PARSONS

CALCULATION COVER SHEET

CLIENT Kingston Fossil Plant

PROJECT Dredge Cell Restoration

SUBJECT Pond for Detention of 25-yr storm event

JOB NUMBER 51020101 WBS NUMBER

CALCULATION NO.: KIF-0-DC-510201-001

DESCRIPTION/PURPOSE

These calculations are for the Stormwater Management for the existing dredge cell. As part of the design for the dredge cell restoration, a pond is to be constructed and will collect seepage from the dredge cell, as well as stormwater runoff during storm events.

METHOD OF ANALYSIS

Utilize the codes and standards noted below along with calculations for the Stormwater Management, and Stormwater conveyance.

CODES AND STANDARDS

1. State of Tennessee Landfill Regulations 1200-1-7
2. Untied States Department of Agriculture, Natural Resource Conservation Service, Conservation Engineering Division, Technical Release 55 (TR-55)(June 1986), Urban Hydrology for Small Watersheds.
3. "PondPack" Version 9.0, Haestad Methods Inc., Waterbury, CT.
4. "Flow Master" Version 2005. Haestad Methods Inc., Waterbury, CT.

INFORMATION SOURCES

Drawings 10W425-83 and -84

ASSUMPTIONS

Assumptions are included within the body of the calculations.

CONCLUSIONS OR RESULTS

Stormwater Management and Soil Erosion and Sediment Control measures are designed to meet necessary requirements.

REV	DATE	DESCRIPTION	PAGES REVISED	PAGES ADDED	PAGES DELETED	BY/DATE	REV/DATE	LDE/DATE
4								
3								
2								
1								
0	4/26/05	ORIGINAL	BY:	REV'D	------	GDM / 4/26/2005	DRS/ 4/26/2005	DRS 4/26/2005

PARSONS	CLIENT NAME: Kingston Fossil Plant PROJECT NAME: Dredge Cell Restoration					JOB NO.: 51020101
STANDARD CALCULATION SHEET	SUBJECT: Pond for Detention of 25-yr storm event					CALC NO.: KIF-0-DC-510201-001
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	ORIGINATOR	GDM				
	REVIEWER	DRS				
	DATE:	04/26/05				

STORMWATER DRAINAGE DESIGN CRITERIA

These calculations are prepared for stack seepage and stormwater detention for an area of the dredge cell that does not drain to the existing ash pond. Specific design criteria is as follows:

1. Runoff calculations to be based on SCS 24 hour storm duration.
2. Pond routing to be a volume based routing method.
3. Discharge velocities are to be reduced to non-erosive velocities.
4. The proposed pond will contain a 25-year 24-hour storm event without over topping (per Tennessee Landfill Regulations 1200-1-7.

SITE CONDITIONS

The dredge cell is currently covered with a one-foot thick soil layer. A portion of the dredge cell currently does not drain to the existing ash pond. An existing concrete vault is equipped with two submersible pumps (250 gpm each), and seepage from the dredge cell is currently routed to this vault, and effluent is pumped to the existing ash pond. A new pond will be constructed such that runoff from the 25-yr storm event will be detained, and pumped to the existing ash pond. The pond will be lined with a compacted clay liner, where ash is encountered during excavation.

The pond will function as a temporary sediment basin during construction. The pond will be excavated, and appurtenances (i.e., concrete lift station and pipes) will be installed. The pumps will then be relocated to the new lift station. The pond will collect runoff during construction, and will then be converted for permanent use as a detention basin. These calculations include the modeling for the final pond configuration.

THIS IS A DESIGN RECORD

PARSONS	CLIENT NAME: Kingston Fossil Plant PROJECT NAME: Dredge Cell Restoration					JOB NO.: 51020801
STANDARD CALCULATION SHEET	SUBJECT: Pond for Detention of 25-yr storm event					CALC NO.: KIF-0-DC-510201-001
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	ORIGINATOR	GDM				
	REVIEWER	DRS				
	DATE:	04/26/05				

STORM MANAGEMENT CALCULATIONS

1. General approach:

   A. Curve Number Coefficients: Utilize curve numbers from table 2-2a from TR-55 method. Site soils (for the existing stack) are assumed to be primarily hydrologic soil group of C.

   B. Time of Concentration Calculations: Use SCS methods available in Pond Pack. For flows in the terraces, ditches, and channels time of concentrations were estimated based on flows Lengths and velocities.

   C. Rainfall: Use published rainfall values obtained from Codes and Standards Reference 1 as design storm inputs for 2, 10, 25, 50, and 100 year, 24 hour storm events. Utilize Type II storm in accordance with TR-55 method for each storm event. Rainfall events are synthetically generated using Pond Pack.

   D. Drainage Area: Measure drainage tributary area on the drawings. The drainage areas are shown on the sketch provided in Attachment A.

PARSONS	CLIENT NAME: Kingston Fossil Plant PROJECT NAME: Dredge Cell Restoration	JOB NO.: 51020801
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2. Drainage Summary:

See attached Pond Pack output model input and results. 2 models are included: 1) without pumps, and 2) with pumps.

The pond will not discharge the 25 yr storm event even when pumps are not operating.

The pumps are set to operate such that the pond will not have a permanent pool of water exposed.

Seepage flow estimates used in model are conservative – See Attachment 3

PARSONS	CLIENT NAME: Kingston Fossil Plant PROJECT NAME: Dredge Cell Restoration	JOB NO.: 51020101
STANDARD CALCULATION SHEET	SUBJECT: Pond for Detention of 25-yr storm event	CALC NO.: KIF-0-DC-510201-001

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ATTACHMENTS

ATTACHMENT A **Site Drainage Plans**

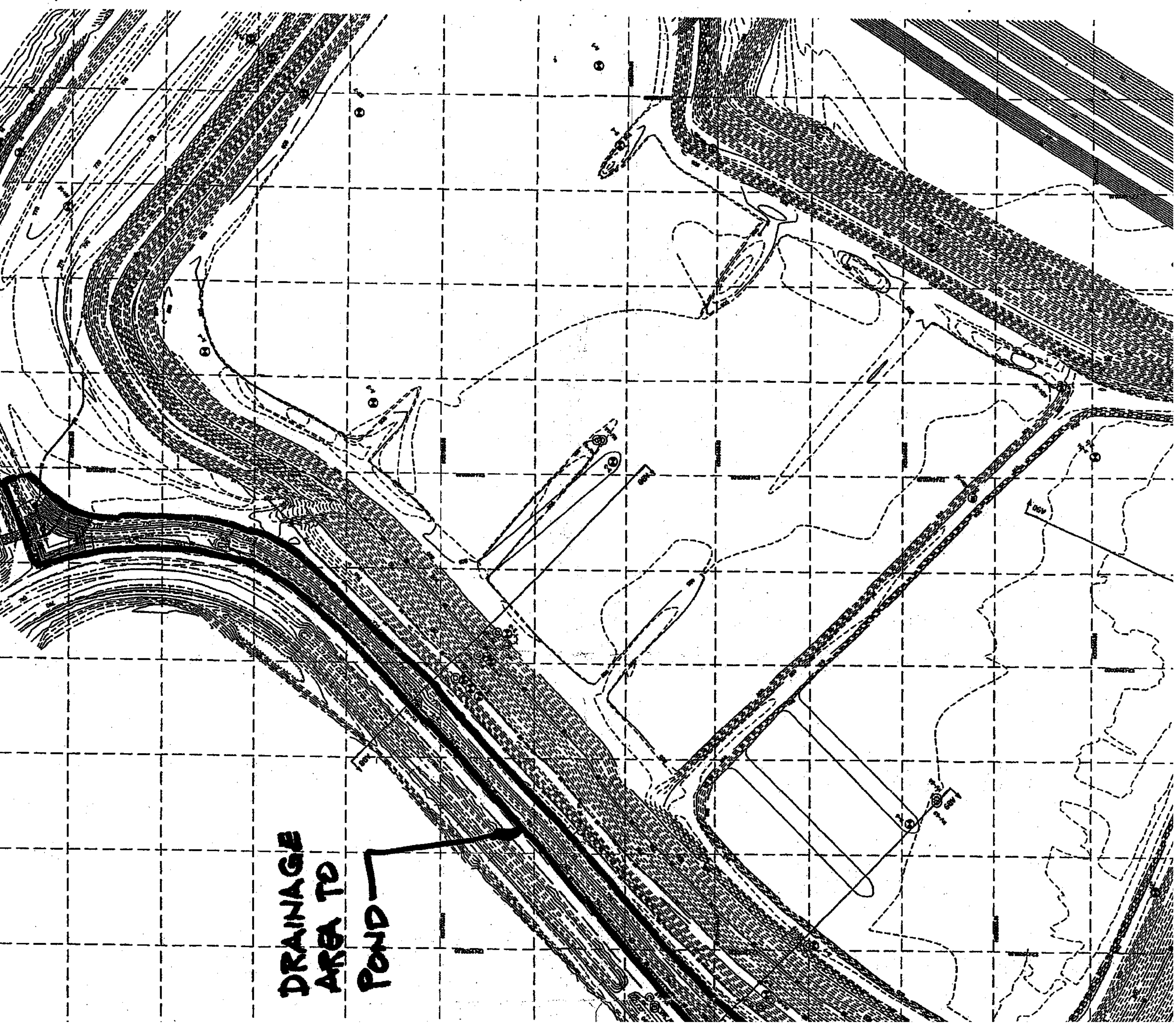
ATTACHMENT B **Pond Routing Calculations**

