CALCULATIONS

Date:	8/28/13	**Made by:**	DPM
Project No.:	130-0193	**Checked by:**	JRD
Subject:	HELP Modeling	**Reviewed by:**	ATN
Project Short Title:	**CHESAPEAKE ENERGY CENTER ASH LANDFILL - SWP #440**		

1.0 OBJECTIVE

The objective of this analysis is to model the existing conditions of the CEC ash landfill and develop a leachate production flow rate to be used for design of the leachate collection system, which will be installed at the landfill. The leachate collection system will be installed during the initial stages of closure construction; therefore as part of the analysis, the anticipated flow volumes following closure will be evaluated. Hydraulic head on the existing bottom liner system was not evaluated.

2.0 METHOD

The analysis was performed using The Hydrologic Evaluation of Landfill Performance (HELP) Model (v3.07) for the following scenarios:

- Open (O): 42-foot lift of fly ash on top of the base liner system.
- Intermediate Cover (IC): 21-foot lift of fly ash in place, 12-inch vegetated soil cover.
- Closed (C): Geomembrane closure cap in place.

3.0 MODEL INPUTS AND ASSUMPTIONS

1. Evapotranspiration data was synthetically generated for 25 years based on data obtained from Richmond, Virginia. Default values for station latitude, start & end of growing season (Julian Date), relative humidity and average annual wind speed were used. This data is included in the attached output files.

2. The evaporative zone depth, the maximum depth from which water may be removed by evapotranspiration, was assumed to be 10 inches for open ash (O) and 22 inches for cover soil (IC or C).

3. The Open condition lift thickness of ash was set at 42 feet, corresponding to approximately the average thickness of in-place ash at the landfill.

4. The Intermediate Cover ash thickness was presumed to be at a point midway up the existing slope and was set at a thickness of 21 feet of ash with 12 inches of vegetated cover soil. This thickness was chosen as the midpoint of the IC slope.

5. The maximum leaf area (LAI), a dimensionless ratio of the leaf area of actively transpiring vegetation to the nominal surface area of the land on which the vegetation is growing, was assumed to be 0 for ash and 3 for cover soil (IC or C).

6. Precipitation data was synthetically generated for 25 years using coefficients for Norfolk, Virginia. Default normal mean monthly precipitation data was used. This data is included in the attached output files.

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7. Temperature data was synthetically generated for 25 years using coefficients for Norfolk, Virginia. Default normal mean monthly temperature data was used.

8. Solar radiation data was synthetically generated for 25 years using coefficients for Norfolk, Virginia and station latitude of 36.54 degrees.

9. The analysis was performed using an assumed landfill area (area projected on a horizontal plane) of 1 acre for all three scenarios. Consequently, all model outputs are "per acre" which allows them to be scaled for use under various scenarios.

10. Initial moisture content of the layers and snow water were computed as nearly steady-state values by the computer program for the Open condition. Follow-on IC and C scenario moisture contents were manually input from the final output of the previous model (e.g. O used for IC and IC used for C).

11. For runoff, the Natural Resource Conservation Service (NRCS) runoff curve number (CN) was chosen based on the cover condition. A CN of 90 was used and runoff was allowed for 50% of the area during the Open condition to force generation of leachate in the model. Under IC and C conditions, a CN of 74 was used with 100% runoff allowed.

12. The pinhole density for the bottom geomembrane is 1 per acre, and 0 per acre for the closure cap.

13. The installation quality is "good" and the geomembrane defect density for the bottom geomembrane is 1 per acre, and 0 per acre for the closure cap.

14. Although no drainage layer is known to have been installed, an assumed bottom slope of 2.0% and a 4-foot thick lateral drainage layer was specified in order to force the HELP model to calculate leachate production.

The following tables summarize the landfill layer components analyzed along with the HELP Model layer type and number designation for the computer program for each modeled condition. The permeability of the geocomposite drainage layer in the closure cap was set at 7.87 cm/s to reflect the as-computed hydraulic conductivity from the manufacturer-specified transmissivity.

Table 1 HELP Model Layers – Open Conditions

Model Component	HELP Model Layer Type	HELP Model Default Material Texture #	Permeability (k), cm/s
504" ash fill	Vertical Percolation	30	5.0×10^{-5}
48" Drainage Layer	Lateral Drainage	31	4.1×10^{-3}
20 mil HDPE Liner	Geomembrane Liner	35	2.0×10^{-13}

Table 2 HELP Model Layers – Intermediate Cover Conditions

Model Component	HELP Model Layer Type	HELP Model Default Material Texture #	Permeability (k), cm/s
12" Interim Cover Soil	Vertical Percolation	10	1.2×10^{-4}
252" ash fill	Vertical Percolation	30	5.0×10^{-5}
48" Drainage Layer	Lateral Drainage	31	4.1×10^{-3}
20 mil HDPE Liner	Geomembrane Liner	35	2.0×10^{-13}

Table 3 HELP Model Layers – Final Closure Conditions			
Model Component	**HELP Model Layer Type**	**HELP Model Default Material Texture #**	**Permeability (k), cm/s**
24" Cover Soil	Vertical Percolation	12	3.3×10^{-5}
250 mil Geocomposite	Lateral Drainage	34 (modified)	7.87
40 mil HDPE Liner	Geomembrane Liner	35	2.0×10^{-13}
12" Interim Cover Soil	Vertical Percolation	10	1.2×10^{-4}
504" FFCP fill	Vertical Percolation	30	5.0×10^{-5}
48" Drainage Layer	Lateral Drainage	31	4.1×10^{-3}
20 mil HDPE Liner	Geomembrane Liner	35	2.0×10^{-13}

Each scenario was run in the model for 25 years to develop the conditions within the landfill that will produce leachate. At the end of the open conditions scenario, the final water storage values were transferred to the intermediate cover model to serve as the starting moisture contents for the layers in the new model. Similarly, the final moisture values were transferred from the intermediate cover model to final closure model. This process more accurately portrays a continuous landfill lifecycle for leachate production modeling.

The value computed for the saturated hydraulic conductivity (cm/s) for the geocomposite in the cap liner system was presumed to be under relatively low loading (approximately 250 psf) and therefore capable of the as-published transmissivity values. A manufacturer (GSE) provided transmissivity value of 5×10^{-4} m^2/sec for a 250-mil material was used, resulting in a computed k of 7.87 cm/s.

Geocomposite Saturated Hydraulic Conductivity Calculation:

$$\left(Transmissivity, \frac{m^2}{\sec}\right)\left(\frac{100\,cm}{m}\right)^2\left(\frac{in}{2.54\,cm}\right)\left(\frac{1}{Thickness, in}\right) = 7.87\frac{cm}{s}$$

4.0 CALCULATIONS AND RESULTS

4.1 Peak Flow Rate

HELP models were run for the Open (O) and Intermediate Cover (IC), and these models were used to determine a peak flow rate for pipe capacity sizing. The peak day was found in the IC model at 0.04712 inches, and this was selected as the design flow basis. The flow was then computed in Gallons Per Minute (GPM) for the full area of the landfill.

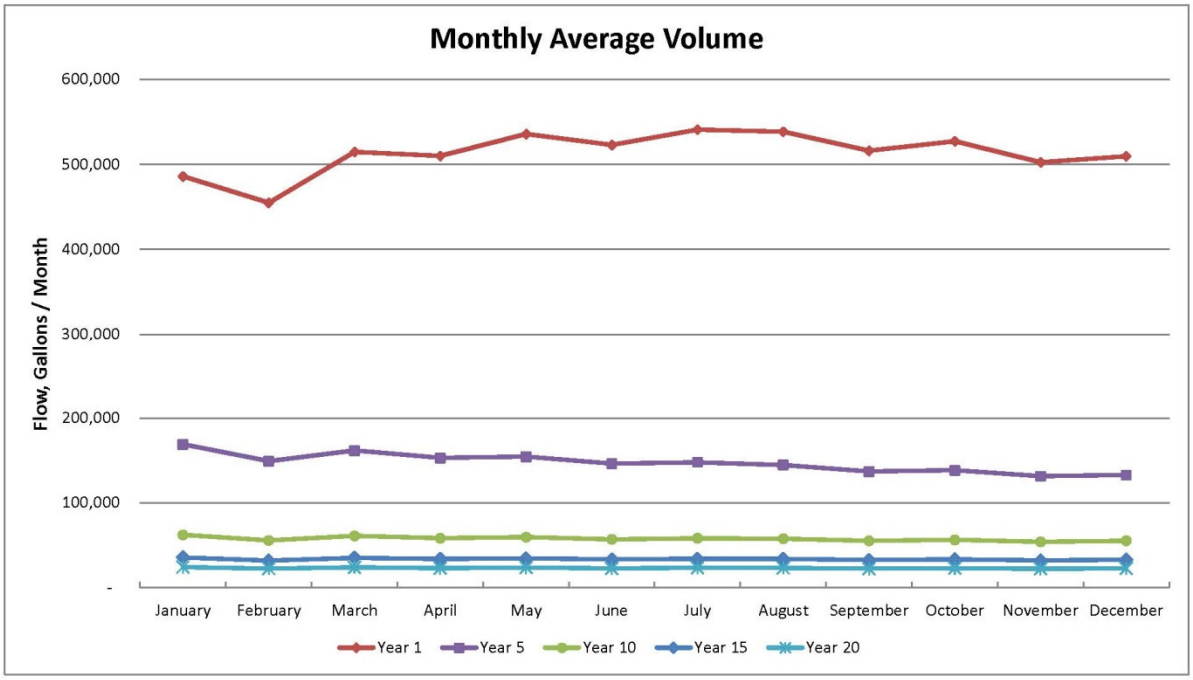
$$\left(depth, \frac{ac-in}{day}\right)\left(\frac{1\,ft}{12\,in}\right)\left(\frac{43{,}560\,ft^2}{1\,ac}\right)\left(\frac{7.4805\,gallons}{ft^3}\right)\left(\frac{1\,day}{1{,}440\,\min}\right) = 0.8885\frac{gal}{\min} \text{ [per acre]}$$

For the full lined area of the landfill, the peak daily flow is then 22.3 x 0.8885 = 19.8 GPM. A factor of safety of 3.0 was applied for design and the design flow used for system sizing was 59.4 GPM.

4.2 Leachate Volume

The proposed collection system will be installed within the perimeter of the landfill as one of the first activities of closure construction. It is anticipated that the system's highest flows will be immediately after installation and decrease after time. The closure cap geomembrane system will effectively isolate the landfill mass; therefore, the leachate production rate will not be influenced by precipitation events.

The HELP model was run under the closure conditions for a 25-year period and, as anticipated, the leachate production rate decreases over time. The chart below shows the modeled monthly leachate volumes during years 1, 5, 10, 15 and 20 following closure.



4.2.1 Average Monthly and Annual Leachate Volume

The average leachate volumes for Years 1, 5, 10, 15 and 20 are shown in Table 1.

Table 1: Post-Closure Leachate Volumes, Gallons

Time Period	Year 1	Year 5	Year 10	Year 15	Year 20
Monthly Average	513,073	147,156	57,491	33,577	23,036
Annual	6,156,878	1,765,873	689,951	402,865	276,429
Monthly Average, as GPM	11.8	3.4	1.3	0.8	0.5

5.0 REFERENCES

1. Schroeder, P.R., Dozier, T.S., Zappi, P.A., McEnroe, B.M., Sjostrom, J.W., and Peyton, R.L. (1994). "Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering Documentation for Version 3," EPA/600/9-94/xxx, U.S. Environmental Protection Agency Risk Reduction Engineering Laboratory, Cincinnati, OH.

