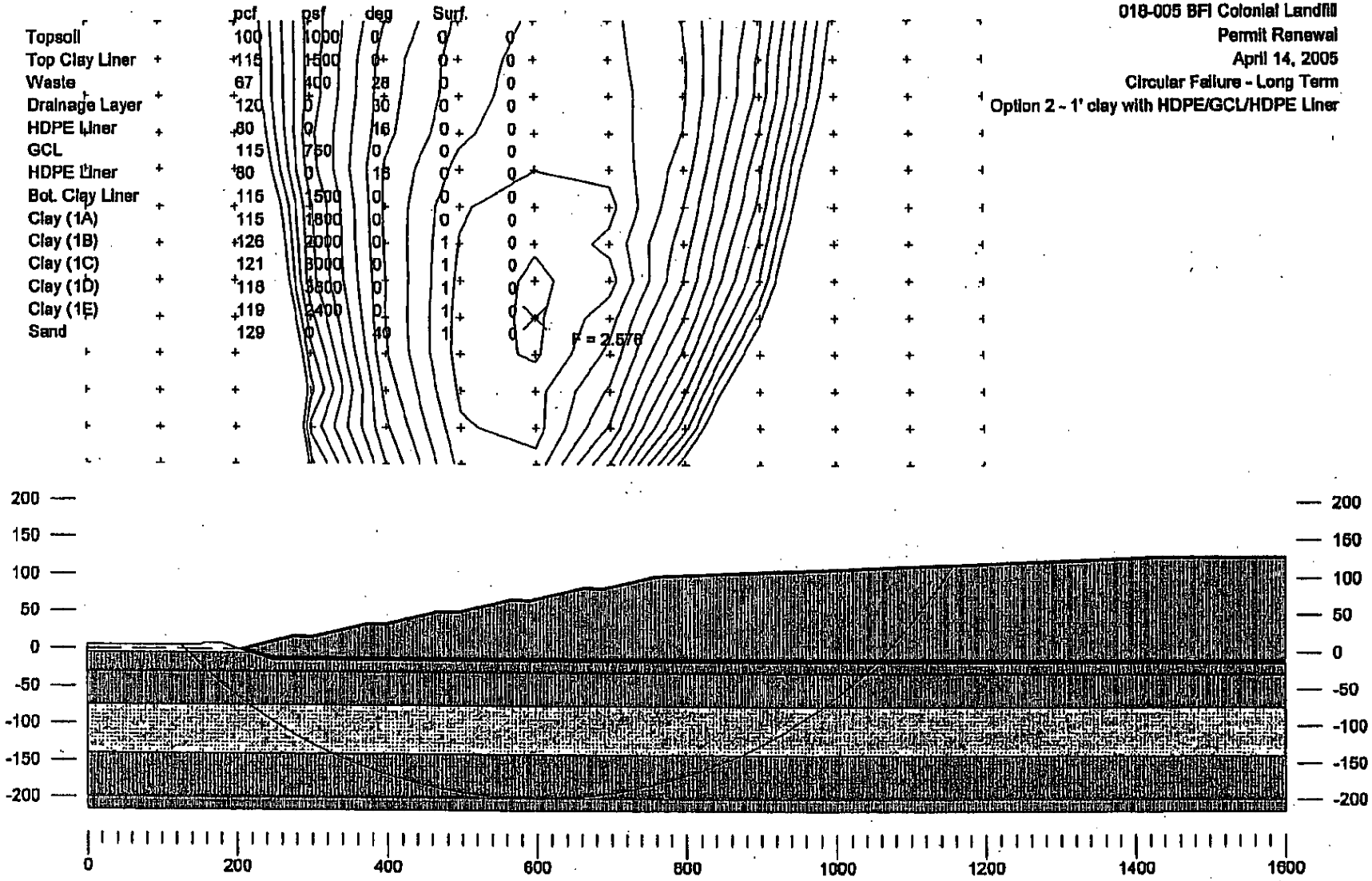
Providence Engineering - Baton Rouge, LA
018-005 BFI Colonial Landfill
Permit Renewal
April 14, 2005
Circular Failure - Long Term
Option 2 - 1' clay with HDPE/GCL/HDPE Liner

	Gamma pcf	C psf	Phi deg	Piezo Surf.	Ru
Topsoil	100	1000	0	0	0
Top Clay Liner	115	1500	0	0	0
Waste	67	400	28	0	0
Drainage Layer	120	0	30	0	0
HDPE Liner	80	0	16	0	0
GCL	115	750	0	0	0
HDPE Liner	80	0	16	0	0
Bot. Clay Liner	115	1500	0	0	0
Clay (1A)	115	1800	0	0	0
Clay (1B)	126	2000	0	1	0
Clay (1C)	121	3000	0	1	0
Clay (1D)	118	3800	0	1	0
Clay (1E)	119	2400	0	1	0
Sand	129	0	40	1	0



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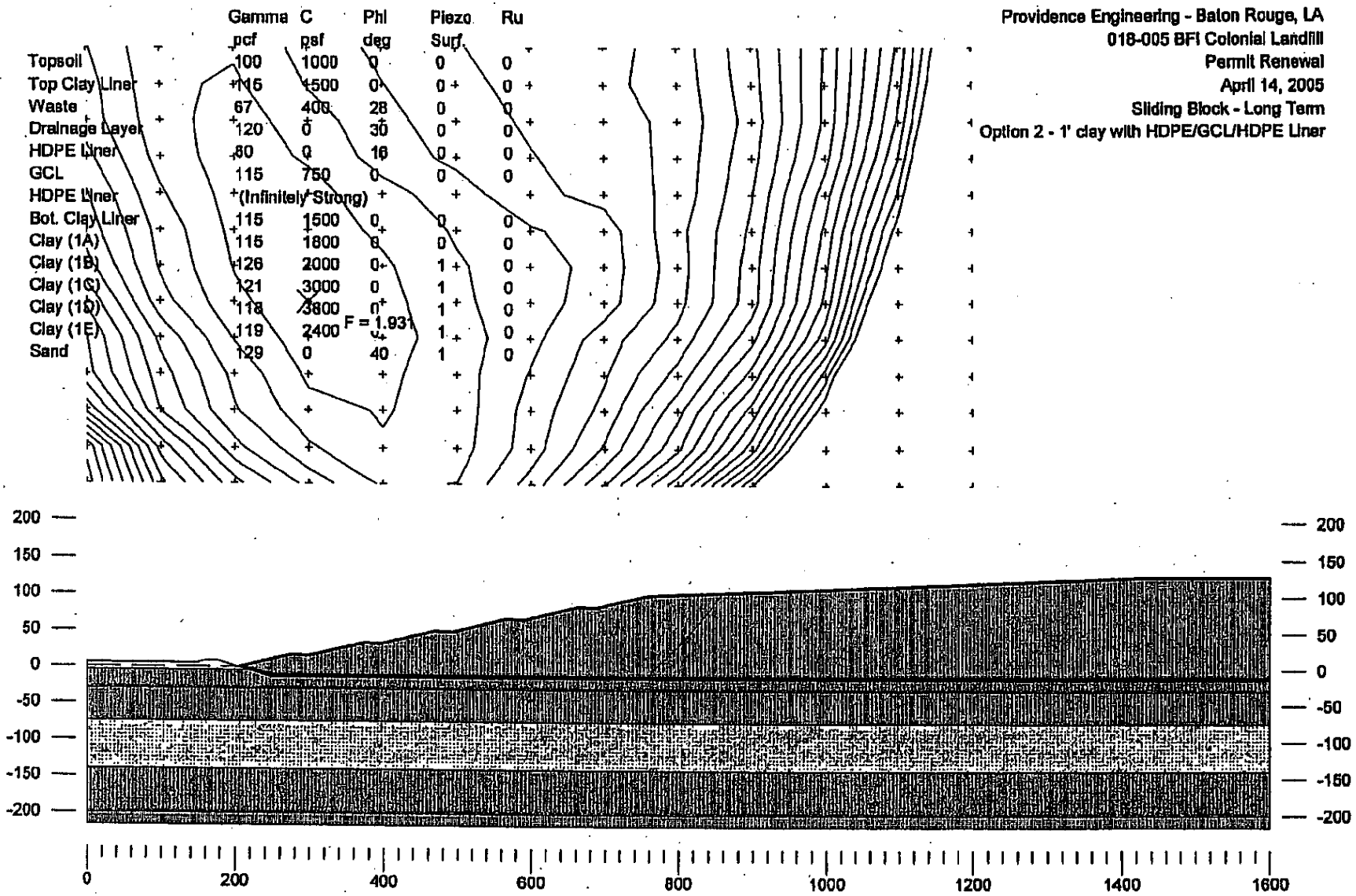
Option 2 - Long Term Circular Failure



Providence Engineering - Baton Rouge, LA
018-005 BFI Colonial Landfill
Permit Renewal
April 14, 2005
Sliding Block - Long Term
Option 2 - 1' clay with HDPE/GCL/HDPE Liner

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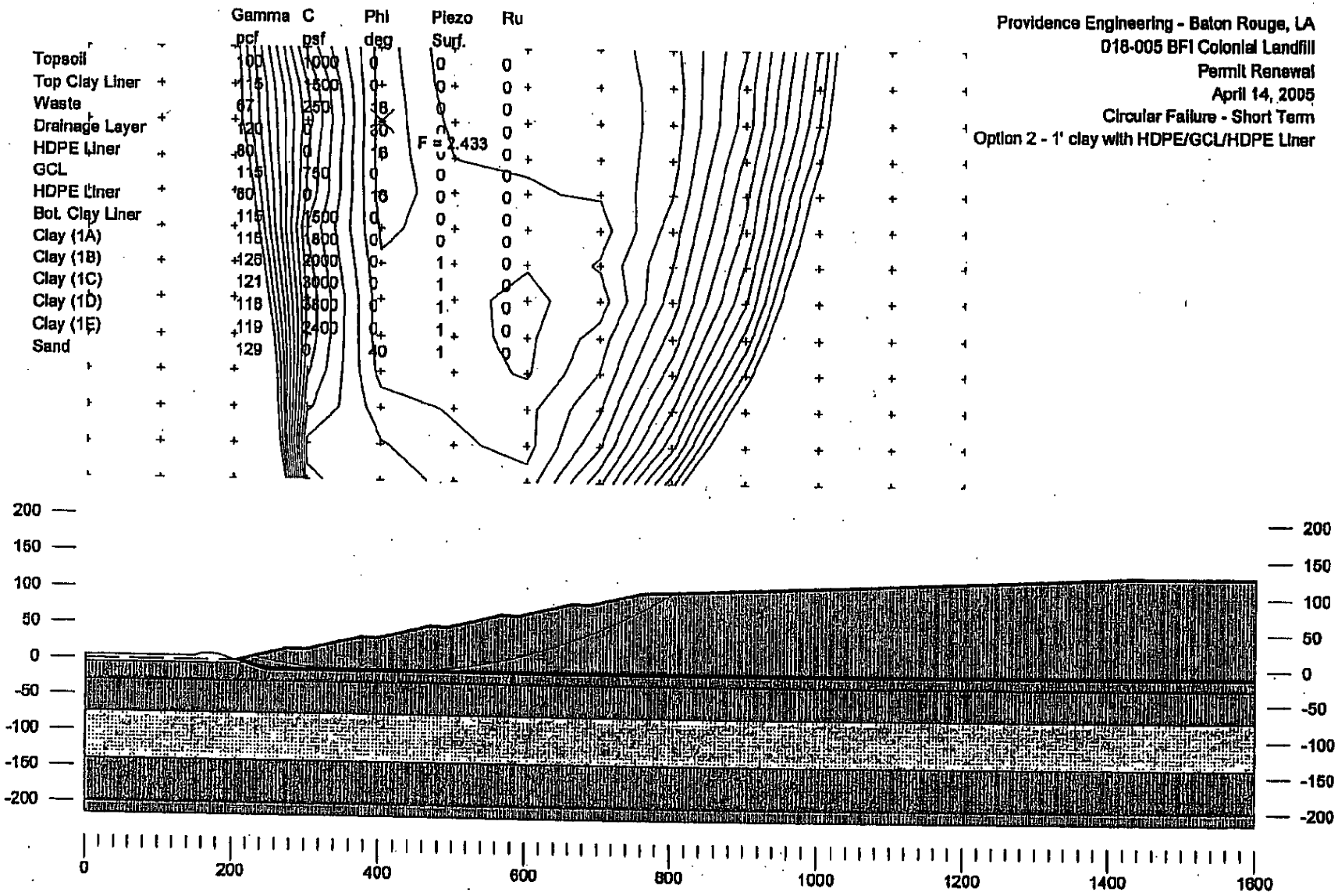
Option 2 - Long Term Sliding Block



Providence Engineering - Baton Rouge, LA
018-005 BFI Colonial Landfill
Permit Renewal
April 14, 2005
Circular Failure - Short Term
Option 2 - 1' clay with HDPE/GCL/HDPE Liner