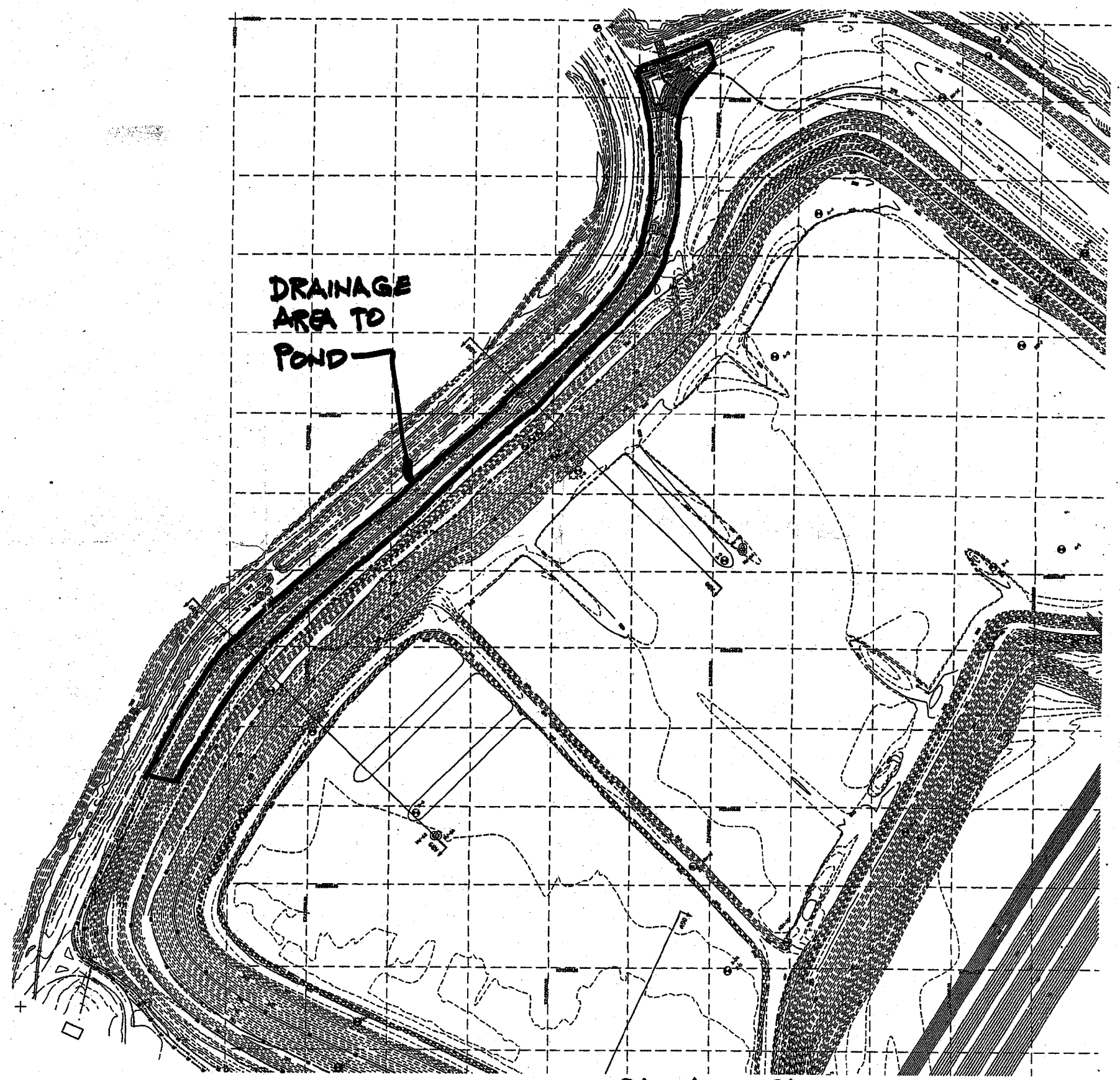
ATTACHMENT C **Seepage flows**

ATTACHMENT A

SITE DRAINAGE PLANS

1" = 200'





SITE DRAINAGE PLAN

1" = 200'

04/26/2005 05:43:36 PM, p0085704

ATTACHMENT B

POND ROUTING CALCULATIONS

CASE 1 – POND WITHOUT PUMPS
CASE 2 – POND WITH PUMPS

Job File: K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1
Rain Dir: K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\

W/O Pumps

==========
JOB TITLE
==========

Project Date: 3/2/2005
Project Engineer: PARSONS
Project Title: KIF Lateral Expansion w/Phase 2 Ditches Ditch D1
Project Comments:

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Table of Contents (continued)

MASTER DESIGN STORM SUMMARY

Network Storm Collection: KIF

Return Event	Total Depth in	Rainfall Type	RNF ID
25yr	5.5000	Synthetic Curve	TypeII 24hr
100yr	6.5000	Synthetic Curve	TypeII 24hr
2yr	3.2500	Synthetic Curve	TypeII 24hr
10yr	3.6000	Synthetic Curve	TypeII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA A1		AREA	25	1.087		12.1000	13.91		
AREA A1		AREA	100	1.437		12.1000	18.46		
AREA A1		AREA	2	.395		12.1000	4.68		
AREA A1		AREA	10	.490		12.1000	5.97		
*OUT 10		JCT	25	.000		.0500	.00		
*OUT 10		JCT	100	.294		12.7000	2.48		
*OUT 10		JCT	2	.000		.0500	.00		
*OUT 10		JCT	10	.000		.0500	.00		
POND 10	IN	POND	25	1.087		12.1000	13.91		
POND 10	IN	POND	100	1.437		12.1000	18.46		
POND 10	IN	POND	2	.395		12.1000	4.68		
POND 10	IN	POND	10	.490		12.1000	5.97		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
POND 10	OUT POND	25	.000		9.2500	.00	763.94	.721
POND 10	OUT POND	100	.294		12.7000	2.48	764.06	.744
POND 10	OUT POND	2	.000		11.3500	.00	760.26	.177
POND 10	OUT POND	10	.000		11.0500	.00	760.84	.243

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\
Title... Project Date: 3/2/2005
Project Engineer: PARSONS
Project Title: KIF Lateral Expansion w/Phase 2
Ditches Ditch D1
Project Comments:

DESIGN STORMS SUMMARY

Design Storm File,ID = KIF

Storm Tag Name = 25yr

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 25 yr
Total Rainfall Depth= 5.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100yr

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 6.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 2yr

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.2500 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10yr

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 3.6000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@10

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time: .3300 hrs

==========
Total Tc: .3300 hrs
==========

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1(

Tc Equations used...