2. The Hydrologic Evaluation of Landfill Performance (HELP) Model V3.07, November 1, 1997.

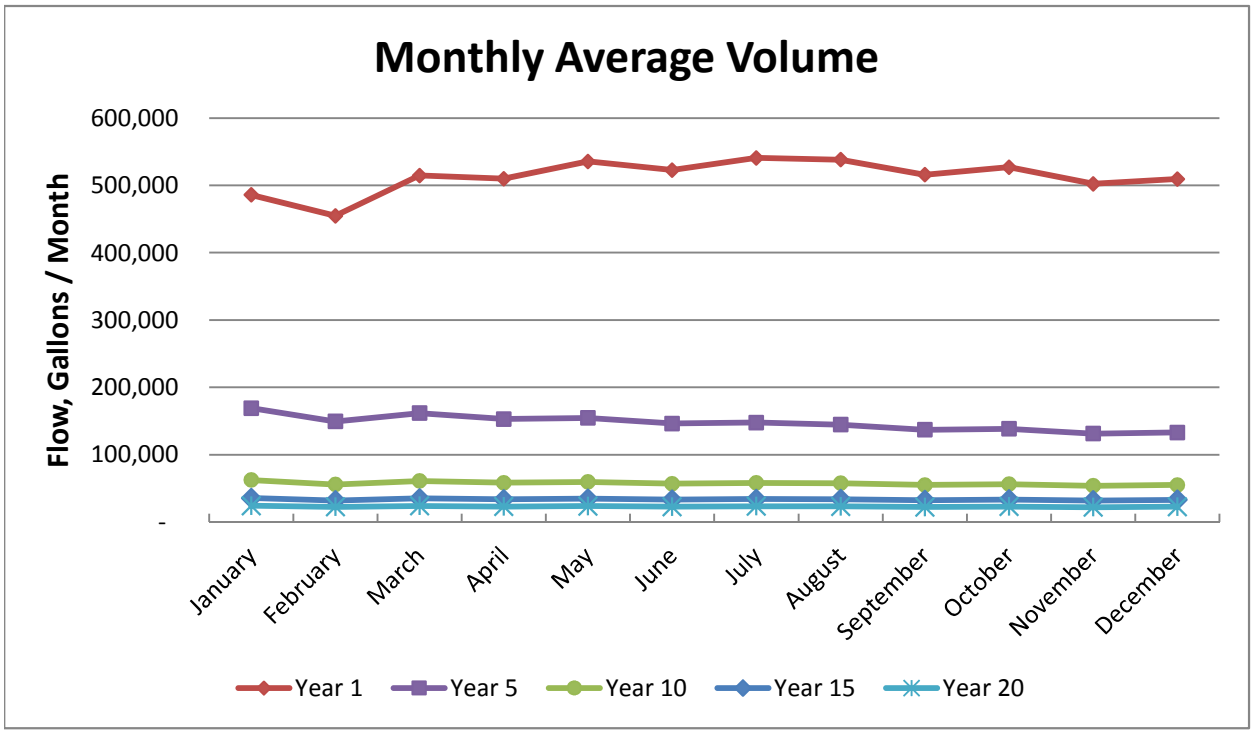
3. "Ash Structural Fill Closure Plan Details" Drawing No. 90-283-E3 prepared by GAI Consultants, Inc., April 1993.

Chesapeake Energy Center
Solid Waste Permit #440

HELP model results for post-closure leachate production

Gallons / Month (22.3 Acre Facility)

Month	Year 1	Year 5	Year 10	Year 15	Year 20
January	485,884	169,006	62,310	35,606	24,161
February	454,639	149,265	55,649	31,912	22,465
March	514,587	161,679	60,917	35,121	23,858
April	509,864	152,959	58,253	33,729	22,950
May	535,539	154,534	59,524	34,576	23,616
June	522,641	146,238	56,981	33,244	22,708
July	540,807	147,812	58,192	34,092	23,374
August	538,264	144,603	57,587	33,850	23,192
September	515,859	136,973	55,104	32,517	22,344
October	527,001	138,547	56,315	33,365	22,950
November	502,355	131,341	53,954	32,033	22,102
December	509,440	132,916	55,104	32,881	22,708
Monthly Avg	513,073	147,156	57,491	33,577	23,036



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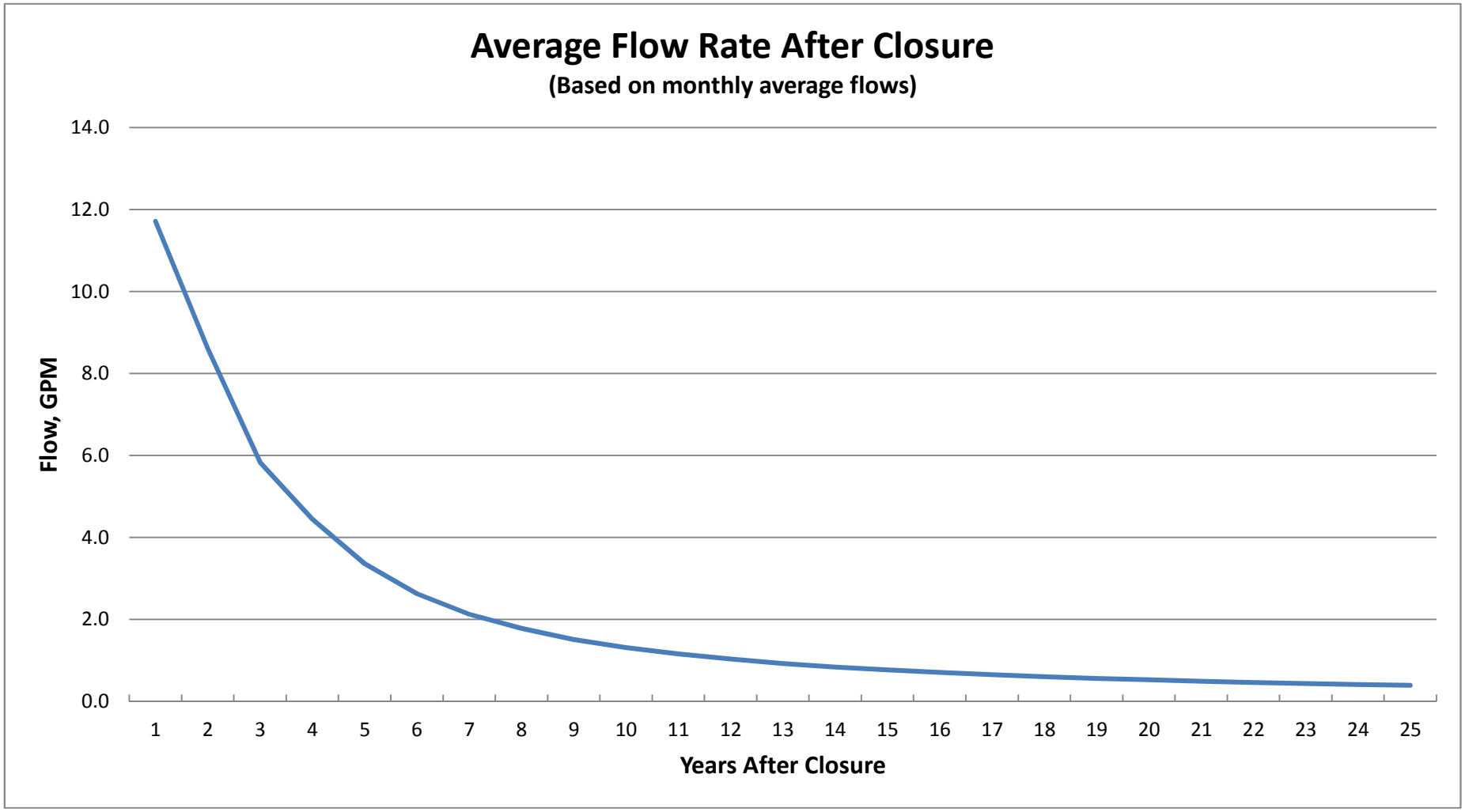

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**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
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 TEMPERATURE DATA FILE:      C:\HELP307\cec-open.D7
 SOLAR RADIATION DATA FILE:  C:\HELP307\cec-open.D13
 EVAPOTRANSPIRATION DATA:    C:\HELP307\cec-open.D11
 SOIL AND DESIGN DATA FILE:  C:\HELP307\cec-open.D10
 OUTPUT DATA FILE:           C:\HELP307\cec-open.OUT

TIME:  15:43     DATE:   7/22/2013

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     TITLE:  CEC - Open Ash Condition

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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  30
          THICKNESS                   =    504.00   INCHES
          POROSITY                    =      0.5410 VOL/VOL
          FIELD CAPACITY              =      0.1870 VOL/VOL
          WILTING POINT               =      0.0470 VOL/VOL
          INITIAL SOIL WATER CONTENT  =      0.2030 VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.499999987000E-04 CM/SEC


                                  LAYER  2
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                       TYPE 2 - LATERAL DRAINAGE LAYER
                         MATERIAL TEXTURE NUMBER  31
          THICKNESS                   =     48.00   INCHES
          POROSITY                    =      0.5780 VOL/VOL
          FIELD CAPACITY              =      0.0760 VOL/VOL
          WILTING POINT               =      0.0250 VOL/VOL
          INITIAL SOIL WATER CONTENT  =      0.0773 VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.410000002000E-02 CM/SEC
          SLOPE                       =      2.00   PERCENT
          DRAINAGE LENGTH             =    350.0    FEET
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LAYER 3

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.02	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	=	1.00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	1.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	90.00	
FRACTION OF AREA ALLOWING RUNOFF	=	50.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	10.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.350	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.410	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.470	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	106.010	INCHES
TOTAL INITIAL WATER	=	106.010	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
RICHMOND VIRGINIA

STATION LATITUDE	=	37.50	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	91	
END OF GROWING SEASON (JULIAN DATE)	=	306	
EVAPORATIVE ZONE DEPTH	=	10.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	68.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	73.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.72	3.28	3.86	2.87	3.75	3.45
5.15	5.33	4.35	3.41	2.88	3.17

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
39.90	41.10	48.50	58.20	66.40	74.30
78.40	77.70	72.20	61.30	51.90	43.50

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA
AND STATION LATITUDE = 36.54 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	44.46	161389.797	100.00
RUNOFF	3.229	11722.678	7.26
EVAPOTRANSPIRATION	32.916	119486.469	74.04
DRAINAGE COLLECTED FROM LAYER 2	0.0006	2.153	0.00
PERC./LEAKAGE THROUGH LAYER 3	0.001991	7.226	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0012		
CHANGE IN WATER STORAGE	8.312	30171.328	18.69
SOIL WATER AT START OF YEAR	106.922	388128.437	
SOIL WATER AT END OF YEAR	115.234	418299.750	
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	-0.054	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	56.36	204586.797	100.00
RUNOFF	6.534	23718.758	11.59
EVAPOTRANSPIRATION	33.393	121216.680	59.25
DRAINAGE COLLECTED FROM LAYER 2	0.0017	5.995	0.00
PERC./LEAKAGE THROUGH LAYER 3	0.004402	15.979	0.01
AVG. HEAD ON TOP OF LAYER 3	0.0034		
CHANGE IN WATER STORAGE	16.427	59629.402	29.15
SOIL WATER AT START OF YEAR	115.234	418299.750	
SOIL WATER AT END OF YEAR	131.562	477570.531	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.099	358.608	0.18
ANNUAL WATER BUDGET BALANCE	0.0000	-0.005	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	60.28	218816.406	100.00
RUNOFF	7.945	28841.086	13.18
EVAPOTRANSPIRATION	36.722	133300.187	60.92
DRAINAGE COLLECTED FROM LAYER 2	0.0043	15.670	0.01
PERC./LEAKAGE THROUGH LAYER 3	0.008218	29.831	0.01
AVG. HEAD ON TOP OF LAYER 3	0.0088		
CHANGE IN WATER STORAGE	15.600	56629.684	25.88
SOIL WATER AT START OF YEAR	131.562	477570.531	
SOIL WATER AT END OF YEAR	147.014	533659.312	
SNOW WATER AT START OF YEAR	0.099	358.608	0.16
SNOW WATER AT END OF YEAR	0.248	899.540	0.41
ANNUAL WATER BUDGET BALANCE	0.0000	-0.042	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.53	139863.875	100.00
RUNOFF	1.937	7029.841	5.03
EVAPOTRANSPIRATION	32.371	117507.086	84.02
DRAINAGE COLLECTED FROM LAYER 2	1.1176	4056.757	2.90
PERC./LEAKAGE THROUGH LAYER 3	0.600802	2180.909	1.56
AVG. HEAD ON TOP OF LAYER 3	2.2937		
CHANGE IN WATER STORAGE	2.504	9089.274	6.50
SOIL WATER AT START OF YEAR	147.014	533659.312	
SOIL WATER AT END OF YEAR	149.765	543648.125	
SNOW WATER AT START OF YEAR	0.248	899.540	0.64
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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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	47.97	174131.156	100.00
RUNOFF	4.512	16377.521	9.41
EVAPOTRANSPIRATION	32.985	119736.469	68.76
DRAINAGE COLLECTED FROM LAYER 2	3.3392	12121.432	6.96
PERC./LEAKAGE THROUGH LAYER 3	1.555471	5646.359	3.24
AVG. HEAD ON TOP OF LAYER 3	6.8870		
CHANGE IN WATER STORAGE	5.578	20249.369	11.63
SOIL WATER AT START OF YEAR	149.765	543648.125	
SOIL WATER AT END OF YEAR	155.344	563897.500	
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	0.011	0.00

