	.001	1314.731
10.80	.001	1308.503	*	11.00	.001	1302.513
11.20	.001	1296.739	*	11.40	.001	1291.161
11.60	.001	1285.766	*	11.80	.001	1280.538
12.00	.001	1275.477	*	12.20	.001	1270.596
12.40	.001	1265.911	*	12.60	.001	1261.414
12.80	.001	1257.089	*	13.00	.001	1252.920
13.20	.001	1248.890	*	13.40	.001	1244.987
13.60	.001	1241.202	*	13.80	.001	1237.544
14.00	.001	1234.018	*	14.20	.001	1230.610
14.40	.001	1227.313	*	14.60	.001	1224.120
14.80	.001	1221.017	*	15.00	.001	1218.000
15.20	.001	1215.062	*	15.40	.001	1212.206
15.60	.001	1209.435	*	15.80	.001	1206.744
16.00	.001	1204.140	*	16.20	.001	1201.627
16.40	.001	1199.197	*	16.60	.001	1196.842
16.80	.001	1194.556	*	17.00	.001	1192.331
17.20	.001	1190.161	*	17.40	.001	1188.042
17.60	.001	1185.969	*	17.80	.001	1183.939
18.00	.001	1181.950	*	18.20	.001	1179.999
18.40	.001	1178.085	*	18.60	.001	1176.204
18.80	.001	1174.355	*	19.00	.001	1172.536
19.20	.001	1170.746	*	19.40	.001	1168.983
19.60	.001	1167.250	*	19.80	.001	1165.555

20.00	.001	1163.900	*	20.20	.001	1162.282
20.40	.001	1160.699	*	20.60	.001	1159.147
20.80	.001	1157.624	*	21.00	.001	1156.127
21.20	.001	1154.654	*	21.40	.001	1153.204
21.60	.001	1151.776	*	21.80	.001	1150.369
22.00	.001	1148.982	*	22.20	.001	1147.614
22.40	.001	1146.265	*	22.60	.001	1144.932
22.80	.001	1143.617	*	23.00	.001	1142.318
23.20	.001	1141.035	*	23.40	.001	1139.775
23.60	.001	1138.543	*	23.80	.001	1137.336
24.00	.001	1136.154	*	24.20	.001	1134.995
24.40	.001	1133.855	*	24.60	.001	1132.733
24.80	.001	1131.628	*	25.00	.001	1130.536
25.20	.001	1129.453	*	25.40	.001	1128.369
25.60	.001	1127.282	*	25.80	.001	1126.194
26.00	.001	1125.106	*	26.20	.001	1124.020
26.40	.001	1122.937	*	26.60	.001	1121.859
26.80	.001	1120.786	*	27.00	.001	1119.723
27.20	.001	1118.673	*	27.40	.001	1117.641
27.60	.001	1116.625	*	27.80	.001	1115.623
28.00	.001	1114.635	*	28.20	.001	1113.660
28.40	.001	1112.695	*	28.60	.001	1111.742
28.80	.001	1110.798	*	29.00	.001	1109.865
29.20	.001	1108.942	*	29.40	.001	1108.029
29.60	.001	1107.125	*	29.80	.001	1106.231
30.00	.001	1105.345	*	30.20	.001	1104.468
30.40	.001	1103.598	*	30.60	.001	1102.737
30.80	.001	1101.887	*	31.00	.001	1101.051
31.20	.001	1100.227	*	31.40	.001	1099.416
31.60	.001	1098.616	*	31.80	.001	1097.826
32.00	.001	1097.045	*	32.20	.001	1096.273
32.40	.001	1095.508	*	32.60	.001	1094.751
32.80	.001	1094.001	*	33.00	.001	1093.258
33.20	.001	1092.521	*	33.40	.001	1091.792
33.60	.001	1091.068	*	33.80	.001	1090.350
34.00	.001	1089.638	*	34.20	.001	1088.931
34.40	.001	1088.229	*	34.60	.001	1087.532
34.80	.001	1086.841	*	35.00	.001	1086.153
35.20	.001	1085.470	*	35.40	.001	1084.792
35.60	.001	1084.118	*	35.80	.001	1083.448
36.00	.001	1082.782	*	36.20	.001	1082.121
36.40	.001	1081.464	*	36.60	.001	1080.811
36.80	.001	1080.161	*	37.00	.001	1079.516
37.20	.001	1078.875	*	37.40	.001	1078.237
37.60	.001	1077.604	*	37.80	.001	1076.974
38.00	.001	1076.348	*	38.20	.001	1075.726
38.40	.001	1075.107	*	38.60	.001	1074.492
38.80	.001	1073.880	*	39.00	.001	1073.272
39.20	.001	1072.667	*	39.40	.001	1072.066
39.60	.001	1071.468	*	39.80	.001	1070.873
40.00	.001	1070.277	*	40.20	.001	1069.675
40.40	.001	1069.067	*	40.60	.001	1068.454
40.80	.001	1067.836	*	41.00	.001	1067.216
41.20	.001	1066.595	*	41.40	.001	1065.973
41.60	.001	1065.350	*	41.80	.001	1064.728
42.00	.001	1064.106	*	42.20	.001	1063.486
42.40	.001	1062.866	*	42.60	.001	1062.247

42.80	.001	1061.630	*	43.00	.001	1061.015
43.20	.001	1060.401	*	43.40	.001	1059.790
43.60	.001	1059.182	*	43.80	.001	1058.575
44.00	.001	1057.972	*	44.20	.001	1057.371
44.40	.001	1056.773	*	44.60	.001	1056.179
44.80	.001	1055.587	*	45.00	.001	1054.998
45.20	.001	1054.411	*	45.40	.001	1053.828
45.60	.001	1053.248	*	45.80	.001	1052.670
46.00	.001	1052.095	*	46.20	.001	1051.523
46.40	.001	1050.953	*	46.60	.001	1050.386
46.80	.001	1049.822	*	47.00	.001	1049.261
47.20	.001	1048.702	*	47.40	.001	1048.146
47.60	.001	1047.592	*	47.80	.001	1047.041
48.00	.001	1046.492	*	48.20	.001	1045.946
48.40	.001	1045.402	*	48.60	.001	1044.861
48.80	.001	1044.322	*	49.00	.001	1043.786
49.20	.001	1043.252	*	49.40	.001	1042.720
49.60	.001	1042.191	*	49.80	.001	1041.664

