

TECHNICAL MEMORANDUM

DATE 9 June 2020

Reference No. 1777197-052-M-Rev1

TO State Resource Development Manager, Alkina Holdings Pty Ltd

CC

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GREAT SOUTHERN LANDFILL – LEACHATE POND SIZING

1.0 INTRODUCTION

Alkina Holdings Pty Ltd (Alkina) proposes to construct and operate the Great Southern Landfill (The landfill), located on Allawuna Farm lots 4869, 5931, 9926, and 26934 Great Southern Highway, St Ronans, approximately 80 km east of Perth.

This technical memorandum addresses the water balance modelling for the adequate operation of landfill cells and wastewater ponds as outlined in Section 3, item 24 of the Draft Environment Scoping Document (ESD) issued by the Environmental Protection Authority (EPA). It also includes the leachate generation modelling, which provided inputs to the water balance modelling, as an appendix. The results of the water balance modelling provide input into the sizing of the leachate pond for the landfill.

The work was conducted in accordance with proposal 1777197-047-L-RevB, dated 31 July 2019.

2.0 LEACHATE MANAGEMENT STRATEGY

The landfill design will incorporate a leachate collection system extending across the base of each stage and along the toe of the side walls. The leachate collection system will intercept vertical and lateral leachate seepage occurring through the waste. The collected leachate will be pumped into a storage pond located to the northwest of the landfill.

The quantity of leachate produced within the landfill will typically be related to the amount of precipitation that percolates into or runs over deposited waste within the open working area and/or the amount that infiltrates through the final capped surface of the landfill. Leachate generation modelling has been undertaken using the Hydrogeological Evaluation of Landfill Performance (HELP) model based on the proposed staging plan and cell footprint areas as presented in the landfill management plan (LMP)¹. A summary of approach, assumptions, and results associated with the HELP modelling is provided in Attachment A.

Figure 1 extracted from the LMP illustrates the landfill footprint with the positioning of each proposed cell.

¹ Alkina Holdings Pty Ltd (2017). Great Southern Landfill Management Plan. Report Number: Alkina01_Rev1

To minimise the amount of leachate produced, the landfill will be operated by keeping the exposed area of waste to a minimum with rehabilitation following shortly after completion of filling each cell. The volume of leachate generated in the landfill will be influenced by the size of the stage and the operational procedures adopted. Measures to reduce leachate generation will include diversion of stormwater away from the active waste disposal area and progressive capping.

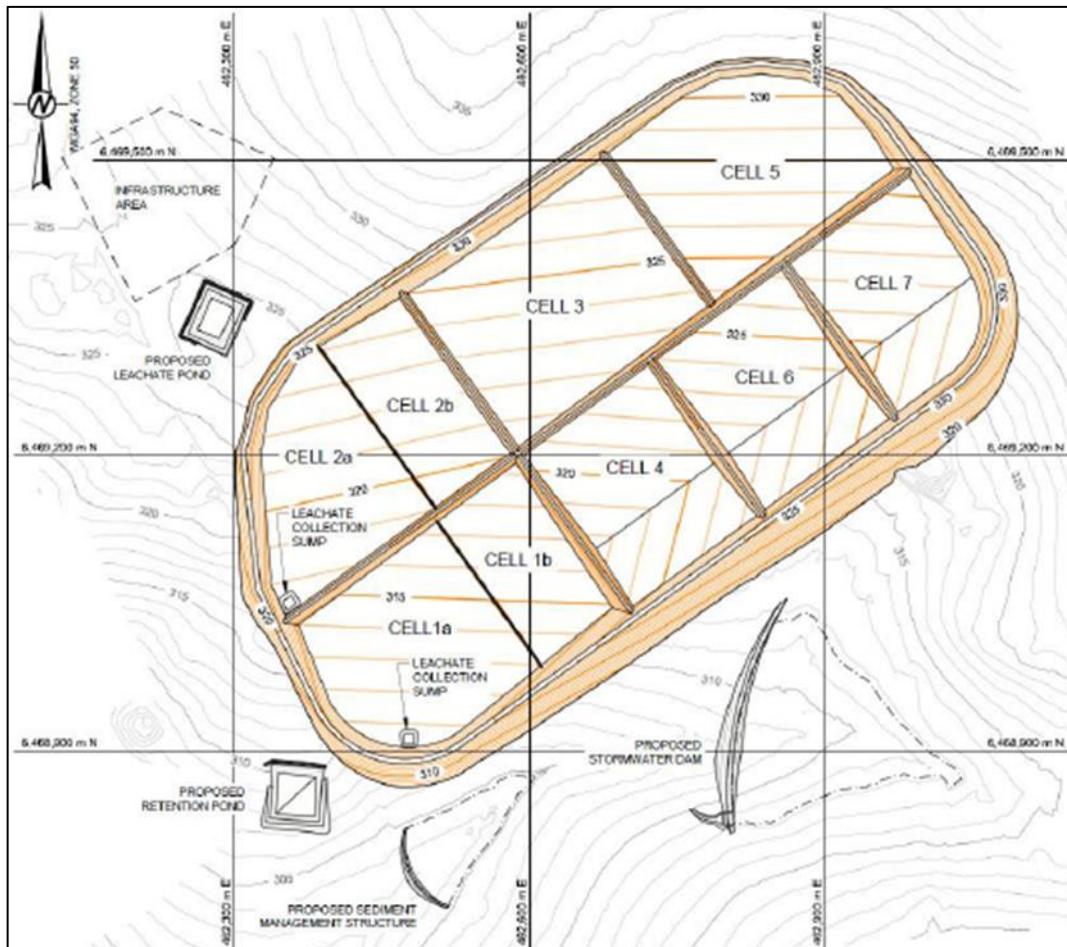


Figure 1: Landfill Footprint and Cell Configurations (from LMP)

The Victorian Best Practice Environmental Management (BPEM) for siting, design, operation, and rehabilitation of landfills (EPA, 2014)² recommends that for the assessment of leachate management options, a water balance model should be modelled over at least two consecutive wet years (90th percentile annual rainfall year), to ensure that the proposed system has sufficient capacity to deal with all leachate generated over the operational life of the landfill.

2.1 Climate Data

For the purpose of the water balance modelling, site-specific long-term continuous daily rainfall and Morton's Lake evaporation records (for the location: 31.90°S, 116.60°E) were obtained from Scientific Information for Land Owners (SILO)³ for the period of 01/01/1900 to 31/12/2018 and are presented in Figure 2.

² EPA, 2014. Publication 788.2 titled 'Best Practice Environmental Management Siting, Design, Operation and Rehabilitation of Landfills', October 2014

³ Queensland Government (2019). Scientific information for land owners – SILO – Gridded daily climate surfaces. Retrieved from <https://silo.longpaddock.qld.gov.au/>.

The SILO rainfall data for 1995 (736 mm) was identified as equivalent to the 90th percentile annual rainfall event. The rainfall data was assessed based on records of 58-year period from 1961 to 2018. Rainfall records prior to 1961 were excluded as the data was considered to be less representative of the current (and future) climate in the region.

The leachate modelling utilised the climate data sourced from the Australian Bureau of Meteorology (BoM) for the York area in Western Australia (BOM Station 10311, 31.9°S and 116.8°E) to estimate the leachate generation. The reported 90th percentile rainfall annual depth using that dataset was equivalent to 700 mm, fairly consistent with that estimated above based on adopted SILO data.

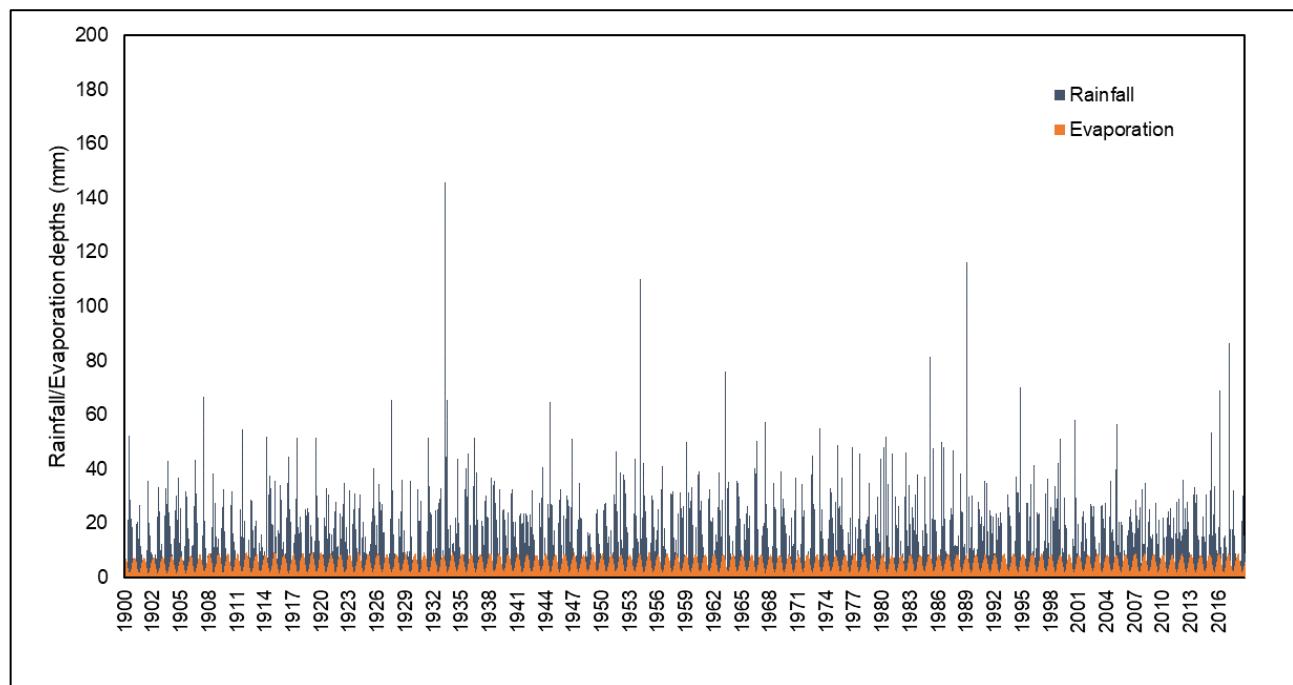


Figure 2: SILO Daily Rainfall and Morton's Lake Evaporation Data Records – 01/01/1900 to 31/12/2018

2.2 Leachate Generation Estimates

The leachate generation analysis was undertaken to estimate the quantity of leachate that may be generated within the landfill, resulting from rainfall infiltration through uncapped waste, rainfall seepage through the interim cap and the final landfill cap areas (Attachment A).

The HELP model developed to estimate the quantity and rate of leachate generated required the input of monthly climate data (rainfall, temperature, and solar radiation), coupled with details of landfilling and final capping system. The model outputs included estimated runoff, evapotranspiration, infiltration rates, and changes in stored water within the landfill waste mass.

HELP modelling software considers a variety of proposed landfill conditions to estimate leachate generation, including, vegetation, cover soils, waste cells, drainage layers, low permeability barrier layers and the moisture condition of the incoming waste. The leachate volumes estimated using the HELP modelling software are sensitive to the assumed moisture condition of the incoming waste, above all the other landfill conditions.

The current HELP modelling assumed incoming waste had an initial moisture condition of 2% dry of field capacity. This was adopted to represent waste that is close to saturation when deposited at the landfill and provide a conservative estimate of leachate that may be generated. The modelled scenarios were set to estimate leachate generation rates for the following three operational stage scenarios:

- The active landfill cell, considering different waste disposal depths per year, ranging from 5 to 25 m
- The interim capped cells, assuming waste disposal depths varying from 15 to 25 m, representing where the interim cap has been installed across
- The final capped landfill, considering a final waste disposal depth of 25 m covered with the final landfill cap.

The simulations were carried out considering monthly average and 90th percentile rainfall depths. Table 1 presents the monthly leachate generation rates for the active landfill cells and interim capped cells, considering the most conservative results, respectively for 5 m waste disposal depth and 15 m waste disposal depth for the 90th percentile rainfall.

The leachate generation rate represents the total depth (mm) of leachate collected within the drainage layer of the base liner system for 1 ha of landfill.

Table 1: Summary of Leachate Generation Rates (mm/ha) for Active and Interim Capped Landfill Cells (90th percentile rainfall)

Month	Active Landfill Cells (5 m waste depth)	Interim Capped Landfill Cells (15 m waste depth)
January	0.0	0.1
February	0.0	0.0
March	0.0	0.0
April	0.0	0.0
May	5.3	1.1
June	7.3	16.3
July	55.3	27.1
August	42.9	26.9
September	51.9	42.5
October	51.3	32.6
November	0.2	15.9
December	0.1	51.8
Total Leachate Collected	214.2	214.3

The leachate generation rates for the final capped landfill were obtained from a long-term simulation, consisting of a 10-year analysis, and, considering the 90th percentile rainfall depths. This simulation demonstrated that the leachate generation rates dropped to zero after leachate was generated at a rate of 0.3 mm/ha in the first year as there is negligible infiltration through the cap. Therefore, leachate generation after a cell is capped was not assessed further with the water balance modelling.

2.3 Leachate Storage Pond Sizing

The sizing of the leachate storage pond considered the maximum storage required to contain the leachate generated by one active landfill cell, based on the monthly leachate rates estimated for a 5 m waste depth within the largest open landfill cell (4.95 ha). Based on the landfill staging plan, it is assumed that the adjacent cells will be fully developed with the installed final cap, generating a negligible leachate volume.

The water balance model for the leachate pond sizing was developed using the GoldSim modelling software (Vers. 12.1) and includes the water volume resulting from incident rainfall on the leachate storage pond as well as direct evaporation losses. The leachate pond will be externally bunded to prevent runoff entering the pond from surrounding upslope areas.

2.3.1 Water Balance Modelling Results

The assumed leachate generation rates were applied to the leachate pond water balance, and a geometry optimisation was carried out to define the pond geometry, including a recommended 0.5 m freeboard. Table 2 presents the estimated leachate pond dimensions and Figure 3 illustrates the water balance modelling results.

Table 2: Final Pond Geometry

Top Width (m)	Top Length (m)	Internal Batter Slopes (zH:1V)	Operational Depth (m)	Total Depth (incl. Freeboard) (m)
100	100	3	2.5	3.0

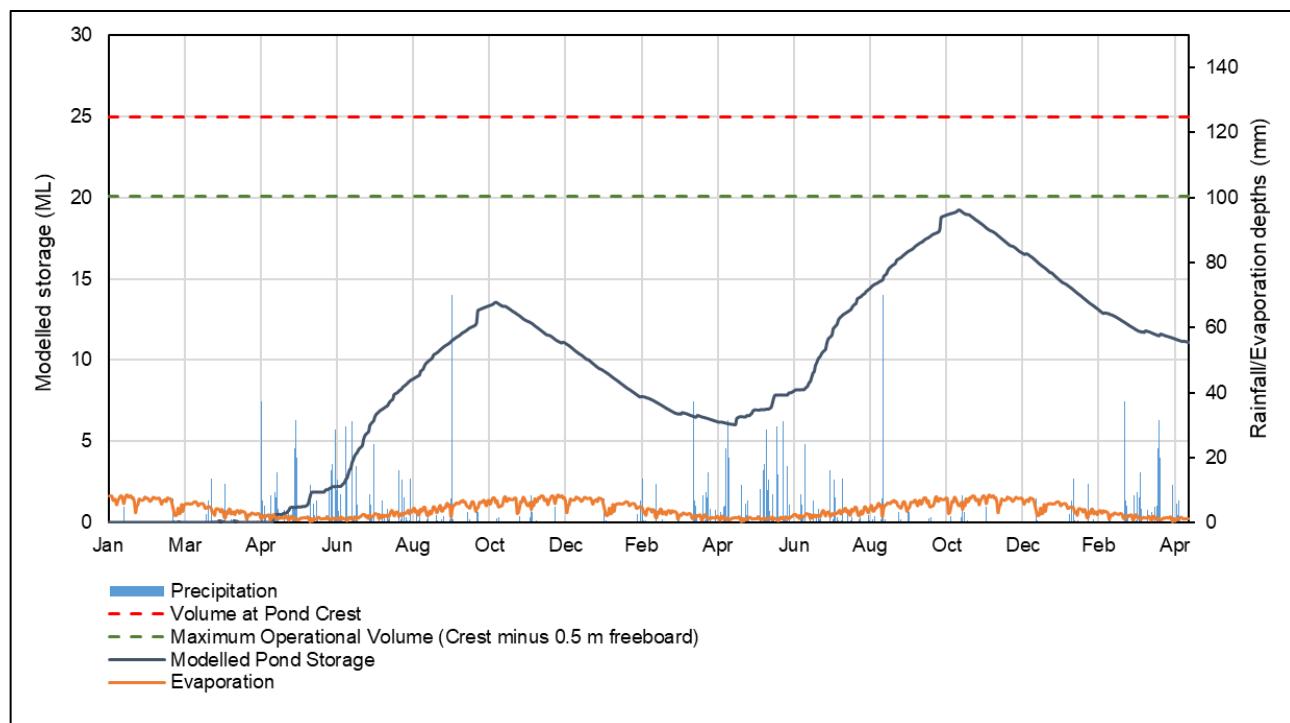


Figure 3: Modelled Leachate Pond Water Balance (consecutive 90th percentile rainfall years)

3.0 RECOMMENDATIONS

Based on results of the water balance modelling assessment, the following is recommended:

- Ongoing monitoring of leachate generation rates to be undertaken as the site develops in order to ensure that sufficient leachate storage capacity is available and that the leachate management strategy remains robust and effective over the life of the landfill.
- The leachate generation and water balance modelling to be calibrated against the monitored leachate rates (once available).

- Further investigations to be undertaken to measure the moisture content of the waste as the estimated leachate volume is highly sensitive to the moisture content of the waste. This might help to reduce the estimated required leachate storage pond size.
- It is suggested that a smaller leachate storage pond (e.g. 40 m x 50 m x 2.5 m (width, length, and depth, including 0.5 m freeboard) based on Golder (2015)⁴ modelling) may be constructed initially. As additional site-specific monitoring data becomes available the modelling results can be calibrated against the monitoring data and construction of a second leachate storage pond can be assessed (if required).

4.0 IMPORTANT INFORMATION

Your attention is drawn to the document – “Important Information”, which is attached to this memo. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Golder, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

5.0 CLOSURE

We trust that this memorandum meets Alkina’s immediate requirements to address the concerns raised by the ESD. If you have any queries, please do not hesitate to contact Golder.

GOLDER ASSOCIATES PTY LTD



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Attachments: A – Leachate Generation Modelling – HELP Model
B – Important Information

<https://golderassociates.sharepoint.com/sites/101511/shared%20documents/06%20deliverables/correspondence%20out/052%20esd%20responses%20-%20leachate%20pond%20sizing/1777197-052-m-rev1%20leachate%20pond%20sizing.docx>

⁴ Golder 2015. Allawuna Farm Landfill – Surface Water, Groundwater and Leachate Management Plan. Golder (ref. 147651033-015-R-Rev0), Perth, March 2015.

ATTACHMENT A

Leachate Generation Modelling

1.0 INTRODUCTION

Alkina Holdings Pty Ltd (Alkina) has engaged Golder Associates Pty Ltd (Golder) to develop a water balance model (WBM) to size leachate ponds for the proposed Great Southern Landfill (GSL) site. Leachate generation volumes are required to be estimated for input into the WBM and to assess leachate storage requirements at the GSL. This document presents the results of our assessment of the leachate generation rates based modelling undertaken using computer modelling program Hydrogeological Evaluation of Landfill Performance (HELP).

Leachate generation modelling has been undertaken using HELP model based on the proposed staging plan and cell footprint areas as presented in the Great Southern Landfill Management Plan (LMP) (ref. Alkina01_Rev1). This appendix presents input parameters and results of HELP modelling.

2.0 CELL DEVELOPMENT

As presented in the LMP the GSL it proposed to comprise of seven cells and will be developed as numbered. The following Figure 1 is an extract from the LMP showing the approximate size and positioning of each of the proposed cells.

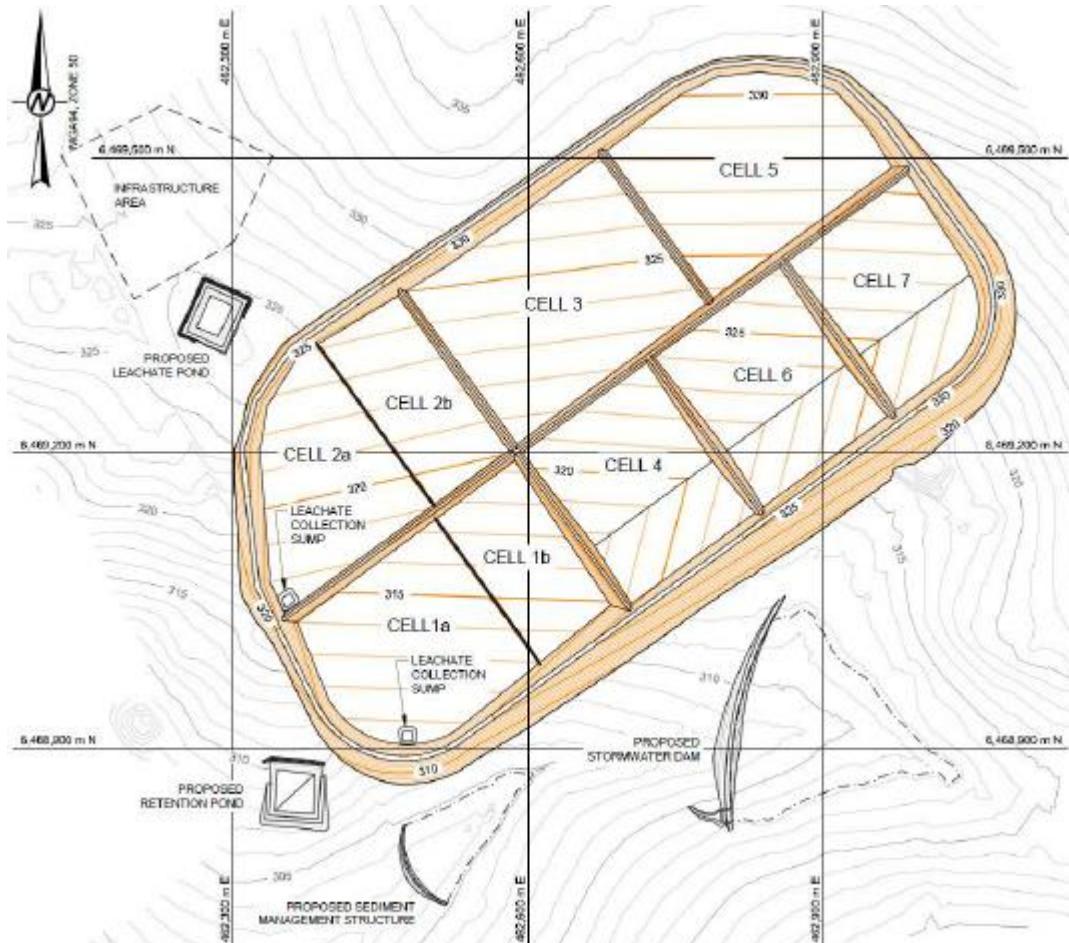


Figure 1: LMP Landfill Cell Configuration

The LMP also presents relevant information regarding the staging and life span of each of the cells. The GFL facility will receive between 150 000 and 250 000 tonnes of waste per year and is expected to operate for approximately 28 years, with a lifetime capacity of approximately 5.6 Mm³.

The following Table 1 presents a breakdown of the capacity for each cell and its life span.

Table 1: LMP Landfill Cell Capacity

Landfill Cell	Available Airspace (m ³)	Annual Tonnage (t)	Life Expectancy (years)
Cell 1	790 000	790 000	4.0
Cell 2	990 000	990 000	5.0
Cell 3	860 000	860 000	4.3
Cell 4	870 000	870 000	4.3
Cell 5	680 000	680 000	3.4
Cell 6	800 000	800 000	4.0
Cell 7	610 000	610 000	3.1
Landfill Total	5 600 000	5 600 000	28.1

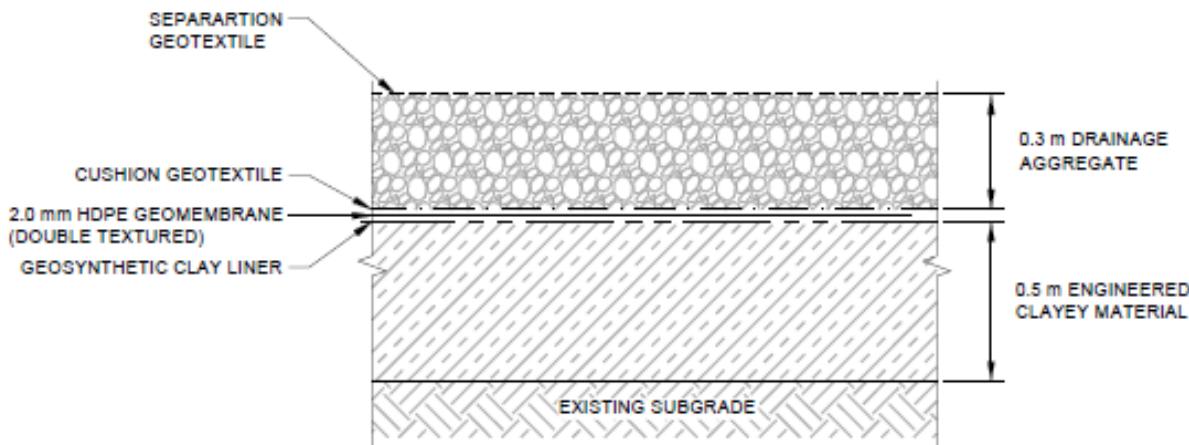
The dimensions of each of the GSL cells has been presented in the drawings set issued for the Cell 1 and 2 Works Approval application titled *Great Southern Landfill Lots 4869, 5931, 9926 & 26934 Great Southern Highway, Saint Ronans Cell 1 and 2 Works Approval* dated 14 July 2019 (the drawing set). From the drawing set we have estimated the average depth of waste in each of the cells to be 25 m. Therefore, the rate of rise of waste is approximately 0.5 m per month across each cell footprint area.

During filling of cells, it is assumed a 300 mm thick layer of cover soils will be placed over the exposed waste surface. This is herein referred to ‘Daily Cover’. Once waste placement has reached the final waste contours, it is assumed an additional 700 mm thick layer of cover soils will be placed above the Daily Cover. This is herein referred to as the ‘Interim Cap’. Once waste filling has been completed in all cells, the Final Cap will be installed.

The drawing set includes a typical liner detail that we have assumed will be installed within all cells at the GSL. The typical liner detail comprises a 500 m subgrade layer beneath a Geosynthetic Clay Liner (GCL), a 2 mm thick HDPE Geomembrane, Cushion Geotextile, a 300 mm drainage aggregate layer, and a Separation Geotextile.

The drawing set also includes an indicative landfill cap detail that we have assumed will be installed as the Final Cap across all cells at the GSL. The indicative landfill cap details comprised of Interim Cap, Geosynthetic Clay Liner (GCL), LLDPE Geomembrane, Cushion Geotextile, Drainage Geocomposite, a 700 mm Subsoil layer, and 300 mm of Top Soil.

The following Figure 2 and Figure 3 presents cross sections extracted from the drawings set for the typical liner detail and the indicative landfill cap, respectively.

