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Concept Design Technical Report

Proposed Final Landform – Concept Design Report

Prepared for:
SUEZ Recycling and Recovery Pty Ltd

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Glossary of terms and abbreviations

Term	Definition
AEMR	Annual Environmental Management Report
bgs	below ground surface
BOM	Bureau of meteorology
C_{ae}	Secondary Compression Ratio
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EPL	Environment Protection Licence
GSW	General solid waste
ha	hectares
HELP	Hydrologic Evaluation of Landfill Performance
km	Kilometre
km^2	Square kilometres
L	litre
LEMP	Landfill Environmental Management Plan
m	meter
m/s	Metres per second
mm	millimetre
NMOC and	Non-methane organic compound
NSW	New South Wales
RL	Reduced Level
RSW	Restricted solid waste
Static water levels	SWLs
SUEZ	SUEZ Recycling and Recovery Pty Ltd
tpa	tonnes per annum
TSS	Total suspended solids
VENM	virgin excavated natural material

Executive Summary

This report outlines detail associated with the concept design prepared for the Project. This design proposes to raise the existing landfill from a final approved level of RL80 to RL95, whilst maintaining the existing footprint. The expansion would contribute approximately 4.8 million cubic metres of additional airspace, providing for another five and half years of operation (compared to the current planned closure date of around 2025). All landfilling operations would continue to be undertaken in a manner generally consistent with the current practices and as outlined in the existing Landfill Environmental Management Plan (LEMP).

The revised final landform would be broadly constructed in three stages. This would commence with filling of the central portion of the Project Area, followed by the south and then the north. Construction of the southern stage would include removal of the existing final cap in this area, the addition of further fill, and the construction of new side batters and final cap as outlined in the concept design.

The side batters of the concept design would be constructed to mid-bench pre-settlement slopes of around 1:3.5. These slopes would be expected to settle to approximately 1:4 in the long term. This settlement has been calculated based upon the reported waste composition and with reference to similar landfills operated elsewhere by SUEZ.

The final batter slopes of the landfill would allow for regular visual inspections for deterioration of the capping's condition, including erosion, cracking, dead or stressed vegetation, ponding, differential settlement, slope instability and damage to any pipes, drains and other works installed on the final capping. At the proposed gradients general maintenance activities including lawn mowing would be possible. The final landform would also include a one-way access road to the top of the cap for ongoing maintenance purposes.

As the Project would not alter the footprint of the landfill there would be no change to the existing catchment area. The benches provided within the side batters allow for the drainage of surface water to the five existing sediment dams around the perimeter of the Site.

The concept design does not propose any changes to the existing final cap basal liner design.

The degree of leachate generated under the concept design has been modelled. This has taken into account rainfall infiltration, groundwater inflow (if any), leachate removal off-site and irrigation, as well as leachate management activities such as regular daily covering of waste and the management of surface water during operations. The results of this modelling demonstrate that the Project would not significantly affect the total leachate generation from the final capped landfill area. In both the Approved Design Final Cap and Proposed Design Final Cap models zero leachate was captured within the leachate drainage aggregate layer and therefore there was zero leakage through the basal liner (compacted clay).

Landfill gas generation under the concept design was also modelled. This took account of the nature of waste deposited historically, currently and likely in the future. It also accounted for the slightly raised input rate of 950,000 tpa. Estimates of volumes and curves outlining the likely generation of landfill gas under different methane generation capacity and constant scenarios were generated. These indicated a nominal increase in the amount of gas generated due to the prolonged life of the landfill.

1.0 Introduction

SUEZ Recycling and Recovery Pty Ltd (SUEZ) currently owns and operates the Elizabeth Drive Landfill and Advanced Waste Treatment (SAWT) Facility (the 'Site') at Badgerys Creek, New South Wales (NSW). The operating landfill facility within the Site, and where the Project would occur, is known as 'Elizabeth Drive Landfill Kemps Creek (the 'Project Area'). In response to future projected market demand for waste disposal, SUEZ is proposing to increase the capacity of the existing landfill by raising the currently approved finished cap height by 15 metres, from RL80 to RL95 (the 'Project').

SUEZ commissioned AECOM to prepare the concept design for the Project. This report describes the proposed design and associated impacts on the operation of the landfill.

1.1 Overview of the Project

The Project Area currently operates as a regional landfill accepting non-putrescible general solid waste and restricted solid waste. The Project would provide an additional landfill airspace capacity for non-putrescible general solid waste of approximately 4.8 million cubic metres and extend the life of the landfill by approximately 5½ years.

The existing landfill currently accepts on average approximately 750,000 tonnes per annum (tpa) of waste. It is envisaged that the rate of filling would increase slightly to take into account changes in the volume of waste being generated and disposed of in NSW and the industry capacity to receive the waste. Under the Project approximately 950,000 tpa of non-putrescible general solid waste and restricted solid waste is expected to be received during the remaining life of the landfill.

Landfilling operations would generally be undertaken in a manner consistent with the current practices and as outlined in the existing Landfill Environmental Management Plan (LEMP) for the Site. Waste would continue to be deposited, spread and compacted in layers. At the end of each working day, exposed waste surfaces would be covered with tarps and/or virgin excavated natural material (VENM) to reduce environmental impacts such as litter, odour etc, in compliance with the Environment Protection Licence (EPL) for the landfill operations.

The landfill cap would be progressively constructed and stabilised as soon as practicable after reaching final landform levels. It is anticipated that capping material would be predominantly sourced from material stockpiled during historic quarrying activities within the site, or imported from suitable external sources. At a minimum the final cap would be rehabilitated with grass cover to encourage binding and stabilisation of the soil.

1.2 Project location

The Site is located at 1725 Elizabeth Drive in the suburb of Kemps Creek, approximately 41 kilometres west of the Sydney Central Business District (CBD), within the Penrith Local Government Area (LGA). Under the *Penrith Local Environmental Plan 2010*, the Site is primarily zoned as RU2 Rural Landscape. An area along the western boundary of the Site, adjacent to Badgerys Creek, is zoned as E2 Environmental Conservation.

The Site is located on approximately 85 hectares of land owned by SUEZ, and is described as Lot 740 on DP810111 and Lot 1 on DP542395. Of the 85 hectares, the Project Area covers an area of approximately 60 hectares, the SAWT Facility covers an area of approximately seven hectares, and the remainder of the Site is reserved for buffers and other facilities (such as a landfill gas power generation facility, administration offices, staff amenities, car parking, equipment maintenance workshop and weighbridge). The landfill footprint it approximately 52 hectares. The Project is proposed to be contained wholly within the boundary of the existing landfill. The existing and active development consents for the SAWT and landfill gas power generation facility would not be affected by the Project. An overview of the Site is shown on **Figure 1.1**.

The surrounding area is comprised of primarily rural and industrial land uses with smaller areas of residential and commercial development. This includes a variety of agricultural production including fruits, vegetables and grazing activity, as well as intensive poultry farming. Industrial activities include metal fabrication and quarrying, particularly for brick manufacture. The surrounding area is the subject of a number of significant proposed future infrastructure items and broad land use changes. Primary

amongst these is the proposed and approved Western Sydney Airport, whose closest boundary is located approximately 600 metres to the south west of the Site. Stage 1 of the Western Sydney Airport was approved in December 2016, and construction commenced in late 2018. The airport is proposed to commence operations in December 2026.

1.3 Purpose of this report

This report has been prepared to provide the technical and engineering background to the proposed landform amendments associated with the proposed Landfill Expansion. The proposed final landform is depicted in Annexure A – Concept Design Drawings.

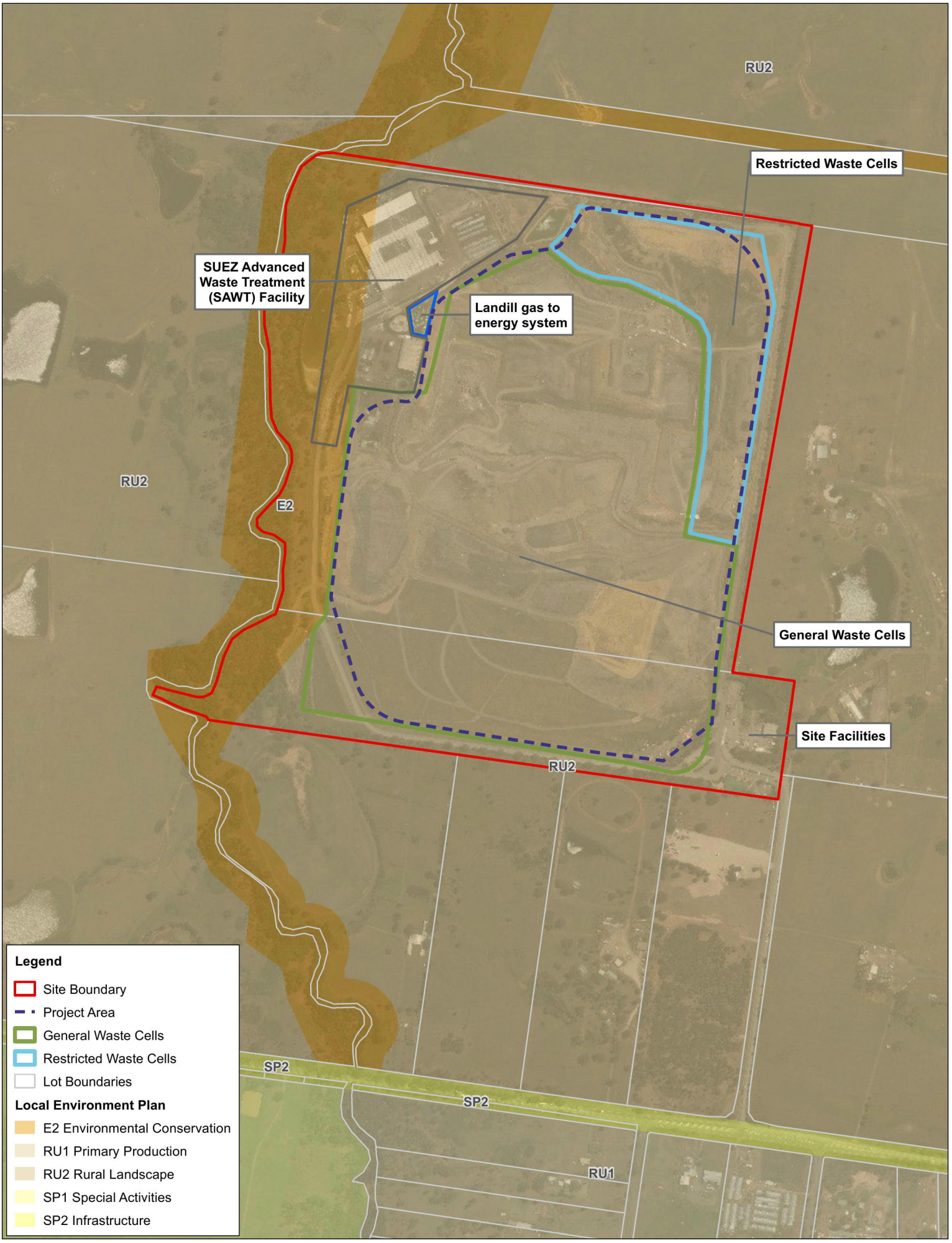
1.4 Structure of this technical report

Section 1 Introduction

Section 2 Existing Environment

Section 3 Concept Design

Section 4 Design Considerations



AECOM

SUEZ

SUEZ ELIZABETH DRIVE LANDFILL

FIGURE 1.1: SITE LAYOUT AND ZONING

0 50 100 200 m

N

Disclaimer Spatial data used under licence from Land and Property Management Authority, NSW © 2018. Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DATE	10/07/2019
SCALE	1:8,000
PROJECT	60571292
DRAWN	CP

2.0 Existing Environment

The Site and surrounds are generally flat with a slight fall in elevation from south to north. Badgerys Creek is located adjacent to the western Site boundary. The creek is an ephemeral watercourse, which flows from south to north following periods of sufficient rainfall.

The landfill is bound on all sides by access roads. The landfill includes 25 cells, all of which either currently or historically have accepted waste material. The southern portion of the landfill is capped, with an active general waste landfill area and active quarrying areas in the central portion of the Site, and active restricted solid waste landfill cells in the central-eastern portion of the Site.

The Site is licenced under EPL 4068 to accept the following waste streams into the landfill cells:

- General solid waste (non-putrescible)
- Asbestos waste
- Waste tyres; and
- Restricted solid waste

2.1 Local climate

Daily average maximum temperatures range from 30.1° C in January to 17.4° C in July at Badgerys Creek. Daily average minimum temperature range from 17.1° C in January/February to 4.1° C in July at Badgerys Creek. Annual average rainfall is 680.9 mm at Badgerys Creek (067108) and 765.0 mm at Horsley Park (067119).

2.2 Geology

According to the Penrith 1:100,000 Geological Sheet Survey (1991, Edition 1), the site is underlain by two lithology groups. The majority of the site is located on shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff. A portion of the Site is located on quaternary alluvial sediments comprising of mud, silt, sand and gravel. The available borelogs for the Site indicate that the Site is underlain by shale (ERM, 2018).

2.3 Hydrogeology

Given that the Site is located on relatively shallow shale bedrock (approximately 5 m below ground surface (bgs)), groundwater beneath the Site is expected to flow within fractures in the bedrock. Gauging the static water levels (SWLs) during quarter four 2017 indicated that groundwater is present at varying depths around the Site boundary, varying between approximately 3 and 15 m bgs. The variable depth to groundwater is likely related to the fractured bedrock aquifer, with carrying depths to fractures and hydraulic pressures likely influencing SWLs in monitoring wells. Previous reports (Golder, 1991) calculated the flow direction as north west towards Badgerys Creek.

2.4 Surface water

The Site is located adjacent to Badgerys Creek, a 16 km long minor tributary of South Creek. South Creek is a tributary of the Hawkesbury River and flows approximately 600 metres to the east of the Site. The South Creek catchment drains approximately 414 km^2 in western Sydney, stretching from Narellan in the south to the confluence with the Hawkesbury River at Windsor in the north.

Surface water drainage within the Project Area predominantly involves diversion drainage around the ridge of each active waste disposal cell to control surface water runoff flowing into the cells. It typically comprises of open channel drains on the outer edge of earthen bunds. Surface water is then collected in drains, swales and ponds before being diverted into one of five sediment dams around the Site boundary, listed in **Table 2.1**.

Table 2.1 Surface water dams

Name	Identifier	Design Capacity (m^3)
Main water supply dam	S19 or F3	24,500
South western dam	S10 or F2	8,500
North western dam	S20 or Sedimentation Pond	6,160
North eastern dam	S5 or F4	5,700
The wheel wash dam	S9 or F1	1,200

The sediment dams, excluding S5, are inter-connected via pipelines or pump-out drains to transfer stormwater between these dams, to minimise off site overflow/discharge.

Surface water discharge is permitted in accordance with the water quality limits set out in the EPL. These discharges occur via licenced discharge points at each basin and flow to agricultural land to the north and east, or to Badgerys Creek. EPL concentration limits are applied for ammonia and total suspended solids (TSS). Exceedances of the TSS discharge limit are permitted by the EPL in the event of rainfall exceeding 48 millimetres over any consecutive five day period.

Sampling of surface water in Badgerys Creek both upstream and downstream of the Site is undertaken quarterly, as required by the LEMP and EPL. Results of sampling activities are included in the AEMR and are provided to Penrith City Council. The 2017 AEMR identified that water quality both upstream and downstream of the Site was acceptable, with tadpoles sighted during December sampling, indicating a healthy watercourse. While minor TSS exceedances were reported within some sediment dams on Site at each sampling event throughout the year, offsite concentrations of both TSS and ammonia were reported below the EPL discharge limits.

2.5 Leachate management

Leachate is generated within the landfill cells through breakdown of waste, surface water infiltration and groundwater infiltration.

The Site is designed to maintain an inward groundwater hydraulic gradient, with groundwater contributing to the total leachate volume, albeit in very small quantities. Perimeter drainage control has been adopted to prevent surface water from adding to leachate reservoirs.