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ANNUAL TOTALS FOR YEAR 6

	INCHES	CU. FEET	PERCENT
PRECIPITATION	47.08	170900.391	100.00
RUNOFF	2.918	10593.738	6.20
EVAPOTRANSPIRATION	34.733	126082.031	73.78
DRAINAGE COLLECTED FROM LAYER 2	4.5116	16377.109	9.58
PERC./LEAKAGE THROUGH LAYER 3	2.001339	7264.860	4.25
AVG. HEAD ON TOP OF LAYER 3	9.3037		
CHANGE IN WATER STORAGE	2.915	10582.755	6.19
SOIL WATER AT START OF YEAR	155.344	563897.500	
SOIL WATER AT END OF YEAR	158.259	574480.250	
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	-0.100	0.00

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ANNUAL TOTALS FOR YEAR 7

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.06	152677.781	100.00
RUNOFF	4.240	15391.515	10.08
EVAPOTRANSPIRATION	30.279	109911.500	71.99
DRAINAGE COLLECTED FROM LAYER 2	4.4850	16280.399	10.66
PERC./LEAKAGE THROUGH LAYER 3	1.990731	7226.354	4.73
AVG. HEAD ON TOP OF LAYER 3	9.2510		
CHANGE IN WATER STORAGE	1.066	3868.008	2.53
SOIL WATER AT START OF YEAR	158.259	574480.250	
SOIL WATER AT END OF YEAR	159.325	578348.250	
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	0.001	0.00

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ANNUAL TOTALS FOR YEAR 8

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.89	148430.719	100.00
RUNOFF	4.002	14526.671	9.79
EVAPOTRANSPIRATION	31.676	114984.820	77.47
DRAINAGE COLLECTED FROM LAYER 2	5.2157	18933.113	12.76
PERC./LEAKAGE THROUGH LAYER 3	2.265596	8224.114	5.54
AVG. HEAD ON TOP OF LAYER 3	10.7338		
CHANGE IN WATER STORAGE	-2.269	-8238.011	-5.55
SOIL WATER AT START OF YEAR	159.325	578348.250	
SOIL WATER AT END OF YEAR	157.055	570110.250	
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	0.001	0.00

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ANNUAL TOTALS FOR YEAR 9

	INCHES	CU. FEET	PERCENT
PRECIPITATION	55.94	203062.203	100.00
RUNOFF	5.103	18525.564	9.12
EVAPOTRANSPIRATION	32.131	116637.250	57.44
DRAINAGE COLLECTED FROM LAYER 2	5.1591	18727.385	9.22
PERC./LEAKAGE THROUGH LAYER 3	2.243256	8143.021	4.01
AVG. HEAD ON TOP OF LAYER 3	10.6438		
CHANGE IN WATER STORAGE	11.303	41028.996	20.21
SOIL WATER AT START OF YEAR	157.055	570110.250	
SOIL WATER AT END OF YEAR	168.210	610602.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.148	536.683	0.26
ANNUAL WATER BUDGET BALANCE	0.0000	-0.006	0.00

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ANNUAL TOTALS FOR YEAR 10

	INCHES	CU. FEET	PERCENT
PRECIPITATION	46.23	167814.891	100.00
RUNOFF	4.574	16603.568	9.89
EVAPOTRANSPIRATION	30.512	110758.242	66.00
DRAINAGE COLLECTED FROM LAYER 2	7.3986	26856.949	16.00
PERC./LEAKAGE THROUGH LAYER 3	3.070177	11144.744	6.64
AVG. HEAD ON TOP OF LAYER 3	15.2226		
CHANGE IN WATER STORAGE	0.675	2451.409	1.46
SOIL WATER AT START OF YEAR	168.210	610602.562	
SOIL WATER AT END OF YEAR	169.033	613590.625	
SNOW WATER AT START OF YEAR	0.148	536.683	0.32
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.010	0.00

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ANNUAL TOTALS FOR YEAR 11

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.51	154311.344	100.00
RUNOFF	3.259	11830.197	7.67
EVAPOTRANSPIRATION	32.029	116264.758	75.34
DRAINAGE COLLECTED FROM LAYER 2	8.8863	32257.350	20.90
PERC./LEAKAGE THROUGH LAYER 3	3.617972	13133.238	8.51
AVG. HEAD ON TOP OF LAYER 3	18.3164		
CHANGE IN WATER STORAGE	-5.282	-19174.316	-12.43
SOIL WATER AT START OF YEAR	169.033	613590.625	
SOIL WATER AT END OF YEAR	163.751	594416.312	
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	0.126	0.00

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ANNUAL TOTALS FOR YEAR 12

	INCHES	CU. FEET	PERCENT
PRECIPITATION	34.85	126505.508	100.00
RUNOFF	2.799	10161.035	8.03
EVAPOTRANSPIRATION	27.502	99833.437	78.92
DRAINAGE COLLECTED FROM LAYER 2	7.3833	26801.350	21.19
PERC./LEAKAGE THROUGH LAYER 3	3.066482	11131.328	8.80
AVG. HEAD ON TOP OF LAYER 3	15.1906		
CHANGE IN WATER STORAGE	-5.901	-21421.574	-16.93
SOIL WATER AT START OF YEAR	163.751	594416.312	
SOIL WATER AT END OF YEAR	157.850	572994.750	
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	-0.069	0.00

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ANNUAL TOTALS FOR YEAR 13

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.75	140662.469	100.00
RUNOFF	4.800	17423.568	12.39
EVAPOTRANSPIRATION	23.257	84422.352	60.02
DRAINAGE COLLECTED FROM LAYER 2	5.8617	21277.793	15.13
PERC./LEAKAGE THROUGH LAYER 3	2.504105	9089.902	6.46
AVG. HEAD ON TOP OF LAYER 3	12.0931		
CHANGE IN WATER STORAGE	2.327	8448.823	6.01
SOIL WATER AT START OF YEAR	157.850	572994.750	
SOIL WATER AT END OF YEAR	160.177	581443.562	
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	0.037	0.00

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ANNUAL TOTALS FOR YEAR 14

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.06	138157.812	100.00
RUNOFF	1.586	5758.645	4.17
EVAPOTRANSPIRATION	31.560	114563.562	82.92
DRAINAGE COLLECTED FROM LAYER 2	5.9158	21474.414	15.54
PERC./LEAKAGE THROUGH LAYER 3	2.524281	9163.139	6.63
AVG. HEAD ON TOP OF LAYER 3	12.2120		
CHANGE IN WATER STORAGE	-3.527	-12801.932	-9.27
SOIL WATER AT START OF YEAR	160.177	581443.562	
SOIL WATER AT END OF YEAR	156.651	568641.625	
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	-0.007	0.00

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ANNUAL TOTALS FOR YEAR 15

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.40	164801.984	100.00
RUNOFF	5.196	18860.240	11.44
EVAPOTRANSPIRATION	30.322	110067.875	66.79
DRAINAGE COLLECTED FROM LAYER 2	4.8763	17700.924	10.74
PERC./LEAKAGE THROUGH LAYER 3	2.138136	7761.434	4.71
AVG. HEAD ON TOP OF LAYER 3	10.0702		
CHANGE IN WATER STORAGE	2.868	10411.546	6.32
SOIL WATER AT START OF YEAR	156.651	568641.625	
SOIL WATER AT END OF YEAR	159.519	579053.187	
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 16

	INCHES	CU. FEET	PERCENT
PRECIPITATION	33.48	121532.383	100.00
RUNOFF	1.315	4772.214	3.93
EVAPOTRANSPIRATION	27.968	101522.617	83.54
DRAINAGE COLLECTED FROM LAYER 2	4.8800	17714.408	14.58
PERC./LEAKAGE THROUGH LAYER 3	2.139961	7768.059	6.39
AVG. HEAD ON TOP OF LAYER 3	10.0383		
CHANGE IN WATER STORAGE	-2.822	-10244.880	-8.43
SOIL WATER AT START OF YEAR	159.519	579053.187	
SOIL WATER AT END OF YEAR	156.697	568808.312	
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	-0.035	0.00

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ANNUAL TOTALS FOR YEAR 17

	INCHES	CU. FEET	PERCENT
PRECIPITATION	54.92	199359.641	100.00
RUNOFF	4.928	17889.992	8.97
EVAPOTRANSPIRATION	33.564	121835.766	61.11
DRAINAGE COLLECTED FROM LAYER 2	5.3165	19298.908	9.68
PERC./LEAKAGE THROUGH LAYER 3	2.302263	8357.216	4.19
AVG. HEAD ON TOP OF LAYER 3	10.9758		
CHANGE IN WATER STORAGE	8.809	31977.744	16.04
SOIL WATER AT START OF YEAR	156.697	568808.312	
SOIL WATER AT END OF YEAR	165.506	600786.062	
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	0.010	0.00

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ANNUAL TOTALS FOR YEAR 18

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.76	180628.844	100.00
RUNOFF	5.853	21245.059	11.76
EVAPOTRANSPIRATION	34.521	125309.664	69.37
DRAINAGE COLLECTED FROM LAYER 2	6.5018	23601.535	13.07
PERC./LEAKAGE THROUGH LAYER 3	2.738604	9941.131	5.50
AVG. HEAD ON TOP OF LAYER 3	13.3924		
CHANGE IN WATER STORAGE	0.146	531.351	0.29
SOIL WATER AT START OF YEAR	165.506	600786.062	
SOIL WATER AT END OF YEAR	165.652	601317.375	
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	0.107	0.00

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ANNUAL TOTALS FOR YEAR 19

	INCHES	CU. FEET	PERCENT
PRECIPITATION	52.23	189594.875	100.00
RUNOFF	5.149	18692.178	9.86
EVAPOTRANSPIRATION	30.110	109301.031	57.65
DRAINAGE COLLECTED FROM LAYER 2	7.6160	27646.051	14.58
PERC./LEAKAGE THROUGH LAYER 3	3.151540	11440.091	6.03
AVG. HEAD ON TOP OF LAYER 3	15.7072		
CHANGE IN WATER STORAGE	6.203	22515.738	11.88
SOIL WATER AT START OF YEAR	165.652	601317.375	
SOIL WATER AT END OF YEAR	171.855	623833.125	
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	-0.0001	-0.219	0.00

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ANNUAL TOTALS FOR YEAR 20

	INCHES	CU. FEET	PERCENT
PRECIPITATION	51.96	188614.828	100.00
RUNOFF	3.861	14015.785	7.43
EVAPOTRANSPIRATION	32.893	119400.352	63.30
DRAINAGE COLLECTED FROM LAYER 2	8.2082	29795.701	15.80
PERC./LEAKAGE THROUGH LAYER 3	3.352607	12169.964	6.45
AVG. HEAD ON TOP OF LAYER 3	16.7491		
CHANGE IN WATER STORAGE	3.645	13232.972	7.02
SOIL WATER AT START OF YEAR	171.855	623833.125	
SOIL WATER AT END OF YEAR	175.500	637066.125	
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	0.052	0.00

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ANNUAL TOTALS FOR YEAR 21

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.32	164511.578	100.00
RUNOFF	3.660	13284.772	8.08
EVAPOTRANSPIRATION	34.262	124372.750	75.60
DRAINAGE COLLECTED FROM LAYER 2	10.7811	39135.559	23.79
PERC./LEAKAGE THROUGH LAYER 3	4.286473	15559.898	9.46
AVG. HEAD ON TOP OF LAYER 3	22.0214		
CHANGE IN WATER STORAGE	-7.670	-27841.262	-16.92
SOIL WATER AT START OF YEAR	175.500	637066.125	
SOIL WATER AT END OF YEAR	167.831	609224.875	
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	-0.135	0.00