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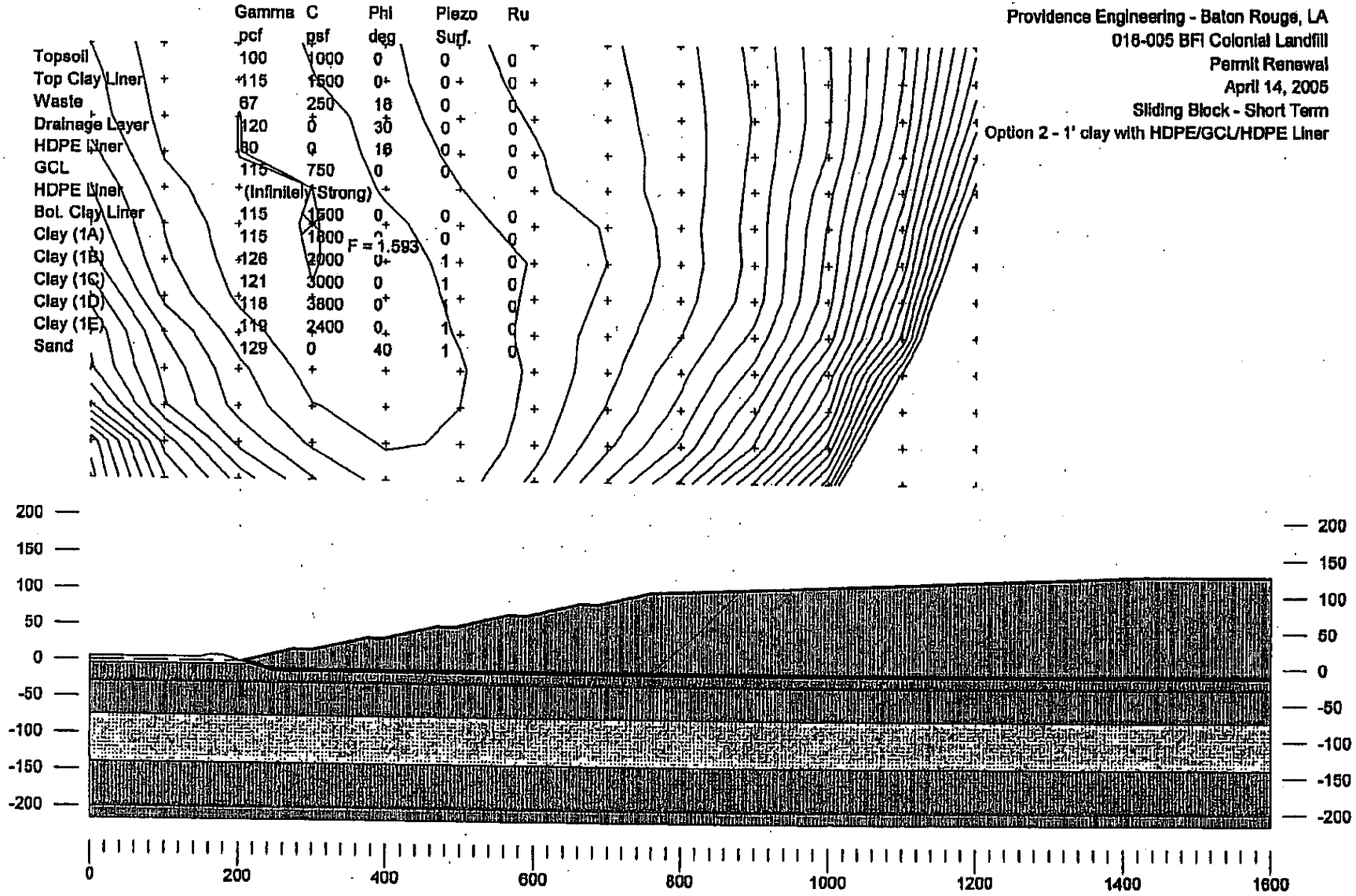
Option 2- Short Term Circular Failure

Providence Engineering - Baton Rouge, LA
018-005 BFI Colonial Landfill
Permit Renewal
April 14, 2005
Sliding Block - Short Term
Option 2 - 1' clay with HDPE/GCL/HDPE Liner



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Option 2 - Short Term Sliding Block

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Job Number	018-005 BFI Colonial Landfill
Title	Permit Renewal
Date	April 14, 2005
Label A	Circular Failure - Long Term
Label B	Option 2 - 1' clay with HDPE/GCL/HDPE Liner

Maximum Slice Width	1
Number of Soil Layers: (1 to 20)	14
Earthquake Acceleration:	0
No. of External Forces: (0 to 100)	0
Piezometric Surfaces: (0 to 9)	1
Unit weight of Water:	62.4
Reinforcement Layers: (0 to 100)	0
FoS against Pullout:	0

Material	Unit Wt	Cohesion	Friction Angle	Piezo Surf.	Ru	Interaction Coefficient
1 Topsoil	100	1000	0	0	0	.7
2 Top Clay Liner	115	1500	0	0	0	.7
3 Waste	67	400	28	0	0	.9
4 Drainage Layer	120	0	30	0	0	.9
5 HDPE Liner	80	0	16	0	0	.9
6 GCL	115	750	0	0	0	.7
7 HDPE Liner	80	0	16	0	0	.9
8 Bot. Clay Liner	115	1500	0	0	0	.7
9 Clay (1A)	115	1800	0	0	0	.7
10 Clay (1B)	126	2000	0	1	0	.7
11 Clay (1C)	121	3000	0	1	0	.7
12 Clay (1D)	118	3800	0	1	0	.7
13 Clay (1E)	119	2400	0	1	0	.7
14 Sand	129	0	40	1	0	.9

Upper Surface of Material # 1 (Topsoil)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
275	18
300	17
375	35
397	34
469	52
494	51
566	69
591	68
663	86
688	85
760	101.5
1430	128
1600	128

Upper Surface of Material # 2 (Top Clay Liner)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
205	0
275	17.5
300	16.5
375	34.5
397	33.5
469	51.5
494	50.5
566	68.5
591	67.5
663	85.5
688	84.5
760	101
1430	127.5
1600	127.5

Upper Surface of Material # 3 (Waste)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
205	0
206	0
209	0
211	0
213	0
275	15.5
300	14.5
375	32.5
397	31.5
469	49.5
494	48.5
566	66.5
591	65.5
663	83.5
688	82.5
760	99
1430	125.5
1600	125.5

Upper Surface of Material # 4 (Drainage Layer)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
209	0
211	0
213	0
251	-10
1600	-10

Upper Surface of Material # 5 (HDPE Liner)

X-Coord	Y-Coord
0	5

150	5
159	8
179	8
188	5
203	0
211	0
250	-11
1600	-11

Upper Surface of Material # 6 (GCL)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
209	0
250	-12
1600	-12

Upper Surface of Material # 7 (HDPE Liner)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
207	0
250	-13
1600	-13

Upper Surface of Material # 8 (Bot. Clay Liner)

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
205	0
249	-14
1600	-14

Upper Surface of Material # 9 (Clay (1A))

X-Coord	Y-Coord
0	5
150	5
159	8
179	8
188	5
203	0
248	-15
1600	-15

Upper Surface of Material # 10 (Clay (1B))

X-Coord	Y-Coord
0	-5
218	-5
248	-15
1600	-15

Upper Surface of Material # 11 (Clay (1C))

X-Coord	Y-Coord
0	-30

1600	-30

Upper Surface of Material # 12 (Clay (1D))

X-Coord	Y-Coord
0	-75
1600	-75

Upper Surface of Material # 13 (Clay (1E))

X-Coord	Y-Coord
0	-140
1600	-140

Upper Surface of Material # 14 (Sand)

X-Coord	Y-Coord
0	-200
1600	-200

Piezometric Surface No. 1

X-Coord	Y-Coord
0	0
203	0
248	-15
1600	-15

There are no explicit external forces in the data set.

Reinforcement Layer No.	Horizontal Extents X1 <-------> X2	Reinforcement Layer Elevation	Max Tension per unit width

Reinf. Layer No.	Soil Mat'l No.	X-Coord of Slip surface Intersection	Total Vertical Stress	Pore Pressure	Force used per unit width

□

ATTACHMENT 3

EFFECTIVE LOAD CALCULATION

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

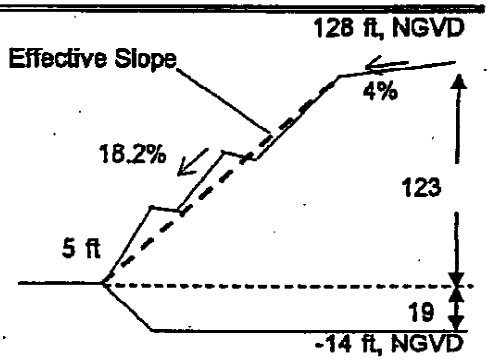
JOB NO.	018-005		
BY	PLP	DATE	4/13/2005
CHECKED	TAB	DATE	5/20/05
PAGE 1 of 1		REV.	

CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill

DESCRIPTION Permit Renewal Calculation of Effective Load @ Below Liner

Inputs

Width of Landfill (at grade) =	2,400	ft
Ground Surface Elevation =	5	ft, NGVD
Maximum Depth of Landfill (below grade) =	19	ft
Average Slope on Excavation =	33.00%	
Average Effective Side Slope =	18.2%	
Horizontal length of side slopes =	530	ft
Top Cap Sloping =	4%	
Bottom Liner Thickness =	3	ft
Bottom Liner Unit Weight =	100	lb/ft^3
Drainage Layer Thickness =	1	ft
Drainage Layer Unit Weight =	120	lb/ft^3
Waste Unit Weight =	67	lb/ft^3
Top Clay Liner Thickness =	2	ft
Top Clay Liner Unit Weight =	100	lb/ft^3
Topsoil Thickness =	0.5	ft
Topsoil Unit Weight =	100	lb/ft^3



Bottom Elevation =	-14	ft, NGVD
Width of excavation Slope =	58	ft
Total Width of cap =	1,340	ft
Final Elevation =	128	ft, NGVD
Height above grade =	123	ft
Total Landfill height =	142	ft

Effective Height

Effective Load Above Grade =	82.4	ft
Total Effective Load =	101.4	ft
2/3 of final Height + depth =	101.0	ft

Effective Load

Maximum Height of Waste =	135.5	ft
Total Load =	9,748.5	lb/ft^2
Effective weight =	68.7	lb/ft^3

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

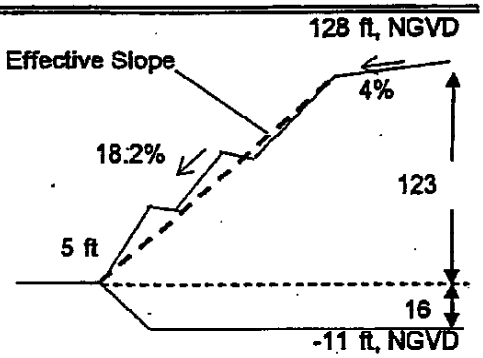
CALCULATIONS AND SKETCHES

JOB NO.	D18-005		
BY	PLP	**DATE**	4/13/2005
CHECKED	TAB	**DATE**	5/20/05
PAGE	1 of 1	**REV.**	

CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal Calculation of Effective Load @ Top of Liner

Inputs

Width of Landfill (at grade) =	2,400	ft
Ground Surface Elevation =	5	ft, NGVD
Maximum Depth of Landfill (below grade) =	16	ft
Average Slope on Excavation =	33.00%	
Average Effective Side Slope =	18.2%	
Horizontal length of side slopes =	530	ft
Top Cap Sloping =	4%	
Bottom Liner Thickness =	0	ft
Bottom Liner Unit Weight =	0	lb/ft^3
Drainage Layer Thickness =	1	ft
Drainage Layer Unit Weight =	120	lb/ft^3
Waste Unit Weight =	67	lb/ft^3
Top Clay Liner Thickness =	2	ft
Top Clay Liner Unit Weight =	100	lb/ft^3
Topsoil Thickness =	0.5	ft
Topsoil Unit Weight =	100	lb/ft^3



Bottom liner thickness and unit weight are below the leachate pipe and assumed as 0 for this calculation

Bottom Elevation =	-11	ft, NGVD
Width of excavation Slope =	48	ft
Total Width of cap =	1,340	ft
Final Elevation =	128	ft, NGVD
Height above grade =	123	ft
Total Landfill height =	139	ft

Effective Height

Effective Load Above Grade =	82.4	ft
Total Effective Load =	98.4	ft
2/3 of final Height + depth =	98.0	ft

Effective Load

Maximum Height of Waste =	135.5	ft
Total Load =	9,448.5	lb/ft^2
Effective weight =	68.0	lb/ft^3

ATTACHMENT 4

SETTLEMENT ANALYSIS

LDEQ-EDMS Document 36275708, Page 212 of 499

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	018-005		
BY	PLP	DATE	04/13/05
CHECKED	TAB	DATE	5/20/05
PAGE	1 of 4	REV.	

CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Primary and Secondary Consolidation Settlement Calculation

Determine Primary Consolidation Settlement

1) For normally consolidated clays

$$S_P = \frac{C_c * H}{1+e_o} * Log\left(\frac{P_o + \Delta P}{P_o}\right)$$

2) For over consolidated clays

a) if $P_o + \Delta P < P_c$

$$S_P = \frac{C_s * H}{1+e_o} * Log\left(\frac{P_o + \Delta P}{P_o}\right)$$

a) if $P_o + \Delta P > P_c$

$$S_P = \frac{C_s * H}{1+e_o} * Log\left(\frac{P_c}{P_o}\right) + \left(\frac{C_c * H}{1+e_o}\right) * Log\left(\frac{P_o + \Delta P}{P_c}\right)$$

where

S_P = primary consolidation settlement (feet)
C_c = compression index
e_o = initial void ratio
P_o = initial average overburden pressure (lbs/ft^2)
ΔP = increase of vertical pressure (lbs/ft^2)
C_s = swell index
P_c = preconsolidation pressure (lbs/ft^2)

supplemental equations

$C_c = (1+e_o)*[0.1+0.6(wc-0.25)]$ [if C_c is not given]
$C_s = 0.0463 * (LL/100) * SG$ [if C_s is not given]
$e_o = \omega * SG$ [if e_o is not given]
$SG = \gamma_s/\gamma_w + 1 = \gamma_s/62.4 + 1$
ω = saturated water content of soil
Notes: Cc supplemental formula for varied clays

given

γ_{se} = average wet unit weight of excavated soil =	120	lbs/ft^3
D_f = depth to bottom of foundation =	19	feet
d_w = depth to groundwater =	5	feet
H_w = effective thickness of waste/foundation =	101.4	feet *
γ_w = effective unit waste of waste/foundation =	68.7	lbs/ft^3

* Actual maximum landfill thickness is 142 feet. However, an estimated effective thickness of 101.4 feet was used to account for triangular distribution of waste.
(may be less than actual height increase)

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Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	018-005		
BY	PLP	DATE	04/13/05
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PAGE	2 of 4	REV.	

CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Primary and Secondary Consolidation Settlement Calculation

Sublayer Primary Consolidation Input Information

Layer	Type Material (Sand or Clay)	Sublayer Depth (ft)		Drainage Paths	Average soil unit weight	C_c (if known)	e_o (if known)	C_s (if known)	Pc (if known)	Liquid Limit (if known)	water content (if known)
		TOP	BOTTOM								
1	C	19	25	1	126					46.8	0.27
2	C	25	80	2	121	0.193	0.894			55.8	0.29
3	C	80	145	2	118					53	0.27
4	C	145	205	2	119					43.3	0.28
5											
6											
7											
8											
9											
10											

Sublayer Primary Consolidation Settlement Calculations

Layer	Sublayer Thickness, H (ft)	Average depth of layer (ft)	Drainage Path Length (ft)	Average soil unit weight	Effective Overburden Pressure, Po (psf)	ΔP (psf)	Final Pressure, (P_o +ΔP)	Virgin Curve, Cc	Rebound Curve, Cs	Void Ratio, eo	Pc	S (feet)	S (inches)
1	6	22	6	126	1,597	4,686	6,283	0.203	NA	0.815	NA	0.40	4.80
2	55	52.5	27.5	121	3,400	4,686	8,086	0.193	NA	0.894	NA	1.05	12.65
3	65	112.5	32.5	118	6,818	4,686	11,504	0.199	NA	0.781	NA	0.83	9.92
4	60	175	87.5	119	10,323	4,686	15,009	0.214	NA	0.814	NA	1.68	20.14
5													
6													
7													
8													
9													
10													
								Total Primary Settlement (consolidation):				3.96	47.51

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Determine Secondary Consolidation Settlement

$$S_C = \frac{C_\alpha * H}{1 + e_p} * Log\left(\frac{t_s}{t_{pf}}\right) \quad \text{and} \quad t_{pf} = \frac{T_v * H_t^2}{C_v}$$

$$T_v = \frac{\pi}{4} * \left(\frac{U\%}{100}\right)^2 \quad \text{[for U < 60 %], or} \quad TV = 1.781 - 0.933 * Log(100 - U\%) \quad \text{[for U > 60%]}$$

where

S_C = secondary consolidation settlement [ft]
C_α = secondary compression index
H = thickness of the layer to be evaluated after excavation, but before loading [ft]
t_s = time over which secondary compression is to be calculated (use 100 years + the maximum time it will take to complete primary consolidation) [yrs]
t_{pf} = time to complete primary consolidation of the consolidating layer [yrs]
e_p = the void ratio at the time of complete primary consolidation in the compressible layer
T_V = a dimensionless time factor associated with the time it takes for primary settlement to be completed
H_t = maximum length of drainage in the consolidated layer [ft]
C_v = coefficient of consolidation [ft^2/year]
U% = percent of primary consolidation

Assuming U% = 99.999 of primary consolidation is reached, then T_V = 4.58

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Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	018-005		
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CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Primary and Secondary Consolidation Settlement Calculation

Determine Secondary Consolidation Settlement (cont'd)

Sublayer Secondary Consolidation Settlement Calculations

Layer	Sublayer Thickness, H (ft)	Drainage Path Length (ft)	U%	T_V	C_V @T_{90} (in^2/min)	t_{pr} (yrs)	t_s (yrs)	$C\alpha$	e_p	S (feet)	S (inches)
1	6	6	99.999	4.58	0.0250	45.8	146	0.0110	0.121	0.030	0.36
2	55	27.5	99.999	4.58	0.0240	1,002.2	1,102	0.0106	0.036	0.012	0.14
3	65	32.5	99.999	4.58	0.0240	1,399.8	1,500	0.0112	0.023	0.011	0.13
4	60	30	99.999	4.58	0.0240	1,192.7	1,293	0.0110	0.051	0.011	0.13
5											
6											
7											
8											
9											
10											
					Total Secondary Settlement (consolidation):					0.06	0.76
					Total Primary Settlement (consolidation):					3.96	47.51
					TOTAL CONSOLIDATION SETTLEMENT					4.02	48.27

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	018-005		
BY	PLP	DATE	4/7/2005
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CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Differential Strain analysis

Purpose: Estimate the potential strain increase associated with the anticipated differential settlement of the landfill.

Once settlement has been calculated for a point, the strain that will occur between each adjacent point can be calculated by using the following equation:

$$E_T(\%) = \frac{L_f - L_o}{L_o} * 100$$

where,

E_T = tensile strain
L_O = original distance separating two location points
L_T = final distance separating the same two points after settlement is complete

using

S_{center} = 48.27 inches
S_{side} = 50% * S_{center} = 24.14 inches
S_{corner} = 25% * S_{center} = 12.07 inches

Side Differential Settlement = 24.14 inches
Corner Differential Settlement = 36.20 inches

L_{O_side} = 2.200 ft
L_{O_corner} = 1.200 ft

Then

LT_side = 2200.001 ft
LT_corner = 1200.004 ft

and

ET_side = 4E-05 %
ET_corner = 3E-04 %

ATTACHMENT 5

BEARING CAPACITY ANALYSIS

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	018-005		
BY	PLP	DATE	4/13/2005
CHECKED	TAB	DATE	5/20/05
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CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Bearing Capacity Analysis

Determine Instantaneous and Long-Term Bearing Capacity

$$q_u = c*N_c*F_{cs}*F_{cd} + q*N_q*F_{qs}*F_{qd} + 0.5*\gamma*B*N_\gamma*F_{\gamma s}*F_{\gamma d}$$

$$FS_{BC} = (q_u - q) / q_{load}$$

where

q_u = ultimate bearing capacity (lbs/ft^2)
c = cohesion (lbs/ft^2)
q = effective stress at the bottom of landfill (lbs/ft^2)
γ = unit weight of soil (lbs/ft^3)
B^1 = width of landfill (ft)
F_{cs}, F_{qs}, $F_{\gamma s}$ = shape factors
F_{cd}, F_{qd}, $F_{\gamma d}$ = depth factors
N_c, N_q, N_γ = bearing capacity factors
FS_{BC} = factor of safety for bearing capacity
q_{inc} = net stress increase on soil (lbs/ft^2)

Given

γ_{se} = average unit weight of excavated soil =	120	lbs/ft^3
γ_s = unit weight of soil beneath foundation =	126	lbs/ft^3
D_f = depth to bottom of foundation =	19	feet
d_w = depth to groundwater =	5	feet
B^1 = width of landfill/foundation =	2400	feet[1]
L^1 = length of landfill/foundation =	3500	feet[1]
γ_w = effective unit waste of waste/foundation =	68.7	lbs/ft^3
H_w = effective thickness of waste/foundation =	101.4	feet[2]
ϕ_{st} = instantaneous soil friction angle	0	deg
ϕ_{lt} = long-term soil friction angle =	15	deg
c_{st} = instantaneous soil cohesion =	2000	lbs/ft^2
c_{lt} = long-term soil cohesion =	0	lbs/ft^2

Note: Setting ϕ_{st} and c_{lt} equal to zero is conservative for bearing capacity analysis

[1] Based upon a "simplified" overall length and width of foundation (landfill)

[2] Actual maximum landfill thickness is 161 feet. However, an estimated effective thickness of 123 feet was used to account for triangular distribution of waste.

Determine q

Case I:	If	$0 < d_w < D_f$
	then	$q = d_w*\gamma_{se} + (D_f - d_w)*(\gamma_{se} - 62.4)$
Case II:	If	$0 < D_f < d_w$
	then	$q = \gamma_{se} * D_f$

Since: 0 < dw < Df use Case I Equation

q = 1,406 lbs/ft^2

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	018-005		
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CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Bearing Capacity Analysis

Determine Instantaneous Bearing Capacity Factor of Safety

$q_u = c*N_c*F_{cs}*F_{cd} + q*N_q*F_{qs}*F_{qd} + 0.5*\gamma*B*N_\gamma*F_{\gamma s}*F_{\gamma d}$

ϕ_{st} = 0 deg

D_f/B = 0.00791667

q = 1,406 lbs/ft^2

$N_q = \tan^2(45+\phi/2)e^{\pi \tan \phi}$ = 1.00

$F_{qs} = 1 + B/L * \tan \phi$ = 1.00

$F_{qd} = 1+2*\tan\phi(1-\sin\phi)^2*(D_f/B)$ for $D_f/B<=1$; or $F_{qd}=1+2\tan\phi(1-\sin\phi)^2\tan^{-1}(D_f/B)$ for $D_f/B>1$

Use F_{qd} = 1.00

$q*N_q*F_{qs}*F_{qd}$ = 1,406.4 lbs/ft^2

c_{st} = 2000 lbs/ft^2

$N_c = (N_q - 1)\cot\phi$ = 5.14

$F_{cs} = 1 + (B/L)*(N_q/N_c)$ = 1.13

$F_{cd} = 1 + 0.4*(D_f/B)$ for $D_f/B <= 1$; or $F_{qd} = 1 + (0.4)\tan^{-1}(D_f/B)$ for $D_f/B >1$

Use F_{cd} = 1.00

$c*N_c*F_{cs}*F_{cd}$ = 11,688.3 lbs/ft^2

γ_s = 126 lbs/ft^3

B = 2,400 feet

$N_\gamma = 2*(N_q + 1)\tan\phi$ = 0.00

$F_{\gamma s} = 1 - 0.4*(B/L)$ = 0.73

$F_{\gamma d} = 1$ $D_f/B <= 1$; or $F_{qd} = 1$ for $D_f/B >1$

Use $F_{\gamma d}$ = 1.00

$0.5*\gamma*B*N_\gamma*F_{\gamma s}*F_{\gamma d}$ = 0.0 lbs/ft^2

$q_u = c*N_c*F_{cs}*F_{cd} + q*N_q*F_{qs}*F_{qd} + 0.5*\gamma*B*N_g*F_{gs}*F_{gd}$

q_u = 13,094.7 lbs/ft^2

$q_{load} = H_w * \gamma_w$ = 6,966 lbs/ft^2

$FS_{st} = (q_u - q) / q_{load}$ = 1.678

FS_{st} = 1.68

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

JOB NO.	0 018-005		
BY	PLP	DATE	4/13/2005
CHECKED	TRB	DATE	5/20/05
PAGE	3 of 3	REV.	

CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal - Bearing Capacity Analysis

Determine Long Term Bearing Capacity Factor of Safety

$$q_u = c*N_c*F_{cs}*F_{cd} + q*N_q*F_{qs}*F_{qd} + 0.5*\gamma*B*N_\gamma*F_{\gamma s}*F_{\gamma d}$$

ϕ_{st} = 15 deg
D_f/B = 0.00791667

q = 1,406 lbs/ft^2
N_q = 3.94
F_{qs} = 1.18
F_{qd} = 1.00
$q*N_q*F_{qs}*F_{qd}$ = 6,576.5 lbs/ft^2

c_{lt} = 0 lbs/ft^2
N_c = 10.98
F_{cs} = 1.25
F_{cd} = 1.00
$c*N_c*F_{cs}*F_{cd}$ = 0.0 lbs/ft^2

γ_{se} = 126 lbs/ft^3
B = 2,400 feet
N_γ = 2.65
$F_{\gamma s}$ = 0.73
$F_{\gamma d}$ = 1.00
$0.5*\gamma*B*N_\gamma*F_{\gamma s}*F_{\gamma d}$ = 581,109.1 lbs/ft^2

$$q_u = c*N_c*F_{cs}*F_{cd} + q*N_q*F_{qs}*F_{qd} + 0.5*\gamma*B*N_\gamma*F_{\gamma s}*F_{\gamma d}$$

q_u = 587,685.6 lbs/ft^2

$q_{load} = H_w * \gamma_w$ = 6,966 lbs/ft^2

$FS_{lt} = (q_u - q) / q_{load}$ = 84.161

FS_{lt} = 84.16

SUMMARY	
Bearing Capacity	**Factor of Safety**
Short-Term	**1.68**
Long-Term	**84.16**

ATTACHMENT 6

HEAVING FAILURE ANALYSIS

Providence Engineering and Environmental Group LLC
BATON ROUGE, LOUISIANA

CALCULATIONS AND SKETCHES

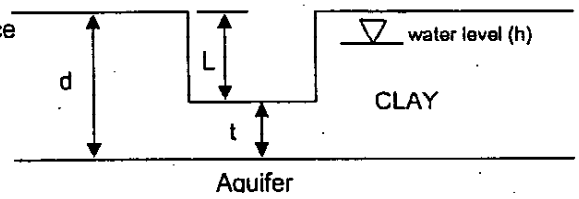
JOB NO.	018-005		
BY	PLP	**DATE**	4/13/2005
CHECKED	TAB	**DATE**	5/20/05
PAGE	1 of 1	**REV.**	

CLIENT BFI Waste Systems of North America, Inc. - Colonial Landfill
DESCRIPTION Permit Renewal Heave Analysis

Determine the factor of safety for heave in the landfill excavation

Heave may occur at the bottom of cuts of soft clay. The depth of excavation at which a heaving failure

For Factor of Safety (FOS) = down force / up force



where
down force = $\gamma s * t$
up force = $\gamma w * (d - h)$

Inputs

γ_s =	125	lb/ft^3
d =	48	ft
L =	19	ft
h =	5	ft
t =	d - L	
t =	29	ft

where
d = depth from surface to continuous aquifer [ft]
L = excavation depth [ft]
t = depth from bottom of excavation to continuous aquifer [ft]
h = depth from surface to stablized water level (head) [ft]
γ_w = density of water [lb/ft^3] = 62.4 lb/ft^3
γ_s = density of clay material [lb/ft^3]

down force = 3,625.0 psf

up force = 2,683.2 psf

FOS = 1.35 > 1.1, Okay

(The miminum factor of safety for a short term excavation used for similar construction projects is 1.1)

ATTACHMENT 7

LEACHATE PRODUCTION (USING H.E.L.P. MODEL)

BEST COPY

H.E.L.P MODEL RESULTS
Alternative Liner System 1
With Final Cover System

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******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1TOP.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1TOP.OUT