**Figure 2: Typical Liner Detail**

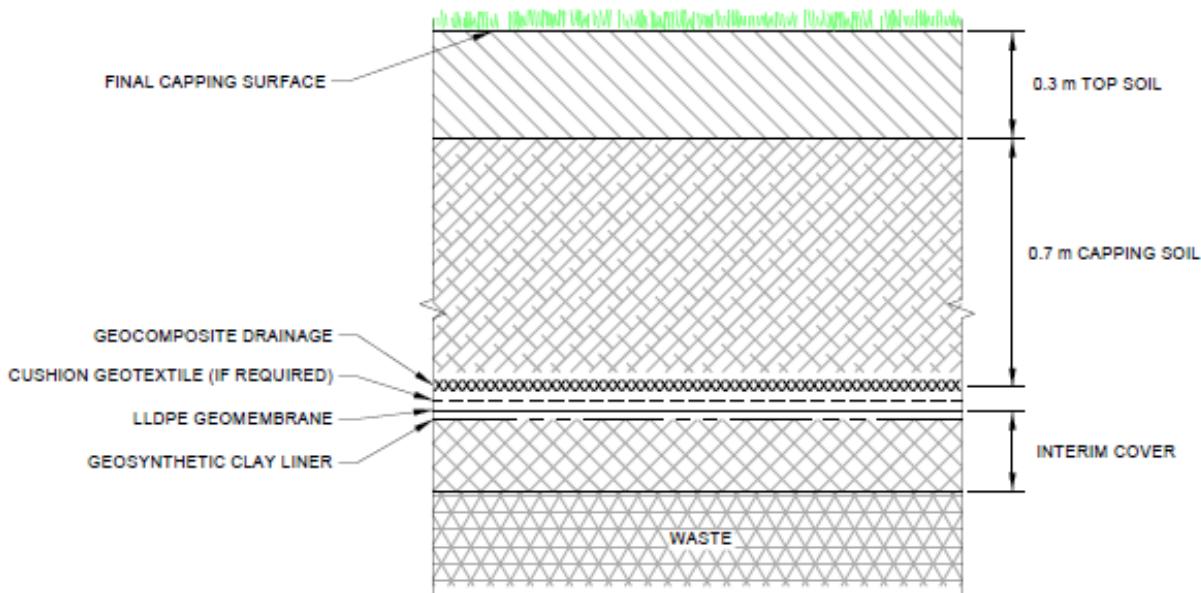


Figure 3: Indicative Landfill Cap Detail

3.0 MODEL PARAMETERS

Various scenarios were simulated to form a model of the life of the landfill in terms of leachate generation. Three scenarios were assessed for filtration through the cap. Table 3 presents the material properties, thickness of each later and assumed coefficient of permeability of the material for each profile. Where applicable, we have applied the Coefficient of Permeability values as presented in the report titled '*Great Southern Landfill Technical Specification for Construction of Cell 1 and Ancillary Works*' dated September 2017 (1777197-012-R-Rev1) (Technical Specification).

Table 2: HELP Model Profiles

	Layer	Thickness (mm)	Coefficient of Permeability (m/s)
Base Liner	Drainage Aggregate	300	1×10^{-3}
	HDPE Geomembrane Liner	2	2×10^{-14}
	GCL	8	5×10^{-11}
	Engineered Clayey Material	500	1×10^{-7}
Daily Cover	Moderately compacted earthen fill	300	1×10^{-5}
Interim Cap	Moderately compacted earthen fill	1000	1×10^{-5}
Final Cap	Topsoil	300	1×10^{-5}
	Subsoil	700	1×10^{-5}
	Drainage Geocomposite ¹	300	3×10^{-3}
	LLDPE Geomembrane	1.5	2×10^{-14}
	GCL	8	5×10^{-11}

Note 1: Drainage Geocomposite properties not specified within the Technical Specification. Within HELP modelling we have inputted properties for Drainage Geocomposite as per those typical for a 300 mm drainage layer within a typical landfill cap profile.

4.0 ASSUMPTIONS

The following assumptions were made for the model scenarios:

- The approximate life span of each cell is four years. This has been assumed as the average of cell life expectancies as presented in Table 1.

- Waste filling will occur in stages, with one active cell at a time.
- The Interim Cap will be constructed over the cell within three months of landfilling reaching the top of waste contours.
- The Final Cap will be constructed once waste placement has been completed within all cells.
- Rainfall (precipitation) falling on the open cell (Daily Cover) infiltrates through the waste with negligible surface water runoff.
- Runoff from the Final Cap is classified as stormwater and is diverted as clean water and stored separately from leachate.
- The initial moisture content of the waste layer is considered to be 2% dry of field capacity (the water content reached if a sample of the waste is initially saturated and then subject to prolonged free drainage). This is considered a conservative estimate of municipal waste entering the GSL based on our experience and the estimated filling rates.

5.0 MODEL SCENARIOS

5.1 Scenario 1 – Daily Cover

The first scenario simulated an open landfill cell with Daily Cover. An initial moisture content for the waste of 2% dry of field capacity was adopted. The final moisture content of the waste layer at the end of the first year of modelling was input into the following simulation year as the initial moisture content. This enabled the model to show how the infiltrated rainwater drains through the waste, allowing for water storage within the waste layer. The parameters shown in Table 3 were used for the top of the Daily Cover layer.

Table 3: Top of Daily Cover Input Parameters

Parameter	Input
Surface Slope	5%
Leaf Area Index	0 – bare stand of grass
Evaporative Zone Depth	360 mm
Runoff Allowed	0%

5.2 Scenario 2 – Interim Cap

The second scenario simulates the Interim Cap cell phase. An interim cover of 1.0 m (including 700 mm of cover soils placed over 300 mm daily cover), was assumed and that the waste was covered with 1.0 m of soil 3 months of achieving final waste contours.

We have also assumed that all cells will be covered with Interim Cap until filling of all cells is complete, at which stage the final capping will commence.

The final moisture content of the waste layer at the end of Scenario 1 (Daily Cover simulation), was adopted as the initial moisture content of the waste layer for Scenario 2. This models the change in water stored within the waste following the installation of the Interim Cap.

Table 4 presents the input parameters used for the Interim Cap.

Table 4: Interim Cap Input Parameters

Parameter	Input
Surface Slope	5%
Leaf Area Index	0 – bare stand of grass
Evaporative Zone Depth	360 mm
Runoff Allowed	100%

5.3 Scenario 3 – Final Cap

Scenario 3 assumes that the Final Cap has been installed. The final moisture content of the waste layer at the end of Scenario 2 Interim Cap simulation was adopted as the initial moisture content of the waste layers for Scenario 3. This models the change in water stored within the waste layer subsequent to installing the Final Cap. The modelling indicates that waste reaches field capacity prior to installation of the Final Cap. The rainwater that infiltrates through the waste and capping layers is absorbed and stored within the waste.

A summary of the input parameters for the Final Cap is provided in Table 5.

Table 5: Final Cap Input Parameters

Parameter	Input
Surface Slope	10%
Leaf Area Index	1 – poor stand of grass
Evaporative Zone Depth	460 mm
Runoff Allowed	100%

6.0 CLIMATE DATA

Climate data was sourced from the Australian Bureau of Meteorology (BOM) for the York area in Western Australian (BOM station 10311. Latitude 31.9°S and Longitude 116.8°E), approximately 20 km east of the site, and was considered as representative of conditions at the landfill. For average conditions a 50th percentile annual rainfall was estimated at 415 mm. Monthly rainfall values were input to the model to simulate rainfall consistent with the 50th percentile rainfall years.

The HELP model growing season was adjusted to suit southern hemisphere climate variation for Australian growing seasons. The start of the growing season was set to March and the end of the growing season as the end of November each year.

7.0 MODEL SIMULATIONS

7.1 Short Term Simulation Period – one-year analysis

7.1.1 Scenario 1 (Daily Cover)

The shortest simulation period available within the HELP Model is one year. Therefore, Scenario 1 - Daily Cover model was run for the following different waste depths for a simulation period of one year per waste depth:

- 5 m waste
- 10 m waste
- 15 m waste
- 20 m waste
- 25 m waste.

A summary of the leachate generation rates for average rainfall is provided in Table 6 and selected model outputs are included in Attachment 1. The average rainfall for each year is 400 mm, runoff is 0 mm, and evapotranspiration is 340 mm. The moisture content of waste from the previous year was input as the moisture content of the waste for the following year.

The leachate generation rates represent the total depth (mm) of leachate collected within the drainage layer of the base liner system for 1 ha of landfill.

Table 6: Summary of Leachate Generation Rates (mm/ha) for Scenario 1 Average Rainfall – 1 year Models

Month/Depth of Waste	5 m	10 m	15 m	20 m	25 m
January	0.0	0.0	0.1	0.1	0.3
February	0.0	0.0	0.0	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0
May	0.0	0.0	0.0	0.0	0.0
June	0.0	0.0	0.0	0.0	0.0
July	0.0	0.0	0.0	0.0	0.0
August	13.1	0.4	0.3	0.4	0.3
September	17.2	16.9	13.0	12.7	12.6
October	1.0	0.4	4.4	4.5	4.4
November	0.1	0.1	0.1	0.1	0.1
December	0.0	0.1	0.1	0.1	0.1
Total Leachate Collected	31.4	17.9	18.0	17.9	17.8

As shown in Table 6, the 5 m depth of waste saturates at a quicker rate than other modelled waste depths and therefore produces the greatest volume of leachate. However, the volumes of leachate modelled are considered relatively low due to the low average volumes of rainfall expected at the site based on meteorological data used. We have therefore also assessed the likely leachate volumes generated using the 90th percentile rainfall amounts to consider a wet year at the GSL.

A summary of the leachate generation rates for 90th percentile rainfall is provided in Table 7 and selected model outputs are included in Attachment 1. The 90th percentile rainfall for each year is 700 mm, runoff is 5 mm, and evapotranspiration is 450 mm.

Table 7: Summary of Leachate Generation Rates (mm/ha) for Scenario 1 90th Percentile Rainfall – 1 year Models

Month/Depth of Waste	5 m	10 m	15 m	20 m	25 m
January	0.0	0.0	0.1	0.1	0.3
February	0.0	0.0	0.0	0.0	0.0
March	0.0	0.0	0.0	0.0	0.0
April	0.0	0.0	0.0	0.0	0.0
May	5.3	0.6	0.0	0.0	0.0
June	7.3	1.1	0.8	0.8	0.6
July	55.3	24.2	23.6	23.7	20.9
August	42.9	46.3	28.9	24.6	27.3
September	51.9	33.6	39.7	34.9	23.0
October	51.3	43.4	38.8	38.7	36.9
November	0.2	51.9	27.0	18.3	31.9
December	0.1	0.1	41.8	39.1	8.1
Total Leachate Collected	214.3	201.2	200.0	180.2	149.0

Similar to the results presented for average rainfall leachate generation, Table 7 indicates that the 5 m depth of waste saturates at a quicker rate than other modelled waste depths and therefore produces the greatest volume of leachate. The leachate values show for January for the 15 m, 20 m and 25 m depths of waste are considered to be a result of the waste from previous years having already saturated over those previous years.

The results indicate an average leachate generation rate of approximately 20 mm/ha, and a 90th percentile leachate generation rate of approximately 190 mm/ha for the Scenario 1 (Daily Cover) model. This is considered slightly conservative as there is expected to be more than 5 m of waste placed in a year. Further discussion in relation to waste depths and the model sensitivity to the initial moisture content of the waste is provided in Section 8.2.

7.1.2 Scenario 2 (Interim Cap)

Similar to Scenario 1, the Scenario 2 (Interim Cap) Model was run for the following different waste depths for a simulation period of 1 year per waste depth:

- 15 m waste
- 20 m waste
- 25 m waste.

A summary of the leachate generation rates for average rainfall is provided in Table 8 and attached in Attachment 2, for a year with an average rainfall of 400 mm, runoff of 0 mm, and evapotranspiration of 340 mm. The moisture content of waste from the Scenario 1 Models was input into the Scenario 2 Models to represent the saturation of waste.

The leachate generation rates represent the total depth (mm) of leachate collected within the drainage layer of the base liner system for 1 ha of landfill.

Table 8: Summary of Leachate Generation Rates (mm/ha) for Scenario 2 Average Rainfall – 1 year Models

Month/Depth of Waste	15 m	20 m	25 m
January	0.1	0.1	0.3
February	0.0	0.0	0.0
March	0.0	0.0	0.0
April	0.0	0.0	0.0
May	0.0	0.0	0.0
June	0.0	0.0	0.0
July	0.0	0.0	0.0
August	7.1	6.9	6.7
September	22.0	22.0	22.0
October	0.2	0.2	0.3
November	0.0	0.0	0.0
December	0.0	0.0	0.0
Total Leachate Collected	29.4	29.2	29.3

The results indicate an average leachate generation of approximately 29.3 mm/ha per year for Interim Cap Model (Scenario 2) considering average rainfall. As per leachate generation rates using average rainfall for Scenario 1, the assessed volumes of leachate modelled are considered relatively low due to the low average volumes of rainfall expected at the site based on meteorological data used and we have therefore also assessed the likely leachate volumes generated using the 90th percentile rainfall amounts to consider an a wet year at the GSL.

A summary of the leachate generation rates for 90th percentile rainfall is provided in Table 9 and selected model outputs are included in Attachment 2. The 90th percentile rainfall for each year is 700 mm, runoff is 5 mm, and evapotranspiration is 450 mm.

Table 9: Summary of Leachate Generation Rates (mm/ha) for Scenario 2 90th Percentile Rainfall – 1 year Models

Month/Depth of Waste	15 m	20 m	25 m
January	0.1	0.1	0.3
February	0.0	0.0	0.0
March	0.0	0.0	0.0
April	0.0	0.0	0.0
May	1.1	1.0	0.9
June	16.3	16.1	16.1
July	27.1	27.2	27.2
August	26.9	26.3	25.8
September	42.5	33.1	33.5
October	32.6	42.3	33.1
November	15.9	10.2	13.4
December	51.8	28.3	9.3
Total Leachate Collected	214.3	184.6	159.6

The results indicate an average leachate generation of approximately 240 mm/ha per year for Interim Cap Model (Scenario 2) considering 90th percentile rainfall. This assumes that the waste is saturated after slower than expected filling rates during Scenario 1 and is therefore considered conservative.

7.2 Mid Term Simulation Period – 5-year Analysis

7.2.1 Scenario 2 (Interim Cap)

The Scenario 2 (Interim Cap) Model was run for the following different waste depths for a simulation period of five years per waste depth:

- 15 m waste
- 20 m waste
- 25 m waste.

This is considered to represent the case where the Interim Cap has been installed across the waste mass and the Final Cap has not yet been constructed. That is for example, waste filling in the initial cells (i.e. approximately Cell 1 to 4) has been completed up to the final waste contours and waste filling is being undertaken in approximately Cells 5 to 7. Once waste filling has been completed in all cells, the Final Cap will be constructed.

A summary of the leachate generation rates is provided in Table 10 for the fifth year and selected model outputs are included in Attachment 2. Note, the average rainfall over the five-year period equates to an average annual rainfall of approximately 440 mm. This is approximately 10% higher than the average annual rainfall for the GSL area. Additionally, the rainfall for the fifth year is 430 mm, also higher than the average annual rainfall for the area. Therefore, leachate generation rates from this model are considered conservative.

The moisture content of the waste layers at the start of the five-year simulation period was taken from the Scenario 1 (Daily Cover) models to represent the extent of saturation of the waste prior to placement of the Interim Cap materials.

The leachate generation rates represent the total depth (mm) of leachate collected within the drainage layer of the base liner system for 1 ha of landfill.

Table 10: Summary of Leachate Generation Rates (mm/ha) for the 5th year of Scenario 2 using Average Rainfall

Month/Depth of Waste	15 m	20 m	25 m
January	0.0	0.0	2.6
February	0.5	0.5	0.5
March	0.9	0.9	0.8
April	0.0	0.0	0.0
May	0.2	0.2	0.2
June	9.9	9.9	9.9
July	9.3	9.1	9.0
August	31.9	27.9	27.5
September	28.3	32.4	32.9
October	23.2	23.2	17.6
November	0.1	0.1	5.7
December	0.0	0.0	0.0
Total Leachate Collected	104.3	104.2	106.7

As shown in Table 10, the average annual leachate collected after five years of Interim Cap is approximately 105 mm/ha. However, assuming average rainfall is approximately 10% less than the model inputs (to match average rainfall records for the GSL area), this equates to an average annual leachate generation rate of approximately 94.5 mm per annum using average rainfall data.

We have also assessed leachate generation for Scenario 2 using 90th percentile rainfall as presented in the below Table 11. Note, the average rainfall over the five-year period equates to a 90th percentile annual rainfall of approximately 790 mm. This is approximately 10% higher than the 90th percentile annual rainfall for the GSL area. Additionally, the rainfall for the fifth year is 760 mm, also higher than the 90th percentile annual rainfall for the area. Therefore, similar to our assessment considering average rainfall, the leachate generation rates from this model are considered conservative.

Table 11: Summary of Leachate Generation Rates (mm/ha) for the 5th year of Scenario 2 using 90th percentile Rainfall

Month/Depth of Waste	15 m	20 m	25 m
January	92.1	21.2	15.8
February	3.7	92.6	12.1
March	0.7	25.8	72.7
April	3.4	3.4	42.5
May	0.7	0.7	0.7
June	17.4	17.4	17.4
July	28.8	28.5	28.5
August	37.3	33.8	32.8
September	22.9	26.8	27.8
October	19.3	19.3	19.3
November	11.7	10.2	10.2
December	82.3	9.4	9.3
Total Leachate Collected	320.3	271.7	269.8

As shown in Table 11, the average annual leachate collected after five years, considering 90th percentile rainfall and Interim Cap is approximately 290 mm/ha. However, assuming 90th percentile rainfall is approximately 10% less than the model inputs (to match 90th percentile rainfall records for the GSL area), this equates to an average annual leachate generation rate of approximately 260 mm/ha per annum using 90th percentile rainfall data.

The slightly higher annual leachate generation rates assessed, when compared with the one-year models is due to the waste becoming saturated over the five-year period. This is a result of inputting moisture contents of the waste layers from the one-year models into the five-year model and is considered a conservative approach. That is, only the top 5 m of the waste layers in the models summarised in Table 10 and Table 11 were set at 2% dry. All other waste layers were set based on the outputs from the Scenario 1 models and were either saturated or near saturated.

7.3 Long Term Simulation Period – 10-year Analysis

The Scenario 3 (Final Cap) Model was run with a waste depth of 25 m for a simulation period of 10 years to assess the decline in leachate generation rates once the Final Cap is installed.

The moisture content of the waste layers was taken from the Scenario 1 (Daily Cover) Models. We have considered leachate generation rates using both average rainfall and 90th percentile rainfall amounts as presented in Table 12 and Table 13, respectively.

Table 12: Summary of HELP Model Outputs for Scenario 3 (Cap) – using average rainfall data

Year	Rainfall (mm)	Runoff (mm)	Evapotranspiration (mm)	Stormwater from Drainage Layer (mm)	Leachate Generation (mm)
Year 1	400	0.0	418.2	0.1	0.3
Year 2	488	0.3	407.7	0.1	0.0
Year 5	427	0.1	411.5	0.4	0.0
Year 10	513	36.4	478.0	0.5	0.0

Table 13: Summary of HELP Model Outputs for Scenario 3 (Cap) – using 90th percentile rainfall data

Year	Rainfall (mm)	Runoff (mm)	Evapotranspiration (mm)	Stormwater from Drainage Layer (mm)	Leachate Generation (mm)
Year 1	696	6.2	532	0.2	0.3
Year 2	907	126.9	737.1	0.5	0.0
Year 5	752	83.0	644.7	0.5	0.0
Year 10	918	282.1	639.5	0.5	0.0

The long-term simulation demonstrates the majority of rainfall which falls on the landfill cap area is lost to either runoff or evapotranspiration. Therefore, leachate generation rates drop after the first year, as there is negligible infiltration through the cap.

8.0 SENSITIVITY ANALYSIS

8.1 General

A sensitivity analysis was undertaken to assess the impact of the following input parameters on leachate generation rates:

- Initial moisture content of waste and corresponding waste thickness
- Evaporative zone depth

8.2 Waste Moisture Content and Waste Depth

The results presented in Section 7.0 are considered to be conservative by over-estimating the degree of saturation of the waste.

The waste is assumed to be covered with Daily Cover (300 mm cover soils) for a maximum period of three months, at which point an additional 700 mm of cover soils has been assumed to form the Interim Cap.

Therefore, to assess the sensitivity of saturating the waste each year by assuming that only 5 m of waste is added per year, a second analysis was undertaken.

Based on a filling rate of approximately 0.5 m per month, it is estimated that approximately 6 m of waste may be placed within a single year. Therefore, the following waste depth were modelled assuming the full depth of waste is at an initial moisture content of 2% dry:

- 5 m
- 10 m
- 15 m.

The models were run for 1 year and using 90th percentile rainfall. A summary of the leachate generation rates is provided in Table 14.

Table 14: Summary of Leachate Generation Rates (mm/ha) Scenario 1 – 90th percentile Rainfall

Month/Depth of Waste	5 m	10 m	15 m
January	0.0	0.0	0.0
February	0.0	0.0	0.0
March	0.0	0.0	0.0
April	0.0	0.0	0.0
May	5.3	0.0	0.0
June	7.3	0.0	0.0
July	55.3	0.0	0.0
August	42.9	24.7	0.1
September	51.9	38.7	4.3
October	51.3	49.4	9.0
November	0.2	0.2	0.2
December	0.1	0.1	0.1
Total Leachate Collected	214.3	113.1	13.7

As shown in Table 14, leachate generation rates for 10 m and 15 m waste depths are lower than the results summarised in Table 7. As the waste does not become fully saturated for any of the waste depths, there is capacity within the waste to absorb some of the infiltrated rainfall.

Therefore, the results provided in Table 6 and Table 7 (Scenario 1), Table 8 and Table 9 (Scenario 2), and Table 10 and Table 11 (Scenario 3) are considered conservative as the models assume the waste layers become saturated over the one-year simulation period and the rate of waste rise is slower than expected on site.

8.3 Evaporative Zone Depth

The evaporative zone depth is the maximum depth from which water may be removed by evapotranspiration. Typically, a sandy material has a much shallower evaporative zone depth than a clayey material.

Where surface vegetation is present, the evaporative depth should at least equal the expected average depth of root penetration.

An evaporative zone depth for bare ground should take into account direct evaporation from the soil and is a function of the soil type and vapour and heat flux at the surface.

As per the HELP Model guidance document, the depth of capillary draw to the surface without vegetation may vary between 200 mm and 460 mm for a silty material.

Therefore, the evaporative zone depth for the Scenario 1 (Daily Cover) model was selected as approximately 360 mm. It is estimated the material will be a gravelly, silty clay.

In order to assess the sensitivity of the evaporative zone depth, the Scenario 2 (Interim Cap) model was assessed with two different evaporative zone depths. The selected depths were 360 mm and 460 mm respectively.

The models indicate that increasing the evaporative zone depth decreases the rate of runoff and increases the rate of evapotranspiration. The change in the evaporative zone depths resulted in a delay in saturation of the waste as evapotranspiration was increased. As the method adopted for assessing waste saturation is considered conservative, as discussed in Section 8.2, an evaporative zone depth of 360 mm was adopted for the Interim Cap and is considered to have negligible impact on the modelled leachate generation rates. This is based on the expected material properties and layer thickness of the Interim Cap.

9.0 SHORT-TERM LEACHATE GENERATION MODELLING

9.1 General

The leachate generation rates estimated by the HELP model does not account for short term intense rainfall events. To provide a representative leachate generation rate, the following short-term rainfall events were considered:

- Rainfall Event 1: A 1 in 20-year Annual Recurrence Interval (ARI) rainfall event with 30 minute duration.
- Rainfall Event 2: A 1 in 20-year ARI rainfall event with 24 hour duration.

9.2 Assumptions

The following assumptions were assigned to the short-term rainfall event conceptual model;

- A typical cell has a life of four years and a surface area of around 4 ha.
- Waste filling will occur on a staged basis with one active cell (approximately 4 ha) open at any one time.
- Runoff from the final capped cell that does not grade towards the open cell is classified as stormwater and does not form leachate.
- Rainfall infiltrating into the 5 m thick waste layer is considered to generate leachate as the waste is at field capacity (i.e. saturated).

9.3 Rainfall Event 1

The open cell area of approximately 4 ha encompasses a 5 m thick layer of waste.

The rational method was used to estimate the leachate generated from a 1 in 20-year ARI rainfall event over a duration of 30 minutes. All runoff from the open cell is classified as leachate. The runoff over the open cell was estimated using the equation:

$$Q = 0.278 CIA$$

Where Q = maximum discharge rate (m^3/s)

C = coefficient of runoff

I = rainfall intensity (mm/h)

A = catchment area (km^2)

A coefficient of runoff of 1.0 was assumed and a rainfall intensity of 43.3 mm/hr for the 1 in 20-year ARI storm over a 30 minute duration, as sourced from BOM intensity frequency duration (IFD) data. Using this method, the volume of leachate generated was estimated to be approximately 870 m^3 .

9.4 Rainfall Event 2

For a low intensity rainfall event it is assumed that rainfall falling over the open cell area with a 5 m thick layer of waste infiltrates into the waste and is stored within the waste layer.

As supported by HELP modelling, the 5 m thick layer of waste, placed over a 4 ha area of open cell is assumed to be saturated. Therefore, all rainfall received in this 4 hectare area of open cell is assumed to be collected by the leachate collection drainage layer above the base liner as leachate.

A coefficient of runoff of 1.0 was assumed and a rainfall intensity of 3.48 mm/hr for the 1 in 20-year ARI storm, over a 24 hour duration, as sourced from BOM IFD data. Based on these assumptions, the volume of leachate generated is estimated to be 3 400 m^3 .

9.5 Conclusion

As the volume estimates provided from the short-term scenarios is less than leachate generation rates as per the HELP model and Water Balance models considering 90th percentile rainfall, the estimates are not considered critical in sizing the Leachate Ponds. The assessment does, however, indicate that the ponds have capacity for the short-term rainfall events at the commencement of waste filling in the respective cells.

10.0 DISCUSSION

The HELP modeling undertaken to assess the volume of leachate generated from the GSL area indicates there is variability and sensitivity in the outputs.

Based on the limitations of the model, there is variability in the output of the one-year models. The assessment does however indicate that leachate generation generally reduces with the depth of waste modelled over a one-year period. That is, the quicker waste is placed, the more leachate generation rates are expected to reduce.

It also demonstrates that increasing the cover soil thicknesses results in a reduced leachate generation rate. However, the most significant impact on leachate generation rates is the construction of the Final Cap, where there is negligible infiltration through the cap.

Based on the results of the HELP models, the outputs have been reviewed to provide a 'range' of typical leachate generation rates from the Daily Cover Scenario, the Interim Cap Scenario, and the Final Cap scenario. These 'ranges' have then been applied to the GoldSim model for the overall site water balance assessment.