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ANNUAL TOTALS FOR YEAR 22

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.06	178087.781	100.00
RUNOFF	4.199	15241.764	8.56
EVAPOTRANSPIRATION	36.881	133879.437	75.18
DRAINAGE COLLECTED FROM LAYER 2	7.8401	28459.461	15.98
PERC./LEAKAGE THROUGH LAYER 3	3.233660	11738.187	6.59
AVG. HEAD ON TOP OF LAYER 3	16.1871		
CHANGE IN WATER STORAGE	-3.094	-11231.088	-6.31
SOIL WATER AT START OF YEAR	167.831	609224.875	
SOIL WATER AT END OF YEAR	164.737	597993.750	
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	0.010	0.00

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ANNUAL TOTALS FOR YEAR 23

	INCHES	CU. FEET	PERCENT
PRECIPITATION	50.87	184658.094	100.00
RUNOFF	3.581	12999.131	7.04
EVAPOTRANSPIRATION	32.690	118663.602	64.26
DRAINAGE COLLECTED FROM LAYER 2	7.5929	27562.154	14.93
PERC./LEAKAGE THROUGH LAYER 3	3.142118	11405.889	6.18
AVG. HEAD ON TOP OF LAYER 3	15.6668		
CHANGE IN WATER STORAGE	3.864	14027.366	7.60
SOIL WATER AT START OF YEAR	164.737	597993.750	
SOIL WATER AT END OF YEAR	168.601	612021.125	
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	-0.045	0.00

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ANNUAL TOTALS FOR YEAR 24

	INCHES	CU. FEET	PERCENT
PRECIPITATION	52.22	189558.594	100.00
RUNOFF	3.739	13573.855	7.16
EVAPOTRANSPIRATION	31.612	114752.102	60.54
DRAINAGE COLLECTED FROM LAYER 2	9.0731	32935.535	17.37
PERC./LEAKAGE THROUGH LAYER 3	3.685289	13377.601	7.06
AVG. HEAD ON TOP OF LAYER 3	18.6341		
CHANGE IN WATER STORAGE	4.110	14919.523	7.87
SOIL WATER AT START OF YEAR	168.601	612021.125	
SOIL WATER AT END OF YEAR	172.711	626940.625	
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	-0.021	0.00

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ANNUAL TOTALS FOR YEAR 25

	INCHES	CU. FEET	PERCENT
PRECIPITATION	44.99	163313.672	100.00
RUNOFF	3.911	14196.233	8.69
EVAPOTRANSPIRATION	32.355	117449.039	71.92
DRAINAGE COLLECTED FROM LAYER 2	8.7867	31895.787	19.53
PERC./LEAKAGE THROUGH LAYER 3	3.577892	12987.748	7.95
AVG. HEAD ON TOP OF LAYER 3	18.0537		
CHANGE IN WATER STORAGE	-3.641	-13215.081	-8.09
SOIL WATER AT START OF YEAR	172.711	626940.625	
SOIL WATER AT END OF YEAR	169.070	613725.562	
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	-0.046	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 25

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.00	3.14	4.16	2.56	3.53	3.82
	5.99	7.18	4.66	2.53	2.57	3.41
STD. DEVIATIONS	1.89	1.30	1.61	1.14	1.36	1.88
	2.68	2.61	2.66	1.53	1.53	1.66
RUNOFF						
TOTALS	0.154	0.138	0.305	0.061	0.201	0.204
	0.670	1.108	0.746	0.162	0.132	0.232
STD. DEVIATIONS	0.258	0.160	0.452	0.120	0.254	0.213
	0.767	0.771	0.677	0.231	0.214	0.240
EVAPOTRANSPIRATION						
TOTALS	1.549	1.738	3.145	2.850	3.133	3.406
	3.900	4.294	2.955	2.063	1.615	1.323
STD. DEVIATIONS	0.195	0.321	0.265	0.886	0.803	1.410
	1.292	0.861	1.086	0.703	0.433	0.183
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
TOTALS	0.4708	0.4141	0.4348	0.4210	0.4306	0.4419
	0.4915	0.5289	0.5255	0.5272	0.4685	0.4755
STD. DEVIATIONS	0.2767	0.2375	0.2404	0.2308	0.2380	0.2573
	0.2867	0.2998	0.2812	0.2669	0.2380	0.2484
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.1978	0.1748	0.1849	0.1792	0.1836	0.1868
	0.2059	0.2197	0.2179	0.2196	0.1972	0.2007
STD. DEVIATIONS	0.1100	0.0951	0.0970	0.0928	0.0954	0.1017
	0.1125	0.1171	0.1103	0.1056	0.0946	0.0984

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3						
AVERAGES	11.4180	11.0299	10.5575	10.5628	10.4527	11.0752
	11.9116	12.8091	13.1573	12.7842	11.7433	11.5339
STD. DEVIATIONS	6.6917	6.3102	5.8295	5.7825	5.7629	6.4288
	6.9231	7.2306	7.0147	6.4528	5.9457	6.0041

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 25

	INCHES		CU. FEET	PERCENT
PRECIPITATION	46.57	(6.945)	169039.0	100.00
RUNOFF	4.113	(1.4817)	14931.02	8.833
EVAPOTRANSPIRATION	31.970	(2.8704)	116050.36	68.653
LATERAL DRAINAGE COLLECTED FROM LAYER 2	5.63013	(2.95941)	20437.354	12.09032
PERCOLATION/LEAKAGE THROUGH LAYER 3	2.36813	(1.18117)	8596.328	5.08541
AVERAGE HEAD ON TOP OF LAYER 3	11.586	(6.074)		
CHANGE IN WATER STORAGE	2.486	(6.2843)	9023.89	5.338

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               PEAK DAILY VALUES FOR YEARS    1 THROUGH   25
   ------------------------------------------------------------------------
                                              (INCHES)      (CU. FT.)
                                             ----------   -------------
      PRECIPITATION                            4.85         17605.500

      RUNOFF                                   2.141         7771.5937

      DRAINAGE COLLECTED FROM LAYER  2         0.03189        115.77056

      PERCOLATION/LEAKAGE THROUGH LAYER  3     0.012542        45.52798

      AVERAGE HEAD ON TOP OF LAYER  3         23.631

      MAXIMUM HEAD ON TOP OF LAYER  3         30.081

      LOCATION OF MAXIMUM HEAD IN LAYER  2
            (DISTANCE FROM DRAIN)            130.8 FEET

      SNOW WATER                               2.89         10491.8437


      MAXIMUM VEG. SOIL WATER (VOL/VOL)                 0.5069

      MINIMUM VEG. SOIL WATER (VOL/VOL)                 0.0638


       ***  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   25
    ---------------------------------------------------------------------
                   LAYER        (INCHES)       (VOL/VOL)
                   -----        --------       ---------
                     1          153.5193         0.3046

                     2           14.6391         0.3050

                     3            0.0000         0.0000

                  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:\HELP307\cec-ic.D4
 TEMPERATURE DATA FILE:      C:\HELP307\cec-ic.D7
 SOLAR RADIATION DATA FILE:  C:\HELP307\cec-ic.D13
 EVAPOTRANSPIRATION DATA:    C:\HELP307\cec-ic.D11
 SOIL AND DESIGN DATA FILE:  C:\HELP307\cec-ic.D10
 OUTPUT DATA FILE:           C:\HELP307\cec-ic.OUT

TIME:  15:39     DATE:   7/22/2013


 ******************************************************************************
      TITLE:  CEC - Intermediate Cover
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      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER
               WERE SPECIFIED BY THE USER.


                                    LAYER  1
                                    --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  10
           THICKNESS                   =     12.00   INCHES
           POROSITY                    =      0.3980 VOL/VOL
           FIELD CAPACITY              =      0.2440 VOL/VOL
           WILTING POINT               =      0.1360 VOL/VOL
           INITIAL SOIL WATER CONTENT  =      0.2205 VOL/VOL
           EFFECTIVE SAT. HYD. COND.   =  0.119999997000E-03 CM/SEC
         NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.20
                  FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.


                                    LAYER  2
                                    --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  30
           THICKNESS                   =    252.00   INCHES
           POROSITY                    =      0.5410 VOL/VOL
           FIELD CAPACITY              =      0.1870 VOL/VOL
           WILTING POINT               =      0.0470 VOL/VOL
           INITIAL SOIL WATER CONTENT  =      0.3046 VOL/VOL
           EFFECTIVE SAT. HYD. COND.   =  0.499999987000E-04 CM/SEC
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LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 31

THICKNESS	=	48.00	INCHES
POROSITY	=	0.5780	VOL/VOL
FIELD CAPACITY	=	0.0760	VOL/VOL
WILTING POINT	=	0.0250	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3050	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.410000002000E-02	CM/SEC
SLOPE	=	2.00	PERCENT
DRAINAGE LENGTH	=	350.0	FEET

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.02	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	=	1.00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	1.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	74.00	
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	=	5.641	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	10.186	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	2.102	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	63.929	INCHES
TOTAL INITIAL WATER	=	63.929	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
RICHMOND VIRGINIA

STATION LATITUDE	=	37.50 DEGREES
MAXIMUM LEAF AREA INDEX	=	3.00
START OF GROWING SEASON (JULIAN DATE)	=	91
END OF GROWING SEASON (JULIAN DATE)	=	306
EVAPORATIVE ZONE DEPTH	=	22.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	68.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	73.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.72	3.28	3.86	2.87	3.75	3.45
5.15	5.33	4.35	3.41	2.88	3.17

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
39.90	41.10	48.50	58.20	66.40	74.30
78.40	77.70	72.20	61.30	51.90	43.50

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA
AND STATION LATITUDE = 36.54 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	44.46	161389.797	100.00
RUNOFF	0.290	1053.010	0.65
EVAPOTRANSPIRATION	34.071	123676.539	76.63
DRAINAGE COLLECTED FROM LAYER 3	0.0011	4.154	0.00
PERC./LEAKAGE THROUGH LAYER 4	0.003313	12.027	0.01
AVG. HEAD ON TOP OF LAYER 4	0.0024		
CHANGE IN WATER STORAGE	10.095	36644.051	22.71
SOIL WATER AT START OF YEAR	64.841	235372.594	
SOIL WATER AT END OF YEAR	74.936	272016.656	
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 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	56.36	204586.797	100.00
RUNOFF	0.862	3129.348	1.53
EVAPOTRANSPIRATION	36.653	133049.172	65.03
DRAINAGE COLLECTED FROM LAYER 3	0.8509	3088.724	1.51
PERC./LEAKAGE THROUGH LAYER 4	0.419545	1522.949	0.74
AVG. HEAD ON TOP OF LAYER 4	1.7468		
CHANGE IN WATER STORAGE	17.575	63796.680	31.18
SOIL WATER AT START OF YEAR	74.936	272016.656	
SOIL WATER AT END OF YEAR	92.412	335454.719	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.099	358.608	0.18
ANNUAL WATER BUDGET BALANCE	0.0000	-0.065	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	60.28	218816.406	100.00
RUNOFF	1.738	6310.682	2.88
EVAPOTRANSPIRATION	40.069	145449.203	66.47
DRAINAGE COLLECTED FROM LAYER 3	8.3187	30196.734	13.80
PERC./LEAKAGE THROUGH LAYER 4	3.392669	12315.389	5.63
AVG. HEAD ON TOP OF LAYER 4	17.0027		
CHANGE IN WATER STORAGE	6.762	24544.289	11.22
SOIL WATER AT START OF YEAR	92.412	335454.719	
SOIL WATER AT END OF YEAR	99.024	359458.062	
SNOW WATER AT START OF YEAR	0.099	358.608	0.16
SNOW WATER AT END OF YEAR	0.248	899.540	0.41
ANNUAL WATER BUDGET BALANCE	0.0000	0.118	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.53	139863.875	100.00
RUNOFF	0.066	238.617	0.17
EVAPOTRANSPIRATION	33.057	119995.547	85.79
DRAINAGE COLLECTED FROM LAYER 3	10.8354	39332.625	28.12
PERC./LEAKAGE THROUGH LAYER 4	4.307450	15636.043	11.18
AVG. HEAD ON TOP OF LAYER 4	22.0739		
CHANGE IN WATER STORAGE	-9.735	-35338.930	-25.27
SOIL WATER AT START OF YEAR	99.024	359458.062	
SOIL WATER AT END OF YEAR	89.537	325018.687	
SNOW WATER AT START OF YEAR	0.248	899.540	0.64
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.042	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	47.97	174131.156	100.00
RUNOFF	0.531	1926.556	1.11
EVAPOTRANSPIRATION	32.391	117578.000	67.52
DRAINAGE COLLECTED FROM LAYER 3	8.1510	29588.016	16.99
PERC./LEAKAGE THROUGH LAYER 4	3.345155	12142.913	6.97
AVG. HEAD ON TOP OF LAYER 4	16.8061		
CHANGE IN WATER STORAGE	3.553	12895.623	7.41
SOIL WATER AT START OF YEAR	89.537	325018.687	
SOIL WATER AT END OF YEAR	93.089	337914.312	
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	0.056	0.00