The waste cells are designed for leachate to percolate through the waste, until it reaches the landfill liner and drains to the leachate sump.

Leachate is collected via a grid of trapezoidal shaped drains incorporated in the bottom on the liner. These drains are filled with porous material and slope to header lines leading to a collection sump within each cell.

Leachate from the general solid waste (GSW) cells is then removed from the sump and transferred to 4 x 20 kL on-site storage tanks. Leachate from the restricted solid waste (RSW) cells is kept separate from the GSW leachate and stored in 8 x 20 kL tanks. From the storage tanks the leachate is then re-circulated in the landfill. Some of the leachate is lost to evaporation and the remainder is retained within the solid waste. Any excess leachate is currently transported off site to a licensed facility for treatment. While re-circulation through refuse cells and ad hoc disposal currently meets leachate generation levels in the short term, as the volume of leachate generated increases, pump and treatment infrastructure will be installed.

2.6 Landfill Gas

The primary function of the landfill gas management system is to control odourous emissions from the landfill. Landfill gas is collected via a series of wells and pipes, and transported to the gas engines adjacent to the SAWT. Here the gas is combusted to generate electricity, with excess gas being flared.

Gas infrastructure is maintained and monitored by the landfill gas contractors to ensure that landfill gases are being effectively managed. Landfill gas monitoring includes surface gas monitoring,

subsurface gas monitoring and gas accumulation monitoring of buildings and structures (e.g. service pits and weighbridge hatches).

The gas infrastructure and collection system consists of gas extraction wells, the associated header pipe, a knock-out pot, and blower/flare station.

The gas extraction system complements the engineered containment system as it provides advective pressure relief, reducing the risk of a breach in the containment system and reducing upward migration of landfill gas prior to the construction of final capping. The active extraction coupled to a flare allows the effective destruction (in excess of 98% of NMOC and methane), or coupled to electricity generators provides the added benefit of renewable energy.

Leachate produced in the landfill affects the ability of the gas extraction system to operate and significantly impedes the ability to control gas. Landfill gas management must be undertaken in conjunction with leachate management.

3.0 Concept Design

3.1 Landfill expansion description

The available airspace, and therefore lifespan of the landfill, is proposed to be expanded by raising the final landform levels from those currently approved. As such the Project is essentially a vertical expansion of the available airspace within the current landfill footprint. The concept design proposes to construct the final design levels in three stages. Once waste has been placed at the proposed design levels each stage will be capped to minimise leachate generation, windblown litter, potential odour and dust.

Stage 1 **Stage 2** **Stage 3**

To enable the final landform to be raised the cap grading design has adopted a series of batters and benches. The proposed design results in a batter slope of approximately 1 in 3.5 (pre settlement) eventually settling to 1 in 4 (post settlement). The crest of the proposed cap has slopes of approximately 1 in 20, which is not expected to change substantially throughout the settlement period.

The cross section of the proposed batter slopes is shown on **Figure 3.1** below. The cross section includes batters at a pre-settlement slope of 1 in 3.5 with 10 m wide benches. The benches are graded inwards to a swale drain at the toe of the higher batter thereby controlling stormwater flows to within the drainage system and preventing greater stormwater flows down the steeper batters.

Following waste settlement it is expected that batter slopes will flatten out to approximately 1 in 4. Refer **section 4.3** for further discussion on waste settlement.

The proposed top platform of the cap reaches a highest level of RL 95 m (95 m AHD).

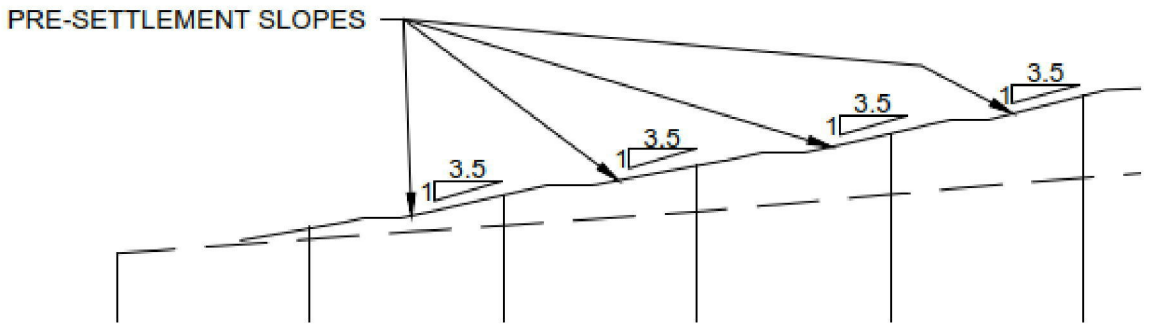


Figure 3.1 Typical side slope design

3.2 Basal liner

The following figures provide the liner profiles for the landfill cells. The liners for the general solid waste cells were designed in accordance with the 1996 NSW Landfill Guidelines benchmark technique

for general solid waste landfills, prior to the released of the current NSW EPA Solid Waste Landfill Guidelines 2016 (the '*Landfill Guidelines 2016*') being introduced.

All existing cell liner systems were approved through the relevant design and construction process at the time.

Figure 3.2 General solid waste (non-putrescible) basal liner (source: GHD Drawing 21-27038-C010)

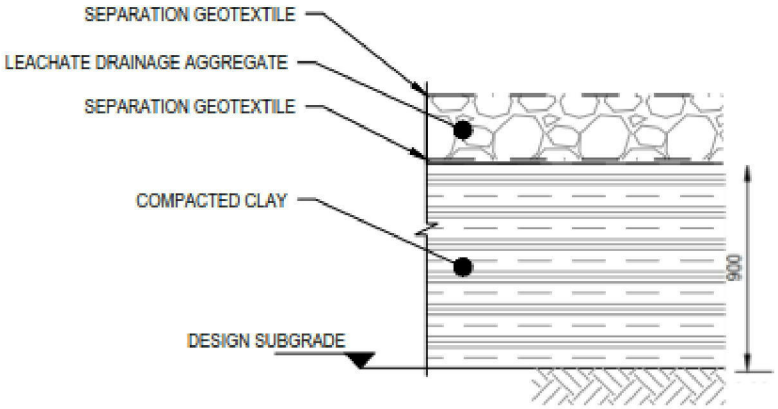


Figure 3.3 Restricted solid waste basal liner (source: GHD Drawing 21-19947-C421)

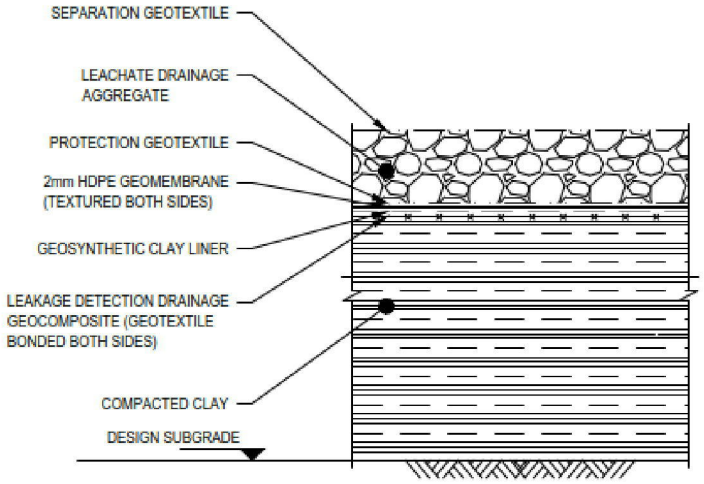
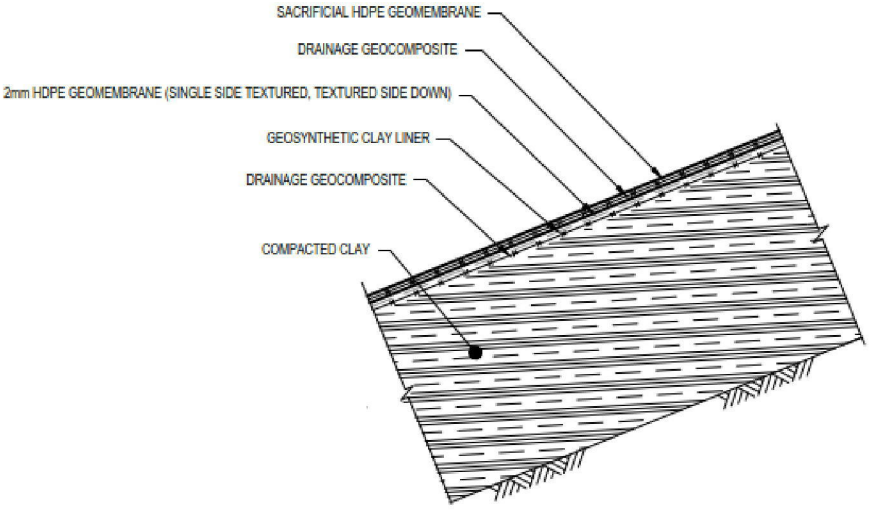


Figure 3.4 Restricted Waste Side Wall Liner (Reference GHD Drawing 21-19947-C421))



3.3 Cap design

As per EPL 4068 Condition O6.20 – O6.22, the general solid waste (non-putrescible) landfill cell final capping must consist of the following from top to bottom:

- A revegetation layer at least 300 mm thick
- A sealing layer of at least 500 mm of compacted clay or shale having permeability of less than k=1 x 10^{-8} ms^{-1} as described in the NSW EPA Solid Waste Landfill Guidelines
- A seal bearing layer of no less than 300 mm.

Figure 3.5 and **Figure 3.6** provide the capping profiles adopted for both the general solid waste and restricted solid waste cells. Further information in relation to the interface and extent of the cap profiles is provided in the approved GHD drawings referenced.

The proposed expansion of the landfill does not include a change to the cap design described in the EPL.

As per the Final Capping Layer Design prepared by GHD Pty Ltd, dated November 2006, the final cap design includes a network of gas collection trenches 450 mm by 450 mm consisting of brick/tile fill that is required to exhibit a permeability greater than 5 x 10^{-5} m/s. The gas collection trenches would be located below the seal bearing layer.

The whole extent of waste at the Site will be capped in sections with either the general solid waste or restricted solid waste cap as the waste reaches final levels. At a minimum the final cap would be rehabilitated with grass cover to encourage binding and stabilisation of the soil. Capping of general solid waste cells has already been completed in the southern portion of the Project Area where waste levels have met the currently approved contour design. In these areas it is intended to exhume the capping layers where practicable for later re-use at the proposed design levels.

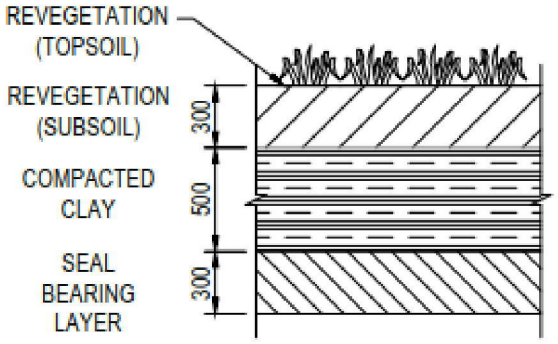


Figure 3.5 General solid waste cell cap profile (source: GHD drawing 21-27038-C023)

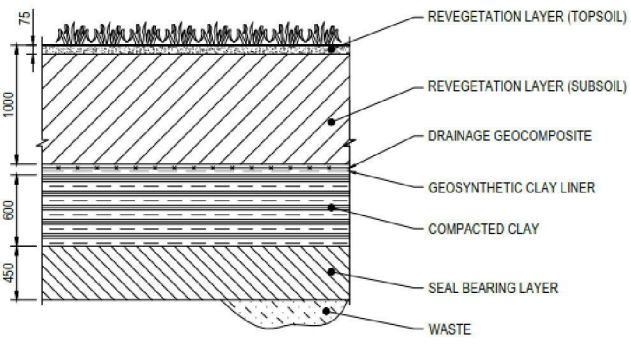


Figure 3.6 Restricted solid waste cell cap profile (source GHD drawing 21-27038-C023)

4.0 Design considerations

The following sections outline design considerations that have been reviewed in line with the proposed landfill expansion.

4.1 Slope stability

The final landform design includes pre-settlement batters of 1:3.5 with predicted post settlement of approximately 1:4. These slopes are not considered steep and are consistent with typical landfill industry practice allowing for ongoing maintenance. For example Tchobanagolous (2002) notes the typical slopes used for completed portions of a landfill will vary from 1:2.5 to 1:4 with 1:3 being the most common. In addition the side slopes include 10 m wide benches at regular intervals thereby increasing the overall stability (and maintainability) of the batters. In line with the Landfill Guidelines 2016 post-closure monitoring would be undertaken to assess the continued integrity and performance of the final capping. This would include regular visual inspections for deterioration of the capping's condition, including erosion, cracking, dead or stressed vegetation, ponding, differential settlement, slope instability and damage to any pipes, drains and other works installed on the final capping. At the proposed slopes general maintenance activities including lawn mowing would be possible. Potential impacts from erosion are discussed below.

4.2 Surface water and erosion management

Surface water runoff at the Site is generated at the roads and hardstands, as well as the landfill cells with final capping. Any stormwater which is generated at the active landfill cells, or cells with interim capping, is retained within the cells and is managed as leachate.

Surface water controls, as shown in drawing 60571292-SHT-CI-00012, include a series of bench drains at the toe of the 1:3.5 batter slopes, grading to a slope/swale drain which would be constructed to minimise erosion. At this angle runoff would be possible without significant scour. To further reduce erosion the final cap would be rehabilitated with grass cover to encourage binding and stabilisation of the soil (at a minimum).

Surface water is directed from the landfill cap to one of five sediment dams on the perimeter of the Site. To minimise off site overflow/discharge the sediment dams, excluding S5, are inter-connected via pipelines or pump-out drains to transfer stormwater between these dams if required. Given the nature of the Project, being a vertical expansion of the landfill only, the overall size of the catchment for the Site would not change.

Table 4.1 provides an overview of the estimated catchment areas for each stormwater dam for the existing approved final cap and the proposed final cap with the landfill expansion.

Table 4.1 Stormwater catchments during proposed filling stages

Stormwater dams	Proposed landfill expansion final cap catchment area
S19 or F3	9.95
S10 or F2	16.31
S20 or Sedimentation Pond	3.61
S9 or F1	5.31
S5 or F4	16.44
Total	**51.62 ha**

4.3 Waste settlement

To assess the likely settlement of the waste over time, an analysis of the waste types has been undertaken. This accounts for the different settlement rates of different wastes. This data has then been based on available literature and calculation methods. The outcome of this has then been

compared to historical surveys at other sites operated by SUEZ a 9% settlement over time has been found.

From the historical waste composition derived from weighbridge data from 1991 through to 2016 an approximate breakdown of waste types is provided in the **Table 4.2**. It is noted that more recent waste from 2017 through to the present is largely inert with some degradable fractions at a lesser proportion than previously received. These historical data have been used in this analysis as this represents the majority of the waste currently present in the landfill cells.

Table 4.2 Historical waste composition

Waste Stream	Food	Paper and paper board	Garden and park	Wood and wood waste	Textiles	Sludge	Nappies	Rubber and Leather	Inert Material
Average	0.00%	12.0%	3.5%	10.9%	2.8%	1.1%	0.0%	2.4%	67.2%

From this data the waste fractions that will exhibit degradation and settlement over time represent approximately 32% of the total waste volume.

To determine the likely settlement based on this waste composition a paper written by Sam Yuen and John Styles titled "*Settlement and Characteristics of Waste at a Municipal Solid Waste Landfill in Melbourne, 2012*"[1] (the Paper) has been referenced. Table 2 of this paper is reproduced as **Figure 4.1** below, showing the compressive ratio for commercial and industrial, and inert wastes with low biodegradation as being 0.025, rising to 0.075 for waste with more organic fractions.