TIME:  12:50     DATE:   5/17/2005


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

     TITLE:  BFI Colonial Renewal/Modification - Option 1 4% Top

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


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   9
          THICKNESS                  =      6.00   INCHES
          POROSITY                   =      0.5010 VOL/VOL
          FIELD CAPACITY             =      0.2840 VOL/VOL
          WILTING POINT              =      0.1350 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.4977 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
```

LAYER 2

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 36

THICKNESS	=	0.04	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999993000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	1509.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES

POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0620	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 6

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 670. FEET.

SCS RUNOFF CURVE NUMBER	=	74.50	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES

INITIAL WATER IN EVAPORATIVE ZONE	=	2.986	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	3.006	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.810	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	469.979	INCHES
TOTAL INITIAL WATER	=	469.979	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	5.580	20254.498	14.45
EVAPOTRANSPIRATION	33.023	119873.719	85.53
PERC./LEAKAGE THROUGH LAYER 3	0.001391	5.050	0.00
AVG. HEAD ON TOP OF LAYER 2	2.4240		
DRAINAGE COLLECTED FROM LAYER 5	0.0014	5.024	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.011	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0006		
CHANGE IN WATER STORAGE	0.006	20.937	0.01
SOIL WATER AT START OF YEAR	469.979	1706022.620	
SOIL WATER AT END OF YEAR	469.984	1706043.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.153	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	21.790	79096.984	37.74
EVAPOTRANSPIRATION	35.925	130407.328	62.23
PERC./LEAKAGE THROUGH LAYER 3	0.001402	5.090	0.00

AVG. HEAD ON TOP OF LAYER 2	2.4361		
DRAINAGE COLLECTED FROM LAYER 5	0.0015	5.436	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.011	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0006		
CHANGE IN WATER STORAGE	0.014	50.183	0.02
SOIL WATER AT START OF YEAR	469.984	1706043.500	
SOIL WATER AT END OF YEAR	469.998	1706093.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.061	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	30.721	111516.875	45.40
EVAPOTRANSPIRATION	37.122	134751.047	54.86
PERC./LEAKAGE THROUGH LAYER 3	0.001833	6.652	0.00
AVG. HEAD ON TOP OF LAYER 2	3.2047		
DRAINAGE COLLECTED FROM LAYER 5	0.0017	6.137	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.012	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0007		
CHANGE IN WATER STORAGE	-0.184	-668.107	-0.27
SOIL WATER AT START OF YEAR	469.998	1706093.620	
SOIL WATER AT END OF YEAR	469.814	1705425.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	-0.0001	-0.236	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	13.365	48516.594	27.21
EVAPOTRANSPIRATION	35.591	129195.164	72.46
PERC./LEAKAGE THROUGH LAYER 3	0.001580	5.734	0.00
AVG. HEAD ON TOP OF LAYER 2	2.7612		
DRAINAGE COLLECTED FROM LAYER 5	0.0016	5.884	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.012	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0007		
CHANGE IN WATER STORAGE	0.162	587.903	0.33
SOIL WATER AT START OF YEAR	469.814	1705425.620	
SOIL WATER AT END OF YEAR	469.976	1706013.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.056	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	9.766	35451.664	24.01
EVAPOTRANSPIRATION	30.970	112422.656	76.15

PERC./LEAKAGE THROUGH LAYER 3	0.001178	4.278	0.00
AVG. HEAD ON TOP OF LAYER 2	2.0382		
DRAINAGE COLLECTED FROM LAYER 5	0.0013	4.574	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.011	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0005		
CHANGE IN WATER STORAGE	-0.068	-246.815	-0.17
SOIL WATER AT START OF YEAR	469.976	1706013.500	
SOIL WATER AT END OF YEAR	469.908	1705766.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.019	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.202	0.825	2.793	0.965	0.078	0.114
	1.349	1.801	1.101	0.230	1.003	3.784
STD. DEVIATIONS	2.127	0.685	4.170	0.954	0.150	0.254
	2.623	2.172	2.242	0.408	0.926	0.660
EVAPOTRANSPIRATION						
TOTALS	1.538	2.199	3.133	3.072	2.833	3.292
	5.360	4.859	3.941	1.999	1.270	1.030

STD. DEVIATIONS	0.169	0.119	0.429	1.551	0.436	1.657
	1.462	0.916	1.533	0.874	0.295	0.082

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.0002	0.0002	0.0002	0.0001	0.0000	0.0000
	0.0001	0.0001	0.0001	0.0000	0.0002	0.0003
STD. DEVIATIONS	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001
	0.0001	0.0001	0.0001	0.0000	0.0001	0.0000

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	5.1374	3.9524	3.4725	1.2758	0.6556	0.6692
	1.3631	2.0929	2.3115	0.6694	3.6198	5.6548
STD. DEVIATIONS	0.5201	0.5016	1.4685	1.1509	0.3558	1.0769
	1.3682	1.5821	1.6831	0.4129	2.3503	0.1954

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0010	0.0010	0.0010	0.0008	0.0005	0.0004
	0.0003	0.0004	0.0004	0.0004	0.0005	0.0007
STD. DEVIATIONS	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001
	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	16.244	(10.0537)	58967.32	32.004
EVAPOTRANSPIRATION	34.526	(2.4863)	125329.99	68.021
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.00148	(0.00024)	5.361	0.00291
AVERAGE HEAD ON TOP OF LAYER 2	2.573	(0.436)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.00149	(0.00017)	5.411	0.00294
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00000	(0.00000)	0.011	0.00001
AVERAGE HEAD ON TOP OF LAYER 6	0.001	(0.000)		
CHANGE IN WATER STORAGE	-0.014	(0.1265)	-51.18	-0.028

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	3.983	14459.4053
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.000009	0.03357
AVERAGE HEAD ON TOP OF LAYER 2	6.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00001	0.02835
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000000	0.00004
AVERAGE HEAD ON TOP OF LAYER 6	0.001	
MAXIMUM HEAD ON TOP OF LAYER 6	0.002	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0.0 FEET	

SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.5010

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	2.9159	0.4860
2	0.0000	0.0000
3	10.2480	0.4270
4	440.6280	0.2920
5	0.7443	0.0620
6	0.0000	0.0000
7	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1BEN.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1BEN.OUT


TIME:  12:47     DATE:   5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 Benches

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
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                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   9
          THICKNESS                  =      6.00   INCHES
          POROSITY                   =      0.5010 VOL/VOL
          FIELD CAPACITY             =      0.2840 VOL/VOL
          WILTING POINT              =      0.1350 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.4977 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
```

LAYER 2

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 36

THICKNESS	=	0.04	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999993000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	477.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES

POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0620	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 6

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH AN EXCELLENT STAND OF GRASS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 300. FEET.

SCS RUNOFF CURVE NUMBER	=	73.40	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES

INITIAL WATER IN EVAPORATIVE ZONE	=	2.986	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	3.006	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.810	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	168.635	INCHES
TOTAL INITIAL WATER	=	168.635	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	5.556	20167.187	14.39
EVAPOTRANSPIRATION	33.047	119961.164	85.59
PERC./LEAKAGE THROUGH LAYER 3	0.001390	5.046	0.00
AVG. HEAD ON TOP OF LAYER 2	2.4220		
DRAINAGE COLLECTED FROM LAYER 5	0.0014	5.021	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.011	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0006		
CHANGE IN WATER STORAGE	0.006	20.882	0.01
SOIL WATER AT START OF YEAR	168.635	612143.812	
SOIL WATER AT END OF YEAR	168.640	612164.687	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.076	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	21.824	79221.367	37.80
EVAPOTRANSPIRATION	35.891	130282.805	62.17
PERC./LEAKAGE THROUGH LAYER 3	0.001405	5.099	0.00

AVG. HEAD ON TOP OF LAYER 2	2.4404		
DRAINAGE COLLECTED FROM LAYER 5	0.0015	5.444	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.011	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0006		
CHANGE IN WATER STORAGE	0.014	50.238	0.02
SOIL WATER AT START OF YEAR	168.640	612164.687	
SOIL WATER AT END OF YEAR	168.654	612214.937	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.022	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	30.732	111558.016	45.42
EVAPOTRANSPIRATION	37.110	134711.078	54.85
PERC./LEAKAGE THROUGH LAYER 3	0.001832	6.650	0.00
AVG. HEAD ON TOP OF LAYER 2	3.2038		
DRAINAGE COLLECTED FROM LAYER 5	0.0017	6.136	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.012	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0007		
CHANGE IN WATER STORAGE	-0.184	-669.381	-0.27
SOIL WATER AT START OF YEAR	168.654	612214.937	
SOIL WATER AT END OF YEAR	168.470	611545.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0000	-0.124	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	13.364	48511.109	27.21
EVAPOTRANSPIRATION	35.592	129199.234	72.46
PERC./LEAKAGE THROUGH LAYER 3	0.001582	5.743	0.00
AVG. HEAD ON TOP OF LAYER 2	2.7656		
DRAINAGE COLLECTED FROM LAYER 5	0.0016	5.891	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.012	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0007		
CHANGE IN WATER STORAGE	0.162	589.399	0.33
SOIL WATER AT START OF YEAR	168.470	611545.562	
SOIL WATER AT END OF YEAR	168.632	612134.937	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.035	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	9.767	35453.684	24.01
EVAPOTRANSPIRATION	30.970	112420.852	76.15

PERC./LEAKAGE THROUGH LAYER 3	0.001177	4.273	0.00
AVG. HEAD ON TOP OF LAYER 2	2.0359		
DRAINAGE COLLECTED FROM LAYER 5	0.0013	4.571	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000003	0.011	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0005		
CHANGE IN WATER STORAGE	-0.068	-246.981	-0.17
SOIL WATER AT START OF YEAR	168.632	612134.937	
SOIL WATER AT END OF YEAR	168.564	611887.937	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.026	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.202	0.825	2.796	0.965	0.077	0.114
	1.356	1.801	1.095	0.230	1.003	3.784
STD. DEVIATIONS	2.127	0.685	4.178	0.954	0.150	0.254
	2.637	2.172	2.241	0.408	0.926	0.660
EVAPOTRANSPIRATION						
TOTALS	1.538	2.201	3.130	3.069	2.837	3.289
	5.353	4.859	3.943	2.003	1.270	1.030

STD. DEVIATIONS	0.168	0.120	0.422	1.551	0.434	1.660
	1.452	0.916	1.535	0.877	0.295	0.082

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.0002	0.0002	0.0002	0.0001	0.0000	0.0000
	0.0001	0.0001	0.0001	0.0000	0.0002	0.0003
STD. DEVIATIONS	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001
	0.0001	0.0001	0.0001	0.0000	0.0001	0.0000

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	5.1376	3.9509	3.4715	1.2760	0.6575	0.6665
	1.3689	2.0985	2.3093	0.6709	3.6198	5.6550
STD. DEVIATIONS	0.5200	0.5028	1.4719	1.1534	0.3565	1.0712
	1.3765	1.5843	1.6781	0.4095	2.3501	0.1955

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0010	0.0010	0.0010	0.0008	0.0005	0.0004
	0.0003	0.0004	0.0004	0.0004	0.0005	0.0007
STD. DEVIATIONS	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001
	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	16.249	(10.0689)	58982.27	32.012
EVAPOTRANSPIRATION	34.522	(2.4755)	125315.01	68.013
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.00148	(0.00024)	5.362	0.00291
AVERAGE HEAD ON TOP OF LAYER 2	2.574	(0.437)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.00149	(0.00018)	5.412	0.00294
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00000	(0.00000)	0.011	0.00001
AVERAGE HEAD ON TOP OF LAYER 6	0.001	(0.000)		
CHANGE IN WATER STORAGE	-0.014	(0.1267)	-51.17	-0.028

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	3.976	14433.4365
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.000009	0.03357
AVERAGE HEAD ON TOP OF LAYER 2	6.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00001	0.02834
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000000	0.00004
AVERAGE HEAD ON TOP OF LAYER 6	0.001	
MAXIMUM HEAD ON TOP OF LAYER 6	0.003	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0.0 FEET	

SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.5010

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	2.9159	0.4860
2	0.0000	0.0000
3	10.2480	0.4270
4	139.2840	0.2920
5	0.7443	0.0620
6	0.0000	0.0000
7	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1SS.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1SS.OUT


TIME:  12:51     DATE:  5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 Side Slopes

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
            COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   9
          THICKNESS                  =      6.00   INCHES
          POROSITY                   =      0.5010 VOL/VOL
          FIELD CAPACITY             =      0.2840 VOL/VOL
          WILTING POINT              =      0.1350 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.4954 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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LAYER 2

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	477.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0783	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL

FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 80. FEET.