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ANNUAL TOTALS FOR YEAR 6

	INCHES	CU. FEET	PERCENT
PRECIPITATION	47.08	170900.391	100.00
RUNOFF	0.199	720.958	0.42
EVAPOTRANSPIRATION	36.420	132205.266	77.36
DRAINAGE COLLECTED FROM LAYER 3	7.3666	26740.682	15.65
PERC./LEAKAGE THROUGH LAYER 4	3.059928	11107.537	6.50
AVG. HEAD ON TOP OF LAYER 4	15.2036		
CHANGE IN WATER STORAGE	0.035	125.983	0.07
SOIL WATER AT START OF YEAR	93.089	337914.312	
SOIL WATER AT END OF YEAR	93.124	338040.281	
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	-0.040	0.00

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ANNUAL TOTALS FOR YEAR 7

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.06	152677.781	100.00
RUNOFF	0.416	1510.009	0.99
EVAPOTRANSPIRATION	30.759	111653.687	73.13
DRAINAGE COLLECTED FROM LAYER 3	7.0915	25742.305	16.86
PERC./LEAKAGE THROUGH LAYER 4	2.956777	10733.100	7.03
AVG. HEAD ON TOP OF LAYER 4	14.5972		
CHANGE IN WATER STORAGE	0.837	3038.690	1.99
SOIL WATER AT START OF YEAR	93.124	338040.281	
SOIL WATER AT END OF YEAR	93.961	341078.969	
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	-0.010	0.00

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ANNUAL TOTALS FOR YEAR 8

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.89	148430.719	100.00
RUNOFF	0.787	2856.724	1.92
EVAPOTRANSPIRATION	31.363	113846.102	76.70
DRAINAGE COLLECTED FROM LAYER 3	7.1377	25909.805	17.46
PERC./LEAKAGE THROUGH LAYER 4	2.976310	10804.005	7.28
AVG. HEAD ON TOP OF LAYER 4	14.6749		
CHANGE IN WATER STORAGE	-1.374	-4985.877	-3.36
SOIL WATER AT START OF YEAR	93.961	341078.969	
SOIL WATER AT END OF YEAR	92.588	336093.094	
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 9

	INCHES	CU. FEET	PERCENT
PRECIPITATION	55.94	203062.203	100.00
RUNOFF	0.234	849.467	0.42
EVAPOTRANSPIRATION	34.476	125146.625	61.63
DRAINAGE COLLECTED FROM LAYER 3	8.6193	31288.193	15.41
PERC./LEAKAGE THROUGH LAYER 4	3.500221	12705.802	6.26
AVG. HEAD ON TOP OF LAYER 4	17.6040		
CHANGE IN WATER STORAGE	9.111	33072.086	16.29
SOIL WATER AT START OF YEAR	92.588	336093.094	
SOIL WATER AT END OF YEAR	101.551	368628.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.148	536.683	0.26
ANNUAL WATER BUDGET BALANCE	0.0000	0.034	0.00

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ANNUAL TOTALS FOR YEAR 10

	INCHES	CU. FEET	PERCENT
PRECIPITATION	46.23	167814.891	100.00
RUNOFF	0.731	2655.004	1.58
EVAPOTRANSPIRATION	33.995	123402.805	73.54
DRAINAGE COLLECTED FROM LAYER 3	11.1622	40518.629	24.14
PERC./LEAKAGE THROUGH LAYER 4	4.415079	16026.735	9.55
AVG. HEAD ON TOP OF LAYER 4	22.7154		
CHANGE IN WATER STORAGE	-4.074	-14788.211	-8.81
SOIL WATER AT START OF YEAR	101.551	368628.500	
SOIL WATER AT END OF YEAR	97.625	354376.969	
SNOW WATER AT START OF YEAR	0.148	536.683	0.32
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 11

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.51	154311.344	100.00
RUNOFF	0.224	811.356	0.53
EVAPOTRANSPIRATION	36.131	131153.734	84.99
DRAINAGE COLLECTED FROM LAYER 3	9.9859	36248.691	23.49
PERC./LEAKAGE THROUGH LAYER 4	4.008702	14551.589	9.43
AVG. HEAD ON TOP OF LAYER 4	20.4959		
CHANGE IN WATER STORAGE	-7.839	-28454.062	-18.44
SOIL WATER AT START OF YEAR	97.625	354376.969	
SOIL WATER AT END OF YEAR	89.786	325922.906	
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 12

	INCHES	CU. FEET	PERCENT
PRECIPITATION	34.85	126505.508	100.00
RUNOFF	0.322	1170.070	0.92
EVAPOTRANSPIRATION	27.616	100245.461	79.24
DRAINAGE COLLECTED FROM LAYER 3	6.4986	23589.861	18.65
PERC./LEAKAGE THROUGH LAYER 4	2.739828	9945.576	7.86
AVG. HEAD ON TOP OF LAYER 4	13.3845		
CHANGE IN WATER STORAGE	-2.327	-8445.472	-6.68
SOIL WATER AT START OF YEAR	89.786	325922.906	
SOIL WATER AT END OF YEAR	87.459	317477.437	
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	0.012	0.00

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ANNUAL TOTALS FOR YEAR 13

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.75	140662.469	100.00
RUNOFF	0.926	3359.985	2.39
EVAPOTRANSPIRATION	26.202	95115.008	67.62
DRAINAGE COLLECTED FROM LAYER 3	5.8482	21228.961	15.09
PERC./LEAKAGE THROUGH LAYER 4	2.498423	9069.275	6.45
AVG. HEAD ON TOP OF LAYER 4	12.0579		
CHANGE IN WATER STORAGE	3.275	11889.253	8.45
SOIL WATER AT START OF YEAR	87.459	317477.437	
SOIL WATER AT END OF YEAR	90.735	329366.687	
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	-0.012	0.00

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ANNUAL TOTALS FOR YEAR 14

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.06	138157.812	100.00
RUNOFF	0.000	1.223	0.00
EVAPOTRANSPIRATION	32.201	116888.125	84.60
DRAINAGE COLLECTED FROM LAYER 3	6.6936	24297.816	17.59
PERC./LEAKAGE THROUGH LAYER 4	2.811547	10205.916	7.39
AVG. HEAD ON TOP OF LAYER 4	13.8344		
CHANGE IN WATER STORAGE	-3.646	-13235.271	-9.58
SOIL WATER AT START OF YEAR	90.735	329366.687	
SOIL WATER AT END OF YEAR	87.089	316131.437	
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	0.012	0.00

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ANNUAL TOTALS FOR YEAR 15

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.40	164801.984	100.00
RUNOFF	0.542	1968.390	1.19
EVAPOTRANSPIRATION	32.783	119004.023	72.21
DRAINAGE COLLECTED FROM LAYER 3	4.8905	17752.373	10.77
PERC./LEAKAGE THROUGH LAYER 4	2.142656	7777.841	4.72
AVG. HEAD ON TOP OF LAYER 4	10.1002		
CHANGE IN WATER STORAGE	5.041	18299.469	11.10
SOIL WATER AT START OF YEAR	87.089	316131.437	
SOIL WATER AT END OF YEAR	92.130	334430.906	
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	-0.105	0.00

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ANNUAL TOTALS FOR YEAR 16

	INCHES	CU. FEET	PERCENT
PRECIPITATION	33.48	121532.383	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	29.559	107300.758	88.29
DRAINAGE COLLECTED FROM LAYER 3	6.8248	24773.994	20.38
PERC./LEAKAGE THROUGH LAYER 4	2.857626	10373.184	8.54
AVG. HEAD ON TOP OF LAYER 4	14.0120		
CHANGE IN WATER STORAGE	-5.762	-20915.564	-17.21
SOIL WATER AT START OF YEAR	92.130	334430.906	
SOIL WATER AT END OF YEAR	86.368	313515.312	
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	0.016	0.00

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ANNUAL TOTALS FOR YEAR 17

	INCHES	CU. FEET	PERCENT
PRECIPITATION	54.92	199359.641	100.00
RUNOFF	0.379	1375.767	0.69
EVAPOTRANSPIRATION	35.853	130144.898	65.28
DRAINAGE COLLECTED FROM LAYER 3	5.8206	21128.861	10.60
PERC./LEAKAGE THROUGH LAYER 4	2.487882	9031.011	4.53
AVG. HEAD ON TOP OF LAYER 4	12.0416		
CHANGE IN WATER STORAGE	10.380	37679.086	18.90
SOIL WATER AT START OF YEAR	86.368	313515.312	
SOIL WATER AT END OF YEAR	96.748	351194.406	
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	0.015	0.00

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ANNUAL TOTALS FOR YEAR 18

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.76	180628.844	100.00
RUNOFF	2.812	10208.035	5.65
EVAPOTRANSPIRATION	35.534	128988.516	71.41
DRAINAGE COLLECTED FROM LAYER 3	8.5628	31082.928	17.21
PERC./LEAKAGE THROUGH LAYER 4	3.485076	12650.826	7.00
AVG. HEAD ON TOP OF LAYER 4	17.5274		
CHANGE IN WATER STORAGE	-0.634	-2301.485	-1.27
SOIL WATER AT START OF YEAR	96.748	351194.406	
SOIL WATER AT END OF YEAR	96.114	348892.937	
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	0.028	0.00

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ANNUAL TOTALS FOR YEAR 19

	INCHES	CU. FEET	PERCENT
PRECIPITATION	52.23	189594.875	100.00
RUNOFF	0.642	2328.782	1.23
EVAPOTRANSPIRATION	31.711	115110.953	60.71
DRAINAGE COLLECTED FROM LAYER 3	8.6186	31285.455	16.50
PERC./LEAKAGE THROUGH LAYER 4	3.518850	12773.425	6.74
AVG. HEAD ON TOP OF LAYER 4	17.7626		
CHANGE IN WATER STORAGE	7.740	28096.330	14.82
SOIL WATER AT START OF YEAR	96.114	348892.937	
SOIL WATER AT END OF YEAR	103.854	376989.250	
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	-0.074	0.00

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ANNUAL TOTALS FOR YEAR 20

	INCHES	CU. FEET	PERCENT
PRECIPITATION	51.96	188614.828	100.00
RUNOFF	0.224	814.890	0.43
EVAPOTRANSPIRATION	35.472	128762.656	68.27
DRAINAGE COLLECTED FROM LAYER 3	13.5803	49296.469	26.14
PERC./LEAKAGE THROUGH LAYER 4	5.178844	18799.205	9.97
AVG. HEAD ON TOP OF LAYER 4	26.7497		
CHANGE IN WATER STORAGE	-2.495	-9058.438	-4.80
SOIL WATER AT START OF YEAR	103.854	376989.250	
SOIL WATER AT END OF YEAR	101.358	367930.812	
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	0.043	0.00

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ANNUAL TOTALS FOR YEAR 21

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.32	164511.578	100.00
RUNOFF	0.299	1085.906	0.66
EVAPOTRANSPIRATION	36.310	131804.531	80.12
DRAINAGE COLLECTED FROM LAYER 3	11.7751	42743.586	25.98
PERC./LEAKAGE THROUGH LAYER 4	4.619768	16769.758	10.19
AVG. HEAD ON TOP OF LAYER 4	23.8668		
CHANGE IN WATER STORAGE	-7.684	-27892.221	-16.95
SOIL WATER AT START OF YEAR	101.358	367930.812	
SOIL WATER AT END OF YEAR	93.675	340038.594	
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	0.024	0.00

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ANNUAL TOTALS FOR YEAR 22

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.06	178087.781	100.00
RUNOFF	0.767	2782.918	1.56
EVAPOTRANSPIRATION	39.825	144563.750	81.18
DRAINAGE COLLECTED FROM LAYER 3	8.1649	29638.523	16.64
PERC./LEAKAGE THROUGH LAYER 4	3.352498	12169.568	6.83
AVG. HEAD ON TOP OF LAYER 4	16.8357		
CHANGE IN WATER STORAGE	-3.049	-11066.941	-6.21
SOIL WATER AT START OF YEAR	93.675	340038.594	
SOIL WATER AT END OF YEAR	90.626	328971.656	
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	-0.048	0.00