Table 2 - Reported Secondary Compression Ratio, C_{ae} (after Phillips et al., 1993)

Reference	C_{ae}	Comment	Type of Landfill
Sowers (1973)	0.075	For e_p=3	Highly organic, favourable biodegradation
	0.025	For e_p=3	Low biodegradation
Burlingame (1984)	0.022	3m thick	Upper limit for old landfill, 75 kPa surcharge
	0.008	12m thick	
Walker & Kurzeme (1984)	0.08	6m surcharge	Typical upper limits for 3-15m thickness of variable age
	0.04	3m surcharge	
Yen & Scanlon (1975)	0.14	<12m thick	Upper limits of self-weight creep of recent refuse
	0.06	12-30m thick	
Watts & Charles (1990)	0.10/0.23	12m thick	Biodegradation component of recent domestic refuse
	0.02		Corresponding physical creep component
Edil et al. (1990)	0.075	10-30m thick	Upper limit, recent refuse under self-weight
	0.012	15m thick	Upper limit, old refuse
Gifford et al. (1990)	0.020	-	Upper limit, old landfill

Figure 4.1 Settlement characteristics of waste at a MSW landfill in Melbourne (Source: Yuen, S., and Styles, J., 2012[1])

Based on the waste composition being approximately 65% inert and 35% degradable wastes, a Secondary Compression Ratio (C_{ae}) value of 0.04 has been adopted for the analysis. Yuen and Styles (2012) suggest the Sowers model is used for settlement prediction, as shown in **Figure 4.2** below.

[1] Yuen, S., and Styles, J., (2012) Settlement and Characteristics of Waste at a Municipal Solid Waste Landfill in Melbourne

$$S_s / H_p = C_{ae} \log (t / t_p) \quad (1)$$

$$C_a = C_{ae} (1 + e_p) \quad (2)$$

S_s is the secondary settlement (m),
H_p is the height of waste upon completion of primary settlement (m),
C_{ae} is the slope of the strain versus log-time curve or the secondary compression ratio,
t is the elapsed time (days),
t_p is the time for primary compression to complete (days),
C_a is the secondary compression index, and
e_p is the void ratio upon completion of primary settlement.

Figure 4.2 Sowers Settlement Analysis Formula

Based on an elapsed time (t) of 50 years and time for primary compression (t_p) of 90 days, as suggested by Yuen and Styles, this results in a long term settlement of 9% of the overall waste depth. This value compares well to the other SUEZ sites where survey data shows a similar settlement value. This value of 9% settlement has been adopted to determine the post settlement top of cap contours.

4.4 Access to raised cap levels

The Site has an existing road extending around the perimeter to allow access to the landfill, the SAWT and gas facility, monitoring locations, leachate tanks and other infrastructure. To allow access to the landfill cells, both during waste placement and for maintenance of the final cap, an access road has been designed (Refer drawings 13 and 14 in Annexure A).

The landfill cap access road includes the following features:

- Approximately 5 m wide
- Cross fall of 5% to facilitate runoff
- One-way circulation

The access road cross section grades to a swale drain on the internal side against the upper batter to collect stormwater. These drains are connected to the drains along each bench which then flow down the batter slopes to the sediment ponds. Safety barriers using rock or soil are proposed to be installed on the outer side of the access road.

4.5 Leachate management

Leachate is currently separated based on the category of landfill cell in which it originated. Leachate from GSW cells is contained within four 25 kL leachate storage tanks with a combined storage of 100,000 L. All leachate generated within the site is collected and transported to a SUEZ tanking facility at Spring Farm, NSW for further treatment.

As per Section 2.3 of the Landfill Guidelines 2016, a water balance model should be conducted for new landfill cells to estimate the required leachate storage capacity.

A water balance model accounts for:

- Rainfall infiltration into the waste that becomes leachate (rainfall depth x surface area)
- Groundwater inflow (if any)
- Rainfall onto the leachate dam, less evaporation from the leachate dam
- Leachate removal off-site and irrigation.

The amount of rainfall that infiltrates to become leachate (rather than surface runoff or evapotranspiration) has been estimated. This takes account of inputs such as climate, soil, waste type

and landfill design data as part of the Hydrologic Evaluation of Landfill Performance (HELP) model (HELP 3.95D; Berger, 2013).

As discussed in Section 2.3, groundwater is adequately managed with very small quantities contributing to leachate. The water balance is modelled with zero groundwater flow into the landfill cell.

As leachate is captured and stored in tanks the effect of direct rainfall on a leachate dam (and its evaporation) have not been included in the model.

The model has been conducted for the currently approved final capped landfill and the proposed expanded landfill cap with both scenarios having final capping applied. Modelling of Daily cover has not been modelled as there are no proposed changes to the tipping face size or daily and intermediate cover materials as part of this concept design.

Leachate management system

The Elizabeth Drive Landfill Water Balance **Table 4.5** identifies that leachate is managed through the following measures:

- Regular daily covering and smooth rolling of the cover to allow sheet flow of surface water to collection points from where water is pumped to sediment ponds
- Bunding of the working face to prevent ingress of surface water
- Use of daily and intermediate cover for areas that are not being landfilled
- Proposed progressive capping of the landfilled areas as the final landform is reached to reduce rainfall infiltration
- A 1,000 mm clay liner compacted to a hydraulic conductivity of less than 10^{-9} m/s. The clay liner is constructed over the site shales and clays which, based on recent site testing, exhibits a permeability on average of approximately 10^{-8} m/s
- Basal gradients of 1.5% longitudinally and 3% transversely across the final surface of the clay liner to direct leachate towards the leachate collection sumps
- A 300 mm continuous gravel leachate collection layer incorporating a network of HDPE perforated leachate collection pipes
- Recirculation of leachate from the non-putrescible waste cells.

In order to maintain the leachate head on the clay liner to less than 300 mm, and therefore minimise leakage through the basal liner (based on Darcy's equation), level indicators have been installed within the leachate sumps to monitor the depth of accumulated leachate

The above leachate collection system has been designed to facilitate the collection and direction of leachate towards the leachate sumps to which submersible pumps and sidewall risers are constructed to allow leachate extraction. The sidewall risers also allow for the monitoring and maintenance (flushing) of the leachate collection pipes

It is noted that the arrangement and minor construction details of the leachate collection layer varies between landfill cells, which reflect changes in best practice design throughout the life of the Site.

Groundwater management

Elizabeth Drive Landfill Water Balance **Table 4.5** identifies that to reduce in the risk of impact from local groundwater, a number of precautions have been developed at the landfill which include:

- Construction of groundwater depressurisation drains underneath the perimeter and base of the landfill liner to transfer groundwater away from the basal liner (the primary method of groundwater management)
- Assessment of groundwater levels and contours annually to confirm that the location of depressurisation drains are still appropriate and whether additional drains are necessary
- Construction of a basal clay liner and leachate collection system. The leachate collection system prevents the development of high leachate heads on top of the clay liner, which in turn minimise the migration of leachate through the clay liner and therefore minimise the impact of groundwater.

4.5.1 Water balance

A monthly water balance was used to estimate the quantity of leachate produced from the general solid waste cells for the following conditions:

1. The approved final cap design
2. The proposed final cap design
3. intermediate cap of Stage 1.

A water balance has been conducted of the proposed design assuming Stage 1 has intermediate capping, Stage 2 has a restricted cap (therefore excluded from the modelling as leachate from the restricted landfill cells collects in separate leachate tanks), and Stage 3 has the approved cap design (as it is currently capped).

HELP modelling was undertaken using local historical rainfall data, which was ranked and the 90th percentile year identified (1978). The rainfall used in the model is considered conservative as it incorporates rainfall from three years above and including the 90th percentile (1975, 1983 and 1978).

4.5.1.1 Climate data collection

Climate data used within the model was taken from the Bureau of Meteorological (BOM) data, gathered at the Badgerys Creek McMaster's Fire Station (station number 067068). Where small gaps in the data existed, approximately one to two days, an average of the surrounding days was adopted. Larger gaps in the data were supplemented with data taken from the BOM's Sydney Observatory Station (station number 066062).

Table 4.3 Weather data parameters

Parameter	Data source	Years	No. of Years
Rainfall	BOM, Badgerys Creek McMaster's Fire Station (station number 067068)	1967 – 1986	20
Temperature	BOM, Badgerys Creek McMaster's Fire Station (station number 067068)	1967 – 1986	20
Solar radiation	BOM, Badgerys Creek McMaster's Fire Station (station number 067068)	1990 – 2010*	20
Evapotranspiration	Generated by the HELP model	-	-

**solar radiation was not recorded at station number 067068 until 1990.*

As per the GHD Water Balance **Table 4.5**, the depth of potential evaporation used within the model was 100 mm, as per the recommendations of Chow (1964, in Qian *et al 2002*) for the intermediate cover profiles. For the final cover the depth of the potential evaporation layer was increased to 125 mm to take into account the root depth of grass to be incorporated into the final cap design.

The results of the water balance have been included in **Annexure B**.

4.5.1.2 HELP modelling material parameters

A summary of the adopted modelling parameters used for the different landfill profiles for the future conditions are provided in **Table 4.5** and **Table 4.6**. Permeability and other geotechnical parameters for the basal liner and capping materials were based on the HELP model default soil, waste and geosynthetic characteristics[2], excluding initial moisture content. The initial moisture content was specified as being at field capacity for the all the layers, except for the waste layer which was modelled with an initial moisture content 10% below the adopted field capacity. This was considered a reasonable assumption given the types of non-putrescible waste disposed of at the landfill, and takes into consideration the absorptive capacity of the waste.

The permeability and other geotechnical parameters for the waste layer were manually calculated based on the characteristics of the waste. The average permeability and geotechnical parameters

have been calculated based on the average of the values provided for a 'Loamy Sand' and 'Municipal Waste (with channelling and dead zones)' provided in HELP model[2].

Table 4.4 Hydraulic conductivity parameters

Waste Type	Total Porosity	Field Capacity	Wilting Point	Initial Moisture	Saturated Hydraulic Conductivity
	(Vol/Vol)				(cm/sec)
Non-putrescible waste	0.3025	0.089	0.033	0.08	1.35×10^{-3}

The model assumes that the amount of water on the surface at the beginning of simulation was zero.

Table 4.5 Water balance modelling parameters

Layer Type	Layer Thickness (mm)	Saturated hydraulic conductivity (cm/sec^{-1})
Intermediate Cover		
Compacted clay or shale	500	6.8×10^{-9}
Waste	70,000	1.35×10^{-3}
Basal leachate drainage gravel	300	3×10^{-1}
Basal clay liner	1000	1×10^{-7}
Approved final cover profile		
Revegetation layer	300	3.7×10^{-4}
Sealing layer (compacted clay or shale)	500	1×10^{-7}
Seal bearing layer	300	1.2×10^{-6}
Gas collection trench	300	3×10^{-1}
Waste	50,000	1.35×10^{-3}
Basal leachate drainage gravel	300	3×10^{-1}
Basal clay liner	1000	1×10^{-7}
Proposed final cover profile		
Revegetation layer	300	3.7×10^{-4}
Sealing layer (compacted clay or shale)	500	1×10^{-7}
Seal bearing layer	300	1.2×10^{-6}
Gas collection trench	300	3×10^{-1}
Waste	70,000	1.35×10^{-3}
Basal leachate drainage gravel	300	3×10^{-1}
Basal clay liner	1000	1×10^{-7}

[2] Schroeder, P. R., Aziz, N. M., Lloyd, C. M. and Zappi, P. A. (1994). "The Hydrologic Evaluation of Landfill Performance (HELP) Model: User's Guide for Version 3," EPA/600/R-94/168a, September 1994, U.S. Environmental Protection Agency Office of Research and Development, Washington, DC.

Table 4.6 Additional HELP model parameters

Type	Input	Source
Landfill area	51.67 ha	Concept drawings in Annexure A
Percentage where runoff is possible	100%	AECOM assumption
Basal Leachate drainage length	50 m	GHD, 2006, Elizabeth Drive Landfill Water Balance
Basal Leachate drainage slope	5%	GHD, 2006, Elizabeth Drive Landfill Water Balance
Approved final cover		
Slope %	5%	GHD, 2006, Elizabeth Drive Landfill Water Balance
Slope Length	380 m	GHD, 2006, Elizabeth Drive Landfill Water Balance
Proposed final cover		
Slope %	5%	Slope angle is reflective of the angle of the crest of the proposed design
Slope Length	380 m	Average slope length of the proposed design

4.5.1.3 HELP modelling results

The results of the HELP modelling have been included in **Annexure C**. These results demonstrate that the Project would not significantly affect the total leachate generation from the final capped landfill area. In both the Approved Design Final Cap and Proposed Design Final Cap models zero leachate was captured within the leachate drainage aggregate layer and therefore there was zero leakage through the basal liner (compacted clay).

Where the intermediate cap is placed on Stage 1, assuming no progressive final capping as the worst case scenario, for the 90th percentile rainfall year (1978) a total of 311 m^3 of leachate would be captured from the leachate drainage aggregate layer. This is within the capacity of the leachate tanks maintained on-site (4 x 20 kL tanks).

4.6 Landfill gas management

The potential environmental impacts from landfill gas depend on various factors including the rate of generation, the concentration of the landfill gas, the nature of and potential pathways through which landfill gas can migrate, and the effectiveness of a landfill gas collection system.

The EPA has outlined acceptable measures for managing and monitoring landfill gas[3]. These include:

- landfill gas control
- landfill gas surface emissions monitoring
- landfill gas sub-surface monitoring
- gas accumulation monitoring in enclosed structures
- managing emissions from combustion of landfill gas.

Landfill gas modelling, which involves forecasting gas generation based on past and future waste disposal history, assists with the design of landfill gas management and monitoring infrastructure. This section of the concept design report outlines the landfill gas modelling approach and results for the Project.

4.6.1 Overview of the Landfill Gas Emissions Model (LandGEM)

Anaerobic decomposition of the organic fraction of waste in landfills results in generation of landfill gas. This gas consists mainly of methane and carbon dioxide, as well as potential trace amounts of water vapour and non-methane organic compounds (NMOC). Various models have been developed to

[3] NSW Environment Protection Authority (EPA), 2016. Environmental Guidelines. Solid waste landfills, Second edition

estimate landfill gas generation rates. The most widely used models use a first order decay equation to calculate methane emissions from landfills. An example is the LandGEM[4] tool - a Microsoft Excel-based software application developed by the US EPA that uses a first order decay equation (Equation 1) to calculate estimates of landfill gas emissions from the decomposition of waste in municipal solid waste (MSW) landfills. The governing equation is represented below:

[4] U.S. Environmental Protection Agency LandGEM – Landfill Gas Emissions Model, Version 3.02

$$Q_{CH_4} \quad \sum_{i=1}^{n} \sum_{j=0\,1}^{1} kL_0 \left(M_i / \quad \right) \left(e^{-kt_{ij}} \right) \quad \text{------- (1)}$$

Where:

Q_{CH4} = estimated methane generation flow rate (m^3 per year), i = 1- year time increment, n = (year of calculation) – (initial year of acceptance), j = 0.1-year time increment, k = methane generation rate constant (1/year), L_0 = potential methane generation capacity (m^3 per Mg, where Mg stands for megagrams and 1Mg = 1 tonne) , M_i = mass of solid waste disposed in the i^{th} year (Mg or tonnes), t_{ij} = age of the j^{th} section of waste mass disposed in the i^{th} year (decimal years)

The LandGEM model was utilised in this study to simulate landfill gas generation. The model parameters indicate that the rate of methane gas generation depends on a number of factors relating to existing conditions outside and within the landfill. Furthermore, it is noted from equation 1 that the model calculates the amount of methane gas generated; however it is also important to determine the potential generation of other gases and pollutants to estimate the total landfill gas generation. LandGEM assumes that methane generation is at its peak shortly after initial waste placement (following establishment of anaerobic conditions in the landfill), after which point the rate of landfill methane generation decreases exponentially (first-order decay) as organic material is decomposed by bacteria.