Attachment 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   **
*****
```

PRECIPITATION DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63690.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\I_465301.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\O_465301.prt

TIME: 15:22 DATE: 10/17/2019

```
*****
```

TITLE: 90th Daily Cover - 5 m 90th Percentile Rainfall

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*****
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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 4

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 151.850 CM
TOTAL INITIAL WATER = 151.850 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 6

MONTHLY TOTALS (MM) FOR YEAR 1

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

PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5	
	67.7	125.5	95.7	37.9	55.4	0.2	
RUNOFF	0.00	0.00	0.00	0.39	4.71	0.03	
	0.00	0.00	0.09	0.00	0.00	0.00	
EVAPOTRANSPIRATION	10.39	7.69	7.33	48.80	55.13	45.02	
	43.10	43.51	62.77	68.89	42.17	15.04	
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	5.266	7.245	
FROM LAYER 3	55.289	42.290	51.877	51.311	0.208	0.017	
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000	
LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000	
LAYER 6	0.000	0.000	0.000	0.000	0.000	0.000	

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.033	0.047
TOP OF LAYER 4	0.344	0.263	0.334	0.320	0.001	0.000
STD. DEVIATION OF DAILY	0.000	0.000	0.000	0.000	0.098	0.093
HEAD ON TOP OF LAYER 4	0.227	0.245	0.193	0.261	0.005	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.220	52.195	0.75
EVAPOTRANSPIRATION	449.846	4498.464	64.57
DRAINAGE COLLECTED FROM LAYER 3	213.5031	2135.031	30.64
PERC./LEAKAGE THROUGH LAYER 5	0.000086	0.001	0.00

AVG. HEAD ON TOP OF LAYER 4	1.1185		
PERC./LEAKAGE THROUGH LAYER 6	0.000097	0.001	0.00
CHANGE IN WATER STORAGE	28.131	281.309	4.04
SOIL WATER AT START OF YEAR	1518.499	15184.986	
SOIL WATER AT END OF YEAR	1546.629	15466.295	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 11

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

PRECIPITATION

TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20

STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.389	4.714	0.029
	0.000	0.000	0.087	0.000	0.000	0.000

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS	10.395	7.693	7.329	48.799	55.126	45.023
	43.096	43.511	62.765	68.893	42.173	15.044

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	5.2656	7.2454
	55.2893	42.2901	51.8772	51.3111	0.2077	0.0167
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 5

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

PERCOLATION/LEAKAGE THROUGH LAYER 6

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	0.0000	0.0000	0.0000	0.0000	0.0328	0.0466
	0.3444	0.2634	0.3339	0.3196	0.0013	0.0001
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

	MM	CU. METERS	PERCENT	
PRECIPITATION	696.70	(0.000)	6967.0	100.00
RUNOFF	5.220	(0.0000)	52.20	0.749
EVAPOTRANSPIRATION	449.846	(0.0000)	4498.46	64.568
LATERAL DRAINAGE COLLECTED FROM LAYER 3	213.50310	(0.00000)	2135.031	30.64491
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00009	(0.00000)	0.001	0.00001
AVERAGE HEAD ON TOP OF LAYER 4	1.118	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00010	(0.00000)	0.001	0.00001
CHANGE IN WATER STORAGE	28.131	(0.0000)	281.31	4.038

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	45.40	454.00000	1260001
RUNOFF	4.714	47.13572	1260001
DRAINAGE COLLECTED FROM LAYER 3	3.81714	38.17142	2620001

PERCOLATION/LEAKAGE THROUGH LAYER 5 0.000001 0.00001 2620001
 AVERAGE HEAD ON TOP OF LAYER 4 7.370
 MAXIMUM HEAD ON TOP OF LAYER 4 13.973
 LOCATION OF MAXIMUM HEAD IN LAYER 3
 (DISTANCE FROM DRAIN) 1.5 METERS
 PERCOLATION/LEAKAGE THROUGH LAYER 6 0.000010 0.00010 2620001
 SNOW WATER 0.00 0.0000 0
 MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2806
 MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0631

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	1.8398	0.0613
2	144.7132	0.2894
3	0.9600	0.0320
4	0.0000	0.0000
5	0.6000	0.7500
6	6.5500	0.1310

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:\WHI\VHELP22\data\P63690.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63690.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\I_465244.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\O_465244.prt

TIME: 15:24 DATE: 10/17/2019

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TITLE: 90th Daily Cover - 10 m 90th Percentile Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 5

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 7

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 296.550 CM
TOTAL INITIAL WATER = 296.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING

COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 5
DRAIN #1: LATERAL DRAINAGE FROM LAYER 4 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 6
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 7

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2
RUNOFF	0.00	0.00	0.00	0.39	4.71	0.03
	0.00	0.00	0.09	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.39	7.69	7.33	48.77	55.13	45.02
	43.10	43.51	62.77	68.89	42.17	15.04
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.000	0.000	0.000	0.000	0.059	1.075
	24.191	46.352	33.588	43.339	51.928	0.017
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.007
	0.151	0.289	0.216	0.270	0.334	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.001	0.030
	0.127	0.191	0.158	0.200	0.290	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.220	52.195	0.75
EVAPOTRANSPIRATION	449.812	4498.115	64.56
DRAINAGE COLLECTED FROM LAYER 4	200.5485	2005.485	28.79
PERC./LEAKAGE THROUGH LAYER 6	0.000079	0.001	0.00
AVG. HEAD ON TOP OF LAYER 5	1.0559		
PERC./LEAKAGE THROUGH LAYER 7	0.000087	0.001	0.00
CHANGE IN WATER STORAGE	41.120	411.204	5.90
SOIL WATER AT START OF YEAR	2965.499	29654.986	
SOIL WATER AT END OF YEAR	3006.619	30066.190	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
RUNOFF						
TOTALS	0.000	0.000	0.000	0.391	4.712	0.029
	0.000	0.000	0.087	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	10.395	7.693	7.329	48.771	55.127	45.023
	43.096	43.511	62.765	68.893	42.173	15.037
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0586 1.0746
 24.1909 46.3521 33.5885 43.3390 51.9281 0.0168

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

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES 0.0000 0.0000 0.0000 0.0000 0.0004 0.0069
 0.1507 0.2887 0.2162 0.2699 0.3342 0.0001

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

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

	MM	CU. METERS	PERCENT	
PRECIPITATION	696.70	(0.000)	6967.0	100.00
RUNOFF	5.220	(0.0000)	52.20	0.749
EVAPOTRANSPIRATION	449.812	(0.0000)	4498.12	64.563
LATERAL DRAINAGE COLLECTED FROM LAYER 4	200.54847	(0.00000)	2005.485	28.78549
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00008	(0.00000)	0.001	0.00001
AVERAGE HEAD ON TOP OF LAYER 5	1.056	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00009	(0.00000)	0.001	0.00001
CHANGE IN WATER STORAGE	41.120	(0.0000)	411.20	5.902

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)		
PRECIPITATION	45.40	454.00000	1260001	
RUNOFF	4.712	47.12204	1260001	
DRAINAGE COLLECTED FROM LAYER 4		3.60843	36.08430	3200001
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000001		0.00001	3200001
AVERAGE HEAD ON TOP OF LAYER 5		6.967		
MAXIMUM HEAD ON TOP OF LAYER 5		13.238		
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)		1.5 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000010		0.00010	3200001
SNOW WATER	0.00	0.0000	0	
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2813		
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0631		

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	1.8387	0.0613
2	144.7132	0.2894
3	146.0000	0.2920
4	0.9600	0.0320
5	0.0000	0.0000
6	0.6000	0.7500
7	6.5500	0.1310
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:\WHI\VHELP22\data\P63690.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63690.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\I_465263.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\O_465263.prt

TIME: 15:26 DATE: 10/17/2019

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TITLE: 90th Daily Cover - 15 m 90th Percentile Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 6

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 442.550 CM
TOTAL INITIAL WATER = 442.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2
RUNOFF	0.00	0.00	0.00	0.39	4.71	0.03
	0.00	0.00	0.09	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.39	7.69	7.33	48.77	55.13	45.02
	43.10	43.51	62.77	68.89	42.17	15.04
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.008	0.000	0.000	0.000	0.000	0.817
	23.641	28.907	39.664	38.750	27.001	41.762
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.005
TOP OF LAYER 6 0.147 0.180 0.255 0.241 0.174 0.260

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.027
HEAD ON TOP OF LAYER 6 0.110 0.112 0.163 0.122 0.234 0.287

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.220	52.195	0.75
EVAPOTRANSPIRATION	449.812	4498.115	64.56
DRAINAGE COLLECTED FROM LAYER 5	200.5485	2005.485	28.79
PERC./LEAKAGE THROUGH LAYER 7	0.000078	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.0526		
PERC./LEAKAGE THROUGH LAYER 8	0.000087	0.001	0.00
CHANGE IN WATER STORAGE	41.120	411.204	5.90
SOIL WATER AT START OF YEAR	4425.499	44254.986	
SOIL WATER AT END OF YEAR	4466.619	44666.190	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
RUNOFF						
TOTALS	0.000	0.000	0.000	0.391	4.712	0.029

0.000 0.000 0.087 0.000 0.000 0.000

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS 10.395 7.693 7.329 48.771 55.127 45.023
43.096 43.511 62.765 68.893 42.173 15.037

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS 0.0082 0.0000 0.0000 0.0000 0.0000 0.8171
23.6408 28.9068 39.6637 38.7495 27.0007 41.7615

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

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES 0.0001 0.0000 0.0000 0.0000 0.0000 0.0053
0.1472 0.1800 0.2553 0.2414 0.1738 0.2601

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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	(0.000)	6967.0 100.00
RUNOFF	5.220	(0.0000)	52.20 0.749
EVAPOTRANSPIRATION	449.812	(0.0000)	4498.12 64.563
LATERAL DRAINAGE COLLECTED FROM LAYER 5	200.54848	(0.00000)	2005.485 28.78549

PERCOLATION/LEAKAGE THROUGH LAYER 7 0.00008 (0.00000) 0.001 0.00001

AVERAGE HEAD ON TOP OF LAYER 6 1.053 (0.000)

PERCOLATION/LEAKAGE THROUGH LAYER 8 0.00009 (0.00000) 0.001 0.00001

CHANGE IN WATER STORAGE 41.120 (0.0000) 411.20 5.902

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	45.40	454.00000	1260001
RUNOFF	4.712	47.12204	1260001
DRAINAGE COLLECTED FROM LAYER 5	3.52587	35.25867	3470001
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000001	0.00001	3470001
AVERAGE HEAD ON TOP OF LAYER 6	6.808		
MAXIMUM HEAD ON TOP OF LAYER 6	12.946		
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1.5 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000010	0.00010	3470001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2813	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0631	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	1.8387	0.0613
2	144.7132	0.2894

3	146.0000	0.2920
4	146.0000	0.2920
5	0.9600	0.0320
6	0.0000	0.0000
7	0.6000	0.7500
8	6.5500	0.1310

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:\WHI\VHELP22\data\P63690.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63690.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\I_465282.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\O_465282.prt

TIME: 15:27 DATE: 10/17/2019

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TITLE: 90th Daily Cover - 20 m 90th Percentile Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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. = 0.30000000000 CM/SEC
SLOPE = 3.00 PERCENT
DRAINAGE LENGTH = 30.0 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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 588.550 CM
TOTAL INITIAL WATER = 588.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2

RUNOFF	0.00	0.00	0.00	0.39	4.71	0.03
	0.00	0.00	0.09	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.39	7.69	7.33	48.77	55.13	45.02
	43.10	43.51	62.77	68.89	42.17	15.04
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.076	0.000	0.000	0.000	0.000	0.764
	23.624	24.584	34.809	38.628	18.255	37.016
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.000	0.000	0.000	0.000	0.000	0.005
	0.147	0.153	0.224	0.241	0.117	0.231
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.002	0.000	0.000	0.000	0.000	0.024
	0.090	0.065	0.138	0.088	0.147	0.256

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.220	52.195	0.75
EVAPOTRANSPIRATION	449.812	4498.115	64.56
DRAINAGE COLLECTED FROM LAYER 6	177.7557	1777.557	25.51
PERC./LEAKAGE THROUGH LAYER 8	0.000072	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	0.9320		
PERC./LEAKAGE THROUGH LAYER 9	0.000077	0.001	0.00
CHANGE IN WATER STORAGE	63.913	639.132	9.17
SOIL WATER AT START OF YEAR	5885.499	58854.986	
SOIL WATER AT END OF YEAR	5949.412	59494.118	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20

STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.391	4.712	0.029
	0.000	0.000	0.087	0.000	0.000	0.000

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	10.395	7.693	7.329	48.771	55.127	45.023
	43.096	43.511	62.765	68.893	42.173	15.037

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 6

TOTALS	0.0763	0.0000	0.0000	0.0000	0.0000	0.7644
	23.6238	24.5844	34.8085	38.6277	18.2550	37.0156

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 9

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0005	0.0000	0.0000	0.0000	0.0000	0.0049
	0.1471	0.1531	0.2240	0.2406	0.1175	0.2306

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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	(0.000)	6967.0 100.00
RUNOFF	5.220	(0.0000)	52.20 0.749
EVAPOTRANSPIRATION	449.812	(0.0000)	4498.12 64.563
LATERAL DRAINAGE COLLECTED FROM LAYER 6	177.75568	(0.00000)	1777.557 25.51395
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00007	(0.00000)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 7	0.932	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00008	(0.00000)	0.001 0.00001
CHANGE IN WATER STORAGE	63.913	(0.0000)	639.13 9.174

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	45.40	454.00000	1260001
RUNOFF	4.712	47.12204	1260001
DRAINAGE COLLECTED FROM LAYER 6	3.09386	30.93856	3070001
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.00001	3070001
AVERAGE HEAD ON TOP OF LAYER 7	5.974		
MAXIMUM HEAD ON TOP OF LAYER 7	11.412		
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	1.3 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000010	0.00010	3020001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2813	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0631	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

----- LAYER	----- (CM)	----- (VOL/VOL)
1	1.8387	0.0613
2	144.7132	0.2894
3	146.0000	0.2920
4	146.0000	0.2920
5	148.0785	0.2962
6	1.1608	0.0387
7	0.0000	0.0000
8	0.6000	0.7500
9	6.5500	0.1310

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:\WHI\VHELP22\data\P63690.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63690.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\I_465320.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63690.VHP\O_465320.prt

TIME: 15:28 DATE: 10/17/2019

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TITLE: 90th Daily Cover - 25 m 90th Percentile Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 8

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 9

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT

AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 734.550 CM
TOTAL INITIAL WATER = 734.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Australia
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 1

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

PRECIPITATION 0.0 23.8 3.4 80.3 70.3 136.5
67.7 125.5 95.7 37.9 55.4 0.2

RUNOFF 0.00 0.00 0.00 0.39 4.71 0.03
0.00 0.00 0.09 0.00 0.00 0.00

EVAPOTRANSPIRATION 10.39 7.69 7.33 48.77 55.13 45.02
43.10 43.51 62.77 68.89 42.17 15.04

LATERAL DRAINAGE COLLECTED 0.301 0.000 0.000 0.000 0.000 0.613
FROM LAYER 7 20.849 27.286 22.947 36.814 31.930 8.030

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 9 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 10 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.002 0.000 0.000 0.000 0.000 0.004
TOP OF LAYER 8 0.130 0.170 0.148 0.229 0.206 0.050

STD. DEVIATION OF DAILY 0.006 0.000 0.000 0.000 0.000 0.021
HEAD ON TOP OF LAYER 8 0.077 0.083 0.079 0.087 0.164 0.060

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
	-----	-----	-----
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.220	52.195	0.75
EVAPOTRANSPIRATION	449.812	4498.115	64.56
DRAINAGE COLLECTED FROM LAYER 7	148.7704	1487.704	21.35
PERC./LEAKAGE THROUGH LAYER 9	0.000060	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	0.7818		
PERC./LEAKAGE THROUGH LAYER 10	0.000068	0.001	0.00
CHANGE IN WATER STORAGE	92.898	928.985	13.33
SOIL WATER AT START OF YEAR	7345.499	73454.986	
SOIL WATER AT END OF YEAR	7438.397	74383.971	

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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20

STD. DEVIATIONS 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.391	4.712	0.029
	0.000	0.000	0.087	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	10.395	7.693	7.329	48.771	55.127	45.023
	43.096	43.511	62.765	68.893	42.173	15.037

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 7

TOTALS	0.3007	0.0000	0.0000	0.0000	0.0000	0.6131
	20.8486	27.2861	22.9469	36.8145	31.9303	8.0303

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 9

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 10

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES	0.0019	0.0000	0.0000	0.0000	0.0000	0.0039
	0.1299	0.1700	0.1477	0.2293	0.2055	0.0500
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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	(0.000)	6967.0 100.00
RUNOFF	5.220	(0.0000)	52.20 0.749
EVAPOTRANSPIRATION	449.812	(0.0000)	4498.12 64.563
LATERAL DRAINAGE COLLECTED FROM LAYER 7	148.77039	(0.00000)	1487.704 21.35358
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00006	(0.00000)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 8	0.782	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.00007	(0.00000)	0.001 0.00001
CHANGE IN WATER STORAGE	92.898	(0.0000)	928.98 13.334

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)
PRECIPITATION	45.40	454.00000 1260001
RUNOFF	4.712	47.12204 1260001
DRAINAGE COLLECTED FROM LAYER 7	3.12264	31.22640 3160001
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000001	0.00001 3160001
AVERAGE HEAD ON TOP OF LAYER 8	6.029	
MAXIMUM HEAD ON TOP OF LAYER 8	11.515	
LOCATION OF MAXIMUM HEAD IN LAYER 7 (DISTANCE FROM DRAIN)	1.3 METERS	
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000010	0.00010 2690001

SNOW WATER 0.00 0.0000 0

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2813

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0631

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	1.8387	0.0613
2	144.7132	0.2894
3	146.0000	0.2920
4	146.0000	0.2920
5	148.0785	0.2962
6	149.0993	0.2982
7	0.9600	0.0320
8	0.0000	0.0000
9	0.6000	0.7500
10	6.5500	0.1310

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:\WHI\VHELP22\data\P63674.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63674.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\I_465073.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\O_465073.prt

TIME: 12:55 DATE: 10/17/2019

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TITLE: Daily Cover - 5 m - Average Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 4

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 151.850 CM
TOTAL INITIAL WATER = 151.850 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
YORK AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 6

MONTHLY TOTALS (MM) FOR YEAR 1

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

PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.89	6.32	6.27	7.53	54.61	33.00
	43.18	43.51	62.77	47.27	15.79	8.79
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 3	0.000	13.057	17.167	0.910	0.018	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.081	0.110	0.006	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.152	0.126	0.014	0.000	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	336.941	3369.415	84.09
DRAINAGE COLLECTED FROM LAYER 3	31.1519	311.519	7.77

PERC./LEAKAGE THROUGH LAYER 5	0.000022	0.000	0.00
AVG. HEAD ON TOP OF LAYER 4	0.1647		
PERC./LEAKAGE THROUGH LAYER 6	0.000029	0.000	0.00
CHANGE IN WATER STORAGE	32.607	326.066	8.14
SOIL WATER AT START OF YEAR	1518.499	15184.986	
SOIL WATER AT END OF YEAR	1551.105	15511.052	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10

STD. DEVIATIONS 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00 0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	7.893	6.323	6.274	7.534	54.611	32.999
	43.182	43.515	62.767	47.266	15.791	8.786

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	13.0573	17.1669	0.9101	0.0176	0.0001

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

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0813 0.1105 0.0057 0.0001 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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	(0.000)	4007.0 100.00
RUNOFF	0.000	(0.0000)	0.00 0.000
EVAPOTRANSPIRATION	336.941	(0.0000)	3369.41 84.088
LATERAL DRAINAGE COLLECTED FROM LAYER 3	31.15194	(0.00000)	311.519 7.77438
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.00002	(0.00000)	0.000 0.00001
AVERAGE HEAD ON TOP OF LAYER 4	0.165	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00003	(0.00000)	0.000 0.00001
CHANGE IN WATER STORAGE	32.607	(0.0000)	326.07 8.137

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)
PRECIPITATION	22.60	226.00000 1260001
RUNOFF	0.000	0.00000 0

DRAINAGE COLLECTED FROM LAYER 3 2.84676 28.46756 2370001
 PERCOLATION/LEAKAGE THROUGH LAYER 5 0.000001 0.00001 2370001
 AVERAGE HEAD ON TOP OF LAYER 4 5.497
 MAXIMUM HEAD ON TOP OF LAYER 4 10.530
 LOCATION OF MAXIMUM HEAD IN LAYER 3
 (DISTANCE FROM DRAIN) 1.2 METERS
 PERCOLATION/LEAKAGE THROUGH LAYER 6 0.000010 0.00010 2600001
 SNOW WATER 0.00 0.0000 0
 MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2620
 MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0655

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	2.2907	0.0764
2	144.7099	0.2894
3	0.9600	0.0320
4	0.0000	0.0000
5	0.6000	0.7500
6	6.5500	0.1310
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:\WHI\VHELP22\data\P63674.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63674.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\I_465168.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\O_465168.prt

TIME: 13:52 DATE: 10/17/2019

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TITLE: Daily Cover - 10 m - Average Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 5

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 7

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 296.550 CM
TOTAL INITIAL WATER = 296.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
YORK AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING

COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
 COEFFICIENTS FOR YORK AUST
 AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 5
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 4 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 6
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 7

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.89	6.32	6.27	7.53	54.61	33.00
	43.18	43.51	62.77	47.76	15.80	8.79
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.356	16.867	0.416	0.011	0.002
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.002	0.109	0.003	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.006	0.117	0.008	0.000	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.458	3374.576	84.22
DRAINAGE COLLECTED FROM LAYER 4	17.6513	176.513	4.41
PERC./LEAKAGE THROUGH LAYER 6	0.000017	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0945		
PERC./LEAKAGE THROUGH LAYER 7	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	45.591	455.911	11.38
SOIL WATER AT START OF YEAR	2965.499	29654.986	
SOIL WATER AT END OF YEAR	3011.090	30110.897	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	7.893	6.323	6.274	7.534	54.611	32.999
	43.182	43.515	62.767	47.761	15.804	8.794
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000

0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.3559 16.8669 0.4156 0.0107 0.0021

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

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0022 0.1086 0.0026 0.0001 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

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

	MM	CU. METERS	PERCENT	
PRECIPITATION	400.70	(0.000)	4007.0	100.00
RUNOFF	0.000	(0.0000)	0.00	0.0000
EVAPOTRANSPIRATION	337.458	(0.0000)	3374.58	84.217
LATERAL DRAINAGE COLLECTED FROM LAYER 4	17.65126	(0.00000)	176.513	4.40511
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00002	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 5	0.095	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00002	(0.00000)	0.000	0.00000
CHANGE IN WATER STORAGE	45.591	(0.0000)	455.91	11.378

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	22.60	226.00000	1260001
RUNOFF	0.000	0.00000	0
DRAINAGE COLLECTED FROM LAYER 4		2.08393	20.83934 2670001
PERCOLATION/LEAKAGE THROUGH LAYER 6		0.000001	0.00001 2670001
AVERAGE HEAD ON TOP OF LAYER 5		4.024	
MAXIMUM HEAD ON TOP OF LAYER 5		7.778	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)		1.0 METERS	
PERCOLATION/LEAKAGE THROUGH LAYER 7		0.000010	0.00010 2760001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2620	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0655	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	2.2891	0.0763
2	144.7099	0.2894
3	146.0000	0.2920
4	0.9600	0.0320
5	0.0000	0.0000
6	0.6000	0.7500
7	6.5500	0.1310

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:\WHI\VHELP22\data\P63674.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63674.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\I_465187.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\O_465187.prt

TIME: 13:53 DATE: 10/17/2019

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TITLE: Daily Cover - 15 m - Average Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 6

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 442.550 CM
TOTAL INITIAL WATER = 442.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
YORK AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.89	6.32	6.27	7.53	54.61	33.00
	43.18	43.51	62.77	47.03	16.60	8.79
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.008	0.000	0.000	0.000	0.000	0.000
	0.000	0.211	12.943	4.374	0.046	0.003
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 6 0.000 0.001 0.083 0.027 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 6 0.000 0.005 0.060 0.095 0.001 0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.510	3375.098	84.23
DRAINAGE COLLECTED FROM LAYER 5	17.5853	175.853	4.39
PERC./LEAKAGE THROUGH LAYER 7	0.000018	0.000	0.00
AVG. HEAD ON TOP OF LAYER 6	0.0935		
PERC./LEAKAGE THROUGH LAYER 8	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	45.605	456.049	11.38