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ANNUAL TOTALS FOR YEAR 23

	INCHES	CU. FEET	PERCENT
PRECIPITATION	50.87	184658.094	100.00
RUNOFF	0.076	274.996	0.15
EVAPOTRANSPIRATION	35.016	127107.219	68.83
DRAINAGE COLLECTED FROM LAYER 3	7.9035	28689.809	15.54
PERC./LEAKAGE THROUGH LAYER 4	3.248305	11791.349	6.39
AVG. HEAD ON TOP OF LAYER 4	16.2075		
CHANGE IN WATER STORAGE	4.627	16794.648	9.09
SOIL WATER AT START OF YEAR	90.626	328971.656	
SOIL WATER AT END OF YEAR	95.252	345766.312	
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	0.076	0.00

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ANNUAL TOTALS FOR YEAR 24

	INCHES	CU. FEET	PERCENT
PRECIPITATION	52.22	189558.594	100.00
RUNOFF	0.158	573.826	0.30
EVAPOTRANSPIRATION	33.906	123080.570	64.93
DRAINAGE COLLECTED FROM LAYER 3	9.5690	34735.473	18.32
PERC./LEAKAGE THROUGH LAYER 4	3.862707	14021.628	7.40
AVG. HEAD ON TOP OF LAYER 4	19.6113		
CHANGE IN WATER STORAGE	4.724	17147.064	9.05
SOIL WATER AT START OF YEAR	95.252	345766.312	
SOIL WATER AT END OF YEAR	99.976	362913.375	
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	0.024	0.00

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ANNUAL TOTALS FOR YEAR 25

	INCHES	CU. FEET	PERCENT
PRECIPITATION	44.99	163313.672	100.00
RUNOFF	0.143	520.587	0.32
EVAPOTRANSPIRATION	34.419	124939.414	76.50
DRAINAGE COLLECTED FROM LAYER 3	10.1771	36942.758	22.62
PERC./LEAKAGE THROUGH LAYER 4	4.075170	14792.865	9.06
AVG. HEAD ON TOP OF LAYER 4	20.8385		
CHANGE IN WATER STORAGE	-3.824	-13881.887	-8.50
SOIL WATER AT START OF YEAR	99.976	362913.375	
SOIL WATER AT END OF YEAR	96.152	349031.500	
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	-0.062	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 25

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.00	3.14	4.16	2.56	3.53	3.82
	5.99	7.18	4.66	2.53	2.57	3.41
STD. DEVIATIONS	1.89	1.30	1.61	1.14	1.36	1.88
	2.68	2.61	2.66	1.53	1.53	1.66
RUNOFF						
TOTALS	0.006	0.002	0.116	0.000	0.006	0.003
	0.074	0.169	0.122	0.012	0.010	0.014
STD. DEVIATIONS	0.014	0.008	0.463	0.002	0.018	0.013
	0.214	0.246	0.188	0.037	0.027	0.030
EVAPOTRANSPIRATION						
TOTALS	1.320	1.564	2.930	3.091	4.479	4.037
	4.356	5.188	3.440	1.348	1.079	0.999
STD. DEVIATIONS	0.179	0.270	0.237	0.777	0.789	1.704
	1.424	0.874	0.983	0.351	0.222	0.161
LATERAL DRAINAGE COLLECTED FROM LAYER 3						
TOTALS	0.6337	0.5609	0.5784	0.5511	0.5911	0.6082
	0.6974	0.7352	0.7233	0.7349	0.6841	0.6796
STD. DEVIATIONS	0.2857	0.2465	0.2558	0.2464	0.2754	0.2997
	0.3206	0.3208	0.2901	0.2752	0.2558	0.2646
PERCOLATION/LEAKAGE THROUGH LAYER 4						
TOTALS	0.2593	0.2306	0.2395	0.2285	0.2437	0.2486
	0.2818	0.2956	0.2912	0.2970	0.2777	0.2771
STD. DEVIATIONS	0.1092	0.0951	0.0992	0.0954	0.1053	0.1128
	0.1204	0.1202	0.1079	0.1024	0.0954	0.0988

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4						
AVERAGES	15.3024	14.8810	14.0050	13.7851	14.2775	15.1337
	16.7644	17.6594	17.9692	17.7008	17.0457	16.3973
STD. DEVIATIONS	6.8012	6.4660	6.1516	6.1117	6.5528	7.3026
	7.5249	7.5147	7.0330	6.4616	6.2270	6.2590

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     AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS    1 THROUGH   25
-------------------------------------------------------------------------------
                                       INCHES            CU. FEET       PERCENT
                                  -------------------   -------------   ---------
 PRECIPITATION                     46.57    (   6.945)     169039.0     100.00

 RUNOFF                             0.535   (  0.6109)       1941.08      1.148

 EVAPOTRANSPIRATION                33.832   (  3.2557)     122808.48     72.651

 LATERAL DRAINAGE COLLECTED         7.77791 (  3.00027)     28233.814   16.70255
   FROM LAYER  3

 PERCOLATION/LEAKAGE THROUGH        3.17057 (  1.14572)     11509.182    6.80860
   LAYER  4

 AVERAGE HEAD ON TOP               15.910 (    6.025)
   OF LAYER  4

 CHANGE IN WATER STORAGE            1.252   (  6.6999)       4546.36      2.690

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               PEAK DAILY VALUES FOR YEARS    1 THROUGH   25
   ------------------------------------------------------------------------
                                              (INCHES)      (CU. FT.)
                                             ----------   -------------
      PRECIPITATION                            4.85         17605.500

      RUNOFF                                   2.149         7800.6265

      DRAINAGE COLLECTED FROM LAYER  3         0.04712        171.03398

      PERCOLATION/LEAKAGE THROUGH LAYER  4     0.017411        63.20053

      AVERAGE HEAD ON TOP OF LAYER  4         33.221

      MAXIMUM HEAD ON TOP OF LAYER  4         40.501

      LOCATION OF MAXIMUM HEAD IN LAYER  3
            (DISTANCE FROM DRAIN)            150.2 FEET

      SNOW WATER                               2.89         10491.8437


      MAXIMUM VEG. SOIL WATER (VOL/VOL)                 0.4033

      MINIMUM VEG. SOIL WATER (VOL/VOL)                 0.0955


       ***  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   25
    ----------------------------------------------------------------------
                   LAYER        (INCHES)       (VOL/VOL)
                   -----        --------       ---------
                     1            2.5280         0.2107

                     2           77.3100         0.3068

                     3           15.4019         0.3209

                     4            0.0000         0.0000

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


 PRECIPITATION DATA FILE:    C:\HELP307\cec-ic.D4
 TEMPERATURE DATA FILE:      C:\HELP307\cec-ic.D7
 SOLAR RADIATION DATA FILE:  C:\HELP307\cec-ic.D13
 EVAPOTRANSPIRATION DATA:    C:\HELP307\cec-ic.D11
 SOIL AND DESIGN DATA FILE:  C:\HELP307\cec-cl.D10
 OUTPUT DATA FILE:           C:\HELP307\cec-cl.OUT

TIME:   9:56     DATE:   8/ 28/2013

 ******************************************************************************
      TITLE:  CEC - Closure Cap
******************************************************************************



      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER
               WERE SPECIFIED BY THE USER.


                                   LAYER  1
                                   --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER  13
           THICKNESS                   =     24.00   INCHES
           POROSITY                    =      0.4300 VOL/VOL
           FIELD CAPACITY              =      0.3210 VOL/VOL
           WILTING POINT               =      0.2210 VOL/VOL
           INITIAL SOIL WATER CONTENT  =      0.2500 VOL/VOL
           EFFECTIVE SAT. HYD. COND.   =  0.330000003000E-04 CM/SEC
         NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  4.20
                  FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.


                                   LAYER  2
                                   --------

                       TYPE 2 - LATERAL DRAINAGE LAYER
                         MATERIAL TEXTURE NUMBER   0
           THICKNESS                   =      0.25   INCHES
           POROSITY                    =      0.8500 VOL/VOL
           FIELD CAPACITY              =      0.0100 VOL/VOL
           WILTING POINT               =      0.0050 VOL/VOL
           INITIAL SOIL WATER CONTENT  =      0.0070 VOL/VOL
           EFFECTIVE SAT. HYD. COND.   =   7.86000013000     CM/SEC
           SLOPE                       =      9.46   PERCENT
           DRAINAGE LENGTH             =    270.0    FEET
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                        LAYER  3
                        --------

            TYPE 4 - FLEXIBLE MEMBRANE LINER
              MATERIAL TEXTURE NUMBER  35
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.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =      0.00   HOLES/ACRE
FML INSTALLATION DEFECTS    =      0.00   HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                        LAYER  4
                        --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER  10
THICKNESS                   =     12.00   INCHES
POROSITY                    =      0.3980 VOL/VOL
FIELD CAPACITY              =      0.2440 VOL/VOL
WILTING POINT               =      0.1360 VOL/VOL
INITIAL SOIL WATER CONTENT  =      0.2107 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.119999997000E-03 CM/SEC


                        LAYER  5
                        --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER  30
THICKNESS                   =    504.00   INCHES
POROSITY                    =      0.5410 VOL/VOL
FIELD CAPACITY              =      0.1870 VOL/VOL
WILTING POINT               =      0.0470 VOL/VOL
INITIAL SOIL WATER CONTENT  =      0.3068 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.499999987000E-04 CM/SEC