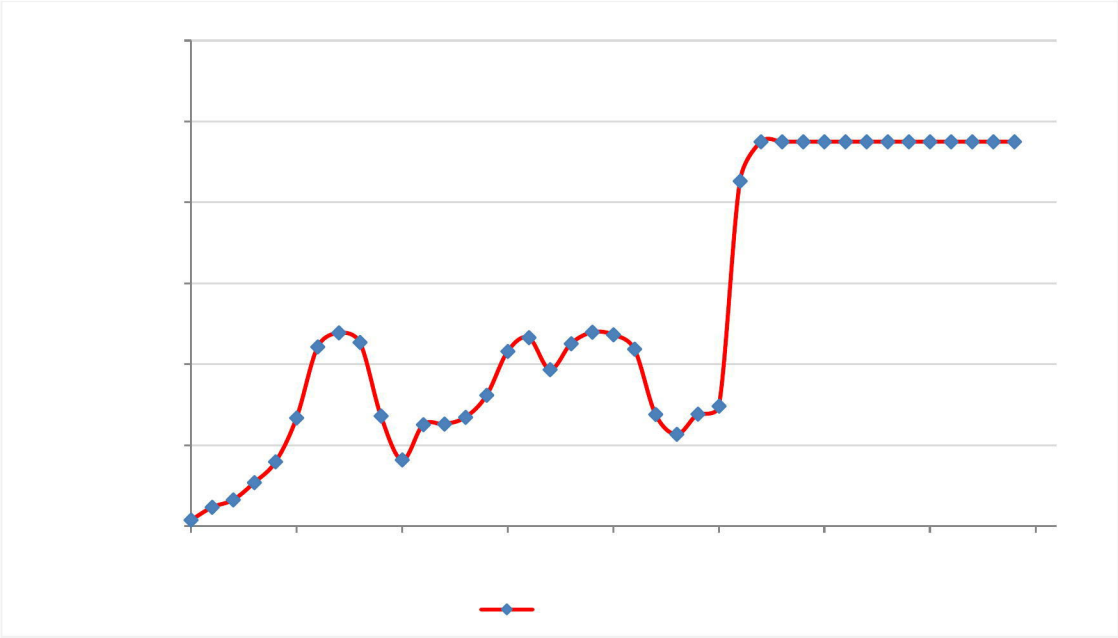
4.6.2 Waste acceptance and characterisation

Waste tonnages entering the landfill from 1992 to 2018 and forecast throughput between 2018 and 2031 were provided by SUEZ. It is noted from the data provided that the landfill has been accepting C&D and C&I waste since 1992.

Waste Acceptance

Figure 4.3 shows the amount of waste accepted annually at the landfill until a projected worst case year of closure of 2031.

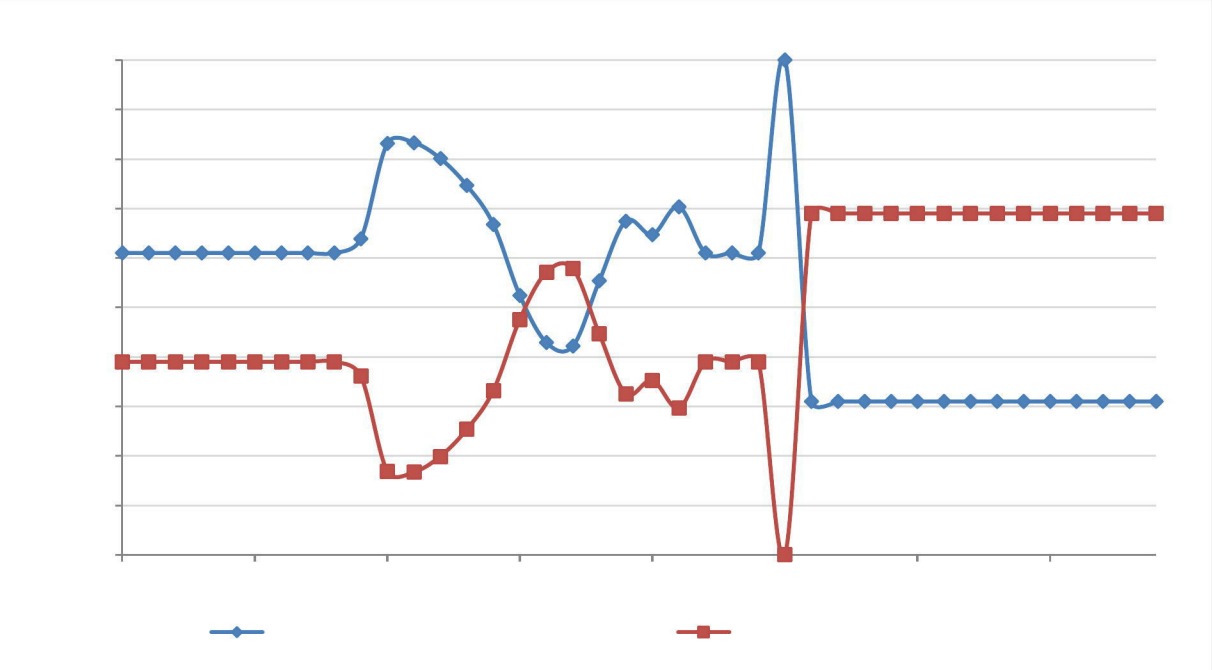
Figure 4.3 Waste acceptance at the landfill until 2031



Waste composition

A representative description of waste composition is essential to determine the biodegradable fraction of the waste accepted at a landfill which is required to predict landfill gas generation. SUEZ has provided the percentages of C&I and C&D waste accepted at the landfill from 1992 to 2018. This trend is shown in Figure 4.4 and is forecast to 2031, assuming that the current percentages are maintained.

Figure 4.4 C&I and C&D acceptance at the Project Area (percentages of total)[6]



The composition of waste accepted at the landfill in the financial year 2017/2018 is indicated in **Table 4.7** below[7]. According to the data, this period was characterised by a transitional increase in C&D waste in the total waste stream compared to the period between 1992 and 2017 which was characterised by higher C&I than C&D tonnages.

Table 4.7 Financial year (FY) 2017 - 2018 landfill waste acceptance

Waste Stream and Constituents	Tonnes per year	% of total waste accepted
C&D	**592,283**	**69.5%**
Asbestos Contaminated Sludge-8035	3,833	0.4%
Construction Material - 8031	10,814	1.3%
Contaminated Asbestos Soil - 8032	481,166	56.4%
Contaminated Soil - 8033	16,477	1.9%
Contaminated Waste - 8034	16,979	2.0%
Restricted Soil - 8094	63,014	7.4%
C&I	**260,408**	**30.5%**
Dry Waste - 8040	171,602	20.1%
Dry Waste (Levy Exempt) - 8154	1,159	0.1%
Dry Waste Council - 8043	34,983	4.1%

[6] *Elizabeth Drive Landfill NGER Solid Waste Calculator 2019—2033_Proposed.xlsx*
[7] *EDL Landfill tonnage report FY 17-18 v6(SWC Input).xls*

Waste Stream and Constituents	Tonnes per year	% of total waste accepted
Incompatible Material - 8063	18,983	2.2%
Mattress (e) - 8065	1	<0.1%
Polystyrene - 8089	8	<0.1%
Restricted Sludge - 8096	5,160	0.6%
Restricted Waste - 8095	5,148	0.6%
Security Burial - 8103	378	<0.1%
Special Waste - 8109	22,202	2.6%
Synthetic Mineral Fibres - 8112	783	<0.1%
Inert homogeneous	15,394	1.8%
Total	**852,691**	**100%**

Data in Table 4.7 indicates that over 50% of the total waste stream accepted at the landfill in FY 2017/2018 was contaminated asbestos soil and approximately 25% was dry waste.

The waste composition was also calculated based on the NGER default composition of the total waste stream[8] for C&I and C&D. Waste mix type proportions (adjusted for licencing restrictions) and is shown in Table 4.2 in Section 4.3.

Data in **Table 4.2** calculated for the period from 1992 to 2031 indicates that on average, over 65% of waste accepted is inert material, and approximately 23% is dry material. This is generally in line with the actual landfill tonnage data presented in **Table 4.7**. For the purposes of landfill gas modelling, the calculated waste composition in Table 4.3 was used in determining the model parameters.

4.6.3 Model parameters and inputs

The LandGEM model includes default parameter values, however there is a need to calibrate the model and use site specific data where possible to improve the accuracy of methane generation rates.

Potential methane generation capacity (L_0)

The potential methane generation capacity (L_0) describes the total amount of methane gas that could potentially be generated by a given amount of degradable waste under anaerobic conditions. The value of L_0 depends almost entirely on the type of degradable waste present in the landfill.

For this concept design, the potential methane generation capacity (L_0) was estimated by determining the biodegradable fraction (BF) as well as an estimate of the ultimate methane potential (of the total waste stream). Published literature data for the different streams in the total waste streams were used, as outlined in **Table 4.8**.

Table 4.8 Methane generation potential and biodegradable fraction of various waste streams[9]

Waste organic component	Biodegradable Fraction (Average literature values)	Methane generation potential (m^3 CH_4/dry Mg)
Paper	0.39	418.51
Cardboard	0.41	438.70
Textiles	0.31	573.87
Leather	0.40	759.58

[8] National Greenhouse and Energy Reporting (NGER) Determination 2008 Section 5.11
[9] Machado et al., (2009). Methane generation in tropical landfills: Simplified methods and field results. *Waste Management (29)* pp 153-161

Waste organic component	Biodegradable Fraction (Average literature values)	Methane generation potential (m^3 CH_4/dry Mg)
Yard wastes	0.42	481.72
Wood	0.31	484.94
Garden waste	0.42*	481.72*
Sludge	0.45**	250**
Nappies	0.1*	400*
Inert material	0.0*	0.0*

**Assumed values based on AECOM estimates*
***Values for yard wastes were used for garden waste as an assumption*

Values of L_0 vary widely, and site-specific determinations based on typical waste compositions are recommended for accurate predictions. Model parameters can be predicted using various methods for example by using non-linear regression techniques and actual landfill gas generation data from the Project Area. The USEPA[10] provided a range from 56.6 to 198.2 m^3 CH_4 per megagram (Mg) of waste. It is worth noting that models and parameters are constantly validated and improved. For example, the USEPA[9] also noted that L_0 varies between 6.2 and 270 m^3 CH_4 /Mg of MSW. In this study, the estimated L_0 value based on the waste composition and biodegradable fraction calculated was 17 m^3 CH_4/Mg of waste; however results from LFG modelling using this value (17 m^3 CH_4/Mg of waste) were not consistent with actual landfill gas generation data reported by SUEZ in the period 2011 to 2018.

In this study, no detailed regression analysis was conducted, however a simple method was applied to estimate likely model parameters. This method used three scenarios based on three different L_0 values. Data obtained from modelling these three scenarios was compared with actual landfill gas generation data provided by SUEZ to determine the most likely parameters (refer to **Figure 4.5** and **Figure 4.6**).

Methane generation rate constant (k)

The methane generation rate constant (k) describes the rate at which waste placed in a landfill decomposes and generates landfill gas [10]. The value of k is a function of waste moisture content, availability of nutrients for methane-generating bacteria, pH, and temperature. Moisture levels strongly influence the value of k and thus waste decay rates. Moisture conditions within a landfill are not usually readily available, so annual precipitation data is often used in predicting k values. Internal temperatures are relatively independent of outside temperatures for typical, properly engineered and managed landfills. At higher values of k, the methane generation at a landfill increases at a faster rate (as long as the landfill is still receiving waste), and then declines more quickly after the landfill closes.

An estimate of k was based on published values according to the Intergovernmental Panel on Climate Change (IPCC)[9] which provided k values based on climatic conditions and the type of waste. The climatic conditions and waste classes were categorised as follows:

Table 4.9 Conditions for selecting k values

Waste type	Example waste stream
Slowly degrading waste	Paper, textile, wood and straw
Moderately degrading waste	Other (non-food) organic putrescible/garden and park waste
Rapidly degrading waste	Food waste/sewage sludge
Bulk waste	-
Landfill climate description	
Dry boreal and temperate climate	Wet boreal and temperate climate

[10] U.S. EPA. 2005. Landfill Gas Emissions Model (LandGEM) Version 3.02 User's Guide. EPA-60/R-05/047.p. 17

Waste type	Example waste stream
Dry tropical climate	Wet tropical climate

Based on the waste composition assumed for the landfill (**Table 4.2**), the biodegradable fraction mainly constitutes dry waste which falls under the ***slowly degrading waste*** category. Furthermore, based on rainfall data from the BOM[11] for various weather stations within a 15 km radius of ELD, the mean annual precipitation is less than 1,000 mm and the mean annual temperature is greater than 20° C. According to NGER[12], under these climate conditions the landfill can be described as ***tropical dry***. The conditions of slowly degrading waste in a tropical dry-type landfill are associated with k values ranging from 0.04 – 0.067. In this study, the upper limit k value (0.06) was used as a conservative estimate in landfill gas modelling.

Summary of model parameters and inputs

The parameter values used in this study and model scenarios evaluated are shown in **Table 4.10**.

Table 4.10 Model parameter for the three scenarios evaluated

Model Scenario	L_0 Value (m^3 CH_4/Mg of waste)	k value ($year^{-1}$)
1	17	0.06
2	32	0.06
3	40	0.06

The scenarios in **Table 4.10** use different methane generation potential (L_0) values to demonstrate the sensitivity of model results to waste composition. Determining the composition of waste placed in a landfill accurately is quite challenging, and furthermore, the mix of streams could vary significantly.

The LFG modelling was conducted using the scenarios in based on the following additional inputs:

Table 4.11 Modelled Options

Parameter	Modelled Option	
	Assuming no landfill expansion	With proposed landfill expansion
Landfill Open Year	1992	1992
Landfill Closure Year	2025	2031
Methane content (vol %)	50	50
Other pollutant/gases in landfill gas	Carbon dioxide and hydrogen sulphide	Carbon dioxide and hydrogen sulphide

4.6.4 LFG modelling results

LandGEM calculates landfill gas emission estimates, including waste-in-place amounts, estimates of methane, carbon dioxide, hydrogen sulphide and total landfill gas generation. Actual landfill gas generation was calculated from methane combustion and methane flaring data reported from 2011 to 2018 by SUEZ[6] and assuming an 85% capture efficiency. Landfill gas model results obtained from k = 0.06 and L0 = 40 m^3 CH_4/Mg of waste seem to correlate well with actual landfill gas generation data. The key results of the modelling are illustrated in the figures below.

[11] http://www.bom.gov.au/climate/data/?ref=ftr, reviewed 21.01.2019
[12] National Greenhouse and Energy Reporting (Measurement) Determination 2008. Compilation No.10

Figure 4.5 shows a graphical representation of the landfill gas generation modelling assuming that the Elizabeth drive landfill would continue to accept waste under the current approvals with no landfill expansion.

Figure 4.5 Project Area – Landfill Gas Generation Estimates assuming no expansion [LandGEM V 3.02]

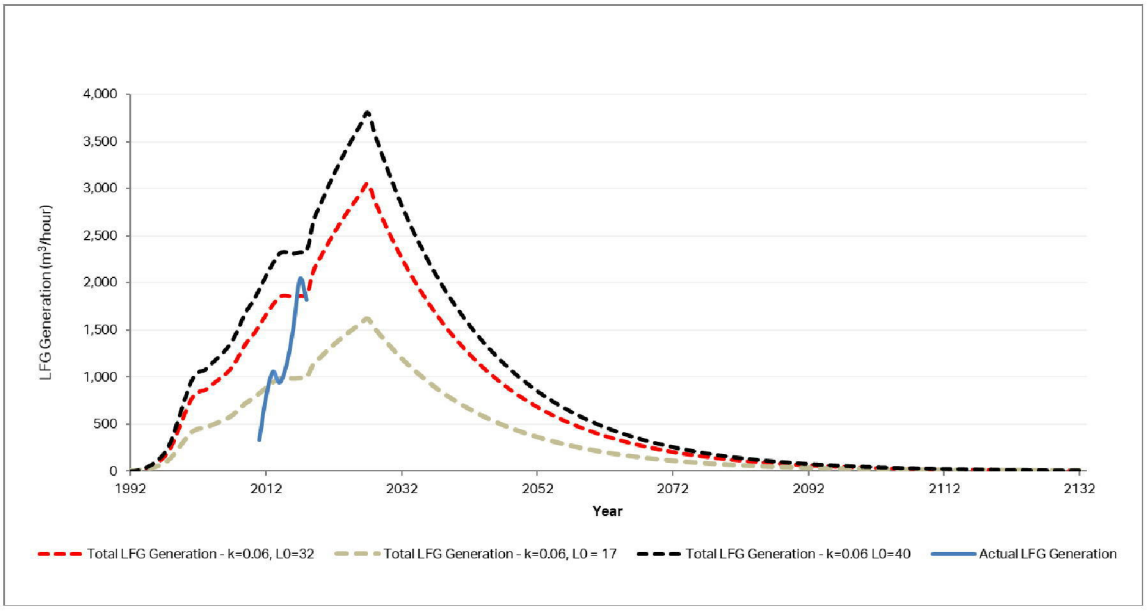


Figure 4.6 shows a graphical representation of the landfill gas generation modelling associated with the proposed landfill expansion. Based on the proposed landfill expansion, peak landfill gas generation is predicted to occur around 2032, one year after the projected closure of the landfill for the purposes of this assessment. The peak LFG generation rates range from 1,700 m^3/hour to 5,000 m^3/hour for the three scenarios evaluated (L_0 = 17, L_0 = 32 and L_0 = 40 m^3 CH_4/Mg of waste).

