

BASIN 3

114354-1

Pre-Development Drainage Basin Data



BASIN BREAKDOWN

MADE BY: MSF 23-Apr-08
 CHECK BY: KMV 24-Apr-08

DATE

PROJECT: HARTWOOD MARSH ROAD

LOCATION: **BASIN 3 PHASE 1**

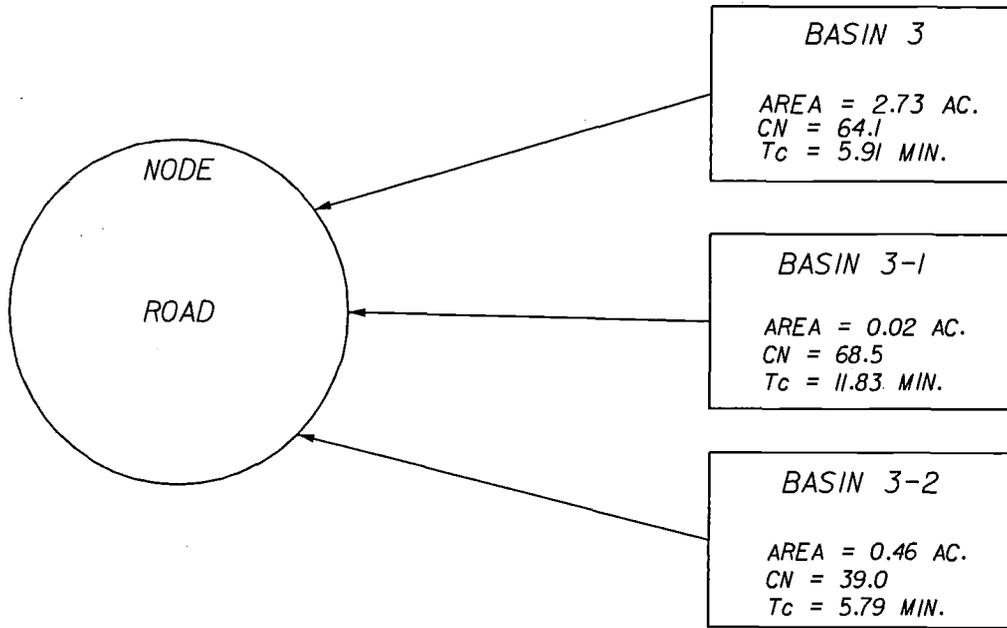
BASIN LIMITS: STA. 152+39 to STA. 162+00, CL CONST. HARTWOOD MARSH RD.

EXISTING CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (FL)	IMP AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	0.843	1.887	2.730	
ON-SITE SUBTOTAL:					0.843	1.887	2.73	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					0.01	0.47	0.48	
TOTAL:					0.85	2.35	3.21	

PROPOSED CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (FL)	IMP AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	1.73	1.00	2.73	
ON-SITE SUBTOTAL:					1.73	1.00	2.73	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					0.01	0.47	0.48	
TOTAL:					1.74	1.47	3.21	



BASIN 3

LOCATION: LAKE COUNTY SEC. 9 & 10, T23S, R26E HARTWOOD MARSH ROAD RECONSTRUCTION US 27 TO 1500 FT EAST OF S. HANCOCK RD	COUNTY: LAKE STATE: FLORIDA DATE: 04-08	DATUM: NAVD 88 PURPOSE: PRE-DEVELOPMENT NODAL DIAGRAM
 HNTB CORPORATION 300 PRIMERA BLVD, SUITE 200 LAKE MARY, FL 32746 (407) 805-0355 CERT. OF AUTH. NO. 6500 ENGINEER OF RECORD: KAREN M. VAN DEN AVONT, P.E. FL. REGISTRATION NO. 44794	 LAKE COUNTY FLORIDA	LAKE COUNTY HARTWOOD MARSH ROAD



RUNOFF CURVE NUMBER

MADE BY:	MSF	DATE:	23-Apr-08
CHKED BY:	KMV		24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3

UNDERLINE ONE: EXISTING PROPOSED

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN			Area acres	Product of CN x Area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
-	IMPERVIOUS AREA Exist Pavement (On-Site)	98			0.84	82.62
Astatula Sand (A)	GRASS Fair Condition (On-Site)	49			1.89	92.47
Totals =					2.73	175.09

Use CN = 64.1

REFERENCE: Urban Hydrology for Small Watersheds
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986



RUNOFF CURVE NUMBER

DATE:

MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-1

UNDERLINE ONE: EXISTING PROPOSED

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN			Area acres	Product of CN x Area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.01	0.98
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.01	0.39
Totals =					0.02	1.37

Use CN = 68.5

REFERENCE: Urban Hydrology for Small Watersheds
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

RUNOFF CURVE NUMBER

HNTB

DATE:	
MADE BY: MSF	23-Apr-08
CHKED BY: KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-2

UNDERLINE ONE: EXISTING PROPOSED

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN			Area acres	Product of CN x Area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.00	0.00
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.46	17.79
Totals =					0.46	17.79

Use CN = 39.0

REFERENCE: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS



DATE:

MADE BY: MSF	12-Mar-08
CHECKED BY: KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION:

BASIN 3

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: Tc Tt Through subarea

SHEET FLOW:

- 1 SURFACE DESCRIPTION
- 2 MANNING'S COEFFICIENT, n
- 3 FLOW LENGTH, L, (< 300')
- 4 2 YR/ 24 HR RAINFALL, P
- 5 LAND SLOPE, S
- 6 $Tt = (0.007 (nL)^{0.8}) / (P^{0.5} * S^{0.4})$

SMOOTH SURFACE			
0.011			
112	FT.		
4.70	IN.		
0.0286			
0.0158	HR. OR	<table border="1"><tr><td>0.95</td></tr></table> MIN.	0.95
0.95			

SHALLOW CONCENTRATED FLOW:

- 7 SURFACE DESCRIPTION (PAVED OR UNPAVED)
- 8 FLOW LENGTH, L
- 9 WATERCOURSE SLOPE, S
- 10 AVERAGE VELOCITY, V
- 11 $Tt = L / (3600 * V)$

UNPAVED			
877	L.F.		
0.0334	FT./ FT.		
2.949	FT./SEC.		
0.08	HR. OR	<table border="1"><tr><td>4.96</td></tr></table> MIN.	4.96
4.96			

CHANNEL FLOW:

- 12 CROSS-SECTIONAL FLOW AREA, A
- 13 WETTED PERIMETER, Pw
- 14 HYDRAULIC RADIUS, R = (A / Pw)
- 15 CHANNEL SLOPE, S
- 16 MANNING'S ROUGHNESS COEFFICIENT, n
- 17 VELOCITY, V, = $(1.49 * R^{0.667} * S^{0.5}) / n$
- 18 FLOW LENGTH, L
- 19 $Tt = L / (3600 V)$
- 20 Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)

	S.F.		
	L.F.		
	L.F.		
	FT./FT.		
	FT./SEC.		
	L.F.		
	HR. OR	<table border="1"><tr><td>0.00</td></tr></table> MIN.	0.00
0.00			

TOTAL Tc =

5.91

 MIN.

Reference: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS



DATE:
 MADE BY: MSF 12-Mar-08
 CHECKED BY: KMV 13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-1

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: T_c T_t Through subarea

SHEET FLOW:

1	SURFACE DESCRIPTION	SHORT GRASS	
2	MANNING'S COEFFICIENT, n	0.150	
3	FLOW LENGTH, L, (< 300')	100	FT.
4	2 YR/ 24 HR RAINFALL, P	4.70	IN.
5	LAND SLOPE, S	0.030	
6	T _t = (0.007 (nL) ^{0.8}) / (P ^{0.5} * S ^{0.4})	0.115	HR. OR 6.87 MIN. (TO ROAD)

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED	
8	FLOW LENGTH, L	877	L.F.
9	WATERCOURSE SLOPE, S	0.0334	FT./FT.
10	AVERAGE VELOCITY, V	2.949	FT./SEC.
11	T _t = L / (3600 * V)	0.08	HR. OR 4.96 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A		S.F.
13	WETTED PERIMETER, P _w		L.F.
14	HYDRAULIC RADIUS, R = (A / P _w)		L.F.
15	CHANNEL SLOPE, S		FT./FT.
16	MANNING'S ROUGHNESS COEFFICIENT, n		
17	VELOCITY, V, = (1.49 * R ^{0.667} * S ^{0.5}) / n		FT./SEC.
18	FLOW LENGTH, L		L.F.
19	T _t = L / (3600 V)		HR. OR 0.00 MIN.
20	Watershed or subarea T _c or T _t (add T _t in steps 6, 11, and 19)		

TOTAL T_c = 11.83 MIN.

Reference: Urban Hydrology for Small Watersheds
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

DATE:

MADE BY: MSF	12-Mar-08
CHECKED BY: KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION:

BASIN 3-2

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: Tc Tt Through subarea

SHEET FLOW:

1	SURFACE DESCRIPTION	SHORT GRASS			
2	MANNING'S COEFFICIENT, n	0.150			
3	FLOW LENGTH, L, (< 300')	32	FT.		
4	2 YR/ 24 HR RAINFALL, P	4.70	IN.		
5	LAND SLOPE, S	0.128			
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.026	HR. OR	<table border="1"><tr><td>1.55</td></tr></table> MIN. (TO ROAD)	1.55
1.55					

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED			
8	FLOW LENGTH, L	755	L.F.		
9	WATERCOURSE SLOPE, S	0.0338	FT./FT.		
10	AVERAGE VELOCITY, V	2.965	FT./SEC.		
11	Tt = L / (3600 * V)	0.07	HR. OR	<table border="1"><tr><td>4.24</td></tr></table> MIN.	4.24
4.24					

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A		S.F.		
13	WETTED PERIMETER, Pw		L.F.		
14	HYDRAULIC RADIUS, R = (A / Pw)		L.F.		
15	CHANNEL SLOPE, S		FT./FT.		
16	MANNING'S ROUGHNESS COEFFICIENT, n				
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n		FT./SEC.		
18	FLOW LENGTH, L		L.F.		
19	Tt = L / (3600 V)		HR. OR	<table border="1"><tr><td>0.00</td></tr></table> MIN.	0.00
0.00					
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)				

TOTAL Tc =

5.79

 MIN.

Reference: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

Hartwood Marsh Road Phase I
 Pre Development
 Basin 3
 Input

=====
 Basins
 =====

Name: BASIN 3 Node: ROAD Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph

 Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Sjrwm96 Storm Duration(hrs): 96.00
 Rainfall Amount(in): 11.000 Time of Conc(min): 5.91
 Area(ac): 2.730 Time Shift(hrs): 0.00
 Curve Number: 64.10 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

Existing Hartwood

 Name: BASIN 3-1 Node: ROAD Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Sjrwm96 Storm Duration(hrs): 96.00
 Rainfall Amount(in): 11.000 Time of Conc(min): 11.83
 Area(ac): 0.020 Time Shift(hrs): 0.00
 Curve Number: 68.50 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

 Name: BASIN 3-2 Node: ROAD Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Sjrwm96 Storm Duration(hrs): 96.00
 Rainfall Amount(in): 11.000 Time of Conc(min): 5.79
 Area(ac): 0.460 Time Shift(hrs): 0.00
 Curve Number: 39.00 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

=====
 Nodes
 =====

Name: Base Flow(cfs): 0.000 Init Stage(ft): 0.000
 Group: BASE Warn Stage(ft): 0.000
 Type: Stage/Area

Stage(ft) Area(ac)

=====
 Drop Structures
 =====

Name: From Node: Length(ft): 0.00
 Group: BASE To Node: Count: 1

 UPSTREAM DOWNSTREAM Friction Equation: Average Conveyance
 Geometry: Circular Circular Solution Algorithm: Automatic
 Span(in): 0.00 0.00 Flow: Both
 Rise(in): 0.00 0.00 Entrance Loss Coef: 0.000
 Invert(ft): 0.000 0.000 Exit Loss Coef: 0.000
 Manning's N: 0.000000 0.000000 Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000 0.000 Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000 0.000 Solution Incs: 10

Upstream FHWA Inlet Edge Description:
 Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
 Circular Concrete: Square edge w/ headwall

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Input

==== Hydrology Simulations =====
=====

Name: 100Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\PRE\100Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 10.20

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 10Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\PRE\10Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 7.00

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 4.90

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.R32

Override Defaults: No

Time(hrs)	Print Inc(min)
50.000	60.00
62.000	15.00
97.000	60.00

==== Routing Simulations =====
=====

Name: 2.3Y24H Hydrology Sim: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.I32

Execute: No Restart: No Patch: No

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Input

Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 25Y24H Hydrology Sim: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 25Y96H Hydrology Sim: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 97.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
55.000	60.000
65.000	15.000
97.000	60.000

Group	Run
BASE	Yes

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==== Boundary Conditions =====
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Hartwood Marsh Road Phase I
 Pre Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	Rain Sum in	Excess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	2.00	0.027	0.000	0.027	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	3.00	0.054	0.000	0.054	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	4.00	0.081	0.000	0.081	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	5.00	0.108	0.000	0.108	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	6.00	0.134	0.000	0.134	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	7.00	0.161	0.000	0.161	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	8.00	0.188	0.000	0.188	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	9.00	0.215	0.000	0.215	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	10.00	0.242	0.000	0.242	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	11.00	0.268	0.000	0.268	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	12.00	0.295	0.000	0.295	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	13.00	0.322	0.000	0.322	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	14.00	0.349	0.000	0.349	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	15.00	0.376	0.000	0.376	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	16.00	0.403	0.000	0.403	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	17.00	0.430	0.000	0.430	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	18.00	0.457	0.000	0.457	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	19.00	0.483	0.000	0.483	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	20.00	0.510	0.000	0.510	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	21.00	0.537	0.000	0.537	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	22.00	0.564	0.000	0.564	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	23.00	0.591	0.000	0.591	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	24.00	0.618	0.000	0.618	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	25.00	0.645	0.000	0.645	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	26.00	0.671	0.000	0.671	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	27.00	0.697	0.000	0.697	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	28.00	0.724	0.000	0.724	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	29.00	0.750	0.000	0.750	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	30.00	0.776	0.000	0.776	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	31.00	0.802	0.000	0.802	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	32.00	0.828	0.000	0.828	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	33.00	0.854	0.000	0.854	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	34.00	0.880	0.000	0.880	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	35.00	0.906	0.000	0.906	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	36.00	0.932	0.000	0.932	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	37.00	0.958	0.000	0.958	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	38.00	0.984	0.000	0.984	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	39.00	1.010	0.000	1.010	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	40.00	1.036	0.000	1.036	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	41.00	1.062	0.000	1.062	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	42.00	1.088	0.000	1.088	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	43.00	1.114	0.000	1.114	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	44.00	1.140	0.000	1.140	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	45.00	1.166	0.000	1.166	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	46.00	1.192	0.000	1.192	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	47.00	1.218	0.000	1.218	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	48.00	1.244	0.000	1.244	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	49.00	1.270	0.000	1.270	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	50.00	1.296	0.000	1.296	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	50.25	1.303	0.000	1.303	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	50.50	1.310	0.000	1.310	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	50.75	1.317	0.000	1.317	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	51.00	1.324	0.000	1.324	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	51.25	1.331	0.000	1.331	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	51.50	1.338	0.000	1.338	0.000	0.000	0.000	0.000	0.000

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Hartwood Marsh Road Phase I
 Pre Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	78.00	10.089	0.048	5.562	0.041	56528.098	5.704	0.113	0.000
25Y96H	BASIN 3	BASE	79.00	10.137	0.048	5.603	0.041	56935.305	5.745	0.113	0.000
25Y96H	BASIN 3	BASE	80.00	10.185	0.048	5.644	0.041	57342.961	5.786	0.113	0.000
25Y96H	BASIN 3	BASE	81.00	10.233	0.048	5.685	0.041	57749.414	5.827	0.113	0.000
25Y96H	BASIN 3	BASE	82.00	10.281	0.048	5.726	0.041	58154.668	5.868	0.113	0.000
25Y96H	BASIN 3	BASE	83.00	10.329	0.048	5.767	0.041	58560.359	5.909	0.113	0.000
25Y96H	BASIN 3	BASE	84.00	10.377	0.048	5.808	0.041	58966.484	5.950	0.113	0.000
25Y96H	BASIN 3	BASE	85.00	10.425	0.048	5.849	0.041	59373.039	5.991	0.113	0.000
25Y96H	BASIN 3	BASE	86.00	10.473	0.048	5.891	0.041	59780.016	6.032	0.113	0.000
25Y96H	BASIN 3	BASE	87.00	10.520	0.048	5.932	0.041	60187.414	6.073	0.113	0.000
25Y96H	BASIN 3	BASE	88.00	10.568	0.048	5.973	0.041	60595.230	6.115	0.113	0.000
25Y96H	BASIN 3	BASE	89.00	10.616	0.048	6.015	0.042	61005.129	6.156	0.114	0.000
25Y96H	BASIN 3	BASE	90.00	10.664	0.048	6.056	0.042	61417.105	6.198	0.114	0.000
25Y96H	BASIN 3	BASE	91.00	10.712	0.048	6.098	0.042	61829.496	6.239	0.115	0.000
25Y96H	BASIN 3	BASE	92.00	10.761	0.048	6.140	0.042	62242.289	6.281	0.115	0.000
25Y96H	BASIN 3	BASE	93.00	10.809	0.048	6.181	0.041	62653.809	6.322	0.114	0.000
25Y96H	BASIN 3	BASE	94.00	10.857	0.048	6.222	0.041	63064.055	6.364	0.114	0.000
25Y96H	BASIN 3	BASE	95.00	10.904	0.048	6.264	0.041	63474.691	6.405	0.114	0.000
25Y96H	BASIN 3	BASE	96.00	10.952	0.048	6.305	0.041	63883.160	6.446	0.113	0.000
25Y96H	BASIN 3	BASE	97.00	11.000	0.048	6.305	0.000	64086.215	6.467	0.000	0.000
25Y96H	BASIN 3-1	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	30.00	0.963	0.065	0.002	0.002	0.165	0.002	0.000	0.000
25Y96H	BASIN 3-1	BASE	31.00	1.028	0.065	0.006	0.004	0.422	0.006	0.000	0.000
25Y96H	BASIN 3-1	BASE	32.00	1.093	0.065	0.012	0.005	0.800	0.011	0.000	0.000
25Y96H	BASIN 3-1	BASE	33.00	1.159	0.065	0.019	0.008	1.285	0.018	0.000	0.000
25Y96H	BASIN 3-1	BASE	34.00	1.222	0.063	0.027	0.007	1.867	0.026	0.000	0.000
25Y96H	BASIN 3-1	BASE	35.00	1.285	0.063	0.037	0.010	2.550	0.035	0.000	0.000
25Y96H	BASIN 3-1	BASE	36.00	1.348	0.063	0.047	0.011	3.330	0.046	0.000	0.000

← MAX

Hartwood Marsh Road Phase I
 Pre Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-1	BASE	37.00	1.411	0.063	0.063	0.060	0.012	4.204	0.058	0.000	0.000
25Y96H	BASIN 3-1	BASE	38.00	1.474	0.063	0.063	0.073	0.013	5.168	0.071	0.000	0.000
25Y96H	BASIN 3-1	BASE	39.00	1.538	0.063	0.063	0.088	0.015	6.218	0.086	0.000	0.000
25Y96H	BASIN 3-1	BASE	40.00	1.601	0.063	0.063	0.104	0.016	7.353	0.101	0.000	0.000
25Y96H	BASIN 3-1	BASE	41.00	1.664	0.063	0.063	0.121	0.018	8.589	0.118	0.000	0.000
25Y96H	BASIN 3-1	BASE	42.00	1.729	0.065	0.065	0.140	0.019	9.928	0.137	0.000	0.000
25Y96H	BASIN 3-1	BASE	43.00	1.795	0.065	0.065	0.160	0.020	11.347	0.156	0.000	0.000
25Y96H	BASIN 3-1	BASE	44.00	1.860	0.065	0.065	0.180	0.021	12.844	0.177	0.000	0.000
25Y96H	BASIN 3-1	BASE	45.00	1.925	0.065	0.065	0.202	0.022	14.388	0.198	0.000	0.000
25Y96H	BASIN 3-1	BASE	46.00	1.988	0.063	0.063	0.224	0.022	15.976	0.220	0.000	0.000
25Y96H	BASIN 3-1	BASE	47.00	2.052	0.063	0.063	0.247	0.023	17.630	0.243	0.000	0.000
25Y96H	BASIN 3-1	BASE	48.00	2.115	0.063	0.063	0.270	0.024	19.347	0.266	0.000	0.000
25Y96H	BASIN 3-1	BASE	49.00	2.178	0.063	0.063	0.304	0.033	21.446	0.295	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.00	2.263	0.085	0.085	0.338	0.035	23.948	0.330	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.25	2.348	0.085	0.085	0.349	0.035	24.638	0.339	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.50	2.373	0.025	0.025	0.359	0.011	25.390	0.350	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.75	2.397	0.025	0.025	0.370	0.011	26.158	0.360	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.00	2.422	0.025	0.025	0.381	0.011	26.933	0.371	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.25	2.447	0.025	0.025	0.392	0.011	27.717	0.382	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.50	2.472	0.025	0.025	0.403	0.011	28.510	0.393	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.75	2.497	0.025	0.025	0.414	0.011	29.310	0.404	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.00	2.521	0.025	0.025	0.425	0.011	30.118	0.415	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.25	2.546	0.025	0.025	0.439	0.014	31.019	0.427	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.50	2.577	0.031	0.031	0.453	0.014	32.028	0.441	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.75	2.608	0.031	0.031	0.468	0.014	33.061	0.455	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.00	2.638	0.031	0.031	0.482	0.015	34.107	0.470	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.25	2.669	0.031	0.031	0.497	0.015	35.163	0.484	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.50	2.700	0.031	0.031	0.512	0.015	36.231	0.499	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.75	2.730	0.031	0.031	0.527	0.015	37.310	0.514	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.00	2.761	0.031	0.031	0.542	0.015	38.401	0.529	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.25	2.792	0.031	0.031	0.561	0.019	39.623	0.546	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.50	2.830	0.038	0.038	0.580	0.019	40.998	0.565	0.002	0.000
25Y96H	BASIN 3-1	BASE	54.75	2.869	0.038	0.038	0.600	0.020	42.408	0.584	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.00	2.907	0.038	0.038	0.620	0.020	43.833	0.604	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.25	2.945	0.038	0.038	0.640	0.020	45.275	0.624	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.50	2.984	0.038	0.038	0.660	0.020	46.732	0.644	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.75	3.022	0.038	0.038	0.680	0.020	48.204	0.664	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.00	3.061	0.038	0.038	0.701	0.021	49.692	0.684	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.25	3.099	0.039	0.039	0.723	0.032	51.541	0.710	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.50	3.158	0.058	0.058	0.785	0.032	53.806	0.741	0.003	0.000
25Y96H	BASIN 3-1	BASE	56.75	3.216	0.058	0.058	0.798	0.033	56.151	0.773	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.00	3.275	0.058	0.058	0.831	0.033	58.529	0.806	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.25	3.333	0.058	0.058	0.864	0.033	60.938	0.839	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.50	3.391	0.058	0.058	0.898	0.034	63.376	0.873	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.75	3.450	0.058	0.058	0.932	0.034	65.844	0.907	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.00	3.508	0.058	0.058	0.967	0.035	68.343	0.941	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.25	3.567	0.058	0.058	1.029	0.062	71.729	0.988	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.50	3.670	0.103	0.103	1.093	0.064	76.152	1.049	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.75	3.773	0.104	0.104	1.157	0.065	80.788	1.113	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.00	3.877	0.104	0.104	1.224	0.067	85.511	1.178	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.25	3.980	0.104	0.104	1.342	0.118	91.971	1.267	0.009	0.000
25Y96H	BASIN 3-1	BASE	59.50	4.164	0.184	0.184	1.485	0.143	100.575	1.385	0.010	0.000
25Y96H	BASIN 3-1	BASE	59.75	4.349	0.185	0.185	2.516	1.031	138.850	1.913	0.075	0.000
25Y96H	BASIN 3-1	BASE	60.00	4.556	1.456	1.456	3.654	1.138	214.087	2.949	0.092	0.000
25Y96H	BASIN 3-1	BASE	60.25	7.264	1.460	1.460	3.907	0.253	268.321	3.696	0.028	0.000
25Y96H	BASIN 3-1	BASE	60.50	7.541	0.277	0.277	4.136	0.228	289.530	3.988	0.019	0.000
25Y96H	BASIN 3-1	BASE	60.75	7.817	0.276	0.276	4.258	0.122	302.849	4.171	0.011	0.000