*** run completed ****

```
Pasture Pond 100 year 6 hour Permit Term Phase 2 June 2006                    X
       2       0
    2.05    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .2500  1.0000
  14.000  69.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .2500  1.0000
   8.600  69.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .2500  1.0000
   5.500  69.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .2500  1.0000
       3       1       1       1       1
   3.100  69.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .2500  1.0000
   7.400  69.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .2500  1.0000
   4.100  69.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .2500  1.0000
       1       1       1       1       1
  10.300  69.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .2500  1.0000
       1       1       1       1       1
   7.900  69.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .2500  1.0000
       1       1       1       1       1
   1.900  69.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .2500  1.0000
       4       1       1       1       1
   3.400  69.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .2500  1.0000
   3.900  69.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .2500  1.0000
   1.200  69.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .2500  1.0000
   2.000  69.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .2500  1.0000
       1       1       1       1       1
   1.700  69.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .2500  1.0000
       2       1       1       1       1
   3.600  69.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .2500  1.0000
   2.400  69.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .2500  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .2500  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

UPDES DISCHARGE 009
Reference Drawings 7-1, 7-1G, 7-9

Hydrologic and Sediment Parameters

10 year 6 hour storm
10 year 24 hour storm
25 year 6 hour storm
100 year 6 hour storm

Diversion and culvert design criteria.

This appendix segment is a replacement for prior hydrologic calculations for the Pasture Pond and the Clear Water Pond and Slurry Ponds 1 and 2. The watersheds which have hitherto drained into these ponds are proposed to be combined together and the storm water is to be processed through an enlarged Pasture Pond. Clear Water and Slurry Ponds are approved for use as the Excess Spoil Disposal Area #2.

PASTURE SEDIMENT POND - Hydrologic Calculations

INTRODUCTION

The Pasture Sediment Pond (UPDES 009) is located north of the West Slurry Cell (see Plate 7-1). The pond is an off channel, temporary sediment control structure, with a total as-built volume of 3.08 acre-feet (top of bank). Surface water runoff and sediment runoff from a 109.25 acre watershed is captured by the pond.

The Pasture Pond has been in service for a number of decades. In 2006, SCA proposed to enlarge this pond and use it to treat runoff from the area formerly served by the Clear Water Pond and Slurry Ponds 1 and 2. These former ponds are now the site of the Excess Spoil Disposal Area #2. The new hydrologic modeling accompanying this appendix section includes the entire combined watershed and the proposed design size of the pond.

The structure is a temporary pond as addressed in R645-301-732.200. The structure does not meet the size or other qualifying criteria of the MSHA of 30 CPR 77.216(a). Therefore, it provides a combination of principal and emergency spillways that will safely discharge a 25 year, 6 hour event.

The pond contains a 2 inch drain pipe. This 2 inch pipe is normally closed but can be opened to discharge the pond after major storm events after appropriate settling times. The pond is modeled in Sedimot-II with the 2 inch drain pipe closed, however, the pond is considered empty above the level of the drain pipe when the storm begins. The maximum sediment level allowed in the pond is therefore set at the elevation of the inlet to the 2-inch drain pipe.

The pond can discharge through an 18 inch culvert when the water level reaches the stage elevation of 6490.6 (6.1 feet deep). The 18 inch pipe spillway is capable of passing the 25 year, 6 hour peak flow. The pond treats the 10 year, 24 hour storm such that effluent is well within the UPDES limits.

Culverts and diversion ditches were designed for these watersheds previously under a very conservative storm (100 yr 6 hr). With the combined watersheds now proposed, many of the ditches and culverts will experience a different flow rate for a given storm since upper sub watersheds will now be routed through these lower ditches. Nonetheless, we have compared the previous design flows with the current modeled flows for the 10 year 6 hour storm, 10 year 24 hour storm and 25 year 6 hour storm. We have used the higher of the previous design flow or the current modeled design flow from these storms.

SUBWATERSHEDS

The Pasture Pond drainage area is divided into eighteen sub watersheds for routing analysis. These are labeled in keeping with former naming convention as follows: CW-SWS1, CW-SWS2, CW-SWS3, CW-SWS4, CW-SWS6, CW-SWS7, CW-SWS8, CW-SWS9, CW-SWS10, CW-SWS11, PAST-SWSl, PAST-SWS2, PAST-SWS3, PAST-SWS4, PAST-SWS5, PAST-SWS6, PAST-SWS7, and PAST-SWS8 (see Plate 7-1).

SOIL TYPE

According to the SCS Soil Survey of Carbon Area, Utah, the soil type found in this drainage area is predominantly SCS # 114, Strych. Three soil samples from the adjacent Reclamation Borrow Area were analyzed by Huntingdon/Chen-Northern in the early 1990s. The particle size distribution from these samples was plotted and averaged as shown in Figure One. Other soil characteristics are as follows:

SCS Soil Name	Strych
Submerged Specific Gravity	1.75
Specific Gravity	2.75
Erosion K value	0.20
Bulk Density	1.4

CURVE NUMBERS

The Pasture Pond curve numbers are based on the Soil Conservation Service graph included as Figure Two. The soil types found on the site correspond to SCS hydrologic Class B as indicated in the SCS Soil Survey for Carbon Area, Utah. The vegetation cover is relatively sparse, consisting of a mixture of Juniper Grass, Mountain Brush, and Desert Brush. Curve numbers were averaged from these vegetation types. When the storage areas are covered with a pile of coarse refuse and refuse fines which have relatively high infiltration rates, these curve numbers will be conservative.

TIME OF CONCENTRATION

Each sub watershed requires a certain time for the water to reach the outlet following the longest path. The runoff from these sub watersheds is approximated by Sedimot-II unit "Disturbed" unit hydrograph for areas with poor vegetative cover. The overland flow velocity was estimated using the Soil Conservation Service Upland Curves (SCS 1972) corresponding to the slope and vegetation of the drainage areas. Time of concentration was calculated by dividing the average velocity into the distance to the sub watershed outlet.

SUB WATERSHED CHARACTERISTICS

Drainage Area	SCS Hydro Class	Vegetation Cover Density	Juniper Grass CN	Mt. Brush CN	Desert Brush CN	**Average Curve Number**	Area acres	Distance to Outlet (ft)	Average Velocity (ft/s)	**Concentration (hrs)**
CW-SWS1	B	50%	58	57	80	**65**	27.7	1800	2.8	**0.18**
CW-SWS2	B	40%	63	66	81	**70**	14	1000	1.4	**0.20**
CW-SWS3	B	40%	63	66	81	**70**	8.6	800	1.1	**0.20**
CW-SWS4	B	40%	63	66	81	**70**	5.5	600	1.2	**0.14**
CW-SWS6	B	40%	63	66	81	**70**	3.1	900	1.3	**0.19**
CW-SWS7	B	40%	63	66	81	**70**	7.4	800	1.1	**0.20**
CW-SWS8	B	40%	63	66	81	**70**	4.1	500	1.3	**0.11**
CW-SWS9	B	40%	63	66	81	**70**	10.3	400	1.1	**0.10**
CW-SWS10	Spoil Fill	0%	-	-	-	**75**	7.9	250	1.9	**0.04**
CW-SWS11	Spoil Fill	0%	-	-	-	**75**	3.4	100	1.3	**0.02**
Past-SWS1	B	30%	69	73	83	**75**	3.9	900	1.79	**0.14**
Past-SWS2	B	15%	76	79	83	**79**	1.2	300	2.08	**0.04**
Past-SWS3	B	15%	76	79	83	**79**	2	950	1.76	**0.15**
Past-SWS4	B	15%	76	79	83	**79**	1.9	800	1.85	**0.12**
Past-SWS5	B	15%	76	79	83	**79**	3.6	700	0.78	**0.25**
Past-SWS6	B	30%	69	73	83	**75**	2.4	900	1	**0.25**
Past-SWS7	B	15%	76	79	83	**79**	1.7	400	1.59	**0.07**
Past-SWS8	B	15%	76	79	83	**79**	0.2	40	1.11	**0.01**

ROUTING COEFFICIENTS

"Sedimot-II" uses Muskingum routing methods. Flows must be routed between structures or from a subwatershed outlet to the corresponding structure (if the outlet is not at the structure). No routing is used through sub watersheds that do not have inflow from a previous watershed, or structure (this water flow is accounted for with the time of concentration and the unit hydrograph). Areas requiring routing coefficients are indicated in the program output data. Muskingum coefficients K and X are used as follows:

K = Travel time through diversion.

$$X = \frac{0.5^* \text{ Velocity}}{1.7 + \text{Velocity}}$$

RIPRAP SIZING

Riprap is placed along steep channel slopes and at select culvert outlets to control erosion. The size of the stones is based on the expected maximum velocity of water flowing. When peak velocities in the smooth channel are expected to reach 5 ft/s, riprap is required. Figure Three is used to determine the median stone diameter (D_{50}). The riprap mixture should approximate the following gradation:

Stone Size	% Finer
$2*D_{50}$	100
D_{50}	50
$0.5*D_{50}$	20
$0.2*D_{50}$	0

In areas where the increased roughness from riprap does not reduce the velocity below 5 ft/s, a filter blanket (or gravel bedding in a layer $3*D_{50}$) will be used.

STORM RUNOFF VOLUMES AND DESIGN FLOWS

Storm Event	Total Runoff (acft)	Pond Stage Elevation	CW D1 cfs	CW D2 cfs	CW D3 cfs	CW D4 cfs	CW D5 cfs	CW D6 cfs	CW D7 cfs	CW D8 cfs	Past D1 cfs	Past D2 cfs	Past D3/C1 cfs	Past D4/C2 cfs	Past D5/C3 cfs	Past D6/C4 cfs	Past D8/C5 cfs	Past D9 outlet cfs
10yr 6 hr	**0.56**	6487.4	0.20	0.62	0.07	0.30	0.90	0.11	1.06	1.37	0.75	0.43	1.24	1.41	0.81	0.88	0.61	0.00
10yr 24 hr	**1.93**	6490.5	0.93	2.54	0.34	1.05	3.44	0.71	3.92	2.64	1.60	0.63	2.60	4.71	1.38	1.61	0.89	0.00
25yr 6 hr	**1.27**	6489.0	0.93	2.53	0.34	1.10	3.24	0.76	3.82	3.03	1.80	0.74	2.65	4.86	1.50	1.67	1.05	0.00
100yr 6 hr	**2.65**	6491.0	2.64	7.90	0.98	2.99	10.31	1.92	11.52	5.75	3.00	1.22	5.40	13.14	2.64	3.11	1.74	3.98
Design flow rate			**2.40**	**7.80**	**2.50**	**4.80**	**10.10**	**5.00**	**14.50**	**3.03**	**2.20**	**1.20**	**2.80**	**4.86**	**2.50**	**3.60**	**1.70**	**3.98**

DIVERSION DESIGN

Temporary diversions and culverts for these miscellaneous flows are required to be designed to pass the 10 year, 6 hour storm (R645-301-742.333). They were previously designed for the 100 year 6 hour storm. Combining of the watersheds as proposed in 2006 does not always allow for that same conservative design. However, the designs are still more conservative than the 10 year 6 hour storm. See the table above for design flow rates.

Permanent diversion designs are described in the permit term reclamation plan and final reclamation plan. Design summaries are given in the tables below. The diversions were designed to fit within a range of expected field values. The minimum design channel depth is conservatively calculated by using a minimum channel slope and a maximum expected Mannings N. Additional freeboard is not required in the regulations, but the

operator may construct the diversions larger than required to reduce the risk of overflow from storms greater than the required design precipitation event.

The Maximum velocity expected in the channel is calculated by using minimum Manning's N values and maximum channel slopes. Manning's N for a channel bed with riprap is estimated by the equation $N=0.0395*(D_{50})^{1/6}$ with D_{50} in feet (Applied Hydrology and Sedimentology for Disturbed Areas page 188). If the normal depth of flow is less than twice D_{50} then N is estimated by the equation $N=0.456*(D_{50}*Slope)0.159$ with D_{50} in inches and slope in feet/feet (*Development of Riprap Design Criteria by Riprap Testing in Flumes: Phase 1* May 1987, Colorado State University, prepared for Uranium Recovery Field Office and Division of Waste Management).

While the slopes and N values are expected to be near the middle of the range provided, these values provide the maximum variance accepted without additional rip rap or lining through the channel. The cross sections may vary but must always be sufficient to provide the maximum required flow area.

DIVERSION DESIGN CRITERIA

Ditch No.	Manning N		Side Slope	Min Bottom Width	Design Flow	Channel Slope (%)		Flow Depth (ft)		Flow Area (ft^2)		Maximum Velocity	Minimum Channel Depth	Comments
	Min	Max	minH/1V	(ft)	(cfs)	Min	Max	Min	Max	Min	Max	(ft/s)	(ft)	No lining required
CW-D1	0.03	0.05	2	0	**2.40**	1.6	5	0.53	0.8	0.60	1.30	4.3	0.80	No lining required
CW-D2	0.03	0.05	2	0	**7.80**	3	4	0.89	1.1	1.58	2.40	4.9	1.10	No lining required
CW-D3	0.03	0.05	2	0	**2.50**	2	6	0.52	0.8	0.54	1.30	4.62	0.80	No lining required
CW-D4	0.03	0.05	2	0	**4.80**	2	5	0.70	1.0	0.98	2.10	4.9	1.00	No lining required
CW-D5	0.03	0.05	2	0	**10.10**	1	2.5	1.04	1.5	2.16	4.70	4.7	1.50	No lining required
CW-D6	0.03	0.05	2	1	**5.00**	1	6	0.56	0.9	1.19	2.50	4.2	0.90	No lining required
CW-D7	0.03	0.05	2	1	**14.50**	1	2.3	0.98	1.5	2.90	6.00	5	1.50	No lining required
CW-D8	0.03	0.05	2	0	**3.03**	2	5	0.62	0.9	0.72	1.80	4.2	0.90	No lining required
Past-D1	0.012	0.03	2	2	**2.20**	0.2	1.5	0.20	0.6	0.48	1.92	4.58	0.60	No lining required
Past-D2	0.025	0.05	2	0	**1.20**	1	4	0.40	0.7	0.32	0.98	3.75	0.70	No lining required
Past-D3	0.025	0.05	2	0	**2.80**	1	4	0.55	0.9	0.61	1.62	4.59	0.90	No lining required
Past-D4	0.025	0.05	2	1	**4.86**	2	5	0.49	0.8	0.97	2.10	4.95	0.80	No lining required
Past-D5	0.025	0.05	2	1	**2.50**	0.5	2.5	0.38	0.8	0.67	2.08	3.73	0.80	No lining required
Past-D6	0.03	0.05	2	1	**3.60**	2	5	0.42	0.7	0.77	1.68	4.68	0.70	No lining required
Past-D8	0.025	0.05	2	0	**1.70**	1	5	0.44	0.8	0.39	1.28	4.36	0.80	No lining required
Past-D9	0.025	0.05	2	1	**3.98**	0.8	5	0.46	1.0	0.82	2.20	4.85	1.00	No lining required

CULVERT DESIGN CRITERIA

Culvert No	Minimum Pipe Diameter (in)	Pipe Length (ft)	Pipe Slope %	Controlling Head Water (Ft)	Design Flow (cfs)	Design Velocity (ft/s)	Inlet / Outlet Conditions
Past-C1	18	40	1	1	**2.8**	2.3	No lining req'd
Past-C2	24	115	3	1.2	**4.9**	2.9	No lining req'd
Past-C3	18	80	0.3	0.9	**2.5**	2	No lining req'd
Past-C4	12	75	3	1.65	**3.6**	4.6	Submerged inlet outlet Riprap D50=6"
Past-C5	18	100	1	0.8	**1.7**	1.9	No lining req'd
CW-C1	12	60	3.7	1.9	**4**	5	No lining req'd
CW-C2	18	20	2.5	1.9	**7.8**	4.4	No lining req'd
CW-C3	4@8"	10	6	0.67	**6.8**	5	No lining req'd
CW-C4	36	60	1.7	1.9	**14.5**	4.2	No lining req'd
CW-C5	18	30	2	0.9	**3.03**	4	No lining req'd
CW-C6	18	20	2	1.1	**3.82**	4	No lining req'd
CW-C7	24	160	3	1.1	**4.86**	2.7	No lining req'd

Culverts were designed for these watersheds previously under a very conservative storm (100 yr 6 hr). With the combined watersheds now proposed, we have checked to make sure that the designs are still more conservative than the required 10 year 6 hour storm. See the table above for the design flow rates used.

(mm)	38	25	13	4.75	2	0.85	0.425	0.25	0.15	0.075	0.05	0.03	0.02	0.01	0.008	0.006	0.004	0.002
BOR1	100	88	85	77	70	68	65	61	54	32	18	13	10	9	8.5	8	6	5
BOR2	100	100	98	93	89	86	82	77	70	53	37	27	21	15	14	12	11	10
BOR3	100	100	100	95	92	90	87	82	75	50	47	39	30	21	19	17	16	15
AVG	**100**	**96.0**	**94.3**	**88.3**	**83.7**	**81.3**	**78.0**	**73.3**	**66.3**	**45.0**	**34.0**	**26.3**	**20.3**	**15.0**	**13.8**	**12.3**	**11.0**	**10.0**

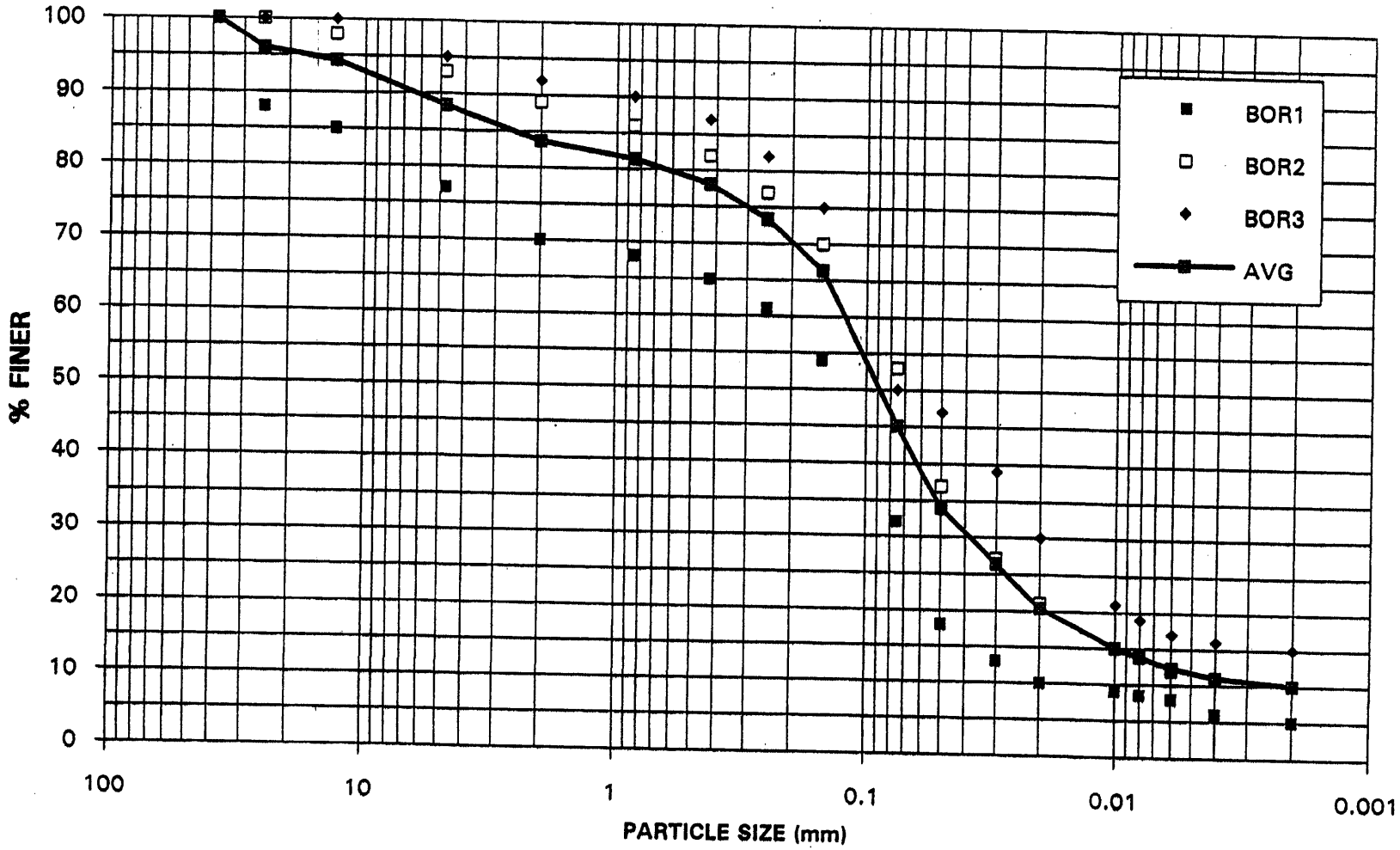


FIGURE ONE. SEDIMENT PARTICLE SIZE DISTRIBUTION

Soil Samples Analyzed at HCN

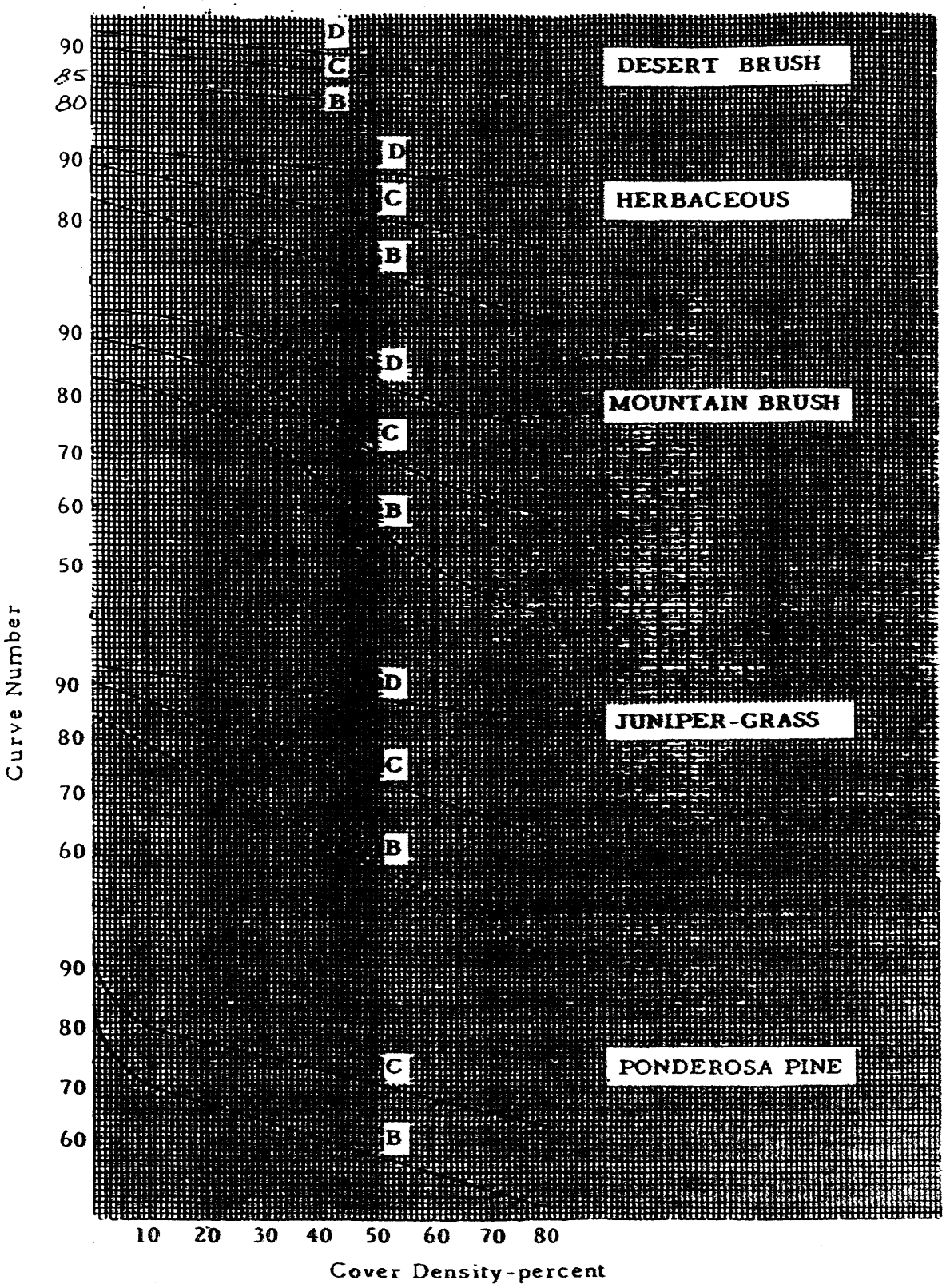
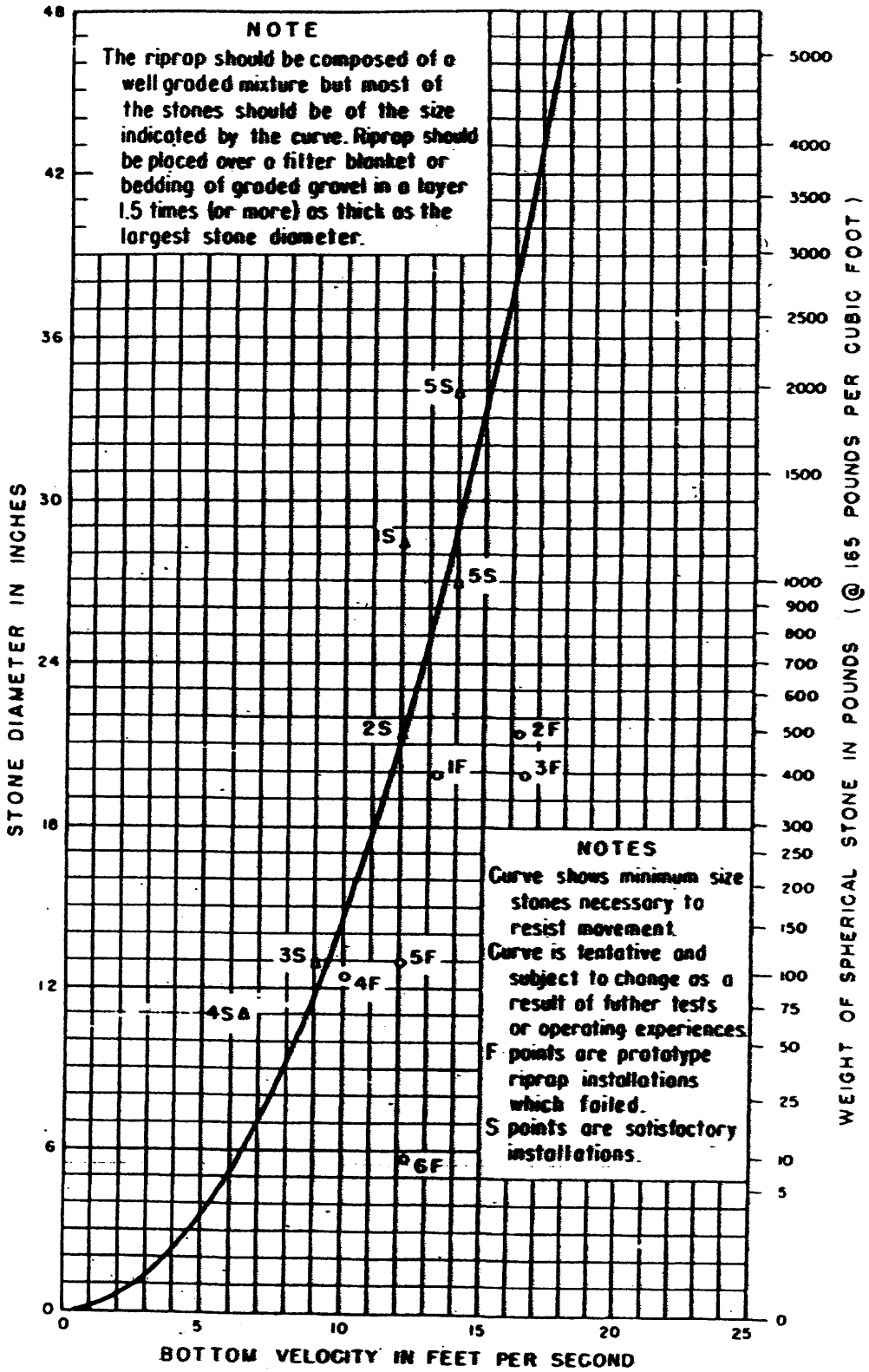


FIGURE 2

HYDROLOGIC SOIL - COVER COMPLEXES
AND ASSOCIATED CURVE NUMBERS



From USBR

FIGURE 3 RIPRAP SIZING

PASTURE SEDIMENT POND

10 Year 6 Hour Storm Hydrologic Model

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************
```

```
*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************
    watershed identification code
    -----------------------------
    Pasture Pond 10 year 24 hour 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000
```

```
*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      1.31   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

****

beta is negative which inherently indicates that the stream system transport capacity exceeds the sediment load, as evaluated by williams' technique. SEDIMOT II does not consider erodible channels so beta is set equal to .01. if the user wishes to evaluate the transport capacity of the stream directly he/she should use subroutine sloss.

****

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.700	1.0	.0
2	1	.20	500.0	2.50	.900	1.0	.0
3	1	.20	400.0	2.80	.900	1.0	.0
4	1	.20	200.0	1.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.12	.01	.93	.078	.922	.999
2	.33	.04	.67	.051	.693	1.000
3	.20	.04	.40	.051	.693	1.000
4	.13	.04	.10	.052	.706	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1237	acre-ft
peak discharge	=	.6182	cfs
area	=	55.8000	acres
time of peak discharge	=	3.70	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	24259.45	mg/l
peak settleable concentration	=	13.73	ml/l
peak settleable concentration	=	19221.15	mg/l
total sediment yield	=	2.0960	tons
representative particle size	=	.0600	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.99	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	6.99	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.37	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.60	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	70.00	.200	.100	.100	.35	1.0
3	4.10	70.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.900	1.0	.0
2	1	.20	250.0	5.00	.900	1.0	.0
3	1	.20	150.0	5.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.07	.04	.06	.052	.697	1.000
2	.17	.04	.71	.051	.693	1.000
3	.11	.04	.30	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0527	acre-ft
peak discharge	=	.2952	cfs
area	=	14.6000	acres
time of peak discharge	=	3.50	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	20340.58	mg/l
peak settleable concentration	=	11.44	ml/l
peak settleable concentration	=	16010.96	mg/l
total sediment yield	=	1.0703	tons
representative particle size	=	.0578	mm

time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.46	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	8.46	ml/l
arithmetic average settleable concentration during period of significant concentration	=	8.07	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.18	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	70.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.27	.04	.62	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0371	acre-ft
peak discharge	=	.2516	cfs
area	=	10.3000	acres
time of peak discharge	=	3.60	hrs
beta	=	.0100	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	16321.70	mg/l
peak settleable concentration	=	9.75	ml/l
peak settleable concentration	=	13652.53	mg/l
total sediment yield	=	.6175	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.60	hrs
period of significant concentration	=	2.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	7.65	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	7.65	ml/l

arithmetic average settleable concentration during period of significant concentration	=	7.49	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.91	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	.90	cfs
time of routed peak discharge	=	3.80	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.2135	ac-ft
peak runoff discharge	=	1.06	cfs
time to peak discharge	=	3.80	hrs
previous structure delivery ratio	=	1.00	
previous structure travel time	=	.1500	hrs
total sediment yield	=	3.7826	tons
peak sediment concentration	=	23234.61	mg/l
peak settleable concentration	=	13.2428	ml/l
peak settleable concentration	=	18539.97	mg/l
time to peak concentration	=	6.80	hrs
period of significant concentration	=	5.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	7.46	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	7.46	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.85	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.67	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	75.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.37	.10	11.55	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0685	acre-ft
peak discharge	=	1.3723	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	219377.70	mg/l
peak settleable concentration	=	131.07	ml/l
peak settleable concentration	=	183501.80	mg/l
total sediment yield	=	11.5546	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	2.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	72.57	ml/l
volume weighted average settleable concentration during peak 24 hour			

period	=	72.57	ml/l
arithmetic average settleable concentration during period of significant concentration	=	59.31	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.17	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	80.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.68	.20	.28	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0314	acre-ft
peak discharge	=	.6826	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	3.5993	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	11812.29	mg/l
peak settleable concentration	=	7.06	ml/l
peak settleable concentration	=	9880.57	mg/l
total sediment yield	=	.2771	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.96	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.96	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.74	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.35	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	1.32	cfs
time of routed peak discharge	=	3.60	hrs
total drainage area	=	90.50	acres
total runoff volume	=	.3134	ac-ft
peak runoff discharge	=	1.41	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.90	
previous structure travel time	=	.1000	hrs
total sediment yield	=	14.1266	tons
peak sediment concentration	=	176264.70	mg/l
peak settleable concentration	=	101.9228	ml/l
peak settleable concentration	=	142691.90	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	19.12	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	19.12	ml/l
arithmetic average settleable concentration during period of significant concentration	=	14.25	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.32	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	75.00	.020	.300	.300	.35	.0
2	3.90	75.00	.140	.200	.200	.35	1.0
3	1.20	80.00	.040	.200	.200	.35	.0
4	2.00	80.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.900	1.0	.0
2	1	.20	40.0	10.00	.900	1.0	.0
3	1	.20	30.0	10.00	.800	1.0	.0
4	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.59	.10	.42	.088	1.000	.834
2	.44	.10	1.41	.055	.729	.909
3	.43	.20	.79	.088	1.000	.886
4	.53	.20	.22	.064	.812	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1162	acre-ft
peak discharge	=	1.2356	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	2.0330	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	24422.79	mg/l
peak settleable concentration	=	13.68	ml/l
peak settleable concentration	=	19148.62	mg/l
total sediment yield	=	2.5541	tons

representative particle size	=	.0566	mm
time of peak concentration	=	3.20	hrs
period of significant concentration	=	3.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.14	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.14	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.59	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.14	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	80.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.61	.20	.22	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0281	acre-ft
peak discharge	=	.6108	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	2.5420	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	10332.47	mg/l
peak settleable concentration	=	6.17	ml/l
peak settleable concentration	=	8642.75	mg/l
total sediment yield	=	.2166	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.47	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.47	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.45	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.31	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	2.40	cfs
time of routed peak discharge	=	3.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	.4576	ac-ft
peak runoff discharge	=	2.53	cfs
time to peak discharge	=	3.10	hrs
previous structure delivery ratio	=	.97	
previous structure travel time	=	.0500	hrs
total sediment yield	=	16.3591	tons
peak sediment concentration	=	104722.00	mg/l
peak settleable concentration	=	59.8455	ml/l
peak settleable concentration	=	83783.66	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	15.15	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	15.15	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.29	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.63	ml/l

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* * * * * * * * * * * * *
     null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	80.00	.250	.200	.200	.35	1.0
2	2.40	75.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.900	1.0	.0
2	1	.20	50.0	10.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.81	.20	.51	.056	.739	.969
2	.22	.10	.73	.046	.654	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0803	acre-ft
peak discharge	=	.8783	cfs
area	=	6.0000	acres
time of peak discharge	=	3.30	hrs
beta	=	.6703	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	16835.13	mg/l
peak settleable concentration	=	9.18	ml/l
peak settleable concentration	=	12846.44	mg/l
total sediment yield	=	1.2206	tons
representative particle size	=	.0496	mm
time of peak concentration	=	3.20	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.00	ml/l

volume weighted average settleable concentration during peak 24 hour period	=	6.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.68	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.74	ml/l

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* * * * * * * * * * * * *
    null structure
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   junction  5, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.48	.54	2.37	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0248	acre-ft
peak discharge	=	.4822	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	15.26	ei unit
peak concentration	=	106873.10	mg/l
peak settleable concentration	=	63.85	ml/l
peak settleable concentration	=	89395.61	mg/l
total sediment yield	=	2.3661	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	41.28	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	41.28	ml/l

arithmetic average settleable concentration during period of significant concentration	=	25.35	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.38	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	3.01	cfs
time of routed peak discharge	=	3.20	hrs
total drainage area	=	109.25	acres
total runoff volume	=	.5627	ac-ft
peak runoff discharge	=	3.11	cfs
time to peak discharge	=	3.20	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	19.7277	tons
peak sediment concentration	=	89183.48	mg/l
peak settleable concentration	=	50.9601	ml/l
peak settleable concentration	=	71344.10	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	14.80	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.80	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.36	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.94	ml/l

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                    pond results

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***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	.563	acre-ft
outflow routed volume	=	.003	acre-ft
storm volume discharged (plug flow)	=	.002	acre-ft
pond volume at peak stage	=	.893	acre-ft
peak stage	=	2.904	ft
peak inflow rate	=	3.111	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	89183.48	mg/l
peak effluent sediment concentration	=	1998.96	mg/l

peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.00	mg/l
storm average effluent concentration	=	1381.19	mg/l
average effluent sediment concentration	=	1381.19	mg/l
basin trap efficiency	=	99.98	percent
detention time of flow with sediment	=	20.59	hrs
detention time from hydrograph centers	=	20.59	hrs
detention time including stored flow	=	20.59	hrs
sediment load discharged	=	.00	tons
period of significant concentration	=	42.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	9.658	*	3.00	.000	249.960
3.20	.000	940.514	*	3.40	.000	1446.388
3.60	.000	1743.125	*	3.80	.000	1896.795
4.00	.000	1966.853	*	4.20	.000	1994.628
4.40	.000	1998.962	*	4.60	.000	1997.115
4.80	.000	1985.105	*	5.00	.001	1970.606
5.20	.001	1952.336	*	5.40	.001	1930.260
5.60	.001	1909.439	*	5.80	.001	1890.312
6.00	.001	1860.615	*	6.20	.001	1829.328
6.40	.001	1802.390	*	6.60	.001	1770.374
6.80	.001	1737.565	*	7.00	.001	1709.729
7.20	.001	1686.923	*	7.40	.001	1667.303
7.60	.001	1650.008	*	7.80	.001	1634.510
8.00	.001	1620.502	*	8.20	.001	1607.729
8.40	.001	1595.941	*	8.60	.001	1585.032
8.80	.001	1574.968	*	9.00	.001	1565.636
9.20	.001	1556.964	*	9.40	.001	1548.862
9.60	.001	1541.253	*	9.80	.001	1534.073
10.00	.001	1527.272	*	10.20	.001	1520.810
10.40	.001	1514.657	*	10.60	.001	1508.794
10.80	.001	1503.234	*	11.00	.001	1497.959
11.20	.001	1492.928	*	11.40	.001	1488.116
11.60	.001	1483.501	*	11.80	.001	1479.060
12.00	.001	1474.777	*	12.20	.001	1470.643
12.40	.001	1466.662	*	12.60	.001	1462.840
12.80	.001	1459.158	*	13.00	.001	1455.596
13.20	.001	1452.127	*	13.40	.001	1448.715
13.60	.001	1445.352	*	13.80	.001	1442.046
14.00	.001	1438.799	*	14.20	.001	1435.632
14.40	.001	1432.551	*	14.60	.001	1429.544
14.80	.001	1426.608	*	15.00	.001	1423.734
15.20	.001	1420.919	*	15.40	.001	1418.160
15.60	.001	1415.457	*	15.80	.001	1412.816
16.00	.001	1410.246	*	16.20	.001	1407.740
16.40	.001	1405.293	*	16.60	.001	1402.902
16.80	.001	1400.562	*	17.00	.001	1398.270
17.20	.001	1396.024	*	17.40	.001	1393.820
17.60	.001	1391.657	*	17.80	.001	1389.533
18.00	.001	1387.446	*	18.20	.001	1385.393
18.40	.001	1383.374	*	18.60	.001	1381.386
18.80	.001	1379.430	*	19.00	.001	1377.502

19.20	.001	1375.601	*	19.40	.001	1373.727
19.60	.001	1371.877	*	19.80	.001	1370.045
20.00	.001	1368.224	*	20.20	.001	1366.397
20.40	.001	1364.562	*	20.60	.001	1362.726
20.80	.001	1360.893	*	21.00	.001	1359.065
21.20	.001	1357.248	*	21.40	.001	1355.440
21.60	.001	1353.645	*	21.80	.001	1351.862
22.00	.001	1350.091	*	22.20	.001	1348.333
22.40	.001	1346.588	*	22.60	.001	1344.857
22.80	.001	1343.139	*	23.00	.001	1341.435
23.20	.001	1339.745	*	23.40	.001	1338.071
23.60	.001	1336.411	*	23.80	.001	1334.768
24.00	.001	1333.141	*	24.20	.001	1331.529
24.40	.001	1329.933	*	24.60	.001	1328.353
24.80	.001	1326.788	*	25.00	.001	1325.239
25.20	.001	1323.704	*	25.40	.001	1322.183
25.60	.001	1320.677	*	25.80	.001	1319.184
26.00	.001	1317.706	*	26.20	.001	1316.241
26.40	.001	1314.788	*	26.60	.001	1313.344
26.80	.001	1311.905	*	27.00	.001	1310.458
27.20	.001	1309.001	*	27.40	.001	1307.541
27.60	.001	1306.078	*	27.80	.001	1304.616
28.00	.001	1303.158	*	28.20	.001	1301.705
28.40	.001	1300.257	*	28.60	.001	1298.815
28.80	.001	1297.380	*	29.00	.001	1295.951
29.20	.001	1294.529	*	29.40	.001	1293.115
29.60	.001	1291.708	*	29.80	.001	1290.309
30.00	.001	1288.918	*	30.20	.001	1287.536
30.40	.001	1286.163	*	30.60	.001	1284.800
30.80	.001	1283.447	*	31.00	.001	1282.103
31.20	.001	1280.769	*	31.40	.001	1279.445
31.60	.001	1278.131	*	31.80	.001	1276.827
32.00	.001	1275.531	*	32.20	.001	1274.245
32.40	.001	1272.968	*	32.60	.001	1271.700
32.80	.001	1270.441	*	33.00	.001	1269.191
33.20	.001	1267.949	*	33.40	.001	1266.713
33.60	.001	1265.478	*	33.80	.001	1264.236
34.00	.001	1262.986	*	34.20	.001	1261.730
34.40	.001	1260.472	*	34.60	.001	1259.213
34.80	.001	1257.956	*	35.00	.001	1256.701
35.20	.001	1255.449	*	35.40	.001	1254.201
35.60	.001	1252.956	*	35.80	.001	1251.715
36.00	.001	1250.479	*	36.20	.001	1249.248
36.40	.001	1248.021	*	36.60	.001	1246.799
36.80	.001	1245.583	*	37.00	.001	1244.373
37.20	.001	1243.169	*	37.40	.001	1241.971
37.60	.001	1240.781	*	37.80	.001	1239.598
38.00	.001	1238.421	*	38.20	.001	1237.251
38.40	.001	1236.088	*	38.60	.001	1234.932
38.80	.001	1233.783	*	39.00	.001	1232.640
39.20	.001	1231.504	*	39.40	.001	1230.374
39.60	.001	1229.251	*	39.80	.001	1228.134
40.00	.001	1227.022	*	40.20	.001	1225.916
40.40	.001	1224.812	*	40.60	.001	1223.704
40.80	.001	1222.591	*	41.00	.001	1221.477

41.20	.001	1220.361	*	41.40	.001	1219.246
41.60	.001	1218.132	*	41.80	.001	1217.021
42.00	.001	1215.913	*	42.20	.001	1214.808
42.40	.001	1213.705	*	42.60	.001	1212.607
42.80	.001	1211.511	*	43.00	.001	1210.420
43.20	.001	1209.332	*	43.40	.001	1208.249
43.60	.001	1207.169	*	43.80	.001	1206.094
44.00	.001	1205.024	*	44.20	.001	1203.959
44.40	.001	1202.899	*	44.60	.001	1201.844
44.80	.001	1200.794	*	45.00	.001	1199.750
45.20	.001	1198.710	*	45.40	.001	1197.676

*** run completed ****