Figure 4.6 Landfill gas generation estimates for proposed expansion [LandGEM V 3.02]

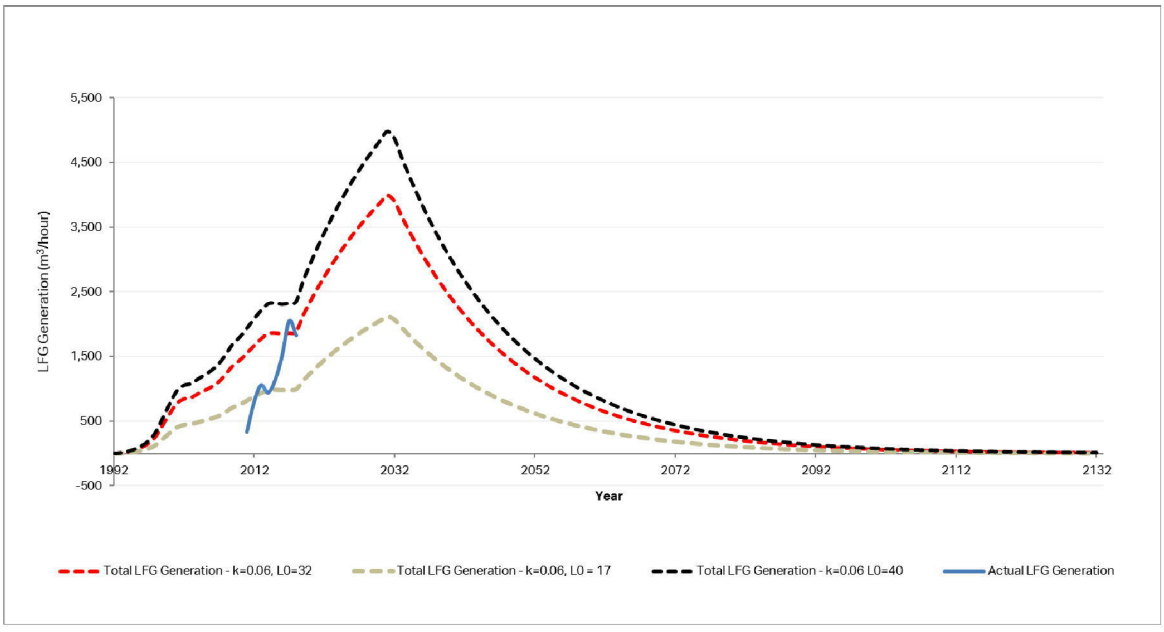


Figure 4.7 shows a comparison of the landfill gas generation model results using Scenario 3 model parameters (k=0.06 and L_0 = 40 m^3 CH_4/Mg of waste) to show the potential increase in landfill gas generation that would occur as a result of the proposed landfill expansion.

Figure 4.7 Landfill gas generation estimates with and without landfill expansion (LandGEM V 3.02)

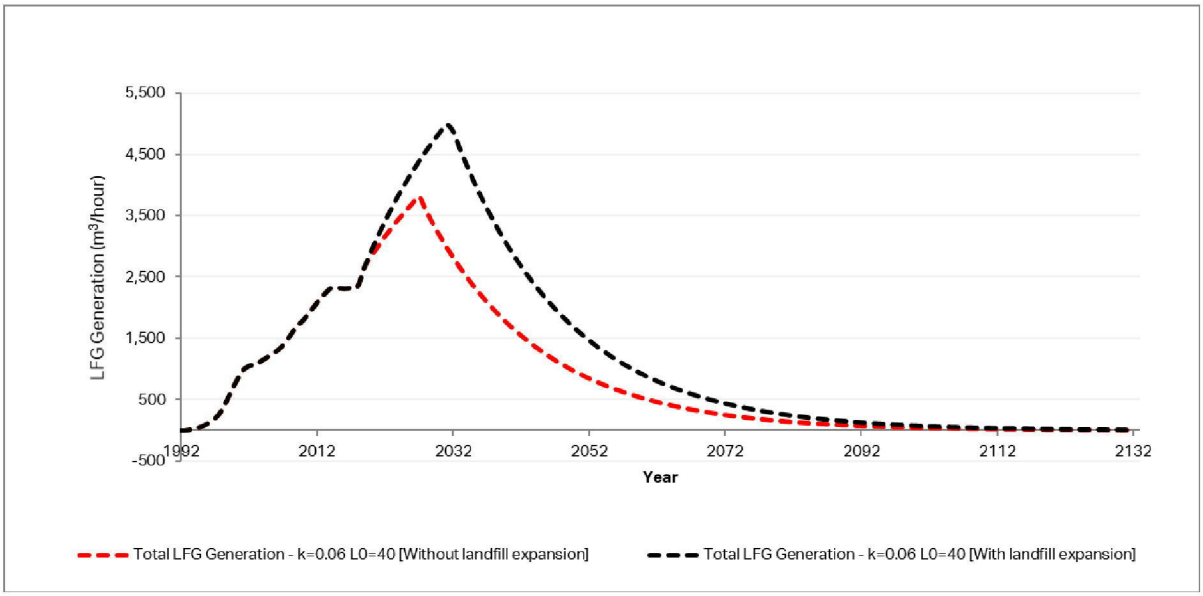


Figure 4.7 indicates that landfill gas generation would potentially increase by an average of 55 % as a result of the Project over the period modelled (between 2019 and 2132).

Subject to further detailed modelling during the detailed design of the project, the above results indicate that the existing landfill gas capture and management infrastructure will need to be expanded to accommodate the increase in landfill gas in future years.

4.7 Leachate collection system

AECOM reviewed the previous assessment of leachate collection pipes performed by GHD and assessed the additional loading on the pipes if the waste depth increases from 58 m to 70 m. The assessment assumed the same pipe parameters and average unit weight of landfill used by GHD. The increase in waste depth corresponds to about a 20% increase in vertical stress on the leachate collection pipes. This increase corresponds to a similar reduction in the factors of safety for buckling and bending. Vertical displacement will also occur as a result of the additional loading. Using this relatively simple methodology, the calculated deformations and factors of safety may not meet the criteria AS2566. However, a more detailed assessment at the detailed design stage may reveal that the original design had excess capacity and/or arching of load around the pipes reduces stresses and deformations of the pipes. Furthermore, the leachate collection system has gravel filled trenches and a gravel drainage layer across the floor of each cell. If there were some collapsed pipe sections, the overall leachate collection system should continue to function. The risks associated with a compromised leachate collection system should be able to be mitigated by monitoring of leachate levels and the installation of additional pumping capacity, if required. A detailed assessment of the leachate collection pipe system will be required as part of the detail design process for the landfill expansion.

Annexure A – Concept design drawings

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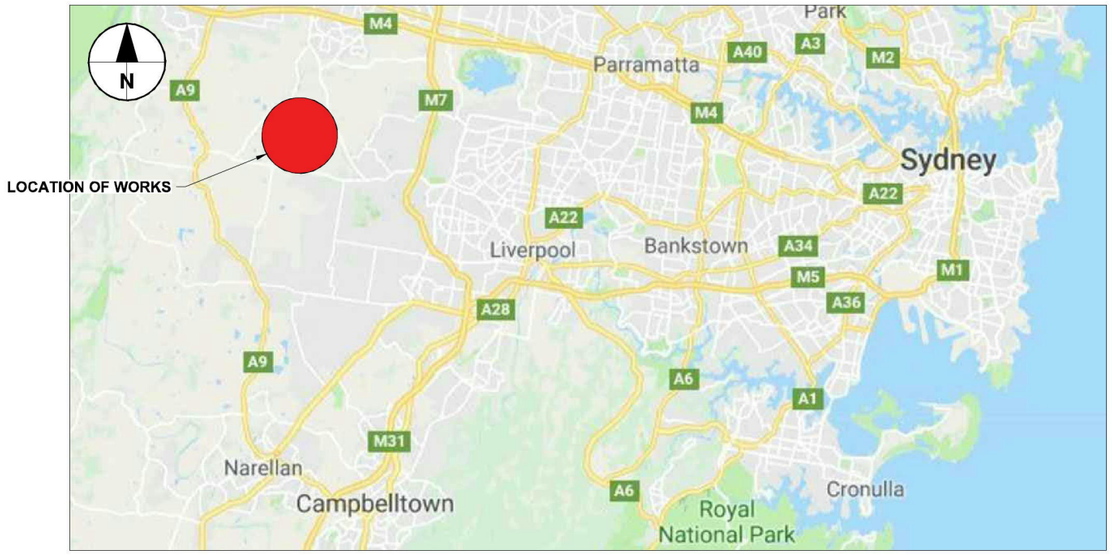
ISO A1 594mm x 841mm

BADGERYS CREEK LANDFILL EXPANSION PROJECT

PROJECT NO. 60571292



LOCALITY PLAN - OVERALL

NTS

DRAWING INDEX	
DWG No.	**DRAWING TITLE**
60571292-SHT-CI-00001	LOCALITY PLAN AND DRAWING INDEX
60571292-SHT-CI-00002	CURRENT FILL AND EXISTING SITE LAYOUT
60571292-SHT-CI-00003	APPROVED FINAL LANDFORM
60571292-SHT-CI-00004	PROPOSED FINAL LANDFORM PRE-SETTLEMENT CONTOURS
60571292-SHT-CI-00005	PRE-SETTLEMENT FINAL LANDFORM SECTIONS AND APPROVED CAP SECTIONS
60571292-SHT-CI-00006	PRE-SETTLEMENT FINAL LANDFORM SECTIONS
60571292-SHT-CI-00007	INDICATIVE STAGE 1 FILL - LAYOUT
60571292-SHT-CI-00008	INDICATIVE STAGE 2 FILL - LAYOUT
60571292-SHT-CI-00009	INDICATIVE STAGE 3 FILL - LAYOUT
60571292-SHT-CI-00010	INDICATIVE STAGE 1 FILL - CATCHMENTS AND STROM WATER DRAINAGE PLAN
60571292-SHT-CI-00011	INDICATIVE STAGE 2 FILL - CATCHMENTS AND STROM WATER DRAINAGE PLAN
60571292-SHT-CI-00012	INDICATIVE STAGE 3 FILL - CATCHMENTS AND STROM WATER DRAINAGE PLAN
60571292-SHT-CI-00013	PROPOSED FINAL ACCESS ROAD ON PROPOSED FINAL LANDFORM
60571292-SHT-CI-00014	PROPOSED FINAL ACCESS ROAD - LONG SECTION
60571292-SHT-CI-00015	POST-SETTLEMENT FINAL LANDFORM
60571292-SHT-CI-00016	POST-SETTLEMENT FINAL LANDFORM - SECTION SHEET 01 OF 02
60571292-SHT-CI-00017	POST-SETTLEMENT FINAL LANDFORM - SECTION SHEET 02 OF 02

LOCALITY PLAN - SITE

NTS

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.01.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

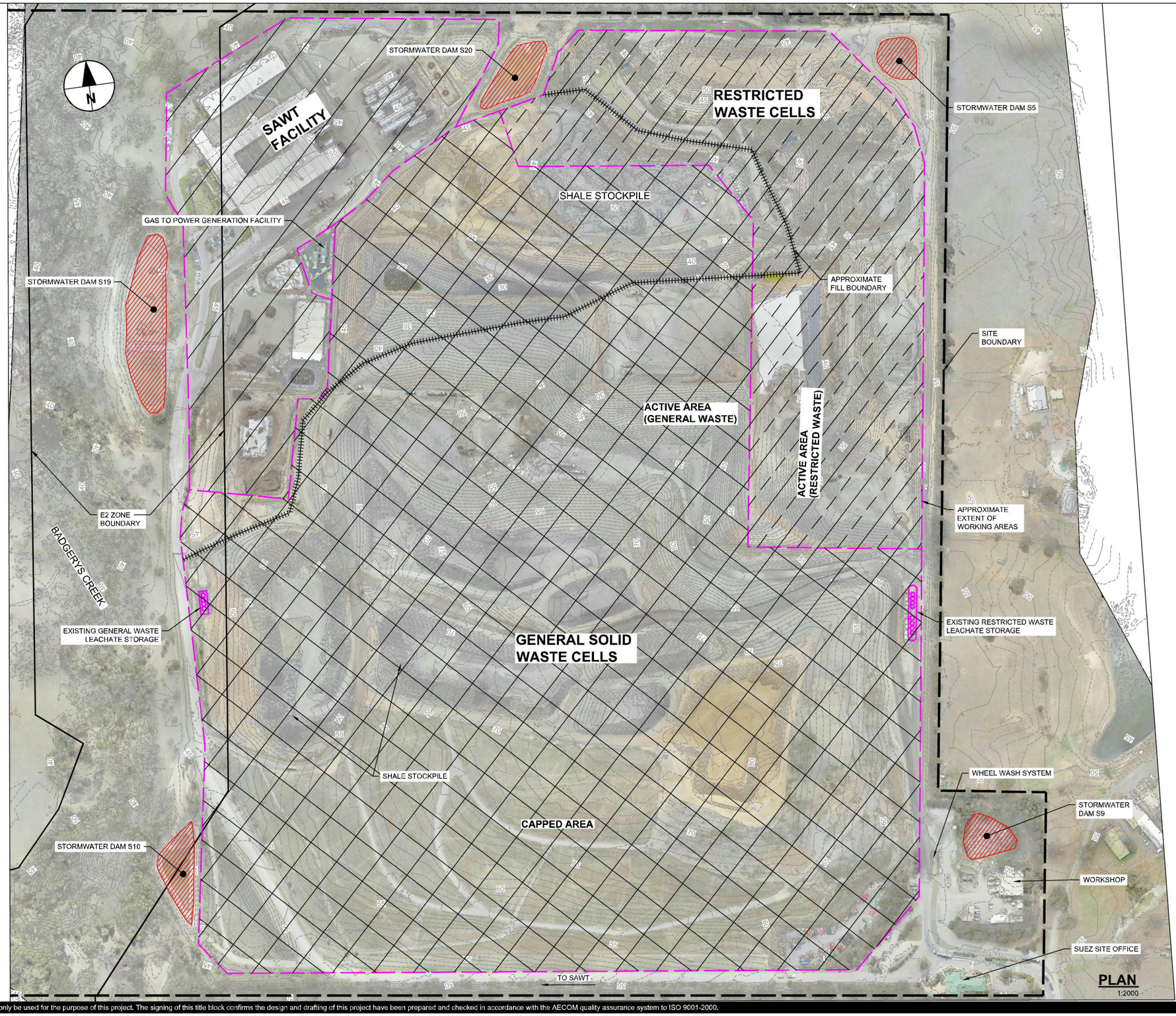
SHEET TITLE

BADGERYS CREEK
LANDFILL LOCALITY
PLAN
AND DRAWING INDEX

SHEET NUMBER

60571292-SHT-CI-00001

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

NOTE:

EXISTING GROUND SURVEY IS SEPT 2018 SURVEY.