SOIL WATER AT START OF YEAR	4425.499	44254.986	
SOIL WATER AT END OF YEAR	4471.104	44711.035	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS 0.00 12.50 1.20 33.50 34.90 74.40
44.30 88.00 63.70 21.50 26.60 0.10

STD. DEVIATIONS 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00

RUNOFF

TOTALS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS 7.893 6.323 6.274 7.534 54.611 32.999
 43.182 43.515 62.767 47.028 16.598 8.785

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS 0.0082 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.2109 12.9434 4.3739 0.0458 0.0030

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

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES 0.0001 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0013 0.0833 0.0272 0.0003 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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	(0.000)	4007.0 100.00
RUNOFF	0.000	(0.0000)	0.00 0.000
EVAPOTRANSPIRATION	337.510	(0.0000)	3375.10 84.230

LATERAL DRAINAGE COLLECTED 17.58530 (0.00000) 175.853 4.38864
FROM LAYER 5

PERCOLATION/LEAKAGE THROUGH 0.00002 (0.00000) 0.000 0.00000
LAYER 7

AVERAGE HEAD ON TOP 0.094 (0.000)
OF LAYER 6

PERCOLATION/LEAKAGE THROUGH 0.00002 (0.00000) 0.000 0.00000
LAYER 8

CHANGE IN WATER STORAGE 45.605 (0.0000) 456.05 11.381

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)		
PRECIPITATION	22.60	226.00000	1260001	
RUNOFF	0.000	0.00000	0	
DRAINAGE COLLECTED FROM LAYER 5	2.15379	21.53791	2740001	
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000001	0.00001	2740001	
AVERAGE HEAD ON TOP OF LAYER 6	4.159			
MAXIMUM HEAD ON TOP OF LAYER 6	8.032			
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1.0 METERS			
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000010	0.00010	2760001	
SNOW WATER	0.00	0.0000	0	
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2620			
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0666			

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
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1	2.2905	0.0763
2	144.7099	0.2894
3	146.0000	0.2920
4	146.0000	0.2920
5	0.9600	0.0320
6	0.0000	0.0000
7	0.6000	0.7500
8	6.5500	0.1310

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:\WHI\VHELP22\data\P63674.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63674.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\I_465206.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\O_465206.prt

TIME: 13:56 DATE: 10/17/2019

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TITLE: Daily Cover - 20 m - Average Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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. = 0.30000000000 CM/SEC
SLOPE = 3.00 PERCENT
DRAINAGE LENGTH = 30.0 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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 588.550 CM
TOTAL INITIAL WATER = 588.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
YORK AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1

RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.89	6.32	6.27	7.53	54.61	33.00
	43.18	43.51	62.77	47.03	16.60	8.79
LATERAL DRAINAGE COLLECTED	0.076	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	0.000	0.364	12.665	4.432	0.046	0.003
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	0.000	0.002	0.082	0.028	0.000	0.000
STD. DEVIATION OF DAILY	0.002	0.000	0.000	0.000	0.000	0.000
HEAD ON TOP OF LAYER 7	0.000	0.008	0.060	0.072	0.001	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.510	3375.098	84.23
DRAINAGE COLLECTED FROM LAYER 6	17.5853	175.853	4.39
PERC./LEAKAGE THROUGH LAYER 8	0.000018	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0935		
PERC./LEAKAGE THROUGH LAYER 9	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	45.605	456.049	11.38
SOIL WATER AT START OF YEAR	5885.499	58854.986	
SOIL WATER AT END OF YEAR	5931.104	59311.035	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	7.893	6.323	6.274	7.534	54.611	32.999
	43.182	43.515	62.767	47.028	16.598	8.785
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 6

TOTALS	0.0763	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.3638	12.6648	4.4315	0.0458	0.0030
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

PERCOLATION/LEAKAGE THROUGH LAYER 8

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

PERCOLATION/LEAKAGE THROUGH LAYER 9

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0023	0.0815	0.0276	0.0003	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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	(0.000)	4007.0 100.00
RUNOFF	0.000	(0.0000)	0.00 0.000
EVAPOTRANSPIRATION	337.510	(0.0000)	3375.10 84.230
LATERAL DRAINAGE COLLECTED FROM LAYER 6	17.58530	(0.00000)	175.853 4.38864
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00002	(0.00000)	0.000 0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.093	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00002	(0.00000)	0.000 0.00000
CHANGE IN WATER STORAGE	45.605	(0.0000)	456.05 11.381

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	22.60	226.00000	1260001
RUNOFF	0.000	0.00000	0
DRAINAGE COLLECTED FROM LAYER 6	1.80537	18.05374	2780001
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.00001	2780001
AVERAGE HEAD ON TOP OF LAYER 7	3.486		
MAXIMUM HEAD ON TOP OF LAYER 7	6.762		
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	0.9 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000010	0.00010	2780001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2620	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0666	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	2.2905	0.0763
2	144.7099	0.2894
3	146.0000	0.2920
4	146.0000	0.2920
5	146.0000	0.2920
6	0.9600	0.0320
7	0.0000	0.0000
8	0.6000	0.7500
9	6.5500	0.1310

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:\WHI\VHELP22\data\P63674.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63674.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\I_465225.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63674.VHP\O_465225.prt

TIME: 13:58 DATE: 10/17/2019

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TITLE: Daily Cover - 25 m - Average Rainfall

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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 5
THICKNESS = 30.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 8

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 9

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT

AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.432 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 17.736 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.202 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 734.550 CM
TOTAL INITIAL WATER = 734.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
YORK AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR YORK AUST
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.89	6.32	6.27	7.53	54.61	33.00
	43.18	43.51	62.77	47.03	16.60	8.79
LATERAL DRAINAGE COLLECTED FROM LAYER 7	0.301	0.000	0.000	0.000	0.000	0.000
	0.000	0.205	12.600	4.430	0.046	0.003
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.002	0.000	0.000	0.000	0.000	0.000
	0.000	0.001	0.081	0.028	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.006	0.000	0.000	0.000	0.000	0.000
	0.000	0.005	0.060	0.060	0.001	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.510	3375.098	84.23
DRAINAGE COLLECTED FROM LAYER 7	17.5853	175.853	4.39
PERC./LEAKAGE THROUGH LAYER 9	0.000019	0.000	0.00
AVG. HEAD ON TOP OF LAYER 8	0.0935		
PERC./LEAKAGE THROUGH LAYER 10	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	45.605	456.049	11.38
SOIL WATER AT START OF YEAR	7345.499	73454.986	
SOIL WATER AT END OF YEAR	7391.104	73911.035	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	7.893	6.323	6.274	7.534	54.611	32.999
	43.182	43.515	62.767	47.028	16.598	8.785
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 7

TOTALS	0.3007	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.2053	12.6004	4.4301	0.0458	0.0030
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 9

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 10

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0013	0.0811	0.0276	0.0003	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

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

	MM	CU. METERS	PERCENT	
PRECIPITATION	400.70	(0.000)	4007.0	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	337.510	(0.0000)	3375.10	84.230
LATERAL DRAINAGE COLLECTED FROM LAYER 7	17.58530	(0.00000)	175.853	4.38864
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00002	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 8	0.093	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.00002	(0.00000)	0.000	0.00000
CHANGE IN WATER STORAGE	45.605	(0.0000)	456.05	11.381

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	22.60	226.00000	1260001
RUNOFF	0.000	0.00000	0
DRAINAGE COLLECTED FROM LAYER 7	1.57715	15.77151	2810001
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000001	0.00001	2810001
AVERAGE HEAD ON TOP OF LAYER 8	3.045		
MAXIMUM HEAD ON TOP OF LAYER 8	5.925		
LOCATION OF MAXIMUM HEAD IN LAYER 7 (DISTANCE FROM DRAIN)	0.8 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000010	0.00010	2780001
SNOW WATER	0.00	0.0000	0

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2620

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0666

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	2.2905	0.0763
2	144.7099	0.2894
3	146.0000	0.2920
4	146.0000	0.2920
5	146.0000	0.2920
6	146.0000	0.2920
7	0.9600	0.0320
8	0.0000	0.0000
9	0.6000	0.7500
10	6.5500	0.1310

SNOW WATER 0.000

Attachment 2

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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\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465358.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465358.prt

TIME: 16:35 DATE: 10/17/2019

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*****
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TITLE: Interim Cover - 15 m 90th Percentile Rainfall

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*****
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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 6

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 460.750 CM
TOTAL INITIAL WATER = 460.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2
RUNOFF	0.00	0.00	0.00	0.37	4.53	0.03
	0.00	0.00	0.08	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.41	7.70	7.34	48.76	55.07	44.99
	43.07	43.50	62.75	65.59	41.22	15.03
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.008	0.000	0.000	0.000	1.104	16.245
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.007 0.105
TOP OF LAYER 6 0.168 0.168 0.273 0.203 0.103 0.322

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.021 0.093
HEAD ON TOP OF LAYER 6 0.077 0.051 0.044 0.130 0.154 0.289

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.012	50.116	0.72
EVAPOTRANSPIRATION	445.436	4454.360	63.94
DRAINAGE COLLECTED FROM LAYER 5	214.1275	2141.275	30.73
PERC./LEAKAGE THROUGH LAYER 7	0.000083	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.1243		
PERC./LEAKAGE THROUGH LAYER 8	0.000087	0.001	0.00
CHANGE IN WATER STORAGE	32.125	321.249	4.61
SOIL WATER AT START OF YEAR	4607.499	46074.987	
SOIL WATER AT END OF YEAR	4639.624	46396.236	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS 0.00 23.80 3.40 80.30 70.30 136.50
67.70 125.50 95.70 37.90 55.40 0.20

STD. DEVIATIONS 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00

RUNOFF

TOTALS 0.000 0.000 0.000 0.374 4.530 0.028
 0.000 0.000 0.079 0.000 0.000 0.000

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS 10.414 7.704 7.341 48.762 55.067 44.990
 43.072 43.499 62.747 65.590 41.221 15.030

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS 0.0082 0.0000 0.0000 0.0000 1.1042 16.2449
 27.0474 26.9857 42.4453 32.5781 15.9633 51.7504

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

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES 0.0001 0.0000 0.0000 0.0000 0.0069 0.1046
 0.1685 0.1681 0.2732 0.2029 0.1027 0.3223

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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	(0.000)	6967.0 100.00
RUNOFF	5.012	(0.0000)	50.12 0.719
EVAPOTRANSPIRATION	445.436	(0.0000)	4454.36 63.935

LATERAL DRAINAGE COLLECTED 214.12749 (0.00000) 2141.275 30.73453
 FROM LAYER 5

PERCOLATION/LEAKAGE THROUGH 0.00008 (0.00000) 0.001 0.00001
 LAYER 7

AVERAGE HEAD ON TOP 1.124 (0.000)
 OF LAYER 6

PERCOLATION/LEAKAGE THROUGH 0.00009 (0.00000) 0.001 0.00001
 LAYER 8

CHANGE IN WATER STORAGE 32.125 (0.0000) 321.25 4.611

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	45.40	454.00000	1260001
RUNOFF	4.530	45.30408	1260001
DRAINAGE COLLECTED FROM LAYER 5	3.64884	36.48844	3500001
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000001	0.00001	3500001
AVERAGE HEAD ON TOP OF LAYER 6	7.045		
MAXIMUM HEAD ON TOP OF LAYER 6	13.380		
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1.5 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000010	0.00010	3370001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2600	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0581	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
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1	17.8524	0.1785
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	0.9600	0.0320
6	0.0000	0.0000
7	0.6000	0.7500
8	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465358.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465358.prt

TIME: 16:40 DATE: 10/17/2019

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TITLE: Interim Cover - 15 m 90th Percentile Rainfall

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 6

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 460.750 CM
TOTAL INITIAL WATER = 460.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2
RUNOFF	0.00	0.00	0.00	0.37	4.53	0.03
	0.00	0.00	0.08	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.41	7.70	7.34	48.76	55.07	44.99
	43.07	43.50	62.75	65.59	41.22	15.03
LATERAL DRAINAGE COLLECTED	0.008	0.000	0.000	0.000	1.104	16.245
FROM LAYER 5	27.047	26.986	42.445	32.578	15.963	51.750
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.007 0.105
TOP OF LAYER 6 0.168 0.168 0.273 0.203 0.103 0.322

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.021 0.093
HEAD ON TOP OF LAYER 6 0.077 0.051 0.044 0.130 0.154 0.289

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.012	50.116	0.72
EVAPOTRANSPIRATION	445.436	4454.360	63.94
DRAINAGE COLLECTED FROM LAYER 5	214.1275	2141.275	30.73
PERC./LEAKAGE THROUGH LAYER 7	0.000083	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.1243		
PERC./LEAKAGE THROUGH LAYER 8	0.000087	0.001	0.00
CHANGE IN WATER STORAGE	32.125	321.249	4.61
SOIL WATER AT START OF YEAR	4607.499	46074.987	
SOIL WATER AT END OF YEAR	4639.624	46396.236	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 2

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

PRECIPITATION	108.3	136.5	61.8	43.3	26.7	94.1
	192.2	87.4	58.1	38.5	7.6	55.2
RUNOFF	15.95	1.50	0.28	0.00	0.00	0.65
	2.60	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	51.58	135.12	56.75	44.53	35.71	37.66
	41.60	52.38	64.05	34.91	7.20	16.60
LATERAL DRAINAGE COLLECTED FROM LAYER 5	6.781	16.321	5.130	0.679	0.012	16.380
	25.140	40.116	36.156	20.271	24.763	77.071
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 6	0.042	0.113	0.032	0.004	0.000	0.105
	0.157	0.250	0.233	0.126	0.159	0.480
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 6	0.063	0.083	0.083	0.013	0.000	0.095
	0.058	0.080	0.074	0.085	0.197	0.261

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
-----	-----	-----	-----
PRECIPITATION	909.70	9097.000	100.00
RUNOFF	20.971	209.706	2.31
EVAPOTRANSPIRATION	578.081	5780.811	63.55
DRAINAGE COLLECTED FROM LAYER 5	268.8189	2688.189	29.55
PERC./LEAKAGE THROUGH LAYER 7	0.000104	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.4179		
PERC./LEAKAGE THROUGH LAYER 8	0.000116	0.001	0.00
CHANGE IN WATER STORAGE	41.829	418.293	4.60
SOIL WATER AT START OF YEAR	4639.624	46396.236	
SOIL WATER AT END OF YEAR	4681.453	46814.528	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6
DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 3

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

PRECIPITATION 165.1 29.7 35.5 8.5 176.6 69.5
94.3 27.2 40.2 62.0 30.8 45.5

RUNOFF 57.78 0.00 0.00 0.00 0.09 0.00
0.00 0.00 0.04 0.00 0.00 0.00

EVAPOTRANSPIRATION 62.59 9.24 37.81 18.47 49.93 42.87
41.66 47.85 41.30 69.46 26.48 22.49

LATERAL DRAINAGE COLLECTED 24.492 8.339 42.383 12.845 23.831 34.145
FROM LAYER 5 30.698 36.021 30.716 18.643 0.009 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 7 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 8 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.153 0.058 0.264 0.083 0.148 0.220
TOP OF LAYER 6 0.191 0.224 0.198 0.116 0.000 0.000

STD. DEVIATION OF DAILY 0.086 0.062 0.255 0.201 0.077 0.030
HEAD ON TOP OF LAYER 6 0.055 0.114 0.229 0.230 0.000 0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
	-----	-----	-----
PRECIPITATION	784.90	7849.000	100.00
RUNOFF	57.908	579.077	7.38
EVAPOTRANSPIRATION	470.148	4701.481	59.90
DRAINAGE COLLECTED FROM LAYER 5	262.1211	2621.211	33.40

PERC./LEAKAGE THROUGH LAYER 7	0.000107	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.3786		
PERC./LEAKAGE THROUGH LAYER 8	0.000106	0.001	0.00
CHANGE IN WATER STORAGE	-5.277	-52.769	-0.67
SOIL WATER AT START OF YEAR	4681.453	46814.528	
SOIL WATER AT END OF YEAR	4676.176	46761.759	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION	13.2	83.9	5.6	8.0	61.1	129.9
	98.0	207.2	47.9	62.6	18.1	50.9

RUNOFF	0.00	1.44	0.00	0.00	0.00	0.00
	0.13	0.25	0.00	0.00	0.00	0.77

EVAPOTRANSPIRATION	40.16	37.21	38.35	7.88	26.04	43.20
	40.49	46.11	63.58	60.65	18.88	60.73

LATERAL DRAINAGE COLLECTED	0.197	4.005	16.411	0.001	4.831	16.327
FROM LAYER 5	34.113	34.990	32.758	21.853	11.121	69.830

PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 6	0.001	0.027	0.102	0.000	0.030	0.105
	0.212	0.218	0.211	0.136	0.072	0.435

STD. DEVIATION OF DAILY 0.005 0.057 0.102 0.000 0.068 0.063
 HEAD ON TOP OF LAYER 6 0.035 0.040 0.121 0.094 0.098 0.252

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
PRECIPITATION	786.40	7864.000	100.00
RUNOFF	2.586	25.859	0.33
EVAPOTRANSPIRATION	483.273	4832.732	61.45
DRAINAGE COLLECTED FROM LAYER 5	246.4374	2464.374	31.34
PERC./LEAKAGE THROUGH LAYER 7	0.000097	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.2910		
PERC./LEAKAGE THROUGH LAYER 8	0.000106	0.001	0.00
CHANGE IN WATER STORAGE	54.103	541.035	6.88
SOIL WATER AT START OF YEAR	4676.176	46761.759	
SOIL WATER AT END OF YEAR	4730.279	47302.794	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.2	64.5	20.0	48.3	19.5	81.6
	121.9	168.6	66.4	41.0	8.9	46.5
RUNOFF	0.93	0.00	0.00	0.00	0.00	0.52
	3.61	0.05	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	21.26	83.45	23.52	33.41	29.46	42.63

42.74 45.78 61.98 80.41 8.90 24.39

LATERAL DRAINAGE COLLECTED 92.067 3.634 0.669 3.367 0.641 17.329
FROM LAYER 5 28.807 37.287 22.915 19.293 11.644 82.271

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 7 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 8 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.573 0.025 0.004 0.022 0.004 0.112
TOP OF LAYER 6 0.179 0.232 0.147 0.120 0.075 0.512

STD. DEVIATION OF DAILY 0.206 0.048 0.012 0.053 0.011 0.072
HEAD ON TOP OF LAYER 6 0.096 0.057 0.104 0.078 0.092 0.226

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT
PRECIPITATION	753.40	7534.000	100.00
RUNOFF	5.108	51.079	0.68
EVAPOTRANSPIRATION	497.942	4979.423	66.09
DRAINAGE COLLECTED FROM LAYER 5	319.9238	3199.238	42.46
PERC./LEAKAGE THROUGH LAYER 7	0.000130	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	1.6722		
PERC./LEAKAGE THROUGH LAYER 8	0.000136	0.001	0.00
CHANGE IN WATER STORAGE	-69.574	-695.741	-9.23
SOIL WATER AT START OF YEAR	4730.279	47302.794	
SOIL WATER AT END OF YEAR	4660.705	46607.053	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 5

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

PRECIPITATION

TOTALS	70.56	67.68	25.26	37.68	70.84	102.32
	114.82	123.18	61.66	48.40	24.16	39.66
STD. DEVIATIONS	68.28	45.76	24.15	30.39	62.98	29.59
	47.33	70.04	21.47	12.74	19.77	22.39

RUNOFF

TOTALS	14.931	0.588	0.055	0.075	0.925	0.240
	1.266	0.059	0.023	0.000	0.000	0.154
STD. DEVIATIONS	24.893	0.806	0.124	0.167	2.016	0.319
	1.714	0.108	0.035	0.000	0.000	0.345

EVAPOTRANSPIRATION

TOTALS	37.201	54.546	32.755	30.611	39.240	42.271
	41.913	47.122	58.731	62.205	20.536	27.846
STD. DEVIATIONS	21.398	54.487	18.465	17.287	12.719	2.741
	1.025	3.321	9.777	16.907	13.956	18.796

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS	24.7091	6.4598	12.9186	3.3782	6.0838	20.0850
	29.1611	35.0800	32.9980	22.5277	12.7000	56.1844
STD. DEVIATIONS	38.9537	6.2552	17.7338	5.4708	10.0974	7.8719
	3.4512	4.9154	7.1793	5.7470	8.9560	33.4638

PERCOLATION/LEAKAGE THROUGH LAYER 7

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.1539	0.0444	0.0805	0.0217	0.0379	0.1293
	0.1816	0.2185	0.2124	0.1403	0.0817	0.3500
STD. DEVIATIONS	0.2426	0.0432	0.1105	0.0352	0.0629	0.0507
	0.0215	0.0306	0.0462	0.0358	0.0576	0.2084

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

	MM	CU. METERS	PERCENT
PRECIPITATION	786.22	(78.007)	7862.2 100.00
RUNOFF	18.317	(23.3101)	183.17 2.330
EVAPOTRANSPIRATION	494.976	(50.3062)	4949.76 62.956
LATERAL DRAINAGE COLLECTED FROM LAYER 5	262.28574	(38.52028)	2622.857 33.36035
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00010	(0.00002)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 6	1.377	(0.200)	
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00011	(0.00002)	0.001 0.00001
CHANGE IN WATER STORAGE	10.641	(1.9696)	106.41 1.353

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	119.70	1197.00000	20003
RUNOFF	53.384	533.83720	20003
DRAINAGE COLLECTED FROM LAYER 5	4.54950	45.49504	3620004
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000002	0.00002	3620004
AVERAGE HEAD ON TOP OF LAYER 6	8.785		
MAXIMUM HEAD ON TOP OF LAYER 6	16.534		
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1.7 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000010	0.00010	60005
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2799	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0580	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(CM)	(VOL/VOL)
1	19.9605	0.1996
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	0.9600	0.0320
6	0.0000	0.0000
7	0.6000	0.7500
8	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465377.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465377.prt

TIME: 16:37 DATE: 10/17/2019

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TITLE: Interim Cover - 20 m 90th Percentile Rainfall

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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. = 0.30000000000 CM/SEC
SLOPE = 3.00 PERCENT
DRAINAGE LENGTH = 30.0 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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 606.750 CM
TOTAL INITIAL WATER = 606.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2

RUNOFF	0.00	0.00	0.00	0.37	4.53	0.03
	0.00	0.00	0.08	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.41	7.70	7.34	48.76	55.07	44.99
	43.07	43.50	62.75	65.59	41.22	15.03
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.076	0.000	0.000	0.000	1.037	16.095
	27.197	26.288	33.070	42.250	10.135	28.225
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.000	0.000	0.000	0.000	0.006	0.104
	0.169	0.164	0.213	0.263	0.065	0.176
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.002	0.000	0.000	0.000	0.019	0.076
	0.074	0.051	0.028	0.104	0.068	0.228

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.012	50.116	0.72
EVAPOTRANSPIRATION	445.436	4454.360	63.94
DRAINAGE COLLECTED FROM LAYER 6	184.3717	1843.717	26.46
PERC./LEAKAGE THROUGH LAYER 8	0.000074	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	0.9672		
PERC./LEAKAGE THROUGH LAYER 9	0.000077	0.001	0.00
CHANGE IN WATER STORAGE	61.881	618.807	8.88
SOIL WATER AT START OF YEAR	6067.499	60674.987	
SOIL WATER AT END OF YEAR	6129.379	61293.794	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20

STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.374	4.530	0.028
	0.000	0.000	0.079	0.000	0.000	0.000

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	10.414	7.704	7.341	48.762	55.067	44.990
	43.072	43.499	62.747	65.590	41.221	15.030

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 6

TOTALS	0.0763	0.0000	0.0000	0.0000	1.0366	16.0948
	27.1970	26.2876	33.0701	42.2498	10.1350	28.2245

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 9

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0005	0.0000	0.0000	0.0000	0.0065	0.1036
	0.1694	0.1637	0.2128	0.2632	0.0652	0.1758

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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	(0.000)	6967.0 100.00
RUNOFF	5.012	(0.0000)	50.12 0.719
EVAPOTRANSPIRATION	445.436	(0.0000)	4454.36 63.935
LATERAL DRAINAGE COLLECTED FROM LAYER 6	184.37165	(0.00000)	1843.717 26.46356
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00007	(0.00000)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 7	0.967	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00008	(0.00000)	0.001 0.00001
CHANGE IN WATER STORAGE	61.881	(0.0000)	618.81 8.882

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	45.40	454.00000	1260001
RUNOFF	4.530	45.30408	1260001
DRAINAGE COLLECTED FROM LAYER 6	3.00910	30.09101	3630001
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.00001	3630001
AVERAGE HEAD ON TOP OF LAYER 7	5.810		
MAXIMUM HEAD ON TOP OF LAYER 7	11.110		
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	1.3 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000010	0.00010	3580001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2600	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0581	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

----- LAYER	----- (CM)	----- (VOL/VOL)
1	17.8524	0.1785
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	148.7680	0.2975
6	1.1676	0.0389
7	0.0000	0.0000
8	0.6000	0.7500
9	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465377.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465377.prt

TIME: 16:41 DATE: 10/17/2019

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TITLE: Interim Cover - 20 m 90th Percentile Rainfall

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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. = 0.30000000000 CM/SEC
SLOPE = 3.00 PERCENT
DRAINAGE LENGTH = 30.0 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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 606.750 CM
TOTAL INITIAL WATER = 606.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 1

PRECIPITATION	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2

RUNOFF	0.00	0.00	0.00	0.37	4.53	0.03
	0.00	0.00	0.08	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.41	7.70	7.34	48.76	55.07	44.99
	43.07	43.50	62.75	65.59	41.22	15.03
LATERAL DRAINAGE COLLECTED	0.076	0.000	0.000	0.000	1.037	16.095
FROM LAYER 6	27.197	26.288	33.070	42.250	10.135	28.225
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.006	0.104
TOP OF LAYER 7	0.169	0.164	0.213	0.263	0.065	0.176
STD. DEVIATION OF DAILY	0.002	0.000	0.000	0.000	0.019	0.076
HEAD ON TOP OF LAYER 7	0.074	0.051	0.028	0.104	0.068	0.228

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.012	50.116	0.72
EVAPOTRANSPIRATION	445.436	4454.360	63.94
DRAINAGE COLLECTED FROM LAYER 6	184.3717	1843.717	26.46