                        LAYER  6
                        --------

            TYPE 2 - LATERAL DRAINAGE LAYER
              MATERIAL TEXTURE NUMBER  31
THICKNESS                   =     48.00   INCHES
POROSITY                    =      0.5780 VOL/VOL
FIELD CAPACITY              =      0.0760 VOL/VOL
WILTING POINT               =      0.0250 VOL/VOL
INITIAL SOIL WATER CONTENT  =      0.3209 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.410000002000E-02 CM/SEC
SLOPE                       =      2.00   PERCENT
DRAINAGE LENGTH             =    350.0    FEET
```

LAYER 7

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.02	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	=	1.00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	1.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	74.00	
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	=	5.500	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	9.460	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	4.862	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	178.561	INCHES
TOTAL INITIAL WATER	=	178.561	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
RICHMOND VIRGINIA

STATION LATITUDE	=	37.50	DEGREES
MAXIMUM LEAF AREA INDEX	=	3.00	
START OF GROWING SEASON (JULIAN DATE)	=	91	
END OF GROWING SEASON (JULIAN DATE)	=	306	
EVAPORATIVE ZONE DEPTH	=	22.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	68.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	73.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.72	3.28	3.86	2.87	3.75	3.45
5.15	5.33	4.35	3.41	2.88	3.17

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
39.90	41.10	48.50	58.20	66.40	74.30
78.40	77.70	72.20	61.30	51.90	43.50

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR NORFOLK VIRGINIA
AND STATION LATITUDE = 36.54 DEGREES

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ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	44.46	161389.797	100.00
RUNOFF	0.485	1759.983	1.09
EVAPOTRANSPIRATION	32.598	118332.195	73.32
DRAINAGE COLLECTED FROM LAYER 2	9.5203	34558.738	21.41
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.004	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0017		
DRAINAGE COLLECTED FROM LAYER 6	10.1676	36908.395	22.87
PERC./LEAKAGE THROUGH LAYER 7	4.073444	14786.602	9.16
AVG. HEAD ON TOP OF LAYER 7	20.8428		
CHANGE IN WATER STORAGE	-12.385	-44956.035	-27.86
SOIL WATER AT START OF YEAR	184.940	671331.125	
SOIL WATER AT END OF YEAR	172.555	626375.062	
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	-0.076	0.00

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ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	56.36	204586.797	100.00
RUNOFF	2.687	9752.949	4.77
EVAPOTRANSPIRATION	34.402	124879.664	61.04
DRAINAGE COLLECTED FROM LAYER 2	17.3265	62895.332	30.74
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.007	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0030		
DRAINAGE COLLECTED FROM LAYER 6	7.4647	27096.969	13.24
PERC./LEAKAGE THROUGH LAYER 7	3.093945	11231.021	5.49
AVG. HEAD ON TOP OF LAYER 7	15.4126		
CHANGE IN WATER STORAGE	-8.614	-31269.186	-15.28
SOIL WATER AT START OF YEAR	172.555	626375.062	
SOIL WATER AT END OF YEAR	163.842	594747.250	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.099	358.608	0.18
ANNUAL WATER BUDGET BALANCE	0.0000	0.052	0.00

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ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	60.28	218816.406	100.00
RUNOFF	4.050	14702.683	6.72
EVAPOTRANSPIRATION	39.093	141909.125	64.85
DRAINAGE COLLECTED FROM LAYER 2	18.3029	66439.648	30.36
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0032		
DRAINAGE COLLECTED FROM LAYER 6	5.0634	18380.082	8.40
PERC./LEAKAGE THROUGH LAYER 7	2.207951	8014.863	3.66

AVG. HEAD ON TOP OF LAYER 7	10.4540		
CHANGE IN WATER STORAGE	-8.438	-30630.064	-14.00
SOIL WATER AT START OF YEAR	163.842	594747.250	
SOIL WATER AT END OF YEAR	155.255	563576.250	
SNOW WATER AT START OF YEAR	0.099	358.608	0.16
SNOW WATER AT END OF YEAR	0.248	899.540	0.41
ANNUAL WATER BUDGET BALANCE	0.0000	0.079	0.00

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ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.53	139863.875	100.00
RUNOFF	0.101	367.162	0.26
EVAPOTRANSPIRATION	32.707	118725.156	84.89
DRAINAGE COLLECTED FROM LAYER 2	6.7191	24390.377	17.44
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.005	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0012		
DRAINAGE COLLECTED FROM LAYER 6	3.8604	14013.074	10.02
PERC./LEAKAGE THROUGH LAYER 7	1.756113	6374.689	4.56
AVG. HEAD ON TOP OF LAYER 7	7.9468		
CHANGE IN WATER STORAGE	-6.613	-24006.613	-17.16
SOIL WATER AT START OF YEAR	155.255	563576.250	
SOIL WATER AT END OF YEAR	148.890	540469.187	
SNOW WATER AT START OF YEAR	0.248	899.540	0.64
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.028	0.00

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ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	47.97	174131.156	100.00
RUNOFF	1.521	5521.864	3.17
EVAPOTRANSPIRATION	31.644	114866.977	65.97
DRAINAGE COLLECTED FROM LAYER 2	14.5211	52711.695	30.27
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0026		
DRAINAGE COLLECTED FROM LAYER 6	2.9162	10585.685	6.08
PERC./LEAKAGE THROUGH LAYER 7	1.391603	5051.519	2.90
AVG. HEAD ON TOP OF LAYER 7	6.0211		
CHANGE IN WATER STORAGE	-4.024	-14606.573	-8.39
SOIL WATER AT START OF YEAR	148.890	540469.187	
SOIL WATER AT END OF YEAR	144.866	525862.625	
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	-0.007	0.00

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ANNUAL TOTALS FOR YEAR 6

	INCHES	CU. FEET	PERCENT
PRECIPITATION	47.08	170900.391	100.00
RUNOFF	0.418	1518.666	0.89
EVAPOTRANSPIRATION	34.523	125319.523	73.33
DRAINAGE COLLECTED FROM LAYER 2	11.0069	39955.070	23.38
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0019		
DRAINAGE COLLECTED FROM LAYER 6	2.2812	8280.679	4.85
PERC./LEAKAGE THROUGH LAYER 7	1.139425	4136.112	2.42

AVG. HEAD ON TOP OF LAYER 7	4.7097		
CHANGE IN WATER STORAGE	-2.289	-8309.629	-4.86
SOIL WATER AT START OF YEAR	144.866	525862.625	
SOIL WATER AT END OF YEAR	142.577	517553.000	
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	-0.029	0.00

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ANNUAL TOTALS FOR YEAR 7

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.06	152677.781	100.00
RUNOFF	1.159	4205.680	2.75
EVAPOTRANSPIRATION	29.993	108874.461	71.31
DRAINAGE COLLECTED FROM LAYER 2	10.0888	36622.328	23.99
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.005	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0018		
DRAINAGE COLLECTED FROM LAYER 6	1.8470	6704.716	4.39
PERC./LEAKAGE THROUGH LAYER 7	0.961454	3490.077	2.29
AVG. HEAD ON TOP OF LAYER 7	3.8131		
CHANGE IN WATER STORAGE	-1.989	-7219.510	-4.73
SOIL WATER AT START OF YEAR	142.577	517553.000	
SOIL WATER AT END OF YEAR	140.588	510333.500	
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	0.027	0.00

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ANNUAL TOTALS FOR YEAR 8

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.89	148430.719	100.00
RUNOFF	1.885	6842.574	4.61
EVAPOTRANSPIRATION	30.324	110076.211	74.16
DRAINAGE COLLECTED FROM LAYER 2	10.2531	37218.742	25.07
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.005	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0018		
DRAINAGE COLLECTED FROM LAYER 6	1.5434	5602.506	3.77
PERC./LEAKAGE THROUGH LAYER 7	0.833610	3026.005	2.04
AVG. HEAD ON TOP OF LAYER 7	3.1768		
CHANGE IN WATER STORAGE	-3.949	-14335.332	-9.66
SOIL WATER AT START OF YEAR	140.588	510333.500	
SOIL WATER AT END OF YEAR	136.639	495998.156	
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	0.000	0.00

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ANNUAL TOTALS FOR YEAR 9

	INCHES	CU. FEET	PERCENT
PRECIPITATION	55.94	203062.203	100.00
RUNOFF	1.010	3667.546	1.81
EVAPOTRANSPIRATION	33.332	120996.227	59.59
DRAINAGE COLLECTED FROM LAYER 2	21.4201	77755.047	38.29
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0038		
DRAINAGE COLLECTED FROM LAYER 6	1.3123	4763.697	2.35
PERC./LEAKAGE THROUGH LAYER 7	0.732662	2659.562	1.31

AVG. HEAD ON TOP OF LAYER 7	2.7089		
CHANGE IN WATER STORAGE	-1.868	-6779.925	-3.34
SOIL WATER AT START OF YEAR	136.639	495998.156	
SOIL WATER AT END OF YEAR	134.623	488681.562	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.148	536.683	0.26
ANNUAL WATER BUDGET BALANCE	0.0000	0.057	0.00

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ANNUAL TOTALS FOR YEAR 10

	INCHES	CU. FEET	PERCENT
PRECIPITATION	46.23	167814.891	100.00
RUNOFF	1.891	6864.728	4.09
EVAPOTRANSPIRATION	32.810	119101.469	70.97
DRAINAGE COLLECTED FROM LAYER 2	10.9744	39836.953	23.74
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.004	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0020		
DRAINAGE COLLECTED FROM LAYER 6	1.1394	4135.854	2.46
PERC./LEAKAGE THROUGH LAYER 7	0.655405	2379.120	1.42
AVG. HEAD ON TOP OF LAYER 7	2.3518		
CHANGE IN WATER STORAGE	-1.241	-4503.229	-2.68
SOIL WATER AT START OF YEAR	134.623	488681.562	
SOIL WATER AT END OF YEAR	133.530	484715.000	
SNOW WATER AT START OF YEAR	0.148	536.683	0.32
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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ANNUAL TOTALS FOR YEAR 11

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.51	154311.344	100.00
RUNOFF	1.060	3846.470	2.49
EVAPOTRANSPIRATION	34.566	125473.953	81.31
DRAINAGE COLLECTED FROM LAYER 2	7.7194	28021.395	18.16
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.005	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0014		
DRAINAGE COLLECTED FROM LAYER 6	1.0034	3642.167	2.36
PERC./LEAKAGE THROUGH LAYER 7	0.593138	2153.091	1.40
AVG. HEAD ON TOP OF LAYER 7	2.0710		
CHANGE IN WATER STORAGE	-2.431	-8825.692	-5.72
SOIL WATER AT START OF YEAR	133.530	484715.000	
SOIL WATER AT END OF YEAR	131.099	475889.312	
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	-0.032	0.00

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ANNUAL TOTALS FOR YEAR 12

	INCHES	CU. FEET	PERCENT
PRECIPITATION	34.85	126505.508	100.00
RUNOFF	0.520	1887.646	1.49
EVAPOTRANSPIRATION	27.222	98816.141	78.11
DRAINAGE COLLECTED FROM LAYER 2	7.4140	26912.896	21.27
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0013		
DRAINAGE COLLECTED FROM LAYER 6	0.8962	3253.051	2.57
PERC./LEAKAGE THROUGH LAYER 7	0.543253	1972.010	1.56

AVG. HEAD ON TOP OF LAYER 7	1.8444		
CHANGE IN WATER STORAGE	-1.745	-6336.160	-5.01
SOIL WATER AT START OF YEAR	131.099	475889.312	
SOIL WATER AT END OF YEAR	129.353	469553.156	
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	-0.071	0.00

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ANNUAL TOTALS FOR YEAR 13

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.75	140662.469	100.00
RUNOFF	2.449	8889.192	6.32
EVAPOTRANSPIRATION	24.950	90569.133	64.39
DRAINAGE COLLECTED FROM LAYER 2	11.0849	40238.133	28.61
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.004	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0020		
DRAINAGE COLLECTED FROM LAYER 6	0.8037	2917.442	2.07
PERC./LEAKAGE THROUGH LAYER 7	0.498682	1810.216	1.29
AVG. HEAD ON TOP OF LAYER 7	1.6588		
CHANGE IN WATER STORAGE	-1.036	-3761.661	-2.67
SOIL WATER AT START OF YEAR	129.353	469553.156	
SOIL WATER AT END OF YEAR	128.317	465791.500	
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	0.018	0.00

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ANNUAL TOTALS FOR YEAR 14

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.06	138157.812	100.00
RUNOFF	0.003	10.377	0.01
EVAPOTRANSPIRATION	31.970	116052.320	84.00
DRAINAGE COLLECTED FROM LAYER 2	6.9781	25330.389	18.33
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.004	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0012		
DRAINAGE COLLECTED FROM LAYER 6	0.7287	2645.247	1.91
PERC./LEAKAGE THROUGH LAYER 7	0.462051	1677.244	1.21
