

# PRILOG 1

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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_388551.inp
OUTPUT DATA FILE:           C:\WHI\VHELP22\data\P3728.VHP\O_388551.prt
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TIME: 11:58      DATE: 2/10/2006

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## **TITLE: 5% s laminiranim kompozitnim slojem**

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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 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	=	0.2261	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.

# PRILOG 1

## LAYER 2

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### TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 34

THICKNESS	=	0.60	CM
POROSITY	=	0.8500	VOL/VOL
FIELD CAPACITY	=	0.0100	VOL/VOL
WILTING POINT	=	0.0050	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0157	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	33.0000000000	CM/SEC
SLOPE	=	5.00	PERCENT
DRAINAGE LENGTH	=	80.0	METERS

## LAYER 3

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### TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 36

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.	=	0.400000000000E-12	CM/SEC
FML PINHOLE DENSITY	=	7.50	HOLES/HECTARE
FML INSTALLATION DEFECTS	=	7.50	HOLES/HECTARE
FML PLACEMENT QUALITY	=	4 - POOR	

## LAYER 4

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### 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 5

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### TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 18

THICKNESS	=	3800.00	CM
POROSITY	=	0.6710	VOL/VOL
FIELD CAPACITY	=	0.2920	VOL/VOL
WILTING POINT	=	0.0770	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3100	VOL/VOL

# PRILOG 1

EFFECTIVE SAT. HYD. COND. = 0.100000224000E-02 CM/SEC  
GENERAL DESIGN AND EVAPORATIVE ZONE DATA  
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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 5. %  
AND A SLOPE LENGTH OF 80. METERS.

SCS RUNOFF CURVE NUMBER	=	70.22	
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	=	5.652	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	=	1202.119	CM
TOTAL INITIAL WATER	=	1202.119	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

## EVAPOTRANSPIRATION AND WEATHER DATA

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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	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING  
COEFFICIENTS FOR SPLIT/KASTEL FORM

## NORMAL MEAN MONTHLY PRECIPITATION (MM)

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

# PRILOG 1

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 4  
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 5

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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						
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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						
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TOTALS	0.057 0.000	0.019 0.013	0.034 0.041	0.036 0.035	0.010 0.088	0.000 0.085
STD. DEVIATIONS	0.215 0.000	0.083 0.057	0.151 0.127	0.159 0.158	0.040 0.271	0.000 0.239
EVAPOTRANSPIRATION						
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TOTALS	28.018 26.593	39.051 36.627	61.137 38.516	66.791 35.607	59.297 21.536	47.827 19.512
STD. DEVIATIONS	1.941 18.722	2.463 27.899	11.847 22.190	26.052 17.726	28.229 4.146	20.167 2.182
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
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TOTALS	61.5370 5.5265	51.0694 3.2793	46.3201 3.3399	29.7521 6.4378	14.3310 34.7384	10.6911 61.6568
STD. DEVIATIONS	41.9017 2.5004	27.4210 2.6298	33.7934 4.7041	19.9858 6.5616	9.4057 29.0826	12.1875 45.5793
PERCOLATION/LEAKAGE THROUGH LAYER 4						
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TOTALS	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000
STD. DEVIATIONS	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000
PERCOLATION/LEAKAGE THROUGH LAYER 5						
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TOTALS	5.3220 3.9851	5.0169 1.4836	5.1661 0.0000	4.6588 0.0000	4.5045 0.0000	4.0935 0.0000
STD. DEVIATIONS	23.8006 17.8218	22.4364 6.6347	23.1034 0.0000	20.8348 0.0000	20.1449 0.0000	18.3066 0.0000

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## AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

### DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	0.0056	0.0051	0.0042	0.0028	0.0013	0.0010
	0.0005	0.0003	0.0003	0.0006	0.0033	0.0056
STD. DEVIATIONS	0.0038	0.0027	0.0031	0.0019	0.0009	0.0011
	0.0002	0.0002	0.0004	0.0006	0.0027	0.0041

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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	0.418	( 0.5449)	4.18	0.052
EVAPOTRANSPIRATION	480.512	( 64.6250)	4805.12	59.439
LATERAL DRAINAGE COLLECTED FROM LAYER 2	328.67935	(103.60260)	3286.793	40.65776
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.00012	( 0.00001)	0.001	0.00002
AVERAGE HEAD ON TOP OF LAYER 3	0.025	( 0.008)		
PERCOLATION/LEAKAGE THROUGH LAYER 5	34.23044	(153.08319)	342.304	4.23432
CHANGE IN WATER STORAGE	-35.434	( 6.2488)	-354.34	-4.383

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 20		
	(MM)	(CU. METERS)
PRECIPITATION	66.60	666.00000
RUNOFF	1.122	11.21735
DRAINAGE COLLECTED FROM LAYER 2	36.68582	366.85824
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.000002	0.00002
AVERAGE HEAD ON TOP OF LAYER 3	1.032	
MAXIMUM HEAD ON TOP OF LAYER 3	2.057	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	0.1 METERS	
PERCOLATION/LEAKAGE THROUGH LAYER 5	3.891376	38.91376
SNOW WATER	23.17	231.6890
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.3233
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0850

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FINAL WATER STORAGE AT END OF YEAR 20		
LAYER	(CM)	(VOL/VOL)
1	20.2047	0.2020
2	0.0074	0.0123
3	0.0000	0.0000
4	1.5000	0.7500
5	1109.5394	0.2920
SNOW WATER	0.000	

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