SCS RUNOFF CURVE NUMBER	=	78.70	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.973	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	3.006	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.810	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	168.816	INCHES
TOTAL INITIAL WATER	=	168.816	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BATON ROUGE LOUISIANA

STATION LATITUDE = 30.32 DEGREES

MAXIMUM LEAF AREA INDEX	=	3.50
START OF GROWING SEASON (JULIAN DATE)	=	39
END OF GROWING SEASON (JULIAN DATE)	=	351
EVAPORATIVE ZONE DEPTH	=	6.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	5.091	18480.512	13.19
EVAPOTRANSPIRATION	32.627	118434.578	84.50
PERC./LEAKAGE THROUGH LAYER 2	0.888274	3224.436	2.30

AVG. HEAD ON TOP OF LAYER 2	2.2878		
DRAINAGE COLLECTED FROM LAYER 4	0.8867	3218.847	2.30
PERC./LEAKAGE THROUGH LAYER 6	0.000224	0.811	0.00
AVG. HEAD ON TOP OF LAYER 5	0.3706		
CHANGE IN WATER STORAGE	0.005	19.497	0.01
SOIL WATER AT START OF YEAR	168.816	612802.500	
SOIL WATER AT END OF YEAR	168.821	612822.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.096	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	21.136	76722.102	36.61
EVAPOTRANSPIRATION	35.656	129429.891	61.76
PERC./LEAKAGE THROUGH LAYER 2	0.909491	3301.453	1.58
AVG. HEAD ON TOP OF LAYER 2	2.3582		
DRAINAGE COLLECTED FROM LAYER 4	0.9672	3511.003	1.68
PERC./LEAKAGE THROUGH LAYER 6	0.000242	0.880	0.00
AVG. HEAD ON TOP OF LAYER 5	0.4038		
CHANGE IN WATER STORAGE	-0.029	-103.855	-0.05
SOIL WATER AT START OF YEAR	168.821	612822.000	
SOIL WATER AT END OF YEAR	168.793	612718.125	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0000	-0.132	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	29.821	108250.344	44.07
EVAPOTRANSPIRATION	36.958	134157.375	54.62
PERC./LEAKAGE THROUGH LAYER 2	1.095636	3977.157	1.62
AVG. HEAD ON TOP OF LAYER 2	3.1462		
DRAINAGE COLLECTED FROM LAYER 4	1.0215	3707.869	1.51
PERC./LEAKAGE THROUGH LAYER 6	0.000255	0.925	0.00
AVG. HEAD ON TOP OF LAYER 5	0.4264		
CHANGE IN WATER STORAGE	-0.141	-510.635	-0.21
SOIL WATER AT START OF YEAR	168.793	612718.125	
SOIL WATER AT END OF YEAR	168.652	612207.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.149	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	12.612	45781.691	25.68
EVAPOTRANSPIRATION	35.357	128347.562	71.98

PERC./LEAKAGE THROUGH LAYER 2	0.962556	3494.079	1.96
AVG. HEAD ON TOP OF LAYER 2	2.6776		
DRAINAGE COLLECTED FROM LAYER 4	0.9797	3556.427	1.99
PERC./LEAKAGE THROUGH LAYER 6	0.000245	0.888	0.00
AVG. HEAD ON TOP OF LAYER 5	0.4080		
CHANGE IN WATER STORAGE	0.171	619.032	0.35
SOIL WATER AT START OF YEAR	168.652	612207.500	
SOIL WATER AT END OF YEAR	168.823	612826.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.007	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	9.287	33713.312	22.84
EVAPOTRANSPIRATION	30.621	111153.766	75.29
PERC./LEAKAGE THROUGH LAYER 2	0.840705	3051.758	2.07
AVG. HEAD ON TOP OF LAYER 2	1.9205		
DRAINAGE COLLECTED FROM LAYER 4	0.8665	3145.257	2.13
PERC./LEAKAGE THROUGH LAYER 6	0.000219	0.794	0.00
AVG. HEAD ON TOP OF LAYER 5	0.3623		
CHANGE IN WATER STORAGE	-0.105	-381.024	-0.26
SOIL WATER AT START OF YEAR	168.823	612826.562	
SOIL WATER AT END OF YEAR	168.718	612445.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.001	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.076	0.783	2.685	0.950	0.084	0.107
	1.323	1.762	1.059	0.221	0.935	3.605
STD. DEVIATIONS	2.137	0.645	4.093	0.935	0.144	0.239
	2.572	2.121	2.199	0.394	0.894	0.668
EVAPOTRANSPIRATION						
TOTALS	1.548	2.205	3.131	2.929	2.819	3.274
	5.330	4.812	3.946	1.934	1.277	1.039
STD. DEVIATIONS	0.169	0.120	0.425	1.622	0.417	1.662
	1.478	0.934	1.524	0.869	0.296	0.085
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0.1276	0.1110	0.1156	0.0474	0.0296	0.0327
	0.0506	0.0690	0.0820	0.0461	0.0979	0.1299
STD. DEVIATIONS	0.0026	0.0037	0.0129	0.0364	0.0109	0.0360
	0.0409	0.0435	0.0500	0.0252	0.0502	0.0011
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.1081	0.1048	0.1168	0.1001	0.0727	0.0541
	0.0491	0.0586	0.0610	0.0633	0.0666	0.0891
STD. DEVIATIONS	0.0122	0.0080	0.0051	0.0149	0.0171	0.0081

	0.0158	0.0208	0.0183	0.0235	0.0220	0.0209

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	5.0370	3.7739	3.1906	1.2250	0.6455	0.6429
	1.3261	2.0509	2.2101	0.6044	3.4622	5.5682
STD. DEVIATIONS	0.5886	0.5139	1.6226	1.1527	0.3528	1.0427
	1.3463	1.5680	1.6682	0.4119	2.3403	0.2555

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.5304	0.5648	0.5732	0.5078	0.3566	0.2745
	0.2410	0.2875	0.3094	0.3106	0.3379	0.4371
STD. DEVIATIONS	0.0599	0.0376	0.0249	0.0756	0.0839	0.0409
	0.0777	0.1021	0.0928	0.1153	0.1114	0.1028

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	15.589	(9.9007)	56589.59	30.713
EVAPOTRANSPIRATION	34.244	(2.5662)	124304.64	67.465
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.93933	(0.09772)	3409.777	1.85061
AVERAGE HEAD ON TOP OF LAYER 2	2.478	(0.460)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.94432	(0.06539)	3427.881	1.86044

PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00024	(0.00002)	0.860	0.00047
AVERAGE HEAD ON TOP OF LAYER 5	0.394	(0.027)		
CHANGE IN WATER STORAGE	-0.020	(0.1212)	-71.40	-0.039

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	3.933	14277.0410
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.004252	15.43442
AVERAGE HEAD ON TOP OF LAYER 2	6.000	
DRAINAGE COLLECTED FROM LAYER 4	0.00402	14.57675
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000001	0.00353
AVERAGE HEAD ON TOP OF LAYER 5	0.611	
MAXIMUM HEAD ON TOP OF LAYER 5	1.086	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	11.1 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5010
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	2.9004	0.4834
2	10.2480	0.4270
3	139.2840	0.2920
4	0.9135	0.0761
5	0.0000	0.0000
6	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**            FOR USEPA RISK REDUCTION ENGINEERING LABORATORY               **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1OP.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1OP.OUT


TIME:  12:49     DATE:   5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 Open Phase

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
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                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  18
          THICKNESS                  =    477.00   INCHES
          POROSITY                   =      0.6710 VOL/VOL
          FIELD CAPACITY             =      0.2920 VOL/VOL
          WILTING POINT              =      0.0770 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.2955 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.100000005000E-02 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1410	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 3

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 4

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #18 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 10.% AND A SLOPE LENGTH OF 300. FEET.

SCS RUNOFF CURVE NUMBER	=	80.70	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	6.617	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	14.762	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.694	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	158.036	INCHES
TOTAL INITIAL WATER	=	158.036	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC

50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	0.137	496.600	0.35
EVAPOTRANSPIRATION	33.975	123328.195	87.99
DRAINAGE COLLECTED FROM LAYER 2	4.4788	16258.099	11.60
PERC./LEAKAGE THROUGH LAYER 4	0.000944	3.425	0.00
AVG. HEAD ON TOP OF LAYER 3	1.8880		
CHANGE IN WATER STORAGE	0.019	67.907	0.05
SOIL WATER AT START OF YEAR	158.036	573672.437	
SOIL WATER AT END OF YEAR	158.055	573740.312	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.121	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	1.894	6876.229	3.28

EVAPOTRANSPIRATION	40.588	147334.172	70.31
DRAINAGE COLLECTED FROM LAYER 2	14.9614	54309.770	25.92
PERC./LEAKAGE THROUGH LAYER 4	0.002828	10.265	0.00
AVG. HEAD ON TOP OF LAYER 3	5.9814		
CHANGE IN WATER STORAGE	0.284	1029.468	0.49
SOIL WATER AT START OF YEAR	158.055	573740.312	
SOIL WATER AT END OF YEAR	158.339	574769.812	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.016	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	3.066	11130.344	4.53
EVAPOTRANSPIRATION	40.278	146210.531	59.53
DRAINAGE COLLECTED FROM LAYER 2	20.7946	75484.289	30.73
PERC./LEAKAGE THROUGH LAYER 4	0.003852	13.983	0.01
AVG. HEAD ON TOP OF LAYER 3	8.3167		
CHANGE IN WATER STORAGE	3.517	12766.704	5.20
SOIL WATER AT START OF YEAR	158.339	574769.812	
SOIL WATER AT END OF YEAR	161.856	587536.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.125	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	0.814	2955.515	1.66
EVAPOTRANSPIRATION	37.798	137206.875	76.95
DRAINAGE COLLECTED FROM LAYER 2	14.9693	54338.461	30.47
PERC./LEAKAGE THROUGH LAYER 4	0.002752	9.988	0.01
AVG. HEAD ON TOP OF LAYER 3	5.8678		
CHANGE IN WATER STORAGE	-4.464	-16205.167	-9.09
SOIL WATER AT START OF YEAR	161.856	587536.500	
SOIL WATER AT END OF YEAR	157.392	571331.375	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.065	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	0.344	1250.323	0.85
EVAPOTRANSPIRATION	35.058	127261.242	86.20
DRAINAGE COLLECTED FROM LAYER 2	5.7295	20798.174	14.09
PERC./LEAKAGE THROUGH LAYER 4	0.001187	4.310	0.00
AVG. HEAD ON TOP OF LAYER 3	2.3931		

CHANGE IN WATER STORAGE	-0.463	-1682.010	-1.14
SOIL WATER AT START OF YEAR	157.392	571331.375	
SOIL WATER AT END OF YEAR	156.928	569649.312	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.068	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	0.055	0.024	0.164	0.149	0.042	0.012
	0.140	0.134	0.375	0.021	0.052	0.084
STD. DEVIATIONS	0.111	0.054	0.234	0.234	0.068	0.028
	0.256	0.179	0.772	0.024	0.114	0.071
EVAPOTRANSPIRATION						
TOTALS	1.502	2.213	3.172	4.396	3.615	3.315
	5.218	5.379	4.265	2.283	1.210	0.971
STD. DEVIATIONS	0.145	0.111	0.411	1.507	0.923	1.881
	1.449	1.094	0.996	1.135	0.336	0.098
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
TOTALS	0.8614	1.1757	1.5597	1.4509	1.6778	1.3215
	0.9355	0.6725	0.6907	0.6061	0.6472	0.5876
STD. DEVIATIONS	0.4309	0.2572	0.6328	0.8463	1.1611	1.1786
	0.9604	0.5684	0.6639	0.6795	0.9413	0.7389

PERCOLATION/LEAKAGE THROUGH LAYER 4

TOTALS	0.0002	0.0002	0.0003	0.0003	0.0003	0.0002
	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
STD. DEVIATIONS	0.0001	0.0000	0.0001	0.0001	0.0002	0.0002
	0.0002	0.0001	0.0001	0.0001	0.0002	0.0001

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	4.1811	6.2221	7.2943	6.9236	7.6473	6.4932
	4.4128	3.2729	3.4359	2.9184	3.0808	2.7904
STD. DEVIATIONS	2.0287	1.1605	2.6819	3.7470	5.1557	5.7810
	4.3693	2.7529	3.2619	3.2348	4.3343	3.4250

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	1.251	(1.2210)	4541.80	2.465
EVAPOTRANSPIRATION	37.539	(2.9886)	136268.20	73.958
LATERAL DRAINAGE COLLECTED FROM LAYER 2	12.18671	(6.90368)	44237.762	24.00944
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.00231	(0.00122)	8.394	0.00456
AVERAGE HEAD ON TOP OF LAYER 3	4.889	(2.699)		
CHANGE IN WATER STORAGE	-0.222	(2.8438)	-804.62	-0.437

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	1.753	6362.4165
DRAINAGE COLLECTED FROM LAYER 2	0.09935	360.65027
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.000018	0.06620
AVERAGE HEAD ON TOP OF LAYER 3	14.909	
MAXIMUM HEAD ON TOP OF LAYER 3	17.595	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	51.2 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3835
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0770

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	140.6990	0.2950
2	0.8572	0.0714
3	0.0000	0.0000
4	15.3720	0.4270

BEST COPY OF THE NEXT 02 PAGES

SNOW WATER 0.000

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H.E.L.P MODEL RESULTS
Alternative Liner System 1
With Interim Cover (2 Feet of Cover)

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**                                                                          **
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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1ICT.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1ICT.OUT


TIME:  12:48     DATE:   5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 Int.CV Top

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   0
          THICKNESS                    =     24.00   INCHES
          POROSITY                     =      0.4750 VOL/VOL
          FIELD CAPACITY               =      0.3780 VOL/VOL
          WILTING POINT                =      0.2650 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.2826 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.999999997000E-06 CM/SEC
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LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	1509.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0620	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES

POROSITY	=	0.4270 VOL/VOL
FIELD CAPACITY	=	0.4180 VOL/VOL
WILTING POINT	=	0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #15 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 670. FEET.