```
Pasture Pond 10 year 24 hour 2006                                                                                    X
       2       0
    1.31    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .7000  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .9000  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .9000  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .9000  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .9000  1.0000
   7.400  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .9000  1.0000
   4.100  70.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .9000  1.0000
       1       1       1       1       1
  10.300  70.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .8000  1.0000
       1       1       1       1       1
   7.900  75.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8000  1.0000
       1       1       1       1       1
   1.900  80.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .9000  1.0000
       4       1       1       1       1
   3.400  75.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .9000  1.0000
   3.900  75.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .9000  1.0000
   1.200  80.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8000  1.0000
   2.000  80.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       1       1       1       1       1
   1.700  80.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       2       1       1       1       1
   3.600  80.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .9000  1.0000
   2.400  75.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8000  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .9000  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

10 Year 24 Hour Storm Hydrologic Model

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************


*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************
     watershed identification code
     -----------------------------
     Pasture Pond 10 year 24 hour 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000


*********************input values*********************

storm duration                    =      24.00   hours
precipation depth                 =       1.84   inches
specific gravity                  =       2.75
load rate exponent factor         =       1.50
submerged bulk specific gravity   =       1.40
```

1

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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

****

beta is negative which inherently indicates that the stream system transport capacity exceeds the sediment load, as evaluated by williams' technique. SEDIMOT II does not consider erodible channels so beta is set equal to .01. if the user wishes to evaluate the transport capacity of the stream directly he/she should use subroutine sloss.

****

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.700	1.0	.0
2	1	.20	500.0	2.50	.900	1.0	.0
3	1	.20	400.0	2.80	.900	1.0	.0
4	1	.20	200.0	1.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.41	.09	6.64	.025	.477	1.000
2	1.51	.18	3.56	.054	.723	1.000
3	.93	.18	2.14	.054	.723	1.000
4	.65	.18	.53	.058	.757	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.6480	acre-ft
peak discharge	=	2.5380	cfs
area	=	55.8000	acres
time of peak discharge	=	12.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	20804.17	mg/l
peak settleable concentration	=	10.74	ml/l
peak settleable concentration	=	15029.11	mg/l
total sediment yield	=	12.8613	tons
representative particle size	=	.0349	mm
time of peak concentration	=	12.20	hrs
period of significant concentration	=	14.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	7.43	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	7.43	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.23	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.77	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * * *
                 junction  1, branch  2, structure  1
            * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	70.00	.200	.100	.100	.35	1.0
3	4.10	70.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.900	1.0	.0
2	1	.20	250.0	5.00	.900	1.0	.0
3	1	.20	150.0	5.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.34	.18	.32	.055	.733	.631
2	.80	.18	3.76	.054	.723	.796
3	.71	.18	1.96	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2231	acre-ft
peak discharge	=	1.0534	cfs
area	=	14.6000	acres
time of peak discharge	=	12.30	hrs
beta	=	9.8107	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	44459.95	mg/l
peak settleable concentration	=	24.24	ml/l
peak settleable concentration	=	33939.00	mg/l
total sediment yield	=	5.1520	tons
representative particle size	=	.0498	mm
time of peak concentration	=	12.00	hrs

period of significant concentration	=	12.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.16	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.16	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.78	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.59	ml/l

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* * * * * * * * * * * * *
     null structure
* * * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	70.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.80	.18	3.99	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1574	acre-ft
peak discharge	=	1.5119	cfs
area	=	10.3000	acres
time of peak discharge	=	12.10	hrs
beta	=	2.9788	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	43796.88	mg/l
peak settleable concentration	=	26.17	ml/l
peak settleable concentration	=	36634.56	mg/l
total sediment yield	=	3.9941	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.10	hrs
period of significant concentration	=	12.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.19	ml/l
volume weighted average settleable concentration during peak 24 hour			

period	=	11.19	ml/l
arithmetic average settleable concentration during period of significant concentration	=	7.97	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.98	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	3.44	cfs
time of routed peak discharge	=	12.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	1.0284	ac-ft
peak runoff discharge	=	3.92	cfs
time to peak discharge	=	12.40	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.1500	hrs
total sediment yield	=	20.5015	tons
peak sediment concentration	=	35660.37	mg/l
peak settleable concentration	=	18.7262	ml/l
peak settleable concentration	=	26216.65	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	14.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	7.64	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	7.64	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.18	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.71	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	75.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.64	.31	30.46	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2011	acre-ft
peak discharge	=	2.6394	cfs
area	=	7.9000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	236770.90	mg/l
peak settleable concentration	=	141.46	ml/l
peak settleable concentration	=	198050.60	mg/l
total sediment yield	=	30.4573	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	63.35	ml/l
volume weighted average settleable concentration during peak 24 hour			

period	=	63.35	ml/l
arithmetic average settleable concentration during period of significant concentration	=	37.18	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	18.74	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	80.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.99	.47	.55	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0740	acre-ft
peak discharge	=	.9906	cfs
area	=	1.9000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	11597.69	mg/l
peak settleable concentration	=	6.93	ml/l
peak settleable concentration	=	9701.06	mg/l
total sediment yield	=	.5520	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.28	ml/l
volume weighted average settleable concentration during peak 24 hour			

period	=	3.28	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.64	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.83	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	4.49	cfs
time of routed peak discharge	=	12.50	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.3036	ac-ft
peak runoff discharge	=	4.71	cfs
time to peak discharge	=	12.50	hrs
previous structure delivery ratio	=	.98	
previous structure travel time	=	.1000	hrs
total sediment yield	=	50.2657	tons
peak sediment concentration	=	159620.90	mg/l
peak settleable concentration	=	90.1395	ml/l
peak settleable concentration	=	126195.40	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	14.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	15.65	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	15.65	ml/l
arithmetic average settleable concentration during period of significant concentration	=	10.36	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	6.35	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	75.00	.020	.300	.300	.35	.0
2	3.90	75.00	.140	.200	.200	.35	1.0
3	1.20	80.00	.040	.200	.200	.35	.0
4	2.00	80.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.900	1.0	.0
2	1	.20	40.0	10.00	.900	1.0	.0
3	1	.20	30.0	10.00	.800	1.0	.0
4	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.14	.31	1.11	.088	1.000	.952
2	1.02	.31	4.12	.068	.845	.971
3	.63	.47	1.58	.088	1.000	.967
4	.88	.47	.47	.074	.893	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3105	acre-ft
peak discharge	=	2.5985	cfs
area	=	10.5000	acres
time of peak discharge	=	12.20	hrs
beta	=	.5561	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	33685.27	mg/l
peak settleable concentration	=	19.57	ml/l
peak settleable concentration	=	27398.99	mg/l
total sediment yield	=	7.0606	tons

representative particle size	=	.0713	mm
time of peak concentration	=	12.30	hrs
period of significant concentration	=	12.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.58	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.58	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.89	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.14	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	80.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.89	.47	.43	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0662	acre-ft
peak discharge	=	.8863	cfs
area	=	1.7000	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	10138.62	mg/l
peak settleable concentration	=	6.06	ml/l
peak settleable concentration	=	8480.60	mg/l
total sediment yield	=	.4315	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	12.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	2.87	ml/l
volume weighted average settleable concentration during peak 24 hour			

period	=	2.87	ml/l
arithmetic average settleable concentration during period of significant concentration	=	1.43	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.73	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	6.32	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	102.70	acres
total runoff volume	=	1.6804	ac-ft
peak runoff discharge	=	6.51	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	57.0572	tons
peak sediment concentration	=	106780.60	mg/l
peak settleable concentration	=	60.3554	ml/l
peak settleable concentration	=	84497.49	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	14.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	13.88	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	13.88	ml/l
arithmetic average settleable concentration during period of significant concentration	=	8.92	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	5.46	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	80.00	.250	.200	.200	.35	1.0
2	2.40	75.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.900	1.0	.0
2	1	.20	50.0	10.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.38	.47	1.11	.065	.826	.964
2	.54	.31	2.17	.059	.773	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2014	acre-ft
peak discharge	=	1.6097	cfs
area	=	6.0000	acres
time of peak discharge	=	12.20	hrs
beta	=	.7179	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	25311.09	mg/l
peak settleable concentration	=	14.33	ml/l
peak settleable concentration	=	20061.53	mg/l
total sediment yield	=	3.2416	tons
representative particle size	=	.0601	mm
time of peak concentration	=	12.10	hrs
period of significant concentration	=	13.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	6.58	ml/l

volume weighted average settleable concentration during peak 24 hour period	=	6.58	ml/l
arithmetic average settleable concentration during period of significant concentration	=	4.01	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.17	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
   junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.55	.96	3.52	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0443	acre-ft
peak discharge	=	.5488	cfs
area	=	.5540	acres
time of peak discharge	=	12.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	18.15	ei unit
peak concentration	=	105220.20	mg/l
peak settleable concentration	=	62.87	ml/l
peak settleable concentration	=	88013.02	mg/l
total sediment yield	=	3.5160	tons
representative particle size	=	.0883	mm
time of peak concentration	=	12.00	hrs
period of significant concentration	=	13.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	34.53	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	34.53	ml/l

arithmetic average settleable concentration during period of significant concentration	=	14.18	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.92	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	7.95	cfs
time of routed peak discharge	=	12.10	hrs
total drainage area	=	109.25	acres
total runoff volume	=	1.9260	ac-ft
peak runoff discharge	=	8.05	cfs
time to peak discharge	=	12.10	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	63.0831	tons
peak sediment concentration	=	90725.34	mg/l
peak settleable concentration	=	51.2968	ml/l
peak settleable concentration	=	71815.59	mg/l
time to peak concentration	=	12.10	hrs
period of significant concentration	=	15.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	13.40	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	13.40	ml/l
arithmetic average settleable concentration during period of significant concentration	=	8.94	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	5.92	ml/l

* *

pond results

* *

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	1.926	acre-ft
outflow routed volume	=	.003	acre-ft
storm volume discharged (plug flow)	=	.003	acre-ft
pond volume at peak stage	=	2.266	acre-ft
peak stage	=	5.955	ft
peak inflow rate	=	8.053	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	90725.34	mg/l
peak effluent sediment concentration	=	6686.22	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.01	mg/l
storm average effluent concentration	=	2663.08	mg/l
average effluent sediment concentration	=	2663.08	mg/l
basin trap efficiency	=	99.98	percent
detention time of flow with sediment	=	15.50	hrs
detention time from hydrograph centers	=	15.50	hrs
detention time including stored flow	=	15.50	hrs
sediment load discharged	=	.01	tons
period of significant concentration	=	39.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.000
2.80	.000	.000	*	3.00	.000	.000
3.20	.000	.000	*	3.40	.000	.000
3.60	.000	.000	*	3.80	.000	.000
4.00	.000	.000	*	4.20	.000	.000
4.40	.000	.000	*	4.60	.000	.000
4.80	.000	.000	*	5.00	.000	.000
5.20	.000	.000	*	5.40	.000	.000
5.60	.000	.000	*	5.80	.000	.000
6.00	.000	.000	*	6.20	.000	.000
6.40	.000	.000	*	6.60	.000	.000
6.80	.000	.000	*	7.00	.000	.000
7.20	.000	.000	*	7.40	.000	.000
7.60	.000	.000	*	7.80	.000	.000
8.00	.000	.000	*	8.20	.000	.000
8.40	.000	.000	*	8.60	.000	.000
8.80	.000	.000	*	9.00	.000	.000
9.20	.000	.000	*	9.40	.000	.000
9.60	.000	.000	*	9.80	.000	.000
10.00	.000	.000	*	10.20	.000	.000
10.40	.000	.000	*	10.60	.000	.004
10.80	.000	.018	*	11.00	.000	.042
11.20	.000	.109	*	11.40	.000	.237
11.60	.000	6.005	*	11.80	.000	223.457
12.00	.000	2353.231	*	12.20	.000	5752.378
12.40	.000	6686.222	*	12.60	.001	6584.016
12.80	.001	6158.169	*	13.00	.001	5768.604
13.20	.001	5450.572	*	13.40	.001	5189.965
13.60	.001	4978.294	*	13.80	.001	4791.661
14.00	.001	4630.155	*	14.20	.001	4485.196
14.40	.001	4354.168	*	14.60	.001	4239.030
14.80	.001	4136.826	*	15.00	.001	4046.093
15.20	.001	3964.216	*	15.40	.001	3889.109
15.60	.001	3819.268	*	15.80	.001	3753.588
16.00	.001	3691.290	*	16.20	.001	3628.385
16.40	.001	3566.263	*	16.60	.001	3509.269
16.80	.001	3457.584	*	17.00	.001	3411.600
17.20	.001	3369.859	*	17.40	.001	3330.900
17.60	.001	3293.909	*	17.80	.001	3258.475
18.00	.001	3224.340	*	18.20	.001	3191.331
18.40	.001	3159.313	*	18.60	.001	3128.176
18.80	.001	3097.833	*	19.00	.001	3068.215
19.20	.001	3039.315	*	19.40	.001	3011.206

19.60	.001	2983.876	*	19.80	.001	2957.211
20.00	.001	2931.125	*	20.20	.001	2904.425
20.40	.001	2877.663	*	20.60	.001	2852.450
20.80	.001	2828.927	*	21.00	.001	2807.369
21.20	.001	2787.326	*	21.40	.001	2768.283
21.60	.001	2749.954	*	21.80	.001	2732.213
22.00	.001	2715.007	*	22.20	.001	2698.285
22.40	.001	2682.025	*	22.60	.001	2666.201
22.80	.001	2650.742	*	23.00	.001	2635.597
23.20	.001	2620.724	*	23.40	.001	2606.087
23.60	.001	2591.663	*	23.80	.001	2577.432
24.00	.001	2560.704	*	24.20	.001	2544.909
24.40	.001	2530.917	*	24.60	.001	2516.150
24.80	.001	2502.175	*	25.00	.001	2490.386
25.20	.001	2480.392	*	25.40	.001	2471.463
25.60	.001	2463.293	*	25.80	.001	2455.702
26.00	.001	2448.593	*	26.20	.001	2441.890
26.40	.001	2435.516	*	26.60	.001	2429.454
26.80	.001	2423.682	*	27.00	.001	2418.140
27.20	.001	2412.804	*	27.40	.001	2407.653
27.60	.001	2402.669	*	27.80	.001	2397.839
28.00	.001	2393.153	*	28.20	.001	2388.616
28.40	.001	2384.242	*	28.60	.001	2380.021
28.80	.001	2375.929	*	29.00	.001	2371.955
29.20	.001	2368.087	*	29.40	.001	2364.313
29.60	.001	2360.618	*	29.80	.001	2356.963
30.00	.001	2353.333	*	30.20	.001	2349.747
30.40	.001	2346.210	*	30.60	.001	2342.724
30.80	.001	2339.294	*	31.00	.001	2335.924
31.20	.001	2332.630	*	31.40	.001	2329.423
31.60	.001	2326.295	*	31.80	.001	2323.235
32.00	.001	2320.237	*	32.20	.001	2317.294
32.40	.001	2314.404	*	32.60	.001	2311.561
32.80	.001	2308.763	*	33.00	.001	2306.010
33.20	.001	2303.296	*	33.40	.001	2300.623
33.60	.001	2297.986	*	33.80	.001	2295.385
34.00	.001	2292.822	*	34.20	.001	2290.309
34.40	.001	2287.847	*	34.60	.001	2285.431
34.80	.001	2283.055	*	35.00	.001	2280.716
35.20	.001	2278.410	*	35.40	.001	2276.136
35.60	.001	2273.891	*	35.80	.001	2271.675
36.00	.001	2269.486	*	36.20	.001	2267.324
36.40	.001	2265.187	*	36.60	.001	2263.074
36.80	.001	2260.985	*	37.00	.001	2258.919
37.20	.001	2256.876	*	37.40	.001	2254.854
37.60	.001	2252.853	*	37.80	.001	2250.873
38.00	.001	2248.912	*	38.20	.001	2246.971
38.40	.001	2245.050	*	38.60	.001	2243.147
38.80	.001	2241.264	*	39.00	.001	2239.398
39.20	.001	2237.550	*	39.40	.001	2235.720
39.60	.001	2233.906	*	39.80	.001	2232.109
40.00	.001	2230.328	*	40.20	.001	2228.563
40.40	.001	2226.813	*	40.60	.001	2225.078
40.80	.001	2223.358	*	41.00	.001	2221.652
41.20	.001	2219.958	*	41.40	.001	2218.271

41.60	.001	2216.572	*	41.80	.001	2214.853
42.00	.001	2213.128	*	42.20	.001	2211.401
42.40	.001	2209.677	*	42.60	.001	2207.959
42.80	.001	2206.249	*	43.00	.001	2204.547
43.20	.001	2202.854	*	43.40	.001	2201.170
43.60	.001	2199.495	*	43.80	.001	2197.829
44.00	.001	2196.173	*	44.20	.001	2194.527
44.40	.001	2192.889	*	44.60	.001	2191.261
44.80	.001	2189.643	*	45.00	.001	2188.034
45.20	.001	2186.433	*	45.40	.001	2184.842
45.60	.001	2183.259	*	45.80	.001	2181.685
46.00	.001	2180.119	*	46.20	.001	2178.563
46.40	.001	2177.016	*	46.60	.001	2175.477
46.80	.001	2173.947	*	47.00	.001	2172.426
47.20	.001	2170.913	*	47.40	.001	2169.408
47.60	.001	2167.911	*	47.80	.001	2166.423
48.00	.001	2164.942	*	48.20	.001	2163.469
48.40	.001	2162.003	*	48.60	.001	2160.545
48.80	.001	2159.094	*	49.00	.001	2157.650
49.20	.001	2156.214	*	49.40	.001	2154.785
49.60	.001	2153.363	*	49.80	.001	2151.948

*** run completed ****

```
Pasture Pond 10 year 24 hour 2006                                                                                    X
       2       0
    1.84   24.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .7000  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .9000  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .9000  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .9000  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .9000  1.0000
   7.400  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .9000  1.0000
   4.100  70.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .9000  1.0000
       1       1       1       1       1
  10.300  70.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .8000  1.0000
       1       1       1       1       1
   7.900  75.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8000  1.0000
       1       1       1       1       1
   1.900  80.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .9000  1.0000
       4       1       1       1       1
   3.400  75.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .9000  1.0000
   3.900  75.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .9000  1.0000
   1.200  80.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8000  1.0000
   2.000  80.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       1       1       1       1       1
   1.700  80.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       2       1       1       1       1
   3.600  80.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .9000  1.0000
   2.400  75.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8000  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .9000  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

