

PRILOG 10

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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:\WHI\VHELP22\data\P3728.VHP\_weather1.dat
TEMPERATURE DATA FILE:       C:\WHI\VHELP22\data\P3728.VHP\_weather2.dat
SOLAR RADIATION DATA FILE:   C:\WHI\VHELP22\data\P3728.VHP\_weather3.dat
EVAPOTRANSPIRATION DATA:     C:\WHI\VHELP22\data\P3728.VHP\_weather4.dat
SOIL AND DESIGN DATA FILE:   C:\WHI\VHELP22\data\P3728.VHP\I_389262.inp
OUTPUT DATA FILE:           C:\WHI\VHELP22\data\P3728.VHP\O_389262.prt
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TIME: 13:42 DATE: 2/10/2006

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TITLE: Zatvoreno 1+2_1 : 3

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

LAYER 1 -----

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TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 6
THICKNESS                = 100.00 CM
POROSITY                  = 0.4530 VOL/VOL
FIELD CAPACITY            = 0.1900 VOL/VOL
WILTING POINT            = 0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.1900 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.720000000000E-03 CM/SEC
NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 5.00
      FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 20

THICKNESS	=	0.50	CM
POROSITY	=	0.8500	VOL/VOL
FIELD CAPACITY	=	0.0100	VOL/VOL
WILTING POINT	=	0.0050	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0100	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	10.0000000000	CM/SEC
SLOPE	=	33.00	PERCENT
DRAINAGE LENGTH	=	60.0	METERS

LAYER 3

TYPE 3 - BARRIER SOIL LINER

MATERIAL TEXTURE NUMBER 17

THICKNESS	=	2.00	CM
POROSITY	=	0.7500	VOL/VOL
FIELD CAPACITY	=	0.7470	VOL/VOL
WILTING POINT	=	0.4000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.7500	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.300000000000E-08	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 18

THICKNESS	=	3500.00	CM
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2953	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000224000E-02	CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 5

THICKNESS	=	60.00	CM
POROSITY	=	0.4570	VOL/VOL
FIELD CAPACITY	=	0.1310	VOL/VOL
WILTING POINT	=	0.0580	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1310	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000000000E-02	CM/SEC

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LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 21

THICKNESS	=	50.00	CM
POROSITY	=	0.3970	VOL/VOL
FIELD CAPACITY	=	0.0320	VOL/VOL
WILTING POINT	=	0.0130	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0300	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.300000000000	CM/SEC
SLOPE	=	3.00	PERCENT
DRAINAGE LENGTH	=	120.0	METERS

LAYER 7

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.10	CM
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.	=	0.200000000000E-12	CM/SEC
FML PINHOLE DENSITY	=	7.50	HOLES/HECTARE
FML INSTALLATION DEFECTS	=	7.50	HOLES/HECTARE
FML PLACEMENT QUALITY	=	4 - POOR	

LAYER 8

TYPE 3 - BARRIER SOIL LINER

MATERIAL TEXTURE NUMBER 28

THICKNESS	=	10.00	CM
POROSITY	=	0.4520	VOL/VOL
FIELD CAPACITY	=	0.4110	VOL/VOL
WILTING POINT	=	0.3110	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4520	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.120000000000E-05	CM/SEC

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 6 WITH A
FAIR STAND OF GRASS, A SURFACE SLOPE OF 33. %
AND A SLOPE LENGTH OF 60. METERS.

SCS RUNOFF CURVE NUMBER	=	72.51	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	25.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	4.750	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	11.325	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	2.125	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL WATER IN LAYER MATERIALS	=	1067.935	CM
TOTAL INITIAL WATER	=	1067.935	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
SPLIT/KASTEL FORM

STATION LATITUDE	=	43.53	DEGREES
MAXIMUM LEAF AREA INDEX	=	5.00	
START OF GROWING SEASON (JULIAN DATE)	=	74	
END OF GROWING SEASON (JULIAN DATE)	=	319	
EVAPORATIVE ZONE DEPTH	=	25.0	CM
AVERAGE ANNUAL WIND SPEED	=	11.26	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	72.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	65.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	61.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	76.00	%

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
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82.1	80.0	94.8	70.1	79.0	50.5
20.0	50.2	52.5	79.1	89.0	99.8

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
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7.3	7.9	10.2	13.1	17.6	21.3
24.3	24.2	20.8	16.8	11.7	8.9

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HEAD #1: AVERAGE HEAD ON TOP OF LAYER 3
DRAIN #1: LATERAL DRAINAGE FROM LAYER 2 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 3
HEAD #2: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #2: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 20

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

TOTALS	91.94 21.86	75.85 43.90	102.40 50.22	67.88 70.36	67.34 79.52	49.46 87.70
STD. DEVIATIONS	45.26 19.47	32.70 39.46	53.08 32.08	45.18 37.11	43.66 37.14	25.03 54.96
RUNOFF						