SCS RUNOFF CURVE NUMBER	=	96.50	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	6.026	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	10.450	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	5.830	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	463.526	INCHES
TOTAL INITIAL WATER	=	463.526	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	26.802	97292.258	69.42
EVAPOTRANSPIRATION	11.795	42815.367	30.55
DRAINAGE COLLECTED FROM LAYER 3	0.0006	2.108	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0002		
CHANGE IN WATER STORAGE	0.012	44.533	0.03
SOIL WATER AT START OF YEAR	463.526	1682600.370	
SOIL WATER AT END OF YEAR	463.539	1682644.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.066	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	44.505	161554.187	77.09
EVAPOTRANSPIRATION	12.941	46975.191	22.42
DRAINAGE COLLECTED FROM LAYER 3	0.0004	1.410	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0002		
CHANGE IN WATER STORAGE	0.283	1029.024	0.49
SOIL WATER AT START OF YEAR	463.539	1682644.870	
SOIL WATER AT END OF YEAR	463.822	1683674.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.058	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	53.395	193824.203	78.92
EVAPOTRANSPIRATION	14.273	51811.957	21.10
DRAINAGE COLLECTED FROM LAYER 3	0.0004	1.579	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0002		

CHANGE IN WATER STORAGE	-0.009	-31.794	-0.01
SOIL WATER AT START OF YEAR	463.822	1683674.000	
SOIL WATER AT END OF YEAR	463.813	1683642.120	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.222	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	35.169	127662.773	71.60
EVAPOTRANSPIRATION	14.020	50894.266	28.54
DRAINAGE COLLECTED FROM LAYER 3	0.0004	1.532	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0002		
CHANGE IN WATER STORAGE	-0.070	-253.019	-0.14
SOIL WATER AT START OF YEAR	463.813	1683642.120	
SOIL WATER AT END OF YEAR	463.744	1683389.120	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.047	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT

PRECIPITATION	40.67	147632.109	100.00
RUNOFF	28.961	105127.523	71.21
EVAPOTRANSPIRATION	11.837	42967.414	29.10
DRAINAGE COLLECTED FROM LAYER 3	0.0003	0.948	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0001		
CHANGE IN WATER STORAGE	-0.128	-463.831	-0.31
SOIL WATER AT START OF YEAR	463.744	1683389.120	
SOIL WATER AT END OF YEAR	463.616	1682925.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.043	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.731	1.870	4.508	2.280	2.290	2.272
	5.134	4.841	3.809	1.997	2.036	3.998
STD. DEVIATIONS	1.738	0.882	4.857	1.452	0.428	1.370
	3.508	3.161	2.639	1.274	1.347	0.619

EVAPOTRANSPIRATION

TOTALS	0.751	0.907	1.119	0.787	0.890	1.151
	2.252	1.863	1.136	0.664	0.728	0.726
STD. DEVIATIONS	0.105	0.103	0.481	0.487	0.243	0.589
	0.727	0.478	0.399	0.258	0.137	0.092

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
	0.0002	0.0003	0.0003	0.0002	0.0002	0.0001
STD. DEVIATIONS	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	37.766	(11.1149)	137092.19	74.405
EVAPOTRANSPIRATION	12.973	(1.1692)	47092.84	25.559
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.00042	(0.00011)	1.516	0.00082
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00000	(0.00000)	0.010	0.00001

AVERAGE HEAD ON TOP OF LAYER 4	0.000 (	0.000)		
CHANGE IN WATER STORAGE	0.018	(0.1582)	64.98	0.035

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	5.288	19196.2520
DRAINAGE COLLECTED FROM LAYER 3	0.00000	0.01367
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000000	0.00003
AVERAGE HEAD ON TOP OF LAYER 4	0.001	
MAXIMUM HEAD ON TOP OF LAYER 4	0.001	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2984
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.2650

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	6.8717	0.2863
2	440.6280	0.2920
3	0.7440	0.0620
4	0.0000	0.0000
5	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1ICB.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1ICB.OUT


TIME:  12:47     DATE:   5/17/2005


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   TITLE:  BFI Colonial Renewal/Modification - Option 1 Int.Cv Benches

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    NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
             COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   0
          THICKNESS                    =     24.00   INCHES
          POROSITY                     =      0.4750 VOL/VOL
          FIELD CAPACITY               =      0.3780 VOL/VOL
          WILTING POINT                =      0.2650 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.2826 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.999999997000E-06 CM/SEC
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LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	477.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0620	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES

POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #15 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 300. FEET.

SCS RUNOFF CURVE NUMBER	=	96.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	6.026	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	10.450	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	5.830	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	162.182	INCHES
TOTAL INITIAL WATER	=	162.182	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	26.818	97349.555	69.46
EVAPOTRANSPIRATION	11.781	42766.004	30.51
DRAINAGE COLLECTED FROM LAYER 3	0.0007	2.375	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0003		
CHANGE IN WATER STORAGE	0.010	36.335	0.03
SOIL WATER AT START OF YEAR	162.182	588722.375	
SOIL WATER AT END OF YEAR	162.192	588758.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.062	0.00

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POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #15 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 300. FEET.

SCS RUNOFF CURVE NUMBER	=	96.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	6.026	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	10.450	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	5.830	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	162.182	INCHES
TOTAL INITIAL WATER	=	162.182	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	26.818	97349.555	69.46
EVAPOTRANSPIRATION	11.781	42766.004	30.51
DRAINAGE COLLECTED FROM LAYER 3	0.0007	2.375	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0003		
CHANGE IN WATER STORAGE	0.010	36.335	0.03
SOIL WATER AT START OF YEAR	162.182	588722.375	
SOIL WATER AT END OF YEAR	162.192	588758.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.062	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	44.573	161801.656	77.21
EVAPOTRANSPIRATION	12.866	46705.168	22.29
DRAINAGE COLLECTED FROM LAYER 3	0.0003	1.254	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0001		
CHANGE IN WATER STORAGE	0.290	1051.789	0.50
SOIL WATER AT START OF YEAR	162.192	588758.750	
SOIL WATER AT END OF YEAR	162.482	589810.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.007	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	53.411	193881.250	78.94
EVAPOTRANSPIRATION	14.260	51765.602	21.08
DRAINAGE COLLECTED FROM LAYER 3	0.0006	2.257	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0003		

CHANGE IN WATER STORAGE	-0.012	-43.259	-0.02
SOIL WATER AT START OF YEAR	162.482	589810.500	
SOIL WATER AT END OF YEAR	162.470	589767.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.128	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	35.134	127535.531	71.53
EVAPOTRANSPIRATION	14.056	51024.168	28.62
DRAINAGE COLLECTED FROM LAYER 3	0.0005	1.722	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0002		
CHANGE IN WATER STORAGE	-0.070	-255.844	-0.14
SOIL WATER AT START OF YEAR	162.470	589767.250	
SOIL WATER AT END OF YEAR	162.400	589511.437	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.023	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT

PRECIPITATION	40.67	147632.109	100.00
RUNOFF	28.994	105247.086	71.29
EVAPOTRANSPIRATION	11.804	42848.672	29.02
DRAINAGE COLLECTED FROM LAYER 3	0.0003	1.140	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0001		
CHANGE IN WATER STORAGE	-0.128	-464.883	-0.31
SOIL WATER AT START OF YEAR	162.400	589511.437	
SOIL WATER AT END OF YEAR	162.272	589046.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.079	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.733	1.870	4.512	2.280	2.316	2.272
	5.117	4.846	3.809	1.995	2.036	3.999
STD. DEVIATIONS	1.738	0.882	4.858	1.452	0.423	1.369
	3.527	3.165	2.640	1.272	1.346	0.617

EVAPOTRANSPIRATION

TOTALS	0.748	0.909	1.116	0.787	0.864	1.150
	2.270	1.859	1.134	0.667	0.726	0.725
STD. DEVIATIONS	0.104	0.102	0.480	0.488	0.236	0.588
	0.707	0.476	0.397	0.258	0.137	0.090

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
	0.0003	0.0003	0.0003	0.0003	0.0002	0.0001
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	37.786	(11.1225)	137163.02	74.443
EVAPOTRANSPIRATION	12.954	(1.1861)	47021.92	25.521
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.00048	(0.00016)	1.750	0.00095
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00000	(0.00000)	0.010	0.00001

AVERAGE HEAD ON TOP OF LAYER 4	0.000 (	0.000)		
CHANGE IN WATER STORAGE	0.018	(0.1612)	64.83	0.035

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	5.288	19196.6426
DRAINAGE COLLECTED FROM LAYER 3	0.00000	0.01580
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000000	0.00003
AVERAGE HEAD ON TOP OF LAYER 4	0.001	
MAXIMUM HEAD ON TOP OF LAYER 4	0.002	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2985
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.2650

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	6.8717	0.2863
2	139.2840	0.2920
3	0.7440	0.0620
4	0.0000	0.0000
5	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                   USAE WATERWAYS EXPERIMENT STATION                      **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_1ICS.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_1ICS.OUT


TIME:  12:48     DATE:   5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 Int.Cv Slopes

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
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                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   0
          THICKNESS                  =     24.00   INCHES
          POROSITY                   =      0.4750 VOL/VOL
          FIELD CAPACITY             =      0.3780 VOL/VOL
          WILTING POINT              =      0.2650 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.2826 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.999999997000E-06 CM/SEC
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LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	477.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0620	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES

POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #15 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 80. FEET.

SCS RUNOFF CURVE NUMBER	=	97.00	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	6.026	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	10.450	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	5.830	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	162.182	INCHES
TOTAL INITIAL WATER	=	162.182	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	27.057	98217.578	70.08
EVAPOTRANSPIRATION	11.542	41896.937	29.89
DRAINAGE COLLECTED FROM LAYER 3	0.0009	3.161	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0004		
CHANGE IN WATER STORAGE	0.010	36.612	0.03
SOIL WATER AT START OF YEAR	162.182	588722.000	
SOIL WATER AT END OF YEAR	162.192	588758.625	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.045	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	44.746	162427.719	77.51
EVAPOTRANSPIRATION	12.697	46089.273	21.99
DRAINAGE COLLECTED FROM LAYER 3	0.0003	1.239	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0001		
CHANGE IN WATER STORAGE	0.287	1041.653	0.50
SOIL WATER AT START OF YEAR	162.192	588758.625	
SOIL WATER AT END OF YEAR	162.479	589800.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.017	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	53.391	193808.250	78.91
EVAPOTRANSPIRATION	14.278	51828.590	21.10
DRAINAGE COLLECTED FROM LAYER 3	0.0007	2.434	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0003		

CHANGE IN WATER STORAGE	-0.009	-33.455	-0.01
SOIL WATER AT START OF YEAR	162.479	589800.250	
SOIL WATER AT END OF YEAR	162.470	589766.812	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.093	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	35.350	128319.914	71.97
EVAPOTRANSPIRATION	13.841	50241.879	28.18
DRAINAGE COLLECTED FROM LAYER 3	0.0005	1.648	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0002		
CHANGE IN WATER STORAGE	-0.071	-257.893	-0.14
SOIL WATER AT START OF YEAR	162.470	589766.812	
SOIL WATER AT END OF YEAR	162.399	589508.937	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.053	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT

PRECIPITATION	40.67	147632.109	100.00
RUNOFF	29.102	105639.266	71.56
EVAPOTRANSPIRATION	11.695	42454.043	28.76
DRAINAGE COLLECTED FROM LAYER 3	0.0003	1.183	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000003	0.010	0.00
AVG. HEAD ON TOP OF LAYER 4	0.0001		
CHANGE IN WATER STORAGE	-0.127	-462.391	-0.31
SOIL WATER AT START OF YEAR	162.399	589508.937	
SOIL WATER AT END OF YEAR	162.272	589046.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.005	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.738	1.879	4.519	2.280	2.316	2.296
	5.161	4.872	3.816	2.008	2.041	4.003
STD. DEVIATIONS	1.737	0.882	4.859	1.452	0.410	1.380
	3.513	3.165	2.639	1.284	1.354	0.612

EVAPOTRANSPIRATION

TOTALS	0.745	0.899	1.112	0.782	0.864	1.121
	2.231	1.832	1.128	0.653	0.721	0.722
STD. DEVIATIONS	0.106	0.104	0.484	0.482	0.227	0.578
	0.694	0.469	0.395	0.251	0.142	0.091

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000
STD. DEVIATIONS	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	0.0002	0.0002	0.0001	0.0001	0.0002	0.0002
	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002
STD. DEVIATIONS	0.0003	0.0002	0.0001	0.0001	0.0001	0.0001
	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	37.929	(11.0488)	137682.55	74.725
EVAPOTRANSPIRATION	12.811	(1.2329)	46502.14	25.238
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.00053	(0.00023)	1.933	0.00105
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00000	(0.00000)	0.010	0.00001

AVERAGE HEAD ON TOP OF LAYER 4	0.000 (	0.000)		
CHANGE IN WATER STORAGE	0.018	(0.1598)	64.91	0.035

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	5.287	19193.4395
DRAINAGE COLLECTED FROM LAYER 3	0.00001	0.02161
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000000	0.00003
AVERAGE HEAD ON TOP OF LAYER 4	0.001	
MAXIMUM HEAD ON TOP OF LAYER 4	0.002	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2982
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.2650

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	6.8717	0.2863
2	139.2840	0.2920
3	0.7440	0.0620
4	0.0000	0.0000
5	15.3720	0.4270
SNOW WATER	0.000	

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BEST COPY

H.E.L.P MODEL RESULTS
Alternative Liner System 1
With Interim Cover (30-mil HDPE liner)

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                   USAE WATERWAYS EXPERIMENT STATION                      **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
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PRECIPITATION DATA FILE:      c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:        C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:    C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:      c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:    C:\temp\help3\CL-130T.D10
OUTPUT DATA FILE:             C:\temp\help3\CL_130T.OUT


TIME:  12:46     DATE:   5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 30 mil Top

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   8
          THICKNESS                  =      0.10   INCHES
          POROSITY                   =      0.4630 VOL/VOL
          FIELD CAPACITY             =      0.2320 VOL/VOL
          WILTING POINT              =      0.1160 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.4630 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.369999994000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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LAYER 2

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.03	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	1509.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0622	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	98.00	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	0.1	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	0.046	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	0.046	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.012	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	456.793	INCHES
TOTAL INITIAL WATER	=	456.793	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BATON ROUGE LOUISIANA

STATION LATITUDE = 30.32 DEGREES

MAXIMUM LEAF AREA INDEX	=	3.50
START OF GROWING SEASON (JULIAN DATE)	=	39
END OF GROWING SEASON (JULIAN DATE)	=	351
EVAPORATIVE ZONE DEPTH	=	0.1 INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	33.550	121788.242	86.90
EVAPOTRANSPIRATION	5.043	18306.287	13.06
PERC./LEAKAGE THROUGH LAYER 2	0.016460	59.749	0.04

AVG. HEAD ON TOP OF LAYER 2	0.0226		
DRAINAGE COLLECTED FROM LAYER 4	0.0165	59.898	0.04
PERC./LEAKAGE THROUGH LAYER 6	0.000008	0.030	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0069		
CHANGE IN WATER STORAGE	0.000	-0.222	0.00
SOIL WATER AT START OF YEAR	456.797	1658172.000	
SOIL WATER AT END OF YEAR	456.797	1658171.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.109	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	52.830	191771.141	91.51
EVAPOTRANSPIRATION	4.882	17721.834	8.46
PERC./LEAKAGE THROUGH LAYER 2	0.018429	66.896	0.03
AVG. HEAD ON TOP OF LAYER 2	0.0252		
DRAINAGE COLLECTED FROM LAYER 4	0.0182	65.916	0.03
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.032	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0076		
CHANGE IN WATER STORAGE	0.000	0.997	0.00
SOIL WATER AT START OF YEAR	456.797	1658171.750	
SOIL WATER AT END OF YEAR	456.797	1658172.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0000	-0.043	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	62.229	225890.047	91.97
EVAPOTRANSPIRATION	5.448	19774.965	8.05
PERC./LEAKAGE THROUGH LAYER 2	0.018388	66.749	0.03
AVG. HEAD ON TOP OF LAYER 2	0.0252		
DRAINAGE COLLECTED FROM LAYER 4	0.0179	64.964	0.03
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.032	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0074		
CHANGE IN WATER STORAGE	-0.034	-124.183	-0.05
SOIL WATER AT START OF YEAR	456.797	1658172.750	
SOIL WATER AT END OF YEAR	456.763	1658048.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.098	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	43.479	157829.797	88.52
EVAPOTRANSPIRATION	5.614	20378.719	11.43