25 Year 6 Hour Storm Hydrologic Model

1

```
*****************************************************************
*****************************************************************

       University of Kentucky computer model
       of surface mine hydrology and sedimentology
       for more information contact the Agricultural
       Engineering Department

       the UK model is a design model developed to predict
       the hydraulic and sediment response from surface
       mined lands for a specified rainfall event (single storm)

       version date 9-23-83

       disclaimer: neither the University nor any of its employees
       accept any responsibility or legal liability for the
       conclusions drawn from the results of this model

*****************************************************************
*****************************************************************
```

```
*****************************************************************
*                                                               *
*     the following values are now predicted by SEDIMOT II.     *
*     they can be found in summary tables.                      *
*      1. period of significant concentration                   *
*      2. volume weighted average settleable concentration      *
*         during period of significant concentration            *
*      3. volume weighted average settleable concentration      *
*         during peak 24 hour period                            *
*      4. arithmetic average settleable concentration during    *
*         period of significant concentration                   *
*      5. arithmetic average settleable concentration           *
*         during peak 24 hour period                            *
*                                                               *
*     all concentrations are in ml/l.                           *
*                                                               *
*****************************************************************
```



```
*********************************************
     watershed identification code
     -----------------------------
     Pasture Pond 10 year 24 hour 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000
```

```
*********************input values*********************

storm duration                    =       6.00   hours
precipation depth                 =       1.62   inches
specific gravity                  =       2.75
load rate exponent factor         =       1.50
submerged bulk specific gravity   =       1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.700	1.0	.0
2	1	.20	500.0	2.50	.900	1.0	.0
3	1	.20	400.0	2.80	.900	1.0	.0
4	1	.20	200.0	1.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.47	.05	5.05	.037	.589	.985
2	1.51	.12	2.74	.050	.680	.987
3	.93	.12	1.65	.050	.680	.991
4	.65	.12	.41	.053	.716	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3848	acre-ft
peak discharge	=	2.5272	cfs
area	=	55.8000	acres
time of peak discharge	=	3.20	hrs
beta	=	.3854	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	21965.77	mg/l
peak settleable concentration	=	11.67	ml/l
peak settleable concentration	=	16337.88	mg/l
total sediment yield	=	9.7209	tons

representative particle size	=	.0414	mm
time of peak concentration	=	6.60	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	9.70	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	9.70	ml/l
arithmetic average settleable concentration during period of significant concentration	=	8.66	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.95	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	70.00	.200	.100	.100	.35	1.0
3	4.10	70.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.900	1.0	.0
2	1	.20	250.0	5.00	.900	1.0	.0
3	1	.20	150.0	5.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.34	.12	.25	.051	.690	.647
2	.80	.12	2.89	.050	.680	.806
3	.76	.12	1.56	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1402	acre-ft
peak discharge	=	1.0975	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	9.6326	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	43437.11	mg/l
peak settleable concentration	=	23.45	ml/l
peak settleable concentration	=	32835.31	mg/l
total sediment yield	=	4.0560	tons
representative particle size	=	.0463	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.60	hrs

volume weighted average settleable concentration during period of significant concentration	=	11.38	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.38	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.64	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.45	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	70.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.90	.12	3.18	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0989	acre-ft
peak discharge	=	1.5609	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	2.7311	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	42845.51	mg/l
peak settleable concentration	=	25.60	ml/l
peak settleable concentration	=	35838.77	mg/l
total sediment yield	=	3.1824	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	2.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	14.72	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.72	ml/l

arithmetic average settleable concentration during period of significant concentration	=	12.58	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.52	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	3.24	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	.6240	ac-ft
peak runoff discharge	=	3.82	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.1500	hrs
total sediment yield	=	15.8405	tons
peak sediment concentration	=	35751.59	mg/l
peak settleable concentration	=	19.1040	ml/l
peak settleable concentration	=	26745.58	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.30	hrs
volume weighted average settleable concentration during period of significant concentration	=	10.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	10.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	8.96	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.98	ml/l

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* * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	75.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	3.03	.21	26.81	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1396	acre-ft
peak discharge	=	3.0280	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	239658.70	mg/l
peak settleable concentration	=	143.19	ml/l
peak settleable concentration	=	200466.20	mg/l
total sediment yield	=	26.8083	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	81.40	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	81.40	ml/l

arithmetic average settleable concentration during period of significant concentration	=	60.23	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.53	ml/l

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* * * * * * * * * * * * *
    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	80.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.17	.35	.51	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0549	acre-ft
peak discharge	=	1.1734	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	11992.98	mg/l
peak settleable concentration	=	7.17	ml/l
peak settleable concentration	=	10031.71	mg/l
total sediment yield	=	.5132	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	4.18	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	4.18	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.79	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.36	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	4.58	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	90.50	acres
total runoff volume	=	.8184	ac-ft
peak runoff discharge	=	4.86	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	.97	
previous structure travel time	=	.1000	hrs
total sediment yield	=	42.0868	tons
peak sediment concentration	=	181616.50	mg/l
peak settleable concentration	=	103.6196	ml/l
peak settleable concentration	=	145067.40	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	21.24	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	21.24	ml/l
arithmetic average settleable concentration during period of significant concentration	=	15.12	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.53	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  3, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	75.00	.020	.300	.300	.35	.0
2	3.90	75.00	.140	.200	.200	.35	1.0
3	1.20	80.00	.040	.200	.200	.35	.0
4	2.00	80.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.900	1.0	.0
2	1	.20	40.0	10.00	.900	1.0	.0
3	1	.20	30.0	10.00	.800	1.0	.0
4	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.30	.21	.98	.088	1.000	.874
2	1.07	.21	3.44	.062	.793	.928
3	.74 *	.35	1.47	.088	1.000	.914
4	.98	.35	.42	.069	.854	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2214	acre-ft
peak discharge	=	2.6545	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	1.5078	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	30036.49	mg/l
peak settleable concentration	=	17.10	ml/l
peak settleable concentration	=	23941.89	mg/l
total sediment yield	=	5.8184	tons

representative particle size	=	.0622	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	11.07	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	11.07	ml/l
arithmetic average settleable concentration during period of significant concentration	=	8.62	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.33	ml/l

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* * * * * * * * * * * * *
    null structure
* * * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	80.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.05	.35	.40	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0491	acre-ft
peak discharge	=	1.0499	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	10484.37	mg/l
peak settleable concentration	=	6.26	ml/l
peak settleable concentration	=	8769.81	mg/l
total sediment yield	=	.4012	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.66	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.66	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.44	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.31	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	6.53	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	102.70	acres
total runoff volume	=	1.0889	ac-ft
peak runoff discharge	=	6.77	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	47.7096	tons
peak sediment concentration	=	120578.20	mg/l
peak settleable concentration	=	68.5972	ml/l
peak settleable concentration	=	96036.01	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	18.23	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	18.23	ml/l
arithmetic average settleable concentration during period of significant concentration	=	12.77	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.98	ml/l

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* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  4, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	80.00	.250	.200	.200	.35	1.0
2	2.40	75.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.900	1.0	.0
2	1	.20	50.0	10.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.50	.35	.98	.060	.781	.937
2	.55	.21	1.80	.054	.719	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.1464	acre-ft
peak discharge	=	1.6658	cfs
area	=	6.0000	acres
time of peak discharge	=	3.30	hrs
beta	=	1.3279	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	25127.58	mg/l
peak settleable concentration	=	13.95	ml/l
peak settleable concentration	=	19528.94	mg/l
total sediment yield	=	2.7246	tons
representative particle size	=	.0542	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	7.47	ml/l

volume weighted average settleable concentration during peak 24 hour period	=	7.47	ml/l
arithmetic average settleable concentration during period of significant concentration	=	5.66	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.90	ml/l

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* * * * * * * * * * * *
   null structure
* * * * * * * * * * * *
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* * * * * * * * * * * * * * * * * * * * * * *
   junction  5, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.67	.78	3.51	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0360	acre-ft
peak discharge	=	.6728	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	24.10	ei unit
peak concentration	=	106642.00	mg/l
peak settleable concentration	=	63.72	ml/l
peak settleable concentration	=	89202.34	mg/l
total sediment yield	=	3.5071	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	42.24	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	42.24	ml/l

arithmetic average settleable concentration during period of significant concentration	=	24.47	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.47	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	8.22	cfs
time of routed peak discharge	=	3.30	hrs
total drainage area	=	109.25	acres
total runoff volume	=	1.2712	ac-ft
peak runoff discharge	=	8.36	cfs
time to peak discharge	=	3.30	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	53.3203	tons
peak sediment concentration	=	102620.30	mg/l
peak settleable concentration	=	58.3338	ml/l
peak settleable concentration	=	81667.37	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	17.43	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	17.43	ml/l
arithmetic average settleable concentration during period of significant concentration	=	13.04	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.21	ml/l

* *

pond results

* *

***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	1.271	acre-ft
outflow routed volume	=	.004	acre-ft
storm volume discharged (plug flow)	=	.004	acre-ft
pond volume at peak stage	=	1.599	acre-ft
peak stage	=	4.532	ft
peak inflow rate	=	8.361	cfs
peak discharge rate	=	.001	cfs
peak inflow sediment concentration	=	102620.30	mg/l
peak effluent sediment concentration	=	6460.12	mg/l
peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.01	mg/l
storm average effluent concentration	=	2798.12	mg/l
average effluent sediment concentration	=	2798.12	mg/l
basin trap efficiency	=	99.97	percent
detention time of flow with sediment	=	22.53	hrs
detention time from hydrograph centers	=	22.53	hrs
detention time including stored flow	=	22.53	hrs
sediment load discharged	=	.01	tons
period of significant concentration	=	47.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.000
2.40	.000	.000	*	2.60	.000	.924
2.80	.000	74.296	*	3.00	.000	1669.803
3.20	.000	5153.220	*	3.40	.000	6460.124
3.60	.001	6388.447	*	3.80	.001	5997.498
4.00	.001	5615.469	*	4.20	.001	5297.653
4.40	.001	5033.381	*	4.60	.001	4815.867
4.80	.001	4624.390	*	5.00	.001	4457.701
5.20	.001	4308.574	*	5.40	.001	4173.026
5.60	.001	4053.830	*	5.80	.001	3949.196
6.00	.001	3839.298	*	6.20	.001	3743.033
6.40	.001	3661.565	*	6.60	.001	3579.389
6.80	.001	3506.728	*	7.00	.001	3446.905
7.20	.001	3397.708	*	7.40	.001	3355.652
7.60	.001	3318.717	*	7.80	.001	3285.688
8.00	.001	3255.806	*	8.20	.001	3228.490
8.40	.001	3203.199	*	8.60	.001	3179.734
8.80	.001	3157.911	*	9.00	.001	3137.381
9.20	.001	3117.963	*	9.40	.001	3099.521
9.60	.001	3081.959	*	9.80	.001	3065.310
10.00	.001	3049.648	*	10.20	.001	3034.881
10.40	.001	3020.863	*	10.60	.001	3007.503
10.80	.001	2994.718	*	11.00	.001	2982.507
11.20	.001	2970.863	*	11.40	.001	2959.718
11.60	.001	2949.024	*	11.80	.001	2938.733
12.00	.001	2928.810	*	12.20	.001	2919.258
12.40	.001	2910.086	*	12.60	.001	2901.294
12.80	.001	2892.901	*	13.00	.001	2884.877
13.20	.001	2877.164	*	13.40	.001	2869.726
13.60	.001	2862.530	*	13.80	.001	2855.548
14.00	.001	2848.762	*	14.20	.001	2842.156
14.40	.001	2835.720	*	14.60	.001	2829.441
14.80	.001	2823.309	*	15.00	.001	2817.315
15.20	.001	2811.455	*	15.40	.001	2805.759
15.60	.001	2800.254	*	15.80	.001	2794.922
16.00	.001	2789.739	*	16.20	.001	2784.688
16.40	.001	2779.754	*	16.60	.001	2774.923
16.80	.001	2770.188	*	17.00	.001	2765.545
17.20	.001	2760.988	*	17.40	.001	2756.514
17.60	.001	2752.120	*	17.80	.001	2747.802
18.00	.001	2743.562	*	18.20	.001	2739.436
18.40	.001	2735.443	*	18.60	.001	2731.561
18.80	.001	2727.775	*	19.00	.001	2724.075

19.20	.001	2720.447	*	19.40	.001	2716.876
19.60	.001	2713.310	*	19.80	.001	2709.722
20.00	.001	2706.138	*	20.20	.001	2702.565
20.40	.001	2699.011	*	20.60	.001	2695.485
20.80	.001	2691.998	*	21.00	.001	2688.582
21.20	.001	2685.246	*	21.40	.001	2681.972
21.60	.001	2678.754	*	21.80	.001	2675.585
22.00	.001	2672.459	*	22.20	.001	2669.372
22.40	.001	2666.321	*	22.60	.001	2663.306
22.80	.001	2660.328	*	23.00	.001	2657.386
23.20	.001	2654.480	*	23.40	.001	2651.609
23.60	.001	2648.783	*	23.80	.001	2646.015
24.00	.001	2643.306	*	24.20	.001	2640.646
24.40	.001	2638.030	*	24.60	.001	2635.452
24.80	.001	2632.909	*	25.00	.001	2630.397
25.20	.001	2627.917	*	25.40	.001	2625.465
25.60	.001	2623.041	*	25.80	.001	2620.645
26.00	.001	2618.274	*	26.20	.001	2615.928
26.40	.001	2613.607	*	26.60	.001	2611.309
26.80	.001	2609.033	*	27.00	.001	2606.779
27.20	.001	2604.546	*	27.40	.001	2602.333
27.60	.001	2600.139	*	27.80	.001	2597.964
28.00	.001	2595.807	*	28.20	.001	2593.668
28.40	.001	2591.546	*	28.60	.001	2589.442
28.80	.001	2587.356	*	29.00	.001	2585.286
29.20	.001	2583.232	*	29.40	.001	2581.194
29.60	.001	2579.173	*	29.80	.001	2577.167
30.00	.001	2575.177	*	30.20	.001	2573.201
30.40	.001	2571.236	*	30.60	.001	2569.253
30.80	.001	2567.240	*	31.00	.001	2565.211
31.20	.001	2563.171	*	31.40	.001	2561.127
31.60	.001	2559.084	*	31.80	.001	2557.044
32.00	.001	2555.010	*	32.20	.001	2552.981
32.40	.001	2550.958	*	32.60	.001	2548.942
32.80	.001	2546.934	*	33.00	.001	2544.934
33.20	.001	2542.943	*	33.40	.001	2540.960
33.60	.001	2538.987	*	33.80	.001	2537.026
34.00	.001	2535.075	*	34.20	.001	2533.135
34.40	.001	2531.208	*	34.60	.001	2529.292
34.80	.001	2527.388	*	35.00	.001	2525.497
35.20	.001	2523.617	*	35.40	.001	2521.750
35.60	.001	2519.895	*	35.80	.001	2518.051
36.00	.001	2516.219	*	36.20	.001	2514.398
36.40	.001	2512.588	*	36.60	.001	2510.790
36.80	.001	2509.003	*	37.00	.001	2507.226
37.20	.001	2505.460	*	37.40	.001	2503.705
37.60	.001	2501.960	*	37.80	.001	2500.226
38.00	.001	2498.501	*	38.20	.001	2496.787
38.40	.001	2495.083	*	38.60	.001	2493.389
38.80	.001	2491.705	*	39.00	.001	2490.030
39.20	.001	2488.365	*	39.40	.001	2486.709
39.60	.001	2485.063	*	39.80	.001	2483.426
40.00	.001	2481.797	*	40.20	.001	2480.178
40.40	.001	2478.569	*	40.60	.001	2476.968
40.80	.001	2475.375	*	41.00	.001	2473.791

41.20	.001	2472.215	*	41.40	.001	2470.645
41.60	.001	2469.062	*	41.80	.001	2467.458
42.00	.001	2465.843	*	42.20	.001	2464.219
42.40	.001	2462.591	*	42.60	.001	2460.962
42.80	.001	2459.334	*	43.00	.001	2457.709
43.20	.001	2456.086	*	43.40	.001	2454.465
43.60	.001	2452.848	*	43.80	.001	2451.236
44.00	.001	2449.627	*	44.20	.001	2448.024
44.40	.001	2446.425	*	44.60	.001	2444.832
44.80	.001	2443.245	*	45.00	.001	2441.664
45.20	.001	2440.090	*	45.40	.001	2438.523
45.60	.001	2436.963	*	45.80	.001	2435.411
46.00	.001	2433.865	*	46.20	.001	2432.327
46.40	.001	2430.797	*	46.60	.001	2429.273
46.80	.001	2427.757	*	47.00	.001	2426.248
47.20	.001	2424.745	*	47.40	.001	2423.250
47.60	.001	2421.761	*	47.80	.001	2420.279
48.00	.001	2418.804	*	48.20	.001	2417.336
48.40	.001	2415.874	*	48.60	.001	2414.419
48.80	.001	2412.971	*	49.00	.001	2411.529
49.20	.001	2410.094	*	49.40	.001	2408.664
49.60	.001	2407.241	*	49.80	.001	2405.824

*** run completed ****

```
Pasture Pond 10 year 24 hour 2006                                                                                    X
       2       0
    1.62    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .7000  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .9000  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .9000  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .9000  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .9000  1.0000
   7.400  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .9000  1.0000
   4.100  70.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .9000  1.0000
       1       1       1       1       1
  10.300  70.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .8000  1.0000
       1       1       1       1       1
   7.900  75.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8000  1.0000
       1       1       1       1       1
   1.900  80.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .9000  1.0000
       4       1       1       1       1
   3.400  75.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .9000  1.0000
   3.900  75.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .9000  1.0000
   1.200  80.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8000  1.0000
   2.000  80.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       1       1       1       1       1
   1.700  80.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       2       1       1       1       1
   3.600  80.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .9000  1.0000
   2.400  75.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8000  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
```

```
.2000 20.0000 20.0000   .9000  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
```

PASTURE SEDIMENT POND

100 Year 6 Hour Storm Hydrologic Model

1

```
*****************************************************************
*****************************************************************

      University of Kentucky computer model
      of surface mine hydrology and sedimentology
      for more information contact the Agricultural
      Engineering Department

      the UK model is a design model developed to predict
      the hydraulic and sediment response from surface
      mined lands for a specified rainfall event (single storm)

      version date 9-23-83

      disclaimer: neither the University nor any of its employees
      accept any responsibility or legal liability for the
      conclusions drawn from the results of this model

*****************************************************************
*****************************************************************
```

```
*****************************************************************
*                                                               *
*    the following values are now predicted by SEDIMOT II.      *
*    they can be found in summary tables.                       *
*     1. period of significant concentration                    *
*     2. volume weighted average settleable concentration       *
*        during period of significant concentration             *
*     3. volume weighted average settleable concentration       *
*        during peak 24 hour period                             *
*     4. arithmetic average settleable concentration during     *
*        period of significant concentration                    *
*     5. arithmetic average settleable concentration            *
*        during peak 24 hour period                             *
*                                                               *
*    all concentrations are in ml/l.                            *
*                                                               *
*****************************************************************
```



```
*********************************************
    watershed identification code
    -----------------------------
    Pasture Pond 10 year 24 hour 2006
*********************************************
```

1

```
input particle size-percent finer distributions
-----------------------------------------------

size,mm          13.000  2.000   .425   .250   .150   .075
                   .050   .030   .020   .010   .008   .006
                   .004   .002   .000
pct finer no. 1  94.300 83.700 78.000 73.300 66.300 45.000
                 34.000 26.300 20.300 15.000 13.800 12.300
                 11.000 10.000   .000
```

```
*********************input values*********************

storm duration                    =      6.00   hours
precipation depth                 =      2.05   inches
specific gravity                  =      2.75
load rate exponent factor         =      1.50
submerged bulk specific gravity   =      1.40
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

****

beta is negative which inherently indicates that the stream system transport capacity exceeds the sediment load, as evaluated by williams' technique. SEDIMOT II does not consider erodible channels so beta is set equal to .01. if the user wishes to evaluate the transport capacity of the stream directly he/she should use subroutine sloss.

****

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	27.70	65.00	.180	.200	.200	.35	3.0
2	14.00	70.00	.200	.150	.150	.35	1.0
3	8.60	70.00	.200	.100	.100	.35	1.0
4	5.50	70.00	.140	.000	.050	.35	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	200.0	10.00	.700	1.0	.0
2	1	.20	500.0	2.50	.900	1.0	.0
3	1	.20	400.0	2.80	.900	1.0	.0
4	1	.20	200.0	1.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.77	.15	19.52	.022	.437	1.000
2	4.30	.26	7.75	.057	.754	1.000
3	2.64	.26	4.66	.057	.754	1.000
4	1.83	.26	1.15	.061	.788	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.9520	acre-ft
peak discharge	=	7.9041	cfs
area	=	55.8000	acres
time of peak discharge	=	3.20	hrs
beta	=	.0100	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	28475.76	mg/l
peak settleable concentration	=	14.27	ml/l
peak settleable concentration	=	19978.96	mg/l
total sediment yield	=	33.0826	tons
representative particle size	=	.0303	mm
time of peak concentration	=	3.50	hrs
period of significant concentration	=	5.50	hrs
volume weighted average settleable concentration during period of significant concentration	=	12.62	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	12.62	ml/l
arithmetic average settleable concentration during period of significant concentration	=	10.14	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.32	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  1, branch  2, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.10	70.00	.190	.200	.250	.30	1.0
2	7.40	70.00	.200	.100	.100	.35	1.0
3	4.10	70.00	.110	.000	.000	.30	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	80.0	2.00	.900	1.0	.0
2	1	.20	250.0	5.00	.900	1.0	.0
3	1	.20	150.0	5.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.98	.26	.70	.058	.764	.650
2	2.27	.26	8.19	.057	.754	.808
3	1.92	.26	4.15	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.3160	acre-ft
peak discharge	=	2.9914	cfs
area	=	14.6000	acres
time of peak discharge	=	3.20	hrs
beta	=	8.9261	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	48433.69	mg/l
peak settleable concentration	=	26.69	ml/l
peak settleable concentration	=	37365.30	mg/l
total sediment yield	=	11.2162	tons
representative particle size	=	.0523	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs

volume weighted average settleable concentration during period of significant concentration	=	14.29	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	14.29	ml/l
arithmetic average settleable concentration during period of significant concentration	=	11.18	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.72	ml/l

```
* * * * * * * * * * * *
    null structure
* * * * * * * * * * * *
```

1

```
* * * * * * * * * * * * * * * * * * * * * * *
    junction  2, branch  1, structure  1
* * * * * * * * * * * * * * * * * * * * * * *
```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	10.30	70.00	.100	.000	.100	.35	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	100.0	5.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	4.83	.26	8.45	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2229	acre-ft
peak discharge	=	4.1059	cfs
area	=	10.3000	acres
time of peak discharge	=	3.10	hrs
beta	=	3.0082	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	49453.88	mg/l
peak settleable concentration	=	29.55	ml/l
peak settleable concentration	=	41366.45	mg/l
total sediment yield	=	8.4476	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.10	hrs
period of significant concentration	=	3.00	hrs
volume weighted average settleable concentration during period of significant concentration	=	17.11	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	17.11	ml/l

arithmetic average settleable concentration during period of significant concentration	=	12.92	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.62	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1500	hrs
previous routed peak discharge	=	10.31	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	80.70	acres
total runoff volume	=	1.4909	ac-ft
peak runoff discharge	=	11.52	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.92	
previous structure travel time	=	.1500	hrs
total sediment yield	=	49.2069	tons
peak sediment concentration	=	40260.49	mg/l
peak settleable concentration	=	20.6986	ml/l
peak settleable concentration	=	28977.98	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.40	hrs
volume weighted average settleable concentration during period of significant concentration	=	12.48	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	12.48	ml/l
arithmetic average settleable concentration during period of significant concentration	=	10.47	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	2.35	ml/l

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     null structure
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    junction  2, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	7.90	75.00	.040	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	20.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	5.75	.41	55.21	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2671	acre-ft
peak discharge	=	5.7479	cfs
area	=	7.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	245025.70	mg/l
peak settleable concentration	=	146.40	ml/l
peak settleable concentration	=	204955.50	mg/l
total sediment yield	=	55.2059	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.10	hrs
volume weighted average settleable concentration during period of significant concentration	=	86.82	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	86.82	ml/l

arithmetic average settleable concentration during period of significant concentration	=	59.73	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	7.72	ml/l

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    null structure
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    junction  3, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.90	80.00	.120	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	30.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.94	.59	.92	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0939	acre-ft
peak discharge	=	1.9394	cfs
area	=	1.9000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	12020.42	mg/l
peak settleable concentration	=	7.18	ml/l
peak settleable concentration	=	10054.67	mg/l
total sediment yield	=	.9188	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	4.36	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	4.36	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.75	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.37	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.40	
previous muskingum routing k	=	.1000	hrs
previous routed peak discharge	=	12.70	cfs
time of routed peak discharge	=	3.50	hrs
total drainage area	=	90.50	acres
total runoff volume	=	1.8519	ac-ft
peak runoff discharge	=	13.14	cfs
time to peak discharge	=	3.50	hrs
previous structure delivery ratio	=	.98	
previous structure travel time	=	.1000	hrs
total sediment yield	=	102.9007	tons
peak sediment concentration	=	154040.50	mg/l
peak settleable concentration	=	85.3786	ml/l
peak settleable concentration	=	119530.00	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	22.32	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	22.32	ml/l
arithmetic average settleable concentration during period of significant concentration	=	15.89	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.77	ml/l

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    null structure
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    junction  3, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.40	75.00	.020	.300	.300	.35	.0
2	3.90	75.00	.140	.200	.200	.35	1.0
3	1.20	80.00	.040	.200	.200	.35	.0
4	2.00	80.00	.150	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	5.00	.900	1.0	.0
2	1	.20	40.0	10.00	.900	1.0	.0
3	1	.20	30.0	10.00	.800	1.0	.0
4	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.47	.41	2.02	.088	1.000	.949
2	2.22	.41	7.46	.068	.845	.970
3	1.22	.59	2.63	.088	1.000	.966
4	1.70	.59	.78	.073	.885	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.4050	acre-ft
peak discharge	=	5.3889	cfs
area	=	10.5000	acres
time of peak discharge	=	3.20	hrs
beta	=	.5862	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	36017.72	mg/l
peak settleable concentration	=	20.91	ml/l
peak settleable concentration	=	29269.67	mg/l
total sediment yield	=	12.4645	tons

representative particle size	=	.0708	mm
time of peak concentration	=	3.30	hrs
period of significant concentration	=	3.80	hrs
volume weighted average settleable concentration during period of significant concentration	=	13.14	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	13.14	ml/l
arithmetic average settleable concentration during period of significant concentration	=	9.45	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.50	ml/l

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    null structure
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    junction  4, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	1.70	80.00	.070	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	2.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	1.74	.59	.72	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0840	acre-ft
peak discharge	=	1.7353	cfs
area	=	1.7000	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	10508.38	mg/l
peak settleable concentration	=	6.28	ml/l
peak settleable concentration	=	8789.89	mg/l
total sediment yield	=	.7183	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	3.81	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	3.81	ml/l

arithmetic average settleable concentration during period of significant concentration	=	2.41	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.32	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	15.61	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	102.70	acres
total runoff volume	=	2.3410	ac-ft
peak runoff discharge	=	15.99	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	114.7351	tons
peak sediment concentration	=	109770.80	mg/l
peak settleable concentration	=	60.9860	ml/l
peak settleable concentration	=	85380.44	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	5.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	19.88	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	19.88	ml/l
arithmetic average settleable concentration during period of significant concentration	=	13.78	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.27	ml/l

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    null structure
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* * * * * * * * * * * * * * * * * * * * * * *
    junction  4, branch  2, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	3.60	80.00	.250	.200	.200	.35	1.0
2	2.40	75.00	.250	.000	.000	.00	1.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	50.0	2.00	.900	1.0	.0
2	1	.20	50.0	10.00	.800	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	2.64	.59	1.82	.064	.814	.951
2	1.16	.41	3.93	.059	.772	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.2591	acre-ft
peak discharge	=	3.1149	cfs
area	=	6.0000	acres
time of peak discharge	=	3.20	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	29456.61	mg/l
peak settleable concentration	=	16.64	ml/l
peak settleable concentration	=	23290.26	mg/l
total sediment yield	=	5.6610	tons
representative particle size	=	.0593	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.90	hrs
volume weighted average settleable concentration during period of significant concentration	=	8.91	ml/l

volume weighted average settleable concentration during peak 24 hour period	=	8.91	ml/l
arithmetic average settleable concentration during period of significant concentration	=	6.30	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	1.02	ml/l

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    null structure
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   junction  5, branch  1, structure  1
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```

*** hydraulic input values for subwatersheds ***

water shed	area acres	curve number	tc hr	tt hr	routing coefficients k-hrs	x	unit hydro
1	.55	90.00	.010	.000	.000	.00	.0

*** sediment input values for subwatersheds ***

water shed	seg num	soil k	length feet	slope pct	cp value	part opt	surf cond
1	1	.20	20.0	20.00	.900	1.0	.0