==== User Defined ==========

Tc = Value entered by user

Where: Tc = Time of concentration

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@10

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Final Cover	71	5.210			71.00
COMPOSITE AREA & WEIGHTED CN --->		5.210			71.00 (71)

SCS UNIT HYDROGRAPH METHOD
(Computational Notes)

DEFINITION OF TERMS: ----------

At = Total area (acres): At = Ai+Ap
Ai = Impervious area (acres)
Ap = Pervious area (acres)
CNi = Runoff curve number for impervious area
CNp = Runoff curve number for pervious area
fLoss = f loss constant infiltration (depth/time)
gKs = Saturated Hydraulic Conductivity (depth/time)
Md = Volumetric Moisture Deficit
Psi = Capillary Suction (length)
hK = Horton Infiltration Decay Rate (time^-1)
fo = Initial Infiltration Rate (depth/time)
fc = Ultimate(capacity)Infiltration Rate (depth/time)
Ia = Initial Abstraction (length)
dt = Computational increment (duration of unit excess rainfall)
Default dt is smallest value of 0.1333Tc, rtm, and th
(Smallest dt is then adjusted to match up with Tp)
UDdt = User specified override computational main time increment
(only used if UDdt is => .1333Tc)
D(t) = Point on distribution curve (fraction of P) for time step t

K = 2 / (1 + (Tr/Tp)): default K = 0.75: (for Tr/Tp = 1.67)
Ks = Hydrograph shape factor
= Unit Conversions * K:
= ((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K
Default Ks = 645.333 * 0.75 = 484

Lag = Lag time from center of excess runoff (dt) to Tp: Lag = 0.6Tc
P = Total precipitation depth, inches
Pa(t) = Accumulated rainfall at time step t
Pi(t) = Incremental rainfall at time step t
qp = Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi.
= (Ks * A * Q) / Tp (where Q = 1in. runoff, A=sq.mi.)
Qu(t) = Unit hydrograph ordinate (cfs) at time step t
Q(t) = Final hydrograph ordinate (cfs) at time step t
Rai(t)= Accumulated runoff (inches) at time step t for impervious area
Rap(t)= Accumulated runoff (inches) at time step t for pervious area
Rii(t)= Incremental runoff (inches) at time step t for impervious area
Rip(t)= Incremental runoff (inches) at time step t for pervious area
R(t) = Incremental weighted total runoff (inches)
Rtm = Time increment for rainfall table
Si = S for impervious area: Si = (1000/CNi) - 10
Sp = S for pervious area: Sp = (1000/CNp) - 10
t = Time step (row) number
Tc = Time of concentration
Tb = Time (hrs) of entire unit hydrograph: Tb = Tp + Tr
Tp = Time (hrs) to peak of a unit hydrograph: Tp = (dt/2) + Lag
Tr = Time (hrs) of receding limb of unit hydrograph: Tr = ratio of Tp

SCS UNIT HYDROGRAPH METHOD
(Computational Notes)

PRECIPITATION: ----------
Column (1): Time for time step t
Column (2): D(t) = Point on distribution curve for time step t
Column (3): Pi(t) = Pa(t) - Pa(t-1): Col.(4) - Preceding Col.(4)
Column (4): Pa(t) = D(t) x P: Col.(2) x P

PERVIOUS AREA RUNOFF (using SCS Runoff CN Method) ----------
Column (5): Rap(t) = Accumulated pervious runoff for time step t
If (Pa(t) is <= 0.2Sp) then use: Rap(t) = 0.0
If (Pa(t) is > 0.2Sp) then use:

Rap(t) = (Col.(4)-0.2Sp)**2 / (Col.(4)+0.8Sp)

Column (6): Rip(t) = Incremental pervious runoff for time step t
Rip(t) = Rap(t) - Rap(t-1)
Rip(t) = Col.(5) for current row - Col.(5) for preceding row.

IMPERVIOUS AREA RUNOFF ----------
Column (7 & 8)... Did not specify to use impervious areas.

INCREMENTAL WEIGHTED RUNOFF: ----------
Column (9): R(t) = (Ap/At) x Rip(t) + (Ai/At) x Rii(t)
R(t) = (Ap/At) x Col.(6) + (Ai/At) x Col.(8)

SCS UNIT HYDROGRAPH METHOD: ----------
Column (10): Q(t) is computed with the SCS unit hydrograph method
using R() and Qu().

TIME vs. ELEVATION (ft)

Output Time increment = .0500 hrs

Time hrs	Time on left represents time for first value in each row.				
8.4000	758.00	758.00	758.00	758.00	758.00
8.6500	758.00	758.00	758.00	758.01	758.01
8.9000	758.01	758.01	758.02	758.02	758.02
9.1500	758.03	758.03	758.03	758.04	758.04
9.4000	758.05	758.05	758.06	758.06	758.07
9.6500	758.07	758.08	758.08	758.09	758.09
9.9000	758.10	758.11	758.11	758.12	758.13
10.1500	758.14	758.15	758.16	758.16	758.18
10.4000	758.19	758.20	758.21	758.22	758.23
10.6500	758.25	758.26	758.28	758.30	758.31
10.9000	758.33	758.35	758.37	758.40	758.42
11.1500	758.44	758.47	758.50	758.52	758.55
11.4000	758.58	758.61	758.65	758.69	758.74
11.6500	758.81	758.91	759.04	759.20	759.44
11.9000	759.76	760.18	760.69	761.24	761.79
12.1500	762.29	762.70	763.02	763.27	763.47
12.4000	763.62	763.74	763.85	763.94	764.01
12.6500	764.05	764.06	764.06	764.05	764.05
12.9000	764.04	764.04	764.04	764.04	764.03
13.1500	764.03	764.03	764.03	764.03	764.03
13.4000	764.03	764.03	764.03	764.02	764.02
13.6500	764.02	764.02	764.02	764.02	764.02
13.9000	764.02	764.02	764.02	764.02	764.02
14.1500	764.02	764.02	764.02	764.01	764.01
14.4000	764.01	764.01	764.01	764.01	764.01
14.6500	764.01	764.01	764.01	764.01	764.01
14.9000	764.01	764.01	764.01	764.01	764.01
15.1500	764.01	764.01	764.01	764.01	764.01
15.4000	764.01	764.01	764.01	764.01	764.01
15.6500	764.01	764.01	764.01	764.01	764.01
15.9000	764.01	764.01	764.01	764.01	764.01
16.1500	764.01	764.01	764.01	764.01	764.01
16.4000	764.01	764.01	764.01	764.01	764.01
16.6500	764.01	764.01	764.01	764.01	764.01
16.9000	764.01	764.00	764.00	764.00	764.00
17.1500	764.00	764.00	764.00	764.00	764.00
17.4000	764.00	764.00	764.00	764.00	764.00
17.6500	764.00	764.00	764.00	764.00	764.00
17.9000	764.00	764.00	764.00	764.00	764.00
18.1500	764.00	764.00	764.00	764.00	764.00
18.4000	764.00	764.00	764.00	764.00	764.00
18.6500	764.00	764.00	764.00	764.00	764.00
18.9000	764.00	764.00	764.00	764.00	764.00

TIME vs. ELEVATION (ft)

Output Time increment = .0500 hrs

Time hrs	Time on left represents time for first value in each row.				
19.1500	764.00	764.00	764.00	764.00	764.00
19.4000	764.00	764.00	764.00	764.00	764.00
19.6500	764.00	764.00	764.00	764.00	764.00
19.9000	764.00	764.00	764.00	764.00	764.00
20.1500	764.00	764.00	764.00	764.00	764.00
20.4000	764.00	764.00	764.00	764.00	764.00
20.6500	764.00	764.00	764.00	764.00	764.00
20.9000	764.00	764.00	764.00	764.00	764.00
21.1500	763.99	763.99	763.99	763.99	763.99
21.4000	763.99	763.99	763.99	763.99	763.99
21.6500	763.99	763.99	763.99	763.99	763.99
21.9000	763.99	763.99	763.99	763.98	763.98
22.1500	763.98	763.98	763.98	763.98	763.98
22.4000	763.98	763.98	763.98	763.98	763.98
22.6500	763.98	763.97	763.97	763.97	763.97
22.9000	763.97	763.97	763.97	763.97	763.97
23.1500	763.97	763.97	763.96	763.96	763.96
23.4000	763.96	763.96	763.96	763.96	763.96
23.6500	763.96	763.95	763.95	763.95	763.95
23.9000	763.95	763.95	763.95	763.95	763.94
24.1500	763.94	763.94	763.93	763.93	763.92
24.4000	763.92	763.91	763.90	763.89	763.89
24.6500	763.88	763.87	763.86	763.85	763.85
24.9000	763.84	763.83	763.82	763.81	763.80
25.1500	763.80	763.79	763.78	763.77	763.76
25.4000	763.76	763.75	763.74	763.73	763.72
25.6500	763.72	763.71	763.70	763.69	763.68
25.9000	763.67	763.67	763.66	763.65	763.64
26.1500	763.63	763.63	763.62	763.61	763.60
26.4000	763.59	763.58	763.58	763.57	763.56
26.6500	763.55	763.54	763.54	763.53	763.52
26.9000	763.51	763.50	763.49	763.49	763.48
27.1500	763.47	763.46	763.45	763.44	763.43
27.4000	763.42	763.42	763.41	763.40	763.39
27.6500	763.38	763.37	763.36	763.35	763.35
27.9000	763.34	763.33	763.32	763.31	763.30
28.1500	763.29	763.29	763.28	763.27	763.26
28.4000	763.25	763.24	763.23	763.22	763.22
28.6500	763.21	763.20	763.19	763.18	763.17
28.9000	763.16	763.15	763.15	763.14	763.13
29.1500	763.12	763.11	763.10	763.09	763.08
29.4000	763.08	763.07	763.06	763.05	763.04
29.6500	763.03	763.02	763.01	763.01	763.00
29.9000	762.99	762.98	762.97	762.96	762.95