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Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-1	BASE	61.00	7.959	0.142	4.377	0.119	312.066	4.298	0.010	0.000
25Y96H	BASIN 3-1	BASE	61.25	8.101	0.142	4.456	0.079	319.459	4.400	0.007	0.000
25Y96H	BASIN 3-1	BASE	61.50	8.193	0.092	4.535	0.079	325.341	4.481	0.006	0.000
25Y96H	BASIN 3-1	BASE	61.75	8.286	0.092	4.613	0.079	331.045	4.560	0.006	0.000
25Y96H	BASIN 3-1	BASE	62.00	8.378	0.092	4.691	0.078	336.755	4.639	0.006	0.000
25Y96H	BASIN 3-1	BASE	63.00	8.470	0.092	4.889	0.198	355.334	4.894	0.004	0.000
25Y96H	BASIN 3-1	BASE	64.00	8.699	0.229	5.087	0.198	369.677	5.092	0.004	0.000
25Y96H	BASIN 3-1	BASE	65.00	8.928	0.229	5.207	0.121	381.223	5.251	0.002	0.000
25Y96H	BASIN 3-1	BASE	66.00	9.067	0.138	5.328	0.121	389.953	5.371	0.002	0.000
25Y96H	BASIN 3-1	BASE	67.00	9.205	0.138	5.449	0.121	398.710	5.492	0.002	0.000
25Y96H	BASIN 3-1	BASE	68.00	9.343	0.138	5.570	0.121	407.488	5.613	0.002	0.000
25Y96H	BASIN 3-1	BASE	69.00	9.481	0.138	5.651	0.081	414.816	5.714	0.002	0.000
25Y96H	BASIN 3-1	BASE	70.00	9.573	0.092	5.732	0.081	420.693	5.795	0.002	0.000
25Y96H	BASIN 3-1	BASE	71.00	9.665	0.092	5.813	0.081	426.579	5.876	0.002	0.000
25Y96H	BASIN 3-1	BASE	72.00	9.757	0.092	5.894	0.081	432.469	5.957	0.002	0.000
25Y96H	BASIN 3-1	BASE	73.00	9.849	0.092	5.937	0.042	436.949	6.019	0.001	0.000
25Y96H	BASIN 3-1	BASE	74.00	9.897	0.048	5.979	0.042	440.019	6.061	0.001	0.000
25Y96H	BASIN 3-1	BASE	75.00	9.945	0.048	6.021	0.042	443.091	6.103	0.001	0.000
25Y96H	BASIN 3-1	BASE	76.00	9.993	0.048	6.064	0.042	446.167	6.146	0.001	0.000
25Y96H	BASIN 3-1	BASE	77.00	10.041	0.048	6.107	0.043	449.257	6.188	0.001	0.000
25Y96H	BASIN 3-1	BASE	78.00	10.089	0.048	6.149	0.043	452.363	6.231	0.001	0.000
25Y96H	BASIN 3-1	BASE	79.00	10.137	0.048	6.192	0.043	455.472	6.274	0.001	0.000
25Y96H	BASIN 3-1	BASE	80.00	10.185	0.048	6.235	0.043	458.583	6.317	0.001	0.000
25Y96H	BASIN 3-1	BASE	81.00	10.233	0.048	6.278	0.043	461.684	6.359	0.001	0.000
25Y96H	BASIN 3-1	BASE	82.00	10.281	0.048	6.320	0.043	464.775	6.402	0.001	0.000
25Y96H	BASIN 3-1	BASE	83.00	10.329	0.048	6.363	0.043	467.869	6.444	0.001	0.000
25Y96H	BASIN 3-1	BASE	84.00	10.377	0.048	6.406	0.043	470.966	6.487	0.001	0.000
25Y96H	BASIN 3-1	BASE	85.00	10.425	0.048	6.449	0.043	474.064	6.530	0.001	0.000
25Y96H	BASIN 3-1	BASE	86.00	10.473	0.048	6.491	0.043	477.166	6.573	0.001	0.000
25Y96H	BASIN 3-1	BASE	87.00	10.520	0.048	6.534	0.043	480.270	6.615	0.001	0.000
25Y96H	BASIN 3-1	BASE	88.00	10.568	0.048	6.577	0.043	483.376	6.658	0.001	0.000
25Y96H	BASIN 3-1	BASE	89.00	10.616	0.048	6.620	0.043	486.497	6.701	0.001	0.000
25Y96H	BASIN 3-1	BASE	90.00	10.664	0.048	6.664	0.043	489.634	6.744	0.001	0.000
25Y96H	BASIN 3-1	BASE	91.00	10.712	0.048	6.707	0.043	492.772	6.787	0.001	0.000
25Y96H	BASIN 3-1	BASE	92.00	10.761	0.048	6.750	0.043	495.913	6.831	0.001	0.000
25Y96H	BASIN 3-1	BASE	93.00	10.809	0.048	6.793	0.043	499.044	6.874	0.001	0.000
25Y96H	BASIN 3-1	BASE	94.00	10.857	0.048	6.836	0.043	502.164	6.917	0.001	0.000
25Y96H	BASIN 3-1	BASE	95.00	10.904	0.048	6.879	0.043	505.287	6.960	0.001	0.000
25Y96H	BASIN 3-1	BASE	96.00	10.952	0.048	6.921	0.042	508.393	7.003	0.001	0.000
25Y96H	BASIN 3-1	BASE	97.00	11.000	0.048	6.921	0.000	509.936	7.024	0.000	0.000
25Y96H	BASIN 3-2	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000

← MAX

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Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	30.00	0.963	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	31.00	1.028	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	32.00	1.093	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	33.00	1.159	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	34.00	1.222	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	35.00	1.285	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	36.00	1.348	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	37.00	1.411	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	38.00	1.474	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	39.00	1.538	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	40.00	1.601	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	41.00	1.664	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	42.00	1.729	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	43.00	1.795	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	44.00	1.860	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	45.00	1.925	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	46.00	1.988	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	47.00	2.052	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	48.00	2.115	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	49.00	2.178	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.00	2.263	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.25	2.348	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.50	2.373	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.75	2.397	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.00	2.422	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.25	2.447	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.50	2.472	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.75	2.497	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.00	2.521	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.25	2.546	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.50	2.577	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.75	2.608	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.00	2.638	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.25	2.669	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.50	2.700	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.75	2.730	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.00	2.761	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.25	2.792	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.50	2.830	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.75	2.869	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.00	2.907	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.25	2.945	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.50	2.984	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.75	3.022	0.038	0.000	0.000	0.000	0.000	0.000	0.000

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Hartwood Marsh Road Phase I
 Pre Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess in	IncExcess in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	56.00	3.061	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.25	3.099	0.039	0.000	0.000	0.079	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.50	3.158	0.058	0.000	0.000	0.593	0.000	0.001	0.000
25Y96H	BASIN 3-2	BASE	56.75	3.216	0.058	0.001	0.001	1.818	0.001	0.002	0.000
25Y96H	BASIN 3-2	BASE	57.00	3.275	0.058	0.003	0.001	3.752	0.002	0.003	0.000
25Y96H	BASIN 3-2	BASE	57.25	3.333	0.058	0.004	0.002	6.387	0.004	0.003	0.000
25Y96H	BASIN 3-2	BASE	57.50	3.391	0.058	0.006	0.002	9.717	0.006	0.004	0.000
25Y96H	BASIN 3-2	BASE	57.75	3.450	0.058	0.009	0.003	13.732	0.008	0.005	0.000
25Y96H	BASIN 3-2	BASE	58.00	3.508	0.058	0.012	0.003	18.427	0.011	0.006	0.000
25Y96H	BASIN 3-2	BASE	58.25	3.567	0.058	0.018	0.006	26.302	0.016	0.012	0.000
25Y96H	BASIN 3-2	BASE	58.50	3.670	0.103	0.026	0.007	38.054	0.023	0.014	0.000
25Y96H	BASIN 3-2	BASE	58.75	3.773	0.104	0.034	0.009	51.850	0.031	0.016	0.000
25Y96H	BASIN 3-2	BASE	59.00	3.877	0.104	0.044	0.010	67.662	0.041	0.019	0.000
25Y96H	BASIN 3-2	BASE	59.25	3.980	0.184	0.064	0.020	93.660	0.056	0.039	0.000
25Y96H	BASIN 3-2	BASE	59.50	4.164	0.184	0.090	0.026	132.327	0.079	0.047	0.000
25Y96H	BASIN 3-2	BASE	59.75	4.349	0.185	0.391	0.301	437.457	0.262	0.631	0.000
25Y96H	BASIN 3-2	BASE	60.00	5.805	1.456	0.860	0.469	1140.289	0.683	0.931	0.000
25Y96H	BASIN 3-2	BASE	60.25	7.264	1.460	0.971	0.111	1649.032	0.988	0.200	0.000
25Y96H	BASIN 3-2	BASE	60.50	7.541	0.277	1.081	0.110	1831.840	1.097	0.206	0.000
25Y96H	BASIN 3-2	BASE	60.75	7.817	0.276	1.140	0.059	1973.821	1.182	0.109	0.000
25Y96H	BASIN 3-2	BASE	61.00	7.959	0.142	1.200	0.060	2072.915	1.241	0.111	0.000
25Y96H	BASIN 3-2	BASE	61.25	8.101	0.142	1.239	0.039	2155.825	1.291	0.073	0.000
25Y96H	BASIN 3-2	BASE	61.50	8.193	0.092	1.279	0.040	2222.085	1.331	0.074	0.000
25Y96H	BASIN 3-2	BASE	61.75	8.286	0.092	1.319	0.040	2289.083	1.371	0.075	0.000
25Y96H	BASIN 3-2	BASE	62.00	8.378	0.092	1.360	0.040	2356.775	1.411	0.076	0.000
25Y96H	BASIN 3-2	BASE	63.00	8.470	0.092	1.463	0.103	2579.787	1.545	0.048	0.000
25Y96H	BASIN 3-2	BASE	64.00	8.699	0.229	1.569	0.106	2755.963	1.650	0.050	0.000
25Y96H	BASIN 3-2	BASE	65.00	8.928	0.229	1.634	0.065	2899.789	1.737	0.030	0.000
25Y96H	BASIN 3-2	BASE	66.00	9.067	0.139	1.700	0.066	3009.883	1.803	0.031	0.000
25Y96H	BASIN 3-2	BASE	67.00	9.205	0.138	1.767	0.067	3121.502	1.869	0.031	0.000
25Y96H	BASIN 3-2	BASE	68.00	9.343	0.138	1.835	0.068	3234.538	1.937	0.032	0.000
25Y96H	BASIN 3-2	BASE	69.00	9.481	0.138	1.881	0.046	3329.643	1.994	0.021	0.000
25Y96H	BASIN 3-2	BASE	70.00	9.573	0.092	1.927	0.046	3406.476	2.040	0.021	0.000
25Y96H	BASIN 3-2	BASE	71.00	9.665	0.092	1.973	0.046	3483.898	2.086	0.022	0.000
25Y96H	BASIN 3-2	BASE	72.00	9.757	0.092	2.020	0.047	3561.899	2.133	0.022	0.000
25Y96H	BASIN 3-2	BASE	73.00	9.849	0.092	2.045	0.024	3621.494	2.169	0.011	0.000
25Y96H	BASIN 3-2	BASE	74.00	9.897	0.048	2.069	0.025	3662.455	2.193	0.011	0.000
25Y96H	BASIN 3-2	BASE	75.00	9.945	0.048	2.094	0.025	3703.581	2.218	0.011	0.000
25Y96H	BASIN 3-2	BASE	76.00	9.993	0.048	2.119	0.025	3744.871	2.243	0.011	0.000
25Y96H	BASIN 3-2	BASE	77.00	10.041	0.048	2.144	0.025	3786.493	2.268	0.012	0.000
25Y96H	BASIN 3-2	BASE	78.00	10.089	0.048	2.169	0.025	3828.448	2.293	0.012	0.000
25Y96H	BASIN 3-2	BASE	79.00	10.137	0.048	2.194	0.025	3870.567	2.318	0.012	0.000
25Y96H	BASIN 3-2	BASE	80.00	10.185	0.048	2.219	0.025	3912.847	2.343	0.012	0.000
25Y96H	BASIN 3-2	BASE	81.00	10.233	0.048	2.245	0.025	3955.115	2.369	0.012	0.000
25Y96H	BASIN 3-2	BASE	82.00	10.281	0.048	2.270	0.025	3997.371	2.394	0.012	0.000
25Y96H	BASIN 3-2	BASE	83.00	10.329	0.048	2.296	0.025	4039.783	2.419	0.012	0.000
25Y96H	BASIN 3-2	BASE	84.00	10.377	0.048	2.321	0.026	4082.350	2.445	0.012	0.000
25Y96H	BASIN 3-2	BASE	85.00	10.425	0.048	2.347	0.026	4125.072	2.470	0.012	0.000
25Y96H	BASIN 3-2	BASE	86.00	10.473	0.048	2.372	0.026	4167.948	2.496	0.012	0.000
25Y96H	BASIN 3-2	BASE	87.00	10.520	0.048	2.398	0.026	4210.977	2.522	0.012	0.000
25Y96H	BASIN 3-2	BASE	88.00	10.568	0.048	2.424	0.026	4254.157	2.548	0.012	0.000
25Y96H	BASIN 3-2	BASE	89.00	10.616	0.048	2.450	0.026	4297.667	2.574	0.012	0.000
25Y96H	BASIN 3-2	BASE	90.00	10.664	0.048	2.477	0.026	4341.504	2.600	0.012	0.000
25Y96H	BASIN 3-2	BASE	91.00	10.712	0.048	2.503	0.026	4385.494	2.626	0.012	0.000
25Y96H	BASIN 3-2	BASE	92.00	10.761	0.048	2.529	0.026	4429.632	2.653	0.012	0.000
25Y96H	BASIN 3-2	BASE	93.00	10.809	0.048	2.556	0.026	4473.740	2.679	0.012	0.000
25Y96H	BASIN 3-2	BASE	94.00	10.857	0.048	2.582	0.026	4517.816	2.706	0.012	0.000

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Hartwood Marsh Road Phase I
 Pre Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess in	IncExcess in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	95.00	10.904	0.048	2.609	0.027	4562.038	2.732	0.012	0.000
25Y96H	BASIN 3-2	BASE	96.00	10.952	0.048	2.635	0.026	4606.295	2.759	0.012	0.000
25Y96H	BASIN 3-2	BASE	97.00	11.000	0.048	2.635	0.000	4628.405	2.772	0.000	0.000 ← MAX

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Post Development Drainage Basin Data

HNTB

BASIN BREAKDOWN

MADE BY: MSF 23-Apr-08
 CHECK BY: KMV 24-Apr-08
 DATE

PROJECT:

HARTWOOD MARSH ROAD

LOCATION:

BASIN 3 - PHASE 1

BASIN LIMITS:

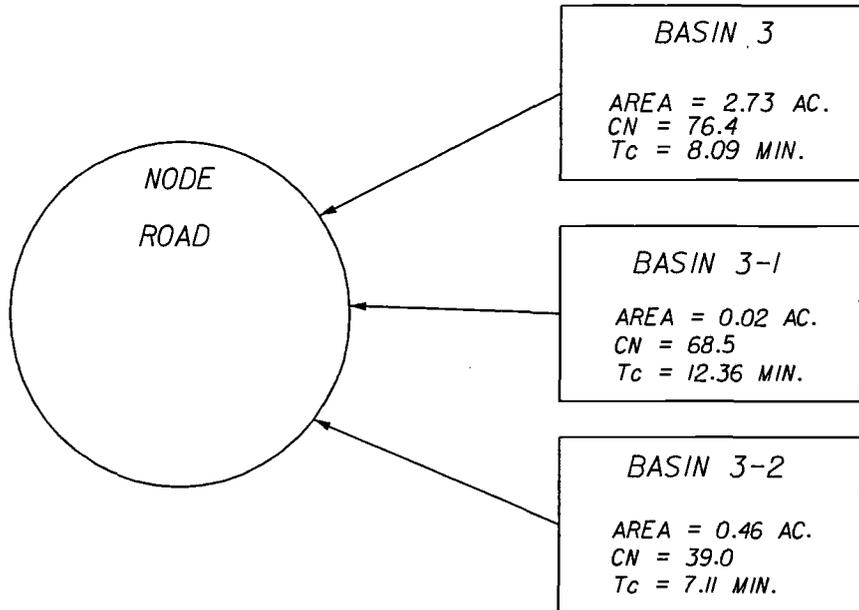
STA. 152+39 to STA. 162+00, CL CONST. HARTWOOD MARSH RD.

EXISTING CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (Fe)	IMP. AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	0.843	1.887	2.730	
ON-SITE SUBTOTAL:					0.843	1.887	2.73	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					0.01	0.47	0.48	
TOTAL:					0.85	2.35	3.21	

PROPOSED CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (Fe)	IMP. AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	1.73	1.00	2.73	
ON-SITE SUBTOTAL:					1.73	1.00	2.73	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					0.01	0.47	0.48	
TOTAL:					1.74	1.47	3.21	



BASIN 3

LOCATION: LAKE COUNTY SEC. 9 & 10, T23S, R26E HARTWOOD MARSH ROAD RECONSTRUCTION US 27 TO 1500 FT EAST OF S. HANCOCK RD	COUNTY: LAKE STATE: FLORIDA DATE: 04-08	DATUM: NAVD 88 PURPOSE: POST-DEVELOPMENT NODAL DIAGRAM
 <p>HNTB CORPORATION 300 PRIMERA BLVD, SUITE 200 LAKE MARY, FL 32746 (407) 805-0355 CERT. OF AUTH. NO. 6500</p> <p>ENGINEER OF RECORD: KAREN M. VAN DEN AVONT, P.E. FL. REGISTRATION NO. 44794</p>	 <p>LAKE COUNTY FLORIDA</p>	<p>LAKE COUNTY HARTWOOD MARSH ROAD</p>

RUNOFF CURVE NUMBER

HNTB

DATE:

MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3

UNDERLINE ONE: EXISTING PROPOSED

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN			Area acres	Product of CN x Area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			1.73	169.59
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			1.00	38.99
Totals =					2.73	208.58

Use CN = 76.4

REFERENCE: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986



RUNOFF CURVE NUMBER

DATE:

MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-1

UNDERLINE ONE: EXISTING PROPOSED

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN			Area acres	Product of CN x Area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.01	0.98
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.01	0.39
Totals =					0.02	1.37

Use CN = 68.5

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

RUNOFF CURVE NUMBER

HNTB

DATE:

MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-2

UNDERLINE ONE: EXISTING PROPOSED

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN			Area acres	Product of CN x Area
		Tab. 2-2	Fig. 2-3	Fig. 2-4		
	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.00	0.00
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.46	17.79
Totals =					0.46	17.79

Use CN = 39.0

REFERENCE: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

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TIME OF CONCENTRATION CALCULATIONS

HNTB

DATE:

MADE BY: MSF 12-Mar-08
 CHECKED BY: KMV 13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: T_c T_t Through subarea

SHEET FLOW:

- 1 SURFACE DESCRIPTION
- 2 MANNING'S COEFFICIENT, n
- 3 FLOW LENGTH, L, (< 300')
- 4 2 YR/ 24 HR RAINFALL, P
- 5 LAND SLOPE, S
- 6 $T_t = (0.007 (nL)^{0.8}) / (P^{0.5} * S^{0.4})$

SMOOTH SURFACE		
0.011		
300	FT.	
4.70	IN.	
0.011		
0.052	HR. OR	3.11 MIN.

SHALLOW CONCENTRATED FLOW:

- 7 SURFACE DESCRIPTION (PAVED OR UNPAVED)
- 8 FLOW LENGTH, L
- 9 WATERCOURSE SLOPE, S
- 10 AVERAGE VELOCITY, V
- 11 $T_t = L / (3600 * V)$

UNPAVED		
806	L.F.	
0.0280	FT./ FT.	
2.699	FT./SEC.	
0.08	HR. OR	4.98 MIN.

CHANNEL FLOW:

- 12 CROSS-SECTIONAL FLOW AREA, A
- 13 WETTED PERIMETER, P_w
- 14 HYDRAULIC RADIUS, R = (A / P_w)
- 15 CHANNEL SLOPE, S
- 16 MANNING'S ROUGHNESS COEFFICIENT, n
- 17 VELOCITY, V, = (1.49 * R^{0.667} * S^{0.5}) / n
- 18 FLOW LENGTH, L
- 19 $T_t = L / (3600 V)$
- 20 Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

		S.F.
		L.F.
		L.F.
		FT./FT.
		FT./SEC.
		L.F.
		HR. OR
		0.00 MIN.

TOTAL T_c = 8.09 MIN.

Reference: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS



DATE:

MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3-1

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: T_c T_t Through subarea

SHEET FLOW:

- 1 SURFACE DESCRIPTION
- 2 MANNING'S COEFFICIENT, n
- 3 FLOW LENGTH, L, (< 300')
- 4 2 YR/ 24 HR RAINFALL, P
- 5 LAND SLOPE, S
- 6 $T_t = (0.007 (nL)^{0.8}) / (P^{0.5} * S^{0.4})$

SHORT GRASS		
0.150		
100	FT.	
4.70	IN.	
0.030		
0.115	HR. OR	6.87 MIN. (TO ROAD)

SHALLOW CONCENTRATED FLOW:

- 7 SURFACE DESCRIPTION (PAVED OR UNPAVED)
- 8 FLOW LENGTH, L
- 9 WATERCOURSE SLOPE, S
- 10 AVERAGE VELOCITY, V
- 11 $T_t = L / (3600 * V)$

UNPAVED		
860	L.F.	
0.0262	FT./ FT.	
2.613	FT./SEC.	
0.09	HR. OR	5.49 MIN.

CHANNEL FLOW:

- 12 CROSS-SECTIONAL FLOW AREA, A
- 13 WETTED PERIMETER, P_w
- 14 HYDRAULIC RADIUS, R = (A / P_w)
- 15 CHANNEL SLOPE, S
- 16 MANNING'S ROUGHNESS COEFFICIENT, n
- 17 VELOCITY, V, = $(1.49 * R^{0.667} * S^{0.5}) / n$
- 18 FLOW LENGTH, L
- 19 $T_t = L / (3600 V)$
- 20 Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

		S.F.
		L.F.
		L.F.
		FT./FT.
		FT./SEC.
		L.F.
		HR. OR
		0.00 MIN.

TOTAL T_c = 12.36 MIN.

Reference: Urban Hydrology for Small Watersheds
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

DATE:

MADE BY: MSF 12-Mar-08
 CHECKED BY: KMV 13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-2

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: Tc Tt Through subarea

SHEET FLOW:

- 1 SURFACE DESCRIPTION
- 2 MANNING'S COEFFICIENT, n
- 3 FLOW LENGTH, L, (< 300')
- 4 2 YR/ 24 HR RAINFALL, P
- 5 LAND SLOPE, S
- 6 $Tt = (0.007 (nL)^{0.8}) / (P^{0.5} * S^{0.4})$

SHORT GRASS
0.150
32
4.70
0.128
0.026

FT.
IN.
HR. OR 1.55 MIN.
(TO ROAD)

SHALLOW CONCENTRATED FLOW:

- 7 SURFACE DESCRIPTION (PAVED OR UNPAVED)
- 8 FLOW LENGTH, L
- 9 WATERCOURSE SLOPE, S
- 10 AVERAGE VELOCITY, V
- 11 $Tt = L / (3600 * V)$

UNPAVED
745
0.0368
3.094
0.07

L.F.
FT./FT.
FT./SEC.
HR. OR 4.01 MIN.

CHANNEL FLOW:

- 12 CROSS-SECTIONAL FLOW AREA, A
- 13 WETTED PERIMETER, Pw
- 14 HYDRAULIC RADIUS, R = (A / Pw)
- 15 CHANNEL SLOPE, S
- 16 MANNING'S ROUGHNESS COEFFICIENT, n
- 17 VELOCITY, V, = $(1.49 * R^{0.667} * S^{0.5}) / n$
- 18 FLOW LENGTH, L
- 19 $Tt = L / (3600 V)$
- 20 Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)

2.500
233
0.03

S.F. Pipe flow
L.F.
L.F.
FT./FT.
FT./SEC.
L.F.
HR. OR 1.55 MIN.

TOTAL Tc = 7.11 MIN.