* * * computed values for individual watersheds * * *

watershed	peak flow (cfs)	runoff (inches)	sediment tons	diam (mm)	delivery ratio 1	delivery ratio 2
1	.94	1.14	5.24	.088	1.000	1.000

note: sediment does not include possible deposition by delivery ratio 2

***** summary table for total watershed *****

runoff volume	=	.0525	acre-ft
peak discharge	=	.9439	cfs
area	=	.5540	acres
time of peak discharge	=	3.00	hrs
beta	=	1.0000	
rainfall erositivity factor	=	40.00	ei unit
peak concentration	=	106593.20	mg/l
peak settleable concentration	=	63.69	ml/l
peak settleable concentration	=	89161.46	mg/l
total sediment yield	=	5.2394	tons
representative particle size	=	.0883	mm
time of peak concentration	=	3.00	hrs
period of significant concentration	=	3.70	hrs
volume weighted average settleable concentration during period of significant concentration	=	43.09	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	43.09	ml/l

arithmetic average settleable concentration during period of significant concentration	=	23.48	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.62	ml/l

summary table of combined hydrograph and sedigraph values

previous muskingum routing x	=	.35	
previous muskingum routing k	=	.0500	hrs
previous routed peak discharge	=	18.46	cfs
time of routed peak discharge	=	3.40	hrs
total drainage area	=	109.25	acres
total runoff volume	=	2.6525	ac-ft
peak runoff discharge	=	18.65	cfs
time to peak discharge	=	3.40	hrs
previous structure delivery ratio	=	.99	
previous structure travel time	=	.0500	hrs
total sediment yield	=	124.2353	tons
peak sediment concentration	=	95842.30	mg/l
peak settleable concentration	=	53.2920	ml/l
peak settleable concentration	=	74608.85	mg/l
time to peak concentration	=	3.10	hrs
period of significant concentration	=	6.20	hrs
volume weighted average settleable concentration during period of significant concentration	=	19.01	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	19.01	ml/l
arithmetic average settleable concentration during period of significant concentration	=	13.59	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	3.51	ml/l

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                    pond results

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***** control variables options *****

flow	fractn	isdo	nrhp	nsp	ncstr
3	0	1	500	10	2

***** basin geometry *****

stage (ft)	area (acres)	average depth (ft)	discharge (cfs)	capacity (acres-ft)
.00	.084	.00	.00	.00
1.50	.366	1.03	.00	.34
3.50	.425	2.85	.00	1.13
5.50	.487	4.65	.00	2.04
6.20	.505	5.27	.00	2.39
6.30	.513	5.36	1.60	2.44
6.50	.520	5.54	4.00	2.54
6.70	.527	5.71	6.50	2.65
6.90	.534	5.88	7.50	2.75
7.50	.554	6.39	7.50	3.08

***** storm event summary *****

turbulence factor	=	1.00	
permanent pool capacity	=	.338	acre-ft
dead storage	=	23.00	percent
time increment outflow	=	.20	hrs
viscosity	=	.009	cm**2/sec
inflow runoff volume	=	2.653	acre-ft
outflow routed volume	=	.592	acre-ft
storm volume discharged (plug flow)	=	.592	acre-ft
pond volume at peak stage	=	2.541	acre-ft
peak stage	=	6.498	ft
peak inflow rate	=	18.652	cfs
peak discharge rate	=	3.979	cfs
peak inflow sediment concentration	=	95842.30	mg/l
peak effluent sediment concentration	=	15457.51	mg/l

peak effluent settleable concentration	=	.0000	ml/l
peak effluent settleable concentration	=	.02	mg/l
storm average effluent concentration	=	5974.40	mg/l
average effluent sediment concentration	=	5974.40	mg/l
basin trap efficiency	=	96.16	percent
detention time of flow with sediment	=	2.23	hrs
detention time from hydrograph centers	=	2.23	hrs
detention time including stored flow	=	2.23	hrs
sediment load discharged	=	4.77	tons
period of significant concentration	=	47.60	hrs
volume weighted average settleable concentration during period of significant concentration	=	.00	ml/l
volume weighted average settleable concentration during peak 24 hour period	=	.00	ml/l
arithmetic average settleable concentration during period of significant concentration	=	.00	ml/l
arithmetic average settleable concentration during peak 24 hour period	=	.00	ml/l

*** particle size distribution of sediment ***

size,mm	13.0000	2.0000	.4250	.2500	.1500	.0750
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0500	.0300	.0200	.0100	.0080	.0060
percent finer	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
size,mm	.0040	.0020	.0001			
percent finer	100.0000	100.0000	.0000			

*** hydrograph and sediment graph ***
(two consecutive values per line)

time (hr)	discharge (cfs)	sed disc (mg/l)	******* *	time (hr)	discharge (cfs)	sed disc (mg/l)
.00	.000	.000	*	.20	.000	.000
.40	.000	.000	*	.60	.000	.000
.80	.000	.000	*	1.00	.000	.000
1.20	.000	.000	*	1.40	.000	.000
1.60	.000	.000	*	1.80	.000	.000
2.00	.000	.000	*	2.20	.000	.003
2.40	.000	.036	*	2.60	.000	6.296
2.80	.000	531.393	*	3.00	.000	7448.291
3.20	.000	15457.510	*	3.40	.001	15008.440
3.60	.001	13091.960	*	3.80	.001	11304.910
4.00	.001	10043.220	*	4.20	.001	9147.465
4.40	.001	8481.300	*	4.60	.001	7968.846
4.80	.001	7544.110	*	5.00	.283	7189.853
5.20	2.311	6890.164	*	5.40	3.257	6634.021
5.60	3.741	6415.694	*	5.80	3.941	6226.633
6.00	3.951	6042.128	*	6.20	3.646	5883.357
6.40	3.302	5748.674	*	6.60	2.911	5615.422
6.80	2.365	5495.084	*	7.00	1.787	5396.585
7.20	1.230	5315.562	*	7.40	.820	5244.975
7.60	.555	5182.138	*	7.80	.379	5125.519
8.00	.261	5074.063	*	8.20	.178	5026.874
8.40	.120	4983.104	*	8.60	.074	4942.570
8.80	.044	4905.005	*	9.00	.026	4870.020
9.20	.015	4837.439	*	9.40	.009	4806.968
9.60	.005	4778.312	*	9.80	.003	4751.234
10.00	.002	4725.531	*	10.20	.001	4701.042
10.40	.001	4677.639	*	10.60	.001	4655.221
10.80	.001	4633.696	*	11.00	.001	4612.985
11.20	.001	4593.010	*	11.40	.001	4573.708
11.60	.001	4555.027	*	11.80	.001	4536.918
12.00	.001	4519.342	*	12.20	.001	4502.266
12.40	.001	4485.719	*	12.60	.001	4469.796
12.80	.001	4454.546	*	13.00	.001	4439.910
13.20	.001	4425.802	*	13.40	.001	4412.164
13.60	.001	4398.938	*	13.80	.001	4386.085
14.00	.001	4373.586	*	14.20	.001	4361.500
14.40	.001	4349.850	*	14.60	.001	4338.581
14.80	.001	4327.658	*	15.00	.001	4317.049
15.20	.001	4306.721	*	15.40	.001	4296.651
15.60	.001	4286.823	*	15.80	.001	4277.242
16.00	.001	4267.938	*	16.20	.001	4258.907
16.40	.001	4250.130	*	16.60	.001	4241.656
16.80	.001	4233.488	*	17.00	.001	4225.570
17.20	.001	4217.876	*	17.40	.001	4210.379
17.60	.001	4203.059	*	17.80	.001	4195.897
18.00	.001	4188.882	*	18.20	.001	4182.004
18.40	.001	4175.257	*	18.60	.001	4168.632
18.80	.001	4162.124	*	19.00	.001	4155.726

19.20	.001	4149.432	*	19.40	.001	4143.237
19.60	.001	4137.136	*	19.80	.001	4131.121
20.00	.001	4125.190	*	20.20	.001	4119.347
20.40	.001	4113.633	*	20.60	.001	4108.073
20.80	.001	4102.642	*	21.00	.001	4097.327
21.20	.001	4092.115	*	21.40	.001	4086.993
21.60	.001	4081.952	*	21.80	.001	4076.988
22.00	.001	4072.096	*	22.20	.001	4067.275
22.40	.001	4062.521	*	22.60	.001	4057.830
22.80	.001	4053.200	*	23.00	.001	4048.630
23.20	.001	4044.116	*	23.40	.001	4039.657
23.60	.001	4035.250	*	23.80	.001	4030.892
24.00	.001	4026.587	*	24.20	.001	4022.359
24.40	.001	4018.232	*	24.60	.001	4014.199
24.80	.001	4010.246	*	25.00	.001	4006.364
25.20	.001	4002.544	*	25.40	.001	3998.779
25.60	.001	3995.064	*	25.80	.001	3991.396
26.00	.001	3987.764	*	26.20	.001	3984.120
26.40	.001	3980.438	*	26.60	.001	3976.744
26.80	.001	3973.043	*	27.00	.001	3969.345
27.20	.001	3965.658	*	27.40	.001	3961.987
27.60	.001	3958.334	*	27.80	.001	3954.701
28.00	.001	3951.104	*	28.20	.001	3947.571
28.40	.001	3944.105	*	28.60	.001	3940.693
28.80	.001	3937.329	*	29.00	.001	3934.007
29.20	.001	3930.721	*	29.40	.001	3927.469
29.60	.001	3924.251	*	29.80	.001	3921.064
30.00	.001	3917.910	*	30.20	.001	3914.788
30.40	.001	3911.696	*	30.60	.001	3908.635
30.80	.001	3905.603	*	31.00	.001	3902.598
31.20	.001	3899.620	*	31.40	.001	3896.667
31.60	.001	3893.739	*	31.80	.001	3890.840
32.00	.001	3887.988	*	32.20	.001	3885.189
32.40	.001	3882.433	*	32.60	.001	3879.716
32.80	.001	3877.033	*	33.00	.001	3874.378
33.20	.001	3871.751	*	33.40	.001	3869.149
33.60	.001	3866.572	*	33.80	.001	3864.017
34.00	.001	3861.485	*	34.20	.001	3858.975
34.40	.001	3856.486	*	34.60	.001	3854.017
34.80	.001	3851.567	*	35.00	.001	3849.137
35.20	.001	3846.724	*	35.40	.001	3844.328
35.60	.001	3841.948	*	35.80	.001	3839.584
36.00	.001	3837.236	*	36.20	.001	3834.903
36.40	.001	3832.583	*	36.60	.001	3830.279
36.80	.001	3827.988	*	37.00	.001	3825.712
37.20	.001	3823.449	*	37.40	.001	3821.199
37.60	.001	3818.963	*	37.80	.001	3816.740
38.00	.001	3814.530	*	38.20	.001	3812.333
38.40	.001	3810.149	*	38.60	.001	3807.978
38.80	.001	3805.819	*	39.00	.001	3803.673
39.20	.001	3801.538	*	39.40	.001	3799.416
39.60	.001	3797.306	*	39.80	.001	3795.207
40.00	.001	3793.120	*	40.20	.001	3791.045
40.40	.001	3788.981	*	40.60	.001	3786.929
40.80	.001	3784.887	*	41.00	.001	3782.856

41.20	.001	3780.835	*	41.40	.001	3778.821
41.60	.001	3776.786	*	41.80	.001	3774.716
42.00	.001	3772.626	*	42.20	.001	3770.520
42.40	.001	3768.403	*	42.60	.001	3766.282
42.80	.001	3764.161	*	43.00	.001	3762.040
43.20	.001	3759.921	*	43.40	.001	3757.804
43.60	.001	3755.691	*	43.80	.001	3753.581
44.00	.001	3751.476	*	44.20	.001	3749.376
44.40	.001	3747.282	*	44.60	.001	3745.194
44.80	.001	3743.114	*	45.00	.001	3741.040
45.20	.001	3738.975	*	45.40	.001	3736.919
45.60	.001	3734.872	*	45.80	.001	3732.835
46.00	.001	3730.807	*	46.20	.001	3728.789
46.40	.001	3726.780	*	46.60	.001	3724.781
46.80	.001	3722.790	*	47.00	.001	3720.809
47.20	.001	3718.838	*	47.40	.001	3716.875
47.60	.001	3714.921	*	47.80	.001	3712.976
48.00	.001	3711.041	*	48.20	.001	3709.113
48.40	.001	3707.195	*	48.60	.001	3705.285
48.80	.001	3703.384	*	49.00	.001	3701.490
49.20	.001	3699.606	*	49.40	.001	3697.730
49.60	.001	3695.863	*	49.80	.001	3694.002

*** run completed ****

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Pasture Pond 10 year 24 hour 2006                                                                                    X
       2       0
    2.05    6.00     .10     .00
       5       2
       2       2       2       2       1
    2.75    1.50    1.40
       1      15
 13.0000  2.0000   .4250   .2500   .1500   .0750   .0500   .0300   .0200   .0100
   .0080   .0060   .0040   .0020   .0001
   94.30   83.70   78.00   73.30   66.30   45.00   34.00   26.30   20.30   15.00
   13.80   12.30   11.00   10.00     .00
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1
    .150    .150    .400
    .000    .000    .000
       1       1
    .100    .100    .400
    .000    .000    .000
       1       1       1
    .050    .050    .350
    .000    .000    .000
       1
    .050    .050    .350
       4       1       1       1       1
  27.700  65.000    .180    .200    .200    .350   1.000   3.000    .000
   .2000200.0000 10.0000   .7000  1.0000
  14.000  70.000    .200    .150    .150    .350   1.000   1.000    .000
   .2000500.0000  2.5000   .9000  1.0000
   8.600  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000400.0000  2.8000   .9000  1.0000
   5.500  70.000    .140    .000    .050    .350   1.000   1.000    .000
   .2000200.0000  1.0000   .9000  1.0000
       3       1       1       1       1
   3.100  70.000    .190    .200    .250    .300   1.000   1.000    .000
   .2000 80.0000  2.0000   .9000  1.0000
   7.400  70.000    .200    .100    .100    .350   1.000   1.000    .000
   .2000250.0000  5.0000   .9000  1.0000
   4.100  70.000    .110    .000    .000    .300   1.000   1.000    .000
   .2000150.0000  5.0000   .9000  1.0000
       1       1       1       1       1
  10.300  70.000    .100    .000    .100    .350   1.000   1.000    .000
   .2000100.0000  5.0000   .8000  1.0000
       1       1       1       1       1
   7.900  75.000    .040    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 20.0000   .8000  1.0000
       1       1       1       1       1
   1.900  80.000    .120    .000    .000    .000   1.000   1.000    .000
   .2000 30.0000  2.0000   .9000  1.0000
       4       1       1       1       1
   3.400  75.000    .020    .300    .300    .350   1.000   1.000    .000
   .2000 20.0000  5.0000   .9000  1.0000
   3.900  75.000    .140    .200    .200    .350   1.000   1.000    .000
   .2000 40.0000 10.0000   .9000  1.0000
   1.200  80.000    .040    .200    .200    .350   1.000   1.000    .000
   .2000 30.0000 10.0000   .8000  1.0000
   2.000  80.000    .150    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       1       1       1       1       1
   1.700  80.000    .070    .000    .000    .000   1.000   1.000    .000
   .2000 20.0000  2.0000   .9000  1.0000
       2       1       1       1       1
   3.600  80.000    .250    .200    .200    .350   1.000   1.000    .000
   .2000 50.0000  2.0000   .9000  1.0000
   2.400  75.000    .250    .000    .000    .000   1.000   1.000    .000
   .2000 50.0000 10.0000   .8000  1.0000
       1       2       1       1       1
    .554  90.000    .010    .000    .000    .000   1.000   1.000    .000
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.2000 20.0000 20.0000   .9000  1.0000
  .20    1.00   23.00
    3       0      10     500       1       2       2
  .00    1.50    3.50    5.50    6.20    6.30    6.50    6.70    6.90    7.50
 .084    .366    .425    .487    .505    .513    .520    .527    .534    .554
  .00     .00    .001    .001    .001    1.60    4.00    6.50    7.50    7.50
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- Measures should be taken to prevent surface water discharge on the side slopes of the fill and foundation.
- Waste material from outside sources with uncertain geotechnical engineering properties, should be placed 10 feet from the outer slopes so that they will not influence potential sliding surfaces in the spoil pile.
- A mass stability factor of safety greater than 1.5 will exist.

Groundwater Conditions

- No signs of groundwater were observed within the foundation soils in the 15 test pits or at the contact with the Mancos Shale.
- No evidence of ground water flow, seeps, springs, or damp soil on the natural slopes comprising the foundation of the spoil pile.
- Surface water from areas above the fill should be diverted around the fill.
- Percolation tests indicate permeability of approximately 2.5×10^{-3} cm/sec for in-place conditions and about 8.4×10^{-2} cm/sec for loose conditions.
- The material should be free draining and thus pore water pressures should not develop.
- Any low permeability or wet waste material should be scattered throughout the fill.

PROTECTION OF SURFACE AND GROUND WATER

Runoff from areas above the Excess Spoil Disposal Areas will be diverted around the disposal areas in stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff from the surface of the Excess Spoil Disposal Areas will be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Hydrologic calculations can be found in Appendix 7-3.

The potential for acidic leachate is minimal because of the sites selected for these permanent disposal areas. The disposal areas do not contain springs, natural or manmade watercourses, or wet weather seeps (see Appendix 9-2, Section 6.3). Under-drains will not be necessary to insure the stability of the fill. Wet waste, such as slurry, will not be disposed in the excess spoil areas. If, for any reason, water seeps out from the base of the fill, it will be contained in the perimeter ditches and diverted with the surface runoff to the existing sediment ponds.

Excess spoil that is acid- or toxic-forming or combustible and all coal mine waste placed in the disposal area will be adequately covered with four-feet of non-acid, non-toxic and non-combustible material, or otherwise treated, to control the impact on surface and groundwater, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved post-mining land use. Excess spoil that is not acid-forming nor toxic-forming nor combustible may be used to provide some, or all, of this adequate cover.

Analysis to determine the acid- and/or toxic-forming and alkalinity producing potential of the waste material disposed in the Excess Spoil Disposal Area will be performed for the constituents outlined in the Division's "Guidelines for Management of Topsoil and Overburden." The objective of this sampling program is to identify areas within the fill that may adversely impact the surface water, groundwater, plant growth, or the post-mining land use. One grab sample per acre will be taken from each four-foot lift immediately following the completion of the lift and throughout construction of the pile. Results of the sampling shall be submitted to the Division with the Quarterly Engineering Inspection Reports.

QUANTITIES

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Over the life of the SCA facility, the spoil material and coal mine waste which may potentially be disposed in the Excess Spoil Disposal Areas will come from various sources. Each of these sources is discussed in detail in Appendix 9-5.

Coal Mine Waste

- Breaker reject from the Bradford breaker located at the Sunnyside Mine
- Material from outside sources
- Low fuel potential high ash fuel reject from the crushing/screening operations

Spoil Material

- West Slurry Cell dike material
- Reclamation materials uncovered from the existing coarse refuse pile
- Fire control materials, Burned wastes within the existing refuse pile, Inert materials
- Sediment cleaned out of the sediment ponds

Table One of Appendix 9-5 projects the approximate quantities per year and for the life of the mine, and the approximate time each source of material will require disposal. Table Two of Appendix 9-5 summarizes the estimated quantities of material to be disposed during different periods through out the life of the mine. Modifications to this plan may still be required throughout the life of the mine as more information is gathered from the mining process.

Some spoil material (less than 15,000 yards) was placed in this area prior to September 1994 in accordance with the previously submitted plan. This material has been inspected and was adequately placed in a stable condition to meet the design criteria of this plan and the permanent program performance standards.

SUMMARY

- Foundation slope no steeper than 2.8H:1V (36%)
- Minimum 25 ft. setback from the crest of natural foundation slopes steeper than 2.8H:1V
- Place material in horizontal lifts no deeper than four feet and compact concurrently
- Sample and analyze for acid- or toxic-forming potential, one sample per acre per lift
- Outer slopes of fill no steeper than 2.5H:1V
- Construct terraces on the outer slope every 25-35 feet elevation, 14 ft. wide, 0.8 ft deep, profile slope 1%-4%
- Maximum height of 70 feet
- Minimum surface slope of 2%
- Protect against surface run-on with diversions designed for 100 yr, 6 hr precipitation event
- Coal mine waste, acid-forming, toxic-forming, or combustible material will be covered with a minimum of four feet of non-acid-forming, non-toxic-forming, and non-combustible material
- Regular inspections as required in R645-301-514.

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EXCESS SPOIL DISPOSAL AREA #2

The northeast portion of the Permit Area is currently occupied by the Slurry Ponds #1 and #2 and the Clear Water Pond. This area has been approved as a permanent disposal area for excess spoil and coal mine waste. It has been designed with a capacity of approximately 217,000 cubic yards (See Appendix 9-7 and drawings 9-8 A-D).

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This area is ideal for its proposed use because it is already a large incised hole in the existing disturbed area. Filling these holes will be the best attempt to return the area to the approximate original contours. This site is designed with a very mild outslope for positive drainage and is located in an area without high groundwater or major surface runoff flows.
Reclamation of this site is bonded for the costs of four feet of cover. At the completion of construction of this disposal area, SCA will perform reclamation with less than four feet in an attempt to demonstrate that successful reclamation can be accomplished with a lesser amount of borrow material cover. In the event that reclamation is not successful, the additional cover will be placed to bring it up to a total of four feet and then reseed the site.

CAPACITY of the EXCESS SPOIL DISPOSAL AREAS

The design of the Excess-Spoil Disposal Area #1 has a capacity of approximately 467,800 cubic yards most of which is still available. It should be noted that the area might be compatible to allow for further expansion of the excess spoil disposal area to the east at a later date to handle additional material if necessary.

The Excess Spoil Disposal Area #2 has a capacity of approximately 217,000 cubic yards. As of the 2002 Permit Renewal, the estimated capacity remaining was approximately 150,000 cubic yards. Although this site is available for disposal for all qualified materials, it is anticipated that it will principally be used for disposal of low fuel rejects. These two Excess Spoil Disposal Areas have ample capacity to accept the material quantities projected during the Permit Term (100,000 yards rejects, 30,000 yards spoil materials).

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The sites described below in "Additional Locations Considered for Excess Spoil Disposal Areas" are available to provide additional capacity for disposal of excess spoil materials in the event that excavation of the existing refuse pile encounters quantities of material beyond what is initially expected. These other areas may also provide SCA with the opportunity to selectively place different types of spoil material into different locations to the extent possible within the capacities available at the time the materials are disposed.

RECLAMATION of EXCESS SPOIL DISPOSAL AREAS

Reclamation of the Excess Spoil Disposal Areas will be in accordance with applicable DOGM regulations. The excess spoil and coal mine waste obtained over the life of SCA operations will be placed in a controlled manner to ensure that the final disposal facility will be suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use. The area will be reclaimed as outlined in Chapters Nine and Ten.

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ADDITIONAL LOCATIONS CONSIDERED FOR EXCESS SPOIL DISPOSAL AREAS

SCA anticipates designation of three additional sites for the disposal of excess spoil. The sites under consideration include the following: Industrial Borrow Area #1; and the Industrial Borrow Area #3 and Reclamation Borrow Area. SCA will submit a permit amendment for approval by DOGM in the event that it appears necessary to utilize additional sites because of the need for additional disposal capacity. SCA does not intend to be actively constructing various excess spoil areas concurrently without specific justification (such as separation of different types of excess spoil materials, etc.).

Construction design of the additional disposal areas will be submitted following the regulations as required. Construction is expected to be similar to the methods described above and in appendices 9-2 and 9-5. However, the locations of these additional areas are such that specific design issues to meet the requirements for structural stability, drainage concerns, approximate original contours, etc will need to be addressed in the permit amendment.

The additional sites are being considered because of the potential to use excess spoil materials to fill areas from which soil materials were or will be removed for other purposes. Filling with excess spoil could attempt to return the areas to the approximate original contours. These areas are not anticipated to be constructed with steep out-slopes or in major drainage-ways where erosion would be a serious concern. These areas may be used for excess spoil disposal following completion of their current or anticipated use.

INDUSTRIAL BORROW AREA #1

The Industrial Borrow Area #1 is located on the north edge of the permit just west of the Pasture Sediment Pond. Some borrow material was removed from this area prior to SCA's purchase of the site. Additional borrow material is available for use in contemporaneous reclamation. If this area is to be used for disposal of excess spoil materials, it could be constructed concurrently with contemporaneous reclamation which removes borrow material from the area. This spoil material could be placed in a manner which helps the area return to the approximate original contours. This area could be expanded to have the capacity to dispose of up to approximately 100,000 to 200,000 cubic yards of spoil material if needed.