PERC./LEAKAGE THROUGH LAYER 8	0.000074	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	0.9672		
PERC./LEAKAGE THROUGH LAYER 9	0.000077	0.001	0.00
CHANGE IN WATER STORAGE	61.881	618.807	8.88
SOIL WATER AT START OF YEAR	6067.499	60674.987	
SOIL WATER AT END OF YEAR	6129.379	61293.794	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7

DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 2

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

PRECIPITATION 108.3 136.5 61.8 43.3 26.7 94.1
192.2 87.4 58.1 38.5 7.6 55.2

RUNOFF 15.95 1.50 0.28 0.00 0.00 0.65
2.60 0.00 0.00 0.00 0.00 0.00

EVAPOTRANSPIRATION 51.58 135.12 56.75 44.53 35.71 37.66
41.60 52.38 64.05 34.91 7.20 16.60

LATERAL DRAINAGE COLLECTED 36.536 15.977 5.474 0.679 0.012 16.377
FROM LAYER 6 24.522 30.608 34.738 31.818 14.162 12.687

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 8 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 9 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.228 0.110 0.034 0.004 0.000 0.105
TOP OF LAYER 7 0.153 0.191 0.224 0.198 0.091 0.079

STD. DEVIATION OF DAILY 0.242 0.072 0.073 0.013 0.000 0.094
HEAD ON TOP OF LAYER 7 0.047 0.037 0.062 0.147 0.074 0.114

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
PRECIPITATION	909.70	9097.000	100.00
RUNOFF	20.971	209.706	2.31
EVAPOTRANSPIRATION	578.081	5780.811	63.55
DRAINAGE COLLECTED FROM LAYER 6	223.5899	2235.899	24.58
PERC./LEAKAGE THROUGH LAYER 8	0.000090	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	1.1808		

PERC./LEAKAGE THROUGH LAYER 9	0.000096	0.001	0.00
CHANGE IN WATER STORAGE	87.058	870.582	9.57
SOIL WATER AT START OF YEAR	6129.379	61293.794	
SOIL WATER AT END OF YEAR	6216.438	62164.377	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7

DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 3

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	165.1 94.3	29.7 27.2	35.5 40.2	8.5 62.0	176.6 30.8	69.5 45.5
RUNOFF	57.78 0.00	0.00 0.00	0.00 0.04	0.00 0.00	0.09 0.00	0.00 0.00
EVAPOTRANSPIRATION	62.59 41.66	9.24 47.85	37.81 41.30	18.47 69.46	49.93 26.48	42.87 22.49
LATERAL DRAINAGE COLLECTED FROM LAYER 6	74.574 31.204	33.242 28.001	7.819 17.563	47.408 39.823	23.376 0.009	34.086 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.464 0.194	0.229 0.174	0.049 0.113	0.305 0.248	0.146 0.000	0.219 0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.130 0.055	0.213 0.088	0.064 0.126	0.251 0.251	0.076 0.000	0.028 0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	784.90	7849.000	100.00
RUNOFF	57.908	579.077	7.38
EVAPOTRANSPIRATION	470.148	4701.481	59.90
DRAINAGE COLLECTED FROM LAYER 6	337.1059	3371.059	42.95
PERC./LEAKAGE THROUGH LAYER 8	0.000131	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	1.7854		
PERC./LEAKAGE THROUGH LAYER 9	0.000135	0.001	0.00
CHANGE IN WATER STORAGE	-80.262	-802.617	-10.23
SOIL WATER AT START OF YEAR	6216.438	62164.377	
SOIL WATER AT END OF YEAR	6136.176	61361.759	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION 13.2 83.9 5.6 8.0 61.1 129.9
 98.0 207.2 47.9 62.6 18.1 50.9

RUNOFF	0.00	1.44	0.00	0.00	0.00	0.00
	0.13	0.25	0.00	0.00	0.00	0.77

LATERAL DRAINAGE COLLECTED 0.197 4.005 16.411 0.001 4.831 15.917
FROM LAYER 6 34.522 33.063 29.092 27.447 11.121 26.679

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000

LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.001	0.027	0.102	0.000	0.030	0.102
	0.215	0.206	0.187	0.171	0.072	0.166

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.005	0.057	0.089	0.000	0.068	0.059
	0.035	0.045	0.076	0.106	0.076	0.085

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
PRECIPITATION	786.40	7864.000	100.00
RUNOFF	2.586	25.859	0.33
EVAPOTRANSPIRATION	483.273	4832.732	61.45
DRAINAGE COLLECTED FROM LAYER 6	203.2866	2032.866	25.85
PERC./LEAKAGE THROUGH LAYER 8	0.000083	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	1.0663		
PERC./LEAKAGE THROUGH LAYER 9	0.000087	0.001	0.00
CHANGE IN WATER STORAGE	97.254	972.542	12.37
SOIL WATER AT START OF YEAR	6136.176	61361.759	
SOIL WATER AT END OF YEAR	6233.430	62334.302	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.2 121.9	64.5 168.6	20.0 66.4	48.3 41.0	19.5 8.9	81.6 46.5
RUNOFF	0.93 3.61	0.00 0.05	0.00 0.00	0.00 0.00	0.00 0.00	0.52 0.00
EVAPOTRANSPIRATION	21.26 42.74	83.45 45.78	23.52 61.98	33.41 80.41	29.46 8.90	42.63 24.39
LATERAL DRAINAGE COLLECTED FROM LAYER 6	21.140 28.483	92.566 33.772	25.814 26.753	3.367 19.293	0.641 10.140	17.329 9.357
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.132 0.177	0.638 0.210	0.161 0.172	0.022 0.120	0.004 0.065	0.112 0.058
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.126 0.087	0.140 0.039	0.251 0.117	0.053 0.076	0.011 0.066	0.070 0.064

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT
PRECIPITATION	753.40	7534.000	100.00
RUNOFF	5.108	51.079	0.68
EVAPOTRANSPIRATION	497.942	4979.423	66.09
DRAINAGE COLLECTED FROM LAYER 6	288.6562	2886.562	38.31
PERC./LEAKAGE THROUGH LAYER 8	0.000119	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	1.5597		
PERC./LEAKAGE THROUGH LAYER 9	0.000126	0.001	0.00
CHANGE IN WATER STORAGE	-38.307	-383.065	-5.08
SOIL WATER AT START OF YEAR	6233.430	62334.302	
SOIL WATER AT END OF YEAR	6195.124	61951.237	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 5

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

PRECIPITATION

TOTALS 70.56 67.68 25.26 37.68 70.84 102.32
114.82 123.18 61.66 48.40 24.16 39.66

STD. DEVIATIONS 68.28 45.76 24.15 30.39 62.98 29.59
47.33 70.04 21.47 12.74 19.77 22.39

RUNOFF

TOTALS 14.931 0.588 0.055 0.075 0.925 0.240
1.266 0.059 0.023 0.000 0.000 0.154

STD. DEVIATIONS 24.893 0.806 0.124 0.167 2.016 0.319
1.714 0.108 0.035 0.000 0.000 0.345

EVAPOTRANSPIRATION

TOTALS 37.201 54.546 32.755 30.611 39.240 42.271
41.913 47.122 58.731 62.205 20.536 27.846

STD. DEVIATIONS 21.398 54.487 18.465 17.287 12.719 2.741
1.025 3.321 9.777 16.907 13.956 18.796

LATERAL DRAINAGE COLLECTED FROM LAYER 6

TOTALS 26.5048 29.1580 11.1037 10.2910 5.9792 19.9608
29.1858 30.3464 28.2433 32.1262 9.1134 15.3894

STD. DEVIATIONS 30.9462 37.7288 10.1285 20.7956 9.9057 7.9152
3.8326 3.2077 6.7543 9.3326 5.3505 11.9658

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 9

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES 0.1651 0.2009 0.0692 0.0662 0.0372 0.1285
0.1818 0.1890 0.1818 0.2001 0.0587 0.0959

STD. DEVIATIONS 0.1928 0.2603 0.0631 0.1338 0.0617 0.0509
0.0239 0.0200 0.0435 0.0581 0.0344 0.0745

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

	MM	CU. METERS	PERCENT
PRECIPITATION	786.22	(78.007)	7862.2 100.00
RUNOFF	18.317	(23.3101)	183.17 2.330
EVAPOTRANSPIRATION	494.976	(50.3062)	4949.76 62.956
LATERAL DRAINAGE COLLECTED FROM LAYER 6	247.40206	(63.70774)	2474.021 31.46728
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00010	(0.00002)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 7	1.312	(0.347)	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00010	(0.00003)	0.001 0.00001
CHANGE IN WATER STORAGE	25.525	(3.1446)	255.25 3.247

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	119.70	1197.00000	20003
RUNOFF	53.384	533.83720	20003
DRAINAGE COLLECTED FROM LAYER 6	4.16751	41.67509	380005
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.00001	380005
AVERAGE HEAD ON TOP OF LAYER 7	8.047		
MAXIMUM HEAD ON TOP OF LAYER 7	15.203		
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	1.6 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000010	0.00010	520005
SNOW WATER	0.00	0.0000	0

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2799
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0580

*** 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.

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(CM)	(VOL/VOL)
1	19.9605	0.1996
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	153.3406	0.3067
6	1.0612	0.0354
7	0.0000	0.0000
8	0.6000	0.7500
9	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465415.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465415.prt

TIME: 16:38 DATE: 10/17/2019

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TITLE: Interim Cover - 25 m 90th Percentile Rainfall

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 8

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 9

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT

AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 752.750 CM
TOTAL INITIAL WATER = 752.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 1

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

PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2
RUNOFF	0.00	0.00	0.00	0.37	4.53	0.03
	0.00	0.00	0.08	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.41	7.70	7.34	48.76	55.07	44.99
	43.07	43.50	62.75	65.59	41.22	15.03
LATERAL DRAINAGE COLLECTED FROM LAYER 7	0.301	0.000	0.000	0.000	0.878	16.029
	27.197	25.813	33.458	33.084	19.387	9.250
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.002	0.000	0.000	0.000	0.005	0.103
	0.169	0.161	0.215	0.206	0.125	0.058
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.006	0.000	0.000	0.000	0.016	0.062
	0.071	0.054	0.027	0.068	0.143	0.064

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.012	50.116	0.72
EVAPOTRANSPIRATION	445.436	4454.360	63.94
DRAINAGE COLLECTED FROM LAYER 7	165.3974	1653.974	23.74
PERC./LEAKAGE THROUGH LAYER 9	0.000067	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	0.8704		
PERC./LEAKAGE THROUGH LAYER 10	0.000077	0.001	0.00
CHANGE IN WATER STORAGE	80.855	808.550	11.61
SOIL WATER AT START OF YEAR	7527.499	75274.987	

SOIL WATER AT END OF YEAR	7608.354	76083.537	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

PRECIPITATION

TOTALS	0.00	23.80	3.40	80.30	70.30	136.50
	67.70	125.50	95.70	37.90	55.40	0.20

STD. DEVIATIONS 0.00 0.00 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00

RUNOFF

TOTALS 0.000 0.000 0.000 0.374 4.530 0.028
 0.000 0.000 0.079 0.000 0.000 0.000

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS	10.414	7.704	7.341	48.762	55.067	44.990
	43.072	43.499	62.747	65.590	41.221	15.030

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 7

TOTALS 0.3007 0.0000 0.0000 0.0000 0.8776 16.0295
27.1970 25.8126 33.4585 33.0840 19.3873 9.2502

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 9

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 10

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES 0.0019 0.0000 0.0000 0.0000 0.0055 0.1032
0.1694 0.1608 0.2153 0.2061 0.1248 0.0576

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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	(0.000)	6967.0 100.00
RUNOFF	5.012	(0.0000)	50.12 0.719
EVAPOTRANSPIRATION	445.436	(0.0000)	4454.36 63.935
LATERAL DRAINAGE COLLECTED FROM LAYER 7	165.39737	(0.00000)	1653.974 23.74011
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00007	(0.00000)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 8	0.870	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.00008	(0.00000)	0.001 0.00001
CHANGE IN WATER STORAGE	80.855	(0.0000)	808.55 11.605

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)
PRECIPITATION	45.40	454.00000 1260001
RUNOFF	4.530	45.30408 1260001
DRAINAGE COLLECTED FROM LAYER 7	3.17961	31.79613 3130001
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000001	0.00001 3130001
AVERAGE HEAD ON TOP OF LAYER 8	6.139	
MAXIMUM HEAD ON TOP OF LAYER 8	11.718	
LOCATION OF MAXIMUM HEAD IN LAYER 7 (DISTANCE FROM DRAIN)	1.3 METERS	

PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000010	0.00010	1810001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2600		
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0581		

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	17.8524	0.1785
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	148.7680	0.2975
6	148.1049	0.2962
7	0.9601	0.0320
8	0.0000	0.0000
9	0.6000	0.7500
10	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465415.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465415.prt

TIME: 16:42 DATE: 10/17/2019

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TITLE: Interim Cover - 25 m 90th Percentile Rainfall

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 8

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 9

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT

AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 752.750 CM
TOTAL INITIAL WATER = 752.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	86.1	110.0
110.0	84.1	55.9	40.9	30.0	30.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 1

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

PRECIPITATION	0.0	23.8	3.4	80.3	70.3	136.5
	67.7	125.5	95.7	37.9	55.4	0.2
RUNOFF	0.00	0.00	0.00	0.37	4.53	0.03
	0.00	0.00	0.08	0.00	0.00	0.00
EVAPOTRANSPIRATION	10.41	7.70	7.34	48.76	55.07	44.99
	43.07	43.50	62.75	65.59	41.22	15.03
LATERAL DRAINAGE COLLECTED	0.301	0.000	0.000	0.000	0.878	16.029
FROM LAYER 7	27.197	25.813	33.458	33.084	19.387	9.250
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.002	0.000	0.000	0.000	0.005	0.103
TOP OF LAYER 8	0.169	0.161	0.215	0.206	0.125	0.058
STD. DEVIATION OF DAILY	0.006	0.000	0.000	0.000	0.016	0.062
HEAD ON TOP OF LAYER 8	0.071	0.054	0.027	0.068	0.143	0.064

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	696.70	6967.000	100.00
RUNOFF	5.012	50.116	0.72
EVAPOTRANSPIRATION	445.436	4454.360	63.94
DRAINAGE COLLECTED FROM LAYER 7	165.3974	1653.974	23.74
PERC./LEAKAGE THROUGH LAYER 9	0.000067	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	0.8704		
PERC./LEAKAGE THROUGH LAYER 10	0.000077	0.001	0.00
CHANGE IN WATER STORAGE	80.855	808.550	11.61
SOIL WATER AT START OF YEAR	7527.499	75274.987	

SOIL WATER AT END OF YEAR	7608.354	76083.537	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 2

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	108.3	136.5	61.8	43.3	26.7	94.1
	192.2	87.4	58.1	38.5	7.6	55.2
RUNOFF	15.95	1.50	0.28	0.00	0.00	0.65
	2.60	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	51.58	135.12	56.75	44.53	35.71	37.66
	41.60	52.38	64.05	34.91	7.20	16.60
LATERAL DRAINAGE COLLECTED FROM LAYER 7	40.772	30.442	5.748	0.679	0.012	16.377
	24.521	30.607	29.199	37.353	14.168	9.263
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.254	0.210	0.036	0.004	0.000	0.105
	0.153	0.191	0.188	0.233	0.091	0.058
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.227	0.155	0.068	0.013	0.000	0.094
	0.048	0.036	0.040	0.130	0.069	0.057

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
PRECIPITATION	909.70	9097.000	100.00
RUNOFF	20.971	209.706	2.31
EVAPOTRANSPIRATION	578.081	5780.811	63.55
DRAINAGE COLLECTED FROM LAYER 7	239.1405	2391.405	26.29
PERC./LEAKAGE THROUGH LAYER 9	0.000095	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	1.2686		
PERC./LEAKAGE THROUGH LAYER 10	0.000096	0.001	0.00
CHANGE IN WATER STORAGE	71.508	715.077	7.86
SOIL WATER AT START OF YEAR	7608.354	76083.537	
SOIL WATER AT END OF YEAR	7679.861	76798.614	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 3

	JAN	FEB	AUG	MAR	SEP	APR	OCT	MAY	NOV	JUN	DEC
PRECIPITATION	165.1	29.7	35.5	8.5	176.6	69.5					
	94.3	27.2	40.2	62.0	30.8	45.5					
RUNOFF	57.78	0.00	0.00	0.00	0.09	0.00					
	0.00	0.00	0.04	0.00	0.00	0.00					
EVAPOTRANSPIRATION	62.59	9.24	37.81	18.47	49.93	42.87					
	41.66	47.85	41.30	69.46	26.48	22.49					
LATERAL DRAINAGE COLLECTED	20.492	50.735	47.832	9.896	60.373	33.909					
FROM LAYER 7	31.105	28.783	17.573	11.168	28.663	0.000					
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000					
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000					
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000					
LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000					

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.128 0.350 0.298 0.064 0.376 0.218
TOP OF LAYER 8 0.194 0.179 0.113 0.070 0.184 0.000

STD. DEVIATION OF DAILY 0.100 0.167 0.244 0.063 0.090 0.027
HEAD ON TOP OF LAYER 8 0.047 0.060 0.093 0.074 0.249 0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	784.90	7849.000	100.00
RUNOFF	57.908	579.077	7.38
EVAPOTRANSPIRATION	470.148	4701.481	59.90
DRAINAGE COLLECTED FROM LAYER 7	340.5296	3405.296	43.39
PERC./LEAKAGE THROUGH LAYER 9	0.000131	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	1.8113		
PERC./LEAKAGE THROUGH LAYER 10	0.000135	0.001	0.00
CHANGE IN WATER STORAGE	-83.685	-836.855	-10.66
SOIL WATER AT START OF YEAR	7679.861	76798.614	
SOIL WATER AT END OF YEAR	7596.176	75961.759	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8

DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION	13.2	83.9	5.6	8.0	61.1	129.9
	98.0	207.2	47.9	62.6	18.1	50.9
RUNOFF	0.00	1.44	0.00	0.00	0.00	0.00
	0.13	0.25	0.00	0.00	0.00	0.77
EVAPOTRANSPIRATION	40.16	37.21	38.35	7.88	26.04	43.20
	40.49	46.11	63.58	60.65	18.88	60.73
LATERAL DRAINAGE COLLECTED FROM LAYER 7	0.197	4.005	16.411	0.001	4.831	15.917
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.001	0.027	0.102	0.000	0.030	0.102
	0.215	0.199	0.195	0.171	0.072	0.166
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.005	0.057	0.078	0.000	0.068	0.059
	0.036	0.042	0.069	0.079	0.071	0.067

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
-----	-----	-----	-----
PRECIPITATION	786.40	7864.000	100.00
RUNOFF	2.586	25.859	0.33
EVAPOTRANSPIRATION	483.273	4832.732	61.45
DRAINAGE COLLECTED FROM LAYER 7	203.2850	2032.850	25.85
PERC./LEAKAGE THROUGH LAYER 9	0.000083	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	1.0665		
PERC./LEAKAGE THROUGH LAYER 10	0.000077	0.001	0.00
CHANGE IN WATER STORAGE	97.256	972.558	12.37
SOIL WATER AT START OF YEAR	7596.176	75961.759	
SOIL WATER AT END OF YEAR	7693.432	76934.318	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 5

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

PRECIPITATION 66.2 64.5 20.0 48.3 19.5 81.6
121.9 168.6 66.4 41.0 8.9 46.5

RUNOFF 0.93 0.00 0.00 0.00 0.00 0.52
3.61 0.05 0.00 0.00 0.00 0.00

EVAPOTRANSPIRATION 21.26 83.45 23.52 33.41 29.46 42.63
42.74 45.78 61.98 80.41 8.90 24.39

LATERAL DRAINAGE COLLECTED 15.760 12.074 72.645 42.411 0.641 17.329
FROM LAYER 7 28.428 32.799 27.782 19.293 10.140 9.243

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 9 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 10 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.098 0.083 0.452 0.273 0.004 0.112
TOP OF LAYER 8 0.177 0.204 0.179 0.120 0.065 0.058

STD. DEVIATION OF DAILY 0.090 0.118 0.256 0.270 0.011 0.068
HEAD ON TOP OF LAYER 8 0.076 0.036 0.100 0.075 0.067 0.057

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT
	-----	-----	-----
PRECIPITATION	753.40	7534.000	100.00
RUNOFF	5.108	51.079	0.68
EVAPOTRANSPIRATION	497.942	4979.423	66.09
DRAINAGE COLLECTED FROM LAYER 7	288.5440	2885.440	38.30

PERC./LEAKAGE THROUGH LAYER 9	0.000118	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	1.5213		
PERC./LEAKAGE THROUGH LAYER 10	0.000126	0.001	0.00
CHANGE IN WATER STORAGE	-38.194	-381.943	-5.07
SOIL WATER AT START OF YEAR	7693.432	76934.318	
SOIL WATER AT END OF YEAR	7655.237	76552.375	
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	0.000	0.00

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 5

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

PRECIPITATION

TOTALS	70.56	67.68	25.26	37.68	70.84	102.32
	114.82	123.18	61.66	48.40	24.16	39.66

STD. DEVIATIONS 68.28 45.76 24.15 30.39 62.98 29.59
47.33 70.04 21.47 12.74 19.77 22.39

RUNOFF

TOTALS	14.931	0.588	0.055	0.075	0.925	0.240
	1.266	0.059	0.023	0.000	0.000	0.154

STD. DEVIATIONS 24.893 0.806 0.124 0.167 2.016 0.319
 1.714 0.108 0.035 0.000 0.000 0.345

EVAPOTRANSPIRATION

TOTALS	37.201	54.546	32.755	30.611	39.240	42.271
	41.913	47.122	58.731	62.205	20.536	27.846

STD. DEVIATIONS 21.398 54.487 18.465 17.287 12.719 2.741
 1.025 3.321 9.777 16.907 13.956 18.796

LATERAL DRAINAGE COLLECTED FROM LAYER 7

TOTALS 15.5043 19.4511 28.5272 10.5973 13.3469 19.9123
29.1538 29.9779 27.6566 25.6693 16.6958 10.8868

STD. DEVIATIONS 16.7992 21.0404 30.8161 18.2727 26.3570 7.8442
 3.8209 2.7740 6.0120 10.5546 7.5978 9.6938

PERCOLATION/LEAKAGE THROUGH LAYER 9

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 10

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES 0.0966 0.1339 0.1777 0.0682 0.0831 0.1282
0.1816 0.1867 0.1780 0.1599 0.1075 0.0678

STD. DEVIATIONS 0.1046 0.1453 0.1919 0.1176 0.1642 0.0505
0.0238 0.0173 0.0387 0.0657 0.0489 0.0604

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

	MM	CU. METERS	PERCENT
PRECIPITATION	786.22	(78.007)	7862.2 100.00
RUNOFF	18.317	(23.3101)	183.17 2.330
EVAPOTRANSPIRATION	494.976	(50.3062)	4949.76 62.956
LATERAL DRAINAGE COLLECTED FROM LAYER 7	247.37930	(69.10995)	2473.793 31.46439
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00010	(0.00003)	0.001 0.00001
AVERAGE HEAD ON TOP OF LAYER 8	1.308	(0.371)	
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.00010	(0.00003)	0.001 0.00001
CHANGE IN WATER STORAGE	25.548	(3.1929)	255.48 3.249

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5 and their dates (DDYY)

	(MM)	(CU. METERS)	
PRECIPITATION	119.70	1197.00000	20003
RUNOFF	53.384	533.83720	20003
DRAINAGE COLLECTED FROM LAYER 7	3.89152	38.91524	780005

PERCOLATION/LEAKAGE THROUGH LAYER 9 0.000001 0.00001 780005
 AVERAGE HEAD ON TOP OF LAYER 8 7.514
 MAXIMUM HEAD ON TOP OF LAYER 8 14.235
 LOCATION OF MAXIMUM HEAD IN LAYER 7
 (DISTANCE FROM DRAIN) 1.6 METERS
 PERCOLATION/LEAKAGE THROUGH LAYER 10 0.000010 0.00010 980005
 SNOW WATER 0.00 0.0000 0
 MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2799
 MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0580

*** 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.

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(CM)	(VOL/VOL)
1	19.9605	0.1996
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	153.3406	0.3067
6	146.0574	0.2921
7	1.0152	0.0338
8	0.0000	0.0000
9	0.6000	0.7500
10	6.5500	0.1310
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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465358.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465358.prt

TIME: 16:48 DATE: 10/17/2019

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TITLE: Daily Cover - 15 m

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 6

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 460.750 CM
TOTAL INITIAL WATER = 460.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
32.0	19.1	18.0	22.1	42.9	59.9
71.1	58.9	37.1	23.1	15.0	13.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	13.0	1.2	33.5	34.9	74.4
	43.8	88.0	63.7	21.5	27.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.93	6.36	6.32	7.56	53.75	32.68
	43.14	43.50	62.75	42.74	18.38	8.91
LATERAL DRAINAGE COLLECTED	0.008	0.000	0.000	0.000	0.000	0.000
FROM LAYER 5	0.000	7.565	24.895	0.311	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 6 0.000 0.047 0.160 0.002 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 6 0.000 0.078 0.110 0.006 0.000 0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	401.70	4017.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	334.020	3340.201	83.15
DRAINAGE COLLECTED FROM LAYER 5	32.7788	327.788	8.16
PERC./LEAKAGE THROUGH LAYER 7	0.000017	0.000	0.00
AVG. HEAD ON TOP OF LAYER 6	0.1744		
PERC./LEAKAGE THROUGH LAYER 8	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	34.901	349.010	8.69
SOIL WATER AT START OF YEAR	4607.499	46074.987	
SOIL WATER AT END OF YEAR	4642.400	46423.997	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 2

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

PRECIPITATION	39.4	74.2	20.5	18.0	13.3	51.3
	124.1	61.2	38.6	21.8	3.8	23.8
RUNOFF	0.08	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	31.19	73.92	21.12	11.29	12.02	35.33
	41.53	52.24	59.24	13.93	9.67	6.67
LATERAL DRAINAGE COLLECTED	0.000	0.002	0.157	0.000	0.033	10.104
FROM LAYER 5	16.572	26.398	20.782	32.391	0.025	0.001
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.000	0.001	0.000	0.000	0.065
TOP OF LAYER 6	0.103	0.164	0.134	0.202	0.000	0.000
STD. DEVIATION OF DAILY	0.000	0.000	0.003	0.000	0.001	0.081
HEAD ON TOP OF LAYER 6	0.087	0.060	0.069	0.239	0.001	0.000

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
PRECIPITATION	490.00	4900.000	100.00
RUNOFF	0.085	0.847	0.02
EVAPOTRANSPIRATION	368.152	3681.515	75.13
DRAINAGE COLLECTED FROM LAYER 5	106.4655	1064.655	21.73
PERC./LEAKAGE THROUGH LAYER 7	0.000054	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	0.5580		
PERC./LEAKAGE THROUGH LAYER 8	0.000058	0.001	0.00
CHANGE IN WATER STORAGE	15.298	152.981	3.12
SOIL WATER AT START OF YEAR	4642.400	46423.997	
SOIL WATER AT END OF YEAR	4657.698	46576.978	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 3

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

PRECIPITATION 60.1 16.3 11.8 3.5 88.1 37.8
 61.0 19.0 26.6 35.0 15.4 19.8

RUNOFF 3.68 0.00 0.00 0.00 0.00 0.00
 0.00 0.00 0.00 0.00 0.00 0.00

EVAPOTRANSPIRATION 62.91 11.88 9.76 7.81 47.79 43.08
 41.81 46.52 24.49 33.65 16.27 10.84

LATERAL DRAINAGE COLLECTED 1.881 0.502 0.000 0.000 5.229 13.155
FROM LAYER 5 6.154 3.890 0.000 0.027 0.003 0.001

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 7 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 8 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.012 0.003 0.000 0.000 0.033 0.085
TOP OF LAYER 6 0.038 0.024 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.028 0.012 0.000 0.000 0.040 0.080
HEAD ON TOP OF LAYER 6 0.053 0.060 0.000 0.001 0.000 0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	394.40	3944.000	100.00
RUNOFF	3.685	36.847	0.93
EVAPOTRANSPIRATION	356.808	3568.085	90.47
DRAINAGE COLLECTED FROM LAYER 5	30.8426	308.426	7.82
PERC./LEAKAGE THROUGH LAYER 7	0.000031	0.000	0.00
AVG. HEAD ON TOP OF LAYER 6	0.1626		

PERC./LEAKAGE THROUGH LAYER 8	0.000029	0.000	0.00
CHANGE IN WATER STORAGE	3.064	30.642	0.78
SOIL WATER AT START OF YEAR	4657.698	46576.978	
SOIL WATER AT END OF YEAR	4660.762	46607.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION	4.8	45.8	1.9	3.2	30.5	70.7
	63.4	145.2	31.7	35.3	9.0	22.0

RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

EVAPOTRANSPIRATION	8.41	38.38	26.66	2.63	8.00	29.65
	40.48	46.10	62.35	30.92	10.71	32.73

LATERAL DRAINAGE COLLECTED	0.000	1.186	0.027	0.000	0.000	11.639
FROM LAYER 5	26.810	23.673	30.599	7.813	46.913	0.002

PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
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PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
-------------------------------------	-------	-------	-------	-------	-------	-------

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 6	0.000	0.008	0.000	0.000	0.000	0.075
	0.167	0.147	0.197	0.049	0.302	0.000

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 6	0.000	0.023	0.001	0.000	0.000	0.087
	0.098	0.069	0.054	0.063	0.252	0.000

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
PRECIPITATION	463.50	4635.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.006	3370.064	72.71
DRAINAGE COLLECTED FROM LAYER 5	148.6641	1486.641	32.07
PERC./LEAKAGE THROUGH LAYER 7	0.000064	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	0.7875		
PERC./LEAKAGE THROUGH LAYER 8	0.000068	0.001	0.00
CHANGE IN WATER STORAGE	-22.171	-221.706	-4.78
SOIL WATER AT START OF YEAR	4660.762	46607.620	
SOIL WATER AT END OF YEAR	4638.591	46385.914	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 1
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 5

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

PRECIPITATION 24.1 35.0 6.6 20.1 9.7 44.5
78.7 117.9 44.1 23.2 4.5 21.0

RUNOFF 0.00 0.00 0.00 0.00 0.00 0.00
 0.04 0.00 0.00 0.00 0.00 0.00

LATERAL DRAINAGE COLLECTED 0.000 0.462 0.825 0.000 0.143 9.829
FROM LAYER 5 9.235 31.893 28.270 23.187 0.006 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000

LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 6	0.000	0.003	0.005	0.000	0.001	0.063
	0.058	0.199	0.182	0.144	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 6	0.000	0.008	0.012	0.000	0.002	0.082
	0.073	0.056	0.094	0.168	0.000	0.000

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT
PRECIPITATION	429.40	4294.000	100.00
RUNOFF	0.036	0.360	0.01
EVAPOTRANSPIRATION	311.147	3111.471	72.46
DRAINAGE COLLECTED FROM LAYER 5	103.8494	1038.494	24.18
PERC./LEAKAGE THROUGH LAYER 7	0.000052	0.001	0.00
AVG. HEAD ON TOP OF LAYER 6	0.5459		
PERC./LEAKAGE THROUGH LAYER 8	0.000058	0.001	0.00
CHANGE IN WATER STORAGE	14.367	143.675	3.35
SOIL WATER AT START OF YEAR	4638.591	46385.914	
SOIL WATER AT END OF YEAR	4652.959	46529.589	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	25.68	36.86	8.40	15.66	35.30	55.74

74.20 86.26 40.94 27.36 12.06 17.34

STD. DEVIATIONS 24.85 24.85 7.99 12.71 31.43 16.12
30.52 49.07 14.36 7.14 9.84 9.75

RUNOFF

TOTALS 0.753 0.000 0.000 0.000 0.000 0.000
0.008 0.000 0.000 0.000 0.000 0.000

STD. DEVIATIONS 1.639 0.000 0.000 0.000 0.000 0.000
0.016 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS 22.909 31.840 16.623 8.089 26.136 35.651
41.436 46.811 54.227 32.631 11.916 13.157

STD. DEVIATIONS 24.781 26.790 8.386 3.529 22.631 5.091
1.171 3.250 16.681 11.642 5.509 11.082

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS 0.3780 0.4304 0.2018 0.0000 1.0810 8.9454
11.7543 18.6840 20.9092 12.7458 9.3894 0.0008

STD. DEVIATIONS 0.8404 0.4864 0.3542 0.0000 2.3194 5.1750
10.3168 12.2613 12.2594 14.4541 20.9764 0.0010

PERCOLATION/LEAKAGE THROUGH LAYER 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES 0.0024 0.0029 0.0013 0.0000 0.0067 0.0576
0.0732 0.1164 0.1346 0.0794 0.0604 0.0000

STD. DEVIATIONS 0.0052 0.0032 0.0022 0.0000 0.0144 0.0333
0.0643 0.0764 0.0789 0.0900 0.1350 0.0000

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

	MM	CU. METERS	PERCENT
PRECIPITATION	435.80	(40.690)	4358.0 100.00

RUNOFF	0.761	(1.6347)	7.61	0.175
EVAPOTRANSPIRATION	341.427	(22.0345)	3414.27	78.345
LATERAL DRAINAGE COLLECTED FROM LAYER 5	84.52010	(51.30331)	845.201	19.39424
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00004	(0.00002)	0.000	0.00001
AVERAGE HEAD ON TOP OF LAYER 6	0.446	(0.271)		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00005	(0.00002)	0.000	0.00001
CHANGE IN WATER STORAGE	9.092	(0.8226)	90.92	2.086

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	43.60	436.00000	20003
RUNOFF	3.685	36.84734	20003
DRAINAGE COLLECTED FROM LAYER 5	3.65936	36.59360	2910002
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000001	0.00001	2910002
AVERAGE HEAD ON TOP OF LAYER 6	7.066		
MAXIMUM HEAD ON TOP OF LAYER 6	13.418		
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1.5 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000010	0.00010	3200004
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2600	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0580	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(CM)	(VOL/VOL)
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1	19.1859	0.1919
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	0.9600	0.0320
6	0.0000	0.0000
7	0.6000	0.7500
8	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465358.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465358.prt

TIME: 16:23 DATE: 10/17/2019

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TITLE: Average Rainfall Interim Cover - 15 m

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 6

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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 460.750 CM
TOTAL INITIAL WATER = 460.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BOWEN AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST
AND STATION LATITUDE = -20.07 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 6

DRAIN #1: LATERAL DRAINAGE FROM LAYER 5 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 7

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 8

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.90	6.33	6.28	7.55	54.83	33.36
	43.80	44.42	62.87	42.94	15.82	8.79
LATERAL DRAINAGE COLLECTED	0.008	0.000	0.000	0.000	0.000	0.000
FROM LAYER 5	0.000	7.004	21.996	0.206	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 6 0.000 0.044 0.142 0.001 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 6 0.000 0.074 0.089 0.006 0.000 0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	334.911	3349.109	83.58
DRAINAGE COLLECTED FROM LAYER 5	29.2144	292.144	7.29
PERC./LEAKAGE THROUGH LAYER 7	0.000015	0.000	0.00
AVG. HEAD ON TOP OF LAYER 6	0.1554		
PERC./LEAKAGE THROUGH LAYER 8	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	36.575	365.747	9.13
SOIL WATER AT START OF YEAR	4607.499	46074.987	
SOIL WATER AT END OF YEAR	4644.073	46440.734	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10

STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

EVAPOTRANSPIRATION

TOTALS 7.904 6.335 6.282 7.552 54.827 33.360
 43.801 44.420 62.872 42.945 15.821 8.794

STD. DEVIATIONS 0.000 0.000 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000 0.000 0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS 0.0082 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 7.0040 21.9965 0.2057 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 7

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES 0.0001 0.0000 0.0000 0.0000 0.0000 0.0000
 0.0000 0.0436 0.1416 0.0013 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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	(0.000)	4007.0 100.00
RUNOFF	0.000	(0.0000)	0.00 0.000
EVAPOTRANSPIRATION	334.911	(0.0000)	3349.11 83.581
LATERAL DRAINAGE COLLECTED	29.21438	(0.00000)	292.144 7.29084

FROM LAYER 5

PERCOLATION/LEAKAGE THROUGH 0.00001 (0.00000) 0.000 0.00000
LAYER 7

AVERAGE HEAD ON TOP 0.155 (0.000)
OF LAYER 6

PERCOLATION/LEAKAGE THROUGH 0.00002 (0.00000) 0.000 0.00000
LAYER 8

CHANGE IN WATER STORAGE 36.575 (0.0000) 365.75 9.128

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	22.60	226.00000	1260001
RUNOFF	0.000	0.00000	0
DRAINAGE COLLECTED FROM LAYER 5	2.02794	20.27944	2590001
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000001	0.00001	2590001
AVERAGE HEAD ON TOP OF LAYER 6	3.916		
MAXIMUM HEAD ON TOP OF LAYER 6	7.574		
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	1.0 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000010	0.00010	2620001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2600		
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0586		

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	18.2973	0.1830

2 146.0000 0.2920

3 146.0000 0.2920

4 146.0000 0.2920

5 0.9600 0.0320

6 0.0000 0.0000

7 0.6000 0.7500

8 6.5500 0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465377.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465377.prt

TIME: 16:49 DATE: 10/17/2019

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TITLE: Daily Cover - 20 m

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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. = 0.30000000000 CM/SEC
SLOPE = 3.00 PERCENT
DRAINAGE LENGTH = 30.0 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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 606.750 CM
TOTAL INITIAL WATER = 606.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
32.0	19.1	18.0	22.1	42.9	59.9
71.1	58.9	37.1	23.1	15.0	13.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	13.0	1.2	33.5	34.9	74.4
	43.8	88.0	63.7	21.5	27.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	
EVAPOTRANSPIRATION	7.93	6.36	6.32	7.56	53.75	32.68
	43.14	43.50	62.75	42.74	18.38	8.91
LATERAL DRAINAGE COLLECTED	0.076	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	0.000	7.496	20.381	4.826	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	0.000	0.047	0.131	0.030	0.000	0.000
STD. DEVIATION OF DAILY	0.002	0.000	0.000	0.000	0.000	0.000
HEAD ON TOP OF LAYER 7	0.000	0.076	0.056	0.101	0.000	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
-----	-----	-----	-----
PRECIPITATION	401.70	4017.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	334.020	3340.201	83.15
DRAINAGE COLLECTED FROM LAYER 6	32.7788	327.788	8.16
PERC./LEAKAGE THROUGH LAYER 8	0.000017	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.1737		
PERC./LEAKAGE THROUGH LAYER 9	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	34.901	349.010	8.69
SOIL WATER AT START OF YEAR	6067.499	60674.987	
SOIL WATER AT END OF YEAR	6102.400	61023.997	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 2

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	39.4 124.1	74.2 61.2	20.5 38.6	18.0 21.8	13.3 3.8	51.3 23.8
RUNOFF	0.08 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
EVAPOTRANSPIRATION	31.19 41.53	73.92 52.24	21.12 59.24	11.29 13.93	12.02 9.67	35.33 6.67
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.000 15.874	0.002 27.096	0.157 20.782	0.000 24.541	0.033 7.875	10.104 0.001
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.000 0.099	0.000 0.169	0.001 0.134	0.000 0.153	0.000 0.051	0.065 0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.000 0.081	0.000 0.060	0.003 0.069	0.000 0.154	0.001 0.165	0.076 0.000

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
PRECIPITATION	490.00	4900.000	100.00
RUNOFF	0.085	0.847	0.02
EVAPOTRANSPIRATION	368.152	3681.515	75.13
DRAINAGE COLLECTED FROM LAYER 6	106.4655	1064.655	21.73
PERC./LEAKAGE THROUGH LAYER 8	0.000055	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	0.5593		
PERC./LEAKAGE THROUGH LAYER 9	0.000058	0.001	0.00
CHANGE IN WATER STORAGE	15.298	152.981	3.12

SOIL WATER AT START OF YEAR	6102.400	61023.997
SOIL WATER AT END OF YEAR	6117.698	61176.978
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7

DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 3

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

PRECIPITATION	60.1	16.3	11.8	3.5	88.1	37.8
	61.0	19.0	26.6	35.0	15.4	19.8

RUNOFF	3.68	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

EVAPOTRANSPIRATION	62.91	11.88	9.76	7.81	47.79	43.08
	41.81	46.52	24.49	33.65	16.27	10.84

LATERAL DRAINAGE COLLECTED	1.881	0.502	0.000	0.000	5.229	13.155
FROM LAYER 6	6.154	3.890	0.000	0.027	0.003	0.001

PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 7	0.012	0.003	0.000	0.000	0.033	0.085
	0.038	0.024	0.000	0.000	0.000	0.000

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.026	0.012	0.000	0.000	0.040	0.079
	0.053	0.060	0.000	0.001	0.000	0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	394.40	3944.000	100.00
RUNOFF	3.685	36.847	0.93
EVAPOTRANSPIRATION	356.808	3568.085	90.47
DRAINAGE COLLECTED FROM LAYER 6	30.8426	308.426	7.82
PERC./LEAKAGE THROUGH LAYER 8	0.000031	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.1626		
PERC./LEAKAGE THROUGH LAYER 9	0.000029	0.000	0.00
CHANGE IN WATER STORAGE	3.064	30.642	0.78
SOIL WATER AT START OF YEAR	6117.698	61176.978	
SOIL WATER AT END OF YEAR	6120.762	61207.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7
DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 4

	JAN	FEB	AUG	MAR	SEP	APR	OCT	MAY	NOV	JUN	DEC
PRECIPITATION	4.8	45.8	1.9	3.2	30.5	70.7					
	63.4	145.2	31.7	35.3	9.0	22.0					
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00	0.00	0.00					
EVAPOTRANSPIRATION	8.41	38.38	26.66	2.63	8.00	29.65					
	40.48	46.10	62.35	30.92	10.71	32.73					
LATERAL DRAINAGE COLLECTED	0.000	1.186	0.027	0.000	0.000	11.635					
FROM LAYER 6	26.755	23.043	31.266	7.836	9.024	37.892					
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000					
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000					
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000					
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000					

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.000 0.008 0.000 0.000 0.000 0.075
TOP OF LAYER 7 0.167 0.144 0.201 0.049 0.058 0.236

STD. DEVIATION OF DAILY 0.000 0.023 0.001 0.000 0.000 0.087
HEAD ON TOP OF LAYER 7 0.069 0.063 0.046 0.063 0.065 0.256

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
PRECIPITATION	463.50	4635.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.006	3370.064	72.71
DRAINAGE COLLECTED FROM LAYER 6	148.6641	1486.641	32.07
PERC./LEAKAGE THROUGH LAYER 8	0.000065	0.001	0.00
AVG. HEAD ON TOP OF LAYER 7	0.7811		
PERC./LEAKAGE THROUGH LAYER 9	0.000067	0.001	0.00
CHANGE IN WATER STORAGE	-22.171	-221.706	-4.78
SOIL WATER AT START OF YEAR	6120.762	61207.620	
SOIL WATER AT END OF YEAR	6098.591	60985.914	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7

DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 5

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

PRECIPITATION 24.1 35.0 6.6 20.1 9.7 44.5

	78.7	117.9	44.1	23.2	4.5	21.0	
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00	
	0.04	0.00	0.00	0.00	0.00	0.00	
EVAPOTRANSPIRATION	4.11	28.67	19.26	11.15	9.12	37.52	
	40.21	45.69	62.31	41.92	4.56	6.63	
LATERAL DRAINAGE COLLECTED	0.000	0.462	0.825	0.000	0.143	9.829	
FROM LAYER 6	9.091	27.966	32.340	23.152	0.042	0.000	
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000	
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000	
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000	

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.003	0.005	0.000	0.001	0.063	
TOP OF LAYER 7	0.057	0.174	0.208	0.144	0.000	0.000	
STD. DEVIATION OF DAILY	0.000	0.008	0.012	0.000	0.002	0.080	
HEAD ON TOP OF LAYER 7	0.071	0.034	0.084	0.123	0.001	0.000	

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT	
	-----	-----	-----	
PRECIPITATION	429.40	4294.000	100.00	
RUNOFF	0.036	0.360	0.01	
EVAPOTRANSPIRATION	311.147	3111.471	72.46	
DRAINAGE COLLECTED FROM LAYER 6	103.8494	1038.494	24.18	
PERC./LEAKAGE THROUGH LAYER 8	0.000051	0.001	0.00	
AVG. HEAD ON TOP OF LAYER 7	0.5466			
PERC./LEAKAGE THROUGH LAYER 9	0.000058	0.001	0.00	
CHANGE IN WATER STORAGE	14.367	143.675	3.35	
SOIL WATER AT START OF YEAR	6098.591	60985.914		
SOIL WATER AT END OF YEAR	6112.959	61129.589		
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	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 5

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

PRECIPITATION

TOTALS	25.68	36.86	8.40	15.66	35.30	55.74
	74.20	86.26	40.94	27.36	12.06	17.34
STD. DEVIATIONS	24.85	24.85	7.99	12.71	31.43	16.12
	30.52	49.07	14.36	7.14	9.84	9.75

RUNOFF

TOTALS	0.753	0.000	0.000	0.000	0.000	0.000
	0.008	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	1.639	0.000	0.000	0.000	0.000	0.000
	0.016	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	22.909	31.840	16.623	8.089	26.136	35.651
	41.436	46.811	54.227	32.631	11.916	13.157
STD. DEVIATIONS	24.781	26.790	8.386	3.529	22.631	5.091
	1.171	3.250	16.681	11.642	5.509	11.082

LATERAL DRAINAGE COLLECTED FROM LAYER 6

TOTALS	0.3916	0.4304	0.2018	0.0000	1.0810	8.9444
	11.5749	17.8984	20.9538	12.0763	3.3889	7.5787
STD. DEVIATIONS	0.8335	0.4864	0.3542	0.0000	2.3194	5.1744
	10.2279	11.3672	12.9942	11.1104	4.6377	16.9454

PERCOLATION/LEAKAGE THROUGH LAYER 8

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

PERCOLATION/LEAKAGE THROUGH LAYER 9

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0024	0.0029	0.0013	0.0000	0.0067	0.0576
	0.0721	0.1115	0.1349	0.0752	0.0218	0.0472
STD. DEVIATIONS	0.0052	0.0032	0.0022	0.0000	0.0144	0.0333
	0.0637	0.0708	0.0836	0.0692	0.0298	0.1055

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

	MM	CU. METERS	PERCENT
PRECIPITATION	435.80	(40.690)	4358.0 100.00
RUNOFF	0.761	(1.6347)	7.61 0.175
EVAPOTRANSPIRATION	341.427	(22.0345)	3414.27 78.345
LATERAL DRAINAGE COLLECTED FROM LAYER 6	84.52010	(51.30331)	845.201 19.39424
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00004	(0.00002)	0.000 0.00001
AVERAGE HEAD ON TOP OF LAYER 7	0.445	(0.269)	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00005	(0.00002)	0.000 0.00001
CHANGE IN WATER STORAGE	9.092	(0.8226)	90.92 2.086

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5 and their dates (DDDYYYY)

	(MM)	(CU. METERS)	
PRECIPITATION	43.60	436.00000	20003
RUNOFF	3.685	36.84734	20003
DRAINAGE COLLECTED FROM LAYER 6	3.69384	36.93836	3490004
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.00001	3490004
AVERAGE HEAD ON TOP OF LAYER 7	7.132		
MAXIMUM HEAD ON TOP OF LAYER 7	13.539		
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	1.5 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000010	0.00010	3060002
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2600	
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0580	

*** 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.

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(CM)	(VOL/VOL)
1	19.1859	0.1919
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	146.0000	0.2920
6	0.9600	0.0320
7	0.0000	0.0000
8	0.6000	0.7500
9	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465377.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465377.prt

TIME: 16:27 DATE: 10/17/2019

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TITLE: Average Rainfall Interim Cover - 20 m

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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. = 0.30000000000 CM/SEC
SLOPE = 3.00 PERCENT
DRAINAGE LENGTH = 30.0 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 = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 8

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.500000000000E-08 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 606.750 CM
TOTAL INITIAL WATER = 606.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BOWEN AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST
AND STATION LATITUDE = -20.07 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 7

DRAIN #1: LATERAL DRAINAGE FROM LAYER 6 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 8

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 9

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	
EVAPOTRANSPIRATION	7.90	6.33	6.28	7.55	54.83	33.36
	43.80	44.42	62.87	42.94	15.82	8.79
LATERAL DRAINAGE COLLECTED	0.076	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	0.000	6.932	22.001	0.206	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 8	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	0.000	0.043	0.142	0.001	0.000	0.000
STD. DEVIATION OF DAILY	0.002	0.000	0.000	0.000	0.000	0.000
HEAD ON TOP OF LAYER 7	0.000	0.071	0.077	0.006	0.000	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
-----	-----	-----	-----
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	334.911	3349.109	83.58
DRAINAGE COLLECTED FROM LAYER 6	29.2144	292.144	7.29
PERC./LEAKAGE THROUGH LAYER 8	0.000015	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.1554		
PERC./LEAKAGE THROUGH LAYER 9	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	36.575	365.747	9.13
SOIL WATER AT START OF YEAR	6067.499	60674.987	
SOIL WATER AT END OF YEAR	6104.073	61040.734	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10

STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	7.904	6.335	6.282	7.552	54.827	33.360
	43.801	44.420	62.872	42.945	15.821	8.794

STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 6

TOTALS	0.0763	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	6.9317	22.0007	0.2057	0.0000	0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

PERCOLATION/LEAKAGE THROUGH LAYER 9

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0432	0.1416	0.0013	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

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

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	(0.000)	4007.0 100.00
RUNOFF	0.000	(0.0000)	0.00 0.000
EVAPOTRANSPIRATION	334.911	(0.0000)	3349.11 83.581
LATERAL DRAINAGE COLLECTED FROM LAYER 6	29.21438	(0.00000)	292.144 7.29084
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00002	(0.00000)	0.000 0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.155	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00002	(0.00000)	0.000 0.00000
CHANGE IN WATER STORAGE	36.575	(0.0000)	365.75 9.128

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDYY)

	(MM)	(CU. METERS)
PRECIPITATION	22.60	226.00000 1260001
RUNOFF	0.000	0.00000 0
DRAINAGE COLLECTED FROM LAYER 6	2.22654	22.26544 2650001
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.00001 2650001
AVERAGE HEAD ON TOP OF LAYER 7	4.299	
MAXIMUM HEAD ON TOP OF LAYER 7	8.295	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	1.0 METERS	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000010	0.00010 2640001
SNOW WATER	0.00	0.0000 0
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.2600
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0586

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	18.2973	0.1830
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	146.0000	0.2920
6	0.9600	0.0320
7	0.0000	0.0000
8	0.6000	0.7500
9	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465415.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465415.prt

TIME: 16:50 DATE: 10/17/2019

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TITLE: Daily Cover - 25 m

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 8

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 9

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT

AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 752.750 CM
TOTAL INITIAL WATER = 752.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
32.0	19.1	18.0	22.1	42.9	59.9
71.1	58.9	37.1	23.1	15.0	13.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust
AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 1

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

PRECIPITATION	0.0	13.0	1.2	33.5	34.9	74.4	
	43.8	88.0	63.7	21.5	27.6	0.1	
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	0.00	0.00	0.00	0.00	0.00	
EVAPOTRANSPIRATION	7.93	6.36	6.32	7.56	53.75	32.68	
	43.14	43.50	62.75	42.74	18.38	8.91	
LATERAL DRAINAGE COLLECTED FROM LAYER 7	0.301	0.000	0.000	0.000	0.000	0.000	
	0.000	7.272	20.381	4.826	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000	
	0.000	0.000	0.000	0.000	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000	
	0.000	0.000	0.000	0.000	0.000	0.000	

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.002	0.000	0.000	0.000	0.000	0.000	
	0.000	0.045	0.131	0.030	0.000	0.000	
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.006	0.000	0.000	0.000	0.000	0.000	
	0.000	0.077	0.057	0.076	0.000	0.000	

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT	
PRECIPITATION	401.70	4017.000	100.00	
RUNOFF	0.000	0.000	0.00	
EVAPOTRANSPIRATION	334.020	3340.201	83.15	
DRAINAGE COLLECTED FROM LAYER 7	32.7788	327.788	8.16	
PERC./LEAKAGE THROUGH LAYER 9	0.000017	0.000	0.00	
AVG. HEAD ON TOP OF LAYER 8	0.1737			
PERC./LEAKAGE THROUGH LAYER 10	0.000019	0.000	0.00	
CHANGE IN WATER STORAGE	34.901	349.010	8.69	
SOIL WATER AT START OF YEAR	7527.499	75274.987		

SOIL WATER AT END OF YEAR	7562.400	75623.997	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 2

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	39.4 124.1	74.2 61.2	20.5 38.6	18.0 21.8	13.3 3.8	51.3 23.8
RUNOFF	0.08 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
EVAPOTRANSPIRATION	31.19 41.53	73.92 52.24	21.12 59.24	11.29 13.93	12.02 9.67	35.33 6.67
LATERAL DRAINAGE COLLECTED FROM LAYER 7	0.000 15.869	0.002 27.102	0.157 20.782	0.000 16.645	0.033 15.771	10.104 0.001
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.000 0.099	0.000 0.169	0.001 0.134	0.000 0.104	0.000 0.102	0.065 0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.000 0.081	0.000 0.056	0.003 0.067	0.000 0.072	0.001 0.178	0.076 0.000

ANNUAL TOTALS FOR YEAR 2

MM	CU. METERS	PERCENT
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PRECIPITATION	490.00	4900.000	100.00
RUNOFF	0.085	0.847	0.02
EVAPOTRANSPIRATION	368.152	3681.515	75.13
DRAINAGE COLLECTED FROM LAYER 7	106.4655	1064.655	21.73
PERC./LEAKAGE THROUGH LAYER 9	0.000055	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	0.5607		
PERC./LEAKAGE THROUGH LAYER 10	0.000058	0.001	0.00
CHANGE IN WATER STORAGE	15.298	152.981	3.12
SOIL WATER AT START OF YEAR	7562.400	75623.997	
SOIL WATER AT END OF YEAR	7577.698	75776.978	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8

DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 3

	JAN	JUL	FEB	AUG	MAR	SEP	APR	OCT	MAY	NOV	JUN	DEC
PRECIPITATION	60.1	16.3	11.8	3.5	88.1	37.8						
	61.0	19.0	26.6	35.0	15.4	19.8						
RUNOFF	3.68	0.00	0.00	0.00	0.00	0.00	0.00					
	0.00	0.00	0.00	0.00	0.00	0.00						
EVAPOTRANSPIRATION	62.91	11.88	9.76	7.81	47.79	43.08						
	41.81	46.52	24.49	33.65	16.27	10.84						
LATERAL DRAINAGE COLLECTED	1.881	0.502	0.000	0.000	5.229	13.155						
FROM LAYER 7	6.154	3.890	0.000	0.027	0.003	0.001						
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.012 0.003 0.000 0.000 0.033 0.085
TOP OF LAYER 8 0.038 0.024 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.025 0.012 0.000 0.000 0.040 0.079
HEAD ON TOP OF LAYER 8 0.053 0.060 0.000 0.001 0.000 0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	394.40	3944.000	100.00
RUNOFF	3.685	36.847	0.93
EVAPOTRANSPIRATION	356.808	3568.085	90.47
DRAINAGE COLLECTED FROM LAYER 7	30.8426	308.426	7.82
PERC./LEAKAGE THROUGH LAYER 9	0.000031	0.000	0.00
AVG. HEAD ON TOP OF LAYER 8	0.1626		
PERC./LEAKAGE THROUGH LAYER 10	0.000029	0.000	0.00
CHANGE IN WATER STORAGE	3.064	30.642	0.78
SOIL WATER AT START OF YEAR	7577.698	75776.978	
SOIL WATER AT END OF YEAR	7580.762	75807.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8

DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION	4.8	45.8	1.9	3.2	30.5	70.7
	63.4	145.2	31.7	35.3	9.0	22.0

RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	8.41	38.38	26.66	2.63	8.00	29.65
	40.48	46.10	62.35	30.92	10.71	32.73
LATERAL DRAINAGE COLLECTED	0.000	1.186	0.027	0.000	0.000	11.635
FROM LAYER 7	24.671	25.093	31.292	7.844	9.024	35.371
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.000	0.008	0.000	0.000	0.000	0.075
TOP OF LAYER 8	0.154	0.156	0.201	0.049	0.058	0.220
STD. DEVIATION OF DAILY	0.000	0.023	0.001	0.000	0.000	0.087
HEAD ON TOP OF LAYER 8	0.065	0.068	0.042	0.063	0.065	0.212

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
PRECIPITATION	463.50	4635.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	337.006	3370.064	72.71
DRAINAGE COLLECTED FROM LAYER 7	146.1438	1461.438	31.53
PERC./LEAKAGE THROUGH LAYER 9	0.000064	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	0.7680		
PERC./LEAKAGE THROUGH LAYER 10	0.000068	0.001	0.00
CHANGE IN WATER STORAGE	-19.650	-196.502	-4.24
SOIL WATER AT START OF YEAR	7580.762	75807.620	
SOIL WATER AT END OF YEAR	7561.112	75611.118	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8

DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 5

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

PRECIPITATION 24.1 35.0 6.6 20.1 9.7 44.5
78.7 117.9 44.1 23.2 4.5 21.0

RUNOFF 0.00 0.00 0.00 0.00 0.00 0.00
0.04 0.00 0.00 0.00 0.00 0.00

EVAPOTRANSPIRATION 4.11 28.67 19.26 11.15 9.12 37.52
40.21 45.69 62.31 41.92 4.56 6.63

LATERAL DRAINAGE COLLECTED 2.520 0.462 0.825 0.000 0.143 9.829
FROM LAYER 7 8.986 27.436 32.945 17.578 5.646 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 9 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 10 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 0.016 0.003 0.005 0.000 0.001 0.063
TOP OF LAYER 8 0.056 0.171 0.212 0.109 0.036 0.000

STD. DEVIATION OF DAILY 0.072 0.008 0.012 0.000 0.002 0.078
HEAD ON TOP OF LAYER 8 0.070 0.032 0.062 0.063 0.105 0.000

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT
PRECIPITATION	429.40	4294.000	100.00
RUNOFF	0.036	0.360	0.01
EVAPOTRANSPIRATION	311.147	3111.471	72.46
DRAINAGE COLLECTED FROM LAYER 7	106.3697	1063.697	24.77
PERC./LEAKAGE THROUGH LAYER 9	0.000053	0.001	0.00
AVG. HEAD ON TOP OF LAYER 8	0.5607		