PERC./LEAKAGE THROUGH LAYER 2	0.020065	72.836	0.04
AVG. HEAD ON TOP OF LAYER 2	0.0275		
DRAINAGE COLLECTED FROM LAYER 4	0.0196	71.284	0.04
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.034	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0082		
CHANGE IN WATER STORAGE	0.007	25.701	0.01
SOIL WATER AT START OF YEAR	456.763	1658048.620	
SOIL WATER AT END OF YEAR	456.770	1658074.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.078	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	36.200	131406.234	89.01
EVAPOTRANSPIRATION	4.460	16191.561	10.97
PERC./LEAKAGE THROUGH LAYER 2	0.016133	58.564	0.04
AVG. HEAD ON TOP OF LAYER 2	0.0222		
DRAINAGE COLLECTED FROM LAYER 4	0.0173	62.787	0.04
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.031	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0072		
CHANGE IN WATER STORAGE	-0.008	-28.470	-0.02
SOIL WATER AT START OF YEAR	456.770	1658074.250	
SOIL WATER AT END OF YEAR	456.762	1658045.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.039	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	3.097	2.324	5.129	2.693	2.880	3.069
	6.618	5.982	4.512	2.431	2.448	4.475
STD. DEVIATIONS	1.793	0.865	5.250	1.641	0.470	1.736
	3.974	3.578	2.748	1.435	1.418	0.616
EVAPOTRANSPIRATION						
TOTALS	0.410	0.340	0.430	0.229	0.272	0.424
	0.760	0.724	0.417	0.272	0.336	0.475
STD. DEVIATIONS	0.146	0.149	0.226	0.139	0.057	0.214
	0.189	0.189	0.132	0.114	0.079	0.144
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0.0016	0.0012	0.0016	0.0009	0.0012	0.0014
	0.0025	0.0021	0.0013	0.0009	0.0012	0.0019
STD. DEVIATIONS	0.0006	0.0003	0.0006	0.0006	0.0003	0.0007
	0.0006	0.0005	0.0004	0.0004	0.0003	0.0006
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0016	0.0014	0.0015	0.0014	0.0013	0.0013
	0.0016	0.0019	0.0017	0.0015	0.0013	0.0014
STD. DEVIATIONS	0.0003	0.0002	0.0002	0.0003	0.0003	0.0002

	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	0.0260	0.0220	0.0263	0.0157	0.0203	0.0237
	0.0395	0.0340	0.0212	0.0148	0.0198	0.0310
STD. DEVIATIONS	0.0098	0.0046	0.0101	0.0095	0.0042	0.0120
	0.0100	0.0074	0.0061	0.0059	0.0044	0.0095

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0078	0.0074	0.0076	0.0071	0.0062	0.0064
	0.0079	0.0095	0.0088	0.0071	0.0066	0.0071
STD. DEVIATIONS	0.0016	0.0010	0.0008	0.0016	0.0016	0.0009
	0.0010	0.0012	0.0009	0.0009	0.0009	0.0010

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	45.658	(11.9039)	165737.09	89.952
EVAPOTRANSPIRATION	5.089	(0.4594)	18474.67	10.027
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.01789	(0.00161)	64.959	0.03526
AVERAGE HEAD ON TOP OF LAYER 2	0.025	(0.002)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.01790	(0.00116)	64.970	0.03526

PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00001	(0.00000)	0.032	0.00002
AVERAGE HEAD ON TOP OF LAYER 5	0.007	(0.000)		
CHANGE IN WATER STORAGE	-0.007	(0.0161)	-25.24	-0.014

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	5.403	19612.4023
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.000205	0.74520
AVERAGE HEAD ON TOP OF LAYER 2	0.100	
DRAINAGE COLLECTED FROM LAYER 4	0.00008	0.28104
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000000	0.00012
AVERAGE HEAD ON TOP OF LAYER 5	0.012	
MAXIMUM HEAD ON TOP OF LAYER 5	0.023	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	1.2 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4630
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1160

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.0116	0.1160
2	0.0000	0.0000
3	440.6280	0.2920
4	0.7465	0.0622
5	0.0000	0.0000
6	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_130B.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_130B.OUT


TIME:  12:46     DATE:   5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 30 mil benches