INDUSTRIAL BORROW AREA #3 AND RECLAMATION BORROW AREA

These borrow areas are located on the east edge of the permit area. Some borrow material has been removed from the Industrial Borrow Area #3. Phased reclamation work throughout the life of the mine, as identified in the reclamation plan, will periodically require additional borrow material to be used until the Industrial Borrow Area #3 has consumed the entire Reclamation Borrow Area at the completion of final reclamation of the permitted area.

If this area is to be used for disposal of excess spoil materials, it could be constructed concurrently with contemporaneous reclamation which removes borrow material from the area. This spoil material could be placed in a manner which helps the area return to the approximate original contours. This area could be expanded to have the capacity to dispose of up to approximately 400,000 to 500,000 cubic yards of spoil material if needed.

9.7 BACKFILLING AND GRADING

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This section discusses the backfilling and regrading that will be done during the operations plan period. Backfilling and regrading will involve redistribution of spoil material and regrading exposed surface areas that will be reclaimed. The objective of these activities is to restore the site to topographic configurations and geomorphic conditions similar to pre-mining conditions. Final grading of all areas will include blending materials into the surrounding areas and reclaiming as detailed in Plate 10-1.

As discussed under section 9.6.3, the Industrial Waste Dump was closed prior to grading the site for temporary storage of coarse and fine refuse. Additional grading was necessary to establish the storage areas. Grading was required for Storage Areas One, Two, and Four whereas Storage Area Three did not require additional grading. Grading requirements for each storage area are specified under section 9.6.3.

9.8 TOPSOIL AND BORROW MATERIAL HANDLING

Mining operations began at the Sunnyside Mines prior to implementation of topsoil salvage requirements. Therefore, borrowed soil materials will be required in most locations in order to achieve successful reclamation on areas affected by the mining operations. A complete discussion of the materials used for topsoil and borrow material is included in Chapter Two, R645-301-200, Soils.

9.8.1 Areas to Receive Topsoil or Borrow Material

Areas within the SCA Permit Area that will receive an application of topsoil or borrow material are shown in Plate 10-6 or in Plate 8-4 for Permit Term Reclamation. Areas of contemporaneous reclamation sequencing are outlined in Plate 10-3. Application of the topsoil or borrow material are outlined in Chapter 10.

9.8.2 Borrow Material Removal

Because very little topsoil has been saved during the SCC mining activities, borrow material will need to be substituted for topsoil in order to establish vegetative growth on reclaimed areas. Detailed descriptions of topsoil handling on any newly disturbed sites is discussed in R645-301-232, Topsoil and Subsoil Removal. The following discussion pertains to the borrow area removal that will be necessary for reclamation.

Approximately 375,000 cubic yards of borrow material will be needed for all reclamation activities to cover the area delineated in Plate 10-3. This borrow material will be obtained from the borrow areas outlined in Chapter Two, R645-301-224, Substitute Topsoil. The borrow material that will be utilized is the best available within the SCA Permit Area which lies close to the existing disturbed areas. Borrow material will be removed from these sites and contoured such that each acts as a catchment basin or drained to flow into the existing sediment ponds. This will be done to control run-off from each borrow area and provide water for wildlife species.

A sufficient amount of material will be left in the bottom of each borrow area for reclamation, and each borrow area will be permanently revegetated according to the procedures discussed in section 9.9. For contemporaneous revegetation efforts, the borrow area will be seeded with the approved interim seed mix if additional borrow excavation is not expected during the next year.

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The borrow material stripping depths will be confirmed by qualified personnel in the field prior to actual disturbance. Salvageable topsoil will be removed from the borrow areas as described in Chapter Two, R645-301-232, Topsoil and Subsoil Removal.

9.8.3 Topsoil Storage

Detailed descriptions of topsoil handling on any newly disturbed sites is discussed in R645-301-232, Topsoil and Subsoil Removal.

9.8.4 Topsoil and Borrow Material Redistribution

The recontoured surfaces of disturbed areas that will receive borrow material or topsoil will be cleaned of waste material including any the hardpan material that may have formed between the refuse and soil layers. The sub-grade will be prepared by ripping to a prudent depth. Ripping will alleviate compaction caused by equipment and will also provide a roughened surface for bonding with the borrow material. All roadbeds will be ripped twice, once each in opposite directions.

After appropriate surface regrading and ripping is completed, borrow material will be applied. The borrow material will be distributed by end-dumping, and minimal grading will be utilized to redistribute the dumped materials sufficient to cover the reclaimed sites. The borrow materials will not be evenly distributed as to depth, thus the materials will be unevenly distributed and result in a rough uneven surface. The small ruts and ridges will serve as catchment for water during the revegetation process. The average borrow material depths are outlined in Section 9.8.1.

On slopes greater than 2:1 the end-dumped topsoil materials will be pushed onto the slopes with a dozer and a backhoe will be used to systematically gouge depressions from four (4) to eight (8) inches deep on 30% of the slope surface or as needed to roughen smoothed surfaces. The footprints of the workers installing the erosion netting or other additional erosion control measures may also provide numerous small depressions.
Prior to seeding, the topsoil and other regraded surfaces will be disced lightly, or be scarified along the contour if a crust has developed since final grading or other soil preparation activities. Otherwise, no special soil preparation will be necessary.

9.8.5 Amendments

It is possible that the applied borrow material may require fertilizer amendments at the time of reclamation. However, it is not the current practice of the Division to apply fertilizer during reclamation. Soil testing at the time of reclamation may be conducted according to DOGM Topsoil Guidelines to determine if fertilizer is needed. SCA will work with DOGM to ensure that the redistributed soils are analyzed according to DOGM Guidelines and that the tests are performed by an approved laboratory. If needed, soil amendments will generally be applied during the fall concurrent with reseeding operations to maximize plant response.

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9.9 REVEGETATION

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The objective of the post-mining revegetation program is to restore the surface-disturbed area to a land use capability similar to that which existed prior to mining. The initial reclamation objectives will be to stabilize the soils and to restore the disturbed area to approximate original topographic conditions. Ultimately, the disturbed areas will be returned to their pre-mining use with watersheds in their approximate pre-mining character. In general, the long-term appearance and usefulness of the reclaimed permit area will be similar to that encountered prior to mining and also to that found in the adjacent areas that remain undisturbed by mining and related activities.

9.9.1 General Revegetation Procedures

All areas that are currently disturbed are shown on Plate 3-1, as well as those areas that will be disturbed as a result of the Mining Plan or the Reclamation Plan activities will be reclaimed according to the procedures discussed in this section. Areas of contemporaneous reclamation which will occur during the operations phase are outlined in Plate 10-3. A Final Reclamation Plan is presented in Plate 10-1 through 10-7. The general procedures outlined below will be used for all reclaimed sites. Additional details on these procedures can be found throughout this chapter and in chapter 10.

- Sub-grade shall be cleaned of waste material, scarified and pulverized before covering with topsoil or borrow material.
- Topsoil or borrow material will be spread unevenly over all areas to approximate depths as described in the final reclamation plan.
- The final grade will be blended into the existing grade with a natural finish.
- The finished grades will be left in a roughened state. On slopes less steep than 2:1, all efforts will be made during grading to conduct the last pass in the direction of the contour rather than perpendicular to the contour. The purpose of this effort will be to leave small berms to break up the slope.
- If it is determined to be needed, fertilizer will be spread just prior to seeding. The fertilizer may be spread by any method that will give an even distribution.

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- Areas with slopes greater than 2:1 shall be scarified to a depth of 6-inches prior to seeding.
- Final reclamation seeding must be accomplished between October 1st and November 30. All efforts will be made to plan and schedule reclamation work such that it can be completed in a time frame that allows seeding to be accomplished during this approved seeding window. If seeding is not finished during this time frame then all remaining seeding and any related reclamation work will be suspended until the following year. Areas which cannot be seeded during the seeding window will be stabilized to reduce erosion. Some acceptable methods of stabilization include: seeding with an annual grain, mulching, or netting until the seeding window has opened. However, seeding with an annual grain will not take place later in the year than September 15 for areas which are to be seeded with a permanent seed mixture that fall due to the potential competition the annual grain may have. Interim seeding may be conducted at SCA's discretion during other times during the year (such as early spring) that currently appear to show promise of success.
- For areas to be hydro-seeded the water and 15% of the wood fiber mulch and 50% of the tackifier will be mixed in the hydroseeder. The slurry will then be mixed with water at a rate of 13,000 gallons per acre and the seed will be added to the slurry. The seed/slurry mixture will be applied to form an even cover within 30 minutes of the seed being added to the slurry. Application will begin at the top of the

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slope and work downward. The remaining mulch and tackifier will be applied immediately following initial seeding.

- For slopes greater than 2:1, seed may be broadcast evenly over the prepared slopes by means of a hand-held seeder. Broadcasting will not be done during windy conditions or when the soil is saturated.

- All areas which are seeded will be raked or chained to provide adequate seed to soil contact.

- On slopes steeper than 2H:1V, additional erosion control measures (such as excelsior type mats) will be implemented to cover the seed bed surface and protect the barren soil surface from wind and water erosion, to increase revegetation success to meet the post-mining land use. If methods of erosion control which are more economically viable than matting are generally accepted by revegetation specialists as effective for slopes similar to what is being reclaimed, SCA will present the option to DOGM for review prior to beginning revegetation work.

- Shrub plantings will be used on a few sites to augment the shrub portion of the existing plant community and to blend in man-made features with the natural terrain. The shrub stock will be pinyon pine and juniper tublings. The tublings will be grouped and not evenly placed at a density of 200 shrubs per acre. The planting site will be saturated with water as the initial irrigation. The planting site and rooting area will be hand-cleared of all vegetative growth to reduce competition from established vegetation. SCA commits to creating six (6) areas consisting of approximately 1000 shrub plantings each as shown on Plate 10-7. These shrub plantings will occur at the time that final reclamation work is performed in each designated area. The shrub plantings are being created for the purpose of establishing areas of cover for wildlife habitat.

- Rock piles will be placed at random across the regraded site. The rock piles will be constructed from boulders obtained during borrow material excavation and will generally consist of boulders larger than one foot in diameter (ie. those easily removed during excavation). Approximately four piles will be constructed per acre until available rock materials obtained from the borrow areas are exhausted. The piles will vary in size but could average approximately 6'-10' in diameter and 3'-8' high. The rock piles are being created for the purpose of providing habitat for snakes, small mammals (marmots, ground squirrels, chipmunks and other ground dwelling rodents), etc.

9.9.2 Interim Revegetation

During the operations phase several areas will receive interim revegetation stabilization including the following:

- New berms or other new disturbances associated with the construction of sedimentation ponds or related structures including embankment tops, slopes, ditches, etc. At this time there are no new sedimentation ponds proposed.

- New topsoil piles associated with new disturbances.

- Any other areas associated within the SCA Permit Area which are judged to require interim stabilization.

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These areas will be disturbed again during final reclamation activities and therefore will not receive topsoil. Because backfilling and construction of hydrologic controls will occur just prior to seeding, many of the seed beds will require no additional preparation. Furthermore, subsequent surface manipulation of these areas would demolish constructed structures.

Compacted areas will be prepared for seeding by ripping, scarifying, or discing the materials in place. All areas will then be seeded, fertilized, and mulched utilizing standard broadcast or hydroseeder methods.

For most areas requiring interim stabilization during the Mining Period, 16-16-8 fertilizer will be applied at a rate of 150 pounds per acre, if it is determined to be needed. Topsoil stockpiles will not be fertilized. The interim seed mix proposed for use in all areas is shown in Figure 9-1, Interim Reclamation Seed Mixture. This mix contains a combination of native and introduced species and is proposed because the species establish rapidly and effectively control erosion. Mulch will consist of a wood fiber or weed-free straw applied at a rate of one ton (1) per acre.

In addition to the benefits received from interim revegetation in terms of soil stabilization and erosion control, SCA also expects to reduce annual weedy species on topsoil piles and borrow areas through establishment of an interim perennial vegetative cover. This reduction in weedy species, and therefore a reduction in available weed seed in the area, could greatly increase the chance of permanent vegetation success. SCA will pay close attention to weed population and determine if additional weed controls are needed in accordance with section 9.11.2.

9.9.2.1 Interim Reclamation of the Third and Forth Lifts of the Coarse Refuse Pile

Revegetation on all land that is disturbed by coal mining and reclamation operations will occur as contemporaneously as practicable with mining operations, except when such mining operations are conducted in accordance with a variance for combined SURFACE and UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES issued under R645-302-280. During the life of SCA operations, interim reclamation will be accomplished as necessary or as required by the Division. Cover material will be obtained from an approved borrow material site and the depth of cover will be approved by DOGM prior to conducting contemporaneous reclamation.

Interim reclamation was performed on the third lift and the fourth lift of the coarse refuse pile in 1993 and the spring of 1994. The Division approved SCA's plan to cover the remaining portion of the third lift with two (2) feet of borrow material. The material in the designated Excess Spoil Pile site was previously approved by DOGM to use as borrow material, therefore, SCA utilized this material to cover the remainder of the third lift. There were approximately two (2) acres on the third lift which were covered with approximately 6,500 cubic yards of material. The fourth lift was covered and reseeded at the same time and in the same manner as the third lift.

The Interim Seed Mixture (Figure 9-1) was utilized for interim reclamation of the third and fourth lifts. Erosion and sediment control consisted of slope stabilization using 16-16-8 fertilizer at a rate of 150 pounds per acre and wood fiber mulch at a rate of one (1) ton per acre.

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EXCESS-SPOIL DISPOSAL AREA #2 DESIGN

INTRODUCTION

This plan describes the design, construction, operation, and maintenance of the Excess Spoil Disposal Area #2. Appropriate maps and cross-section drawings of the area as designed are included in the Mining and Reclamation Plan. The MSHA ID Number associated with this facility is 1211-UT-09-02093-05.

Excess spoil and coal mine waste will be placed in the designated Excess Spoil Disposal Area #2 (see Plates 9-8 A, B, C & D) in a controlled manner to:

(1) Minimize adverse effects of leachate and surface water runoff from the fill on surface and ground-water quality and quantity;
(2) Ensure mass stability and prevent mass movement during and after construction;
(3) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use;
(4) Not create a public hazard; and
(5) Prevent combustion.

At no time will any non-coal mine waste (including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities) be deposited in the excess spoil fill. No burning waste will be placed in the fill.

This disposal area is designed in accordance with the requirements for excess spoil areas, as well as for refuse piles. Coal mine waste, which is disposed of in the excess spoil area, will be placed in accordance with the requirements herein and will be of the proper characteristics to be consistent with the design stability of the fill. Coal mine waste materials from activities located outside this SCA permit area may be disposed of in the permit area only if of the proper characteristics to be consistent with the design stability of the fill as stated in this Appendix.

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SITE SELECTION

The attached exhibit identified for the Excess Spoil Pile #2 identifies the location of the pile with reference to the SCA Power Plant and other features overlaid on a segment of the USGS 7½ minute Sunnyside Topographic Quad. This disposal area is located on relatively flat ground in the north east portion of the permit site in an area previously occupied by Slurry ponds #1 and #2 and the Clear Water Pond. This site was selected because it was already a large incised hole in the existing disturbed area. Filling these holes will attempt to return the area to the approximate original contours. This site is designed with a mild out slope for positive drainage and is located in an area without high groundwater or major surface runoff flows.

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Additional benefits of this site also include the fact that it is a significant distance away from other major surface installations and no mine openings exist within a 500-foot radius of the pile's outer boundary perimeter [30 CFR 77.215-2 (b) (4)]. The SCA power plant is located more than 1000 feet to the west of the pile, and the SCA crushing facilities are located more than 700 feet west of the pile. (See plate 5-1 and 5-1E). It is expected that construction of the disposal area will not affect any previously undisturbed land in the area.

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Federal regulations, 30 CFR 77.214 (b), also require isolation of the pile from any coal seams in the area. No coal seams exist within the near proximity of the spoil pile.

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STABILITY

The fill and appurtenant structures were designed using current, prudent engineering practices and meet the design criteria established by the Division. Qualified registered professional engineers experienced in the design of earth and rock fills have certified the design of the fill and appurtenant structures. Regulations require that the pile not have an outer slope steeper than 2 horizontal to 1 vertical [30 CFR 77.215 (h)]. Since the fill is designed with an out slope of approximately 15-20% it has no trouble attaining a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill are in the hole and will be stable under all conditions of construction.

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FOUNDATION INVESTIGATIONS

Due to the simplicity of this design (filling an existing hole) foundation investigations were limited. No underground mine workings exist within the SCA permit area to have any effect upon the stability of the fill and appurtenant structures. The slope of the native foundation material in the disposal area does not exceed a slope of 2.8h:1v (36 percent).

Groundwater Conditions

* No signs of groundwater have been observed within the existing ponds.
* Surface water from areas above the fill is designed to be diverted around the fill.
* The material to be disposed should be free draining and thus pore water pressures should not develop.
* Any low permeability or wet waste material should be scattered throughout the fill.

TOPSOIL PRESERVATION

No topsoil was segregated from this the Slurry Pond area at the time of their construction in the 1970's. An existing topsoil pile was created for the Clear Water Pond. Since this area has been used as a slurry handling and disposal site for the past couple of decades, it would not be appropriate to segregate additional topsoil from this area for future use. All vegetative and organic materials will be removed from the disposal area prior to placement of excess spoil.

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CONSTRUCTION

In accordance with 30 CFR 77.215-2 (b) (8), a description of the manner of construction to be employed at the site is as follows:

Excess spoil will be transported and placed in a controlled manner in horizontal lifts not exceeding 2 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material. Material will be placed in the fill by end or belly dumping and then spread into compactable lifts. The gradual progression of the fill will essentially fill the two slurry ponds to their proposed surface, then filling the Clearwater Pond and connecting to the initial phases of the pile constructed over the slurry pond area.

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Compaction of the spoil materials and coal mine waste materials will be accomplished by wheel rolling from the hauling and spreading equipment such as ten wheel dump trucks, other haul trucks, belly dumps, scrapers, dozers, etc. Spreading and compacting the material in intermediate lifts less than two feet can add to the effectiveness of compaction by wheel rolling.

The final configuration of the fill will be suitable for the approved post-mining land use. The grade of the out-slope will be approximately 15-20 percent. Detailed drawings (including typical sectional maps of the pile crosswise and lengthwise) as required by 30 CFR 77.215-2 (b) (8), are provided as Plates 9-8 A, B, C, D. These show all dimensions of the spoil pile to be constructed.

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No permanent impoundments will be constructed on the completed fill. The final surface will be left in a roughened condition such that the small depressions should minimize erosion and assist revegetation.

BURNING AND BURNED WASTE UTILIZATION

All possible efforts will be made to reduce the potential for the occurrence of coal mine waste fires in the Excess Spoil Disposal Area #2. Although coal mine waste will be placed in the fill, it is intended that this material will have a very low BTU level and therefore not create a significant risk of combustion. Ash materials from burned coal mine waste may be placed in the fill but should not create a significant risk of combustion. No burning waste will be placed in the fill.

In the event that a coal mine waste fire occurs, it will be extinguished by the proper personal who conduct the surface mining activities, in accordance with the plan approved by the Division and the Mine Safety and Health Administration as required by 30 CFR 77.215(j). This plan essentially entails the placement of two feet (or more if necessary) of non-combustible soil material over the burning area. Only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be

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involved in the extinguishing operations. No burning or unburned coal mine waste will be removed from a permitted disposal area without a removal plan approved by the Division. Consideration will be given to potential hazards to persons working or living in the vicinity of the structure.

ACID- and/or TOXIC-FORMING POTENTIAL OF WASTE

Previous tests of the material at the SCA facilities have indicated that the acid- and/or toxic-forming potential of the waste is not a significant problem. However, in order to be conservative, analysis to determine the acid- and/or toxic-forming and alkalinity producing potential of the waste material disposed in the Excess Spoil Disposal Area will be performed for the constituents listed below. The objective of this sampling program is to identify areas within the fill that may adversely impact the surface water, groundwater, plant growth, or the post-mining land use. One grab sample per acre will be taken from each four-foot lift immediately following the completion of the lift and throughout construction of the pile. Results of the sampling shall be submitted to the Division with the Quarterly Engineering Inspection Reports.

Excess spoil that is acid- or toxic-forming or combustible materials placed in the disposal area will be adequately covered with four-feet of non-acid, non-toxic and non-combustible material, or otherwise treated, to control the impact on surface and groundwater, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved post-mining land use. Excess spoil that is not acid- or toxic-forming or combustible may be used to provide some, or all, of this adequate cover.

Coal mine waste materials, of which geologic properties are uncertain or which have sub-standard geologic characteristics, will be scattered within the interior of the pile at least ten feet from the outer slopes. Waste materials from areas outside of the SCA permit site, but which are comparable to the materials considered in the design of the fill, may be placed in the fill by SCA in accordance with the standards of this section but without additional restriction.

ANALYSIS PARAMETERS

* pH
* Electrical Conductivity
* Particle Size Analysis (% sand, silt, clay)
* Soluble Ca, Mg, and Na
* Sodium Adsorption Ration
* Selenium
* Total N
* Nitrate-N
* Boron
* Maximum Acid Potential Neutralization Potential
* Organic Carbon
* Sulfur-total

PROTECTION OF SURFACE AND GROUND WATER

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Runoff from areas above the Excess Spoil Disposal Area #2 will be diverted around the disposal area in stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff from the surface of the Excess Spoil Disposal Area will be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event.

The potential for acidic leachate is minimal because of the site selected for this permanent disposal area. The disposal area does not contain springs, natural or manmade watercourses, or wet weather seeps. Under-drains will not be necessary to insure the stability of the fill.
Wet waste, such as slurry, will not be disposed in the excess spoil area. If, for any reason, water seeps out from the base of the fill, it will be contained in the perimeter ditches and diverted with the surface runoff to the existing sediment ponds.

HYDROLOGIC FLOWS

Diversions have been constructed and will be maintained around the perimeter of the fill. Hydrologic calculations have been prepared for the surrounding area, which is fairly representative of the proposed ground surface during construction and will improve upon completion of the revegetation.

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During construction of the fill, the existing diversions will be adequate to control runoff and direct the adjacent surface flows around the fill. These existing diversions include the old slurry ditch, which is no longer used for slurry transport, (at least 2 feet deep and 8 feet wide) and the surface diversion into the Clear Water Pond (approximately 1 foot deep and 4 feet wide). [30 CFR 77.215-2 (b) (6)] (See Appendix 7-3 for hydrologic calculations)

Construction of the fill will occur in a layering manner such that the direct precipitation falling on the fill can flow off of the fill when the existing slurry ponds are filled. Following the filling of the slurry ponds and when it is necessary to divert runoff around the Clear Water Pond so that it can be filled with spoils, the final diversions (minimum 1.5 foot cut ditches and culverts where shown) will follow the alignments shown on Plate 9-8C. This shows that the runoff from this area will flow into the diversions, around the fill and either to the Pasture Pond or the upper end of the East Slurry Cell as shown.

EROSION CONTROL

Uncontrolled surface drainage will not be diverted over the out-slope of the disposal area. Outer slopes will be graded at a mild slope in order to minimize surface erosion at the site and provide adequate stability. The final surface configuration will leave a roughened condition to reduce the potential for direct runoff from the fill. This will reduce the amount of rill and gully erosion and therefore increase the long-term stability.

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All disturbed areas of the fill, will be revegetated upon completion of construction in an effort to demonstrate successful reclamation with less than four feet of borrow material cover over coal mine waste. The success of the revegetation will also evaluate its ability to control erosion. However, until it is proven that less than four feet of borrow material will be adequate for reclamation, SCA will maintain its bond based on utilizing the entire four feet of cover.

The sediment ponds in place, until bond release, will perform final sediment control.

INSPECTIONS

A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, will periodically inspect the fill during construction. The professional engineer or specialist will be experienced in the construction of earth and rock fills.

Such inspections will be made at least quarterly throughout construction and during critical construction periods. Critical construction periods will include at a minimum: foundation preparation, including the removal of all organic material and topsoil; installation of final surface drainage systems; and, the final graded and revegetated fill. Regular inspections by the engineer or specialist will also be conducted during placement and compaction of fill materials.

The qualified registered professional engineer will provide a certified report to the Division promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the regulatory requirements. The report will include appearances of instability, structural weakness, and other hazardous conditions as well as the results of samples taken to determine the acid/toxic potential. The photographs accompanying each certified report will be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report will be retained at or near the mine site. A copy of the report will be sent promptly by SCA to DOGM.