PERC./LEAKAGE THROUGH LAYER 10	0.000058	0.001	0.00

CHANGE IN WATER STORAGE	11.847	118.471	2.76
SOIL WATER AT START OF YEAR	7561.112	75611.118	
SOIL WATER AT END OF YEAR	7572.959	75729.589	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 5

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

PRECIPITATION

TOTALS	25.68	36.86	8.40	15.66	35.30	55.74
	74.20	86.26	40.94	27.36	12.06	17.34

STD. DEVIATIONS 24.85 24.85 7.99 12.71 31.43 16.12
 30.52 49.07 14.36 7.14 9.84 9.75

RUNOFF

TOTALS	0.753	0.000	0.000	0.000	0.000	0.000
	0.008	0.000	0.000	0.000	0.000	0.000

STD. DEVIATIONS	1.639	0.000	0.000	0.000	0.000	0.000
	0.016	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	22.909	31.840	16.623	8.089	26.136	35.651
	41.436	46.811	54.227	32.631	11.916	13.157

LATERAL DRAINAGE COLLECTED FROM LAYER 7

TOTALS	0.9405	0.4304	0.2018	0.0000	1.0810	8.9444
	11.1360	18.1586	21.0800	9.3840	6.0888	7.0746

STD. DEVIATIONS 1.1789 0.4864 0.3542 0.0000 2.3194 5.1743
 9.4741 11.5785 13.1340 7.5921 6.6459 15.8183

PERCOLATION/LEAKAGE THROUGH LAYER 9

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 10

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES	0.0059	0.0029	0.0013	0.0000	0.0067	0.0576
	0.0694	0.1131	0.1357	0.0584	0.0392	0.0441
STD. DEVIATIONS	0.0073	0.0032	0.0022	0.0000	0.0144	0.0333
	0.0590	0.0721	0.0845	0.0473	0.0428	0.0985

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

	MM	CU. METERS	PERCENT	
PRECIPITATION	435.80	(40.690)	4358.0	100.00
RUNOFF	0.761	(1.6347)	7.61	0.175
EVAPOTRANSPIRATION	341.427	(22.0345)	3414.27	78.345
LATERAL DRAINAGE COLLECTED FROM LAYER 7	84.52010	(50.78121)	845.201	19.39424
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00004	(0.00002)	0.000	0.00001
AVERAGE HEAD ON TOP OF LAYER 8	0.445	(0.267)		
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.00005	(0.00002)	0.000	0.00001
CHANGE IN WATER STORAGE	9.092	(0.7811)	90.92	2.086

PEAK DAILY VALUES FOR YEARS 1 THROUGH 5 and their dates (DDYY)

	(MM)	(CU. METERS)	
PRECIPITATION	43.60	436.00000	20003
RUNOFF	3.685	36.84734	20003
DRAINAGE COLLECTED FROM LAYER 7	3.50450	35.04499	3650004
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000001	0.00001	3650004
AVERAGE HEAD ON TOP OF LAYER 8	6.767		

MAXIMUM HEAD ON TOP OF LAYER 8 12.870
 LOCATION OF MAXIMUM HEAD IN LAYER 7
 (DISTANCE FROM DRAIN) 1.4 METERS
 PERCOLATION/LEAKAGE THROUGH LAYER 10 0.000010 0.000010 3590004
 SNOW WATER 0.00 0.0000 0

 MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2600
 MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0580

*** 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.

FINAL WATER STORAGE AT END OF YEAR 5

LAYER	(CM)	(VOL/VOL)
1	19.1859	0.1919
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	146.0000	0.2920
6	146.0000	0.2920
7	0.9600	0.0320
8	0.0000	0.0000
9	0.6000	0.7500
10	6.5500	0.1310

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:\WHI\VHELP22\data\P63706.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63706.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\I_465415.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63706.VHP\O_465415.prt

TIME: 16:29 DATE: 10/17/2019

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TITLE: Average Rainfall Interim Cover - 25 m

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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 5
THICKNESS = 100.00 CM
POROSITY = 0.4570 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2600 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 8

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 9

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 5 WITH BARE
GROUND CONDITIONS, A SURFACE SLOPE OF 5% AND
A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.83
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT

AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 36.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 9.360 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 16.452 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 2.088 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 752.750 CM
TOTAL INITIAL WATER = 752.750 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
BOWEN AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 0.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 36.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
31.5	18.3	18.0	22.1	42.9	59.9
71.9	58.9	37.1	23.1	14.5	12.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR BOWEN AUST
AND STATION LATITUDE = -20.07 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 8
DRAIN #1: LATERAL DRAINAGE FROM LAYER 7 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 9
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 10

MONTHLY TOTALS (MM) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.5	1.2	33.5	34.9	74.4
	44.3	88.0	63.7	21.5	26.6	0.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.90	6.33	6.28	7.55	54.83	33.36
	43.80	44.42	62.87	42.94	15.82	8.79
LATERAL DRAINAGE COLLECTED FROM LAYER 7	0.301	0.000	0.000	0.000	0.000	0.000
	0.000	6.707	21.970	0.236	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 8	0.002	0.000	0.000	0.000	0.000	0.000
	0.000	0.042	0.141	0.001	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 8	0.006	0.000	0.000	0.000	0.000	0.000
	0.000	0.071	0.063	0.007	0.000	0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	400.70	4007.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	334.911	3349.109	83.58
DRAINAGE COLLECTED FROM LAYER 7	29.2144	292.144	7.29
PERC./LEAKAGE THROUGH LAYER 9	0.000015	0.000	0.00
AVG. HEAD ON TOP OF LAYER 8	0.1554		
PERC./LEAKAGE THROUGH LAYER 10	0.000019	0.000	0.00
CHANGE IN WATER STORAGE	36.575	365.747	9.13
SOIL WATER AT START OF YEAR	7527.499	75274.987	
SOIL WATER AT END OF YEAR	7564.073	75640.734	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 1

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

PRECIPITATION

TOTALS	0.00	12.50	1.20	33.50	34.90	74.40
	44.30	88.00	63.70	21.50	26.60	0.10
STD. DEVIATIONS	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF

TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	7.904	6.335	6.282	7.552	54.827	33.360
	43.801	44.420	62.872	42.945	15.821	8.794
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

LATERAL DRAINAGE COLLECTED FROM LAYER 7

TOTALS	0.3007	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	6.7073	21.9701	0.2363	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 9

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 10

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 8

AVERAGES	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0418	0.1414	0.0015	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

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

	MM	CU. METERS	PERCENT	
PRECIPITATION	400.70	(0.000)	4007.0	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	334.911	(0.0000)	3349.11	83.581
LATERAL DRAINAGE COLLECTED FROM LAYER 7	29.21438	(0.00000)	292.144	7.29084
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.00002	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 8	0.155	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.00002	(0.00000)	0.000	0.00000
CHANGE IN WATER STORAGE	36.575	(0.0000)	365.75	9.128

PEAK DAILY VALUES FOR YEARS 1 THROUGH 1 and their dates (DDYY)

	(MM)	(CU. METERS)	
PRECIPITATION	22.60	226.00000	1260001
RUNOFF	0.000	0.00000	0
DRAINAGE COLLECTED FROM LAYER 7	1.76278	17.62783	2710001
PERCOLATION/LEAKAGE THROUGH LAYER 9	0.000001	0.00001	2710001
AVERAGE HEAD ON TOP OF LAYER 8	3.404		
MAXIMUM HEAD ON TOP OF LAYER 8	6.606		
LOCATION OF MAXIMUM HEAD IN LAYER 7 (DISTANCE FROM DRAIN)	0.9 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 10	0.000010	0.00010	2640001
SNOW WATER	0.00	0.0000	0

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2600
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0586

*** 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.

FINAL WATER STORAGE AT END OF YEAR 1

LAYER	(CM)	(VOL/VOL)
1	18.2973	0.1830
2	146.0000	0.2920
3	146.0000	0.2920
4	146.0000	0.2920
5	146.0000	0.2920
6	146.0000	0.2920
7	0.9600	0.0320
8	0.0000	0.0000
9	0.6000	0.7500
10	6.5500	0.1310

SNOW WATER 0.000

Attachment 3

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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\P63722.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63722.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\I_465491.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\O_465491.prt

TIME: 10: 2 DATE: 10/21/2019

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TITLE: Final Cap - 25 m - 90th Percentile Rainfall

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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 7

THICKNESS = 30.00 CM
POROSITY = 0.4730 VOL/VOL
FIELD CAPACITY = 0.2220 VOL/VOL
WILTING POINT = 0.1040 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2200 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC
NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 5.00
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 9

THICKNESS = 70.00 CM
POROSITY = 0.5010 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.1350 VOL/VOL

INITIAL SOIL WATER CONTENT = 0.2800 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 0.00 PERCENT
DRAINAGE LENGTH = 10000.0 METERS

LAYER 4

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 3 - GOOD

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 100.00 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. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 11

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL

INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 12

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 13

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 14

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 15

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 7 WITH A
POOR STAND OF GRASS, A SURFACE SLOPE OF 10.%
AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.63
FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
EVAPORATIVE ZONE DEPTH = 46.0 CM
INITIAL WATER IN EVAPORATIVE ZONE = 11.080 CM
UPPER LIMIT OF EVAPORATIVE STORAGE = 22.206 CM
LOWER LIMIT OF EVAPORATIVE STORAGE = 5.280 CM
INITIAL SNOW WATER = 0.000 CM
INITIAL WATER IN LAYER MATERIALS = 767.550 CM
TOTAL INITIAL WATER = 767.550 CM
TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 5.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 46.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York AUST

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
87.9	35.1	54.1	53.1	85.1	110.0
110.0	84.1	55.9	40.9	30.0	28.7

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York AUST

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York AUST

AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 1

PRECIPITATION 0.0 23.8 3.4 80.3 69.5 136.5
 67.7 125.5 95.7 37.9 55.4 0.2

RUNOFF 0.00 0.00 0.00 0.33 5.37 0.13
 0.00 0.02 0.31 0.00 0.00 0.00

EVAPOTRANSPIRATION 47.49 13.15 24.56 50.32 58.77 47.39
 44.09 44.01 63.78 82.38 52.01 3.61

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.001
FROM LAYER 3 0.004 0.015 0.025 0.030 0.029 0.030

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.001
 LAYER 5 0.002 0.006 0.012 0.015 0.015 0.015

LATERAL DRAINAGE COLLECTED 0.301 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	0.000	0.000	0.000	0.000	3.619	7.705
	18.164	40.876	67.382	77.757	77.836	77.816

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4 0.000 0.000 0.000 0.000 2.765 2.629
 1.674 12.786 7.710 0.097 0.006 0.006

AVERAGE DAILY HEAD ON 0.002 0.000 0.000 0.000 0.000 0.000
 TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13 0.006 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	695.90	6959.000	100.00
RUNOFF	6.162	61.621	0.89
EVAPOTRANSPIRATION	531.538	5315.378	76.38
DRAINAGE COLLECTED FROM LAYER 3	0.1361	1.361	0.02
PERC./LEAKAGE THROUGH LAYER 5	0.066246	0.662	0.01
AVG. HEAD ON TOP OF LAYER 4	309.2956		
DRAINAGE COLLECTED FROM LAYER 12	0.3007	3.007	0.04
PERC./LEAKAGE THROUGH LAYER 14	0.000002	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0016		
PERC./LEAKAGE THROUGH LAYER 15	0.000010	0.000	0.00
CHANGE IN WATER STORAGE	157.763	1577.633	22.67
SOIL WATER AT START OF YEAR	7675.499	76754.986	
SOIL WATER AT END OF YEAR	7833.262	78332.619	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 2

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

PRECIPITATION	108.3	136.5	61.8	43.3	26.3	94.1
	192.2	87.4	58.1	38.5	7.6	52.7
RUNOFF	15.57	2.43	0.50	0.00	0.00	0.95
	42.54	41.57	23.33	0.00	0.00	0.00
EVAPOTRANSPIRATION	45.04	105.78	83.78	73.18	36.28	37.79
	42.25	53.68	72.45	127.65	32.32	26.79
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.031	0.031	0.037	0.033	0.033	0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.015	0.016	0.020	0.017	0.017	0.017
	0.026	0.033	0.031	0.024	0.017	0.017
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	78.215	86.768	94.071	86.376	83.983	86.693
	109.441	126.831	124.255	105.056	84.495	83.971
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.644	5.983	1.803	2.550	0.006	2.959
	16.754	2.692	5.114	7.365	1.459	0.007
AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
PRECIPITATION	906.80	9068.000	100.00
RUNOFF	126.878	1268.777	13.99
EVAPOTRANSPIRATION	737.012	7370.119	81.28
DRAINAGE COLLECTED FROM LAYER 3	0.4425	4.425	0.05
PERC./LEAKAGE THROUGH LAYER 5	0.250955	2.510	0.03
AVG. HEAD ON TOP OF LAYER 4	958.4617		
DRAINAGE COLLECTED FROM LAYER 12	0.00000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00

AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	42.468	424.679	4.68
SOIL WATER AT START OF YEAR	7833.262	78332.619	
SOIL WATER AT END OF YEAR	7875.730	78757.298	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 3

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	165.1 94.3	29.7 27.2	35.5 40.2	8.5 62.0	174.5 30.8	69.5 43.5
RUNOFF	58.59 40.24	0.00 0.00	0.00 0.68	0.00 0.01	0.99 0.00	0.00 0.00
EVAPOTRANSPIRATION	59.72 42.80	19.42 49.21	58.90 66.75	64.10 135.15	53.25 71.47	44.07 18.27
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.042 0.051	0.036 0.048	0.039 0.043	0.034 0.040	0.037 0.032	0.045 0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.025 0.033	0.021 0.030	0.022 0.027	0.018 0.024	0.020 0.017	0.029 0.017
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 106.251 101.932 100.157 88.954 94.058 119.095
TOP OF LAYER 4 127.900 121.307 114.316 103.183 85.457 83.975

STD. DEVIATION OF DAILY 6.083 0.533 0.972 5.248 9.084 2.306
HEAD ON TOP OF LAYER 4 1.784 2.906 2.696 5.224 2.712 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	780.80	7808.000	100.00
RUNOFF	100.510	1005.100	12.87
EVAPOTRANSPIRATION	683.103	6831.030	87.49
DRAINAGE COLLECTED FROM LAYER 3	0.4798	4.798	0.06
PERC./LEAKAGE THROUGH LAYER 5	0.282792	2.828	0.04
AVG. HEAD ON TOP OF LAYER 4	1038.8207		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-3.293	-32.928	-0.42
SOIL WATER AT START OF YEAR	7875.730	78757.298	
SOIL WATER AT END OF YEAR	7872.437	78724.370	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION 13.2 83.9 5.6 8.0 60.3 129.9
98.0 207.2 47.9 62.6 18.1 48.6

RUNOFF 0.00 1.54 0.00 0.00 0.00 0.02
1.58 147.49 14.53 0.57 0.00 0.68

EVAPOTRANSPIRATION 31.56 36.10 58.78 7.20 46.81 43.07
41.42 46.90 65.18 129.43 85.36 49.66

LATERAL DRAINAGE COLLECTED 0.033 0.031 0.033 0.032 0.033 0.034
FROM LAYER 3 0.044 0.051 0.047 0.043 0.034 0.033

PERCOLATION/LEAKAGE THROUGH 0.017 0.016 0.017 0.017 0.017 0.019
LAYER 5 0.026 0.033 0.030 0.026 0.018 0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.952 83.930 83.907 83.885 83.862 90.260
TOP OF LAYER 4 111.093 127.845 123.690 110.618 89.313 83.980

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.007 0.006 8.435
HEAD ON TOP OF LAYER 4 6.429 2.895 4.050 7.574 5.567 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 4

MM CU. METERS PERCENT

PRECIPITATION 783.30 7833.000 100.00

RUNOFF 166.413 1664.133 21.25

EVAPOTRANSPIRATION	641.455	6414.548	81.89	
DRAINAGE COLLECTED FROM LAYER 3	0.4460	4.460	0.06	
PERC./LEAKAGE THROUGH LAYER 5	0.253602	2.536	0.03	
AVG. HEAD ON TOP OF LAYER 4	963.6112			
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00	
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00	
AVG. HEAD ON TOP OF LAYER 13	0.0000			
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00	
CHANGE IN WATER STORAGE	-25.014	-250.142	-3.19	
SOIL WATER AT START OF YEAR	7872.437	78724.370		
SOIL WATER AT END OF YEAR	7847.423	78474.228		
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	

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
 HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
 DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
 LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.2	64.5	20.0	48.3	19.4	81.6
	121.9	168.6	66.4	41.0	8.9	45.1
RUNOFF	0.86	0.00	0.00	0.00	0.00	0.55
	4.49	69.99	5.46	1.63	0.00	0.00
EVAPOTRANSPIRATION	32.24	80.72	36.88	19.50	44.26	45.35
	43.87	46.46	63.11	127.97	82.77	21.54
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.030	0.033	0.032	0.033	0.032
	0.037	0.049	0.048	0.046	0.034	0.033

PERCOLATION/LEAKAGE THROUGH 0.017 0.015 0.017 0.017 0.017 0.017
LAYER 5 0.020 0.031 0.032 0.029 0.018 0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.957 83.935 83.913 83.891 83.868 84.236
TOP OF LAYER 4 94.200 122.903 126.706 117.583 89.361 83.977

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.007 0.007 0.309
HEAD ON TOP OF LAYER 4 8.412 7.620 1.768 7.313 6.464 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT	
PRECIPITATION	751.90	7519.000	100.00	
RUNOFF	82.975	829.749	11.04	
EVAPOTRANSPIRATION	644.682	6446.824	85.74	
DRAINAGE COLLECTED FROM LAYER 3	0.4380	4.380	0.06	
PERC./LEAKAGE THROUGH LAYER 5	0.247038	2.470	0.03	
AVG. HEAD ON TOP OF LAYER 4	948.7752			
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00	
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00	
AVG. HEAD ON TOP OF LAYER 13	0.0000			
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00	
CHANGE IN WATER STORAGE	23.805	238.048	3.17	
SOIL WATER AT START OF YEAR	7847.423	78474.228		
SOIL WATER AT END OF YEAR	7871.228	78712.276		
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 6

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

PRECIPITATION 0.0 24.3 36.5 98.7 153.4 92.9
121.9 102.7 22.5 63.0 31.2 49.2

RUNOFF 0.00 0.00 0.00 0.08 5.29 24.74
80.92 52.39 7.81 0.00 0.00 0.00

EVAPOTRANSPIRATION 23.56 24.28 36.50 42.07 58.96 44.57
40.70 50.77 72.14 116.38 83.99 47.10

LATERAL DRAINAGE COLLECTED 0.033 0.030 0.033 0.032 0.040 0.048
FROM LAYER 3 0.051 0.051 0.046 0.042 0.033 0.033

PERCOLATION/LEAKAGE THROUGH 0.017 0.015 0.017 0.017 0.023 0.031
LAYER 5 0.033 0.033 0.029 0.025 0.018 0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.954 83.936 83.922 83.899 100.972 125.561
TOP OF LAYER 4 128.947 127.717 120.783 106.772 87.586 83.982

STD. DEVIATION OF DAILY 0.007 0.004 0.007 0.007 11.128 3.948
HEAD ON TOP OF LAYER 4 0.968 2.257 5.331 3.338 4.418 0.006

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
 HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 6

	MM	CU. METERS	PERCENT
PRECIPITATION	796.30	7963.000	100.00
RUNOFF	171.226	1712.261	21.50
EVAPOTRANSPIRATION	641.006	6410.060	80.50
DRAINAGE COLLECTED FROM LAYER 3	0.4696	4.696	0.06
PERC./LEAKAGE THROUGH LAYER 5	0.275222	2.752	0.03
AVG. HEAD ON TOP OF LAYER 4	1015.0266		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-16.402	-164.018	-2.06
SOIL WATER AT START OF YEAR	7871.228	78712.276	
SOIL WATER AT END OF YEAR	7854.826	78548.258	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 7

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

PRECIPITATION	42.3	53.7	139.0	61.2	18.4	145.3
	60.6	118.7	85.6	50.1	21.6	5.9
RUNOFF	0.00	0.10	0.43	0.10	0.00	1.67
	0.81	31.63	32.55	0.35	0.00	0.00
EVAPOTRANSPIRATION	15.23	71.76	100.53	78.35	42.33	44.26
	42.62	49.31	64.44	125.99	100.09	2.87
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.030	0.033	0.032	0.033	0.034
	0.042	0.048	0.049	0.046	0.034	0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.015	0.017	0.017	0.017	0.019
	0.025	0.030	0.032	0.028	0.019	0.017
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	83.975	83.979	83.995	83.994	83.985	91.216
	107.752	121.132	127.024	116.208	90.260	83.981
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.007	0.018	0.004	0.005	0.006	8.763
	2.735	4.523	1.749	6.999	7.262	0.007
AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 7

	MM	CU. METERS	PERCENT
	-----	-----	-----
PRECIPITATION	802.40	8024.000	100.00
RUNOFF	67.632	676.324	8.43
EVAPOTRANSPIRATION	737.765	7377.653	91.94
DRAINAGE COLLECTED FROM LAYER 3	0.4453	4.453	0.06
PERC./LEAKAGE THROUGH LAYER 5	0.253234	2.532	0.03
AVG. HEAD ON TOP OF LAYER 4	964.5838		
DRAINAGE COLLECTED FROM LAYER 12	0.00000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00

AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-3.443	-34.430	-0.43
SOIL WATER AT START OF YEAR	7854.826	78548.258	
SOIL WATER AT END OF YEAR	7851.383	78513.828	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 8

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	12.9	37.6	37.4	94.8	97.2
	196.5	91.9	50.2	87.1	40.7	36.4
RUNOFF	0.00	0.00	0.11	0.00	0.01	0.00
	109.16	73.52	1.37	1.04	0.00	0.00
EVAPOTRANSPIRATION	3.18	12.90	37.47	23.56	37.90	45.02
	40.56	52.78	70.25	120.06	114.90	41.35
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.031	0.033	0.032	0.033	0.038
	0.049	0.050	0.045	0.040	0.033	0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.016	0.017	0.017	0.017	0.022
	0.031	0.032	0.028	0.023	0.018	0.017
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

----- MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.958 83.935 83.913 83.891 84.919 101.177
TOP OF LAYER 4 122.983 126.203 117.835 101.272 87.478 83.988

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.006 2.285 8.524
HEAD ON TOP OF LAYER 4 7.406 3.436 2.703 6.903 3.619 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 8

	MM	CU. METERS	PERCENT
PRECIPITATION	782.70	7827.000	100.00
RUNOFF	185.201	1852.007	23.66
EVAPOTRANSPIRATION	599.938	5999.382	76.65
DRAINAGE COLLECTED FROM LAYER 3	0.4481	4.481	0.06
PERC./LEAKAGE THROUGH LAYER 5	0.255244	2.552	0.03
AVG. HEAD ON TOP OF LAYER 4	967.9597		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-2.887	-28.870	-0.37
SOIL WATER AT START OF YEAR	7851.383	78513.828	
SOIL WATER AT END OF YEAR	7848.496	78484.958	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 9

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

PRECIPITATION 38.8 48.5 105.4 6.5 89.0 76.4
95.9 123.6 13.1 86.5 1.3 44.6

RUNOFF 0.00 0.00 1.41 0.00 0.00 0.43
0.20 56.24 0.00 0.00 0.00 0.00

EVAPOTRANSPIRATION 38.73 29.98 66.83 62.08 29.32 46.31
42.51 49.33 73.31 132.05 55.63 19.36

LATERAL DRAINAGE COLLECTED 0.033 0.030 0.033 0.032 0.034 0.036
FROM LAYER 3 0.045 0.050 0.045 0.039 0.032 0.033

PERCOLATION/LEAKAGE THROUGH 0.017 0.015 0.017 0.017 0.018 0.020
LAYER 5 0.027 0.033 0.028 0.022 0.017 0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.969 83.987 83.965 83.973 86.157 94.403
TOP OF LAYER 4 113.578 126.629 117.176 99.943 85.912 83.973

STD. DEVIATION OF DAILY 0.011 0.006 0.007 0.014 3.281 2.190
HEAD ON TOP OF LAYER 4 7.326 2.779 4.643 4.322 3.124 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 9

MM CU. METERS PERCENT

PRECIPITATION 729.60 7296.000 100.00

RUNOFF 58.280 582.800 7.99

EVAPOTRANSPIRATION	645.453	6454.529	88.47
DRAINAGE COLLECTED FROM LAYER 3	0.4398	4.398	0.06
PERC./LEAKAGE THROUGH LAYER 5	0.248075	2.481	0.03
AVG. HEAD ON TOP OF LAYER 4	953.0546		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	25.427	254.273	3.49
SOIL WATER AT START OF YEAR	7848.496	78484.958	
SOIL WATER AT END OF YEAR	7873.923	78739.231	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
 HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
 DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
 LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 10

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	25.7	61.3	12.3	169.6	170.9
	139.6	143.4	53.9	47.2	31.5	62.5
RUNOFF	0.00	0.00	0.39	0.00	2.87	74.69
	92.99	90.79	20.25	0.00	0.00	0.07
EVAPOTRANSPIRATION	25.24	23.91	33.03	41.37	53.57	49.41
	37.68	52.27	71.17	128.89	81.35	41.53
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.030	0.033	0.032	0.038	0.047
	0.051	0.050	0.048	0.041	0.033	0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.015	0.017	0.017	0.021	0.030
	0.033	0.033	0.031	0.024	0.017	0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.950 83.929 83.907 83.884 96.313 123.456
TOP OF LAYER 4 128.096 127.207 124.374 104.770 86.548 83.979

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.007 9.832 6.151
HEAD ON TOP OF LAYER 4 1.649 2.496 3.823 7.878 3.544 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 10

	MM	CU. METERS	PERCENT
PRECIPITATION	917.90	9179.000	100.00
RUNOFF	282.060	2820.600	30.73
EVAPOTRANSPIRATION	639.409	6394.086	69.66
DRAINAGE COLLECTED FROM LAYER 3	0.4666	4.666	0.05
PERC./LEAKAGE THROUGH LAYER 5	0.272580	2.726	0.03
AVG. HEAD ON TOP OF LAYER 4	1008.6765		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-4.035	-40.352	-0.44
SOIL WATER AT START OF YEAR	7873.923	78739.231	
SOIL WATER AT END OF YEAR	7869.888	78698.879	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 10

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

PRECIPITATION

TOTALS	43.39	50.35	50.61	40.45	87.52	109.43
	118.86	119.62	53.36	57.59	24.71	38.87

STD. DEVIATIONS	55.79	37.39	43.26	32.51	60.49	33.89
	46.47	48.67	25.41	18.17	16.56	20.09

RUNOFF

TOTALS	7.502	0.407	0.283	0.050	1.452	10.319
	37.294	56.364	10.628	0.359	0.000	0.075

STD. DEVIATIONS	18.599	0.857	0.444	0.104	2.233	23.875
	43.020	43.676	11.491	0.565	0.000	0.213

EVAPOTRANSPIRATION

TOTALS	32.200	41.800	53.727	46.173	46.145	44.723
	41.850	49.471	68.257	122.595	75.989	27.207

STD. DEVIATIONS	16.506	32.424	24.590	23.894	9.979	3.046
	1.880	3.053	3.994	15.135	24.126	17.088

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0301	0.0276	0.0305	0.0288	0.0312	0.0349
	0.0415	0.0461	0.0444	0.0409	0.0327	0.0325

STD. DEVIATIONS	0.0110	0.0099	0.0110	0.0101	0.0111	0.0134
	0.0139	0.0109	0.0069	0.0044	0.0013	0.0008

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0160	0.0146	0.0162	0.0151	0.0168	0.0204
	0.0258	0.0294	0.0278	0.0241	0.0173	0.0169

STD. DEVIATIONS	0.0061	0.0054	0.0060	0.0053	0.0062	0.0088
	0.0094	0.0082	0.0058	0.0038	0.0011	0.0006

LATERAL DRAINAGE COLLECTED FROM LAYER 12

TOTALS	0.0301	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0951	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 14

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 15

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	77.2181	77.6330	78.1751	76.2748	80.1735	92.3801
	106.2152	116.8649	116.3542	104.3162	86.4247	83.3622
STD. DEVIATIONS	28.1359	27.8485	28.0460	26.8524	27.6105	33.5596
	32.8889	26.8243	17.7215	11.0502	3.5407	1.9487

DAILY AVERAGE HEAD ON TOP OF LAYER 13

AVERAGES	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 10

	MM	CU. METERS	PERCENT	
PRECIPITATION	794.76	(70.004)	7947.6	100.00
RUNOFF	124.734	(79.1466)	1247.34	15.695
EVAPOTRANSPIRATION	650.136	(60.7581)	6501.36	81.803
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.42119	(0.10117)	4.212	0.05300
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.24050	(0.06249)	2.405	0.03026
AVERAGE HEAD ON TOP OF LAYER 4	912.827	(214.229)		
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.03007	(0.09508)	0.301	0.00378
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.00000	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 13	0.000	(0.000)		
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.00000	(0.00000)	0.000	0.00000