TIME vs. ELEVATION (ft)

Time hrs	Output Time increment = .0500 hrs Time on left represents time for first value in each row.				
30.1500	762.94	762.93	762.92	762.91	762.90
30.4000	762.89	762.88	762.87	762.86	762.86
30.6500	762.85	762.84	762.83	762.82	762.81
30.9000	762.80	762.79	762.78	762.77	762.76
31.1500	762.75	762.74	762.73	762.72	762.71
31.4000	762.71	762.70	762.69	762.68	762.67
31.6500	762.66	762.65	762.64	762.63	762.62
31.9000	762.61	762.60	762.59	762.58	762.57
32.1500	762.56	762.55	762.55	762.54	762.53
32.4000	762.52	762.51	762.50	762.49	762.48
32.6500	762.47	762.46	762.45	762.44	762.43
32.9000	762.42	762.41	762.40	762.39	762.38
33.1500	762.37	762.36	762.35	762.34	762.33
33.4000	762.32	762.31	762.30	762.29	762.28
33.6500	762.27	762.25	762.24	762.23	762.22
33.9000	762.21	762.20	762.19	762.18	762.17
34.1500	762.16	762.15	762.14	762.13	762.12
34.4000	762.11	762.10	762.09	762.08	762.07
34.6500	762.06	762.05	762.04	762.03	762.02
34.9000	762.01	762.00	761.99	761.98	761.97
35.1500	761.96	761.95	761.94	761.93	761.91
35.4000	761.90	761.89	761.88	761.87	761.86
35.6500	761.85	761.84	761.83	761.82	761.80
35.9000	761.79	761.78	761.77	761.76	761.75
36.1500	761.74	761.73	761.72	761.71	761.69
36.4000	761.68	761.67	761.66	761.65	761.64
36.6500	761.63	761.62	761.61	761.60	761.59
36.9000	761.57	761.56	761.55	761.54	761.53
37.1500	761.52	761.51	761.50	761.49	761.47
37.4000	761.46	761.45	761.44	761.43	761.41
37.6500	761.40	761.39	761.38	761.37	761.35
37.9000	761.34	761.33	761.32	761.31	761.29
38.1500	761.28	761.27	761.26	761.25	761.24
38.4000	761.22	761.21	761.20	761.19	761.18
38.6500	761.16	761.15	761.14	761.13	761.12
38.9000	761.10	761.09	761.08	761.07	761.06
39.1500	761.04	761.03	761.02	761.01	761.00
39.4000	760.98	760.97	760.96	760.94	760.93
39.6500	760.92	760.91	760.89	760.88	760.87
39.9000	760.85	760.84	760.83	760.81	760.80
40.1500	760.79	760.78	760.76	760.75	760.74
40.4000	760.72	760.71	760.70	760.69	760.67
40.6500	760.66	760.65	760.63	760.62	760.61
40.9000	760.59	760.58	760.57	760.56	760.54

TIME vs. ELEVATION (ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
41.1500	760.53	760.52	760.50	760.49	760.48
41.4000	760.46	760.45	760.43	760.42	760.40
41.6500	760.39	760.38	760.36	760.35	760.33
41.9000	760.32	760.30	760.29	760.28	760.26
42.1500	760.25	760.23	760.22	760.21	760.19
42.4000	760.18	760.16	760.15	760.13	760.12
42.6500	760.11	760.09	760.08	760.06	760.05
42.9000	760.04	760.02	760.01	759.99	759.98
43.1500	759.96	759.94	759.93	759.91	759.90
43.4000	759.88	759.87	759.85	759.84	759.82
43.6500	759.80	759.79	759.77	759.76	759.74
43.9000	759.73	759.71	759.70	759.68	759.66
44.1500	759.65	759.63	759.62	759.60	759.59
44.4000	759.57	759.55	759.54	759.52	759.51
44.6500	759.49	759.47	759.46	759.44	759.42
44.9000	759.40	759.39	759.37	759.35	759.34
45.1500	759.32	759.30	759.28	759.27	759.25
45.4000	759.23	759.21	759.20	759.18	759.16
45.6500	759.15	759.13	759.11	759.09	759.08
45.9000	759.06	759.04	759.02	759.01	758.99
46.1500	758.97	758.94	758.92	758.90	758.88
46.4000	758.85	758.83	758.81	758.79	758.77
46.6500	758.74	758.72	758.70	758.68	758.66
46.9000	758.63	758.61	758.59	758.57	758.55
47.1500	758.52	758.50	758.47	758.44	758.41
47.4000	758.38	758.36	758.33	758.31	758.29
47.6500	758.27	758.25	758.23	758.22	758.20
47.9000	758.19	758.18	758.17	758.15	758.14
48.1500	758.13	758.13	758.12	758.11	758.10
48.4000	758.10	758.09	758.08	758.08	758.07
48.6500	758.07	758.06	758.06	758.05	758.05
48.9000	758.05	758.04	758.04	758.04	758.04
49.1500	758.03	758.03	758.03	758.03	758.03
49.4000	758.02	758.02	758.02	758.02	758.02
49.6500	758.02	758.02	758.01	758.01	758.01
49.9000	758.01	758.01	758.01	758.01	758.01
50.1500	758.01	758.01	758.01	758.01	758.01
50.4000	758.01	758.01	758.01	758.00	758.00
50.6500	758.00	758.00			

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
8.4000	.000	.000	.000	.000	.000
8.6500	.000	.000	.000	.000	.000
8.9000	.000	.000	.001	.001	.001
9.1500	.001	.001	.001	.001	.001
9.4000	.002	.002	.002	.002	.002
9.6500	.002	.003	.003	.003	.003
9.9000	.004	.004	.004	.004	.005
10.1500	.005	.005	.006	.006	.006
10.4000	.007	.007	.008	.008	.009
10.6500	.010	.010	.011	.012	.012
10.9000	.013	.014	.015	.016	.018
11.1500	.019	.020	.022	.023	.025
11.4000	.026	.028	.031	.033	.037
11.6500	.042	.049	.060	.074	.095
11.9000	.126	.169	.225	.293	.366
12.1500	.438	.502	.556	.599	.634
12.4000	.661	.684	.704	.721	.735
12.6500	.742	.744	.744	.743	.743
12.9000	.742	.741	.741	.740	.740
13.1500	.740	.739	.739	.739	.738
13.4000	.738	.738	.738	.738	.738
13.6500	.737	.737	.737	.737	.737
13.9000	.737	.737	.737	.736	.736
14.1500	.736	.736	.736	.736	.736
14.4000	.736	.736	.736	.736	.736
14.6500	.736	.735	.735	.735	.735
14.9000	.735	.735	.735	.735	.735
15.1500	.735	.735	.735	.735	.735
15.4000	.735	.735	.735	.735	.735
15.6500	.735	.735	.735	.735	.735
15.9000	.735	.735	.734	.734	.734
16.1500	.734	.734	.734	.734	.734
16.4000	.734	.734	.734	.734	.734
16.6500	.734	.734	.734	.734	.734
16.9000	.734	.734	.734	.734	.734
17.1500	.734	.734	.734	.734	.734
17.4000	.734	.734	.734	.734	.734
17.6500	.734	.734	.734	.734	.734
17.9000	.734	.734	.734	.734	.734
18.1500	.734	.734	.734	.734	.734
18.4000	.734	.734	.734	.734	.734
18.6500	.734	.734	.734	.733	.733
18.9000	.733	.733	.733	.733	.733