If any examination or inspection discloses that a potential hazard exists, the Division will be informed promptly of the findings and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division will be notified immediately. The Division will then notify the appropriate agencies that other emergency procedures are required to protect the public.

More frequent inspections will be conducted if a danger of harm exists to the public health and safety or the environment. Inspections will continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.

CAPACITY of the EXCESS SPOIL DISPOSAL AREA #2

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This disposal area has a design capacity of approximately 217,000 cubic yards (see calculation table on next page). Upon approval, it is readily available for use without additional site preparation. Over the life of the SCA facility, the spoil material and coal mine waste which may potentially be disposed in excess spoil disposal areas may come from various sources. These sources are explained in detail in Appendix 9-5. However, it is expected that this site will principally be used for disposal of low fuel potential/high ash rejects from the crushing operation. Under currently planned operations, it is anticipated that approximately 20,000 cubic yards of this reject material may require disposal each year within the next permit term. This site alone has adequate capacity to dispose of all anticipated reject material to be generated within the next permit term.

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FINAL RECLAMATION OF SPOIL DISPOSAL SITE

Final reclamation of Excess Spoil Disposal Area #2 will be in accordance with applicable DOGM regulations. The excess spoil obtained over the life of SCA operations will be placed in a controlled manner to ensure that the final disposal facility will be suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use. As previously discussed, it is the intent of SCA to initially utilize this site as a demonstration area to evaluate the success of reclamation with less than four feet of borrow material cover over coal mine waste. Nonetheless, SCA has posted bond adequate to reclaim the area with a total of four feet of cover if necessary. Release of this bond will not be requested until the reclamation is demonstrated successful.

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Sunnyside Cogeneration Associates
Sunnyside Refuse and Slurry C/007/035
Excess Spoil Disposal Area #2
Revised Capacity Calculations

	Cross Sectional Areas			Volume Comparison Calculations	
	Total Pile Area (1997 conditions) (sf)	Remaining Pile Area (2002 conditions) (sf)	Dist. Between Sections (ft)	Total Pile Volume (beginning 1997) (cy)	Remaining Pile Volume (after 2002) (cy)
South	0	0	0		
Section E	849	622	48	755	553
Section F	2,222	1,664	100	5,687	4,233
Section G	3,071	2,047	100	9,802	6,872
Section H	3,911	2,426	100	12,930	8,283
Section I	4,479	2,816	100	15,537	9,707
Section J	5,303	3,734	100	18,115	12,130
Section K	9,951	9,258	100	28,248	24,059
Section L	10,424	7,926	100	37,731	31,822
Section M	7,880	4,710	100	33,896	23,400
Section N	7,555	4,240	100	28,583	16,574
Section O	4,110	1,770	100	21,602	11,130
North	0	0	55	4,186	1,803
				217,072	150,567

Note: Volume 1997 represents the total volume of the pile based on the bottom surface that existed in 1997 prior to beginning construction and filling the slurry ponds. Volume 2002 represents the remaining volume based on the existing surface in 2002 with the slurry ponds partially filled. Both calculations are projecting a finished top surface as shown on the drawings signed Oct 18, 2004.

Note: See Drawings 9-8B and 9-8D for cross section maps

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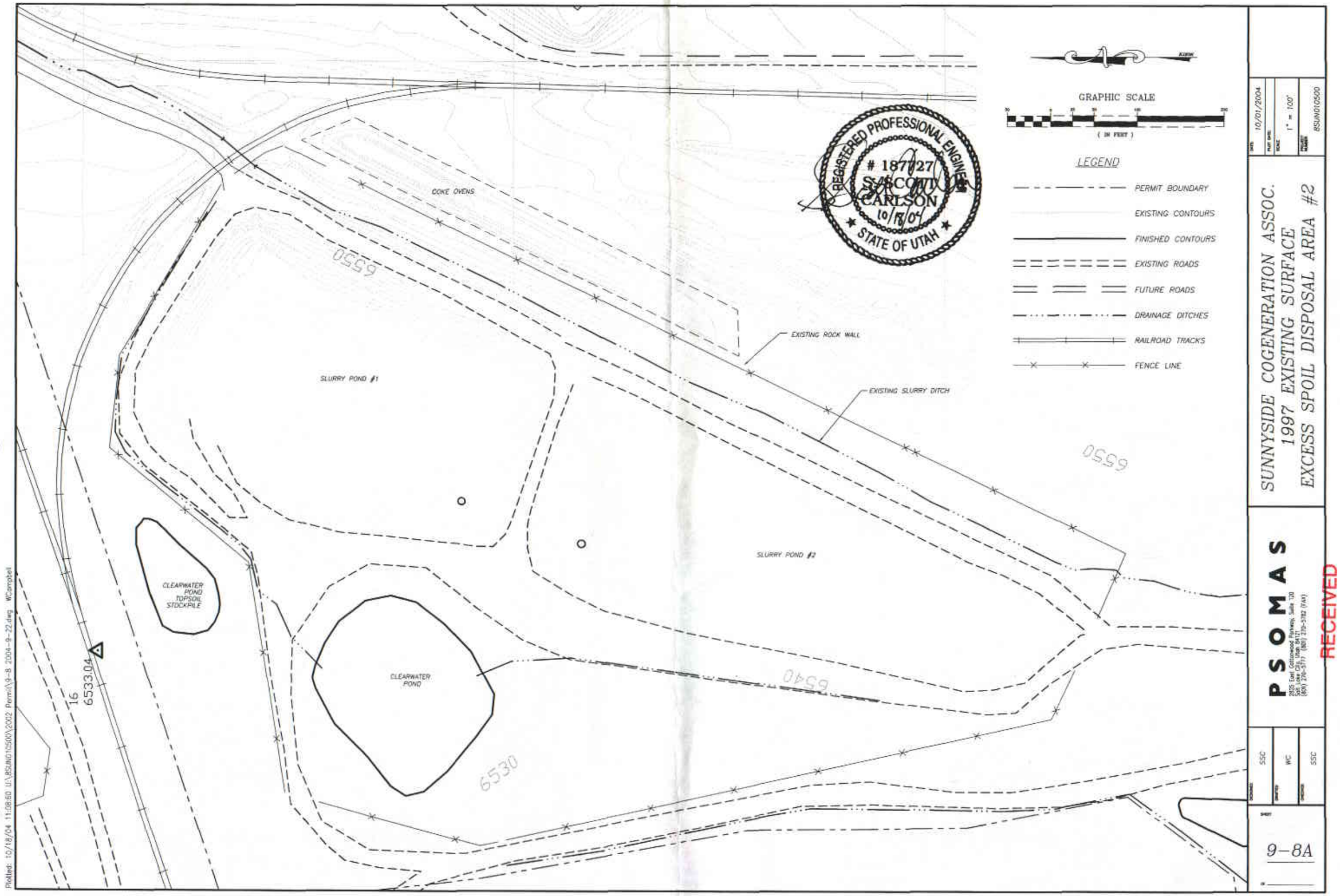

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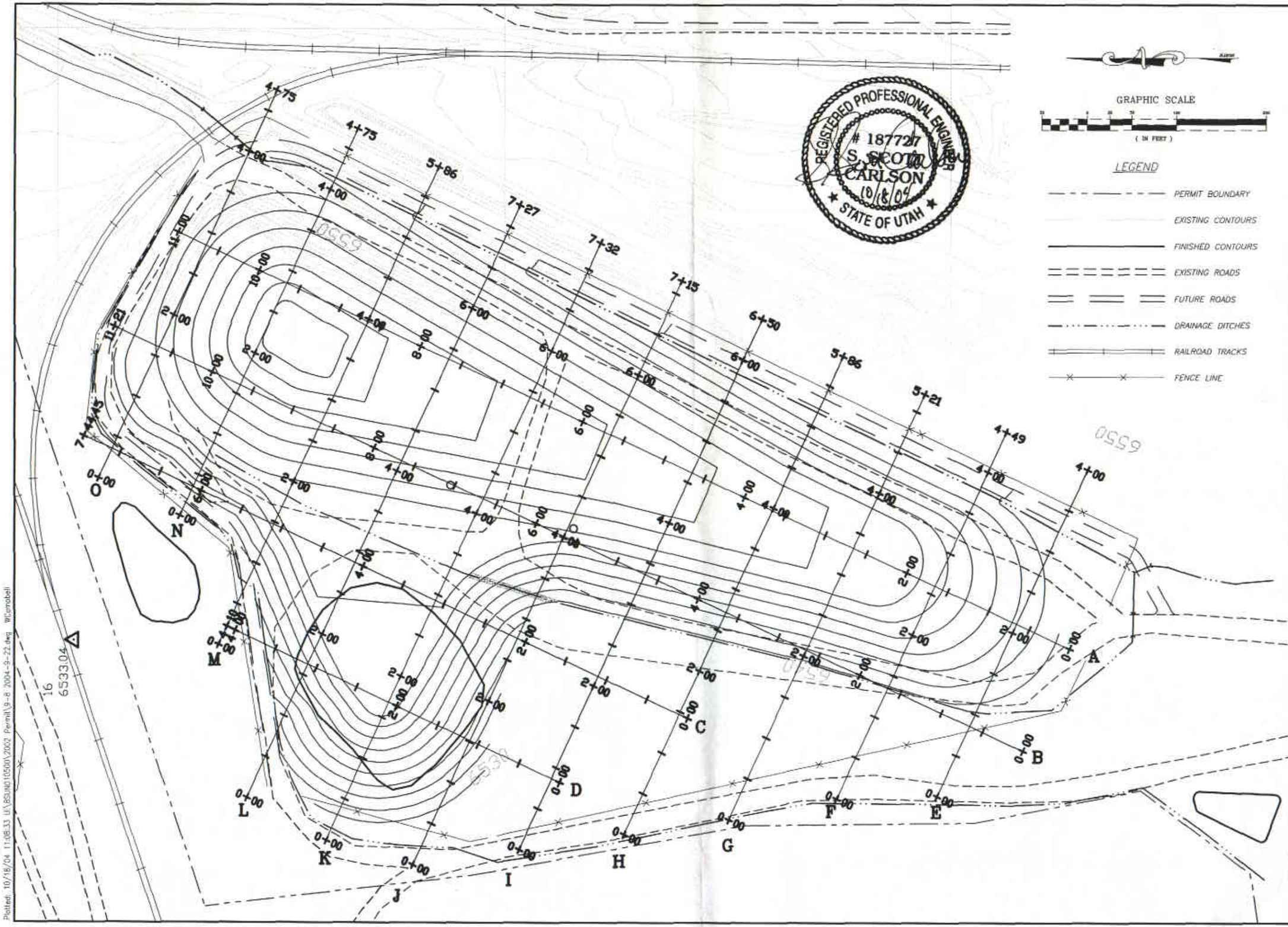

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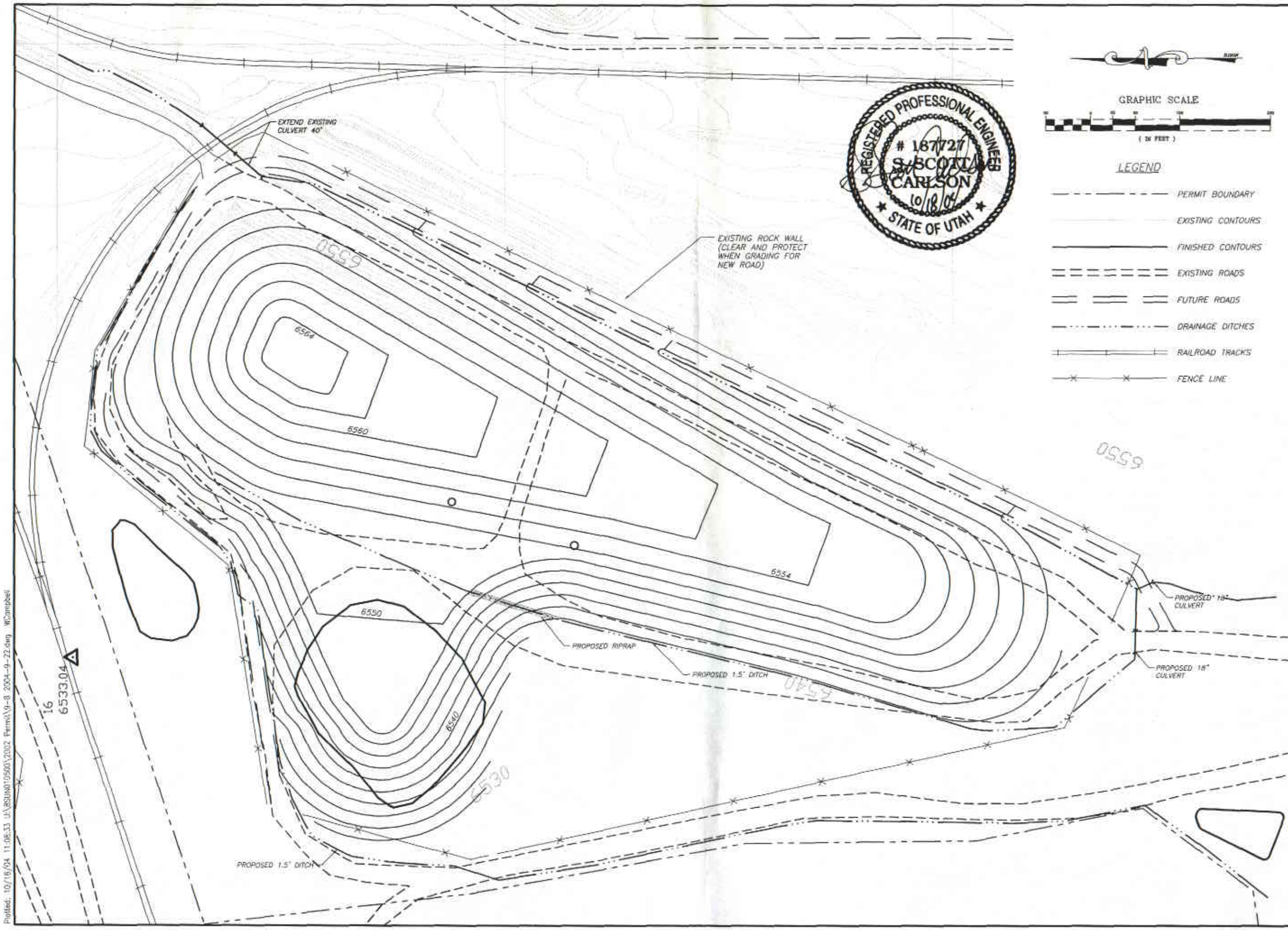

DATE: 10/01/2004
PLOT NOTE:
SCALE: 1" = 100'
PROJECT NUMBER: BSUN010500

SUNNYSIDE COGENERATION ASSOC.
DRAINAGE AND DIVERSIONS
EXCESS SPOIL DISPOSAL AREA #2

PSOMAS
2825 East Cottonwood Parkway, Suite 120
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(801) 270-5777 (801) 270-5702 (FAX)

DESIGNED: SSC
DRAFTED: WC
CHECKED: SSC

SHEET
9-8C

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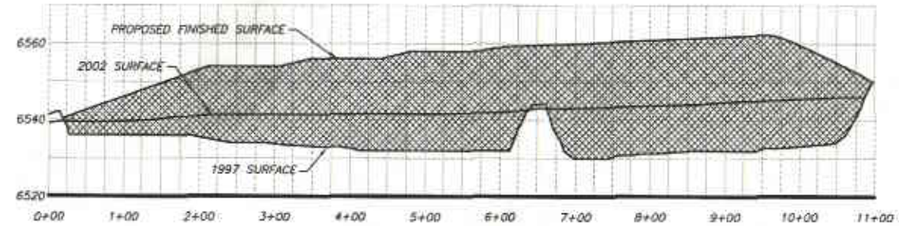

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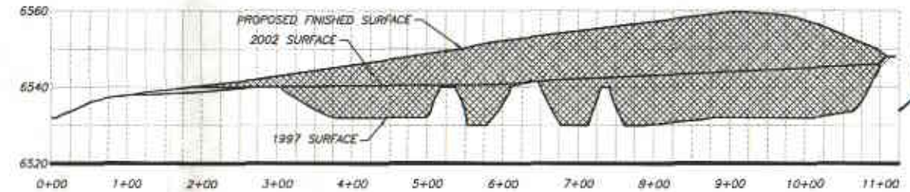

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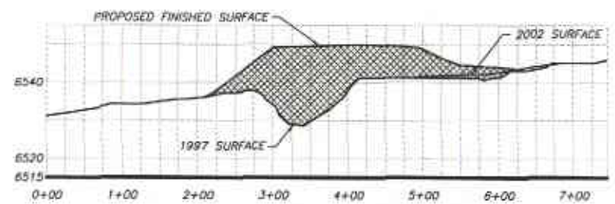

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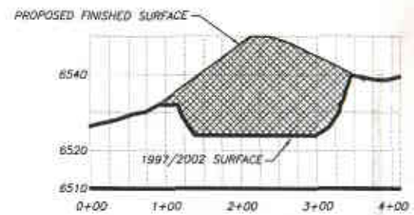

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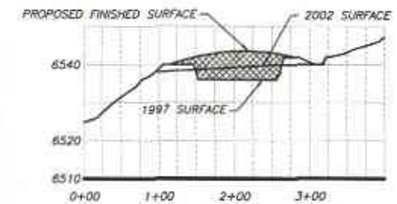

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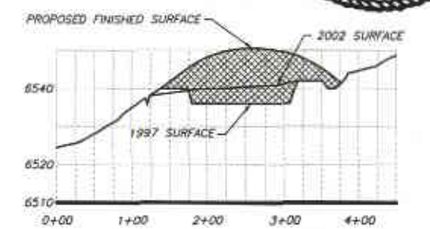

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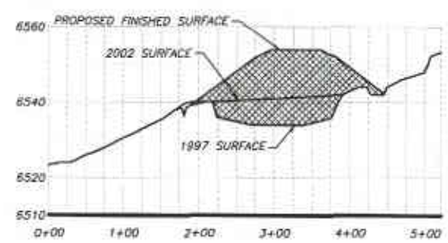

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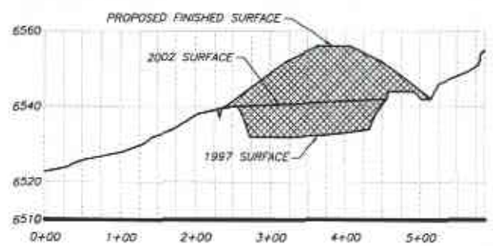

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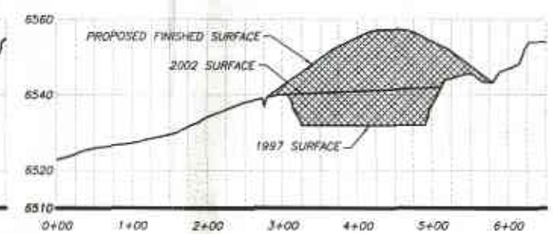

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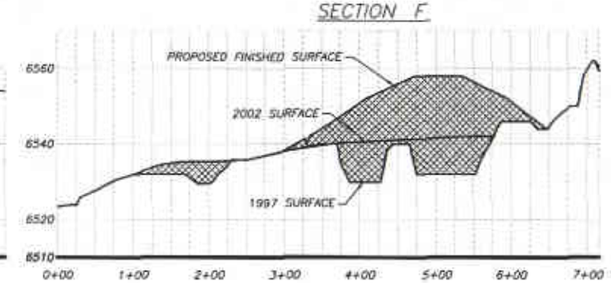

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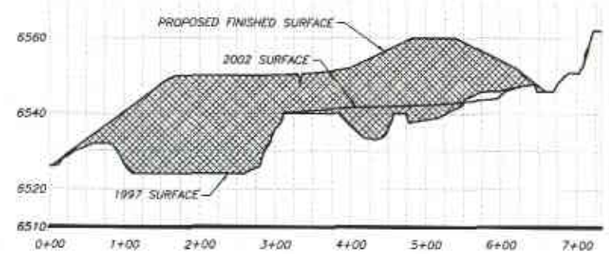

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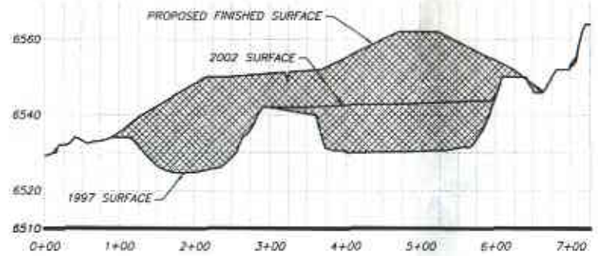
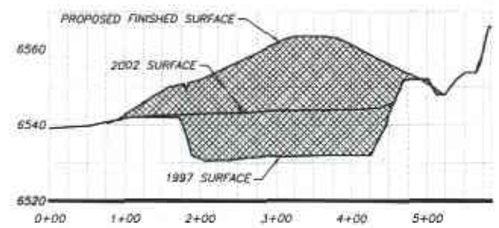


SECTION L



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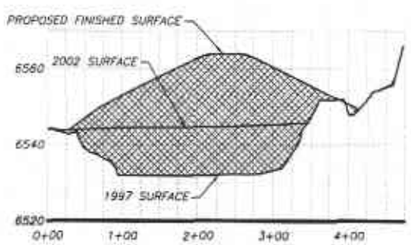
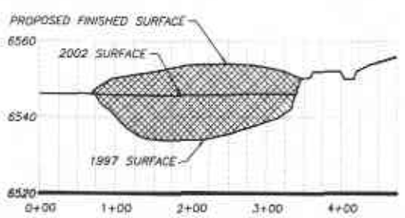


SECTION N



SECTION O

Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut cu.yds	Fill cu.yds	Net cu.yds	Method
1997							
	1997	existing 1997	top-fg				
				55	216600	216545 (F)	Grid
				78	217039	216961 (F)	Composite
				87	218005	217918 (F)	Prismoidal
2002							
	2002	existing 2002	top-fg				
				59	148751	148693 (F)	Grid
				84	149181	149097 (F)	Composite
				84	150394	150310 (F)	Prismoidal

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

HORIZONTAL SCALE: 1" = 200'
VERTICAL SCALE: 1" = 40'

LEGEND

FINISHED SURFACE

EXISTING SURFACE

EXCESS SPOIL MATERIAL

REGISTERED PROFESSIONAL ENGINEER # 187727 SCOTT A. CARLSON 10/18/04 STATE OF UTAH

DATE	10/01/
PLOT SCAL	
SCALE	1" = 200'
PROJECT NUMBER	BSUN010500

SUNNYSIDE COGENERATION ASSOC.
CROSS SECTIONS
EXCESS SPOIL DISPOSAL AREA #2

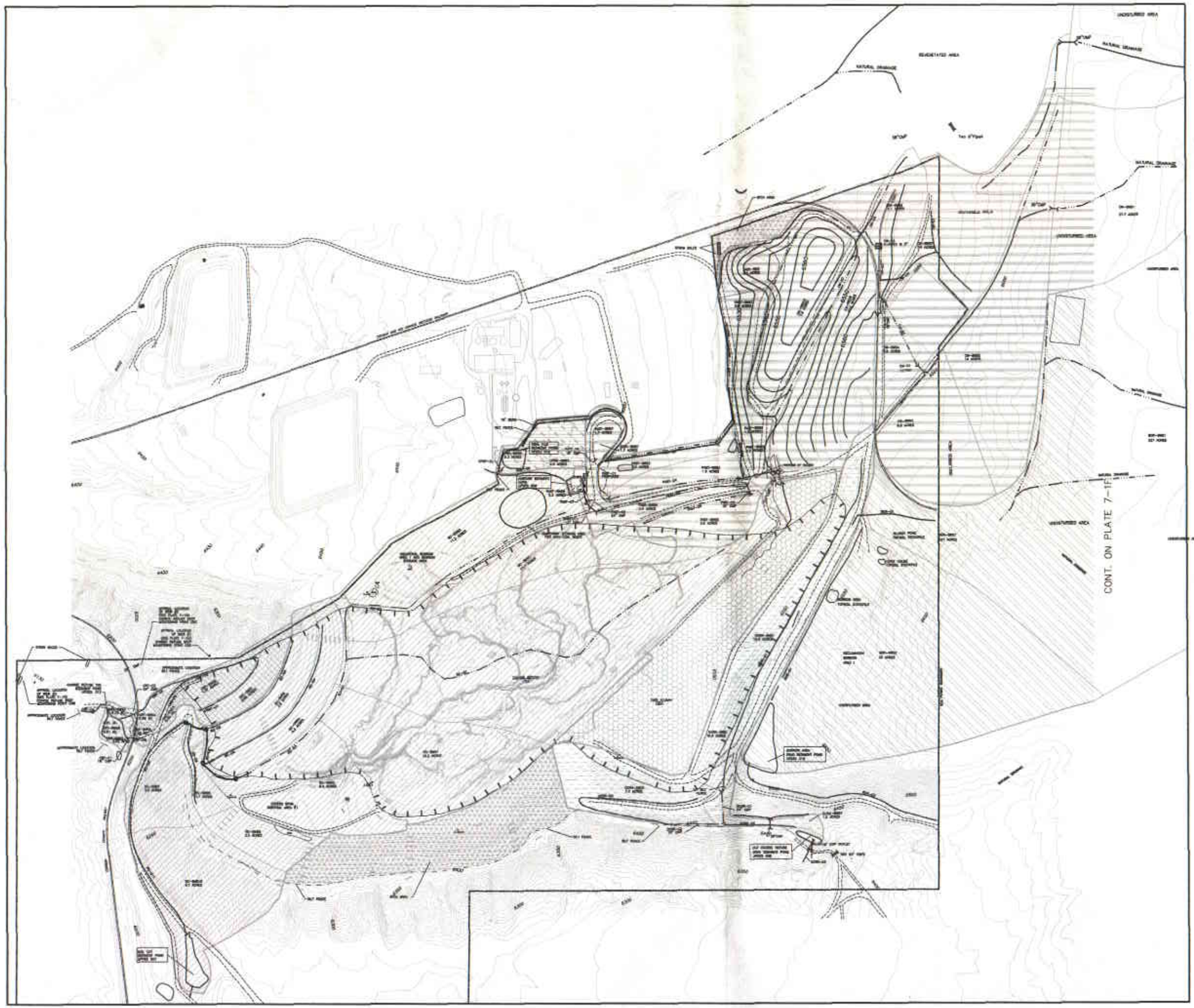
PSOMAS
2825 East Cottonwood Parkway, Suite 120
Salt Lake City, Utah 84121
(801) 270-5777 (801) 270-5782 (FAX)

DESIGNED	DRAFTED	CHECKED
SSC	WC	SSC

SHEET 9-8D OF

RECEIVED
SEP 13 2006
DIV. OF OIL, GAS & MINING

Plotted: 10/18/04 11:08:33 U:\BSUN010500\2002 Permit\9-8 2004-9-22.dwg WCampbell



LEGEND

- PERMIT BOUNDARY
- COLLECTOR DITCH
- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARY
- ROAD
- SILT FENCE
- UPDES POINTS
- COARSE REFUSE TOE SEDIMENT POND DRAINAGE
- BORROW AREA POND DRAINAGE
- OLD COARSE REFUSE ROAD SEDIMENT POND DRAINAGE
- PASTURE SEDIMENT POND DRAINAGE
- RAIL CUT SEDIMENT POND DRAINAGE
- BTCA AREA
- COAL PILE SEDIMENT POND DRAINAGE
- EAST SLURRY CELL DRAINAGE

NOTE:
AREAS HATCHED ARE BASED ON DRAINAGE PATTERNS AND MAY INCLUDE BOTH DISTURBED AND UNDISTURBED GROUND.