TOTALS	0.131 0.000	0.050 0.045	0.074 0.098	0.081 0.070	0.047 0.178	0.001 0.238
STD. DEVIATIONS	0.421 0.000	0.223 0.187	0.311 0.296	0.361 0.294	0.156 0.472	0.006 0.564
EVAPOTRANSPIRATION						

TOTALS	27.781 24.536	38.649 34.311	60.324 36.845	63.768 35.287	55.863 21.684	45.612 19.353
STD. DEVIATIONS	2.518 17.393	3.209 26.104	11.682 21.213	25.476 17.703	26.942 4.365	19.359 2.827
LATERAL DRAINAGE COLLECTED FROM LAYER 2						

TOTALS	61.2135 6.9114	50.6551 5.7301	46.0579 6.0593	30.1405 9.5909	15.5345 36.4804	12.1484 61.4013
STD. DEVIATIONS	42.3031 2.4117	28.2815 2.8036	34.8484 4.6502	21.3373 7.5366	9.6553 28.7708	12.2724 45.0091
PERCOLATION/LEAKAGE THROUGH LAYER 3						

TOTALS	0.0674 0.0804	0.0652 0.0743	0.0721 0.0725	0.0742 0.0670	0.0770 0.0637	0.0765 0.0721
STD. DEVIATIONS	0.0168 0.0000	0.0102 0.0089	0.0086 0.0100	0.0050 0.0151	0.0059 0.0110	0.0034 0.0088
LATERAL DRAINAGE COLLECTED FROM LAYER 6						

TOTALS	0.1682 0.2671	2.4569 0.2430	1.2919 0.2144	0.5282 0.2117	0.3827 0.1890	0.2998 0.1787
STD. DEVIATIONS	0.2312 0.5698	10.3063 0.4560	5.0553 0.3675	1.6984 0.3275	1.0500 0.2697	0.7181 0.2521

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PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0002	0.0020	0.0012	0.0006	0.0004	0.0004
	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
STD. DEVIATIONS	0.0003	0.0081	0.0044	0.0016	0.0011	0.0007
	0.0006	0.0005	0.0004	0.0004	0.0003	0.0003

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	0.0023	0.0021	0.0017	0.0012	0.0006	0.0005
	0.0003	0.0002	0.0002	0.0004	0.0014	0.0023
STD. DEVIATIONS	0.0016	0.0012	0.0013	0.0008	0.0004	0.0005
	0.0001	0.0001	0.0002	0.0003	0.0011	0.0017

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0042	0.0677	0.0322	0.0136	0.0095	0.0077
	0.0067	0.0061	0.0055	0.0053	0.0049	0.0045
STD. DEVIATIONS	0.0058	0.2843	0.1259	0.0437	0.0262	0.0185
	0.0142	0.0114	0.0095	0.0082	0.0069	0.0063

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 20				
	MM		CU. METERS	PERCENT
PRECIPITATION	808.41	(155.888)	8084.1	100.00
RUNOFF	1.014	(1.1762)	10.14	0.125
EVAPOTRANSPIRATION	464.013	(60.4672)	4640.13	57.399
LATERAL DRAINAGE COLLECTED FROM LAYER 2	341.92349	(105.12065)	3419.235	42.29606
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.86236	(0.03897)	8.624	0.10667
AVERAGE HEAD ON TOP OF LAYER 3	0.011	(0.003)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	6.43154	(20.95257)	64.315	0.79558
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00657	(0.01825)	0.066	0.00081
AVERAGE HEAD ON TOP OF LAYER 7	0.140	(0.460)		
CHANGE IN WATER STORAGE	-4.984	(1.7433)	-49.84	-0.616

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 20		
	(MM)	(CU. METERS)
PRECIPITATION	66.60	666.00000
RUNOFF	2.024	20.23849
DRAINAGE COLLECTED FROM LAYER 2	29.66220	296.62202
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.002637	0.02637
AVERAGE HEAD ON TOP OF LAYER 3	0.346	
MAXIMUM HEAD ON TOP OF LAYER 3	0.692	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	0.0 METERS	
DRAINAGE COLLECTED FROM LAYER 6	3.08844	30.88445
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.002375	0.02375
AVERAGE HEAD ON TOP OF LAYER 7	23.854	
MAXIMUM HEAD ON TOP OF LAYER 7	45.573	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	5.3 METERS	
SNOW WATER	23.17	231.6890
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.3317
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0850

FINAL WATER STORAGE AT END OF YEAR 20		
LAYER	(CM)	(VOL/VOL)
1	20.1834	0.2018
2	0.0056	0.0112
3	1.5000	0.7500
4	1022.0000	0.2920
5	8.0097	0.1335
6	1.7488	0.0350
7	0.0000	0.0000
8	4.5200	0.4520
SNOW WATER	0.000	

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