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs

Time hrs	Time on left represents time for first value in each row.				
19.1500	.733	.733	.733	.733	.733
19.4000	.733	.733	.733	.733	.733
19.6500	.733	.733	.733	.733	.733
19.9000	.733	.733	.733	.733	.733
20.1500	.733	.733	.733	.733	.733
20.4000	.733	.733	.733	.733	.733
20.6500	.733	.733	.733	.733	.732
20.9000	.732	.732	.732	.732	.732
21.1500	.732	.732	.732	.732	.732
21.4000	.731	.731	.731	.731	.731
21.6500	.731	.730	.730	.730	.730
21.9000	.730	.730	.730	.729	.729
22.1500	.729	.729	.729	.729	.729
22.4000	.728	.728	.728	.728	.728
22.6500	.728	.727	.727	.727	.727
22.9000	.727	.726	.726	.726	.726
23.1500	.726	.725	.725	.725	.725
23.4000	.725	.724	.724	.724	.724
23.6500	.723	.723	.723	.723	.722
23.9000	.722	.721	.720	.719	.718
24.1500	.717	.715	.714	.713	.711
24.4000	.710	.708	.706	.705	.703
24.6500	.702	.700	.699	.697	.696
24.9000	.694	.693	.691	.690	.688
25.1500	.687	.685	.683	.682	.680
25.4000	.679	.677	.676	.674	.673
25.6500	.671	.670	.668	.667	.665
25.9000	.664	.662	.661	.659	.658
26.1500	.656	.655	.653	.652	.650
26.4000	.649	.647	.646	.644	.643
26.6500	.641	.640	.638	.637	.635
26.9000	.634	.632	.631	.629	.627
27.1500	.626	.624	.623	.621	.620
27.4000	.618	.617	.615	.613	.612
27.6500	.610	.609	.607	.606	.604
27.9000	.603	.601	.600	.598	.597
28.1500	.595	.593	.592	.590	.589
28.4000	.587	.586	.584	.583	.581
28.6500	.580	.578	.577	.575	.574
28.9000	.572	.571	.569	.568	.566
29.1500	.565	.563	.562	.560	.559
29.4000	.557	.556	.554	.553	.552
29.6500	.550	.548	.547	.545	.544
29.9000					

TIME vs. VOLUME (ac-ft)

Time hrs	Output Time increment = .0500 hrs Time on left represents time for first value in each row.				
30.1500	.542	.540	.539	.537	.536
30.4000	.534	.533	.531	.530	.528
30.6500	.526	.525	.523	.522	.520
30.9000	.519	.517	.516	.514	.513
31.1500	.511	.510	.508	.507	.505
31.4000	.503	.502	.500	.499	.497
31.6500	.496	.494	.493	.491	.490
31.9000	.488	.487	.485	.484	.482
32.1500	.481	.480	.478	.477	.475
32.4000	.474	.472	.471	.469	.467
32.6500	.466	.464	.463	.461	.460
32.9000	.458	.456	.455	.453	.452
33.1500	.450	.449	.447	.446	.444
33.4000	.443	.441	.439	.438	.436
33.6500	.435	.433	.432	.430	.429
33.9000	.427	.426	.424	.423	.421
34.1500	.420	.418	.417	.415	.414
34.4000	.412	.411	.409	.408	.406
34.6500	.405	.403	.402	.400	.399
34.9000	.397	.396	.394	.393	.391
35.1500	.390	.388	.386	.385	.383
35.4000	.382	.380	.379	.377	.376
35.6500	.374	.372	.371	.369	.368
35.9000	.366	.365	.363	.362	.360
36.1500	.359	.357	.356	.354	.353
36.4000	.351	.349	.348	.346	.345
36.6500	.344	.342	.341	.339	.338
36.9000	.336	.335	.333	.332	.330
37.1500	.329	.327	.326	.324	.323
37.4000	.321	.319	.318	.316	.315
37.6500	.313	.312	.310	.308	.307
37.9000	.305	.304	.302	.301	.299
38.1500	.298	.296	.295	.293	.291
38.4000	.290	.288	.287	.285	.284
38.6500	.282	.281	.279	.278	.276
38.9000	.275	.273	.272	.270	.269
39.1500	.268	.266	.265	.263	.262
39.4000	.260	.258	.257	.255	.254
39.6500	.252	.251	.249	.247	.246
39.9000	.244	.243	.241	.240	.238
40.1500	.237	.235	.234	.232	.230
40.4000	.229	.227	.226	.224	.223
40.6500	.221	.220	.218	.217	.215
40.9000	.214	.212	.211	.210	.208

TIME vs. VOLUME (ac-ft)

Output Time increment = .0500 hrs
Time on left represents time for first value in each row.

Time hrs					
41.1500	.207	.205	.204	.202	.201
41.4000	.199	.197	.196	.194	.193
41.6500	.191	.189	.188	.186	.185
41.9000	.183	.182	.180	.179	.177
42.1500	.176	.174	.173	.171	.170
42.4000	.168	.167	.165	.164	.162
42.6500	.161	.159	.158	.156	.155
42.9000	.153	.152	.150	.149	.147
43.1500	.146	.144	.142	.141	.139
43.4000	.138	.136	.135	.133	.131
43.6500	.130	.128	.127	.125	.124
43.9000	.122	.121	.119	.118	.116
44.1500	.115	.113	.112	.110	.109
44.4000	.107	.106	.104	.103	.101
44.6500	.100	.098	.097	.095	.094
44.9000	.092	.090	.089	.087	.086
45.1500	.084	.083	.081	.080	.078
45.4000	.076	.075	.073	.072	.070
45.6500	.069	.067	.066	.064	.063
45.9000	.062	.060	.059	.057	.056
46.1500	.054	.052	.050	.048	.047
46.4000	.045	.043	.042	.040	.039
46.6500	.037	.036	.034	.033	.031
46.9000	.030	.029	.027	.026	.025
47.1500	.023	.022	.020	.019	.017
47.4000	.016	.014	.013	.012	.011
47.6500	.010	.010	.009	.008	.008
47.9000	.007	.007	.006	.006	.005
48.1500	.005	.004	.004	.004	.004
48.4000	.003	.003	.003	.003	.002
48.6500	.002	.002	.002	.002	.002
48.9000	.002	.002	.001	.001	.001
49.1500	.001	.001	.001	.001	.001
49.4000	.001	.001	.001	.001	.001
49.6500	.001	.001	.000	.000	.000
49.9000	.000	.000	.000	.000	.000
50.1500	.000	.000	.000	.000	.000
50.4000	.000	.000	.000	.000	.000
50.6500	.000	.000			

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Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
758.00	-----	.0332	.0000	.000	.000
759.00	-----	.0837	.1697	.057	.057
760.00	-----	.1025	.2789	.093	.150
761.00	-----	.1228	.3375	.112	.262
762.00	-----	.1448	.4009	.134	.396
763.00	-----	.1684	.4694	.156	.552
764.00	-----	.1938	.5429	.181	.733
765.00	-----	.2208	.6215	.207	.940

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 758.00 ft
Increment = .50 ft
Max. Elev.= 765.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular	WR	--->	TW	764.000	765.000
TW SETUP, DS Channel					

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OUTLET STRUCTURE INPUT DATA

Structure ID = WR
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 764.00 ft
Weir Length = 20.00 ft
Weir Coeff. = 3.087000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 30
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .10 cfs
Max. Q tolerance = .10 cfs

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = WR (Weir-Rectangular)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, ft	Device Q, cfs	Tail Water TW Elev, ft	Converge +/-ft	Notes: Computation Messages
758.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
758.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
759.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
759.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
760.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
760.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
761.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
761.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
762.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
762.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
763.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
763.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
764.00	.00	Free Outfall		H=.00; Htw=.00; Qfree=.00;
764.50	21.83	Free Outfall		H=.50; Htw=.00; Qfree=21.83;
765.00	61.74	Free Outfall		H=1.00; Htw=.00; Qfree=61.74;

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@10

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Converge		Notes
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
758.00	.00	Free Outfall		None contributing
758.50	.00	Free Outfall		None contributing
759.00	.00	Free Outfall		None contributing
759.50	.00	Free Outfall		None contributing
760.00	.00	Free Outfall		None contributing
760.50	.00	Free Outfall		None contributing
761.00	.00	Free Outfall		None contributing
761.50	.00	Free Outfall		None contributing
762.00	.00	Free Outfall		None contributing
762.50	.00	Free Outfall		None contributing
763.00	.00	Free Outfall		None contributing
763.50	.00	Free Outfall		None contributing
764.00	.00	Free Outfall		WR
764.50	21.83	Free Outfall		WR
765.00	61.74	Free Outfall		WR