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DATE XX-XX-XX
FILE NAME
SCALE 1" = 200'
PROJECT 6SUN010500

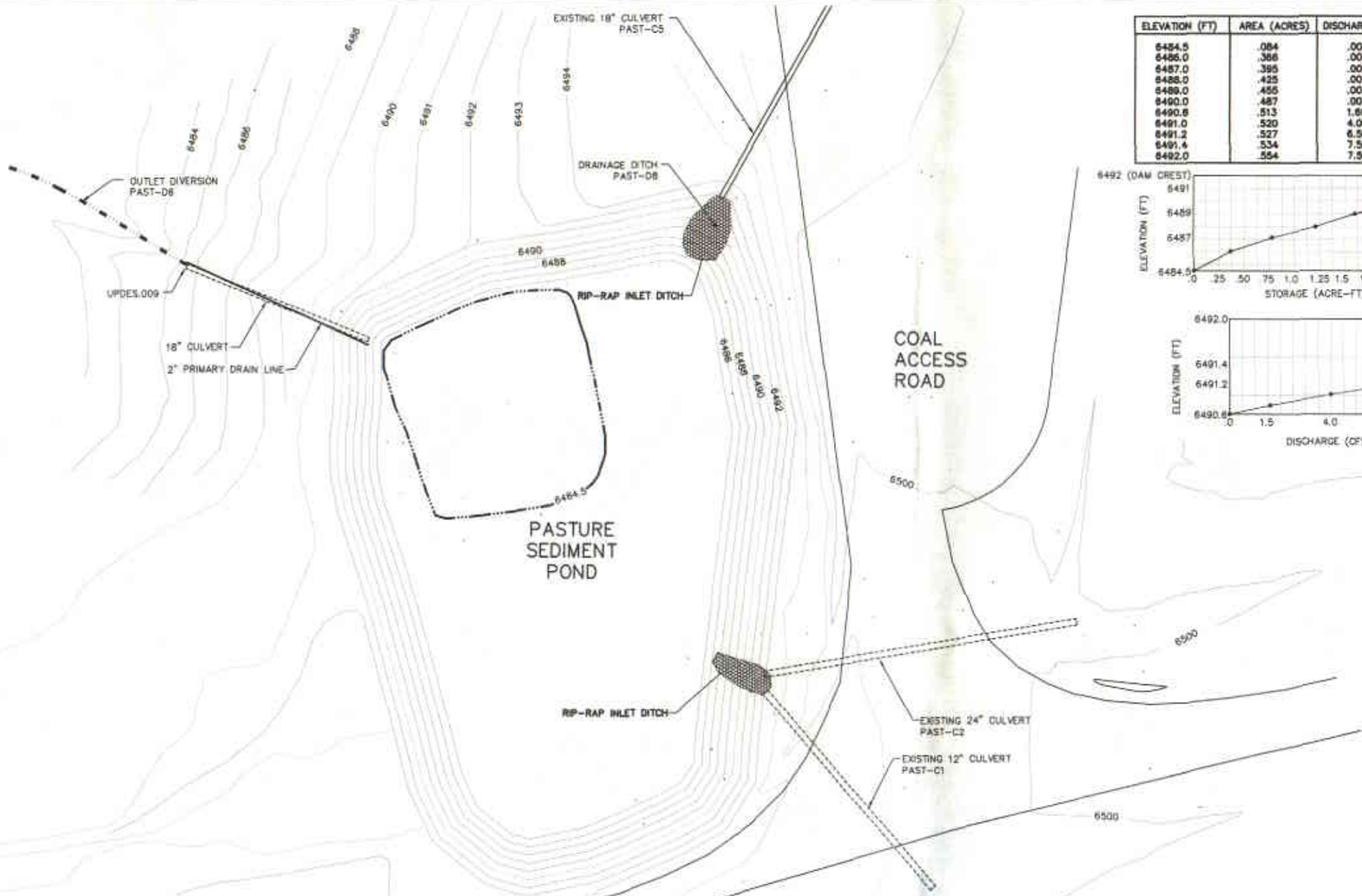
Sunnyside Cogeneration Asso
HYDROLOGIC INDEX MAP

DESIGNED AH
DRAWN
CHECKED AH
APPROVED
CADD SSC

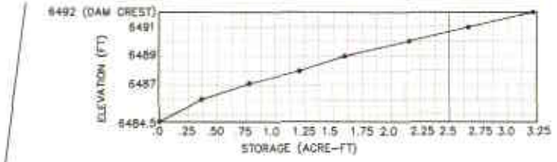
TWIN PEAKS
Engineering & Land Surveying
1980 NORTH 800 EAST LEHI, UTAH 84043
(801) 420-3011, (801) 439-0700 FAX

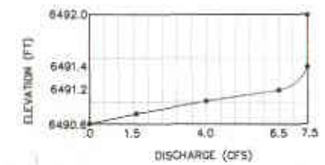
DATE	REVISION	BY
3/06	UPDATE DRAINAGE AREAS	AH
6/07	PERMIT RENEWAL-UPDATES	AH
5/04	ADD E. SLURRY COL. DRN. HATCH	AJZ
5/04	REMOVE DRAINAGE AREA	AH
5/04	UPDATE DRAINAGE AREAS	AH
12/03	ADD ACCESS ROAD DRAINAGE	AH
11/03	UPDATE DRAINAGE AREAS	AH
10/03	UPDATE DRAINAGE AREAS	AH

SHEET 7-1

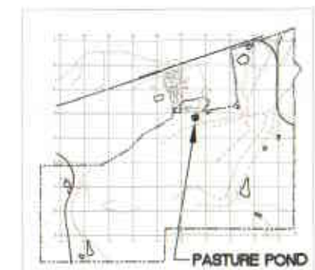


ELEVATION (FT)	AREA (ACRES)	DISCHARGE (CFS)	STORAGE (AC-FT)
6484.5	.084	.00	.00
6486.0	.366	.00	.37
6487.0	.395	.00	.77
6488.0	.425	.00	1.20
6489.0	.455	.00	1.66
6490.0	.487	.00	2.15
6490.6	.513	1.60	2.57
6491.0	.520	4.00	2.67
6491.2	.527	6.50	2.78
6491.4	.534	7.50	2.89
6492.0	.554	7.50	3.22

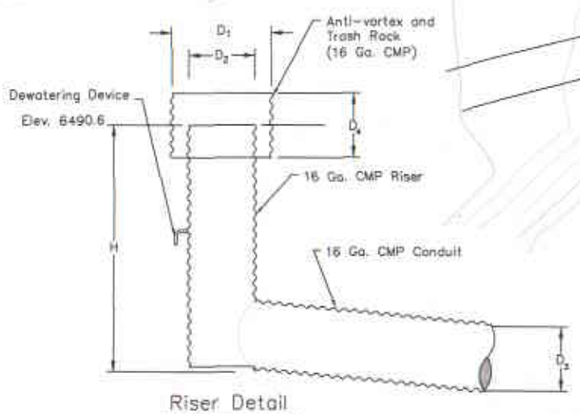




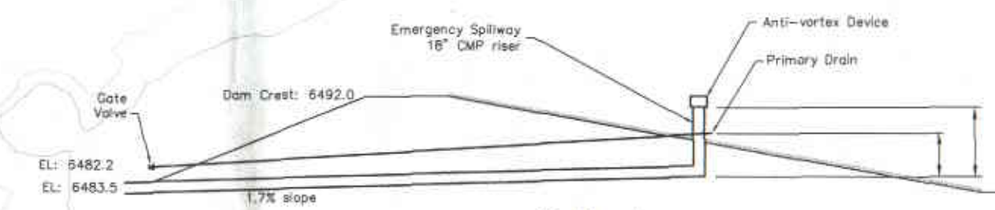
SPILLWAY DIMENSIONS		
	Primary Drain	Emergency
D_1		24"
D_2	2"	18"
D_3	2"	18"
D_4		18"
ELEV	6486.6	6490.6



VICINITY MAP



Riser Detail
N. T. S.



Section A
N. T. S.

RECEIVED
SEP 1 3 2006
DIV. OF OIL, GAS & MINING

REV	DATE	DESCRIPTION	BY	APP'D
4				
3				
2				
4	12/05	PASTURE POND ENLARGEMENT	AH	
3	9/02	2002 PERMIT RENEWAL	PAM	
1	9/97	PERMIT RENEWAL-UPDATES	AH	

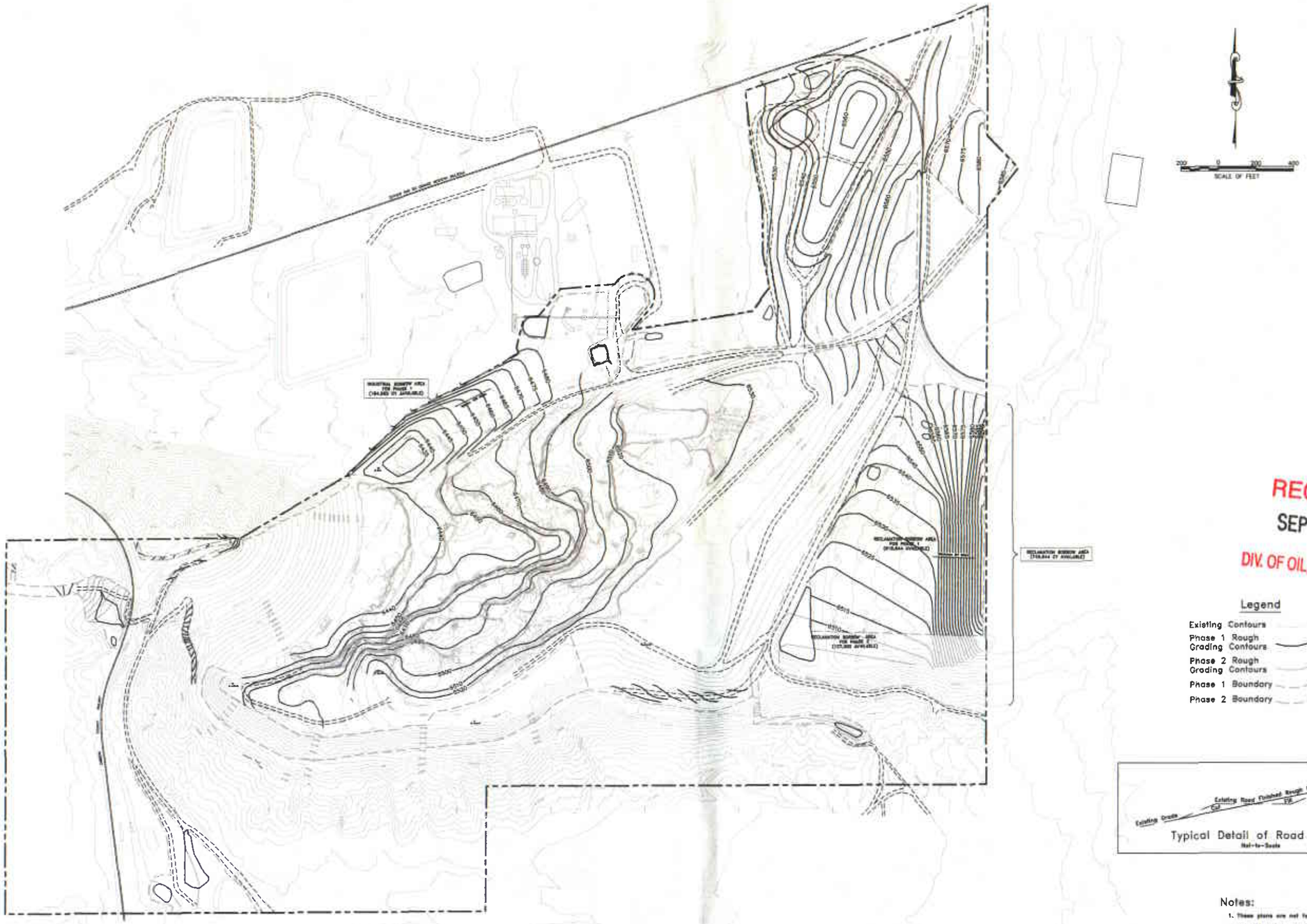
DATE 06-93
SCALE
PROJECT NO. 8SUN010500

Sunnyside Cogeneration Associates
PASTURE POND DRAWING

TWIN PEAKS
Engineering & Land Surveying
1980 NORTH 800 EAST LEHI, UTAH 84043
(801) 420-3511, (801) 439-0700 FAX

DESIGNED AH
DRAWN AH
CHECKED SSC

SHEET 7-9



RECEIVED
SEP 13 2006
DIV. OF OIL, GAS & MINING

Legend

- Existing Contours
- Phase 1 Rough Grading Contours
- Phase 2 Rough Grading Contours
- Phase 1 Boundary
- Phase 2 Boundary

Typical Detail of Road Grading
Not-to-Scale

Notes:

1. These plans are not for construction.
2. Existing contours and Rough Grading contours shown are approximate. Contractor will generally smooth Rough Grade to blend into existing grade at the edges of the disturbed areas.
3. Rough Grade should generally drain as indicated by the Rough Grade contours and the drainage plans. Sheets 8-3(A-E).
4. Maximum Rough Grading slope is to be 33% (3:1).

Sunnyside Cogeneration Associates
PERMIT TERM RECLAMATION PLAN
ROUGH GRADING PLAN

07-11-1994
1" = 200'
85JN010500

AH
AH
SSC

TWIN PEAKS
Engineering & Land Surveying
1680 NORTH 800 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

1.7.03	ISSUED FOR PERM. RECLAMATION	AH	
9.7.03	REVISED GRADING	AH	
7.7.04	ADDED COAL PILE AREA	KM	

8-2

NORTH

SCALE OF FEET

COAL PILE SEDIMENT POND DRAINAGE

BORROW AREA POND DRAINAGE

PASTURE SEDIMENT POND DRAINAGE

COARSE REFUSE TOE SEDIMENT POND DRAINAGE

RAIL CUT SEDIMENT POND DRAINAGE

OLD COARSE REFUSE ROAD SEDIMENT POND DRAINAGE

CARBON COUNTY RAILROAD DRAINAGE

LEGEND

PERMIT BOUNDARY

DIVERSIONS

DRAINAGE BOUNDARY

SUB-DRAINAGE BNDRY

SILT FENCE

RECLAMATION CONTOURS

RECEIVED
SEP 13 2006
DIV. OF OIL, GAS & MINING

REV	DATE	DESCRIPTION	BY	APP'D
4				
3				
2				
1	12/05	CLEAR WATER POND RECLASSIFICATION	AH	
0	9/97	PERMIT RENEWAL UPDATES	AH	
	8/94	ADDED COAL PILE AREA	AH	

DATE 01-10-93
SCALE 1" = 400'
PROJECT NO. 6SUN010500

Sunnyside Cogeneration Associates
PERMIT TERM RECLAMATION PLAN
DRAINAGE AND DIVERSION PLAN

TWIN PEAKS
Engineering & Land Surveying
1880 NORTH 800 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

DESIGNED SSC
DRAWN AH
CHECKED SSC

SHEET 8-3 OF

SCALE OF FEET

LEGEND

- PERMIT BOUNDARY
- ROADS
- POWER POLES

- PHASE 1 RECLAMATION
- PHASE 2 RECLAMATION
- RECLAMATION WORK PERFORMED
  10 YEAR LIABILITY BOND
  CLOCK BEGUN
  ACRES = 5.35

RECEIVED
SEP 13 2006
DIV. OF OIL, GAS & MINING

REV	DATE	DESCRIPTION	BY	APP'D
4				
3				
2				
1	9/05	CLEARWATER POND RECLASSIFICATION	AH	
0	9/02	2002 PERMIT RENEWAL	AH	
	8/95	RECLAMATION OF OLD CORASE REFUSE ROAD	ND	

Sunnyside Cogeneration Associates
FINAL RECLAMATION
GRADING PLAN

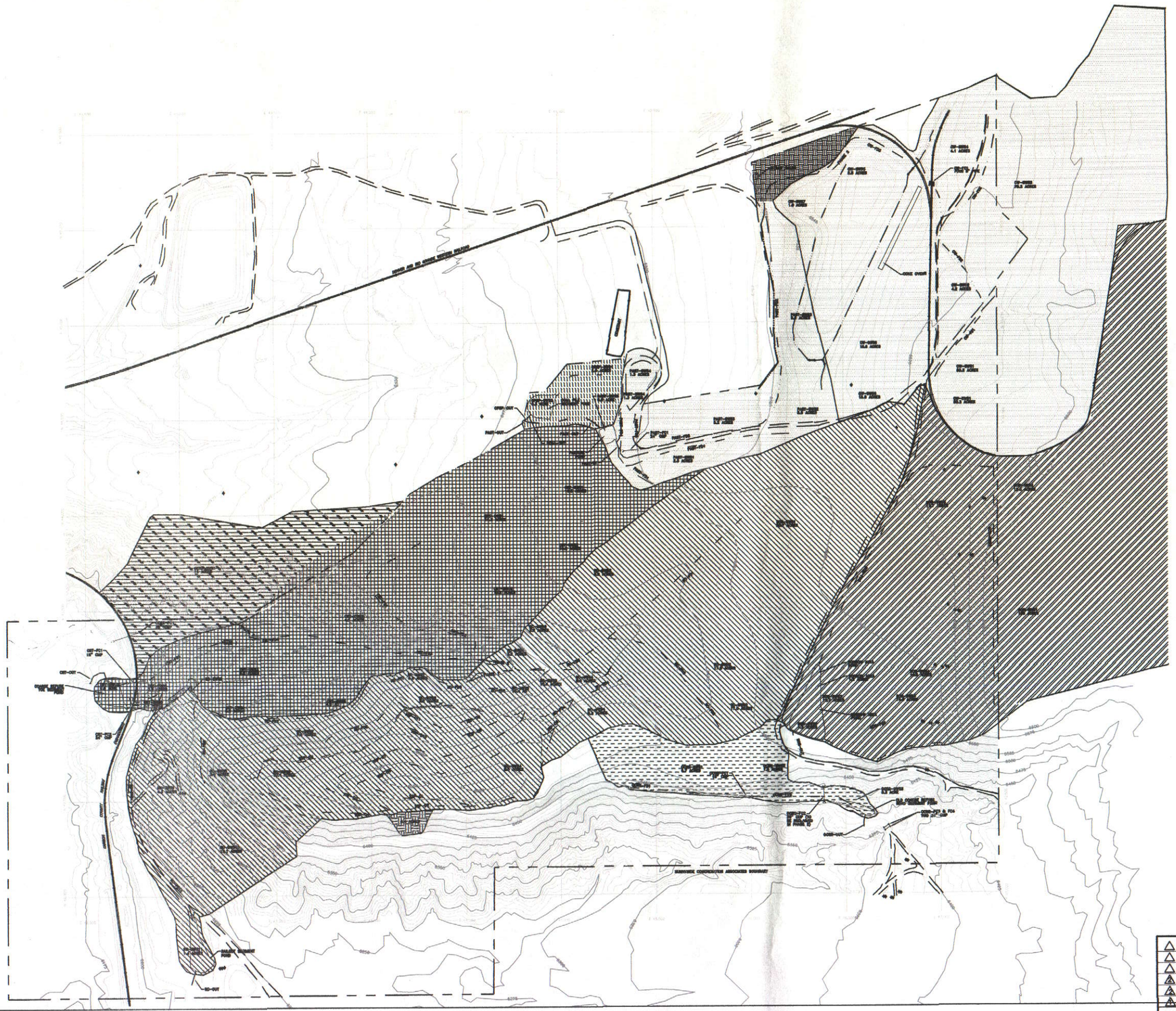
DATE 01-10-95
SCALE 1" = 300'
PROJECT NO. 8SUN010500

TWIN PEAKS
Engineering & Land Surveying
1880 NORTH 800 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

DESIGNED AEB
DRAWN AH
CHECKED AEB

SHEET 10-4 OF

Sept. 23, 2005 - 13:45:52 DWG Name: L:\8SUN010500\2002 Permit\10-4.DWG



200 0 200 400
SCALE OF FEET

PASTURE SEDIMENT POND DRAINAGE

COAL PILE SEDIMENT POND DRAINAGE

CARBON COUNTY RAILROAD DRAINAGE

COARSE REFUSE TOE SEDIMENT POND DRAINAGE

RAIL CUT SEDIMENT POND DRAINAGE

OLD COARSE REFUSE ROAD SEDIMENT POND DRAINAGE

BORROW AREA POND DRAINAGE

BTCA AREA

LEGEND

PERMIT BOUNDARY

DIVERSIONS

DRAINAGE BOUNDARY

EXCESS SPOIL DISPOSAL AREA

POWER POLES

ROADS

RECEIVED
SEP 13 2006
DIV. OF OIL, GAS & MINING

REV	DATE	DESCRIPTION	BY	APP'D
3	9/02	2005 CLEAR WATER POND RECLASSIFICATION	AH	
2	9/02	2002 PERMIT RENEWAL	AH	
1	8/95	~~ADDED RECLAMATION AREA~~	ND	

DATE 01-10-95

SCALE

PROJECT NO. 8SUN010500

Sunnyside Cogeneration Associates
FINAL RECLAMATION DRAINAGE AND DIVERSION PLAN

TWIN PEAKS Engineering & Land Surveying
1880 NORTH 800 EAST LEHI, UTAH 84043
(801) 450-3511, (801) 439-0700 FAX

DESIGNED AH
DRAWN AH
CHECKED SSC

SHEET 10-5

March 10, 2006 - 13:45:52 DWG Name: U:\8SUN010500\2002 Permit\10-4.DWG