CHANGE IN WATER STORAGE	19.439	(2.0779)	194.39	2.446

PEAK DAILY VALUES FOR YEARS 1 THROUGH 10 and their dates (DDYY)

	(MM)	(CU. METERS)	
PRECIPITATION	119.70	1197.00000	20003
RUNOFF	54.067	540.66697	20003
DRAINAGE COLLECTED FROM LAYER 3	0.00166	0.01661	2440010
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.001094	0.01094	2440010
AVERAGE HEAD ON TOP OF LAYER 4	1299.984		
MAXIMUM HEAD ON TOP OF LAYER 4	1648.084		
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	9994.4 METERS		
DRAINAGE COLLECTED FROM LAYER 12	0.12867	1.28671	30001
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000000	0.00000	30001
AVERAGE HEAD ON TOP OF LAYER 13	0.248		
MAXIMUM HEAD ON TOP OF LAYER 13	0.495		
LOCATION OF MAXIMUM HEAD IN LAYER 12 (DISTANCE FROM DRAIN)	0.1 METERS		
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000010	0.00010	10001
SNOW WATER	0.00	0.0000	0
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4827		
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1148		

*** 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.

FINAL WATER STORAGE AT END OF YEAR 10

LAYER	(CM)	(VOL/VOL)
1	4.6442	0.1548
2	29.7741	0.4253

3	11.9100	0.3970
4	0.0000	0.0000
5	0.6000	0.7500
6	12.7065	0.1271
7	136.6340	0.2733
8	144.7000	0.2894
9	145.9355	0.2919
10	145.9744	0.2919
11	146.0000	0.2920
12	0.9600	0.0320
13	0.0000	0.0000
14	0.6000	0.7500
15	6.5500	0.1310

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:\WHI\VHELP22\data\P63722.VHP\weather1.dat
TEMPERATURE DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\weather2.dat
SOLAR RADIATION DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\weather3.dat
EVAPOTRANSPIRATION DATA: C:\WHI\VHELP22\data\P63722.VHP\weather4.dat
SOIL AND DESIGN DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\I_465491.inp
OUTPUT DATA FILE: C:\WHI\VHELP22\data\P63722.VHP\O_465491.prt

TIME: 10:20 DATE: 10/21/2019

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TITLE: Final Cap - 25 m – Average Rainfall

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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 7

THICKNESS = 30.00 CM
POROSITY = 0.4730 VOL/VOL
FIELD CAPACITY = 0.2220 VOL/VOL
WILTING POINT = 0.1040 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2200 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC
NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 5.00
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 9

THICKNESS = 70.00 CM
POROSITY = 0.5010 VOL/VOL
FIELD CAPACITY = 0.2840 VOL/VOL
WILTING POINT = 0.1350 VOL/VOL

INITIAL SOIL WATER CONTENT = 0.2800 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 0.00 PERCENT
DRAINAGE LENGTH = 10000.0 METERS

LAYER 4

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 3 - GOOD

LAYER 5

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 6

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 100.00 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. = 0.10000000000E-02 CM/SEC

LAYER 7

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2720 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 8

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2894 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 9

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 10

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.100000000000E-02 CM/SEC

LAYER 11

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18
THICKNESS = 500.00 CM
POROSITY = 0.6710 VOL/VOL
FIELD CAPACITY = 0.2920 VOL/VOL
WILTING POINT = 0.0770 VOL/VOL

INITIAL SOIL WATER CONTENT = 0.2920 VOL/VOL
EFFECTIVE SAT. HYD. COND. = 0.10000000000E-02 CM/SEC

LAYER 12

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 21
THICKNESS = 30.00 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 = 30.0 METERS

LAYER 13

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. = 0.20000000000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/HECTARE
FML INSTALLATION DEFECTS = 2.00 HOLES/HECTARE
FML PLACEMENT QUALITY = 2 - EXCELLENT

LAYER 14

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 17
THICKNESS = 0.80 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. = 0.50000000000E-08 CM/SEC

LAYER 15

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5
THICKNESS = 50.00 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. = 0.10000000000E-04 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 7 WITH A
POOR STAND OF GRASS, A SURFACE SLOPE OF 10.%
AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER = 83.63
 FRACTION OF AREA ALLOWING RUNOFF = 100.0 PERCENT
 AREA PROJECTED ON HORIZONTAL PLANE = 1.0000 HECTARES
 EVAPORATIVE ZONE DEPTH = 46.0 CM
 INITIAL WATER IN EVAPORATIVE ZONE = 11.080 CM
 UPPER LIMIT OF EVAPORATIVE STORAGE = 22.206 CM
 LOWER LIMIT OF EVAPORATIVE STORAGE = 5.280 CM
 INITIAL SNOW WATER = 0.000 CM
 INITIAL WATER IN LAYER MATERIALS = 767.550 CM
 TOTAL INITIAL WATER = 767.550 CM
 TOTAL SUBSURFACE INFLOW = 0.00 MM/YR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
York AUST

STATION LATITUDE = -31.92 DEGREES
MAXIMUM LEAF AREA INDEX = 5.00
START OF GROWING SEASON (JULIAN DATE) = 50
END OF GROWING SEASON (JULIAN DATE) = 340
EVAPORATIVE ZONE DEPTH = 46.0 CM
AVERAGE ANNUAL WIND SPEED = 8.25 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 45.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 74.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 44.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY PRECIPITATION (MM)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
32.0	19.1	18.0	22.1	42.9	58.9
71.1	57.9	37.1	23.1	15.0	13.0

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR York Aust

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES CELSIUS)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
25.5	25.1	22.5	18.6	14.5	11.7
10.7	10.8	12.5	16.3	20.2	23.3

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR York Aust

AND STATION LATITUDE = -31.92 DEGREES

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 1

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

ANNUAL TOTALS FOR YEAR 1

	MM	CU. METERS	PERCENT
PRECIPITATION	399.00	3990.000	100.00
RUNOFF	0.000	0.004	0.00
EVAPOTRANSPIRATION	418.147	4181.468	104.80
DRAINAGE COLLECTED FROM LAYER 3	0.0047	0.047	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.003828	0.038	0.00
AVG. HEAD ON TOP OF LAYER 4	33.3869		
DRAINAGE COLLECTED FROM LAYER 12	0.3007	3.007	0.08
PERC./LEAKAGE THROUGH LAYER 14	0.000002	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0016		
PERC./LEAKAGE THROUGH LAYER 15	0.000010	0.000	0.00
CHANGE IN WATER STORAGE	-19.453	-194.526	-4.88
SOIL WATER AT START OF YEAR	7675.499	76754.986	
SOIL WATER AT END OF YEAR	7656.046	76560.460	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 2

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	39.4	74.2	20.5	18.0	13.3	50.4
	124.1	60.1	38.6	21.8	3.8	23.8

RUNOFF	0.06	0.00	0.00	0.00	0.00	0.00
	0.19	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	30.41	75.25	26.93	15.77	16.93	28.24
	40.85	53.68	71.42	26.69	3.72	17.86
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.001	0.001	0.001	0.001	0.001	0.001
	0.002	0.008	0.011	0.012	0.011	0.012
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.001	0.001	0.001	0.001	0.001	0.001
	0.001	0.003	0.004	0.004	0.004	0.004
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	9.886	9.886	9.897	9.900	9.899	9.898
	12.062	25.472	29.655	30.242	30.235	30.228
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.000	0.000	0.006	0.000	0.000	0.000
	3.766	1.227	0.638	0.002	0.002	0.002
AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 2

	MM	CU. METERS	PERCENT
PRECIPITATION	488.00	4880.000	100.00
RUNOFF	0.252	2.519	0.05
EVAPOTRANSPIRATION	407.744	4077.441	83.55
DRAINAGE COLLECTED FROM LAYER 3	0.0637	0.637	0.01
PERC./LEAKAGE THROUGH LAYER 5	0.025360	0.254	0.01
AVG. HEAD ON TOP OF LAYER 4	181.0497		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	79.940	799.403	16.38

SOIL WATER AT START OF YEAR	7656.046	76560.460
SOIL WATER AT END OF YEAR	7735.986	77359.862
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
 HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
 DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
 LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 3

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

PRECIPITATION	60.1	16.3	11.8	3.5	88.1	37.2
	61.0	18.6	26.6	35.0	15.4	19.8
RUNOFF	3.47	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	62.12	9.70	14.99	4.71	48.89	43.94
	42.80	49.20	42.59	39.54	15.44	13.45
LATERAL DRAINAGE COLLECTED	0.012	0.011	0.012	0.011	0.012	0.011
FROM LAYER 3	0.012	0.012	0.012	0.012	0.012	0.012
PERCOLATION/LEAKAGE THROUGH	0.004	0.004	0.004	0.004	0.004	0.004
LAYER 5	0.004	0.004	0.004	0.004	0.004	0.004
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 30.229 30.223 30.216 30.209 30.205 30.199

TOP OF LAYER 4	30.225	31.044	31.180	31.172	31.165	31.158
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.002	0.002	0.002	0.002	0.001	0.002
	0.029	0.258	0.002	0.002	0.002	0.002
AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 3

	MM	CU. METERS	PERCENT
PRECIPITATION	393.40	3934.000	100.00
RUNOFF	3.469	34.685	0.88
EVAPOTRANSPIRATION	387.355	3873.554	98.46
DRAINAGE COLLECTED FROM LAYER 3	0.1400	1.400	0.04
PERC./LEAKAGE THROUGH LAYER 5	0.046924	0.469	0.01
AVG. HEAD ON TOP OF LAYER 4	306.0212		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	2.436	24.361	0.62
SOIL WATER AT START OF YEAR	7735.986	77359.862	
SOIL WATER AT END OF YEAR	7738.422	77384.224	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 4

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

PRECIPITATION 4.8 45.8 1.9 3.2 30.5 69.7
63.4 142.6 31.7 35.3 9.0 22.0

RUNOFF 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 0.00 0.00 0.00 0.00

EVAPOTRANSPIRATION 9.98 32.80 16.08 3.11 25.68 32.66
37.93 46.89 64.92 47.84 13.97 22.04

LATERAL DRAINAGE COLLECTED 0.012 0.011 0.012 0.012 0.012 0.012
FROM LAYER 3 0.012 0.017 0.030 0.032 0.031 0.032

PERCOLATION/LEAKAGE THROUGH 0.004 0.004 0.004 0.004 0.004 0.004
LAYER 5 0.004 0.007 0.016 0.017 0.016 0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 31.151 31.144 31.143 31.136 31.128 31.122
TOP OF LAYER 4 31.418 43.372 80.520 82.572 82.814 82.792

STD. DEVIATION OF DAILY 0.002 0.002 0.002 0.002 0.002 0.002
HEAD ON TOP OF LAYER 4 0.555 9.429 1.955 0.428 0.006 0.006

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 4

	MM	CU. METERS	PERCENT
	-----	-----	-----
PRECIPITATION	459.90	4599.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	353.928	3539.283	76.96
DRAINAGE COLLECTED FROM LAYER 3	0.2263	2.263	0.05

PERC./LEAKAGE THROUGH LAYER 5	0.099687	0.997	0.02
AVG. HEAD ON TOP OF LAYER 4	491.9259		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	105.745	1057.454	22.99
SOIL WATER AT START OF YEAR	7738.422	77384.224	
SOIL WATER AT END OF YEAR	7844.168	78441.677	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 5

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 82.769 82.748 82.728 82.706 82.684 82.662
TOP OF LAYER 4 82.640 93.238 108.120 96.711 83.986 83.963

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.006 0.006 0.006
HEAD ON TOP OF LAYER 4 0.007 9.998 1.571 7.354 0.007 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 5

	MM	CU. METERS	PERCENT
PRECIPITATION	426.50	4265.000	100.00
RUNOFF	0.047	0.472	0.01
EVAPOTRANSPIRATION	411.457	4114.568	96.47
DRAINAGE COLLECTED FROM LAYER 3	0.4004	4.004	0.09
PERC./LEAKAGE THROUGH LAYER 5	0.213717	2.137	0.05
AVG. HEAD ON TOP OF LAYER 4	870.7969		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	14.596	145.956	3.42
SOIL WATER AT START OF YEAR	7844.168	78441.677	
SOIL WATER AT END OF YEAR	7858.763	78587.633	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 6

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

PRECIPITATION	0.0	13.2	12.1	41.0	77.4	49.6
	78.3	70.3	15.1	35.7	15.4	22.4
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	6.16	8.57	22.42	34.78	50.05	44.14
	40.67	50.45	71.73	74.91	14.16	22.50
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.030	0.033	0.032	0.033	0.032
	0.033	0.039	0.038	0.034	0.032	0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.015	0.017	0.017	0.017	0.016
	0.017	0.022	0.022	0.018	0.017	0.017
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	83.940	83.918	83.896	83.874	83.852	83.840
	83.922	99.610	99.726	87.130	83.982	83.959
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.007	0.006	0.007	0.006	0.007	0.003
	0.355	5.228	2.548	3.105	0.007	0.007
AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 6

	MM	CU. METERS	PERCENT	
PRECIPITATION	430.50	4305.000	100.00	
RUNOFF	0.061	0.612	0.01	
EVAPOTRANSPIRATION	440.540	4405.402	102.33	
DRAINAGE COLLECTED FROM LAYER 3	0.3991	3.991	0.09	
PERC./LEAKAGE THROUGH LAYER 5	0.212194	2.122	0.05	
AVG. HEAD ON TOP OF LAYER 4	868.0416			
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00	
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00	
AVG. HEAD ON TOP OF LAYER 13	0.0000			
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00	
CHANGE IN WATER STORAGE	-10.500	-105.004	-2.44	
SOIL WATER AT START OF YEAR	7858.763	78587.633		
SOIL WATER AT END OF YEAR	7848.263	78482.629		
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	

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 7

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.4	29.1	47.6	25.4	9.1	77.7
	39.2	81.4	57.0	28.6	11.2	2.7
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.03	0.09	0.00	0.00	0.00
EVAPOTRANSPIRATION	7.54	38.09	40.75	26.51	9.74	35.58
	42.05	49.31	64.43	96.79	11.33	1.47

LATERAL DRAINAGE COLLECTED 0.033 0.030 0.033 0.032 0.033 0.032
 FROM LAYER 3 0.033 0.033 0.035 0.035 0.032 0.033

PERCOLATION/LEAKAGE THROUGH 0.017 0.015 0.017 0.016 0.017 0.016
 LAYER 5 0.017 0.017 0.019 0.019 0.017 0.017

LATERAL DRAINAGE COLLECTED 0.000 0.000 0.000 0.000 0.000 0.000
 FROM LAYER 12 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
 LAYER 14 0.000 0.000 0.000 0.000 0.000 0.000

PERCOLATION/LEAKAGE THROUGH 0.000 0.000 0.000 0.000 0.000 0.000
 LAYER 15 0.000 0.000 0.000 0.000 0.000 0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.936 83.915 83.893 83.870 83.848 83.826
 TOP OF LAYER 4 83.821 84.330 92.381 88.914 83.981 83.959

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.007 0.007 0.006
 HEAD ON TOP OF LAYER 4 0.014 1.565 0.878 4.116 0.006 0.007

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
 TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
 HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 7

	MM	CU. METERS	PERCENT
PRECIPITATION	424.40	4244.000	100.00
RUNOFF	0.115	1.150	0.03
EVAPOTRANSPIRATION	423.590	4235.903	99.81
DRAINAGE COLLECTED FROM LAYER 3	0.3909	3.909	0.09
PERC./LEAKAGE THROUGH LAYER 5	0.205222	2.052	0.05
AVG. HEAD ON TOP OF LAYER 4	850.5616		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	0.304	3.039	0.07
SOIL WATER AT START OF YEAR	7848.263	78482.629	
SOIL WATER AT END OF YEAR	7848.567	78485.668	

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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4
 DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)
 LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5
 HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13
 DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)
 LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14
 LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 8

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

PRECIPITATION	0.0	7.0	12.6	15.6	47.8	51.9
	126.8	63.5	33.3	49.0	20.4	16.5

RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.49	0.90	0.01	0.00	0.00	0.00

EVAPOTRANSPIRATION	1.24	6.74	12.86	15.52	26.32	38.27
	40.48	52.81	68.35	123.12	41.21	16.68

LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.031	0.033	0.032	0.033	0.032
	0.036	0.048	0.043	0.037	0.032	0.033

PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.016	0.017	0.016	0.017	0.016
	0.020	0.030	0.027	0.020	0.017	0.017

LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	83.936	83.914	83.892	83.869	83.847	83.825
	92.928	120.517	113.681	94.150	83.983	83.961

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.007	0.006	0.007	0.006	0.006	0.007
	10.322	6.286	2.576	8.309	0.007	0.007

AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 8

	MM	CU. METERS	PERCENT
PRECIPITATION	444.40	4444.000	100.00
RUNOFF	1.397	13.974	0.31
EVAPOTRANSPIRATION	443.583	4435.829	99.82
DRAINAGE COLLECTED FROM LAYER 3	0.4205	4.205	0.09
PERC./LEAKAGE THROUGH LAYER 5	0.230877	2.309	0.05
AVG. HEAD ON TOP OF LAYER 4	910.4203		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-1.001	-10.008	-0.23
SOIL WATER AT START OF YEAR	7848.567	78485.668	
SOIL WATER AT END OF YEAR	7847.566	78475.659	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 9

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

PRECIPITATION	14.1	26.4	35.1	2.7	44.9	41.1
	59.8	85.0	8.7	49.0	0.7	20.3
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
EVAPOTRANSPIRATION	14.10	26.34	23.93	13.92	20.06	35.84
	40.78	49.28	73.64	65.13	3.90	17.31
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.030	0.033	0.032	0.033	0.032
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.015	0.017	0.016	0.017	0.016
0.017	0.020	0.020	0.017	0.017	0.017	
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON TOP OF LAYER 4	83.938	83.916	83.894	83.872	83.849	83.827
	84.013	91.710	95.955	84.151	83.971	83.948
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 4	0.007	0.006	0.007	0.007	0.007	0.007
	0.502	7.033	3.988	0.637	0.006	0.007
AVERAGE DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	
STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 13	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	

ANNUAL TOTALS FOR YEAR 9

	MM	CU. METERS	PERCENT
	-----	-----	-----
PRECIPITATION	387.80	3878.000	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	384.234	3842.339	99.08
DRAINAGE COLLECTED FROM LAYER 3	0.3934	3.934	0.10
PERC./LEAKAGE THROUGH LAYER 5	0.207351	2.074	0.05
AVG. HEAD ON TOP OF LAYER 4	855.8711		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00

AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	3.173	31.727	0.82
SOIL WATER AT START OF YEAR	7847.566	78475.659	
SOIL WATER AT END OF YEAR	7850.739	78507.386	
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

HEAD #1: AVERAGE HEAD ON TOP OF LAYER 4

DRAIN #1: LATERAL DRAINAGE FROM LAYER 3 (RECIRCULATION AND COLLECTION)

LEAK #1: PERCOLATION OR LEAKAGE THROUGH LAYER 5

HEAD #2: AVERAGE HEAD ON TOP OF LAYER 13

DRAIN #2: LATERAL DRAINAGE FROM LAYER 12 (RECIRCULATION AND COLLECTION)

LEAK #2: PERCOLATION OR LEAKAGE THROUGH LAYER 14

LEAK #3: PERCOLATION OR LEAKAGE THROUGH LAYER 15

MONTHLY TOTALS (MM) FOR YEAR 10

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	0.0	14.0	20.5	5.0	85.5	90.8
	90.4	98.9	36.2	26.9	15.9	28.2
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.03
	0.12	33.44	2.76	0.00	0.00	0.00
EVAPOTRANSPIRATION	2.99	13.78	15.24	10.47	38.13	42.86
	37.49	52.26	71.06	128.62	36.77	28.26
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.033	0.030	0.033	0.032	0.033	0.035
	0.043	0.050	0.047	0.040	0.032	0.033
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.017	0.015	0.017	0.016	0.017	0.020
	0.026	0.032	0.030	0.023	0.017	0.017
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON 83.925 83.903 83.882 83.859 83.838 93.873
TOP OF LAYER 4 109.122 125.732 123.090 101.165 84.186 83.968

STD. DEVIATION OF DAILY 0.007 0.006 0.007 0.007 0.006 9.577
HEAD ON TOP OF LAYER 4 5.036 2.952 4.408 8.805 0.752 0.006

AVERAGE DAILY HEAD ON 0.000 0.000 0.000 0.000 0.000 0.000
TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

STD. DEVIATION OF DAILY 0.000 0.000 0.000 0.000 0.000 0.000
HEAD ON TOP OF LAYER 13 0.000 0.000 0.000 0.000 0.000 0.000

ANNUAL TOTALS FOR YEAR 10

	MM	CU. METERS	PERCENT
PRECIPITATION	512.30	5123.000	100.00
RUNOFF	36.349	363.485	7.10
EVAPOTRANSPIRATION	477.934	4779.344	93.29
DRAINAGE COLLECTED FROM LAYER 3	0.4386	4.386	0.09
PERC./LEAKAGE THROUGH LAYER 5	0.247310	2.473	0.05
AVG. HEAD ON TOP OF LAYER 4	950.4544		
DRAINAGE COLLECTED FROM LAYER 12	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 14	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 13	0.0000		
PERC./LEAKAGE THROUGH LAYER 15	0.000000	0.000	0.00
CHANGE IN WATER STORAGE	-2.422	-24.215	-0.47
SOIL WATER AT START OF YEAR	7850.739	78507.386	
SOIL WATER AT END OF YEAR	7848.317	78483.171	
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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1 THROUGH 10

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

PRECIPITATION

TOTALS	15.79	27.40	16.99	16.80	44.12	58.53
	76.55	82.27	35.50	32.60	12.39	17.68
STD. DEVIATIONS	20.31	20.33	14.70	13.55	30.55	17.99
	30.09	33.50	16.91	10.21	8.24	9.11

RUNOFF

TOTALS	0.353	0.000	0.000	0.000	0.000	0.003
	0.091	3.437	0.286	0.000	0.000	0.000
STD. DEVIATIONS	1.095	0.000	0.000	0.000	0.000	0.009
	0.153	10.544	0.871	0.000	0.000	0.000

EVAPOTRANSPIRATION

TOTALS	18.770	26.476	20.414	16.194	29.469	37.181
	40.610	49.431	65.572	78.591	17.258	14.886
STD. DEVIATIONS	18.945	21.398	9.464	9.550	15.459	5.276
	1.928	3.050	8.891	37.018	13.516	9.058

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0221	0.0201	0.0221	0.0214	0.0221	0.0218
	0.0236	0.0279	0.0294	0.0273	0.0246	0.0254
STD. DEVIATIONS	0.0141	0.0128	0.0141	0.0137	0.0141	0.0140
	0.0154	0.0172	0.0158	0.0136	0.0117	0.0121

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.0111	0.0101	0.0111	0.0107	0.0111	0.0110
	0.0123	0.0156	0.0166	0.0144	0.0124	0.0128
STD. DEVIATIONS	0.0077	0.0070	0.0077	0.0075	0.0077	0.0078
	0.0091	0.0114	0.0104	0.0081	0.0066	0.0068

LATERAL DRAINAGE COLLECTED FROM LAYER 12

TOTALS	0.0301	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0951	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 14

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 15

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

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES 57.3711 57.3568 57.3442 57.3295 57.3150 58.3073
61.0153 71.7482 78.2257 70.6093 65.8189 65.7823

STD. DEVIATIONS 35.1881 35.1782 35.1665 35.1561 35.1462 36.1108
38.4670 42.8080 40.3553 33.2926 29.5728 29.5507

DAILY AVERAGE HEAD ON TOP OF LAYER 13

AVERAGES 0.0002 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

STD. DEVIATIONS 0.0006 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 10

	MM	CU. METERS	PERCENT
PRECIPITATION	436.62	(40.724)	4366.2 100.00
RUNOFF	4.169	(11.3601)	41.69 0.955
EVAPOTRANSPIRATION	414.851	(34.9908)	4148.51 95.014
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.28775	(0.16437)	2.877 0.06590
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.14925	(0.09447)	1.492 0.03418
AVERAGE HEAD ON TOP OF LAYER 4	631.853	(345.950)	
LATERAL DRAINAGE COLLECTED FROM LAYER 12	0.03007	(0.09508)	0.301 0.00689
PERCOLATION/LEAKAGE THROUGH LAYER 14	0.00000	(0.00000)	0.000 0.00000
AVERAGE HEAD ON TOP OF LAYER 13	0.000	(0.000)	
PERCOLATION/LEAKAGE THROUGH LAYER 15	0.00000	(0.00000)	0.000 0.00000
CHANGE IN WATER STORAGE	17.282	(1.6238)	172.82 3.958

PEAK DAILY VALUES FOR YEARS 1 THROUGH 10 and their dates (DDYY)

	(MM)	(CU. METERS)	
PRECIPITATION	43.60	436.00000	20003

RUNOFF 11.458 114.58125 2170010
 DRAINAGE COLLECTED FROM LAYER 3 0.00166 0.01660 2210010
 PERCOLATION/LEAKAGE THROUGH LAYER 5 0.001093 0.01093 2210010
 AVERAGE HEAD ON TOP OF LAYER 4 1298.986
 MAXIMUM HEAD ON TOP OF LAYER 4 1646.818
 LOCATION OF MAXIMUM HEAD IN LAYER 3
 (DISTANCE FROM DRAIN) 9994.4 METERS
 DRAINAGE COLLECTED FROM LAYER 12 0.12867 1.28671 30001
 PERCOLATION/LEAKAGE THROUGH LAYER 14 0.000000 0.00000 30001
 AVERAGE HEAD ON TOP OF LAYER 13 0.248
 MAXIMUM HEAD ON TOP OF LAYER 13 0.495
 LOCATION OF MAXIMUM HEAD IN LAYER 12
 (DISTANCE FROM DRAIN) 0.1 METERS
 PERCOLATION/LEAKAGE THROUGH LAYER 15 0.000010 0.00010 10001
 SNOW WATER 0.00 0.0000 0
 MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4827
 MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1148

*** 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.

FINAL WATER STORAGE AT END OF YEAR 10

LAYER	(CM)	(VOL/VOL)
1	3.1623	0.1054
2	29.1902	0.4170
3	11.9100	0.3970
4	0.0000	0.0000
5	0.6000	0.7500
6	12.6320	0.1263
7	136.6173	0.2732
8	144.7000	0.2894

9 145.9355 0.2919

10 145.9744 0.2919

11 146.0000 0.2920

12 0.9600 0.0320

13 0.0000 0.0000

14 0.6000 0.7500

15 6.5500 0.1310

SNOW WATER 0.000

ATTACHMENT B

Important Information

The document ("Report") to which this page is attached and of which this page forms a part has been issued by Golder Associates Pty Ltd ("Golder") subject to the important limitations and other qualifications set out below.

This Report constitutes or is part of services ("Services") provided by Golder to its client ("Client") under and subject to a contract between Golder and its Client ("Contract"). The contents of this page are not intended to and do not alter Golder's obligations (including any limits on those obligations) to its Client under the Contract.

This Report is provided for use solely by Golder's Client and persons acting on the Client's behalf, such as its professional advisers. Golder is responsible only to its Client for this Report. Golder has no responsibility to any other person who relies or makes decisions based upon this Report or who makes any other use of this Report. Golder accepts no responsibility for any loss or damage suffered by any person other than its Client as a result of any reliance upon any part of this Report, decisions made based upon this Report or any other use of it.

This Report has been prepared in the context of the circumstances and purposes referred to in, or derived from, the Contract and Golder accepts no responsibility for use of the Report, in whole or in part, in any other context or circumstance or for any other purpose.

The scope of Golder's Services and the period of time they relate to are determined by the Contract and are subject to restrictions and limitations set out in the Contract. If a service or other work is not expressly referred to in this Report, do not assume that it has been provided or performed. If a matter is not addressed in this Report, do not assume that any determination has been made by Golder in regards to it.

At any location relevant to the Services conditions may exist which were not detected by Golder, in particular due to the specific scope of the investigation Golder has been engaged to undertake. Conditions can only be verified at the exact location of any tests undertaken. Variations in conditions may occur between tested locations and there may be conditions which have not been revealed by the investigation and which have not therefore been taken into account in this Report.

Golder accepts no responsibility for and makes no representation as to the accuracy or completeness of the information provided to it by or on behalf of the Client or sourced from any third party. Golder has assumed that such information is correct unless otherwise stated and no responsibility is accepted by Golder for incomplete or inaccurate data supplied by its Client or any other person for whom Golder is not responsible. Golder has not taken account of matters that may have existed when the Report was prepared but which were only later disclosed to Golder.

Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

By date, or revision, the Report supersedes any prior report or other document issued by Golder dealing with any matter that is addressed in the Report.

Any uncertainty as to the extent to which this Report can be used or relied upon in any respect should be referred to Golder for clarification.