LEVEL POOL ROUTING DATA

HYG Dir = K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\
Inflow HYG file = NONE STORED - POND 10 IN 25yr
Outflow HYG file = NONE STORED - POND 10 OUT 25yr

Pond Node Data = POND 10
Pond Volume Data = POND 10
Pond Outlet Data = Weir

Infiltration = .37 cfs

INITIAL CONDITIONS

Starting WS Elev = 758.00 ft
Starting Volume = .000 ac-ft
Starting Outflow = .00 cfs
Starting Infiltr. = .00 cfs
Starting Total Qout= .00 cfs
Time Increment = .0500 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
758.00	.00	.000	.0332	.00	.00	.00
758.50	.00	.022	.0556	.37	.37	11.01
759.00	.00	.057	.0837	.37	.37	27.75
759.50	.00	.101	.0929	.37	.37	49.11
760.00	.00	.150	.1025	.37	.37	72.75
760.50	.00	.203	.1124	.37	.37	98.75
761.00	.00	.262	.1228	.37	.37	127.20
761.50	.00	.326	.1335	.37	.37	158.20
762.00	.00	.396	.1448	.37	.37	191.87
762.50	.00	.471	.1564	.37	.37	228.30
763.00	.00	.552	.1684	.37	.37	267.59
763.50	.00	.639	.1809	.37	.37	309.85
764.00	.00	.733	.1938	.37	.37	355.18
764.50	21.83	.833	.2071	.37	22.20	425.51
765.00	61.74	.940	.2208	.37	62.11	517.19

Index of Starting Page Numbers for ID Names

Job File: K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1
Rain Dir: K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\

==========
JOB TITLE
==========

w/ pumps

Project Date: 3/2/2005
Project Engineer: PARSONS
Project Title: KIF Lateral Expansion w/Phase 2 Ditches Ditch D1
Project Comments:

Table of Contents

MASTER DESIGN STORM SUMMARY

Network Storm Collection: KIF

Return Event	Total Depth in	Rainfall Type	RNF ID
25yr	5.5000	Synthetic Curve	TypeII 24hr
100yr	6.5000	Synthetic Curve	TypeII 24hr
2yr	3.2500	Synthetic Curve	TypeII 24hr
10yr	3.6000	Synthetic Curve	TypeII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA A1	AREA	25	1.087		12.1000	13.91		
AREA A1	AREA	100	1.437		12.1000	18.46		
AREA A1	AREA	2	.395		12.1000	4.68		
AREA A1	AREA	10	.490		12.1000	5.97		
*OUT 10	JCT	25	.000		.0500	.00		
*OUT 10	JCT	100	.000		.0500	.00		
*OUT 10	JCT	2	.000		.0500	.00		
*OUT 10	JCT	10	.000		.0500	.00		
*OUT 20	JCT	25	1.021		12.0500	1.11		
*OUT 20	JCT	100	1.205		12.0000	1.11		
*OUT 20	JCT	2	.649		12.5000	.86		
*OUT 20	JCT	10	.697		12.5500	1.09		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
POND 10	IN POND	25	1.087		12.1000	13.91		
POND 10	IN POND	100	1.437		12.1000	18.46		
POND 10	IN POND	2	.395		12.1000	4.68		
POND 10	IN POND	10	.490		12.1000	5.97		
+POND 10	OUT POND	25	.828		12.0500	1.11	762.45	.463
+POND 10	OUT POND	100	1.077		12.0000	1.11	763.69	.675
+POND 10	OUT POND	2	.307		12.5000	.86	759.56	.106
+POND 10	OUT POND	10	.382		12.5500	1.09	759.96	.145

TOTAL POND OUTFLOW CURVE FOR MULTIPLE OUTFALLS

Contributing Outfalls:
Outfall 1: ROUTE 10 25yr (Weir)
Outfall 2: ROUTE 20 25yr (Pumps)

POND HW Elev, ft	OUTFALL 1 Flow, cfs	OUTFALL 2 Flow, cfs	TOTAL Flow, cfs
758.00	.00	.56	.56
758.50	.00	.56	.56
759.00	.00	.56	.56
759.50	.00	.83	.83
760.00	.00	1.11	1.11
760.50	.00	1.11	1.11
761.00	.00	1.11	1.11
761.50	.00	1.11	1.11
762.00	.00	1.11	1.11
762.50	.00	1.11	1.11
763.00	.00	1.11	1.11
763.50	.00	1.11	1.11
764.00	.00	1.11	1.11
764.50	21.83	1.11	22.94
765.00	61.74	1.11	62.85

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 758.00 ft
Increment = .50 ft
Max. Elev.= 765.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
User Defined Table TW SETUP, DS Channel	SP	--->	TW	.000	765.000

OUTLET STRUCTURE INPUT DATA

Structure ID = SP
Structure Type = User Defined Table

ELEV-FLOW RATING TABLE

Elev, ft	Flow, cfs
755.00	.00
756.00	.00
757.00	.00
758.00	.56
759.00	.56
760.00	1.11
761.00	1.11
762.00	1.11
763.00	1.11
764.00	1.11
765.00	1.11

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 30
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .10 cfs
Max. Q tolerance = .10 cfs

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = SP (User Defined Table)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, Device Q		Tail Water		Notes
WS Elev. ft	Q cfs	TW Elev ft	Converge +/-ft	Computation Messages
755.00	.00	Free Outfall		
758.00	.56	Free Outfall		
758.50	.56	Free Outfall		Interpolated from input table
759.00	.56	Free Outfall		
759.50	.83	Free Outfall		Interpolated from input table
760.00	1.11	Free Outfall		
760.50	1.11	Free Outfall		Interpolated from input table
761.00	1.11	Free Outfall		
761.50	1.11	Free Outfall		Interpolated from input table
762.00	1.11	Free Outfall		
762.50	1.11	Free Outfall		Interpolated from input table
763.00	1.11	Free Outfall		
763.50	1.11	Free Outfall		Interpolated from input table
764.00	1.11	Free Outfall		
764.50	1.11	Free Outfall		Interpolated from input table
765.00	1.11	Free Outfall		

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Notes		
		Converge		
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
755.00	.00	Free Outfall		SP
758.00	.56	Free Outfall		SP
758.50	.56	Free Outfall		SP
759.00	.56	Free Outfall		SP
759.50	.83	Free Outfall		SP
760.00	1.11	Free Outfall		SP
760.50	1.11	Free Outfall		SP
761.00	1.11	Free Outfall		SP
761.50	1.11	Free Outfall		SP
762.00	1.11	Free Outfall		SP
762.50	1.11	Free Outfall		SP
763.00	1.11	Free Outfall		SP
763.50	1.11	Free Outfall		SP
764.00	1.11	Free Outfall		SP
764.50	1.11	Free Outfall		SP
765.00	1.11	Free Outfall		SP

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RATING TABLE FOR ONE OUTLET TYPE

Structure ID = SP (User Defined Table)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, Device Q		Tail Water		Notes
WS Elev. ft	Q cfs	TW Elev ft	Converge +/-ft	Computation Messages
755.00	.00	Free Outfall		
758.00	.56	Free Outfall		
758.50	.56	Free Outfall		Interpolated from input table
759.00	.56	Free Outfall		
759.50	.83	Free Outfall		Interpolated from input table
760.00	1.11	Free Outfall		
760.50	1.11	Free Outfall		Interpolated from input table
761.00	1.11	Free Outfall		
761.50	1.11	Free Outfall		Interpolated from input table
762.00	1.11	Free Outfall		
762.50	1.11	Free Outfall		Interpolated from input table
763.00	1.11	Free Outfall		
763.50	1.11	Free Outfall		Interpolated from input table
764.00	1.11	Free Outfall		
764.50	1.11	Free Outfall		Interpolated from input table
765.00	1.11	Free Outfall		