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

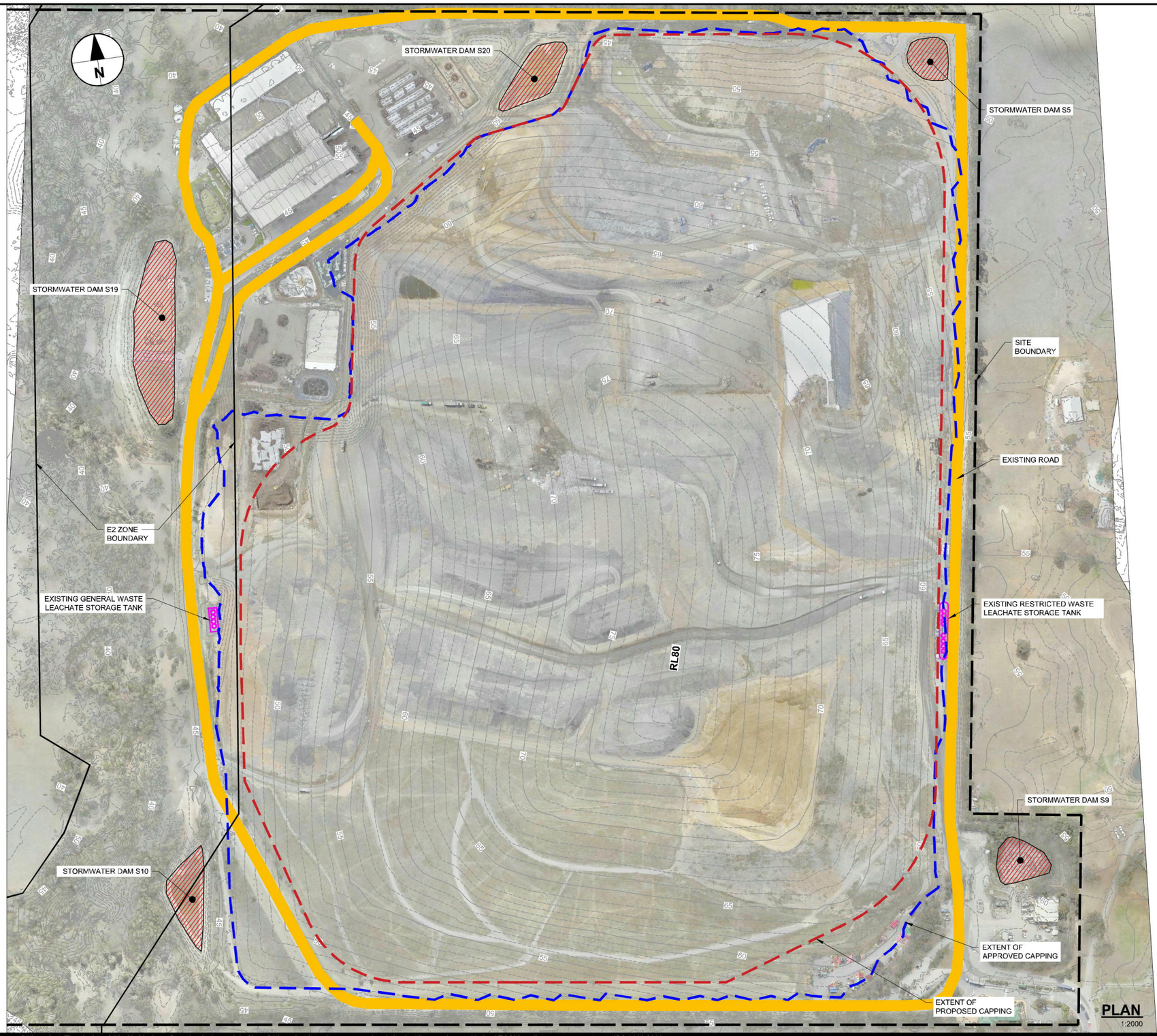
SHEET TITLE

BADGERYS CREEK LANDFILL CURRENT FILL & EXISTING SITE LAYOUT

SHEET NUMBER

60571292-SHT-CI-00002

ISO A1 594mm x 841mm



LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

NOTE:

EXISTING GROUND SURVEY IS A COMBINED SURVEY BASED ON SEPT 2018 SURVEY AND CURRENT APPROVED CAPPING SURFACE.

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS		
QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA			
DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION		
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

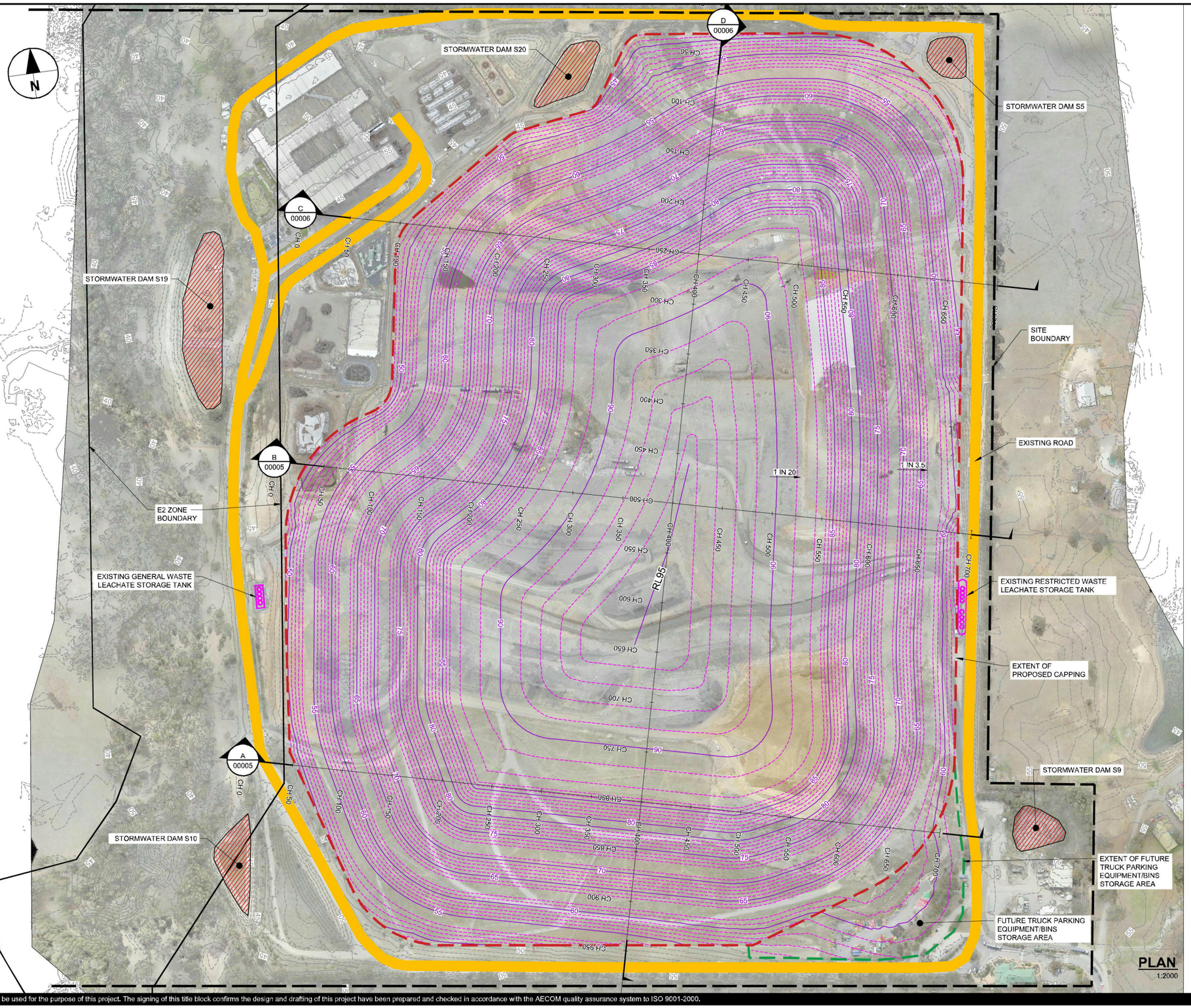
SHEET TITLE

BADGERYS CREEK LANDFILL APPROVED FINAL LANDFORM

SHEET NUMBER

60571292-SHT-CI-00003

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS		
QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA			
DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION		
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

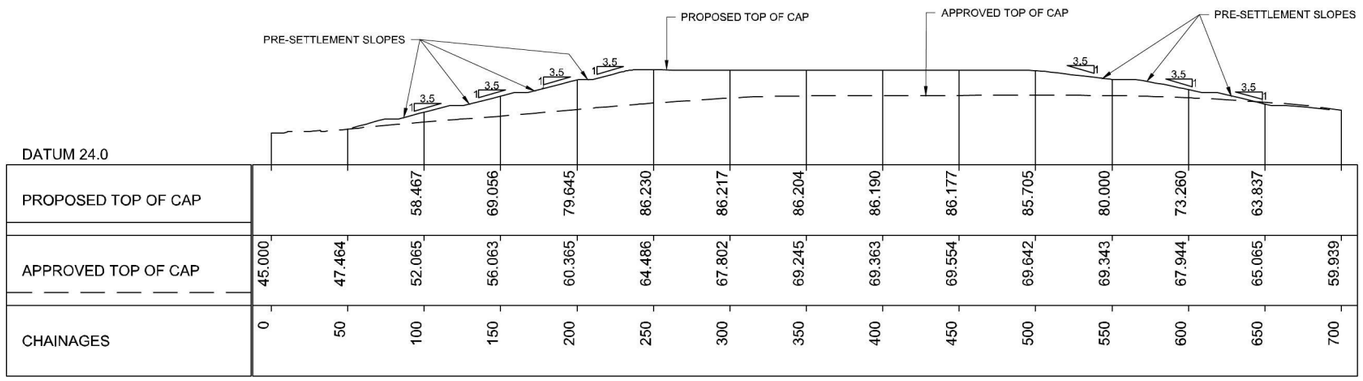
60571292

SHEET TITLE

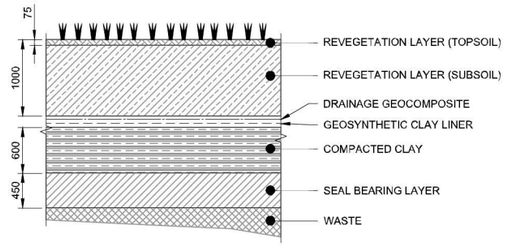
BADGERYS CREEK LANDFILL
PROPOSED FINAL LANDFORM
PRE-SETTLEMENT CONTOURS

SHEET NUMBER

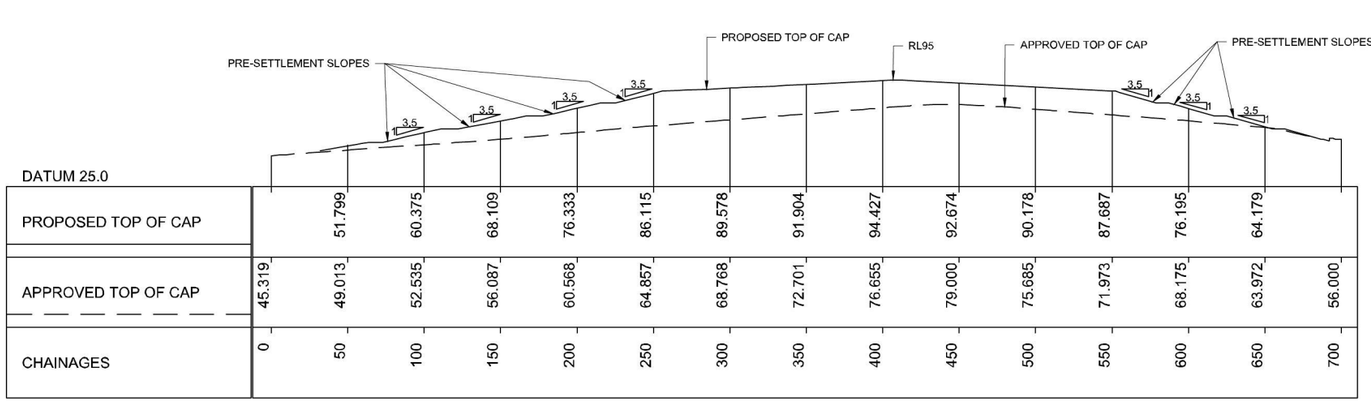
60571292-SHT-CI-00004



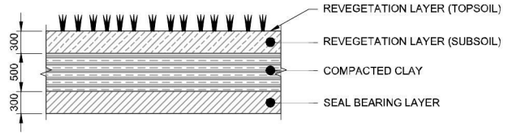
SECTION A
SCALE 1:2000 @A1



APPROVED RESTRICTED SOLID WASTE CELL CAP
N.T.S.



SECTION B
SCALE 1:2000 @A1



APPROVED GENERAL SOLID WASTE CELL CAP
N.T.S.

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

I/R	DATE	DESCRIPTION
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT

PROJECT NUMBER

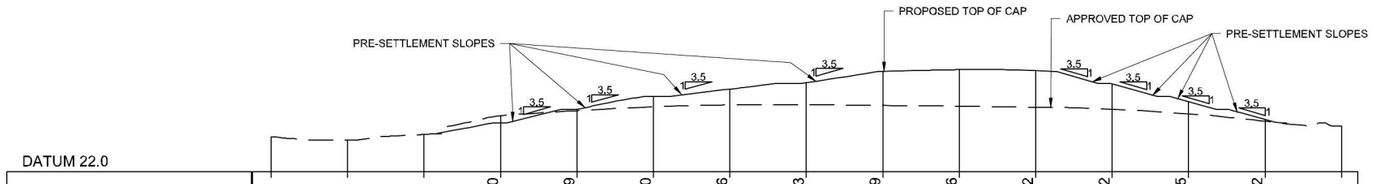
60571292

SHEET TITLE

BADGERYS CREEK LANDFILL
PRE-SETTLEMENT FINAL LANDFORM SECTIONS
AND APPROVED CAP SECTIONS

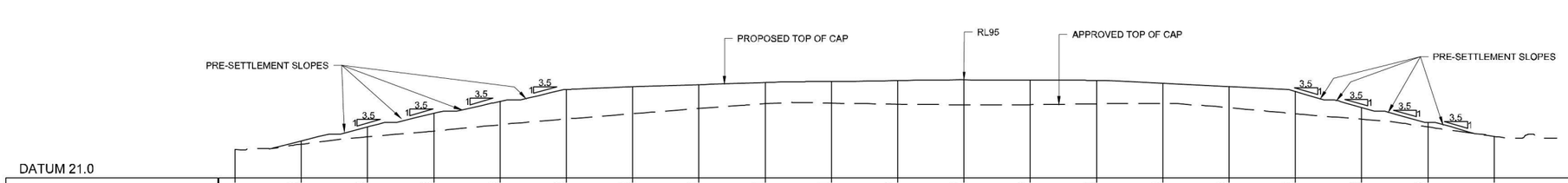
SHEET NUMBER

60571292-SHT-CI-00005



PROPOSED TOP OF CAP				54.200	62.899	71.400	76.176	80.473	87.669	88.976	88.172	79.662	67.905	56.342		
APPROVED TOP OF CAP	45.000	43.000	46.537	58.829	62.030	64.564	65.861	65.937	65.500	65.031	64.367	63.016	60.051	55.131	52.088	
CHAINAGES	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	

SECTION C
SCALE 1:2000 @A1



PROPOSED TOP OF CAP		49.005	59.563	69.736	78.818	87.669	89.742	91.331	92.891	93.731	94.427	94.990	94.717	94.494	92.333	89.835	86.190	74.164	62.800			
APPROVED TOP OF CAP	42.286	46.404	52.108	56.349	61.142	65.500	69.402	73.312	76.974	77.436	76.655	76.231	76.304	76.921	77.205	73.967	69.363	65.331	59.442	52.376		
CHAINAGES	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1019