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   8
        THICKNESS                    =      0.01    INCHES
        POROSITY                     =      0.4630 VOL/VOL
        FIELD CAPACITY               =      0.2320 VOL/VOL
        WILTING POINT                =      0.1160 VOL/VOL
        INITIAL SOIL WATER CONTENT   =      0.4630 VOL/VOL
        EFFECTIVE SAT. HYD. COND.    =  0.369999994000E-03 CM/SEC
      NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
               FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
```

LAYER 2

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.03	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	477.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0621	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	98.00	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	0.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	0.005	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	0.005	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.001	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	155.405	INCHES
TOTAL INITIAL WATER	=	155.405	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BATON ROUGE LOUISIANA

STATION LATITUDE = 30.32 DEGREES

MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	0.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	37.975	137848.609	98.35
EVAPOTRANSPIRATION	0.631	2289.475	1.63
PERC./LEAKAGE THROUGH LAYER 2	0.004466	16.211	0.01

AVG. HEAD ON TOP OF LAYER 2	0.0027		
DRAINAGE COLLECTED FROM LAYER 4	0.0045	16.184	0.01
PERC./LEAKAGE THROUGH LAYER 6	0.000004	0.015	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0019		
CHANGE IN WATER STORAGE	0.000	0.055	0.00
SOIL WATER AT START OF YEAR	155.406	564122.375	
SOIL WATER AT END OF YEAR	155.406	564122.437	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.007	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	57.146	207441.453	98.99
EVAPOTRANSPIRATION	0.579	2103.213	1.00
PERC./LEAKAGE THROUGH LAYER 2	0.004197	15.235	0.01
AVG. HEAD ON TOP OF LAYER 2	0.0026		
DRAINAGE COLLECTED FROM LAYER 4	0.0042	15.232	0.01
PERC./LEAKAGE THROUGH LAYER 6	0.000004	0.015	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0017		
CHANGE IN WATER STORAGE	0.000	-0.055	0.00
SOIL WATER AT START OF YEAR	155.406	564122.437	
SOIL WATER AT END OF YEAR	155.406	564122.375	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0000	0.032	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	67.020	243283.609	99.05
EVAPOTRANSPIRATION	0.639	2318.571	0.94
PERC./LEAKAGE THROUGH LAYER 2	0.004479	16.259	0.01
AVG. HEAD ON TOP OF LAYER 2	0.0027		
DRAINAGE COLLECTED FROM LAYER 4	0.0043	15.525	0.01
PERC./LEAKAGE THROUGH LAYER 6	0.000004	0.015	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0018		
CHANGE IN WATER STORAGE	-0.003	-11.853	0.00
SOIL WATER AT START OF YEAR	155.406	564122.375	
SOIL WATER AT END OF YEAR	155.402	564110.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.140	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	48.411	175732.031	98.56
EVAPOTRANSPIRATION	0.703	2553.255	1.43

PERC./LEAKAGE THROUGH LAYER 2	0.004932	17.901	0.01
AVG. HEAD ON TOP OF LAYER 2	0.0030		
DRAINAGE COLLECTED FROM LAYER 4	0.0050	18.128	0.01
PERC./LEAKAGE THROUGH LAYER 6	0.000004	0.016	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0021		
CHANGE IN WATER STORAGE	0.001	2.160	0.00
SOIL WATER AT START OF YEAR	155.402	564110.500	
SOIL WATER AT END OF YEAR	155.403	564112.687	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.013	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	40.121	145640.000	98.65
EVAPOTRANSPIRATION	0.546	1980.371	1.34
PERC./LEAKAGE THROUGH LAYER 2	0.003894	14.135	0.01
AVG. HEAD ON TOP OF LAYER 2	0.0024		
DRAINAGE COLLECTED FROM LAYER 4	0.0041	14.784	0.01
PERC./LEAKAGE THROUGH LAYER 6	0.000004	0.015	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0017		
CHANGE IN WATER STORAGE	-0.001	-3.046	0.00
SOIL WATER AT START OF YEAR	155.403	564112.687	
SOIL WATER AT END OF YEAR	155.402	564109.625	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.016	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	3.431	2.625	5.497	2.893	3.112	3.444
	7.314	6.621	4.881	2.691	2.730	4.896
STD. DEVIATIONS	1.850	0.873	5.437	1.752	0.486	1.861
	4.128	3.585	2.836	1.534	1.469	0.592
EVAPOTRANSPIRATION						
TOTALS	0.058	0.052	0.054	0.032	0.041	0.046
	0.082	0.076	0.044	0.031	0.041	0.063
STD. DEVIATIONS	0.024	0.020	0.016	0.016	0.007	0.023
	0.016	0.018	0.013	0.012	0.010	0.027
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0.0004	0.0004	0.0004	0.0002	0.0003	0.0003
	0.0006	0.0006	0.0003	0.0002	0.0003	0.0004
STD. DEVIATIONS	0.0001	0.0001	0.0001	0.0001	0.0000	0.0002
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0004	0.0003	0.0004	0.0004	0.0003	0.0003
	0.0004	0.0005	0.0004	0.0004	0.0003	0.0003
STD. DEVIATIONS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000

	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	0.0027	0.0030	0.0029	0.0017	0.0022	0.0025
	0.0044	0.0040	0.0023	0.0015	0.0022	0.0030
STD. DEVIATIONS	0.0010	0.0011	0.0009	0.0009	0.0003	0.0013
	0.0009	0.0010	0.0008	0.0006	0.0006	0.0009

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0018	0.0018	0.0019	0.0018	0.0016	0.0015
	0.0019	0.0023	0.0022	0.0018	0.0016	0.0017
STD. DEVIATIONS	0.0003	0.0004	0.0003	0.0003	0.0003	0.0002
	0.0003	0.0002	0.0004	0.0003	0.0003	0.0003

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	50.135	(12.0974)	181989.14	98.772
EVAPOTRANSPIRATION	0.620	(0.0604)	2248.98	1.221
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.00439	(0.00038)	15.948	0.00866
AVERAGE HEAD ON TOP OF LAYER 2	0.003	(0.000)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.00440	(0.00036)	15.970	0.00867

PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00000 (0.00000)	0.015	0.00001
AVERAGE HEAD ON TOP OF LAYER 5	0.002 (0.000)		
CHANGE IN WATER STORAGE	-0.001 (0.0015)	-2.55	-0.001

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	5.410	19636.9766
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.000046	0.16738
AVERAGE HEAD ON TOP OF LAYER 2	0.010	
DRAINAGE COLLECTED FROM LAYER 4	0.00002	0.07239
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000000	0.00005
AVERAGE HEAD ON TOP OF LAYER 5	0.003	
MAXIMUM HEAD ON TOP OF LAYER 5	0.005	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	9.9 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4630

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1160

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.0012	0.1160
2	0.0000	0.0000
3	139.2840	0.2920
4	0.7446	0.0620
5	0.0000	0.0000
6	15.3720	0.4270
SNOW WATER	0.000	

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:     c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:       C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:   C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:     c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:   C:\temp\help3\CL_130S.D10
OUTPUT DATA FILE:            C:\temp\help3\CL_130S.OUT


TIME:  12:46     DATE:  5/17/2005


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     TITLE:  BFI Colonial Renewal/Modification - Option 1 30 mil Slopes

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                   LAYER  1
                                   --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   8
          THICKNESS                  =      0.10   INCHES
          POROSITY                   =      0.4630 VOL/VOL
          FIELD CAPACITY             =      0.2320 VOL/VOL
          WILTING POINT              =      0.1160 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.4630 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.369999994000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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LAYER 2

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.03	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	477.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0622	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	98.00	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	0.1	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	0.046	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	0.046	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.012	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	155.449	INCHES
TOTAL INITIAL WATER	=	155.449	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BATON ROUGE LOUISIANA

STATION LATITUDE = 30.32 DEGREES

MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	0.1	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	33.550	121788.242	86.90
EVAPOTRANSPIRATION	5.043	18306.287	13.06
PERC./LEAKAGE THROUGH LAYER 2	0.016460	59.749	0.04

AVG. HEAD ON TOP OF LAYER 2	0.0226		
DRAINAGE COLLECTED FROM LAYER 4	0.0165	59.898	0.04
PERC./LEAKAGE THROUGH LAYER 6	0.000008	0.030	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0069		
CHANGE IN WATER STORAGE	0.000	-0.222	0.00
SOIL WATER AT START OF YEAR	155.453	564293.250	
SOIL WATER AT END OF YEAR	155.453	564293.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.109	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	52.830	191771.141	91.51
EVAPOTRANSPIRATION	4.882	17721.834	8.46
PERC./LEAKAGE THROUGH LAYER 2	0.018429	66.896	0.03
AVG. HEAD ON TOP OF LAYER 2	0.0252		
DRAINAGE COLLECTED FROM LAYER 4	0.0182	65.916	0.03
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.032	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0076		
CHANGE IN WATER STORAGE	0.000	0.942	0.00
SOIL WATER AT START OF YEAR	155.453	564293.000	
SOIL WATER AT END OF YEAR	155.453	564293.937	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0000	0.012	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	62.229	225890.047	91.97
EVAPOTRANSPIRATION	5.448	19774.965	8.05
PERC./LEAKAGE THROUGH LAYER 2	0.018388	66.749	0.03
AVG. HEAD ON TOP OF LAYER 2	0.0252		
DRAINAGE COLLECTED FROM LAYER 4	0.0179	64.964	0.03
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.032	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0074		
CHANGE IN WATER STORAGE	-0.034	-124.183	-0.05
SOIL WATER AT START OF YEAR	155.453	564293.937	
SOIL WATER AT END OF YEAR	155.419	564169.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.098	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	43.479	157829.797	88.52
EVAPOTRANSPIRATION	5.614	20378.719	11.43

PERC./LEAKAGE THROUGH LAYER 2	0.020065	72.836	0.04
AVG. HEAD ON TOP OF LAYER 2	0.0275		
DRAINAGE COLLECTED FROM LAYER 4	0.0196	71.284	0.04
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.034	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0082		
CHANGE IN WATER STORAGE	0.007	25.811	0.01
SOIL WATER AT START OF YEAR	155.419	564169.750	
SOIL WATER AT END OF YEAR	155.426	564195.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.033	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	36.200	131406.234	89.01
EVAPOTRANSPIRATION	4.460	16191.561	10.97
PERC./LEAKAGE THROUGH LAYER 2	0.016133	58.564	0.04
AVG. HEAD ON TOP OF LAYER 2	0.0222		
DRAINAGE COLLECTED FROM LAYER 4	0.0173	62.787	0.04
PERC./LEAKAGE THROUGH LAYER 6	0.000009	0.031	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0072		
CHANGE IN WATER STORAGE	-0.008	-28.526	-0.02
SOIL WATER AT START OF YEAR	155.426	564195.562	
SOIL WATER AT END OF YEAR	155.418	564167.062	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.016	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	3.097	2.324	5.129	2.693	2.880	3.069
	6.618	5.982	4.512	2.431	2.448	4.475
STD. DEVIATIONS	1.793	0.865	5.250	1.641	0.470	1.736
	3.974	3.578	2.748	1.435	1.418	0.616
EVAPOTRANSPIRATION						
TOTALS	0.410	0.340	0.430	0.229	0.272	0.424
	0.760	0.724	0.417	0.272	0.336	0.475
STD. DEVIATIONS	0.146	0.149	0.226	0.139	0.057	0.214
	0.189	0.189	0.132	0.114	0.079	0.144
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0.0016	0.0012	0.0016	0.0009	0.0012	0.0014
	0.0025	0.0021	0.0013	0.0009	0.0012	0.0019
STD. DEVIATIONS	0.0006	0.0003	0.0006	0.0006	0.0003	0.0007
	0.0006	0.0005	0.0004	0.0004	0.0003	0.0006
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0016	0.0014	0.0015	0.0014	0.0013	0.0013
	0.0016	0.0019	0.0017	0.0015	0.0013	0.0014
STD. DEVIATIONS	0.0003	0.0002	0.0002	0.0003	0.0003	0.0002

	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	0.0260	0.0220	0.0263	0.0157	0.0203	0.0237
	0.0395	0.0340	0.0212	0.0148	0.0198	0.0310
STD. DEVIATIONS	0.0098	0.0046	0.0101	0.0095	0.0042	0.0120
	0.0100	0.0074	0.0061	0.0059	0.0044	0.0095

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0078	0.0074	0.0076	0.0071	0.0062	0.0064
	0.0079	0.0095	0.0088	0.0071	0.0066	0.0071
STD. DEVIATIONS	0.0016	0.0010	0.0008	0.0016	0.0016	0.0009
	0.0010	0.0012	0.0009	0.0009	0.0009	0.0010

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	45.658	(11.9039)	165737.09	89.952
EVAPOTRANSPIRATION	5.089	(0.4594)	18474.67	10.027
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.01789	(0.00161)	64.959	0.03526
AVERAGE HEAD ON TOP OF LAYER 2	0.025	(0.002)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.01790	(0.00116)	64.970	0.03526

PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00001	(0.00000)	0.032	0.00002
AVERAGE HEAD ON TOP OF LAYER 5	0.007	(0.000)		
CHANGE IN WATER STORAGE	-0.007	(0.0161)	-25.24	-0.014

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	5.403	19612.4023
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.000205	0.74520
AVERAGE HEAD ON TOP OF LAYER 2	0.100	
DRAINAGE COLLECTED FROM LAYER 4	0.00008	0.28104
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000000	0.00012
AVERAGE HEAD ON TOP OF LAYER 5	0.012	
MAXIMUM HEAD ON TOP OF LAYER 5	0.023	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	1.2 FEET	
SNOW WATER	1.61	5845.4434

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4630
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1160

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(INCHES)	(VOL/VOL)
1	0.0116	0.1160
2	0.0000	0.0000
3	139.2840	0.2920
4	0.7465	0.0622
5	0.0000	0.0000
6	15.3720	0.4270
SNOW WATER	0.000	

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BEST COPY

H.E.L.P MODEL RESULTS
Alternative Liner System 2
With Final Cover System

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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:      c:\temp\help3\BFI_CL.D4
TEMPERATURE DATA FILE:        C:\temp\help3\BFI_CL.D7
SOLAR RADIATION DATA FILE:    C:\temp\help3\BFI_CL.D13
EVAPOTRANSPIRATION DATA:      c:\temp\help3\BFI_CL.D11
SOIL AND DESIGN DATA FILE:    C:\temp\help3\CL_2TOP.D10
OUTPUT DATA FILE:             C:\temp\help3\CL_2TOP.OUT


TIME:  12:54     DATE:   5/17/2005


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

     TITLE:  BFI Colonial Renewal/Modification - Option 2 4% Top

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     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
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                      TYPE 1 - VERTICAL PERCOLATION LAYER
                          MATERIAL TEXTURE NUMBER   9
          THICKNESS                  =      6.00   INCHES
          POROSITY                   =      0.5010 VOL/VOL
          FIELD CAPACITY             =      0.2840 VOL/VOL
          WILTING POINT              =      0.1350 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.4977 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.190000006000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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LAYER 2

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 36

THICKNESS	=	0.04	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999993000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	1509.00	INCHES
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2920	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02	CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 2

THICKNESS	=	12.00	INCHES

POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.0620	VOL/VOL
WILTING POINT	=	0.0240	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0620	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.579999993000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	100.0	FEET

LAYER 6

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.10	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	0.75	HOLES/ACRE
FML INSTALLATION DEFECTS	=	2.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

LAYER 7

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 17

THICKNESS	=	0.24	INCHES
POROSITY	=	0.7500	VOL/VOL
FIELD CAPACITY	=	0.7470	VOL/VOL
WILTING POINT	=	0.4000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.7470	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.300000003000E-08	CM/SEC

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 670. FEET.

SCS RUNOFF CURVE NUMBER	=	74.50	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.986	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	3.006	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.810	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	459.910	INCHES
TOTAL INITIAL WATER	=	459.910	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BATON ROUGE LOUISIANA

STATION LATITUDE	=	30.32	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.50	
START OF GROWING SEASON (JULIAN DATE)	=	39	
END OF GROWING SEASON (JULIAN DATE)	=	351	
EVAPORATIVE ZONE DEPTH	=	6.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.70	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	78.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
4.58	4.97	4.59	5.59	4.82	3.11
7.07	5.05	4.42	2.63	3.95	4.99

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
50.80	53.60	60.50	68.40	74.80	80.30
82.10	81.40	77.90	68.20	58.70	53.10

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BATON ROUGE LOUISIANA
AND STATION LATITUDE = 30.32 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.61	140154.344	100.00
RUNOFF	5.580	20254.498	14.45
EVAPOTRANSPIRATION	33.023	119873.719	85.53
PERC./LEAKAGE THROUGH LAYER 3	0.001391	5.050	0.00
AVG. HEAD ON TOP OF LAYER 2	2.4240		
DRAINAGE COLLECTED FROM LAYER 5	0.0014	5.026	0.00
PERC./LEAKAGE THROUGH LAYER 6	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0006		
PERC./LEAKAGE THROUGH LAYER 8	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 8	0.0000		
CHANGE IN WATER STORAGE	0.006	20.937	0.01
SOIL WATER AT START OF YEAR	460.089	1670123.870	
SOIL WATER AT END OF YEAR	460.095	1670144.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.153	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	57.73	209559.891	100.00
RUNOFF	21.790	79096.984	37.74
EVAPOTRANSPIRATION	35.925	130407.328	62.23
PERC./LEAKAGE THROUGH LAYER 3	0.001402	5.090	0.00
AVG. HEAD ON TOP OF LAYER 2	2.4361		
DRAINAGE COLLECTED FROM LAYER 5	0.0015	5.438	0.00
PERC./LEAKAGE THROUGH LAYER 6	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0006		
PERC./LEAKAGE THROUGH LAYER 8	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 8	0.0000		
CHANGE IN WATER STORAGE	0.014	50.183	0.02
SOIL WATER AT START OF YEAR	460.095	1670144.870	
SOIL WATER AT END OF YEAR	460.109	1670195.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.061	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	67.66	245605.734	100.00
RUNOFF	30.721	111516.875	45.40

EVAPOTRANSPIRATION	37.122	134751.047	54.86
PERC./LEAKAGE THROUGH LAYER 3	0.001833	6.652	0.00
AVG. HEAD ON TOP OF LAYER 2	3.2047		
DRAINAGE COLLECTED FROM LAYER 5	0.0017	6.139	0.00
PERC./LEAKAGE THROUGH LAYER 6	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0007		
PERC./LEAKAGE THROUGH LAYER 8	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 8	0.0000		
CHANGE IN WATER STORAGE	-0.184	-668.107	-0.27
SOIL WATER AT START OF YEAR	460.109	1670195.000	
SOIL WATER AT END OF YEAR	459.925	1669526.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.236	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.12	178305.609	100.00
RUNOFF	13.365	48516.594	27.21
EVAPOTRANSPIRATION	35.591	129195.164	72.46
PERC./LEAKAGE THROUGH LAYER 3	0.001580	5.734	0.00
AVG. HEAD ON TOP OF LAYER 2	2.7612		
DRAINAGE COLLECTED FROM LAYER 5	0.0016	5.886	0.00
PERC./LEAKAGE THROUGH LAYER 6	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0007		
PERC./LEAKAGE THROUGH LAYER 8	0.000003	0.009	0.00

AVG. HEAD ON TOP OF LAYER 8	0.0000		
CHANGE IN WATER STORAGE	0.162	587.903	0.33
SOIL WATER AT START OF YEAR	459.925	1669526.870	
SOIL WATER AT END OF YEAR	460.087	1670114.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.056	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.67	147632.109	100.00
RUNOFF	9.766	35451.664	24.01
EVAPOTRANSPIRATION	30.970	112422.656	76.15
PERC./LEAKAGE THROUGH LAYER 3	0.001178	4.278	0.00
AVG. HEAD ON TOP OF LAYER 2	2.0382		
DRAINAGE COLLECTED FROM LAYER 5	0.0013	4.576	0.00
PERC./LEAKAGE THROUGH LAYER 6	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0005		
PERC./LEAKAGE THROUGH LAYER 8	0.000003	0.009	0.00
AVG. HEAD ON TOP OF LAYER 8	0.0000		
CHANGE IN WATER STORAGE	-0.068	-246.815	-0.17
SOIL WATER AT START OF YEAR	460.087	1670114.870	
SOIL WATER AT END OF YEAR	460.019	1669868.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.019	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.49	2.68	5.55	2.92	3.15	3.49
	7.40	6.70	4.92	2.72	2.77	4.96
STD. DEVIATIONS	1.87	0.88	5.45	1.76	0.48	1.88
	4.14	3.58	2.85	1.55	1.47	0.60
RUNOFF						
TOTALS	2.202	0.825	2.793	0.965	0.078	0.114
	1.349	1.801	1.101	0.230	1.003	3.784
STD. DEVIATIONS	2.127	0.685	4.170	0.954	0.150	0.254
	2.623	2.172	2.242	0.408	0.926	0.660
EVAPOTRANSPIRATION						
TOTALS	1.538	2.199	3.133	3.072	2.833	3.292
	5.360	4.859	3.941	1.999	1.270	1.030
STD. DEVIATIONS	0.169	0.119	0.429	1.551	0.436	1.657
	1.462	0.916	1.533	0.874	0.295	0.082
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.0002	0.0002	0.0002	0.0001	0.0000	0.0000
	0.0001	0.0001	0.0001	0.0000	0.0002	0.0003
STD. DEVIATIONS	0.0000	0.0000	0.0001	0.0001	0.0000	0.0001
	0.0001	0.0001	0.0001	0.0000	0.0001	0.0000
LATERAL DRAINAGE COLLECTED FROM LAYER 5						
TOTALS	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PERCOLATION/LEAKAGE THROUGH LAYER 6						

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	5.1374	3.9524	3.4725	1.2758	0.6556	0.6692
	1.3631	2.0929	2.3115	0.6694	3.6198	5.6548
STD. DEVIATIONS	0.5201	0.5016	1.4685	1.1509	0.3558	1.0769
	1.3682	1.5821	1.6831	0.4129	2.3503	0.1954

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0010	0.0010	0.0010	0.0008	0.0005	0.0004
	0.0003	0.0004	0.0004	0.0004	0.0005	0.0007
STD. DEVIATIONS	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001
	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 5

	INCHES		CU. FEET	PERCENT
PRECIPITATION	50.76	(12.107)	184251.5	100.00
RUNOFF	16.244	(10.0537)	58967.32	32.004

EVAPOTRANSPIRATION	34.526	(2.4863)	125329.99	68.021
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.00148	(0.00024)	5.361	0.00291
AVERAGE HEAD ON TOP OF LAYER 2	2.573	(0.436)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.00149	(0.00017)	5.413	0.00294
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00000	(0.00000)	0.009	0.00000
AVERAGE HEAD ON TOP OF LAYER 6	0.001	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00000	(0.00000)	0.009	0.00000
AVERAGE HEAD ON TOP OF LAYER 8	0.000	(0.000)		
CHANGE IN WATER STORAGE	-0.014	(0.1265)	-51.18	-0.028

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 5

	(INCHES)	(CU. FT.)
PRECIPITATION	5.41	19638.299
RUNOFF	3.983	14459.4053
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.000009	0.03357
AVERAGE HEAD ON TOP OF LAYER 2	6.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00001	0.02836
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000000	0.00003
AVERAGE HEAD ON TOP OF LAYER 6	0.001	
MAXIMUM HEAD ON TOP OF LAYER 6	0.004	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0.0 FEET	