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1C

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Notes		
		Converge		
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
755.00	.00	Free Outfall		SP
758.00	.56	Free Outfall		SP
758.50	.56	Free Outfall		SP
759.00	.56	Free Outfall		SP
759.50	.83	Free Outfall		SP
760.00	1.11	Free Outfall		SP
760.50	1.11	Free Outfall		SP
761.00	1.11	Free Outfall		SP
761.50	1.11	Free Outfall		SP
762.00	1.11	Free Outfall		SP
762.50	1.11	Free Outfall		SP
763.00	1.11	Free Outfall		SP
763.50	1.11	Free Outfall		SP
764.00	1.11	Free Outfall		SP
764.50	1.11	Free Outfall		SP
765.00	1.11	Free Outfall		SP

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1C

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 758.00 ft
Increment = .50 ft
Max. Elev.= 765.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Weir-Rectangular	WR	--->	TW	764.000	765.000

TW SETUP, DS Channel

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1C

OUTLET STRUCTURE INPUT DATA

Structure ID = WR
Structure Type = Weir-Rectangular

# of Openings = 1
Crest Elev. = 764.00 ft
Weir Length = 20.00 ft
Weir Coeff. = 3.087000

Weir TW effects (Use adjustment equation)

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 30
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .10 cfs
Max. Q tolerance = .10 cfs

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = WR (Weir-Rectangular)

Upstream ID = (Pond Water Surface)
DNstream ID = TW (Pond Outfall)

WS Elev, Device Q		Tail Water		Notes
WS Elev. ft	Q cfs	TW Elev ft	Converge +/-ft	Computation Messages
758.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
758.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
759.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
759.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
760.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
760.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
761.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
761.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
762.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
762.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
763.00	.00	Free Outfall		HW & TW below Inv.El.=764.000
763.50	.00	Free Outfall		HW & TW below Inv.El.=764.000
764.00	.00	Free Outfall		H=.00; Htw=.00; Qfree=.00;
764.50	21.83	Free Outfall		H=.50; Htw=.00; Qfree=21.83;
765.00	61.74	Free Outfall		H=1.00; Htw=.00; Qfree=61.74;

File.... K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\42605KIF LAT EXP W_PHASE2_DITCH D1@1

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Notes		
		Converge		
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
758.00	.00	Free Outfall		None contributing
758.50	.00	Free Outfall		None contributing
759.00	.00	Free Outfall		None contributing
759.50	.00	Free Outfall		None contributing
760.00	.00	Free Outfall		None contributing
760.50	.00	Free Outfall		None contributing
761.00	.00	Free Outfall		None contributing
761.50	.00	Free Outfall		None contributing
762.00	.00	Free Outfall		None contributing
762.50	.00	Free Outfall		None contributing
763.00	.00	Free Outfall		None contributing
763.50	.00	Free Outfall		None contributing
764.00	.00	Free Outfall		WR
764.50	21.83	Free Outfall		WR
765.00	61.74	Free Outfall		WR

LEVEL POOL ROUTING DATA

HYG Dir = K:\Fossil\KIF\TAO-0201 (KIF G&A Disp)\Seepage analysis\Calcs\
Inflow HYG file = NONE STORED - POND 10 IN 25yr
Outflow HYG file = NONE STORED - POND 10 OUT 25yr

Pond Node Data = POND 10
Pond Volume Data = POND 10
Pond Outlet Data = Weir
Pumps