SECTION D
SCALE 1:2000 @A1

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

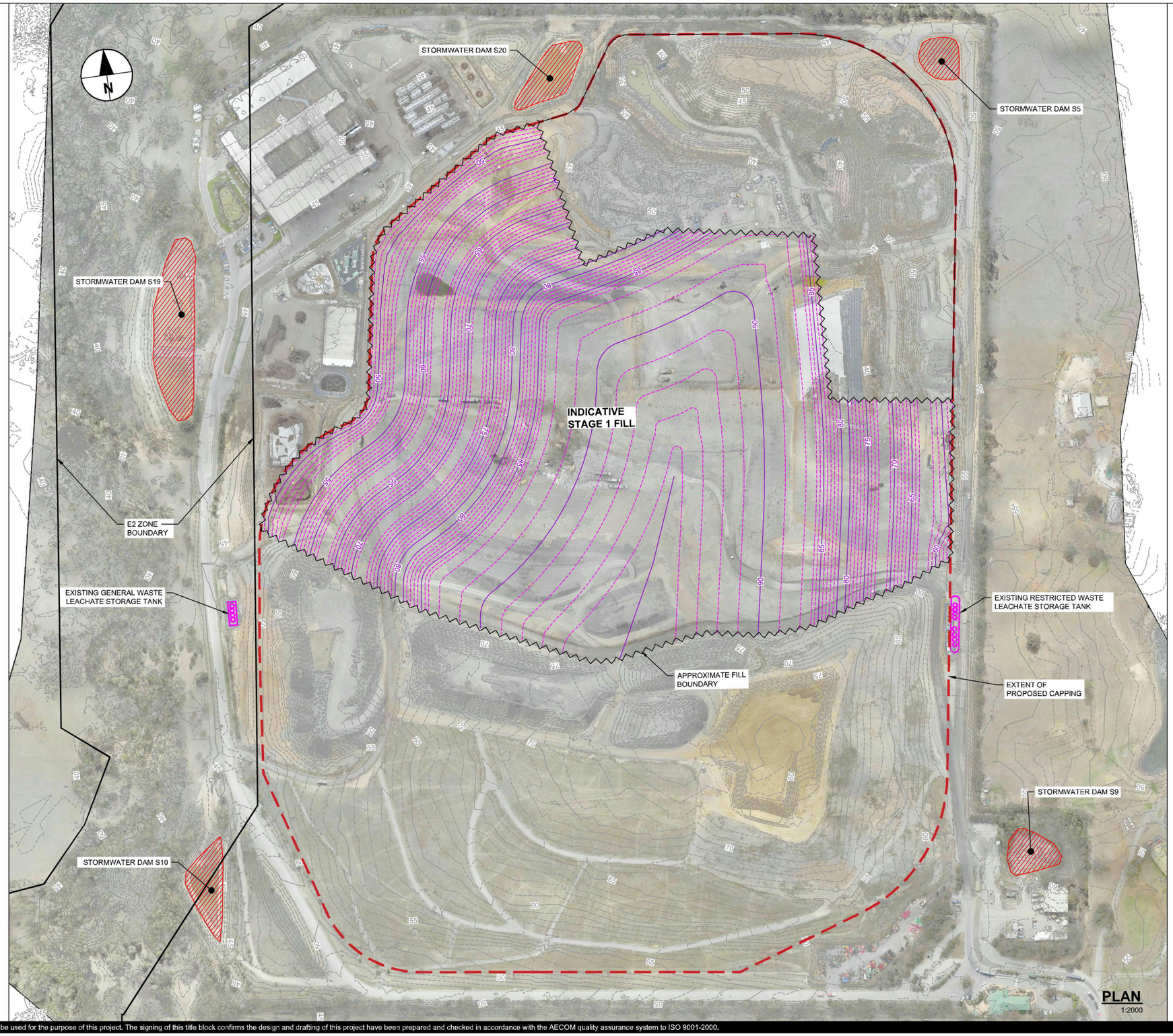
SHEET TITLE

BADGERYS CREEK LANDFILL
PRE-SETTLEMENT FINAL LANDFORM SECTIONS
SECTIONS

SHEET NUMBER

60571292-SHT-CI-00006

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

SHEET TITLE

BADGERYS CREEK
LANDFILL INDICATIVE
STAGE 1 FILL LAYOUT

SHEET NUMBER

60571292-SHT-CI-00007

ISO A1 594mm x 841mm

PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
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- BENCH DRAIN
- SLOPE / SWALE DRAIN

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

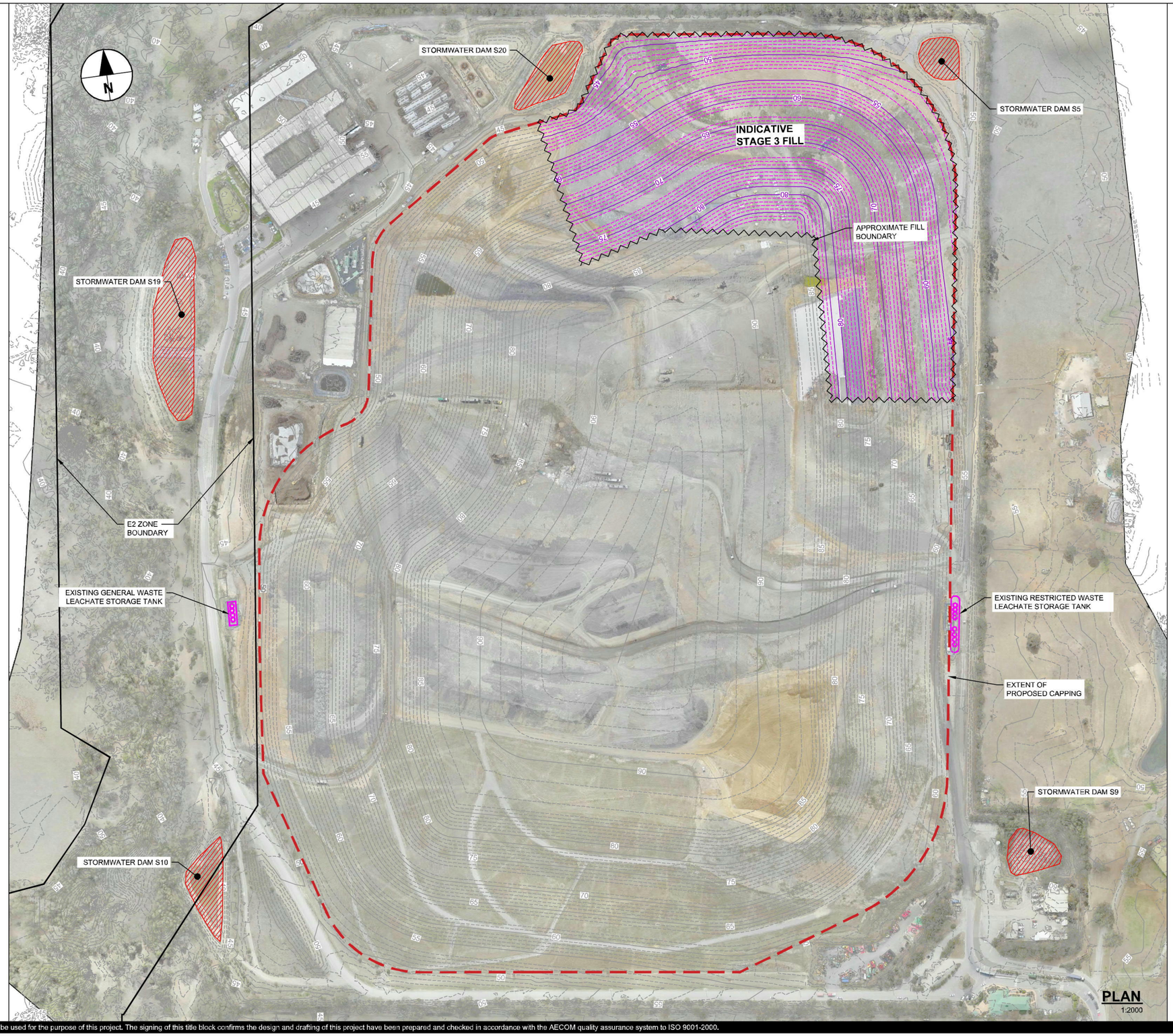
SHEET TITLE

BADGERYS CREEK LANDFILL INDICATIVE STAGE 2 FILL LAYOUT

SHEET NUMBER

60571292-SHT-CI-00008

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

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B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT

PROJECT NUMBER

60571292

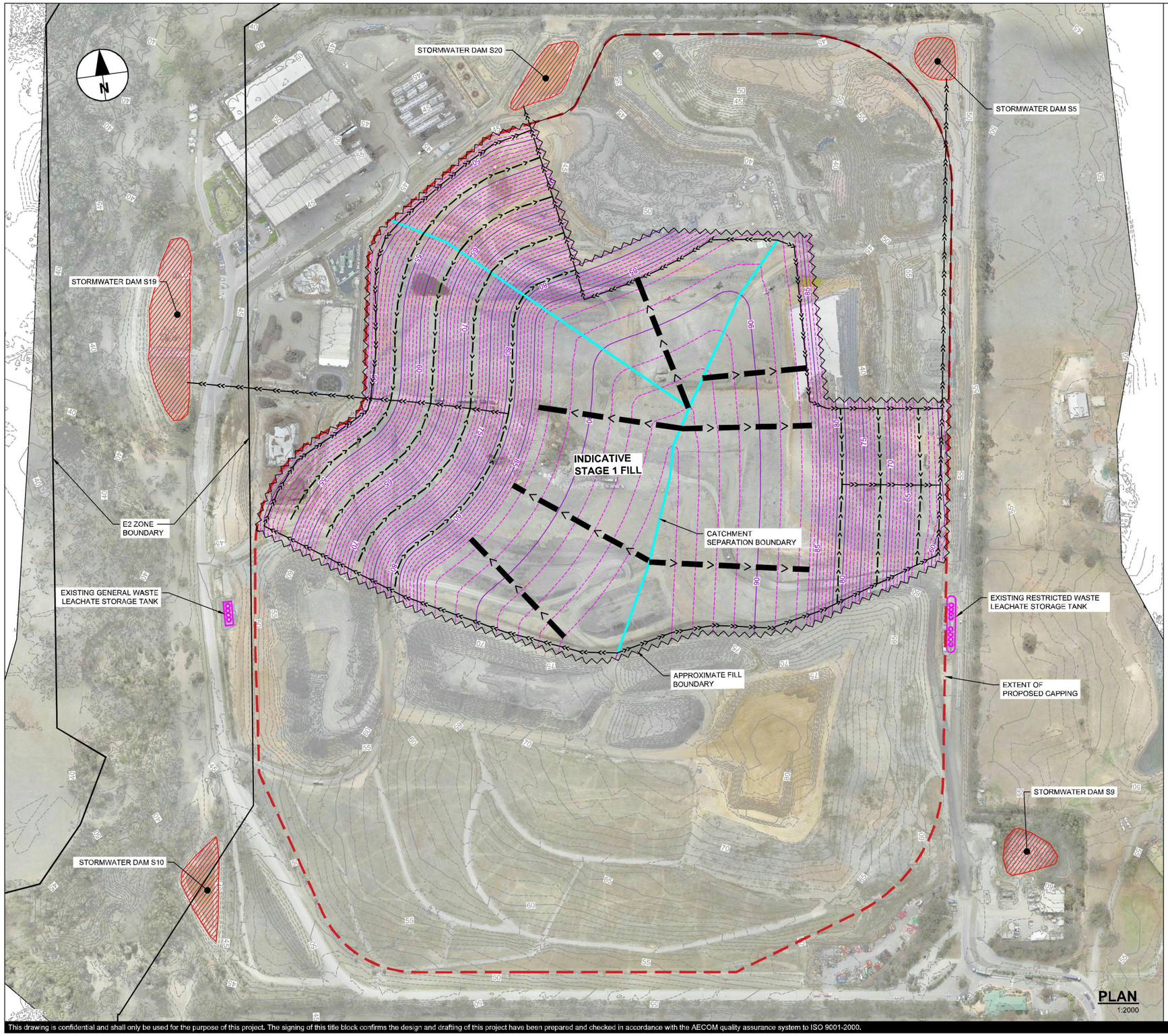
SHEET TITLE

BADGERYS CREEK LANDFILL INDICATIVE STAGE 3 FILL LAYOUT

SHEET NUMBER

60571292-SHT-CI-00009

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
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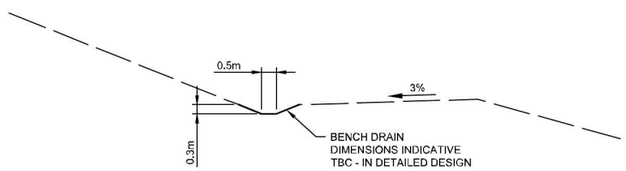
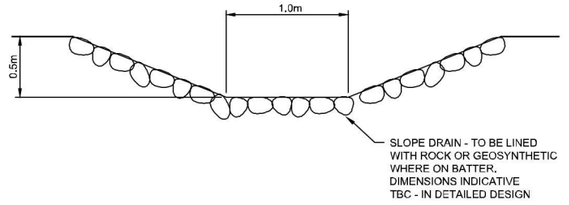
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN



TYPICAL BENCH DRAIN
NTS



TYPICAL SLOPE / SWALE DRAIN
NTS

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

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A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

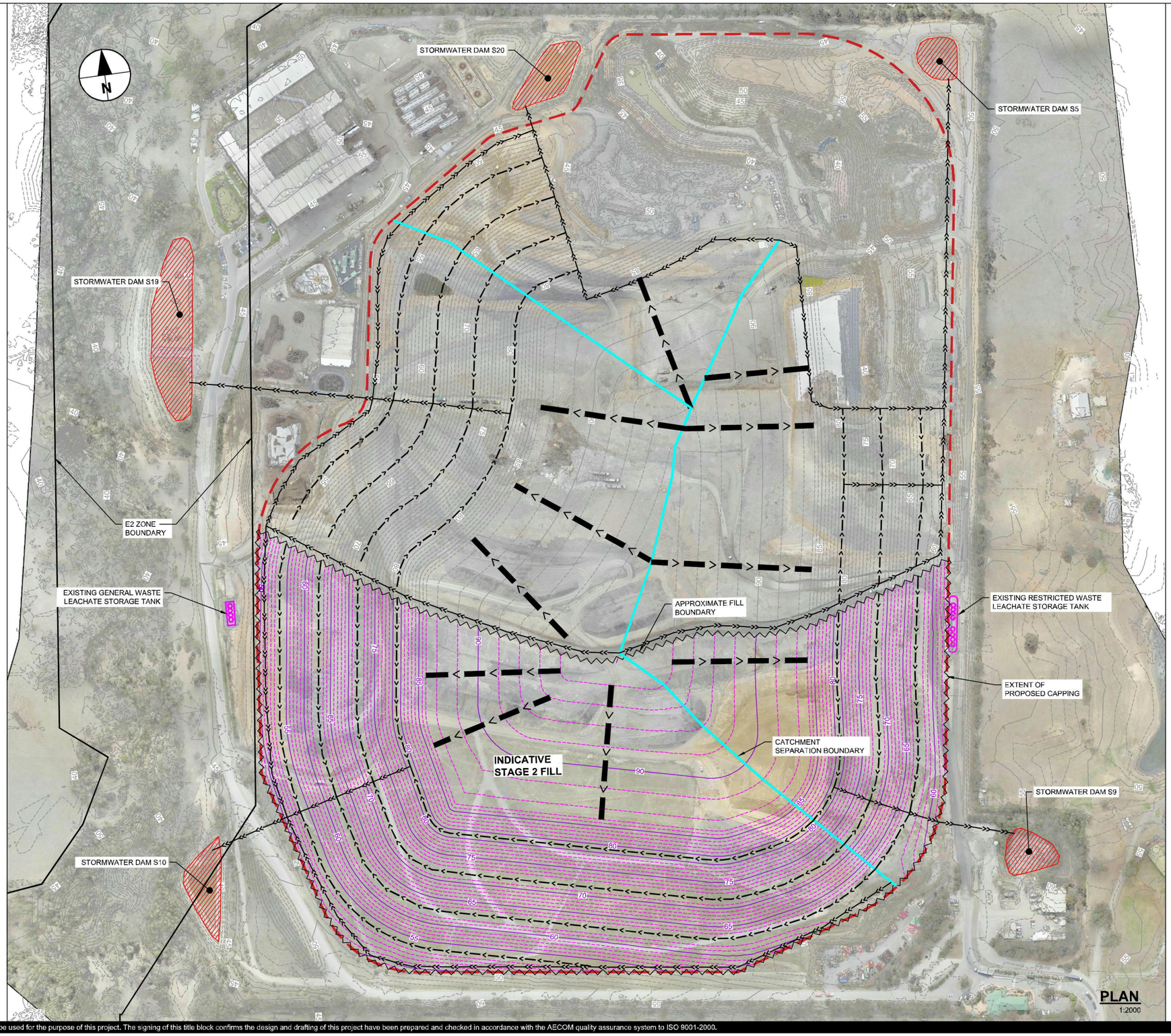
SHEET TITLE

BADGERYS CREEK LANDFILL
INDICATIVE STAGE 1 FILL
CATCHMENTS AND STORMWATER DRAINAGE PLAN

SHEET NUMBER

60571292-SHT-CI-00010

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

0 50 100 m
1:2000

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PROJECT
SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT
SUEZ