Reference: *Urban Hydrology for Small Watersheds*
 Technical Release 55, Soil Conservation Service
 U.S. Department of Agriculture, June 1986

Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Input

=====
 Basins
 =====

Name: BASIN 3 Node: ROAD Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Sjrwnd96 Storm Duration(hrs): 96.00
 Rainfall Amount(in): 11.000 Time of Conc(min): 8.09
 Area(ac): 2.730 Time Shift(hrs): 0.00
 Curve Number: 76.40 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

Existing Hartwood

Name: BASIN 3-1 Node: ROAD Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Sjrwnd96 Storm Duration(hrs): 96.00
 Rainfall Amount(in): 11.000 Time of Conc(min): 12.36
 Area(ac): 0.020 Time Shift(hrs): 0.00
 Curve Number: 68.50 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

Name: BASIN 3-2 Node: ROAD Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Sjrwnd96 Storm Duration(hrs): 96.00
 Rainfall Amount(in): 11.000 Time of Conc(min): 7.11
 Area(ac): 0.460 Time Shift(hrs): 0.00
 Curve Number: 39.00 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

=====
 Hydrology Simulations
 =====

Name: 100Y24H
 Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\POST\100Y24H.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Flmod
 Rainfall Amount(in): 10.20

Time (hrs)	Print	Inc (min)
11.000	60.00	
16.000	15.00	
40.000	60.00	

Name: 10Y24H
 Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\PRE\10Y24H.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Flmod
 Rainfall Amount(in): 7.00

Time (hrs)	Print	Inc (min)
11.000	60.00	
16.000	15.00	
40.000	60.00	

Name: 2.3Y24H
 Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00

Hartwood Marsh Road Phase I
Post Development
Basin 3
Input

Rainfall File: Flmod
Rainfall Amount(in): 4.90

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.R32

Override Defaults: No

Time(hrs)	Print Inc(min)
50.000	60.00
62.000	15.00
97.000	60.00

=====
==== Routing Simulations =====
=====

Name: 10Y24H Hydrology Sim: 10Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\POST\10Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 2.3Y24H Hydrology Sim: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
-----------	----------------

180

Hartwood Marsh Road Phase I
Post Development
Basin 3
Input

11.000 60.000
15.000 15.000
40.000 60.000

Group Run

BASE Yes

Name: 25Y24H Hydrology Sim: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs) Print Inc(min)

11.000 60.000
15.000 15.000
40.000 60.000

Group Run

BASE Yes

Name: 25Y96H Hydrology Sim: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 97.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs) Print Inc(min)

55.000 60.000
65.000 15.000
97.000 60.000

Group Run

BASE Yes

=====
--- Boundary Conditions ---
=====

Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.001	0.000
25Y96H	BASIN 3	BASE	25.00	0.645	0.027	0.003	0.002	2.041	0.000	0.001	0.000
25Y96H	BASIN 3	BASE	26.00	0.708	0.063	0.007	0.005	20.283	0.006	0.009	0.000
25Y96H	BASIN 3	BASE	27.00	0.771	0.063	0.014	0.007	64.155	0.013	0.015	0.000
25Y96H	BASIN 3	BASE	28.00	0.834	0.063	0.023	0.009	130.317	0.013	0.021	0.000
25Y96H	BASIN 3	BASE	29.00	0.897	0.063	0.035	0.011	217.516	0.022	0.027	0.000
25Y96H	BASIN 3	BASE	30.00	0.963	0.065	0.048	0.013	326.787	0.033	0.034	0.000
25Y96H	BASIN 3	BASE	31.00	1.028	0.065	0.063	0.015	457.633	0.046	0.039	0.000
25Y96H	BASIN 3	BASE	32.00	1.093	0.065	0.081	0.017	607.391	0.061	0.044	0.000
25Y96H	BASIN 3	BASE	33.00	1.159	0.065	0.099	0.018	775.029	0.078	0.049	0.000
25Y96H	BASIN 3	BASE	34.00	1.222	0.063	0.118	0.020	956.313	0.097	0.052	0.000
25Y96H	BASIN 3	BASE	35.00	1.285	0.063	0.140	0.021	1149.891	0.116	0.056	0.000
25Y96H	BASIN 3	BASE	36.00	1.348	0.063	0.162	0.023	1357.791	0.137	0.060	0.000
25Y96H	BASIN 3	BASE	37.00	1.411	0.063	0.186	0.024	1579.310	0.159	0.063	0.000
25Y96H	BASIN 3	BASE	38.00	1.474	0.063	0.211	0.025	1813.793	0.183	0.067	0.000
25Y96H	BASIN 3	BASE	39.00	1.538	0.063	0.237	0.026	2060.626	0.208	0.070	0.000
25Y96H	BASIN 3	BASE	40.00	1.601	0.063	0.265	0.027	2319.233	0.234	0.073	0.000
25Y96H	BASIN 3	BASE	41.00	1.664	0.063	0.294	0.029	2589.075	0.261	0.076	0.000
25Y96H	BASIN 3	BASE	42.00	1.729	0.065	0.325	0.031	2874.500	0.290	0.082	0.000
25Y96H	BASIN 3	BASE	43.00	1.795	0.065	0.356	0.032	3175.352	0.320	0.085	0.000
25Y96H	BASIN 3	BASE	44.00	1.860	0.065	0.389	0.033	3486.627	0.352	0.088	0.000
25Y96H	BASIN 3	BASE	45.00	1.925	0.065	0.421	0.032	3807.835	0.384	0.091	0.000
25Y96H	BASIN 3	BASE	46.00	1.988	0.063	0.455	0.033	4133.094	0.417	0.090	0.000
25Y96H	BASIN 3	BASE	47.00	2.052	0.063	0.489	0.034	4461.748	0.450	0.092	0.000
25Y96H	BASIN 3	BASE	48.00	2.115	0.063	0.524	0.035	4798.595	0.484	0.095	0.000
25Y96H	BASIN 3	BASE	49.00	2.178	0.063	0.572	0.048	5143.327	0.519	0.097	0.000
25Y96H	BASIN 3	BASE	50.00	2.263	0.085	0.621	0.049	5558.006	0.561	0.134	0.000
25Y96H	BASIN 3	BASE	50.25	2.348	0.085	0.636	0.049	6045.191	0.610	0.137	0.000
25Y96H	BASIN 3	BASE	50.50	2.373	0.025	0.650	0.015	6179.229	0.624	0.161	0.000
25Y96H	BASIN 3	BASE	50.75	2.397	0.025	0.665	0.015	6324.689	0.638	0.162	0.000
25Y96H	BASIN 3	BASE	51.00	2.422	0.025	0.680	0.015	6471.442	0.653	0.164	0.000
25Y96H	BASIN 3	BASE	51.25	2.447	0.025	0.695	0.015	6619.194	0.668	0.165	0.000
25Y96H	BASIN 3	BASE	51.50	2.472	0.025	0.711	0.015	6767.929	0.683	0.166	0.000
25Y96H	BASIN 3	BASE	2.472	0.025	0.025	0.015	0.015	6917.632	0.698	0.167	0.000

Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	51.75	2.497	0.025	0.726	0.015	7068.290	0.713	0.168	0.000
25Y96H	BASIN 3	BASE	52.00	2.521	0.025	0.741	0.015	7219.930	0.729	0.169	0.000
25Y96H	BASIN 3	BASE	52.25	2.546	0.025	0.760	0.019	7390.221	0.746	0.209	0.000
25Y96H	BASIN 3	BASE	52.50	2.577	0.031	0.780	0.019	7579.898	0.765	0.212	0.000
25Y96H	BASIN 3	BASE	52.75	2.608	0.031	0.799	0.019	7771.500	0.784	0.214	0.000
25Y96H	BASIN 3	BASE	53.00	2.638	0.031	0.819	0.020	7964.447	0.804	0.215	0.000
25Y96H	BASIN 3	BASE	53.25	2.669	0.031	0.838	0.020	8158.716	0.823	0.217	0.000
25Y96H	BASIN 3	BASE	53.50	2.700	0.031	0.858	0.020	8354.283	0.843	0.218	0.000
25Y96H	BASIN 3	BASE	53.75	2.730	0.031	0.878	0.020	8551.126	0.863	0.219	0.000
25Y96H	BASIN 3	BASE	54.00	2.761	0.031	0.898	0.020	8749.286	0.883	0.221	0.000
25Y96H	BASIN 3	BASE	54.25	2.792	0.031	0.923	0.025	8973.177	0.905	0.277	0.000
25Y96H	BASIN 3	BASE	54.50	2.830	0.038	0.949	0.025	9223.761	0.931	0.280	0.000
25Y96H	BASIN 3	BASE	54.75	2.869	0.038	0.974	0.026	9476.907	0.956	0.282	0.000
25Y96H	BASIN 3	BASE	55.00	2.907	0.038	1.000	0.026	9731.862	0.982	0.284	0.000
25Y96H	BASIN 3	BASE	55.25	2.945	0.038	1.026	0.026	9988.589	1.008	0.286	0.000
25Y96H	BASIN 3	BASE	55.50	2.984	0.038	1.052	0.026	10247.049	1.034	0.288	0.000
25Y96H	BASIN 3	BASE	55.75	3.022	0.038	1.079	0.026	10507.206	1.060	0.290	0.000
25Y96H	BASIN 3	BASE	56.00	3.061	0.038	1.106	0.027	10769.219	1.087	0.292	0.000
25Y96H	BASIN 3	BASE	56.25	3.099	0.039	1.146	0.041	11100.069	1.120	0.443	0.000
25Y96H	BASIN 3	BASE	56.50	3.158	0.058	1.187	0.041	11502.350	1.161	0.451	0.000
25Y96H	BASIN 3	BASE	56.75	3.216	0.058	1.228	0.041	11909.983	1.202	0.455	0.000
25Y96H	BASIN 3	BASE	57.00	3.275	0.058	1.270	0.042	12321.057	1.243	0.459	0.000
25Y96H	BASIN 3	BASE	57.25	3.333	0.058	1.312	0.042	12735.467	1.285	0.462	0.000
25Y96H	BASIN 3	BASE	57.50	3.391	0.058	1.355	0.042	13153.114	1.327	0.466	0.000
25Y96H	BASIN 3	BASE	57.75	3.450	0.058	1.397	0.043	13573.903	1.370	0.469	0.000
25Y96H	BASIN 3	BASE	58.00	3.508	0.058	1.440	0.043	13998.123	1.413	0.473	0.000
25Y96H	BASIN 3	BASE	58.25	3.567	0.103	1.517	0.076	14587.068	1.472	0.835	0.000
25Y96H	BASIN 3	BASE	58.50	3.670	0.103	1.594	0.078	15348.230	1.549	0.856	0.000
25Y96H	BASIN 3	BASE	58.75	3.773	0.104	1.673	0.079	16122.914	1.627	0.865	0.000
25Y96H	BASIN 3	BASE	59.00	3.877	0.104	1.752	0.079	16905.689	1.706	0.874	0.000
25Y96H	BASIN 3	BASE	59.25	3.980	0.104	1.895	0.143	18000.586	1.816	1.559	0.000
25Y96H	BASIN 3	BASE	59.50	4.164	0.184	2.053	0.158	19436.186	1.961	1.631	0.000
25Y96H	BASIN 3	BASE	59.75	4.349	0.185	2.251	0.187	20666.941	2.630	13.104	0.000
25Y96H	BASIN 3	BASE	60.00	4.805	1.456	4.519	1.268	38333.980	3.868	14.156	0.000
25Y96H	BASIN 3	BASE	60.25	7.264	1.460	4.787	0.268	46089.785	4.651	3.079	0.000
25Y96H	BASIN 3	BASE	60.50	7.541	0.277	5.036	0.249	48715.223	4.916	2.756	0.000
25Y96H	BASIN 3	BASE	60.75	7.817	0.276	5.167	0.131	50613.117	5.107	1.462	0.000
25Y96H	BASIN 3	BASE	61.00	7.959	0.142	5.297	0.129	51913.082	5.239	1.427	0.000
25Y96H	BASIN 3	BASE	61.25	8.101	0.142	5.381	0.085	52979.293	5.346	0.943	0.000
25Y96H	BASIN 3	BASE	61.50	8.193	0.092	5.466	0.085	53822.117	5.431	0.930	0.000
25Y96H	BASIN 3	BASE	61.75	8.286	0.092	5.551	0.085	54660.098	5.516	0.932	0.000
25Y96H	BASIN 3	BASE	62.00	8.378	0.092	5.635	0.084	55498.617	5.600	0.932	0.000
25Y96H	BASIN 3	BASE	63.00	8.470	0.092	5.846	0.212	58222.336	5.875	0.582	0.000
25Y96H	BASIN 3	BASE	64.00	8.699	0.229	6.058	0.212	60319.406	6.087	0.583	0.000
25Y96H	BASIN 3	BASE	65.00	8.928	0.229	6.187	0.129	62004.629	6.257	0.333	0.000
25Y96H	BASIN 3	BASE	66.00	9.067	0.139	6.315	0.128	63275.883	6.385	0.353	0.000
25Y96H	BASIN 3	BASE	67.00	9.205	0.138	6.444	0.129	64549.414	6.514	0.354	0.000
25Y96H	BASIN 3	BASE	68.00	9.343	0.138	6.573	0.129	65824.039	6.642	0.354	0.000
25Y96H	BASIN 3	BASE	69.00	9.481	0.138	6.659	0.086	66887.086	6.750	0.237	0.000
25Y96H	BASIN 3	BASE	70.00	9.573	0.092	6.745	0.086	67739.023	6.835	0.237	0.000
25Y96H	BASIN 3	BASE	71.00	9.665	0.092	6.831	0.086	68591.359	6.921	0.237	0.000
25Y96H	BASIN 3	BASE	72.00	9.757	0.092	6.917	0.086	69443.945	7.008	0.237	0.000
25Y96H	BASIN 3	BASE	73.00	9.849	0.092	7.003	0.045	70092.211	7.073	0.123	0.000
25Y96H	BASIN 3	BASE	74.00	9.897	0.048	7.007	0.045	70535.969	7.118	0.123	0.000
25Y96H	BASIN 3	BASE	75.00	9.945	0.048	7.052	0.045	70979.953	7.163	0.123	0.000
25Y96H	BASIN 3	BASE	76.00	9.993	0.048	7.096	0.045	71424.164	7.207	0.123	0.000
25Y96H	BASIN 3	BASE	77.00	10.041	0.048	7.142	0.045	71870.406	7.252	0.124	0.000

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Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess in	IncExcess in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	78.00	10.089	0.048	7.187	0.045	72318.680	7.298	0.125	0.000
25Y96H	BASIN 3	BASE	79.00	10.137	0.048	7.232	0.045	72767.172	7.343	0.125	0.000
25Y96H	BASIN 3	BASE	80.00	10.185	0.048	7.278	0.045	73215.875	7.388	0.125	0.000
25Y96H	BASIN 3	BASE	81.00	10.233	0.048	7.323	0.045	73662.977	7.433	0.124	0.000
25Y96H	BASIN 3	BASE	82.00	10.281	0.048	7.368	0.045	74108.477	7.478	0.124	0.000
25Y96H	BASIN 3	BASE	83.00	10.329	0.048	7.413	0.045	74554.180	7.523	0.124	0.000
25Y96H	BASIN 3	BASE	84.00	10.377	0.048	7.458	0.045	75000.086	7.568	0.124	0.000
25Y96H	BASIN 3	BASE	85.00	10.425	0.048	7.503	0.045	75446.195	7.613	0.124	0.000
25Y96H	BASIN 3	BASE	86.00	10.473	0.048	7.548	0.045	75892.508	7.658	0.124	0.000
25Y96H	BASIN 3	BASE	87.00	10.520	0.048	7.593	0.045	76339.016	7.703	0.124	0.000
25Y96H	BASIN 3	BASE	88.00	10.568	0.048	7.638	0.045	76785.719	7.748	0.124	0.000
25Y96H	BASIN 3	BASE	89.00	10.616	0.048	7.684	0.046	77234.438	7.794	0.125	0.000
25Y96H	BASIN 3	BASE	90.00	10.664	0.048	7.729	0.046	77685.172	7.839	0.125	0.000
25Y96H	BASIN 3	BASE	91.00	10.712	0.048	7.775	0.046	78136.102	7.885	0.125	0.000
25Y96H	BASIN 3	BASE	92.00	10.761	0.048	7.820	0.046	78587.211	7.930	0.125	0.000
25Y96H	BASIN 3	BASE	93.00	10.809	0.048	7.866	0.045	79036.680	7.976	0.124	0.000
25Y96H	BASIN 3	BASE	94.00	10.857	0.048	7.911	0.045	79484.516	8.021	0.124	0.000
25Y96H	BASIN 3	BASE	95.00	10.904	0.048	7.956	0.045	79932.531	8.066	0.124	0.000
25Y96H	BASIN 3	BASE	96.00	10.952	0.048	8.001	0.045	80380.523	8.111	0.124	0.000
25Y96H	BASIN 3	BASE	97.00	11.000	0.048	8.046	0.045	80828.515	8.156	0.124	0.000
25Y96H	BASIN 3-1	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	30.00	0.963	0.065	0.002	0.002	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	31.00	1.028	0.065	0.006	0.006	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	32.00	1.093	0.065	0.012	0.012	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	33.00	1.159	0.065	0.019	0.019	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	34.00	1.222	0.063	0.027	0.027	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	35.00	1.285	0.063	0.037	0.037	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-1	BASE	36.00	1.348	0.063	0.047	0.047	0.000	0.000	0.000	0.000

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Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-1	BASE	37.00	1.411	0.063	0.060	0.012	4.198	0.058	0.000	0.000
25Y96H	BASIN 3-1	BASE	38.00	1.474	0.063	0.060	0.012	5.161	0.071	0.000	0.000
25Y96H	BASIN 3-1	BASE	39.00	1.538	0.063	0.088	0.015	6.211	0.086	0.000	0.000
25Y96H	BASIN 3-1	BASE	40.00	1.601	0.063	0.104	0.016	7.344	0.101	0.000	0.000
25Y96H	BASIN 3-1	BASE	41.00	1.664	0.063	0.121	0.018	8.580	0.118	0.000	0.000
25Y96H	BASIN 3-1	BASE	42.00	1.729	0.065	0.140	0.019	9.919	0.137	0.000	0.000
25Y96H	BASIN 3-1	BASE	43.00	1.795	0.065	0.160	0.020	11.337	0.156	0.000	0.000
25Y96H	BASIN 3-1	BASE	44.00	1.860	0.065	0.180	0.021	12.833	0.177	0.000	0.000
25Y96H	BASIN 3-1	BASE	45.00	1.925	0.065	0.202	0.021	14.377	0.198	0.000	0.000
25Y96H	BASIN 3-1	BASE	46.00	1.988	0.063	0.224	0.022	15.965	0.220	0.000	0.000
25Y96H	BASIN 3-1	BASE	47.00	2.052	0.063	0.247	0.023	17.618	0.243	0.000	0.000
25Y96H	BASIN 3-1	BASE	48.00	2.115	0.063	0.270	0.024	19.335	0.266	0.000	0.000
25Y96H	BASIN 3-1	BASE	49.00	2.178	0.063	0.304	0.033	21.435	0.295	0.000	0.000
25Y96H	BASIN 3-1	BASE	50.00	2.263	0.085	0.338	0.035	23.937	0.330	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.25	2.348	0.085	0.349	0.010	24.626	0.339	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.50	2.373	0.025	0.359	0.011	25.376	0.350	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.75	2.397	0.025	0.370	0.011	26.143	0.360	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.00	2.422	0.025	0.381	0.011	26.919	0.371	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.25	2.447	0.025	0.392	0.011	27.702	0.382	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.50	2.472	0.025	0.403	0.011	28.494	0.392	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.75	2.497	0.025	0.414	0.011	29.295	0.404	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.00	2.521	0.025	0.425	0.011	30.103	0.415	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.25	2.546	0.025	0.439	0.014	31.002	0.427	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.50	2.577	0.031	0.453	0.014	32.008	0.441	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.75	2.608	0.031	0.468	0.014	33.041	0.455	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.00	2.638	0.031	0.482	0.015	34.086	0.470	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.25	2.669	0.031	0.497	0.015	35.142	0.484	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.50	2.700	0.031	0.512	0.015	36.210	0.499	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.75	2.730	0.031	0.527	0.015	37.289	0.514	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.00	2.761	0.031	0.542	0.015	38.379	0.529	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.25	2.792	0.031	0.561	0.019	39.598	0.545	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.50	2.830	0.038	0.580	0.019	40.970	0.564	0.002	0.000
25Y96H	BASIN 3-1	BASE	54.75	2.869	0.038	0.600	0.020	42.379	0.584	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.00	2.907	0.038	0.620	0.020	43.804	0.603	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.25	2.945	0.038	0.640	0.020	45.245	0.623	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.50	2.984	0.038	0.660	0.020	46.702	0.643	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.75	3.022	0.038	0.680	0.020	48.173	0.664	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.00	3.061	0.038	0.701	0.021	49.661	0.684	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.25	3.099	0.039	0.733	0.032	51.503	0.709	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.50	3.158	0.058	0.765	0.032	53.759	0.740	0.003	0.000
25Y96H	BASIN 3-1	BASE	56.75	3.216	0.058	0.798	0.033	56.103	0.773	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.00	3.275	0.058	0.831	0.033	58.480	0.806	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.25	3.333	0.058	0.864	0.033	60.888	0.839	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.50	3.391	0.058	0.898	0.034	63.326	0.872	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.75	3.450	0.058	0.932	0.034	65.793	0.906	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.00	3.508	0.058	0.967	0.035	68.291	0.941	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.25	3.567	0.058	1.029	0.062	71.656	0.987	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.50	3.670	0.103	1.093	0.064	76.058	1.048	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.75	3.773	0.104	1.157	0.065	80.689	1.111	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.00	3.877	0.104	1.224	0.066	85.407	1.176	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.25	3.980	0.104	1.342	0.119	91.826	1.265	0.009	0.000
25Y96H	BASIN 3-1	BASE	59.50	4.164	0.184	1.484	0.142	100.380	1.383	0.010	0.000
25Y96H	BASIN 3-1	BASE	59.75	4.349	0.185	2.516	1.032	137.927	1.900	0.073	0.000
25Y96H	BASIN 3-1	BASE	60.00	5.805	1.456	3.652	1.136	212.287	2.924	0.092	0.000
25Y96H	BASIN 3-1	BASE	60.25	7.264	1.460	3.907	1.256	267.030	3.678	0.030	0.000
25Y96H	BASIN 3-1	BASE	60.50	7.541	0.277	4.136	0.228	288.974	3.980	0.019	0.000
25Y96H	BASIN 3-1	BASE	60.75	7.817	0.276	4.258	0.122	302.432	4.166	0.011	0.000

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Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

- Simulation		Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess in	IncExcess in	Volume ft ³	Volume in	Rate cfs	Velocity fps
25Y96H		BASIN 3-1	BASE	61.00	7.959	0.142	4.378	0.120	311.734	4.294	0.010	0.000
25Y96H		BASIN 3-1	BASE	61.25	8.101	0.142	4.456	0.079	319.163	4.396	0.007	0.000
25Y96H		BASIN 3-1	BASE	61.50	8.193	0.092	4.535	0.079	325.072	4.478	0.006	0.000
25Y96H		BASIN 3-1	BASE	61.75	8.286	0.092	4.613	0.079	330.779	4.556	0.006	0.000
25Y96H		BASIN 3-1	BASE	62.00	8.378	0.092	4.692	0.078	336.489	4.635	0.006	0.000
25Y96H		BASIN 3-1	BASE	63.00	8.470	0.092	4.889	0.197	355.070	4.891	0.004	0.000
25Y96H		BASIN 3-1	BASE	64.00	8.659	0.229	5.087	0.198	369.415	5.088	0.004	0.000
25Y96H		BASIN 3-1	BASE	65.00	8.928	0.229	5.207	0.121	380.964	5.247	0.002	0.000
25Y96H		BASIN 3-1	BASE	66.00	9.067	0.139	5.328	0.120	389.693	5.368	0.002	0.000
25Y96H		BASIN 3-1	BASE	67.00	9.205	0.138	5.449	0.121	398.450	5.488	0.002	0.000
25Y96H		BASIN 3-1	BASE	68.00	9.343	0.138	5.570	0.121	407.228	5.609	0.002	0.000
25Y96H		BASIN 3-1	BASE	69.00	9.481	0.138	5.651	0.081	414.557	5.710	0.002	0.000
25Y96H		BASIN 3-1	BASE	70.00	9.573	0.092	5.732	0.081	420.435	5.791	0.002	0.000
25Y96H		BASIN 3-1	BASE	71.00	9.665	0.092	5.813	0.081	426.320	5.872	0.002	0.000
25Y96H		BASIN 3-1	BASE	72.00	9.757	0.092	5.894	0.081	432.207	5.953	0.002	0.000
25Y96H		BASIN 3-1	BASE	73.00	9.849	0.092	5.937	0.043	436.685	6.015	0.001	0.000
25Y96H		BASIN 3-1	BASE	74.00	9.897	0.048	5.979	0.042	439.754	6.057	0.001	0.000
25Y96H		BASIN 3-1	BASE	75.00	9.945	0.048	6.021	0.042	442.827	6.100	0.001	0.000
25Y96H		BASIN 3-1	BASE	76.00	9.993	0.048	6.064	0.042	445.902	6.142	0.001	0.000
25Y96H		BASIN 3-1	BASE	77.00	10.041	0.048	6.107	0.043	448.993	6.184	0.001	0.000
25Y96H		BASIN 3-1	BASE	78.00	10.089	0.048	6.149	0.043	452.099	6.227	0.001	0.000
25Y96H		BASIN 3-1	BASE	79.00	10.137	0.048	6.192	0.043	455.207	6.270	0.001	0.000
25Y96H		BASIN 3-1	BASE	80.00	10.185	0.048	6.235	0.043	458.318	6.313	0.001	0.000
25Y96H		BASIN 3-1	BASE	81.00	10.233	0.048	6.278	0.043	461.420	6.356	0.001	0.000
25Y96H		BASIN 3-1	BASE	82.00	10.281	0.048	6.320	0.043	464.511	6.398	0.001	0.000
25Y96H		BASIN 3-1	BASE	83.00	10.329	0.048	6.363	0.043	467.605	6.441	0.001	0.000
25Y96H		BASIN 3-1	BASE	84.00	10.377	0.048	6.406	0.043	470.701	6.483	0.001	0.000
25Y96H		BASIN 3-1	BASE	85.00	10.425	0.048	6.449	0.043	473.800	6.526	0.001	0.000
25Y96H		BASIN 3-1	BASE	86.00	10.473	0.048	6.491	0.043	476.901	6.569	0.001	0.000
25Y96H		BASIN 3-1	BASE	87.00	10.520	0.048	6.534	0.043	480.005	6.612	0.001	0.000
25Y96H		BASIN 3-1	BASE	88.00	10.568	0.048	6.577	0.043	483.111	6.654	0.001	0.000
25Y96H		BASIN 3-1	BASE	89.00	10.616	0.048	6.620	0.043	486.232	6.697	0.001	0.000
25Y96H		BASIN 3-1	BASE	90.00	10.664	0.048	6.664	0.043	489.369	6.741	0.001	0.000
25Y96H		BASIN 3-1	BASE	91.00	10.712	0.048	6.707	0.043	492.507	6.784	0.001	0.000
25Y96H		BASIN 3-1	BASE	92.00	10.761	0.048	6.750	0.043	495.648	6.827	0.001	0.000
25Y96H		BASIN 3-1	BASE	93.00	10.809	0.048	6.793	0.043	498.779	6.870	0.001	0.000
25Y96H		BASIN 3-1	BASE	94.00	10.857	0.048	6.836	0.043	501.900	6.913	0.001	0.000
25Y96H		BASIN 3-1	BASE	95.00	10.904	0.048	6.879	0.043	505.022	6.956	0.001	0.000
25Y96H		BASIN 3-1	BASE	96.00	10.952	0.048	6.922	0.043	508.141	7.021	0.001	0.000
25Y96H		BASIN 3-2	BASE	97.00	11.000	0.048	6.922	0.000	509.699	7.021	0.000	0.000
25Y96H		BASIN 3-2	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	2.00	0.000	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H		BASIN 3-2	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000