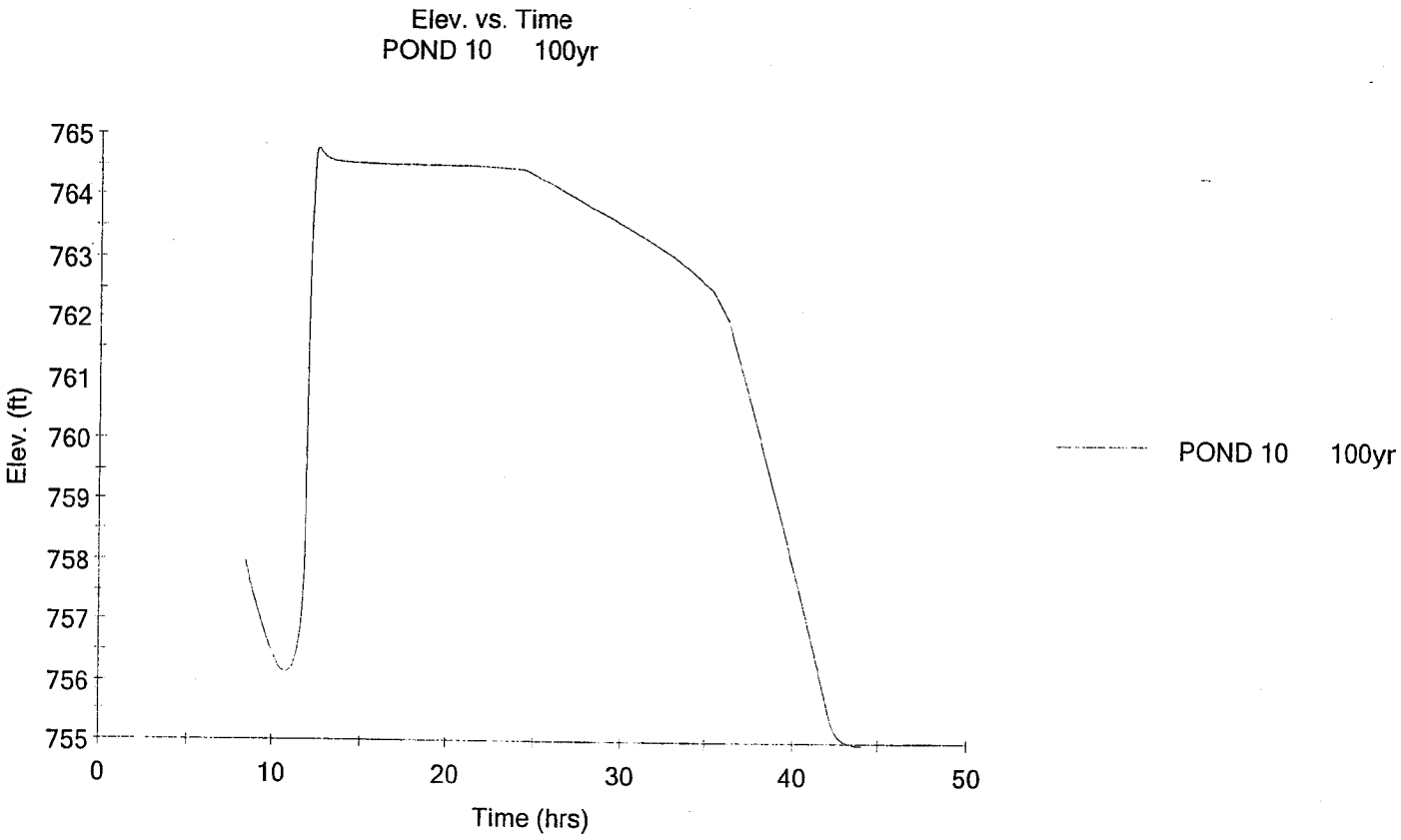
Infiltration = .37 cfs

INITIAL CONDITIONS

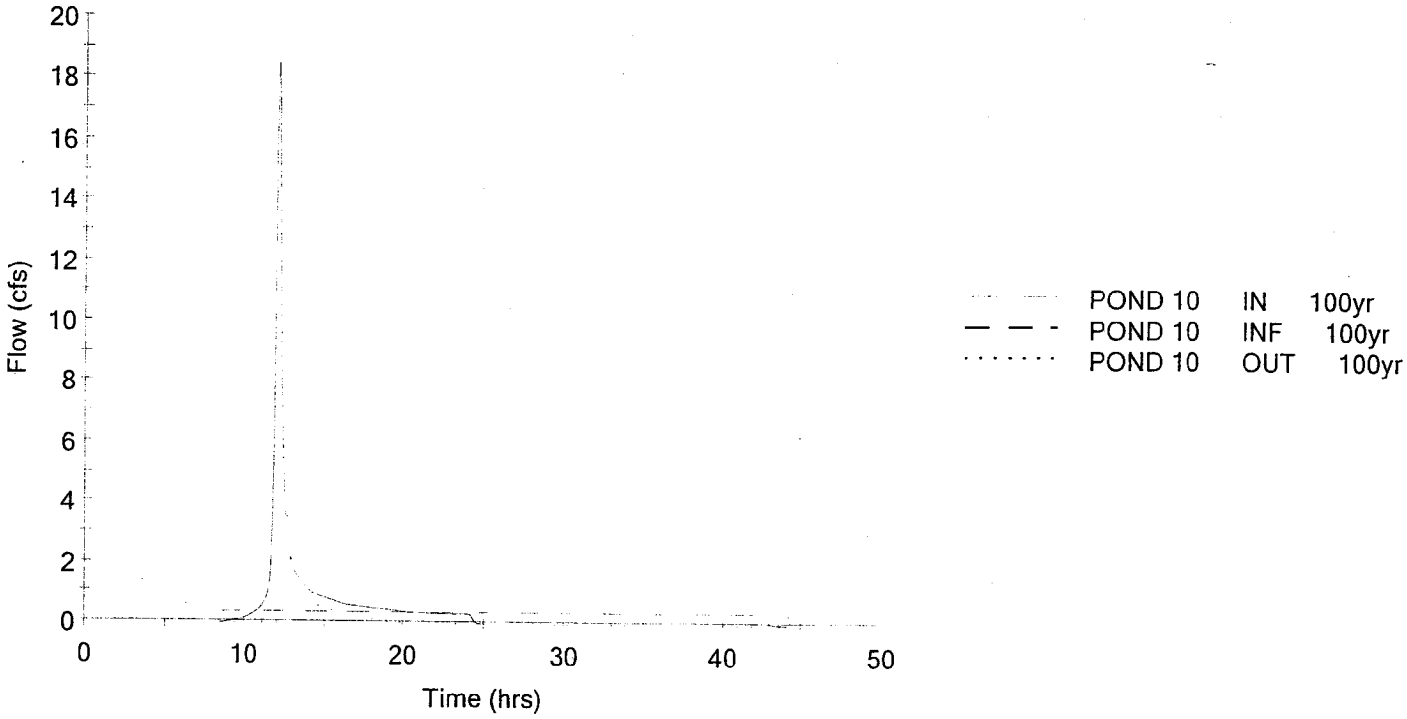
Starting WS Elev	=	758.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.56 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.56 cfs
Time Increment	=	.0500 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
758.00	.56	.000	.0332	.00	.56	.56
758.50	.56	.022	.0556	.37	.93	11.56
759.00	.56	.057	.0837	.37	.93	28.31
759.50	.83	.101	.0929	.37	1.20	49.95
760.00	1.11	.150	.1025	.37	1.48	73.86
760.50	1.11	.203	.1124	.37	1.48	99.86
761.00	1.11	.262	.1228	.37	1.48	128.31
761.50	1.11	.326	.1335	.37	1.48	159.31
762.00	1.11	.396	.1448	.37	1.48	192.98
762.50	1.11	.471	.1564	.37	1.48	229.41
763.00	1.11	.552	.1684	.37	1.48	268.70
763.50	1.11	.639	.1809	.37	1.48	310.96
764.00	1.11	.733	.1938	.37	1.48	356.29
764.50	22.94	.833	.2071	.37	23.31	426.62
765.00	62.85	.940	.2208	.37	63.22	518.30

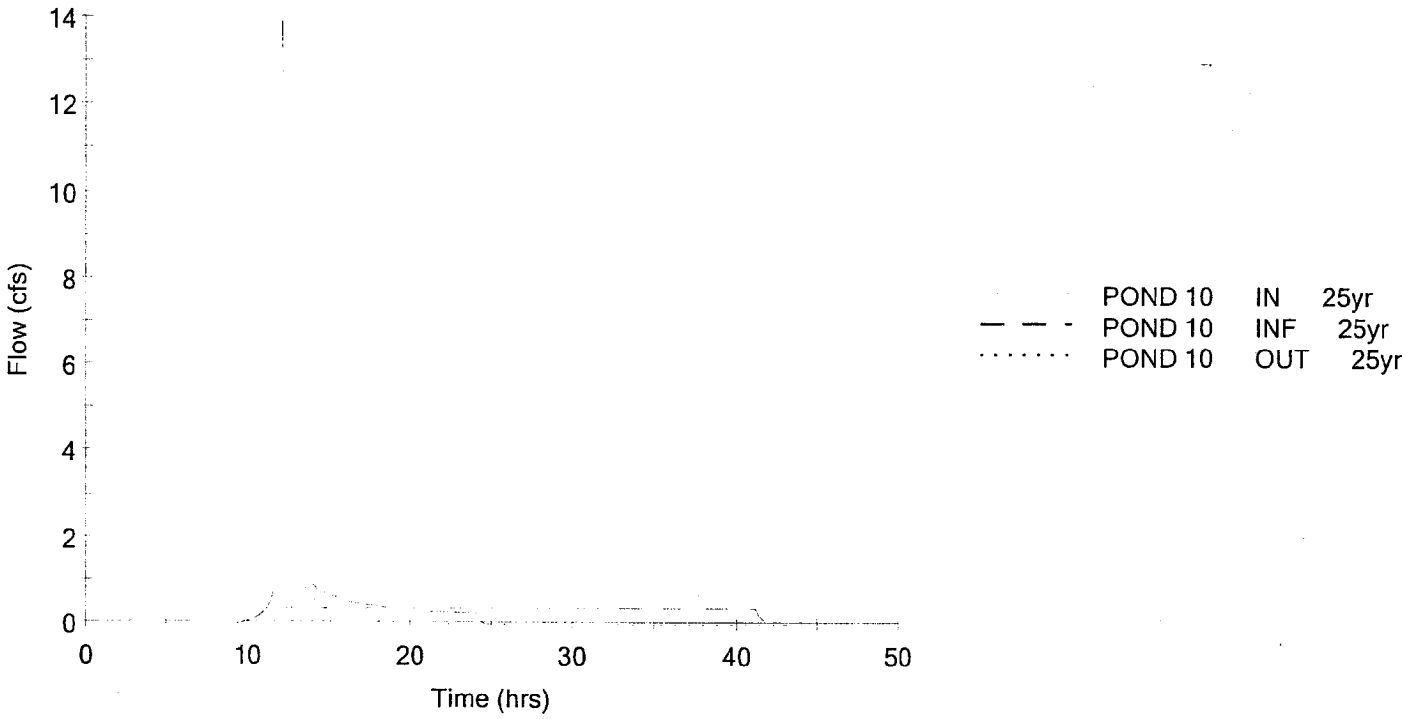
Index of Starting Page Numbers for ID Names


Elev. vs. Time
POND 10 100yr
765
764
763
762
761
760
759
758
757
756
755
Elev. (ft)
0
10
20
30
40
50
Time (hrs)
POND 10 100yr

Hydrograph
POND 10 OUT 100yr



Hydrograph
POND 10 OUT 25yr



ATTACHMENT C

SEEPAGE FLOWS

SEEPAGE ESTIMATES FOR CONTRIBUTIONS TO POND

	Well /Trench	ft3/day/ft	ft3/sec/ft	Distance (ft)	Flow (ft3/sec)
	Buttress Ditch	0.921	1.07E-05	2000	2.13E-02
	Geocomposite Drainage	5.1	5.90E-05	2000	1.18E-01
	8-Inch Pipe	0.592	6.85E-07	2000	1.37E-03
	775 ft Elevation Bench 5-Foot	1.13	1.31E-05	2000	2.62E-02
	781 ft Elevation Bench 5-Foot	1.26	1.46E-05	2000	2.92E-02
	795 ft Elevation Bench 6-Foot	0.38	4.40E-06	2000	8.80E-03
	797 foot Elevation Pipe Drain	0.93	1.08E-05	2000	2.15E-02
	802 foot "	0	0	2000	0.00E+00
	807 foot "	0	0	2000	0.00E+00
	812 foot "	0.0058	6.71E-08	2000	1.34E-04
	817 foot "	0.59	6.83E-06	2000	1.37E-02
	827 foot "	0.29	3.36E-06	2000	6.71E-03
	832 foot "	0.29	3.36E-06	2000	6.71E-03
	842 foot "	0	0	2000	0.00E+00
	847 foot "	0.259	3.00E-06	2000	6.00E-03
	857 foot "	0.172	1.99E-06	2000	3.98E-03
	862 foot "	0.0269	3.09E-07	2000	6.18E-04
	872 foot "	0	0	2000	0.00E+00
	882 foot "	0	0	2000	0.00E+00
	887 foot "	0.804	9.31E-06	2000	1.86E-02
	892 foot "	1.21	1.40E-05	2000	2.80E-02
				Total	3.11E-01