AVG. HEAD ON TOP OF LAYER 7	1.5041		
CHANGE IN WATER STORAGE	-2.082	-7557.746	-5.47
SOIL WATER AT START OF YEAR	128.317	465791.500	
SOIL WATER AT END OF YEAR	126.235	458233.750	
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	-0.014	0.00

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ANNUAL TOTALS FOR YEAR 15

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.40	164801.984	100.00
RUNOFF	0.973	3532.522	2.14
EVAPOTRANSPIRATION	30.654	111274.828	67.52
DRAINAGE COLLECTED FROM LAYER 2	12.5178	45439.570	27.57
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0022		
DRAINAGE COLLECTED FROM LAYER 6	0.6653	2415.012	1.47
PERC./LEAKAGE THROUGH LAYER 7	0.430471	1562.609	0.95

AVG. HEAD ON TOP OF LAYER 7	1.3731		
CHANGE IN WATER STORAGE	0.159	577.490	0.35
SOIL WATER AT START OF YEAR	126.235	458233.750	
SOIL WATER AT END OF YEAR	126.394	458811.250	
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	-0.040	0.00

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ANNUAL TOTALS FOR YEAR 16

	INCHES	CU. FEET	PERCENT
PRECIPITATION	33.48	121532.383	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	29.415	106776.023	87.86
DRAINAGE COLLECTED FROM LAYER 2	5.4509	19786.672	16.28
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.004	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0010		
DRAINAGE COLLECTED FROM LAYER 6	0.6126	2223.822	1.83
PERC./LEAKAGE THROUGH LAYER 7	0.404024	1466.607	1.21
AVG. HEAD ON TOP OF LAYER 7	1.2608		
CHANGE IN WATER STORAGE	-2.402	-8720.757	-7.18
SOIL WATER AT START OF YEAR	126.394	458811.250	
SOIL WATER AT END OF YEAR	123.992	450090.469	
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 17

	INCHES	CU. FEET	PERCENT
PRECIPITATION	54.92	199359.641	100.00
RUNOFF	1.308	4747.264	2.38
EVAPOTRANSPIRATION	34.504	125248.352	62.83
DRAINAGE COLLECTED FROM LAYER 2	17.6858	64199.371	32.20
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0031		
DRAINAGE COLLECTED FROM LAYER 6	0.5640	2047.250	1.03
PERC./LEAKAGE THROUGH LAYER 7	0.378698	1374.672	0.69
AVG. HEAD ON TOP OF LAYER 7	1.1640		
CHANGE IN WATER STORAGE	0.480	1742.745	0.87
SOIL WATER AT START OF YEAR	123.992	450090.469	
SOIL WATER AT END OF YEAR	124.472	451833.219	
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 18

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.76	180628.844	100.00
RUNOFF	3.650	13248.008	7.33
EVAPOTRANSPIRATION	35.078	127331.711	70.49
DRAINAGE COLLECTED FROM LAYER 2	11.5613	41967.660	23.23
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0020		
DRAINAGE COLLECTED FROM LAYER 6	0.5231	1898.783	1.05
PERC./LEAKAGE THROUGH LAYER 7	0.357259	1296.851	0.72

AVG. HEAD ON TOP OF LAYER 7	1.0796		
CHANGE IN WATER STORAGE	-1.409	-5114.187	-2.83
SOIL WATER AT START OF YEAR	124.472	451833.219	
SOIL WATER AT END OF YEAR	123.063	446719.031	
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	0.025	0.00

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ANNUAL TOTALS FOR YEAR 19

	INCHES	CU. FEET	PERCENT
PRECIPITATION	52.23	189594.875	100.00
RUNOFF	2.464	8942.977	4.72
EVAPOTRANSPIRATION	30.841	111954.508	59.05
DRAINAGE COLLECTED FROM LAYER 2	18.7990	68240.430	35.99
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0033		
DRAINAGE COLLECTED FROM LAYER 6	0.4871	1768.293	0.93
PERC./LEAKAGE THROUGH LAYER 7	0.338123	1227.387	0.65
AVG. HEAD ON TOP OF LAYER 7	1.0054		
CHANGE IN WATER STORAGE	-0.699	-2538.663	-1.34
SOIL WATER AT START OF YEAR	123.063	446719.031	
SOIL WATER AT END OF YEAR	122.364	444180.375	
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	-0.066	0.00

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ANNUAL TOTALS FOR YEAR 20

	INCHES	CU. FEET	PERCENT
PRECIPITATION	51.96	188614.828	100.00
RUNOFF	0.472	1714.897	0.91
EVAPOTRANSPIRATION	34.005	123436.828	65.44
DRAINAGE COLLECTED FROM LAYER 2	16.9107	61385.687	32.55
PERC./LEAKAGE THROUGH LAYER 3	0.000001	0.005	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0030		
DRAINAGE COLLECTED FROM LAYER 6	0.4565	1657.187	0.88
PERC./LEAKAGE THROUGH LAYER 7	0.321792	1168.104	0.62
AVG. HEAD ON TOP OF LAYER 7	0.9396		
CHANGE IN WATER STORAGE	-0.206	-747.923	-0.40
SOIL WATER AT START OF YEAR	122.364	444180.375	
SOIL WATER AT END OF YEAR	122.158	443432.437	
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	0.047	0.00

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ANNUAL TOTALS FOR YEAR 21

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.32	164511.578	100.00
RUNOFF	0.418	1517.615	0.92
EVAPOTRANSPIRATION	34.357	124714.641	75.81
DRAINAGE COLLECTED FROM LAYER 2	10.2176	37089.742	22.55
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0018		
DRAINAGE COLLECTED FROM LAYER 6	0.4269	1549.690	0.94
PERC./LEAKAGE THROUGH LAYER 7	0.305369	1108.491	0.67

AVG. HEAD ON TOP OF LAYER 7	0.8811		
CHANGE IN WATER STORAGE	-0.405	-1468.567	-0.89
SOIL WATER AT START OF YEAR	122.158	443432.437	
SOIL WATER AT END OF YEAR	121.753	441963.875	
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	-0.031	0.00

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ANNUAL TOTALS FOR YEAR 22

	INCHES	CU. FEET	PERCENT
PRECIPITATION	49.06	178087.781	100.00
RUNOFF	1.847	6703.990	3.76
EVAPOTRANSPIRATION	37.959	137791.828	77.37
DRAINAGE COLLECTED FROM LAYER 2	10.5224	38196.258	21.45
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0018		
DRAINAGE COLLECTED FROM LAYER 6	0.4015	1457.611	0.82
PERC./LEAKAGE THROUGH LAYER 7	0.291280	1057.347	0.59
AVG. HEAD ON TOP OF LAYER 7	0.8287		
CHANGE IN WATER STORAGE	-1.961	-7119.366	-4.00
SOIL WATER AT START OF YEAR	121.753	441963.875	
SOIL WATER AT END OF YEAR	119.792	434844.531	
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	0.106	0.00

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ANNUAL TOTALS FOR YEAR 23

	INCHES	CU. FEET	PERCENT
PRECIPITATION	50.87	184658.094	100.00
RUNOFF	0.246	894.716	0.48
EVAPOTRANSPIRATION	33.711	122371.766	66.27
DRAINAGE COLLECTED FROM LAYER 2	16.4137	59581.836	32.27
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0029		
DRAINAGE COLLECTED FROM LAYER 6	0.3787	1374.727	0.74
PERC./LEAKAGE THROUGH LAYER 7	0.278432	1010.709	0.55
AVG. HEAD ON TOP OF LAYER 7	0.7816		
CHANGE IN WATER STORAGE	-0.159	-575.662	-0.31
SOIL WATER AT START OF YEAR	119.792	434844.531	
SOIL WATER AT END OF YEAR	119.633	434268.844	
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	0.002	0.00

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ANNUAL TOTALS FOR YEAR 24

	INCHES	CU. FEET	PERCENT
PRECIPITATION	52.22	189558.594	100.00
RUNOFF	0.600	2177.596	1.15
EVAPOTRANSPIRATION	31.932	115913.437	61.15
DRAINAGE COLLECTED FROM LAYER 2	19.6026	71157.437	37.54
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0035		
DRAINAGE COLLECTED FROM LAYER 6	0.3590	1303.240	0.69
PERC./LEAKAGE THROUGH LAYER 7	0.267382	970.598	0.51

AVG. HEAD ON TOP OF LAYER 7	0.7389		
CHANGE IN WATER STORAGE	-0.541	-1963.693	-1.04
SOIL WATER AT START OF YEAR	119.633	434268.844	
SOIL WATER AT END OF YEAR	119.092	432305.156	
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 25

	INCHES	CU. FEET	PERCENT
PRECIPITATION	44.99	163313.672	100.00
RUNOFF	0.568	2060.174	1.26
EVAPOTRANSPIRATION	33.212	120559.984	73.82
DRAINAGE COLLECTED FROM LAYER 2	12.0622	43785.941	26.81
PERC./LEAKAGE THROUGH LAYER 3	0.000002	0.006	0.00
AVG. HEAD ON TOP OF LAYER 3	0.0021		
DRAINAGE COLLECTED FROM LAYER 6	0.3393	1231.531	0.75
PERC./LEAKAGE THROUGH LAYER 7	0.255825	928.645	0.57
AVG. HEAD ON TOP OF LAYER 7	0.7002		
CHANGE IN WATER STORAGE	-1.447	-5252.522	-3.22
SOIL WATER AT START OF YEAR	119.092	432305.156	
SOIL WATER AT END OF YEAR	117.645	427052.625	
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	-0.072	0.00

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 25

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.00	3.14	4.16	2.56	3.53	3.82
	5.99	7.18	4.66	2.53	2.57	3.41
STD. DEVIATIONS	1.89	1.30	1.61	1.14	1.36	1.88
	2.68	2.61	2.66	1.53	1.53	1.66
RUNOFF						
TOTALS	0.032	0.012	0.183	0.002	0.017	0.009
	0.184	0.390	0.337	0.023	0.033	0.049
STD. DEVIATIONS	0.075	0.031	0.544	0.008	0.058	0.027
	0.524	0.608	0.551	0.060	0.095	0.111
EVAPOTRANSPIRATION						
TOTALS	1.315	1.553	2.830	2.723	4.280	3.905
	4.325	5.015	3.249	1.328	1.094	1.015
STD. DEVIATIONS	0.161	0.276	0.290	0.763	0.685	1.622
	1.406	0.803	0.939	0.352	0.223	0.153
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
TOTALS	1.7806	1.3975	1.7106	0.4463	0.3510	0.0947
	0.4150	1.2509	1.1360	0.9453	1.1120	1.9631
STD. DEVIATIONS	1.7160	1.2170	1.2216	0.5348	0.6988	0.2899
	0.8844	1.4158	1.2556	1.0578	1.2599	1.4717
PERCOLATION/LEAKAGE THROUGH LAYER 3						
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
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.1706	0.1540	0.1678	0.1609	0.1644	0.1559
	0.1543	0.1505	0.1434	0.1463	0.1396	0.1420
STD. DEVIATIONS	0.2236	0.2027	0.2234	0.2157	0.2217	0.2097
	0.2039	0.1984	0.1891	0.1929	0.1837	0.1863
PERCOLATION/LEAKAGE THROUGH LAYER 7						
TOTALS	0.0820	0.0741	0.0808	0.0776	0.0794	0.0756
	0.0756	0.0742	0.0709	0.0725	0.0693	0.0708
STD. DEVIATIONS	0.0874	0.0792	0.0873	0.0843	0.0866	0.0820
	0.0800	0.0779	0.0743	0.0759	0.0724	0.0736

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	0.0037	0.0032	0.0036	0.0010	0.0007	0.0002
	0.0009	0.0026	0.0024	0.0020	0.0024	0.0041
STD. DEVIATIONS	0.0036	0.0028	0.0025	0.0012	0.0015	0.0006
	0.0018	0.0030	0.0027	0.0022	0.0027	0.0031

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	4.1381	4.1111	4.0719	4.0320	3.9865	3.9070
	3.7425	3.6509	3.5953	3.5489	3.4990	3.4457
STD. DEVIATIONS	5.4123	5.4271	5.4086	5.3941	5.3632	5.2406
	4.9279	4.7938	4.7226	4.6649	4.5939	4.5104

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 25

	INCHES		CU. FEET	PERCENT
PRECIPITATION	46.57	(6.945)	169039.0	100.00
RUNOFF	1.271	(1.1073)	4615.09	2.730
EVAPOTRANSPIRATION	32.632	(3.0062)	118454.66	70.075
LATERAL DRAINAGE COLLECTED FROM LAYER 2	12.60295	(4.52291)	45748.691	27.06399
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.00000	(0.00000)	0.005	0.00000
AVERAGE HEAD ON TOP OF LAYER 3	0.002	(0.001)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	1.84966	(2.43418)	6714.268	3.97202
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.90286	(0.95537)	3277.367	1.93882
AVERAGE HEAD ON TOP OF LAYER 7	3.811	(5.004)		
CHANGE IN WATER STORAGE	-2.692	(3.1406)	-9771.14	-5.780

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               PEAK DAILY VALUES FOR YEARS    1 THROUGH   25
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                                              (INCHES)      (CU. FT.)
                                             ----------   -------------
      PRECIPITATION                            4.85         17605.500

      RUNOFF                                   2.370         8604.8652

      DRAINAGE COLLECTED FROM LAYER  2         1.05373       3825.02832

      PERCOLATION/LEAKAGE THROUGH LAYER  3     0.000000         0.00004

      AVERAGE HEAD ON TOP OF LAYER  3          0.068

      MAXIMUM HEAD ON TOP OF LAYER  3          0.132

      LOCATION OF MAXIMUM HEAD IN LAYER  2
            (DISTANCE FROM DRAIN)              5.6 FEET

      DRAINAGE COLLECTED FROM LAYER  6         0.02883        104.63743

      PERCOLATION/LEAKAGE THROUGH LAYER  7     0.011501        41.74841

      AVERAGE HEAD ON TOP OF LAYER  7         21.535

      MAXIMUM HEAD ON TOP OF LAYER  7         27.801

      LOCATION OF MAXIMUM HEAD IN LAYER  6
            (DISTANCE FROM DRAIN)            125.8 FEET

      SNOW WATER                               2.89         10491.8437


      MAXIMUM VEG. SOIL WATER (VOL/VOL)                 0.4276

      MINIMUM VEG. SOIL WATER (VOL/VOL)                 0.2210


       ***  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 25

LAYER	(INCHES)	(VOL/VOL)
1	7.5169	0.3132
2	0.0033	0.0131
3	0.0000	0.0000
4	2.5284	0.2107
5	95.2734	0.1890
6	5.9441	0.1238
7	0.0000	0.0000
SNOW WATER	0.000	

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