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Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	30.00	0.963	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	31.00	1.028	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	32.00	1.093	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	33.00	1.159	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	34.00	1.222	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	35.00	1.285	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	36.00	1.348	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	37.00	1.411	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	38.00	1.474	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	39.00	1.538	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	40.00	1.601	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	41.00	1.664	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	42.00	1.729	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	43.00	1.795	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	44.00	1.860	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	45.00	1.925	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	46.00	1.988	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	47.00	2.052	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	48.00	2.115	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	49.00	2.178	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.00	2.263	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.25	2.348	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.50	2.373	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.75	2.397	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.00	2.422	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.25	2.447	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.50	2.472	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.75	2.497	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.00	2.521	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.25	2.546	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.50	2.577	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.75	2.608	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.00	2.638	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.25	2.669	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.50	2.700	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.75	2.730	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.00	2.761	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.25	2.792	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.50	2.830	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.75	2.869	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.00	2.907	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.25	2.945	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.50	2.984	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.75	3.022	0.038	0.000	0.000	0.000	0.000	0.000	0.000

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Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess in	IncExcess in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	56.00	3.061	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.25	3.099	0.039	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.50	3.158	0.058	0.000	0.000	0.533	0.000	0.001	0.000
25Y96H	BASIN 3-2	BASE	56.75	3.216	0.058	0.001	0.001	1.709	0.001	0.002	0.000
25Y96H	BASIN 3-2	BASE	57.00	3.275	0.058	0.003	0.001	3.594	0.002	0.002	0.000
25Y96H	BASIN 3-2	BASE	57.25	3.333	0.058	0.002	0.002	6.181	0.004	0.003	0.000
25Y96H	BASIN 3-2	BASE	57.50	3.391	0.058	0.006	0.004	9.462	0.006	0.004	0.000
25Y96H	BASIN 3-2	BASE	57.75	3.450	0.058	0.009	0.003	13.430	0.008	0.005	0.000
25Y96H	BASIN 3-2	BASE	58.00	3.508	0.058	0.012	0.003	18.077	0.011	0.006	0.000
25Y96H	BASIN 3-2	BASE	58.25	3.567	0.058	0.018	0.006	25.833	0.015	0.012	0.000
25Y96H	BASIN 3-2	BASE	58.50	3.670	0.103	0.026	0.007	37.418	0.022	0.014	0.000
25Y96H	BASIN 3-2	BASE	58.75	3.773	0.104	0.034	0.009	51.073	0.031	0.016	0.000
25Y96H	BASIN 3-2	BASE	59.00	3.877	0.104	0.044	0.010	66.748	0.040	0.019	0.000
25Y96H	BASIN 3-2	BASE	59.25	3.980	0.104	0.064	0.020	92.388	0.055	0.038	0.000
25Y96H	BASIN 3-2	BASE	59.50	4.164	0.184	0.089	0.024	130.130	0.078	0.045	0.000
25Y96H	BASIN 3-2	BASE	59.75	4.349	0.185	0.091	0.302	422.198	0.253	0.604	0.000
25Y96H	BASIN 3-2	BASE	60.00	5.805	1.456	0.858	0.467	1103.809	0.661	0.911	0.000
25Y96H	BASIN 3-2	BASE	60.25	7.264	1.460	0.971	0.113	1607.652	0.963	0.209	0.000
25Y96H	BASIN 3-2	BASE	60.50	7.541	0.277	1.081	0.110	1794.083	1.074	0.206	0.000
25Y96H	BASIN 3-2	BASE	60.75	7.817	0.276	1.140	0.059	1936.241	1.160	0.110	0.000
25Y96H	BASIN 3-2	BASE	61.00	7.959	0.142	1.199	0.059	2035.696	1.219	0.111	0.000
25Y96H	BASIN 3-2	BASE	61.25	8.101	0.142	1.239	0.040	2118.693	1.269	0.074	0.000
25Y96H	BASIN 3-2	BASE	61.50	8.193	0.092	1.279	0.040	2185.098	1.309	0.074	0.000
25Y96H	BASIN 3-2	BASE	61.75	8.286	0.092	1.319	0.040	2252.043	1.349	0.075	0.000
25Y96H	BASIN 3-2	BASE	62.00	8.378	0.092	1.360	0.041	2319.710	1.389	0.076	0.000
25Y96H	BASIN 3-2	BASE	63.00	8.470	0.092	1.463	0.103	2542.694	1.523	0.048	0.000
25Y96H	BASIN 3-2	BASE	64.00	8.699	0.229	1.569	0.106	2718.829	1.628	0.050	0.000
25Y96H	BASIN 3-2	BASE	65.00	8.928	0.229	1.634	0.065	2862.641	1.714	0.030	0.000
25Y96H	BASIN 3-2	BASE	66.00	9.067	0.139	1.700	0.066	2972.708	1.780	0.031	0.000
25Y96H	BASIN 3-2	BASE	67.00	9.205	0.138	1.767	0.067	3084.301	1.847	0.031	0.000
25Y96H	BASIN 3-2	BASE	68.00	9.343	0.138	1.835	0.068	3197.314	1.915	0.032	0.000
25Y96H	BASIN 3-2	BASE	69.00	9.481	0.138	1.881	0.046	3292.404	1.972	0.021	0.000
25Y96H	BASIN 3-2	BASE	70.00	9.573	0.092	1.927	0.046	3369.226	2.018	0.021	0.000
25Y96H	BASIN 3-2	BASE	71.00	9.665	0.092	1.973	0.046	3446.637	2.064	0.022	0.000
25Y96H	BASIN 3-2	BASE	72.00	9.757	0.092	2.020	0.047	3524.609	2.111	0.022	0.000
25Y96H	BASIN 3-2	BASE	73.00	9.849	0.092	2.045	0.024	3584.179	2.146	0.011	0.000
25Y96H	BASIN 3-2	BASE	74.00	9.897	0.048	2.069	0.025	3625.137	2.171	0.011	0.000
25Y96H	BASIN 3-2	BASE	75.00	9.945	0.048	2.094	0.025	3666.260	2.196	0.011	0.000
25Y96H	BASIN 3-2	BASE	76.00	9.993	0.048	2.119	0.025	3707.547	2.220	0.011	0.000
25Y96H	BASIN 3-2	BASE	77.00	10.041	0.048	2.144	0.025	3749.167	2.245	0.012	0.000
25Y96H	BASIN 3-2	BASE	78.00	10.089	0.048	2.169	0.025	3791.120	2.270	0.012	0.000
25Y96H	BASIN 3-2	BASE	79.00	10.137	0.048	2.194	0.025	3833.236	2.296	0.012	0.000
25Y96H	BASIN 3-2	BASE	80.00	10.185	0.048	2.219	0.025	3875.513	2.321	0.012	0.000
25Y96H	BASIN 3-2	BASE	81.00	10.233	0.048	2.245	0.025	3917.779	2.346	0.012	0.000
25Y96H	BASIN 3-2	BASE	82.00	10.281	0.048	2.270	0.025	3960.031	2.372	0.012	0.000
25Y96H	BASIN 3-2	BASE	83.00	10.329	0.048	2.296	0.025	4002.440	2.397	0.012	0.000
25Y96H	BASIN 3-2	BASE	84.00	10.377	0.048	2.321	0.026	4045.005	2.422	0.012	0.000
25Y96H	BASIN 3-2	BASE	85.00	10.425	0.048	2.347	0.026	4087.725	2.448	0.012	0.000
25Y96H	BASIN 3-2	BASE	86.00	10.473	0.048	2.372	0.026	4130.598	2.474	0.012	0.000
25Y96H	BASIN 3-2	BASE	87.00	10.520	0.048	2.398	0.026	4173.624	2.499	0.012	0.000
25Y96H	BASIN 3-2	BASE	88.00	10.568	0.048	2.424	0.026	4216.802	2.525	0.012	0.000
25Y96H	BASIN 3-2	BASE	89.00	10.616	0.048	2.450	0.026	4260.308	2.551	0.012	0.000
25Y96H	BASIN 3-2	BASE	90.00	10.664	0.048	2.477	0.026	4304.143	2.578	0.012	0.000
25Y96H	BASIN 3-2	BASE	91.00	10.712	0.048	2.503	0.026	4348.129	2.604	0.012	0.000
25Y96H	BASIN 3-2	BASE	92.00	10.761	0.048	2.529	0.026	4392.266	2.630	0.012	0.000
25Y96H	BASIN 3-2	BASE	93.00	10.809	0.048	2.556	0.026	4436.371	2.657	0.012	0.000
25Y96H	BASIN 3-2	BASE	94.00	10.857	0.048	2.582	0.026	4480.445	2.683	0.012	0.000

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Hartwood Marsh Road Phase I
 Post Development
 Basin 3
 Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	95.00	10.904	0.048	2.609	0.027	4524.664	2.710	0.012	0.000
25Y96H	BASIN 3-2	BASE	96.00	10.952	0.048	2.635	0.027	4568.993	2.736	0.012	0.000
25Y96H	BASIN 3-2	BASE	97.00	11.000	0.048	2.635	0.000	4591.177	2.750	0.000	0.000

←MAX

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Water Quality Treatment and Recovery
Calculations

POLLUTION ABATEMENT VOLUME

HNTB

DATE

MADE BY:	MSF	18-Sep-07
CHCK BY:	KMV	20-Sep-07

PROJECT: HARTWOOD MARSH ROAD

LOCATION: **BASIN 3 - PHASE 1**

BASIN LIMITS: STA. **152+39.00** to STA. **162+00.00**, CL CONST. HARTWOOD MARSH RD.

TOTAL TREATMENT AREA: **3.21** AC.

IMPERVIOUS AREA: **1.74** AC.

UNDERLINE ONE: RETENTION DETENTION

UNDERLINE ONE: DRY WET

UNDERLINE ONE: ONLINE OFFLINE

REQUIRED TREATMENT VOLUME:

1) COMPUTE FIRST 0.5 INCH OF RUNOFF FROM PROJECT:

$(0.5"/12) \times 3.21 \text{ AC.} = \mathbf{0.134} \text{ AF}$

2) COMPUTE 1.25 INCHES TIMES IMPERVIOUS AREA:

$(1.25"/12) \times 1.74 \text{ AC.} = \mathbf{0.181} \text{ AF}$

CONTROLLING CRITERIA: **2**

REQUIRED TREATMENT VOLUME: **0.181** AF

3) ADDITIONAL 0.5" INCH FOR ON-LINE RETENTION:

$0.13 \text{ AF} + 0.18 \text{ AF} = \mathbf{0.315} \text{ AF}$

TOTAL REQUIRED TREATMENT VOLUME: **0.315** AF

TOTAL PROVIDED TREATMENT VOLUME: **0.316** AF

HNTB

STAGE / STORAGE CALCULATIONS

MADE BY: MSF
 CHECK BY: KMV
 DATE: 23-Apr-08
 24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

SWALES: 

Borings below are within region of swales between Sta. 156+00 and Sta. 161+00
 Ground water was not encountered at a boring depth of 15 feet.
 Boring station in report are based on baseline of survey

Boring	CL Station	Offset	Existing Ground Elevation	Depth to Encountered Water Surface	Estimated Encountered Water Elevation	Depth to Seasonal High Water	Estimated Seasonal High Water	Estimated Normal High Water	Assumed Depth to Confining Layer	Confining Layer Elevation
AB-53	155+97	50.87' ft	153.89	20.0	133.9	15	138.89	136.39	30	123.89
AB-54	157+02	7.99' ft	149.57	20.0	129.6	15	134.57	132.07	30	119.57
AB-55	157+97	38.52' ft	146.6	20.0	126.6	15	131.6	129.1	30	116.6
AB-56	159+04	16.28' ft	140.3	20.0	120.3	15	125.3	122.8	30	110.3
AB-57	159+94	33.05' ft	135.42	20.0	115.4	15	120.42	117.92	30	105.42
AB-58	160+98	15.25' ft	131.53	20.0	111.5	15	116.53	114.03	30	101.53
AB-59	161+93	26.33' ft	127.66	20.0	107.7	15	112.66	110.16	30	97.66

PERCOLATION RATE: Use percolation rate for Stratum 1 soils as found in ponds Ft./Day or Inches/Hr. Boring AB-P2
 FACTOR OF SAFETY: = Inches/Hr. = Ft./Day

PROJECT: HARTWOOD MARSH ROAD

POND: 

Attenuation Volume For 25 Year/96 Hour Storm Event

Volumes from AdICPR

Basin	Pre-development CF	Post Development CF
3	64,086	80,604
3-1	510	510
3-2	4,628	4,591
TOTAL	69,224	85,705

REQUIRED ATTENUATION VOLUME: CF
 PROVIDED ATTENUATION VOLUME: CF

HARTWOOD MARSH ROAD
 BASIN 3
 INTERIM CONDITION
 SWALE STORAGE CALCULATIONS - Water Quality



Station	Ditch Bottom (ft)	Max. Depth (ft)	Max. Elevation (ft)	Est. Elev. Of Base (ft)	Slope	Ditch Back Slope (F) (1:F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)
156+00	151.4	1.21	152.61	151.84		2	4.76	4
156+25	150.85	1.37	152.22	151.90	0.022	2	4.83	4
156+50	150.3	1.53	151.83	151.16	0.022	2	4.9	4
156+75	149.5	1.59	151.09	150.46	0.032	2	5.79	4
157+00	148.7	1.64	150.34	149.75	0.042	2	6.68	4
157+25	147.85	1.74	149.39	149.10	0.042	2	7.205	4
157+50	146.6	1.84	148.44	148.44	0.056	2	7.73	4
157+75	145.2	2.13	147.33	147.33	0.056	2	7.665	4
158+00	143.8	2.41	146.21	146.21	0.078	2	7.6	4
158+25	141.85	2.04	143.90	143.90	0.078	2	7.19	4
158+50	139.9	1.68	141.58	141.58	0.060	2	6.78	4
158+75	138.4	2.10	140.50	140.50	0.060	2	7.01	4
159+00	136.9	2.51	139.41	139.41	0.062	2	7.24	4
159+25	135.35	2.66	138.01	138.01	0.082	2	7.52	4
159+50	133.8	2.81	136.61	136.61	0.050	2	7.8	4
159+75	132.55	2.87	135.42	135.42	0.050	2	7.98	4
160+00	131.3	2.93	134.23	134.23	0.012	2	8.16	4
160+25	131	2.38	133.38	133.38	0.012	2	10.56	4
160+50	130.7	1.82	132.52	132.52	0.044	2	12.96	4
160+75	129.6	1.94	131.54	131.64	0.044	2	14.485	4
161+00	128.5	2.06	130.56	130.75	0.030	2	16.01	4
161+25	127.8	1.79	129.54	129.75	0.030	2	16.545	4
161+50	127.0	1.52	128.52	128.74	0.040	2	17.08	4
161+75	126.0	1.51	127.51	127.72	0.080	2	14.08	4
162+00	124.0	2.50	126.50	126.7		2	14.54	4

Water Quality Storage Between Ditch Blocks - Left

Ditch Station	Ditch Block Height (ft)	Elevation of Ditch Block (ft)	Ditch Back Slope (F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+50	0.85	151.15	2	4.9	4	6.715	25.00	2.37	113.56
156+75	0.95	150.45	2	5.79	4	8.3505	25.00	1.32	120.88
157+00	1.05	149.75	2	6.68	4	10.164	25.00	2.42	157.30
157+25	1.43	149.08	2	7.205	4	14.59315	25.00	3.87	230.79
157+50	1.82	148.42	2	7.73	4	19.5286	25.00	8.26	347.36
157+75	2.12	147.32	2	7.685	4	22.6098	25.00	7.68	378.62
158+00	2.4	146.2	2	7.6	4	25.44	25.00	10.6	450.50
158+25	2.04	143.89	2	7.19	4	20.7876	25.00	0.92	271.35
158+50	1.68	141.58	2	6.78	4	16.4304	21.54	0	176.96
158+75	2.09	140.49	2	7.01	4	20.9209	25.00	5.9	335.26
159+00	2.5	139.4	2	7.24	4	25.6	25.00	10.24	448.00
159+25	2.65	138	2	7.52	4	27.878	25.00	11.57	493.10
159+50	2.8	136.6	2	7.8	4	30.24	25.00	13.5	546.75
159+75	2.85	135.4	2	7.98	4	31.293	25.00	17.57	610.79
160+00	2.92	134.22	2	8.16	4	32.5872	25.00	18.64	640.34
160+25	2.35	133.35	2	10.56	4	31.866	25.00	27.8	745.83
160+50	1.8	132.5	2	12.96	4	28.728	25.00	23.94	658.35
160+75	2	131.6	2	14.485	4	34.97	25.00	16.09	638.25
161+00	2.05	130.55	2	16.01	4	38.9705	25.00	18.06	712.88
161+25	1.8	129.55	2	16.545	4	35.181	25.00	20.52	696.26
161+50	1.55	128.55	2	17.08	4	31.124	25.00	16.06	589.80
161+75	1.5	127.5	2	14.08	4	25.62	25.00	8.54	427.00
162+00	2.5	126.5	2	14.54	4	43.85	25.00	8.77	657.75
Total									10447.87
0.240 af									

HARTWOOD MARSH ROAD
 BASIN 3
 INTERIM CONDITION
 MAXIMUM SWALE STORAGE CALCULATIONS



Station	Ditch Bottom (ft)	Max Depth (ft)	Max Elevation (ft)	Est. Elev. Of Base (ft)	Slope	Ditch Back Slope (F) (1:F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)
156+00	151.4	1.21	152.61	151.94	0.022	2	4.76	4
156+25	150.85	1.37	152.22	151.5	0.022	2	4.83	4
156+50	150.3	1.53	151.83	151.16	0.032	2	4.9	4
156+75	149.5	1.59	151.09	150.455	0.032	2	5.79	4
157+00	148.7	1.64	150.34	149.75	0.042	2	6.68	4
157+25	147.65	1.74	149.39	149.095	0.042	2	7.205	4
157+50	146.6	1.84	148.44	148.44	0.056	2	7.73	4
157+75	145.2	2.13	147.33	147.325	0.056	2	7.665	4
158+00	143.8	2.41	146.21	146.21	0.078	2	7.6	4
158+25	141.85	2.04	143.90	143.895	0.078	2	7.19	4
158+50	139.9	1.88	141.58	141.58	0.060	2	6.78	4
158+75	138.4	2.10	140.50	140.495	0.060	2	7.01	4
159+00	136.9	2.51	139.41	139.41	0.062	2	7.24	4
159+25	135.35	2.66	138.01	138.01	0.062	2	7.52	4
159+50	133.8	2.81	136.61	136.61	0.050	2	7.8	4
159+75	132.55	2.87	135.42	135.42	0.050	2	7.98	4
160+00	131.3	2.93	134.23	134.23	0.012	2	8.16	4
160+25	131	2.38	133.38	133.375	0.012	2	10.56	4
160+50	130.7	1.82	132.52	132.52	0.044	2	12.96	4
160+75	129.6	1.94	131.54	131.635	0.044	2	14.485	4
161+00	128.5	2.06	130.56	130.75	0.030	2	16.01	4
161+25	127.75	1.79	129.54	129.745	0.030	2	16.545	4
161+50	127	1.52	128.52	128.74	0.040	2	17.08	4
161+75	126	1.51	127.51	127.72	0.080	2	14.08	4
162+00	124	2.50	126.50	126.7		2	14.54	4

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Maximum Storage Between Ditch Blocks - Left

Ditch Station	Max Depth (ft)	Top Bank at Ditch Block (ft)	Ditch Back Slope (F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+50	1.53	151.83	2	4.9	4	12.087	25.00	7.74	247.84
156+75	1.59	151.085	2	5.79	4	13.93215	25.00	6.9	260.40
157+00	1.64	150.34	2	6.68	4	15.8752	25.00	8.13	300.07
157+25	1.74	149.39	2	7.205	4	17.7567	25.00	7.04	309.96
157+50	1.84	148.44	2	7.73	4	19.7432	25.00	8.48	352.79
157+75	2.13	147.325	2	7.665	4	22.663125	25.00	7.73	379.91
158+00	2.41	146.21	2	7.6	4	25.546	25.00	10.71	453.20
158+25	2.04	143.895	2	7.19	4	20.63855	25.00	0.97	272.61
158+50	1.68	141.58	2	6.78	4	16.4304	21.54	0	176.96
158+75	2.10	140.495	2	7.01	4	20.97095	25.00	5.96	336.64
159+00	2.51	139.41	2	7.24	4	25.7024	25.00	10.34	450.53
159+25	2.66	138.01	2	7.52	4	27.9832	25.00	11.68	495.79
159+50	2.81	136.61	2	7.8	4	30.348	25.00	13.61	549.48
159+75	2.87	135.42	2	7.98	4	31.5126	25.00	17.79	616.28
160+00	2.93	134.23	2	8.16	4	32.6968	25.00	18.75	643.11
160+25	2.38	133.375	2	10.56	4	32.205	25.00	28.14	754.31
160+50	1.82	132.52	2	12.96	4	29.0472	25.00	24.26	666.34
160+75	1.94	131.54	2	14.485	4	33.9209	25.00	14.69	607.64
161+00	2.06	130.56	2	16.01	4	39.1606	25.00	18.25	717.63
161+25	1.79	129.54	2	16.545	4	34.98555	25.00	20.32	691.32
161+50	1.52	128.52	2	17.08	4	30.5216	25.00	15.46	574.77
161+75	1.51	127.51	2	14.08	4	25.7908	25.00	8.71	431.26
162+00	2.50	126.5	2	14.54	4	43.85	25.00	8.77	657.75
									10946.57
								Total	



Parameters for Recovery Analysis - Left Ditch

Ditch Block	Estimated SHGW (ft)	Confining Layer Elevation (ft)	Width at Ditch Block (ft)	Width at upper end of swale basin (ft)	Equivalent Pond Width (ft)	Equivalent Pond Length (ft)	Stage 1 (ft)	Area 1 (sf)	Stage 2 (ft)	Area 2 (sf)
156+50	136.73	121.73	10.00	4.90	7.45	25.00	150.30	0.00	151.83	309.87
156+75	135.65	120.65	11.49	5.79	8.64	25.00	149.50	0.00	151.09	311.38
157+00	134.57	119.57	12.98	6.68	9.83	25.00	148.70	0.00	150.34	341.88
157+25	133.83	118.83	15.79	7.21	11.50	25.00	147.65	0.00	149.39	355.81
157+50	133.09	118.09	18.65	7.73	13.19	25.00	146.60	0.00	148.44	383.94
157+75	132.34	117.34	20.39	7.67	14.03	25.00	145.20	0.00	147.33	406.19
158+00	131.60	116.60	22.00	7.60	14.80	25.00	143.80	0.00	146.21	447.31
158+25	130.03	115.03	19.43	7.19	13.31	25.00	141.85	0.00	143.90	345.37
158+50	128.45	113.45	16.86	6.78	11.82	21.54	139.90	0.00	141.58	259.02
158+75	126.88	111.88	19.35	7.01	13.28	25.00	138.40	0.00	140.50	374.13
159+00	125.30	110.30	22.24	7.24	14.74	25.00	136.90	0.00	139.41	442.12
159+25	124.08	109.08	23.42	7.52	15.47	25.00	135.35	0.00	138.01	467.25
159+50	122.86	107.86	24.60	7.80	16.20	25.00	133.80	0.00	136.61	496.75
159+75	121.64	106.64	25.08	7.98	16.53	25.00	132.55	0.00	135.42	534.00
160+00	120.42	105.42	25.68	8.16	16.92	25.00	131.30	0.00	134.23	547.50
160+25	119.45	104.45	24.66	10.56	17.61	25.00	131.00	0.00	133.38	567.75
160+50	118.48	103.48	23.76	12.96	18.36	25.00	130.70	0.00	132.52	544.50
160+75	117.50	102.50	26.49	14.49	20.49	25.00	129.60	0.00	131.54	551.56
161+00	116.53	101.53	28.31	16.01	22.16	25.00	128.50	0.00	130.56	607.69
161+25	115.56	100.56	27.35	16.55	21.95	25.00	127.75	0.00	129.54	619.19
161+50	114.60	99.60	26.38	17.08	21.73	25.00	127.00	0.00	128.52	592.06
161+75	113.63	98.63	23.08	14.08	18.58	25.00	126.00	0.00	127.51	541.00
162+00	112.66	97.66	29.54	14.54	22.04	25.00	124.00	0.00	126.50	582.75

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method
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Devo Seereeram, Ph.D., P.E.

Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+25 to 156+50 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-04-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 121.73
Water Table Elevation, [WT] (ft datum): 136.73
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 186.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 7.5
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
150.30	0.0
151.83	309.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 113.56

Initial ground water level (ft datum) default, 136.73

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	18.9267	0.0000	136.730	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	18.9267	0.0000	151.358	0.04306	0.00000	113.6	0.3	0.0	U/P
0.024	0.0000	0.0000	151.342	0.04306	0.00000	113.6	3.7	0.0	U/P
0.048	0.0000	0.0000	151.324	0.04306	0.00000	113.6	7.4	0.0	U/P
0.072	0.0000	0.0000	151.306	0.04306	0.00000	113.6	11.2	0.0	U/P
0.120	0.0000	0.0000	151.268	0.04306	0.00000	113.6	18.6	0.0	U/P
0.192	0.0000	0.0000	151.210	0.04275	0.00000	113.6	29.8	0.0	U/P
0.216	0.0000	0.0000	151.190	0.04217	0.00000	113.6	33.4	0.0	U/P
0.240	0.0000	0.0000	151.169	0.04134	0.00000	113.6	37.0	0.0	U/P
0.360	0.0000	0.0000	151.066	0.03712	0.00000	113.6	54.1	0.0	U/P
0.480	0.0000	0.0000	150.962	0.03238	0.00000	113.6	69.1	0.0	U/P
0.720	0.0000	0.0000	150.750	0.01850	0.00000	113.6	93.1	0.0	U/P
1.200	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
1.920	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry

21 hr

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+50 to 156+75 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-04-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 120.65
Water Table Elevation, [WT] (ft datum): 135.65
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [lv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 216.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 8.6
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
149.50	0.0
151.09	311.4

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 120.88

Initial ground water level (ft datum) default, 135.65

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	20.1467	0.0000	135.650	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	20.1467	0.0000	150.610	0.05000	0.00000	120.9	0.3	0.0	U/P
0.024	0.0000	0.0000	150.591	0.04974	0.00000	120.9	4.3	0.0	U/P
0.048	0.0000	0.0000	150.571	0.04900	0.00000	120.9	8.6	0.0	U/P
0.072	0.0000	0.0000	150.551	0.04824	0.00000	120.9	12.8	0.0	U/P
0.120	0.0000	0.0000	150.510	0.04689	0.00000	120.9	21.0	0.0	U/P
0.192	0.0000	0.0000	150.448	0.04368	0.00000	120.9	32.9	0.0	U/P
0.216	0.0000	0.0000	150.428	0.04252	0.00000	120.9	36.6	0.0	U/P
0.240	0.0000	0.0000	150.408	0.04171	0.00000	120.9	40.2	0.0	U/P
0.360	0.0000	0.0000	150.305	0.03764	0.00000	120.9	57.5	0.0	U/P
0.480	0.0000	0.0000	150.201	0.03307	0.00000	120.9	72.8	0.0	U/P
0.720	0.0000	0.0000	149.989	0.01906	0.00000	120.9	97.5	0.0	U/P
1.200	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	120.9	120.9	0.0	dry

~1hr

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+75 to 157+00 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 119.57
Water Table Elevation, [WT] (ft datum): 134.57
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 246.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 9.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
148.70	0.0
150.34	341.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 157.3

Initial ground water level (ft datum) default, 134.57

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	1.500
0.002	0.015	0.100	0.470	2.000
0.003	0.020	0.150	0.500	2.500
0.005	0.030	0.250	0.600	3.000
0.008	0.050	0.300	0.700	3.500
0.009	0.060	0.350	0.800	4.000
0.010	0.070	0.400	0.900	
0.012	0.080	0.450	1.000	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	26.2167	0.0000	134.570	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	26.2167	0.0000	149.927	0.05694	0.00000	157.3	0.3	0.0	U/P
0.024	0.0000	0.0000	149.909	0.05694	0.00000	157.3	4.9	0.0	U/P
0.048	0.0000	0.0000	149.889	0.05694	0.00000	157.3	9.8	0.0	U/P
0.072	0.0000	0.0000	149.869	0.05677	0.00000	157.3	14.8	0.0	U/P
0.120	0.0000	0.0000	149.829	0.05564	0.00000	157.3	24.5	0.0	U/P
0.192	0.0000	0.0000	149.767	0.05223	0.00000	157.3	38.6	0.0	U/P
0.216	0.0000	0.0000	149.747	0.05100	0.00000	157.3	43.1	0.0	U/P
0.240	0.0000	0.0000	149.727	0.05019	0.00000	157.3	47.4	0.0	U/P
0.288	0.0000	0.0000	149.686	0.04823	0.00000	157.3	56.0	0.0	U/P
0.312	0.0000	0.0000	149.666	0.04725	0.00000	157.3	60.1	0.0	U/P
0.360	0.0000	0.0000	149.625	0.04568	0.00000	157.3	68.2	0.0	U/P
0.480	0.0000	0.0000	149.522	0.04102	0.00000	157.3	86.9	0.0	U/P
0.720	0.0000	0.0000	149.312	0.03122	0.00000	157.3	118.3	0.0	U/P
1.200	0.0000	0.0000	148.859	0.00703	0.00000	157.3	154.7	0.0	U/P
1.440	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
1.680	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
1.920	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
2.160	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
2.400	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	157.3	157.3	0.0	dry

~1 hr

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Project Data

Project Name: Hartwood Marsh Road
 Simulation Description: Swale Recovery Water Quality
 Sta. 157+00 to 157+25 It
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
 Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 118.83
 Water Table Elevation, [WT] (ft datum): 133.83
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 288.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
 Equivalent Pond Width, [W] (ft): 11.5
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
147.65	0.0
149.39	355.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 230.79

Initial ground water level (ft datum) default, 133.83

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	38.4650	0.0000	133.830	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	38.4650	0.0000	149.151	0.06667	0.00000	230.8	0.4	0.0	U/P
0.024	0.0000	0.0000	149.134	0.06667	0.00000	230.8	5.8	0.0	U/P
0.048	0.0000	0.0000	149.114	0.06667	0.00000	230.8	11.5	0.0	U/P
0.072	0.0000	0.0000	149.095	0.06667	0.00000	230.8	17.3	0.0	U/P
0.120	0.0000	0.0000	149.056	0.06661	0.00000	230.8	28.8	0.0	U/P
0.192	0.0000	0.0000	148.994	0.06435	0.00000	230.8	46.0	0.0	U/P
0.216	0.0000	0.0000	148.974	0.06315	0.00000	230.8	51.5	0.0	U/P
0.240	0.0000	0.0000	148.954	0.06236	0.00000	230.8	57.0	0.0	U/P
0.288	0.0000	0.0000	148.913	0.06044	0.00000	230.8	67.6	0.0	U/P
0.312	0.0000	0.0000	148.893	0.05948	0.00000	230.8	72.8	0.0	U/P
0.360	0.0000	0.0000	148.852	0.05795	0.00000	230.8	83.0	0.0	U/P
0.480	0.0000	0.0000	148.750	0.05341	0.00000	230.8	107.0	0.0	U/P
0.720	0.0000	0.0000	148.543	0.04398	0.00000	230.8	149.2	0.0	U/P
1.200	0.0000	0.0000	148.117	0.02389	0.00000	230.8	208.5	0.0	U/P
1.440	0.0000	0.0000	147.896	0.00934	0.00000	230.8	224.6	0.0	U/P
1.680	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
1.920	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
2.160	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
2.400	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
3.600	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	230.8	230.8	0.0	dry

~1.5 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 157+25 to 157+50 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 118.09
Water Table Elevation, [WT] (ft datum): 133.09
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 329.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 13.2
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
146.60	0.0
148.44	383.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 347.36

Initial ground water level (ft datum) default, 133.09

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	57.8933	0.0000	133.090	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	57.8933	0.0000	148.424	0.07633	0.00000	347.4	0.5	0.0	U/P
0.024	0.0000	0.0000	148.407	0.07633	0.00000	347.4	6.6	0.0	U/P
0.048	0.0000	0.0000	148.390	0.07633	0.00000	347.4	13.2	0.0	U/P
0.072	0.0000	0.0000	148.372	0.07633	0.00000	347.4	19.8	0.0	U/P
0.120	0.0000	0.0000	148.336	0.07633	0.00000	347.4	33.0	0.0	U/P
0.192	0.0000	0.0000	148.280	0.07633	0.00000	347.4	52.8	0.0	U/P
0.216	0.0000	0.0000	148.262	0.07633	0.00000	347.4	59.4	0.0	U/P
0.240	0.0000	0.0000	148.242	0.07633	0.00000	347.4	66.0	0.0	U/P
0.288	0.0000	0.0000	148.203	0.07633	0.00000	347.4	79.1	0.0	U/P
0.312	0.0000	0.0000	148.184	0.07633	0.00000	347.4	85.7	0.0	U/P
0.360	0.0000	0.0000	148.143	0.07547	0.00000	347.4	98.9	0.0	U/P
0.480	0.0000	0.0000	148.041	0.07098	0.00000	347.4	130.6	0.0	U/P
0.720	0.0000	0.0000	147.836	0.06145	0.00000	347.4	187.9	0.0	U/P
1.200	0.0000	0.0000	147.420	0.04139	0.00000	347.4	277.2	0.0	U/P
1.440	0.0000	0.0000	147.210	0.03114	0.00000	347.4	308.5	0.0	U/P
1.680	0.0000	0.0000	146.996	0.02078	0.00000	347.4	331.0	0.0	U/P
1.920	0.0000	0.0000	146.767	0.00776	0.00000	347.4	344.4	0.0	U/P
2.160	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
2.400	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
3.600	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry

2 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 157+50 to 157+75 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 117.34
Water Table Elevation, [WT] (ft datum): 132.34
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 350.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 14.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
145.20	0.0
147.33	406.2

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 378.62

Initial ground water level (ft datum) default, 132.34

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	63.1033	0.0000	132.340	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	63.1033	0.0000	147.191	0.08119	0.00000	378.6	0.5	0.0	U/P
0.024	0.0000	0.0000	147.174	0.08119	0.00000	378.6	7.0	0.0	U/P
0.048	0.0000	0.0000	147.155	0.08119	0.00000	378.6	14.0	0.0	U/P
0.072	0.0000	0.0000	147.137	0.08119	0.00000	378.6	21.0	0.0	U/P
0.120	0.0000	0.0000	147.098	0.08119	0.00000	378.6	35.1	0.0	U/P
0.192	0.0000	0.0000	147.039	0.08119	0.00000	378.6	56.1	0.0	U/P
0.216	0.0000	0.0000	147.019	0.08074	0.00000	378.6	63.1	0.0	U/P
0.240	0.0000	0.0000	146.999	0.08000	0.00000	378.6	70.1	0.0	U/P
0.288	0.0000	0.0000	146.958	0.07822	0.00000	378.6	83.8	0.0	U/P
0.312	0.0000	0.0000	146.938	0.07733	0.00000	378.6	90.5	0.0	U/P
0.360	0.0000	0.0000	146.898	0.07590	0.00000	378.6	103.8	0.0	U/P
0.480	0.0000	0.0000	146.796	0.07170	0.00000	378.6	135.7	0.0	U/P
0.720	0.0000	0.0000	146.592	0.06302	0.00000	378.6	193.9	0.0	U/P
1.200	0.0000	0.0000	146.178	0.04478	0.00000	378.6	287.5	0.0	U/P
1.440	0.0000	0.0000	145.970	0.03549	0.00000	378.6	322.1	0.0	U/P
1.680	0.0000	0.0000	145.759	0.02620	0.00000	378.6	348.8	0.0	U/P
1.920	0.0000	0.0000	145.543	0.01665	0.00000	378.6	367.4	0.0	U/P
2.160	0.0000	0.0000	145.304	0.00589	0.00000	378.6	377.6	0.0	U/P ~2.25 hrs
2.400	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
11.040	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
11.280	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
11.520	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
11.760	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
14.400	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
16.800	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
19.200	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
21.600	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	378.6	378.6	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 157+75 to 158+00 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 116.60
Water Table Elevation, [WT] (ft datum): 131.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 370.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 14.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
143.80	0.0
146.21	447.3

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 450.5

Initial ground water level (ft datum) default, 131.60

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	75.0833	0.0000	131.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	75.0833	0.0000	146.002	0.08565	0.00000	450.5	0.5	0.0	U/P
0.024	0.0000	0.0000	145.985	0.08565	0.00000	450.5	7.4	0.0	U/P
0.048	0.0000	0.0000	145.967	0.08565	0.00000	450.5	14.8	0.0	U/P
0.072	0.0000	0.0000	145.948	0.08565	0.00000	450.5	22.2	0.0	U/P
0.120	0.0000	0.0000	145.911	0.08565	0.00000	450.5	37.0	0.0	U/P
0.192	0.0000	0.0000	145.853	0.08565	0.00000	450.5	59.2	0.0	U/P
0.216	0.0000	0.0000	145.834	0.08565	0.00000	450.5	66.6	0.0	U/P
0.240	0.0000	0.0000	145.814	0.08565	0.00000	450.5	74.0	0.0	U/P
0.288	0.0000	0.0000	145.774	0.08510	0.00000	450.5	88.8	0.0	U/P
0.312	0.0000	0.0000	145.754	0.08453	0.00000	450.5	96.1	0.0	U/P
0.360	0.0000	0.0000	145.714	0.08315	0.00000	450.5	110.6	0.0	U/P
0.480	0.0000	0.0000	145.612	0.07907	0.00000	450.5	145.7	0.0	U/P
0.720	0.0000	0.0000	145.408	0.07064	0.00000	450.5	210.4	0.0	U/P
1.200	0.0000	0.0000	144.997	0.05298	0.00000	450.5	317.6	0.0	U/P
1.440	0.0000	0.0000	144.790	0.04402	0.00000	450.5	359.5	0.0	U/P
1.680	0.0000	0.0000	144.582	0.03509	0.00000	450.5	393.7	0.0	U/P
1.920	0.0000	0.0000	144.372	0.02606	0.00000	450.5	420.1	0.0	U/P
2.160	0.0000	0.0000	144.156	0.01679	0.00000	450.5	438.7	0.0	U/P
2.400	0.0000	0.0000	143.921	0.01005	0.00000	450.5	449.2	0.0	U/P
3.600	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.040	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.280	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.520	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.760	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
14.400	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
16.800	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
19.200	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
21.600	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry

~3 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+00 to 158+25 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 115.03
Water Table Elevation, [WT] (ft datum): 130.03
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 332.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 13.3
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
141.85	0.0
143.90	345.4

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 271.35

Initial ground water level (ft datum) default, 130.03

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	45.2250	0.0000	130.030	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	45.2250	0.0000	143.643	0.06999	0.00000	271.4	0.4	0.0	U/P
0.024	0.0000	0.0000	143.625	0.06959	0.00000	271.4	6.0	0.0	U/P
0.048	0.0000	0.0000	143.605	0.06882	0.00000	271.4	12.0	0.0	U/P
0.072	0.0000	0.0000	143.585	0.06816	0.00000	271.4	17.9	0.0	U/P
0.120	0.0000	0.0000	143.544	0.06701	0.00000	271.4	29.6	0.0	U/P
0.192	0.0000	0.0000	143.483	0.06428	0.00000	271.4	46.7	0.0	U/P
0.216	0.0000	0.0000	143.463	0.06329	0.00000	271.4	52.2	0.0	U/P
0.240	0.0000	0.0000	143.443	0.06263	0.00000	271.4	57.7	0.0	U/P
0.288	0.0000	0.0000	143.402	0.06106	0.00000	271.4	68.4	0.0	U/P
0.312	0.0000	0.0000	143.382	0.06027	0.00000	271.4	73.6	0.0	U/P
0.360	0.0000	0.0000	143.342	0.05901	0.00000	271.4	84.0	0.0	U/P
0.480	0.0000	0.0000	143.240	0.05529	0.00000	271.4	108.7	0.0	U/P
0.720	0.0000	0.0000	143.034	0.04759	0.00000	271.4	153.2	0.0	U/P
1.200	0.0000	0.0000	142.617	0.03136	0.00000	271.4	221.8	0.0	U/P
1.440	0.0000	0.0000	142.406	0.02305	0.00000	271.4	245.3	0.0	U/P
1.680	0.0000	0.0000	142.190	0.01460	0.00000	271.4	261.6	0.0	U/P
1.920	0.0000	0.0000	141.950	0.00515	0.00000	271.4	270.5	0.0	U/P
2.160	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
2.400	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
3.600	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	271.4	271.4	0.0	dry

~2 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+25 to 158+50 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 113.45
Water Table Elevation, [WT] (ft datum): 128.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 254.6

Geometry Data

Equivalent Pond Length, [L] (ft): 21.5
Equivalent Pond Width, [W] (ft): 11.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
139.90	0.0
141.58	259.0

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 176.96

Initial ground water level (ft datum) default, 128.45

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	29.4933	0.0000	128.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	29.4933	0.0000	141.414	0.05407	0.00000	177.0	0.3	0.0	U/P
0.024	0.0000	0.0000	141.395	0.05370	0.00000	177.0	4.7	0.0	U/P
0.048	0.0000	0.0000	141.375	0.05300	0.00000	177.0	9.3	0.0	U/P
0.072	0.0000	0.0000	141.355	0.05240	0.00000	177.0	13.8	0.0	U/P
0.120	0.0000	0.0000	141.314	0.05134	0.00000	177.0	22.8	0.0	U/P
0.192	0.0000	0.0000	141.253	0.04883	0.00000	177.0	35.9	0.0	U/P
0.216	0.0000	0.0000	141.233	0.04792	0.00000	177.0	40.1	0.0	U/P
0.240	0.0000	0.0000	141.213	0.04732	0.00000	177.0	44.2	0.0	U/P
0.288	0.0000	0.0000	141.172	0.04588	0.00000	177.0	52.3	0.0	U/P
0.312	0.0000	0.0000	141.152	0.04515	0.00000	177.0	56.2	0.0	U/P
0.360	0.0000	0.0000	141.111	0.04400	0.00000	177.0	63.9	0.0	U/P
0.480	0.0000	0.0000	141.009	0.04058	0.00000	177.0	82.2	0.0	U/P
0.720	0.0000	0.0000	140.802	0.03347	0.00000	177.0	114.2	0.0	U/P
1.200	0.0000	0.0000	140.377	0.01833	0.00000	177.0	159.5	0.0	U/P
1.440	0.0000	0.0000	140.156	0.00721	0.00000	177.0	171.9	0.0	U/P
1.680	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
1.920	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
2.160	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
2.400	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
3.600	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry

u.s hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+50 to 158+75 ft
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 111.88
Water Table Elevation, [WT] (ft datum): 126.88
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 332.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 13.3
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft²)</u>
138.40	0.0
140.50	374.1

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 335.26

Initial ground water level (ft datum) default, 126.88

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	55.8767	0.0000	126.880	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	55.8767	0.0000	140.339	0.07685	0.00000	335.3	0.5	0.0	U/P
0.024	0.0000	0.0000	140.321	0.07685	0.00000	335.3	6.6	0.0	U/P
0.048	0.0000	0.0000	140.301	0.07685	0.00000	335.3	13.3	0.0	U/P
0.072	0.0000	0.0000	140.282	0.07685	0.00000	335.3	19.9	0.0	U/P
0.120	0.0000	0.0000	140.242	0.07649	0.00000	335.3	33.2	0.0	U/P
0.192	0.0000	0.0000	140.180	0.07405	0.00000	335.3	52.9	0.0	U/P
0.216	0.0000	0.0000	140.160	0.07301	0.00000	335.3	59.2	0.0	U/P
0.240	0.0000	0.0000	140.140	0.07232	0.00000	335.3	65.5	0.0	U/P
0.288	0.0000	0.0000	140.100	0.07065	0.00000	335.3	77.9	0.0	U/P
0.312	0.0000	0.0000	140.080	0.06982	0.00000	335.3	84.0	0.0	U/P
0.360	0.0000	0.0000	140.039	0.06849	0.00000	335.3	95.9	0.0	U/P
0.480	0.0000	0.0000	139.938	0.06457	0.00000	335.3	124.7	0.0	U/P
0.720	0.0000	0.0000	139.733	0.05644	0.00000	335.3	177.0	0.0	U/P
1.200	0.0000	0.0000	139.318	0.03937	0.00000	335.3	260.2	0.0	U/P
1.440	0.0000	0.0000	139.109	0.03067	0.00000	335.3	290.4	0.0	U/P
1.680	0.0000	0.0000	138.898	0.02194	0.00000	335.3	313.2	0.0	U/P
1.920	0.0000	0.0000	138.678	0.00877	0.00000	335.3	328.4	0.0	U/P
2.160	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
2.400	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry

24hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+75 to 159+00 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 110.30
Water Table Elevation, [WT] (ft datum): 125.30
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 368.5

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 14.7
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
136.90	0.0
139.41	442.1

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 448

Initial ground water level (ft datum) default, 125.30

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	74.6667	0.0000	125.300	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	74.6667	0.0000	139.154	0.08530	0.00000	448.0	0.5	0.0	U/P
0.024	0.0000	0.0000	139.137	0.08530	0.00000	448.0	7.4	0.0	U/P
0.048	0.0000	0.0000	139.118	0.08530	0.00000	448.0	14.7	0.0	U/P
0.072	0.0000	0.0000	139.099	0.08530	0.00000	448.0	22.1	0.0	U/P
0.120	0.0000	0.0000	139.061	0.08530	0.00000	448.0	36.9	0.0	U/P
0.192	0.0000	0.0000	139.002	0.08530	0.00000	448.0	59.0	0.0	U/P
0.216	0.0000	0.0000	138.982	0.08509	0.00000	448.0	66.3	0.0	U/P
0.240	0.0000	0.0000	138.962	0.08461	0.00000	448.0	73.7	0.0	U/P
0.288	0.0000	0.0000	138.921	0.08296	0.00000	448.0	88.2	0.0	U/P
0.312	0.0000	0.0000	138.901	0.08214	0.00000	448.0	95.3	0.0	U/P
0.360	0.0000	0.0000	138.861	0.08083	0.00000	448.0	109.4	0.0	U/P
0.480	0.0000	0.0000	138.759	0.07696	0.00000	448.0	143.5	0.0	U/P
0.720	0.0000	0.0000	138.556	0.06897	0.00000	448.0	206.6	0.0	U/P
1.200	0.0000	0.0000	138.144	0.05222	0.00000	448.0	311.7	0.0	U/P
1.440	0.0000	0.0000	137.938	0.04372	0.00000	448.0	353.1	0.0	U/P
1.680	0.0000	0.0000	137.731	0.03527	0.00000	448.0	387.2	0.0	U/P
1.920	0.0000	0.0000	137.521	0.02673	0.00000	448.0	414.0	0.0	U/P
2.160	0.0000	0.0000	137.307	0.01800	0.00000	448.0	433.4	0.0	U/P
2.400	0.0000	0.0000	137.080	0.01132	0.00000	448.0	445.2	0.0	U/P
3.600	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	448.0	448.0	0.0	dry

~3 hrs

**PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method
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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 159+00 to 159+25 ft
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 109.08
Water Table Elevation, [WT] (ft datum): 124.08
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 386.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 15.5
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
135.35	0.0
138.01	467.3

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 493.1

Initial ground water level (ft datum) default, 124.08

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	82.1833	0.0000	124.080	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	82.1833	0.0000	137.718	0.08953	0.00000	493.1	0.5	0.0	U/P
0.024	0.0000	0.0000	137.701	0.08953	0.00000	493.1	7.7	0.0	U/P
0.048	0.0000	0.0000	137.682	0.08953	0.00000	493.1	15.5	0.0	U/P
0.072	0.0000	0.0000	137.663	0.08953	0.00000	493.1	23.2	0.0	U/P
0.120	0.0000	0.0000	137.625	0.08953	0.00000	493.1	38.7	0.0	U/P
0.192	0.0000	0.0000	137.566	0.08953	0.00000	493.1	61.9	0.0	U/P
0.216	0.0000	0.0000	137.546	0.08941	0.00000	493.1	69.6	0.0	U/P
0.240	0.0000	0.0000	137.526	0.08901	0.00000	493.1	77.3	0.0	U/P
0.288	0.0000	0.0000	137.485	0.08737	0.00000	493.1	92.6	0.0	U/P
0.312	0.0000	0.0000	137.465	0.08656	0.00000	493.1	100.1	0.0	U/P
0.360	0.0000	0.0000	137.425	0.08525	0.00000	493.1	115.0	0.0	U/P
0.480	0.0000	0.0000	137.324	0.08139	0.00000	493.1	151.0	0.0	U/P
0.720	0.0000	0.0000	137.120	0.07343	0.00000	493.1	217.9	0.0	U/P
1.200	0.0000	0.0000	136.710	0.05676	0.00000	493.1	330.8	0.0	U/P
1.440	0.0000	0.0000	136.504	0.04831	0.00000	493.1	376.1	0.0	U/P
1.680	0.0000	0.0000	136.297	0.03992	0.00000	493.1	414.3	0.0	U/P
1.920	0.0000	0.0000	136.089	0.03146	0.00000	493.1	445.1	0.0	U/P
2.160	0.0000	0.0000	135.878	0.02288	0.00000	493.1	468.6	0.0	U/P
2.400	0.0000	0.0000	135.660	0.01546	0.00000	493.1	484.6	0.0	U/P
3.600	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	493.1	493.1	0.0	dry

~3hrs

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Retention Pond Recovery - Refined Method
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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 159+25 to 159+50 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 107.86
Water Table Elevation, [WT] (ft datum): 122.86
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 405.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 16.2
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
133.80	0.0
136.61	496.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 546.75

Initial ground water level (ft datum) default, 122.86

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	91.1250	0.0000	122.860	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	91.1250	0.0000	136.286	0.09375	0.00000	546.8	0.6	0.0	U/P
0.024	0.0000	0.0000	136.269	0.09375	0.00000	546.8	8.1	0.0	U/P
0.048	0.0000	0.0000	136.250	0.09375	0.00000	546.8	16.2	0.0	U/P
0.072	0.0000	0.0000	136.231	0.09375	0.00000	546.8	24.3	0.0	U/P
0.120	0.0000	0.0000	136.193	0.09375	0.00000	546.8	40.5	0.0	U/P
0.192	0.0000	0.0000	136.135	0.09375	0.00000	546.8	64.8	0.0	U/P
0.216	0.0000	0.0000	136.115	0.09375	0.00000	546.8	72.9	0.0	U/P
0.240	0.0000	0.0000	136.096	0.09375	0.00000	546.8	81.0	0.0	U/P
0.288	0.0000	0.0000	136.055	0.09277	0.00000	546.8	97.2	0.0	U/P
0.312	0.0000	0.0000	136.035	0.09201	0.00000	546.8	105.2	0.0	U/P
0.360	0.0000	0.0000	135.995	0.09070	0.00000	546.8	121.0	0.0	U/P
0.480	0.0000	0.0000	135.894	0.08682	0.00000	546.8	159.3	0.0	U/P
0.720	0.0000	0.0000	135.690	0.07882	0.00000	546.8	231.0	0.0	U/P
1.200	0.0000	0.0000	135.280	0.06207	0.00000	546.8	353.0	0.0	U/P
1.440	0.0000	0.0000	135.075	0.05359	0.00000	546.8	403.0	0.0	U/P
1.680	0.0000	0.0000	134.870	0.04517	0.00000	546.8	445.6	0.0	U/P
1.920	0.0000	0.0000	134.662	0.03670	0.00000	546.8	481.0	0.0	U/P
2.160	0.0000	0.0000	134.453	0.02814	0.00000	546.8	509.0	0.0	U/P
2.400	0.0000	0.0000	134.240	0.01986	0.00000	546.8	529.6	0.0	U/P
3.600	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry

~3 hrs

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Retention Pond Recovery - Refined Method
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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 159+50 to 159+75 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 106.64
Water Table Elevation, [WT] (ft datum): 121.64
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 413.3

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 16.5
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
132.55	0.0
135.42	534.0

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 610.79

Initial ground water level (ft datum) default, 121.64

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	101.7983	0.0000	121.640	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	101.7983	0.0000	135.111	0.09566	0.00000	610.8	0.6	0.0	U/P
0.024	0.0000	0.0000	135.095	0.09566	0.00000	610.8	8.3	0.0	U/P
0.048	0.0000	0.0000	135.077	0.09566	0.00000	610.8	16.5	0.0	U/P
0.072	0.0000	0.0000	135.060	0.09566	0.00000	610.8	24.8	0.0	U/P
0.120	0.0000	0.0000	135.024	0.09566	0.00000	610.8	41.3	0.0	U/P
0.192	0.0000	0.0000	134.970	0.09566	0.00000	610.8	66.1	0.0	U/P
0.216	0.0000	0.0000	134.951	0.09566	0.00000	610.8	74.4	0.0	U/P
0.240	0.0000	0.0000	134.933	0.09566	0.00000	610.8	82.7	0.0	U/P
0.288	0.0000	0.0000	134.895	0.09566	0.00000	610.8	99.2	0.0	U/P
0.312	0.0000	0.0000	134.876	0.09566	0.00000	610.8	107.4	0.0	U/P
0.360	0.0000	0.0000	134.838	0.09566	0.00000	610.8	124.0	0.0	U/P
0.480	0.0000	0.0000	134.738	0.09422	0.00000	610.8	165.3	0.0	U/P
0.720	0.0000	0.0000	134.535	0.08704	0.00000	610.8	244.2	0.0	U/P
1.200	0.0000	0.0000	134.126	0.06944	0.00000	610.8	379.8	0.0	U/P
1.440	0.0000	0.0000	133.921	0.06052	0.00000	610.8	435.9	0.0	U/P
1.680	0.0000	0.0000	133.716	0.05168	0.00000	610.8	484.4	0.0	U/P
1.920	0.0000	0.0000	133.509	0.04279	0.00000	610.8	525.2	0.0	U/P
2.160	0.0000	0.0000	133.301	0.03383	0.00000	610.8	558.3	0.0	U/P
2.400	0.0000	0.0000	133.090	0.02444	0.00000	610.8	583.6	0.0	U/P
3.600	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry

~3hrs

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Project Data

Project Name: Hartwood Marsh Road
 Simulation Description: Swale Recovery Water Quality
 Sta. 159+75 to 160+00 It
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
 Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 105.42
 Water Table Elevation, [WT] (ft datum): 120.42
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 423.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
 Equivalent Pond Width, [W] (ft): 16.9
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
131.30	0.0
134.23	547.5

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Retention Pond Recovery - Refined Method
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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 640.34

Initial ground water level (ft datum) default, 120.42

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	106.7233	0.0000	120.420	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	106.7233	0.0000	133.917	0.09792	0.00000	640.3	0.6	0.0	U/P
0.024	0.0000	0.0000	133.901	0.09792	0.00000	640.3	8.5	0.0	U/P
0.048	0.0000	0.0000	133.883	0.09792	0.00000	640.3	16.9	0.0	U/P
0.072	0.0000	0.0000	133.866	0.09792	0.00000	640.3	25.4	0.0	U/P
0.120	0.0000	0.0000	133.830	0.09792	0.00000	640.3	42.3	0.0	U/P
0.192	0.0000	0.0000	133.776	0.09792	0.00000	640.3	67.7	0.0	U/P
0.216	0.0000	0.0000	133.757	0.09792	0.00000	640.3	76.1	0.0	U/P
0.240	0.0000	0.0000	133.739	0.09792	0.00000	640.3	84.6	0.0	U/P
0.288	0.0000	0.0000	133.702	0.09792	0.00000	640.3	101.5	0.0	U/P
0.312	0.0000	0.0000	133.683	0.09792	0.00000	640.3	110.0	0.0	U/P
0.360	0.0000	0.0000	133.644	0.09792	0.00000	640.3	126.9	0.0	U/P
0.480	0.0000	0.0000	133.546	0.09668	0.00000	640.3	169.2	0.0	U/P
0.720	0.0000	0.0000	133.342	0.08990	0.00000	640.3	250.6	0.0	U/P
1.200	0.0000	0.0000	132.934	0.07223	0.00000	640.3	391.0	0.0	U/P
1.440	0.0000	0.0000	132.729	0.06328	0.00000	640.3	449.5	0.0	U/P
1.680	0.0000	0.0000	132.524	0.05441	0.00000	640.3	500.4	0.0	U/P
1.920	0.0000	0.0000	132.318	0.04550	0.00000	640.3	543.6	0.0	U/P
2.160	0.0000	0.0000	132.110	0.03653	0.00000	640.3	579.0	0.0	U/P
2.400	0.0000	0.0000	131.900	0.02669	0.00000	640.3	606.7	0.0	U/P
3.600	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	640.3	640.3	0.0	dry

~3 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+00 to 160+25 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 104.45
Water Table Elevation, [WT] (ft datum): 119.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 440.3

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 17.6
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
131.00	0.0
133.38	567.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 745.83

Initial ground water level (ft datum) default, 119.45

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	124.3050	0.0000	119.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	124.3050	0.0000	133.503	0.10191	0.00000	745.8	0.6	0.0	U/P
0.024	0.0000	0.0000	133.488	0.10191	0.00000	745.8	8.8	0.0	U/P
0.048	0.0000	0.0000	133.473	0.10191	0.00000	745.8	17.6	0.0	U/P
0.072	0.0000	0.0000	133.457	0.10191	0.00000	745.8	26.4	0.0	U/P
0.120	0.0000	0.0000	133.426	0.10191	0.00000	745.8	44.0	0.0	U/P
0.192	0.0000	0.0000	133.380	0.10191	0.00000	745.8	70.4	0.0	U/P
0.216	0.0000	0.0000	133.364	0.10191	0.00000	745.8	79.2	0.0	U/P
0.240	0.0000	0.0000	133.348	0.10191	0.00000	745.8	88.1	0.0	U/P
0.288	0.0000	0.0000	133.317	0.10191	0.00000	745.8	105.7	0.0	U/P
0.312	0.0000	0.0000	133.301	0.10191	0.00000	745.8	114.5	0.0	U/P
0.360	0.0000	0.0000	133.268	0.10191	0.00000	745.8	132.1	0.0	U/P
0.480	0.0000	0.0000	133.186	0.10191	0.00000	745.8	176.1	0.0	U/P
0.720	0.0000	0.0000	133.010	0.10109	0.00000	745.8	264.2	0.0	U/P
1.200	0.0000	0.0000	132.612	0.08998	0.00000	745.8	436.0	0.0	U/P
1.440	0.0000	0.0000	132.407	0.07958	0.00000	745.8	509.7	0.0	U/P
1.680	0.0000	0.0000	132.202	0.06825	0.00000	745.8	573.5	0.0	U/P
1.920	0.0000	0.0000	131.996	0.05687	0.00000	745.8	627.6	0.0	U/P
2.160	0.0000	0.0000	131.788	0.04540	0.00000	745.8	671.8	0.0	U/P
2.400	0.0000	0.0000	131.578	0.03304	0.00000	745.8	706.1	0.0	U/P
3.600	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	745.8	745.8	0.0	dry

~3hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+25 to 160+50 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 103.48
Water Table Elevation, [WT] (ft datum): 118.48
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 459.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 18.4
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
130.70	0.0
132.52	544.5

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 658.35

Initial ground water level (ft datum) default, 118.48

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	109.7250	0.0000	118.480	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	109.7250	0.0000	132.818	0.10625	0.00000	658.4	0.6	0.0	U/P
0.024	0.0000	0.0000	132.802	0.10625	0.00000	658.4	9.2	0.0	U/P
0.048	0.0000	0.0000	132.785	0.10625	0.00000	658.4	18.4	0.0	U/P
0.072	0.0000	0.0000	132.769	0.10625	0.00000	658.4	27.5	0.0	U/P
0.120	0.0000	0.0000	132.735	0.10625	0.00000	658.4	45.9	0.0	U/P
0.192	0.0000	0.0000	132.684	0.10625	0.00000	658.4	73.4	0.0	U/P
0.216	0.0000	0.0000	132.667	0.10625	0.00000	658.4	82.6	0.0	U/P
0.240	0.0000	0.0000	132.651	0.10625	0.00000	658.4	91.8	0.0	U/P
0.288	0.0000	0.0000	132.617	0.10625	0.00000	658.4	110.2	0.0	U/P
0.312	0.0000	0.0000	132.600	0.10625	0.00000	658.4	119.3	0.0	U/P
0.360	0.0000	0.0000	132.566	0.10625	0.00000	658.4	137.7	0.0	U/P
0.480	0.0000	0.0000	132.482	0.10625	0.00000	658.4	183.6	0.0	U/P
0.720	0.0000	0.0000	132.300	0.10373	0.00000	658.4	275.4	0.0	U/P
1.200	0.0000	0.0000	131.892	0.08474	0.00000	658.4	445.9	0.0	U/P
1.440	0.0000	0.0000	131.685	0.07060	0.00000	658.4	513.1	0.0	U/P
1.680	0.0000	0.0000	131.477	0.05622	0.00000	658.4	568.0	0.0	U/P
1.920	0.0000	0.0000	131.267	0.04165	0.00000	658.4	610.3	0.0	U/P
2.160	0.0000	0.0000	131.051	0.02669	0.00000	658.4	639.9	0.0	U/P
2.400	0.0000	0.0000	130.814	0.01589	0.00000	658.4	656.4	0.0	U/P
3.600	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry

~3 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+50 to 160+75 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 102.50
Water Table Elevation, [WT] (ft datum): 117.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 512.3

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 20.5
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft²)</u>
129.60	0.0
131.54	551.6

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 638.25

Initial ground water level (ft datum) default, 117.50

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	106.3750	0.0000	117.500	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	106.3750	0.0000	131.726	0.11858	0.00000	638.3	0.7	0.0	U/P
0.024	0.0000	0.0000	131.709	0.11858	0.00000	638.3	10.2	0.0	U/P
0.048	0.0000	0.0000	131.690	0.11858	0.00000	638.3	20.5	0.0	U/P
0.072	0.0000	0.0000	131.671	0.11858	0.00000	638.3	30.7	0.0	U/P
0.120	0.0000	0.0000	131.634	0.11858	0.00000	638.3	51.2	0.0	U/P
0.192	0.0000	0.0000	131.579	0.11858	0.00000	638.3	82.0	0.0	U/P
0.216	0.0000	0.0000	131.560	0.11858	0.00000	638.3	92.2	0.0	U/P
0.240	0.0000	0.0000	131.541	0.11858	0.00000	638.3	102.5	0.0	U/P
0.288	0.0000	0.0000	131.504	0.11858	0.00000	638.3	122.9	0.0	U/P
0.312	0.0000	0.0000	131.485	0.11858	0.00000	638.3	133.2	0.0	U/P
0.360	0.0000	0.0000	131.446	0.11853	0.00000	638.3	153.7	0.0	U/P
0.480	0.0000	0.0000	131.346	0.11576	0.00000	638.3	204.8	0.0	U/P
0.720	0.0000	0.0000	131.142	0.10384	0.00000	638.3	300.3	0.0	U/P
1.200	0.0000	0.0000	130.730	0.07675	0.00000	638.3	456.9	0.0	U/P
1.440	0.0000	0.0000	130.523	0.06299	0.00000	638.3	517.2	0.0	U/P
1.680	0.0000	0.0000	130.314	0.04928	0.00000	638.3	565.7	0.0	U/P
1.920	0.0000	0.0000	130.103	0.03536	0.00000	638.3	602.3	0.0	U/P
2.160	0.0000	0.0000	129.884	0.01416	0.00000	638.3	626.8	0.0	U/P
2.400	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	638.3	638.3	0.0	dry

~ 2.3 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+75 to 161+00 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 101.53
Water Table Elevation, [WT] (ft datum): 116.53
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 554.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 22.2
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
128.50	0.0
130.56	607.7

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 712.88

Initial ground water level (ft datum) default, 116.53

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	118.8133	0.0000	116.530	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	118.8133	0.0000	130.702	0.12824	0.00000	712.9	0.8	0.0	U/P
0.024	0.0000	0.0000	130.685	0.12824	0.00000	712.9	11.1	0.0	U/P
0.048	0.0000	0.0000	130.667	0.12824	0.00000	712.9	22.2	0.0	U/P
0.072	0.0000	0.0000	130.648	0.12824	0.00000	712.9	33.2	0.0	U/P
0.120	0.0000	0.0000	130.612	0.12824	0.00000	712.9	55.4	0.0	U/P
0.192	0.0000	0.0000	130.557	0.12824	0.00000	712.9	88.6	0.0	U/P
0.216	0.0000	0.0000	130.539	0.12824	0.00000	712.9	99.7	0.0	U/P
0.240	0.0000	0.0000	130.520	0.12824	0.00000	712.9	110.8	0.0	U/P
0.288	0.0000	0.0000	130.483	0.12824	0.00000	712.9	133.0	0.0	U/P
0.312	0.0000	0.0000	130.464	0.12824	0.00000	712.9	144.0	0.0	U/P
0.360	0.0000	0.0000	130.425	0.12822	0.00000	712.9	166.2	0.0	U/P
0.480	0.0000	0.0000	130.325	0.12544	0.00000	712.9	221.6	0.0	U/P
0.720	0.0000	0.0000	130.121	0.11315	0.00000	712.9	325.2	0.0	U/P
1.200	0.0000	0.0000	129.709	0.08509	0.00000	712.9	497.1	0.0	U/P
1.440	0.0000	0.0000	129.503	0.07084	0.00000	712.9	564.4	0.0	U/P
1.680	0.0000	0.0000	129.296	0.05667	0.00000	712.9	619.5	0.0	U/P
1.920	0.0000	0.0000	129.085	0.04233	0.00000	712.9	662.4	0.0	U/P
2.160	0.0000	0.0000	128.870	0.02763	0.00000	712.9	692.7	0.0	U/P
2.400	0.0000	0.0000	128.637	0.01679	0.00000	712.9	710.1	0.0	U/P
3.600	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry

~3 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 161+00 to 161+25 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 100.56
Water Table Elevation, [WT] (ft datum): 115.56
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 548.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 22.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
127.75	0.0
129.54	619.2

255

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 696.25

Initial ground water level (ft datum) default, 115.56

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	116.0417	0.0000	115.560	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	116.0417	0.0000	129.768	0.12703	0.00000	696.3	0.8	0.0	U/P
0.024	0.0000	0.0000	129.752	0.12703	0.00000	696.3	11.0	0.0	U/P
0.048	0.0000	0.0000	129.734	0.12703	0.00000	696.3	22.0	0.0	U/P
0.072	0.0000	0.0000	129.716	0.12703	0.00000	696.3	32.9	0.0	U/P
0.120	0.0000	0.0000	129.681	0.12703	0.00000	696.3	54.9	0.0	U/P
0.192	0.0000	0.0000	129.628	0.12703	0.00000	696.3	87.8	0.0	U/P
0.216	0.0000	0.0000	129.610	0.12703	0.00000	696.3	98.8	0.0	U/P
0.240	0.0000	0.0000	129.592	0.12703	0.00000	696.3	109.8	0.0	U/P
0.288	0.0000	0.0000	129.557	0.12703	0.00000	696.3	131.7	0.0	U/P
0.312	0.0000	0.0000	129.539	0.12703	0.00000	696.3	142.7	0.0	U/P
0.360	0.0000	0.0000	129.503	0.12703	0.00000	696.3	164.6	0.0	U/P
0.480	0.0000	0.0000	129.410	0.12650	0.00000	696.3	219.5	0.0	U/P
0.720	0.0000	0.0000	129.209	0.11819	0.00000	696.3	327.9	0.0	U/P
1.200	0.0000	0.0000	128.796	0.08671	0.00000	696.3	507.0	0.0	U/P
1.440	0.0000	0.0000	128.589	0.06991	0.00000	696.3	574.6	0.0	U/P
1.680	0.0000	0.0000	128.379	0.05314	0.00000	696.3	627.8	0.0	U/P
1.920	0.0000	0.0000	128.165	0.03603	0.00000	696.3	666.4	0.0	U/P
2.160	0.0000	0.0000	127.939	0.01368	0.00000	696.3	690.1	0.0	U/P
2.400	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry

~23 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 161+25 to 161+50 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 99.60
Water Table Elevation, [WT] (ft datum): 114.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 543.3

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 21.7
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
127.00	0.0
128.52	592.1

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 589.8

Initial ground water level (ft datum) default, 114.60

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	98.3000	0.0000	114.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	98.3000	0.0000	128.755	0.12575	0.00000	589.8	0.8	0.0	U/P
0.024	0.0000	0.0000	128.738	0.12575	0.00000	589.8	10.9	0.0	U/P
0.048	0.0000	0.0000	128.720	0.12575	0.00000	589.8	21.7	0.0	U/P
0.072	0.0000	0.0000	128.701	0.12575	0.00000	589.8	32.6	0.0	U/P
0.120	0.0000	0.0000	128.664	0.12575	0.00000	589.8	54.3	0.0	U/P
0.192	0.0000	0.0000	128.609	0.12575	0.00000	589.8	86.9	0.0	U/P
0.216	0.0000	0.0000	128.591	0.12575	0.00000	589.8	97.8	0.0	U/P
0.240	0.0000	0.0000	128.573	0.12575	0.00000	589.8	108.7	0.0	U/P
0.288	0.0000	0.0000	128.536	0.12575	0.00000	589.8	130.4	0.0	U/P
0.312	0.0000	0.0000	128.518	0.12575	0.00000	589.8	141.2	0.0	U/P
0.360	0.0000	0.0000	128.480	0.12575	0.00000	589.8	163.0	0.0	U/P
0.480	0.0000	0.0000	128.383	0.12335	0.00000	589.8	217.3	0.0	U/P
0.720	0.0000	0.0000	128.178	0.10941	0.00000	589.8	319.7	0.0	U/P
1.200	0.0000	0.0000	127.760	0.07188	0.00000	589.8	477.3	0.0	U/P
1.440	0.0000	0.0000	127.549	0.05265	0.00000	589.8	531.0	0.0	U/P
1.680	0.0000	0.0000	127.333	0.03309	0.00000	589.8	568.3	0.0	U/P
1.920	0.0000	0.0000	127.090	0.01155	0.00000	589.8	588.2	0.0	U/P
2.160	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
2.400	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
3.600	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	589.8	589.8	0.0	dry

~2hrs

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Retention Pond Recovery - Refined Method
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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 161+50 to 161+75 It
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 98.63
Water Table Elevation, [WT] (ft datum): 113.63
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 464.5

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 18.6
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
126.00	0.0
127.51	541.0

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Retention Pond Recovery - Refined Method
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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 427

Initial ground water level (ft datum) default, 113.63

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	71.1667	0.0000	113.630	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	71.1667	0.0000	127.543	0.10752	0.00000	427.0	0.6	0.0	U/P
0.024	0.0000	0.0000	127.527	0.10752	0.00000	427.0	9.3	0.0	U/P
0.048	0.0000	0.0000	127.510	0.10752	0.00000	427.0	18.6	0.0	U/P
0.072	0.0000	0.0000	127.493	0.10752	0.00000	427.0	27.9	0.0	U/P
0.120	0.0000	0.0000	127.458	0.10752	0.00000	427.0	46.5	0.0	U/P
0.192	0.0000	0.0000	127.403	0.10752	0.00000	427.0	74.3	0.0	U/P
0.216	0.0000	0.0000	127.385	0.10752	0.00000	427.0	83.6	0.0	U/P
0.240	0.0000	0.0000	127.366	0.10752	0.00000	427.0	92.9	0.0	U/P
0.288	0.0000	0.0000	127.327	0.10752	0.00000	427.0	111.5	0.0	U/P
0.312	0.0000	0.0000	127.308	0.10752	0.00000	427.0	120.8	0.0	U/P
0.360	0.0000	0.0000	127.267	0.10622	0.00000	427.0	139.4	0.0	U/P
0.480	0.0000	0.0000	127.165	0.09896	0.00000	427.0	183.8	0.0	U/P
0.720	0.0000	0.0000	126.959	0.08247	0.00000	427.0	262.4	0.0	U/P
1.200	0.0000	0.0000	126.535	0.04748	0.00000	427.0	375.7	0.0	U/P
1.440	0.0000	0.0000	126.318	0.02921	0.00000	427.0	408.9	0.0	U/P
1.680	0.0000	0.0000	126.069	0.00999	0.00000	427.0	426.2	0.0	U/P
1.920	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
2.160	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
2.400	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
3.600	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry

~1.7 hrs

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 Sta. 161+75 to 162+00 It
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
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Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 97.66
 Water Table Elevation, [WT] (ft datum): 112.66
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 551.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
 Equivalent Pond Width, [W] (ft): 22.0
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
124.00	0.0
126.50	582.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 657.75

Initial ground water level (ft datum) default, 112.66

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	109.6250	0.0000	112.660	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	109.6250	0.0000	126.374	0.12755	0.00000	657.8	0.8	0.0	U/P
0.024	0.0000	0.0000	126.356	0.12733	0.00000	657.8	11.0	0.0	U/P
0.048	0.0000	0.0000	126.336	0.12656	0.00000	657.8	22.0	0.0	U/P
0.072	0.0000	0.0000	126.315	0.12566	0.00000	657.8	32.9	0.0	U/P
0.120	0.0000	0.0000	126.275	0.12407	0.00000	657.8	54.5	0.0	U/P
0.192	0.0000	0.0000	126.214	0.12030	0.00000	657.8	86.3	0.0	U/P
0.216	0.0000	0.0000	126.194	0.11894	0.00000	657.8	96.6	0.0	U/P
0.240	0.0000	0.0000	126.174	0.11803	0.00000	657.8	106.9	0.0	U/P
0.288	0.0000	0.0000	126.134	0.11586	0.00000	657.8	127.1	0.0	U/P
0.312	0.0000	0.0000	126.114	0.11477	0.00000	657.8	137.1	0.0	U/P
0.360	0.0000	0.0000	126.073	0.11304	0.00000	657.8	156.8	0.0	U/P
0.480	0.0000	0.0000	125.972	0.10792	0.00000	657.8	204.5	0.0	U/P
0.720	0.0000	0.0000	125.768	0.09735	0.00000	657.8	293.3	0.0	U/P
1.200	0.0000	0.0000	125.358	0.07524	0.00000	657.8	442.9	0.0	U/P
1.440	0.0000	0.0000	125.152	0.06402	0.00000	657.8	503.0	0.0	U/P
1.680	0.0000	0.0000	124.946	0.05288	0.00000	657.8	553.5	0.0	U/P
1.920	0.0000	0.0000	124.738	0.04165	0.00000	657.8	594.4	0.0	U/P
2.160	0.0000	0.0000	124.526	0.03026	0.00000	657.8	625.5	0.0	U/P
2.400	0.0000	0.0000	124.309	0.02043	0.00000	657.8	646.7	0.0	U/P
3.600	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	657.8	657.8	0.0	dry

~3h ~5

Water Quality Storage Between Ditch Blocks - Right

Ditch Station	Ditch Block Height (ft)	Elevation of Ditch Block (ft)	Ditch Back Slope (F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+25	1	148.875	2	3.67	4	6.87	25.00	4.17	135.50
156+50	1.4	149.9	2	3.52	4	9.128	25.00	6.68	197.60
156+75	1.2	148.95	2	4.405	4	8.886	25.00	3.33	152.70
157+00	1	148	2	5.29	4	8.29	25.00	2.07	129.50
157+25	1.2	147.2	2	5.09	4	9.708	25.00	1.62	141.60
157+50	1.5	146.5	2	4.89	4	11.835	25.00	3.95	197.31
157+75	1.6	145.85	2	6.635	4	15.416	25.00	8.19	295.08
158+00	1.6	145.1	2	6.38	4	18.208	25.00	9.67	348.48
158+25	1.1	143.35	2	9.035	4	13.2385	22.00	0	145.62
158+50	0.57	141.57	2	9.69	4	7.2333	11.40	0	41.23
158+75	0.55	140.55	2	12.845	4	8.71475	13.75	0	59.91
159+00	0.55	139.55	2	16	4	10.45	13.75	0	71.84
159+25	0.55	138.05	2	16.405	4	10.67275	9.17	0	48.93
159+50	0.6	136.6	2	16.81	4	11.886	10.00	0	59.43
159+75	0.6	135.35	2	14.985	4	10.791	12.00	0	64.75
160+00	0.55	134.05	2	13.16	4	8.888	11.00	0	48.88
160+25	0.7	133.2	2	13.18	4	11.326	17.50	0	99.10
160+50	0.75	132.25	2	13.2	4	12.15	18.75	0	113.91
160+75	0.9	131.4	2	12.355	4	13.8195	22.50	0	155.47
161+00	0.8	130.3	2	11.51	4	11.608	20.00	0	116.08
161+25	0.95	129.6	2	11.35	4	13.6325	25.00	1.44	188.41
161+50	0.92	128.72	2	11.19	4	13.0548	25.00	0.99	175.56
161+95	1	127.74	2	12.5	4	15.5	42.45	0	328.99
Total									3315.88 0.076 af

HARTWOOD MARSH ROAD
 BASIN 3
 INTERIM CONDITION
 MAXIMUM SWALE STORAGE CALCULATIONS



Ditch Parameters-Right Side

Station	Ditch Bottom (ft)	Max Depth (ft)	Max Elevation (ft)	Est. Elev. Of Base (ft)	Slope	Ditch Back Slope (F) (1:F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)
156+00	143.25	0.74	149.99	150.88	0.015	2	3.82	4
156+25	148.875	1.05	149.93	150.565	0.015	2	3.67	4
156+50	148.5	1.36	149.86	150.23	0.030	2	3.52	4
156+75	147.75	1.18	148.93	149.625	0.030	2	4.405	4
157+00	147	1.00	148.00	148.96	0.040	2	5.29	4
157+25	146	1.29	147.29	148.05	0.040	2	5.09	4
157+50	145	1.57	146.57	147.14	0.030	2	4.89	4
157+75	144.25	1.60	145.85	146.14	0.030	2	6.635	4
158+00	143.5	1.62	145.12	145.14	0.060	2	8.38	4
158+25	142.25	1.76	144.01	143.36	0.060	2	9.035	4
158+50	141	1.89	142.89	141.98	0.040	2	9.69	4
158+75	140	1.51	141.52	140.565	0.040	2	12.845	4
159+00	139	1.14	140.14	139.55	0.060	2	16	4
159+25	137.5	1.13	138.63	138.08	0.060	2	16.405	4
159+50	136	1.11	137.11	136.61	0.050	2	16.81	4
159+75	134.75	0.97	135.72	135.35	0.050	2	14.985	4
160+00	133.5	0.83	134.33	134.09	0.040	2	13.16	4
160+25	132.5	1.13	133.64	133.195	0.040	2	13.18	4
160+50	131.5	1.44	132.94	132.3	0.040	2	13.2	4
160+75	130.5	1.55	132.05	131.405	0.040	2	12.355	4
161+00	129.5	1.65	131.15	130.51	0.034	2	11.51	4
161+25	128.65	1.63	130.29	129.627	0.034	2	11.35	4
161+50	127.8	1.62	129.42	128.744	0.024	2	11.19	4
161+95	126.74	1.87	128.61	127.74		2	12.5	4

Maximum Storage Between Ditch Blocks - Right

Ditch Station	Max Depth (ft)	Top Bank at Ditch Block (ft)	Ditch Back Slope (F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+25	1.05	149.925	2	3.67	4	7.0035	25.00	4.5	143.79
156+50	1.36	149.86	2	3.52	4	8.8672	25.00	6.42	191.09
156+75	1.19	148.93	2	4.405	4	8.7379	25.00	3.18	148.97
157+00	1.00	148	2	5.29	4	8.29	25.00	2.07	129.50
157+25	1.29	147.285	2	5.09	4	10.39565	25.00	2.31	158.82
157+50	1.57	146.57	2	4.89	4	12.3873	25.00	4.5	211.09
157+75	1.60	145.845	2	6.695	4	15.367825	25.00	8.14	293.85
158+00	1.62	145.12	2	8.38	4	18.4356	25.00	9.9	354.20
158+25	1.76	144.005	2	9.035	4	21.121425	25.00	6.08	340.02
158+50	1.89	142.89	2	9.69	4	23.9841	25.00	8.13	401.43
158+75	1.51	141.515	2	12.845	4	24.005175	25.00	8.16	402.06
159+00	1.14	140.14	2	16	4	21.86	25.00	2.86	304.00
159+25	1.13	138.625	2	16.405	4	21.830625	18.75	0	204.66
159+50	1.11	137.11	2	16.81	4	21.9891	18.50	0	203.40
159+75	0.97	135.72	2	14.985	4	17.44545	19.40	0	169.22
160+00	0.83	134.33	2	13.16	4	13.4128	16.60	0	111.33
160+25	1.13	133.695	2	13.18	4	18.3643	25.00	2.18	256.80
160+50	1.44	132.94	2	13.2	4	23.328	25.00	7.13	380.73
160+75	1.55	132.045	2	12.355	4	23.723475	25.00	8.37	401.17
161+00	1.65	131.15	2	11.51	4	23.9415	25.00	9.43	417.14
161+25	1.63	130.285	2	11.35	4	23.46225	25.00	11.27	434.15
161+50	1.62	129.42	2	11.19	4	22.9878	25.00	10.83	423.97
161+95	1.87	128.61	2	12.5	4	28.965	45.00	12.56	934.76
Total									7016.16

Total North and South 17962.73 CF

269

Parameters for Recovery Analysis - Right Ditch



Ditch Block	Estimated SHGW (ft)	Confining Layer Elevation (ft)	Width at Ditch Block (ft)	Width at upper end of swale basin (ft)	Equivalent Pond Width (ft)	Equivalent Pond Length (ft)	Stage 1 (ft)	Area 1 (sf)	Stage 2 (ft)	Area 2 (sf)
156+25	137.81	122.81	9.67	3.82	6.75	25.00	148.88	0.00	149.93	223.00
156+50	136.73	121.73	11.92	3.67	7.80	25.00	148.50	0.00	149.86	265.75
156+75	135.65	120.65	11.61	3.52	7.56	25.00	147.75	0.00	148.93	219.81
157+00	134.57	119.57	11.29	4.41	7.85	25.00	147.00	0.00	148.00	214.94
157+25	133.83	118.83	12.29	5.29	8.79	25.00	146.00	0.00	147.29	247.50
157+50	133.09	118.09	13.89	5.09	9.49	25.00	145.00	0.00	146.57	285.25
157+75	132.34	117.34	16.24	4.89	10.56	25.00	144.25	0.00	145.85	327.06
158+00	131.60	116.60	17.98	6.64	12.31	25.00	143.50	0.00	145.12	374.44
158+25	130.03	115.03	15.64	8.38	12.01	22.00	142.25	0.00	144.01	387.19
158+50	128.45	113.45	13.11	9.04	11.07	11.40	141.00	0.00	142.89	423.81
158+75	126.88	111.88	16.15	9.69	12.92	13.75	140.00	0.00	141.52	433.94
159+00	125.30	110.30	19.30	12.85	16.07	13.75	139.00	0.00	140.14	456.56
159+25	124.08	109.08	19.71	16.00	17.85	9.17	137.50	0.00	138.63	367.08
159+50	122.86	107.86	20.41	16.41	18.41	10.00	136.00	0.00	137.11	368.84
159+75	121.64	106.64	18.59	16.81	17.70	12.00	134.75	0.00	135.72	364.87
160+00	120.42	105.42	16.46	14.97	15.72	11.00	133.50	0.00	134.33	274.94
160+25	119.45	104.45	17.38	13.16	15.27	17.50	132.50	0.00	133.64	424.50
160+50	118.48	103.48	17.70	13.18	15.44	18.75	131.50	0.00	132.94	470.75
160+75	117.50	102.50	17.76	13.20	15.48	25.00	130.50	0.00	132.05	476.19
161+00	116.53	101.53	16.31	12.35	14.33	25.00	129.50	0.00	131.15	470.81
161+25	115.56	100.56	17.05	11.51	14.28	25.00	128.65	0.00	130.29	467.25
161+50	114.60	99.60	16.71	11.35	14.03	25.00	127.80	0.00	129.42	461.00
161+95	113.63	98.63	18.50	11.19	14.85	42.45	126.74	0.00	128.61	894.82

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+00 to 156+25 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 122.81
Water Table Elevation, [WT] (ft datum): 137.81
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 168.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 6.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
148.88	0.0
149.93	223.0

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 135.5

Initial ground water level (ft datum) default, 137.81

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	22.5833	0.0000	137.810	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	22.5833	0.0000	150.012	0.03906	0.00000	135.5	0.2	0.0	U/P
0.024	0.0000	0.0000	149.998	0.03906	0.00000	135.5	3.4	0.0	U/P
0.048	0.0000	0.0000	149.982	0.03906	0.00000	135.5	6.8	0.0	U/P
0.072	0.0000	0.0000	149.967	0.03906	0.00000	135.5	10.1	0.0	U/P
0.120	0.0000	0.0000	149.937	0.03906	0.00000	135.5	16.9	0.0	U/P
0.192	0.0000	0.0000	149.891	0.03906	0.00000	135.5	27.0	0.0	U/P
0.216	0.0000	0.0000	149.875	0.03906	0.00000	135.5	30.4	0.0	U/P
0.240	0.0000	0.0000	149.859	0.03906	0.00000	135.5	33.8	0.0	U/P
0.360	0.0000	0.0000	149.774	0.03906	0.00000	135.5	50.6	0.0	U/P
0.480	0.0000	0.0000	149.680	0.03799	0.00000	135.5	67.5	0.0	U/P
0.720	0.0000	0.0000	149.471	0.03068	0.00000	135.5	98.5	0.0	U/P
1.200	0.0000	0.0000	149.011	0.01223	0.00000	135.5	133.7	0.0	U/P
1.920	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
2.400	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
3.600	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	135.5	135.5	0.0	dry

~1.5 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+25 to 156+50 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 121.73
Water Table Elevation, [WT] (ft datum): 136.73
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 195.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 7.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> <u>(ft datum)</u>	<u>Area</u> <u>(ft²)</u>
148.50	0.0
149.86	265.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 197.6

Initial ground water level (ft datum) default, 136.73

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	32.9333	0.0000	136.730	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	32.9333	0.0000	149.923	0.04514	0.00000	197.6	0.3	0.0	U/P
0.024	0.0000	0.0000	149.909	0.04514	0.00000	197.6	3.9	0.0	U/P
0.048	0.0000	0.0000	149.894	0.04514	0.00000	197.6	7.8	0.0	U/P
0.072	0.0000	0.0000	149.880	0.04514	0.00000	197.6	11.7	0.0	U/P
0.120	0.0000	0.0000	149.850	0.04514	0.00000	197.6	19.5	0.0	U/P
0.192	0.0000	0.0000	149.805	0.04514	0.00000	197.6	31.2	0.0	U/P
0.216	0.0000	0.0000	149.790	0.04514	0.00000	197.6	35.1	0.0	U/P
0.240	0.0000	0.0000	149.774	0.04514	0.00000	197.6	39.0	0.0	U/P
0.360	0.0000	0.0000	149.693	0.04514	0.00000	197.6	58.5	0.0	U/P
0.480	0.0000	0.0000	149.606	0.04504	0.00000	197.6	78.0	0.0	U/P
0.720	0.0000	0.0000	149.410	0.04107	0.00000	197.6	116.8	0.0	U/P
1.200	0.0000	0.0000	148.985	0.02011	0.00000	197.6	174.7	0.0	U/P
1.920	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry

~1.5 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+50 to 156+75 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-04-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 120.65
Water Table Elevation, [WT] (ft datum): 135.65
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 189.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 7.6
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
147.75	0.0
148.93	219.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 152.7

Initial ground water level (ft datum) default, 135.65

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	25.4500	0.0000	135.650	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	25.4500	0.0000	149.034	0.04375	0.00000	152.7	0.3	0.0	U/P
0.024	0.0000	0.0000	149.018	0.04375	0.00000	152.7	3.8	0.0	U/P
0.048	0.0000	0.0000	149.000	0.04375	0.00000	152.7	7.6	0.0	U/P
0.072	0.0000	0.0000	148.983	0.04375	0.00000	152.7	11.3	0.0	U/P
0.120	0.0000	0.0000	148.949	0.04375	0.00000	152.7	18.9	0.0	U/P
0.192	0.0000	0.0000	148.897	0.04375	0.00000	152.7	30.2	0.0	U/P
0.216	0.0000	0.0000	148.879	0.04375	0.00000	152.7	34.0	0.0	U/P
0.240	0.0000	0.0000	148.861	0.04375	0.00000	152.7	37.8	0.0	U/P
0.360	0.0000	0.0000	148.765	0.04320	0.00000	152.7	56.7	0.0	U/P
0.480	0.0000	0.0000	148.663	0.04056	0.00000	152.7	75.1	0.0	U/P
0.720	0.0000	0.0000	148.454	0.03188	0.00000	152.7	106.5	0.0	U/P
1.200	0.0000	0.0000	148.015	0.01375	0.00000	152.7	146.2	0.0	U/P
1.920	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
2.400	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
3.600	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
6.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
7.200	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
8.400	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
9.600	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
10.800	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
12.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
24.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
36.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
48.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
60.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
72.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
84.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry
96.000	0.0000	0.0000	---	---	---	152.7	152.7	0.0	dry

~1.5 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 156+75 to 157+00 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 119.57
Water Table Elevation, [WT] (ft datum): 134.57
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 196.3

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 7.9
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
147.00	0.0
148.00	214.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 129.5

Initial ground water level (ft datum) default, 134.57

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	1.500
0.002	0.015	0.100	0.470	2.000
0.003	0.020	0.150	0.500	2.500
0.005	0.030	0.250	0.600	3.000
0.008	0.050	0.300	0.700	3.500
0.009	0.060	0.350	0.800	4.000
0.010	0.070	0.400	0.900	
0.012	0.080	0.450	1.000	

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	21.5833	0.0000	134.570	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	21.5833	0.0000	148.101	0.04543	0.00000	129.5	0.3	0.0	U/P
0.024	0.0000	0.0000	148.084	0.04543	0.00000	129.5	3.9	0.0	U/P
0.048	0.0000	0.0000	148.066	0.04543	0.00000	129.5	7.9	0.0	U/P
0.072	0.0000	0.0000	148.048	0.04543	0.00000	129.5	11.8	0.0	U/P
0.120	0.0000	0.0000	148.011	0.04543	0.00000	129.5	19.6	0.0	U/P
0.192	0.0000	0.0000	147.955	0.04543	0.00000	129.5	31.4	0.0	U/P
0.216	0.0000	0.0000	147.936	0.04543	0.00000	129.5	35.3	0.0	U/P
0.240	0.0000	0.0000	147.916	0.04543	0.00000	129.5	39.3	0.0	U/P
0.288	0.0000	0.0000	147.876	0.04419	0.00000	129.5	47.1	0.0	U/P
0.312	0.0000	0.0000	147.855	0.04323	0.00000	129.5	50.9	0.0	U/P
0.360	0.0000	0.0000	147.814	0.04161	0.00000	129.5	58.2	0.0	U/P
0.480	0.0000	0.0000	147.711	0.03678	0.00000	129.5	75.2	0.0	U/P
0.720	0.0000	0.0000	147.499	0.02125	0.00000	129.5	102.7	0.0	U/P ~ 1 hr
1.200	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
1.440	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
1.680	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
1.920	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
2.160	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
2.400	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
3.600	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
11.040	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
11.280	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
14.400	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
16.800	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
19.200	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
21.600	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	129.5	129.5	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 157+00 to 157+25 ft
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 118.83
Water Table Elevation, [WT] (ft datum): 133.83
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 219.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 8.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
146.00	0.0
147.29	247.5

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 141.6

Initial ground water level (ft datum) default, 133.83

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	23.6000	0.0000	133.830	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	23.6000	0.0000	147.214	0.05087	0.00000	141.6	0.3	0.0	U/P
0.024	0.0000	0.0000	147.196	0.05087	0.00000	141.6	4.4	0.0	U/P
0.048	0.0000	0.0000	147.177	0.05087	0.00000	141.6	8.8	0.0	U/P
0.072	0.0000	0.0000	147.157	0.05087	0.00000	141.6	13.2	0.0	U/P
0.120	0.0000	0.0000	147.117	0.05036	0.00000	141.6	22.0	0.0	U/P
0.192	0.0000	0.0000	147.055	0.04754	0.00000	141.6	34.8	0.0	U/P
0.216	0.0000	0.0000	147.035	0.04641	0.00000	141.6	38.9	0.0	U/P
0.240	0.0000	0.0000	147.015	0.04566	0.00000	141.6	42.8	0.0	U/P
0.288	0.0000	0.0000	146.974	0.04385	0.00000	141.6	50.6	0.0	U/P
0.312	0.0000	0.0000	146.954	0.04295	0.00000	141.6	54.4	0.0	U/P
0.360	0.0000	0.0000	146.913	0.04150	0.00000	141.6	61.7	0.0	U/P
0.480	0.0000	0.0000	146.810	0.03722	0.00000	141.6	78.7	0.0	U/P
0.720	0.0000	0.0000	146.600	0.02818	0.00000	141.6	107.1	0.0	U/P
1.200	0.0000	0.0000	146.143	0.00628	0.00000	141.6	139.6	0.0	U/P
1.440	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
1.680	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
1.920	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
2.160	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
11.040	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
11.280	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
11.520	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
11.760	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
14.400	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
16.800	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
19.200	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
21.600	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry

~1.3 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 157+25 to 157+50 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 118.09
Water Table Elevation, [WT] (ft datum): 133.09
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 237.3

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 9.5
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
145.00	0.0
146.57	285.3

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 197.31

Initial ground water level (ft datum) default, 133.09

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	32.8850	0.0000	133.090	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	32.8850	0.0000	146.473	0.05492	0.00000	197.3	0.3	0.0	U/P
0.024	0.0000	0.0000	146.456	0.05492	0.00000	197.3	4.7	0.0	U/P
0.048	0.0000	0.0000	146.438	0.05492	0.00000	197.3	9.5	0.0	U/P
0.072	0.0000	0.0000	146.420	0.05492	0.00000	197.3	14.2	0.0	U/P
0.120	0.0000	0.0000	146.382	0.05492	0.00000	197.3	23.7	0.0	U/P
0.192	0.0000	0.0000	146.324	0.05492	0.00000	197.3	38.0	0.0	U/P
0.216	0.0000	0.0000	146.305	0.05489	0.00000	197.3	42.7	0.0	U/P
0.240	0.0000	0.0000	146.284	0.05458	0.00000	197.3	47.4	0.0	U/P
0.288	0.0000	0.0000	146.244	0.05288	0.00000	197.3	56.8	0.0	U/P
0.312	0.0000	0.0000	146.224	0.05203	0.00000	197.3	61.3	0.0	U/P
0.360	0.0000	0.0000	146.183	0.05067	0.00000	197.3	70.2	0.0	U/P
0.480	0.0000	0.0000	146.081	0.04663	0.00000	197.3	91.2	0.0	U/P
0.720	0.0000	0.0000	145.874	0.03824	0.00000	197.3	128.0	0.0	U/P
1.200	0.0000	0.0000	145.447	0.02035	0.00000	197.3	179.2	0.0	U/P
1.440	0.0000	0.0000	145.224	0.00786	0.00000	197.3	192.8	0.0	U/P
1.680	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
1.920	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
2.160	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
2.400	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry

~1.5hs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 157+50 to 157+75 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 117.34
Water Table Elevation, [WT] (ft datum): 132.34
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 264.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 10.6
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
144.25	0.0
145.85	327.1

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 295.08

Initial ground water level (ft datum) default, 132.34

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	49.1800	0.0000	132.340	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	49.1800	0.0000	145.951	0.06111	0.00000	295.1	0.4	0.0	U/P
0.024	0.0000	0.0000	145.936	0.06111	0.00000	295.1	5.3	0.0	U/P
0.048	0.0000	0.0000	145.920	0.06111	0.00000	295.1	10.6	0.0	U/P
0.072	0.0000	0.0000	145.904	0.06111	0.00000	295.1	15.8	0.0	U/P
0.120	0.0000	0.0000	145.872	0.06111	0.00000	295.1	26.4	0.0	U/P
0.192	0.0000	0.0000	145.823	0.06111	0.00000	295.1	42.2	0.0	U/P
0.216	0.0000	0.0000	145.806	0.06111	0.00000	295.1	47.5	0.0	U/P
0.240	0.0000	0.0000	145.790	0.06111	0.00000	295.1	52.8	0.0	U/P
0.288	0.0000	0.0000	145.756	0.06111	0.00000	295.1	63.4	0.0	U/P
0.312	0.0000	0.0000	145.739	0.06111	0.00000	295.1	68.6	0.0	U/P
0.360	0.0000	0.0000	145.703	0.06111	0.00000	295.1	79.2	0.0	U/P
0.480	0.0000	0.0000	145.612	0.06078	0.00000	295.1	105.6	0.0	U/P
0.720	0.0000	0.0000	145.410	0.05575	0.00000	295.1	157.5	0.0	U/P
1.200	0.0000	0.0000	144.992	0.03687	0.00000	295.1	238.8	0.0	U/P
1.440	0.0000	0.0000	144.781	0.02677	0.00000	295.1	266.3	0.0	U/P
1.680	0.0000	0.0000	144.564	0.01645	0.00000	295.1	285.0	0.0	U/P
1.920	0.0000	0.0000	144.312	0.00559	0.00000	295.1	294.7	0.0	U/P
2.160	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
2.400	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
3.600	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry

22 hrs

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Project Data

Project Name: Hartwood Marsh Road
 Simulation Description: Swale Recovery Water Quality
 Sta. 157+75 to 158+00 rt
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
 Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 116.60
 Water Table Elevation, [WT] (ft datum): 131.60
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 307.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
 Equivalent Pond Width, [W] (ft): 12.3
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
143.50	0.0
145.12	374.4

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 348.48

Initial ground water level (ft datum) default, 131.60

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	58.0800	0.0000	131.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	58.0800	0.0000	145.240	0.07124	0.00000	348.5	0.4	0.0	U/P
0.024	0.0000	0.0000	145.224	0.07124	0.00000	348.5	6.2	0.0	U/P
0.048	0.0000	0.0000	145.208	0.07124	0.00000	348.5	12.3	0.0	U/P
0.072	0.0000	0.0000	145.191	0.07124	0.00000	348.5	18.5	0.0	U/P
0.120	0.0000	0.0000	145.159	0.07124	0.00000	348.5	30.8	0.0	U/P
0.192	0.0000	0.0000	145.109	0.07124	0.00000	348.5	49.2	0.0	U/P
0.216	0.0000	0.0000	145.093	0.07124	0.00000	348.5	55.4	0.0	U/P
0.240	0.0000	0.0000	145.076	0.07124	0.00000	348.5	61.6	0.0	U/P
0.288	0.0000	0.0000	145.042	0.07124	0.00000	348.5	73.9	0.0	U/P
0.312	0.0000	0.0000	145.024	0.07124	0.00000	348.5	80.0	0.0	U/P
0.360	0.0000	0.0000	144.989	0.07124	0.00000	348.5	92.3	0.0	U/P
0.480	0.0000	0.0000	144.897	0.07083	0.00000	348.5	123.1	0.0	U/P
0.720	0.0000	0.0000	144.695	0.06502	0.00000	348.5	183.6	0.0	U/P
1.200	0.0000	0.0000	144.277	0.04357	0.00000	348.5	278.7	0.0	U/P
1.440	0.0000	0.0000	144.067	0.03218	0.00000	348.5	311.4	0.0	U/P
1.680	0.0000	0.0000	143.851	0.02062	0.00000	348.5	334.3	0.0	U/P
1.920	0.0000	0.0000	143.614	0.00736	0.00000	348.5	347.0	0.0	U/P
2.160	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
2.400	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
3.600	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.040	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.280	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.520	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.760	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
14.400	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
16.800	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
19.200	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
21.600	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry

~2 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+00 to 158+25 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 115.03
Water Table Elevation, [WT] (ft datum): 130.03
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 264.2

Geometry Data

Equivalent Pond Length, [L] (ft): 22.0
Equivalent Pond Width, [W] (ft): 12.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
142.25	0.0
144.01	387.2

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 145.62

Initial ground water level (ft datum) default, 130.03

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	24.2700	0.0000	130.030	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	24.2700	0.0000	143.399	0.05859	0.00000	145.6	0.4	0.0	U/P
0.024	0.0000	0.0000	143.380	0.05806	0.00000	145.6	5.1	0.0	U/P
0.048	0.0000	0.0000	143.360	0.05705	0.00000	145.6	10.0	0.0	U/P
0.072	0.0000	0.0000	143.340	0.05620	0.00000	145.6	14.9	0.0	U/P
0.120	0.0000	0.0000	143.299	0.05468	0.00000	145.6	24.5	0.0	U/P
0.192	0.0000	0.0000	143.238	0.05107	0.00000	145.6	38.4	0.0	U/P
0.216	0.0000	0.0000	143.217	0.04977	0.00000	145.6	42.7	0.0	U/P
0.240	0.0000	0.0000	143.197	0.04892	0.00000	145.6	47.0	0.0	U/P
0.288	0.0000	0.0000	143.156	0.04684	0.00000	145.6	55.3	0.0	U/P
0.312	0.0000	0.0000	143.136	0.04580	0.00000	145.6	59.3	0.0	U/P
0.360	0.0000	0.0000	143.095	0.04415	0.00000	145.6	67.1	0.0	U/P
0.480	0.0000	0.0000	142.992	0.03921	0.00000	145.6	85.1	0.0	U/P
0.720	0.0000	0.0000	142.781	0.02876	0.00000	145.6	114.7	0.0	U/P
1.200	0.0000	0.0000	142.276	0.00596	0.00000	145.6	145.5	0.0	U/P ~1.2hrs
1.440	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
1.680	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
1.920	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
2.160	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
11.040	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
11.280	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
11.520	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
11.760	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
14.400	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
16.800	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
19.200	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
21.600	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	145.6	145.6	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+25 to 158+50 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 113.45
Water Table Elevation, [WT] (ft datum): 128.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 126.2

Geometry Data

Equivalent Pond Length, [L] (ft): 11.4
Equivalent Pond Width, [W] (ft): 11.1
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
141.00	0.0
142.89	423.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 41.23

Initial ground water level (ft datum) default, 128.45

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	6.8717	0.0000	128.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	6.8717	0.0000	141.605	0.02921	0.00000	41.2	0.2	0.0	U/P
0.024	0.0000	0.0000	141.588	0.02921	0.00000	41.2	2.5	0.0	U/P
0.048	0.0000	0.0000	141.568	0.02921	0.00000	41.2	5.0	0.0	U/P
0.072	0.0000	0.0000	141.548	0.02896	0.00000	41.2	7.6	0.0	U/P
0.120	0.0000	0.0000	141.506	0.02758	0.00000	41.2	12.5	0.0	U/P
0.192	0.0000	0.0000	141.442	0.02379	0.00000	41.2	19.3	0.0	U/P
0.216	0.0000	0.0000	141.422	0.02243	0.00000	41.2	21.3	0.0	U/P
0.240	0.0000	0.0000	141.401	0.02154	0.00000	41.2	23.2	0.0	U/P
0.288	0.0000	0.0000	141.359	0.01937	0.00000	41.2	26.8	0.0	U/P
0.312	0.0000	0.0000	141.339	0.01828	0.00000	41.2	28.4	0.0	U/P
0.360	0.0000	0.0000	141.296	0.01653	0.00000	41.2	31.4	0.0	U/P
0.480	0.0000	0.0000	141.184	0.00928	0.00000	41.2	37.4	0.0	U/P
0.720	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.200	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.440	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.680	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.920	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
2.160	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
2.400	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
3.600	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
6.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
7.200	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
8.400	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
9.600	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
10.800	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.040	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.280	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.520	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.760	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
12.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
14.400	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
16.800	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
19.200	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
21.600	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
24.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
36.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
48.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
60.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
72.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
84.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
96.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry

20.6 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+50 to 158+75 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 111.88
Water Table Elevation, [WT] (ft datum): 126.88
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 177.7

Geometry Data

Equivalent Pond Length, [L] (ft): 13.8
Equivalent Pond Width, [W] (ft): 12.9
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
140.00	0.0
141.52	433.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 59.91

Initial ground water level (ft datum) default, 126.88

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	9.9850	0.0000	126.880	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	9.9850	0.0000	140.647	0.04112	0.00000	59.9	0.2	0.0	U/P
0.024	0.0000	0.0000	140.628	0.04112	0.00000	59.9	3.6	0.0	U/P
0.048	0.0000	0.0000	140.608	0.04066	0.00000	59.9	7.1	0.0	U/P
0.072	0.0000	0.0000	140.588	0.03975	0.00000	59.9	10.6	0.0	U/P
0.120	0.0000	0.0000	140.546	0.03775	0.00000	59.9	17.3	0.0	U/P
0.192	0.0000	0.0000	140.483	0.03295	0.00000	59.9	26.7	0.0	U/P
0.216	0.0000	0.0000	140.462	0.03122	0.00000	59.9	29.4	0.0	U/P
0.240	0.0000	0.0000	140.442	0.03010	0.00000	59.9	32.0	0.0	U/P
0.288	0.0000	0.0000	140.400	0.02735	0.00000	59.9	37.1	0.0	U/P
0.312	0.0000	0.0000	140.379	0.02597	0.00000	59.9	39.4	0.0	U/P
0.360	0.0000	0.0000	140.337	0.02375	0.00000	59.9	43.7	0.0	U/P
0.480	0.0000	0.0000	140.227	0.01365	0.00000	59.9	52.5	0.0	U/P
0.720	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.200	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.440	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.680	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
2.160	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry

no. 6 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 158+75 to 159+00 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 110.30
Water Table Elevation, [WT] (ft datum): 125.30
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 206.5

Geometry Data

Equivalent Pond Length, [L] (ft): 16.1
Equivalent Pond Width, [W] (ft): 13.8
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
139.00	0.0
140.14	456.6

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 71.84

Initial ground water level (ft datum) default, 125.30

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	11.9733	0.0000	125.300	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	11.9733	0.0000	139.598	0.04780	0.00000	71.8	0.3	0.0	U/P
0.024	0.0000	0.0000	139.582	0.04780	0.00000	71.8	4.1	0.0	U/P
0.048	0.0000	0.0000	139.564	0.04780	0.00000	71.8	8.3	0.0	U/P
0.072	0.0000	0.0000	139.545	0.04780	0.00000	71.8	12.4	0.0	U/P
0.120	0.0000	0.0000	139.506	0.04743	0.00000	71.8	20.7	0.0	U/P
0.192	0.0000	0.0000	139.442	0.04242	0.00000	71.8	32.8	0.0	U/P
0.216	0.0000	0.0000	139.421	0.03999	0.00000	71.8	36.3	0.0	U/P
0.240	0.0000	0.0000	139.401	0.03840	0.00000	71.8	39.7	0.0	U/P
0.288	0.0000	0.0000	139.358	0.03453	0.00000	71.8	46.1	0.0	U/P
0.312	0.0000	0.0000	139.338	0.03258	0.00000	71.8	49.0	0.0	U/P
0.360	0.0000	0.0000	139.295	0.02945	0.00000	71.8	54.4	0.0	U/P
0.480	0.0000	0.0000	139.183	0.01653	0.00000	71.8	65.1	0.0	U/P
0.720	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
1.200	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
1.440	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
1.680	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
1.920	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
2.160	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
2.400	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
3.600	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry

70.6 hrs

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Project Data

Project Name: Hartwood Marsh Road
 Simulation Description: Swale Recovery Water Quality
 Sta. 159+00 to 159+25 rt
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
 Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 109.08
 Water Table Elevation, [WT] (ft datum): 124.08
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 163.6

Geometry Data

Equivalent Pond Length, [L] (ft): 17.9
 Equivalent Pond Width, [W] (ft): 9.2
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
137.50	0.0
138.63	367.1

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 48.93

Initial ground water level (ft datum) default, 124.08

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	8.1550	0.0000	124.080	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	8.1550	0.0000	138.048	0.03787	0.00000	48.9	0.2	0.0	U/P
0.024	0.0000	0.0000	138.030	0.03787	0.00000	48.9	3.3	0.0	U/P
0.048	0.0000	0.0000	138.011	0.03787	0.00000	48.9	6.5	0.0	U/P
0.072	0.0000	0.0000	137.991	0.03755	0.00000	48.9	9.8	0.0	U/P
0.120	0.0000	0.0000	137.949	0.03564	0.00000	48.9	16.2	0.0	U/P
0.192	0.0000	0.0000	137.884	0.03011	0.00000	48.9	24.9	0.0	U/P
0.216	0.0000	0.0000	137.864	0.02812	0.00000	48.9	27.4	0.0	U/P
0.240	0.0000	0.0000	137.843	0.02684	0.00000	48.9	29.8	0.0	U/P
0.288	0.0000	0.0000	137.801	0.02367	0.00000	48.9	34.3	0.0	U/P
0.312	0.0000	0.0000	137.780	0.02208	0.00000	48.9	36.2	0.0	U/P
0.360	0.0000	0.0000	137.736	0.01950	0.00000	48.9	39.9	0.0	U/P
0.480	0.0000	0.0000	137.620	0.01043	0.00000	48.9	46.6	0.0	U/P 20.6 hrs
0.720	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.200	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.440	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.680	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
2.160	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 159+25 to 159+50 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 107.86
Water Table Elevation, [WT] (ft datum): 122.86
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 184.1

Geometry Data

Equivalent Pond Length, [L] (ft): 18.4
Equivalent Pond Width, [W] (ft): 10.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
136.00	0.0
137.11	368.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 59.43

Initial ground water level (ft datum) default, 122.86

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	9.9050	0.0000	122.860	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	9.9050	0.0000	136.597	0.04262	0.00000	59.4	0.3	0.0	U/P
0.024	0.0000	0.0000	136.579	0.04262	0.00000	59.4	3.7	0.0	U/P
0.048	0.0000	0.0000	136.560	0.04262	0.00000	59.4	7.4	0.0	U/P
0.072	0.0000	0.0000	136.540	0.04225	0.00000	59.4	11.0	0.0	U/P
0.120	0.0000	0.0000	136.498	0.04023	0.00000	59.4	18.2	0.0	U/P
0.192	0.0000	0.0000	136.434	0.03461	0.00000	59.4	28.1	0.0	U/P
0.216	0.0000	0.0000	136.413	0.03259	0.00000	59.4	31.0	0.0	U/P
0.240	0.0000	0.0000	136.393	0.03127	0.00000	59.4	33.8	0.0	U/P
0.288	0.0000	0.0000	136.351	0.02806	0.00000	59.4	39.0	0.0	U/P
0.312	0.0000	0.0000	136.330	0.02644	0.00000	59.4	41.3	0.0	U/P
0.360	0.0000	0.0000	136.287	0.02384	0.00000	59.4	45.7	0.0	U/P
0.480	0.0000	0.0000	136.175	0.01331	0.00000	59.4	54.3	0.0	U/P 20.6 hrs
0.720	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.200	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.440	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.680	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.920	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
2.160	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
2.400	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
3.600	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 159+50 to 159+75 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 106.64
Water Table Elevation, [WT] (ft datum): 121.64
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 212.4

Geometry Data

Equivalent Pond Length, [L] (ft): 17.7
Equivalent Pond Width, [W] (ft): 12.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
134.75	0.0
135.72	364.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 64.75

Initial ground water level (ft datum) default, 121.64

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	10.7917	0.0000	121.640	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	10.7917	0.0000	135.335	0.04917	0.00000	64.8	0.3	0.0	U/P
0.024	0.0000	0.0000	135.317	0.04917	0.00000	64.8	4.2	0.0	U/P
0.048	0.0000	0.0000	135.297	0.04839	0.00000	64.8	8.5	0.0	U/P
0.072	0.0000	0.0000	135.277	0.04703	0.00000	64.8	12.6	0.0	U/P
0.120	0.0000	0.0000	135.235	0.04440	0.00000	64.8	20.5	0.0	U/P
0.192	0.0000	0.0000	135.171	0.03802	0.00000	64.8	31.5	0.0	U/P
0.216	0.0000	0.0000	135.150	0.03573	0.00000	64.8	34.6	0.0	U/P
0.240	0.0000	0.0000	135.130	0.03424	0.00000	64.8	37.7	0.0	U/P
0.288	0.0000	0.0000	135.087	0.03059	0.00000	64.8	43.4	0.0	U/P
0.312	0.0000	0.0000	135.067	0.02876	0.00000	64.8	45.9	0.0	U/P
0.360	0.0000	0.0000	135.024	0.02581	0.00000	64.8	50.7	0.0	U/P
0.480	0.0000	0.0000	134.910	0.01427	0.00000	64.8	59.9	0.0	U/P
0.720	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.200	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.440	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.680	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.920	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
2.160	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
2.400	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
3.600	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry

no-bh as

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Project Data

Project Name: Hartwood Marsh Road
 Simulation Description: Swale Recovery Water Quality
 Sta. 159+75 to 160+00 rt
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
 Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 105.42
 Water Table Elevation, [WT] (ft datum): 120.42
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 172.9

Geometry Data

Equivalent Pond Length, [L] (ft): 15.7
 Equivalent Pond Width, [W] (ft): 11.0
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
133.50	0.0
134.33	274.9

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 48.88

Initial ground water level (ft datum) default, 120.42

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	8.1467	0.0000	120.420	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	8.1467	0.0000	134.042	0.04003	0.00000	48.9	0.2	0.0	U/P
0.024	0.0000	0.0000	134.024	0.04003	0.00000	48.9	3.5	0.0	U/P
0.048	0.0000	0.0000	134.003	0.03931	0.00000	48.9	6.9	0.0	U/P
0.072	0.0000	0.0000	133.983	0.03807	0.00000	48.9	10.3	0.0	U/P
0.120	0.0000	0.0000	133.941	0.03575	0.00000	48.9	16.7	0.0	U/P
0.192	0.0000	0.0000	133.876	0.03010	0.00000	48.9	25.4	0.0	U/P
0.216	0.0000	0.0000	133.856	0.02807	0.00000	48.9	27.9	0.0	U/P
0.240	0.0000	0.0000	133.835	0.02676	0.00000	48.9	30.3	0.0	U/P
0.288	0.0000	0.0000	133.793	0.02352	0.00000	48.9	34.7	0.0	U/P
0.312	0.0000	0.0000	133.772	0.02190	0.00000	48.9	36.6	0.0	U/P
0.360	0.0000	0.0000	133.728	0.01926	0.00000	48.9	40.2	0.0	U/P
0.480	0.0000	0.0000	133.610	0.01021	0.00000	48.9	46.9	0.0	U/P
0.720	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.200	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.440	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.680	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
2.160	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	48.9	48.9	0.0	dry

70.6 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+00 to 160+25 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 104.45
Water Table Elevation, [WT] (ft datum): 119.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 267.2

Geometry Data

Equivalent Pond Length, [L] (ft): 17.5
Equivalent Pond Width, [W] (ft): 15.3
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
132.50	0.0
133.64	424.5

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 99.1

Initial ground water level (ft datum) default, 119.45

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	16.5167	0.0000	119.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	16.5167	0.0000	133.228	0.06186	0.00000	99.1	0.4	0.0	U/P
0.024	0.0000	0.0000	133.210	0.06153	0.00000	99.1	5.3	0.0	U/P
0.048	0.0000	0.0000	133.189	0.06029	0.00000	99.1	10.6	0.0	U/P
0.072	0.0000	0.0000	133.169	0.05883	0.00000	99.1	15.8	0.0	U/P
0.120	0.0000	0.0000	133.128	0.05625	0.00000	99.1	25.7	0.0	U/P
0.192	0.0000	0.0000	133.065	0.05003	0.00000	99.1	39.8	0.0	U/P
0.216	0.0000	0.0000	133.044	0.04779	0.00000	99.1	44.0	0.0	U/P
0.240	0.0000	0.0000	133.024	0.04632	0.00000	99.1	48.0	0.0	U/P
0.288	0.0000	0.0000	132.982	0.04276	0.00000	99.1	55.8	0.0	U/P
0.312	0.0000	0.0000	132.962	0.04097	0.00000	99.1	59.4	0.0	U/P
0.360	0.0000	0.0000	132.920	0.03811	0.00000	99.1	66.3	0.0	U/P
0.480	0.0000	0.0000	132.813	0.02935	0.00000	99.1	80.9	0.0	U/P
0.720	0.0000	0.0000	132.560	0.01351	0.00000	99.1	98.4	0.0	U/P ~072hrs
1.200	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
1.440	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
1.680	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
1.920	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
2.160	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
2.400	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
3.600	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+25 to 160+50 ft
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 103.48
Water Table Elevation, [WT] (ft datum): 118.48
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 203.5

Geometry Data

Equivalent Pond Length, [L] (ft): 18.8
Equivalent Pond Width, [W] (ft): 15.4
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> (ft datum)	<u>Area</u> (ft ²)
131.50	0.0
132.94	470.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 113.91

Initial ground water level (ft datum) default, 118.48

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	18.9850	0.0000	118.480	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	18.9850	0.0000	132.334	0.04711	0.00000	113.9	0.3	0.0	U/P
0.024	0.0000	0.0000	132.320	0.04711	0.00000	113.9	4.1	0.0	U/P
0.048	0.0000	0.0000	132.304	0.04711	0.00000	113.9	8.1	0.0	U/P
0.072	0.0000	0.0000	132.289	0.04711	0.00000	113.9	12.2	0.0	U/P
0.120	0.0000	0.0000	132.257	0.04711	0.00000	113.9	20.4	0.0	U/P
0.192	0.0000	0.0000	132.206	0.04711	0.00000	113.9	32.6	0.0	U/P
0.216	0.0000	0.0000	132.188	0.04711	0.00000	113.9	36.6	0.0	U/P
0.240	0.0000	0.0000	132.169	0.04711	0.00000	113.9	40.7	0.0	U/P
0.288	0.0000	0.0000	132.131	0.04711	0.00000	113.9	48.8	0.0	U/P
0.312	0.0000	0.0000	132.111	0.04681	0.00000	113.9	52.9	0.0	U/P
0.360	0.0000	0.0000	132.070	0.04477	0.00000	113.9	60.9	0.0	U/P
0.480	0.0000	0.0000	131.964	0.03729	0.00000	113.9	78.7	0.0	U/P
0.720	0.0000	0.0000	131.743	0.01976	0.00000	113.9	104.3	0.0	U/P
1.200	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
1.440	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
1.680	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
2.160	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry

~1 hr

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+50 to 160+75 ft
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 102.50
Water Table Elevation, [WT] (ft datum): 117.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 348.3

Geometry Data

Equivalent Pond Length, [L] (ft): 22.5
Equivalent Pond Width, [W] (ft): 15.5
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
130.50	0.0
132.05	476.2

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 155.47

Initial ground water level (ft datum) default, 117.50

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	25.9117	0.0000	117.500	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	25.9117	0.0000	131.505	0.07154	0.00000	155.5	0.4	0.0	U/P
0.024	0.0000	0.0000	131.486	0.07080	0.00000	155.5	6.2	0.0	U/P
0.048	0.0000	0.0000	131.466	0.06939	0.00000	155.5	12.2	0.0	U/P
0.072	0.0000	0.0000	131.445	0.06819	0.00000	155.5	18.2	0.0	U/P
0.120	0.0000	0.0000	131.405	0.06607	0.00000	155.5	29.8	0.0	U/P
0.192	0.0000	0.0000	131.342	0.06101	0.00000	155.5	46.5	0.0	U/P
0.216	0.0000	0.0000	131.322	0.05919	0.00000	155.5	51.6	0.0	U/P
0.240	0.0000	0.0000	131.302	0.05799	0.00000	155.5	56.7	0.0	U/P
0.288	0.0000	0.0000	131.261	0.05508	0.00000	155.5	66.5	0.0	U/P
0.312	0.0000	0.0000	131.241	0.05363	0.00000	155.5	71.2	0.0	U/P
0.360	0.0000	0.0000	131.200	0.05131	0.00000	155.5	80.3	0.0	U/P
0.480	0.0000	0.0000	131.095	0.04436	0.00000	155.5	101.0	0.0	U/P
0.720	0.0000	0.0000	130.881	0.02486	0.00000	155.5	133.2	0.0	U/P
1.200	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
1.440	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
1.680	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
1.920	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
2.160	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
2.400	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
3.600	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
11.040	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
11.280	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
11.520	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
11.760	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
14.400	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
16.800	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
19.200	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
21.600	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry

~1 hr

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 160+75 to 161+00 rt
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 101.53
Water Table Elevation, [WT] (ft datum): 116.53
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 286.6

Geometry Data

Equivalent Pond Length, [L] (ft): 20.0
Equivalent Pond Width, [W] (ft): 14.3
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
129.50	0.0
131.15	470.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 116.08

Initial ground water level (ft datum) default, 116.53

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	19.3467	0.0000	116.530	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	19.3467	0.0000	130.401	0.05957	0.00000	116.1	0.4	0.0	U/P
0.024	0.0000	0.0000	130.382	0.05889	0.00000	116.1	5.1	0.0	U/P
0.048	0.0000	0.0000	130.362	0.05758	0.00000	116.1	10.2	0.0	U/P
0.072	0.0000	0.0000	130.341	0.05646	0.00000	116.1	15.1	0.0	U/P
0.120	0.0000	0.0000	130.300	0.05449	0.00000	116.1	24.7	0.0	U/P
0.192	0.0000	0.0000	130.238	0.04977	0.00000	116.1	38.4	0.0	U/P
0.216	0.0000	0.0000	130.218	0.04807	0.00000	116.1	42.6	0.0	U/P
0.240	0.0000	0.0000	130.197	0.04695	0.00000	116.1	46.7	0.0	U/P
0.288	0.0000	0.0000	130.156	0.04425	0.00000	116.1	54.7	0.0	U/P
0.312	0.0000	0.0000	130.136	0.04289	0.00000	116.1	58.4	0.0	U/P
0.360	0.0000	0.0000	130.095	0.04072	0.00000	116.1	65.7	0.0	U/P
0.480	0.0000	0.0000	129.990	0.03421	0.00000	116.1	81.9	0.0	U/P
0.720	0.0000	0.0000	129.770	0.01838	0.00000	116.1	105.7	0.0	U/P ~1 hr
1.200	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
1.440	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
1.680	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
1.920	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
2.160	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
2.400	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
3.600	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry

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Project Data

Project Name: Hartwood Marsh Road
 Simulation Description: Swale Recovery Water Quality
 Sta. 161+00 to 161+25 rt
 Project Number: 41561
 Engineer : kmv
 Supervising Engineer:
 Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 100.56
 Water Table Elevation, [WT] (ft datum): 115.56
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 30.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 357.0

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
 Equivalent Pond Width, [W] (ft): 14.3
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
128.65	0.0
130.29	467.3

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
 Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 188.41

Initial ground water level (ft datum) default, 115.56

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	31.4017	0.0000	115.560	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	31.4017	0.0000	129.799	0.07584	0.00000	188.4	0.5	0.0	U/P
0.024	0.0000	0.0000	129.780	0.07516	0.00000	188.4	6.5	0.0	U/P
0.048	0.0000	0.0000	129.760	0.07385	0.00000	188.4	13.0	0.0	U/P
0.072	0.0000	0.0000	129.740	0.07274	0.00000	188.4	19.3	0.0	U/P
0.120	0.0000	0.0000	129.699	0.07078	0.00000	188.4	31.7	0.0	U/P
0.192	0.0000	0.0000	129.637	0.06611	0.00000	188.4	49.7	0.0	U/P
0.216	0.0000	0.0000	129.617	0.06442	0.00000	188.4	55.3	0.0	U/P
0.240	0.0000	0.0000	129.597	0.06331	0.00000	188.4	60.8	0.0	U/P
0.288	0.0000	0.0000	129.556	0.06063	0.00000	188.4	71.6	0.0	U/P
0.312	0.0000	0.0000	129.535	0.05928	0.00000	188.4	76.7	0.0	U/P
0.360	0.0000	0.0000	129.495	0.05714	0.00000	188.4	86.8	0.0	U/P
0.480	0.0000	0.0000	129.391	0.05075	0.00000	188.4	110.1	0.0	U/P
0.720	0.0000	0.0000	129.180	0.03721	0.00000	188.4	148.4	0.0	U/P
1.200	0.0000	0.0000	128.674	0.00770	0.00000	188.4	188.3	0.0	U/P
1.440	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
1.680	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
1.920	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
2.160	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
2.400	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
3.600	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	188.4	188.4	0.0	dry

~1.2 hrs

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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 161+25 to 161+50 r
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 99.60
Water Table Elevation, [WT] (ft datum): 114.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 350.8

Geometry Data

Equivalent Pond Length, [L] (ft): 25.0
Equivalent Pond Width, [W] (ft): 14.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
127.80	0.0
129.42	461.0

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 175.56

Initial ground water level (ft datum) default, 114.60

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	29.2600	0.0000	114.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	29.2600	0.0000	128.909	0.07316	0.00000	175.6	0.4	0.0	U/P
0.024	0.0000	0.0000	128.891	0.07248	0.00000	175.6	6.3	0.0	U/P
0.048	0.0000	0.0000	128.871	0.07118	0.00000	175.6	12.5	0.0	U/P
0.072	0.0000	0.0000	128.850	0.07007	0.00000	175.6	18.6	0.0	U/P
0.120	0.0000	0.0000	128.810	0.06811	0.00000	175.6	30.6	0.0	U/P
0.192	0.0000	0.0000	128.748	0.06344	0.00000	175.6	47.8	0.0	U/P
0.216	0.0000	0.0000	128.727	0.06175	0.00000	175.6	53.2	0.0	U/P
0.240	0.0000	0.0000	128.707	0.06064	0.00000	175.6	58.5	0.0	U/P
0.288	0.0000	0.0000	128.666	0.05796	0.00000	175.6	68.8	0.0	U/P
0.312	0.0000	0.0000	128.646	0.05661	0.00000	175.6	73.7	0.0	U/P
0.360	0.0000	0.0000	128.605	0.05447	0.00000	175.6	83.4	0.0	U/P
0.480	0.0000	0.0000	128.502	0.04808	0.00000	175.6	105.5	0.0	U/P
0.720	0.0000	0.0000	128.290	0.02772	0.00000	175.6	141.5	0.0	U/P
1.200	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
1.440	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
1.680	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
1.920	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
2.160	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.040	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.280	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.520	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.760	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
14.400	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
16.800	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
19.200	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
21.600	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry

u/hr

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Retention Pond Recovery - Refined Method
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Project Data

Project Name: Hartwood Marsh Road
Simulation Description: Swale Recovery Water Quality
Sta. 161+50 to 161+95 ft
Project Number: 41561
Engineer : kmv
Supervising Engineer:
Date: 05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 98.63
Water Table Elevation, [WT] (ft datum): 113.63
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 636.3

Geometry Data

Equivalent Pond Length, [L] (ft): 42.5
Equivalent Pond Width, [W] (ft): 14.9
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage</u> (ft datum)	<u>Area</u> (ft ²)
126.74	0.0
128.61	894.8

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Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 328.99

Initial ground water level (ft datum) default, 113.63

<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>	<u>Time After Storm Event (days)</u>
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	54.8317	0.0000	113.630	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	54.8317	0.0000	127.911	0.12988	0.00000	329.0	0.8	0.0	U/P
0.024	0.0000	0.0000	127.893	0.12873	0.00000	329.0	11.2	0.0	U/P
0.048	0.0000	0.0000	127.872	0.12654	0.00000	329.0	22.2	0.0	U/P
0.072	0.0000	0.0000	127.852	0.12467	0.00000	329.0	33.1	0.0	U/P
0.120	0.0000	0.0000	127.811	0.12138	0.00000	329.0	54.4	0.0	U/P
0.192	0.0000	0.0000	127.750	0.11354	0.00000	329.0	85.1	0.0	U/P
0.216	0.0000	0.0000	127.729	0.11071	0.00000	329.0	94.8	0.0	U/P
0.240	0.0000	0.0000	127.709	0.10884	0.00000	329.0	104.3	0.0	U/P
0.288	0.0000	0.0000	127.668	0.10434	0.00000	329.0	122.8	0.0	U/P
0.312	0.0000	0.0000	127.648	0.10208	0.00000	329.0	131.7	0.0	U/P
0.360	0.0000	0.0000	127.607	0.09848	0.00000	329.0	149.1	0.0	U/P
0.480	0.0000	0.0000	127.504	0.08776	0.00000	329.0	189.3	0.0	U/P
0.720	0.0000	0.0000	127.293	0.06510	0.00000	329.0	255.8	0.0	U/P
1.200	0.0000	0.0000	126.817	0.01385	0.00000	329.0	327.6	0.0	U/P
1.440	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
1.680	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
1.920	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
2.160	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
2.400	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
3.600	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry

4.3 hrs

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