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

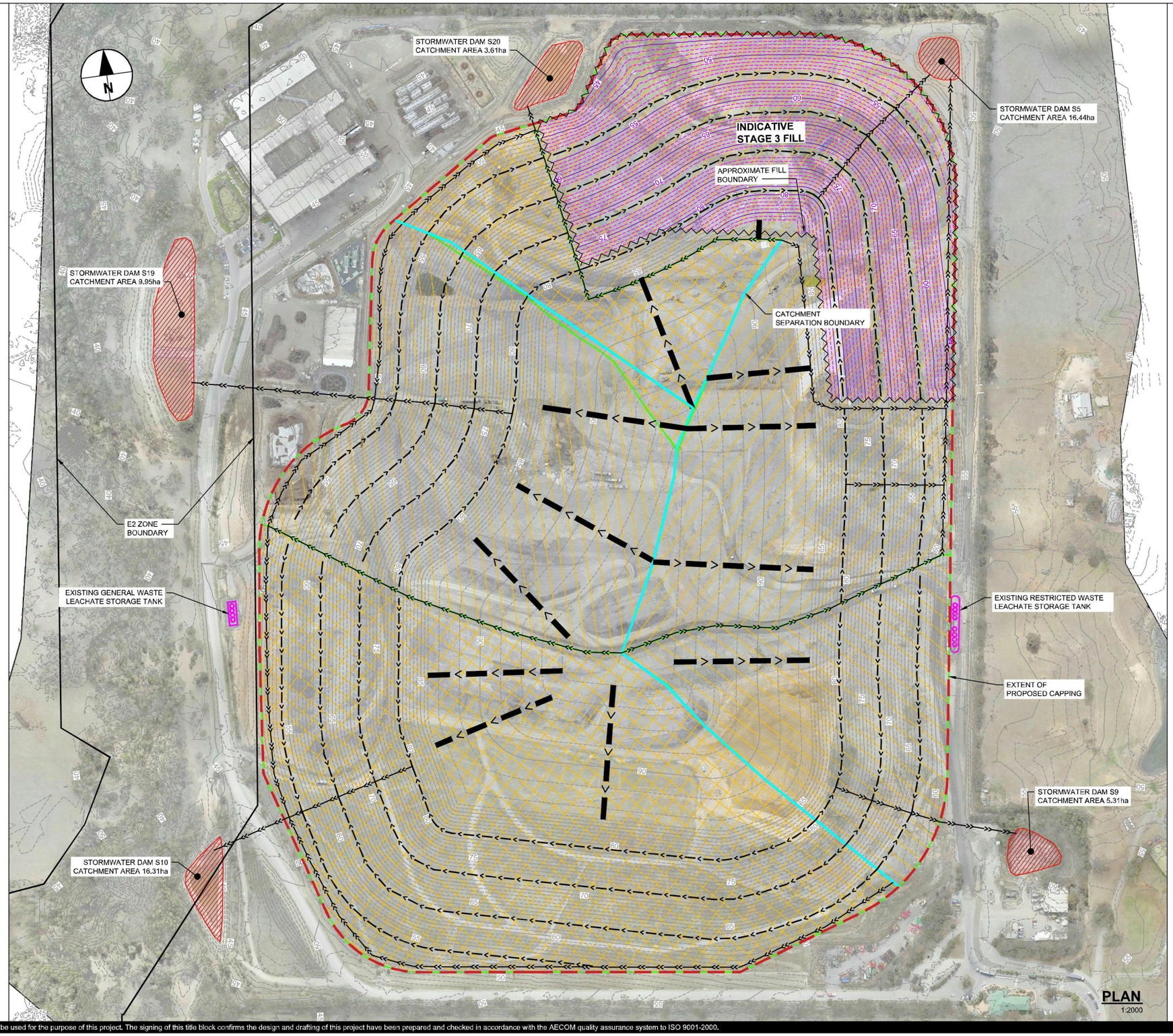
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER
60571292

SHEET TITLE
BADGERYS CREEK LANDFILL
INDICATIVE STAGE 2 FILL
CATCHMENTS AND STORMWATER DRAINAGE PLAN

SHEET NUMBER
60571292-SHT-CI-00011

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

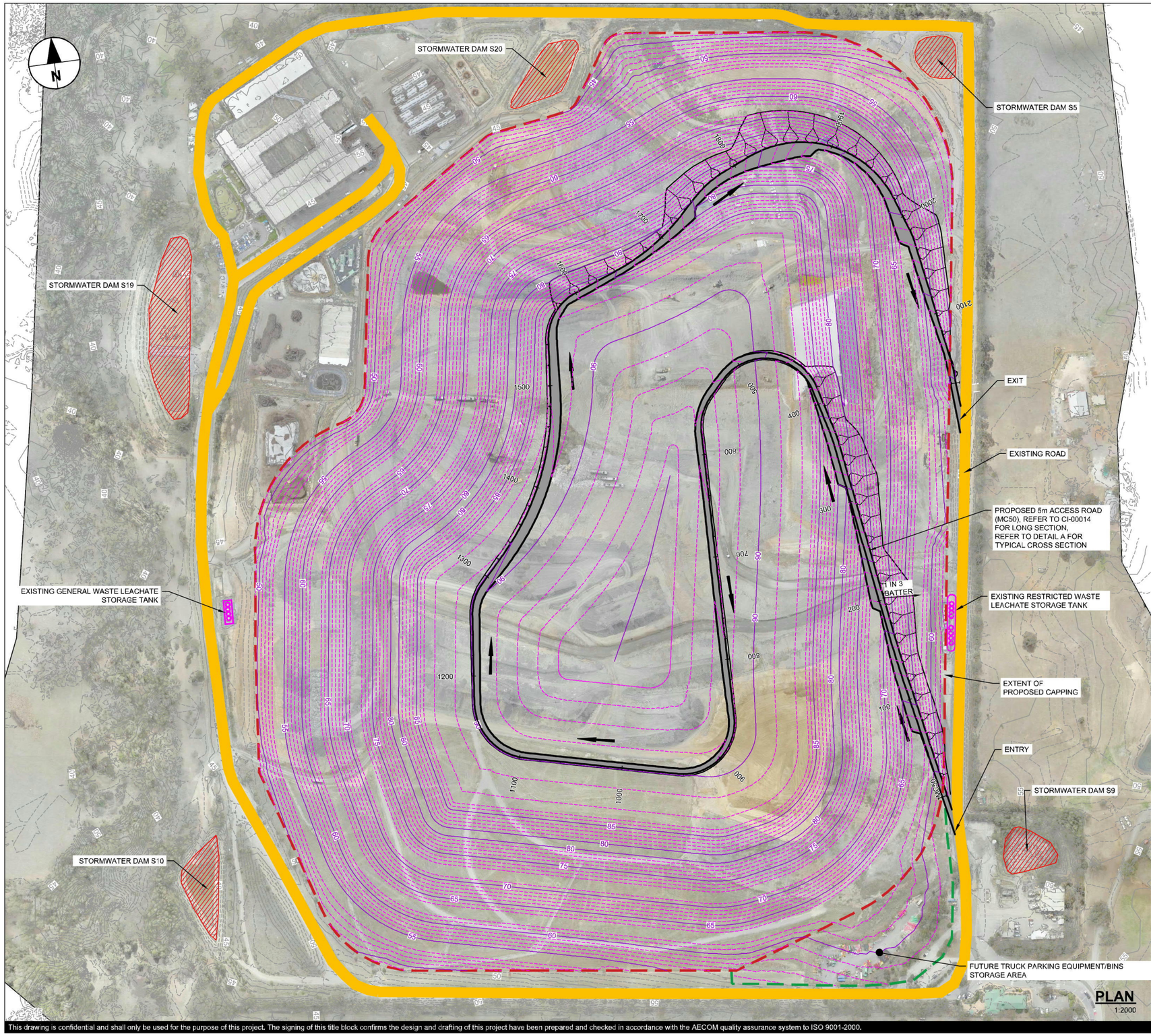
SHEET TITLE

BADGERYS CREEK LANDFILL
INDICATIVE STAGE 3 FILL
CATCHMENTS AND STORMWATER DRAINAGE PLAN

SHEET NUMBER

60571292-SHT-CI-00012

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
- SITE BOUNDARY
- EXTENT OF APPROVED CAPPING
- EXISTING ROAD
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- EXISTING LEACHATE STORAGE TANKS
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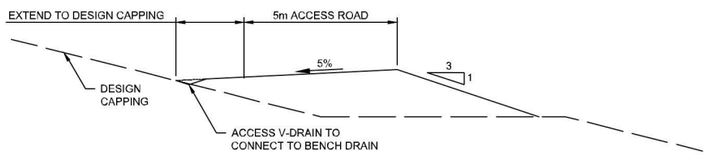
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN



TYPICAL ACCESS ROAD DETAILS
NTS

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Filename: C:\PROJECTS\60\60X60571292\20-SHEETS\60571292-SHT-CI-00013.DWG

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

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1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

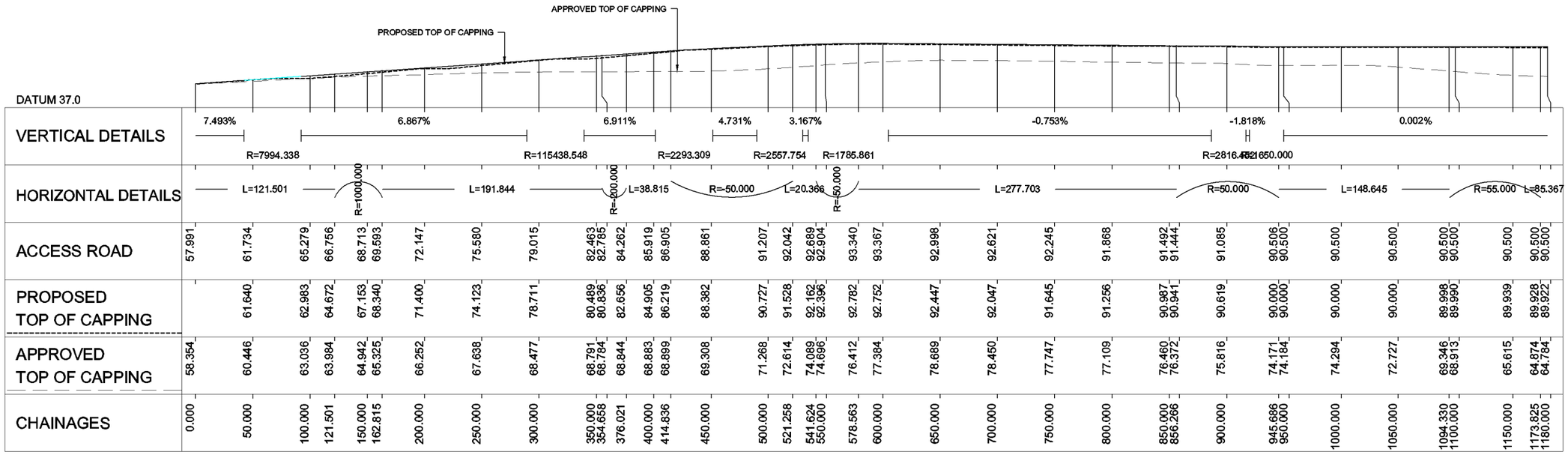
60571292

SHEET TITLE

BADGERYS CREEK LANDFILL
PROPOSED FINAL ACCESS ROAD
ON PROPOSED FINAL LANDFORM

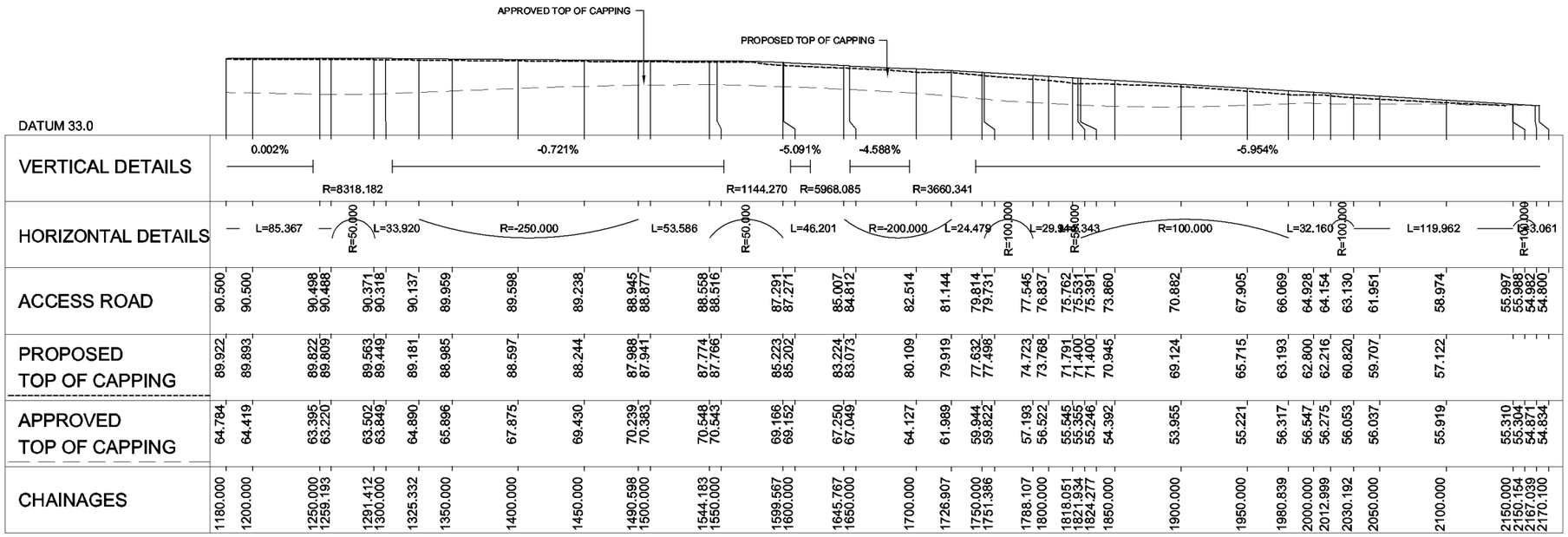
SHEET NUMBER

60571292-SHT-CI-00013



ACCESS ROAD MC50 - LONGITUDINAL SECTION (CH 0 TO CH 1180)

SCALE 1:2000 @A1



ACCESS ROAD MC50 - LONGITUDINAL SECTION (CH1180 TO END)

SCALE 1:2000 @A1

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS		
QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA			
DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION		
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	FINAL DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

60571292

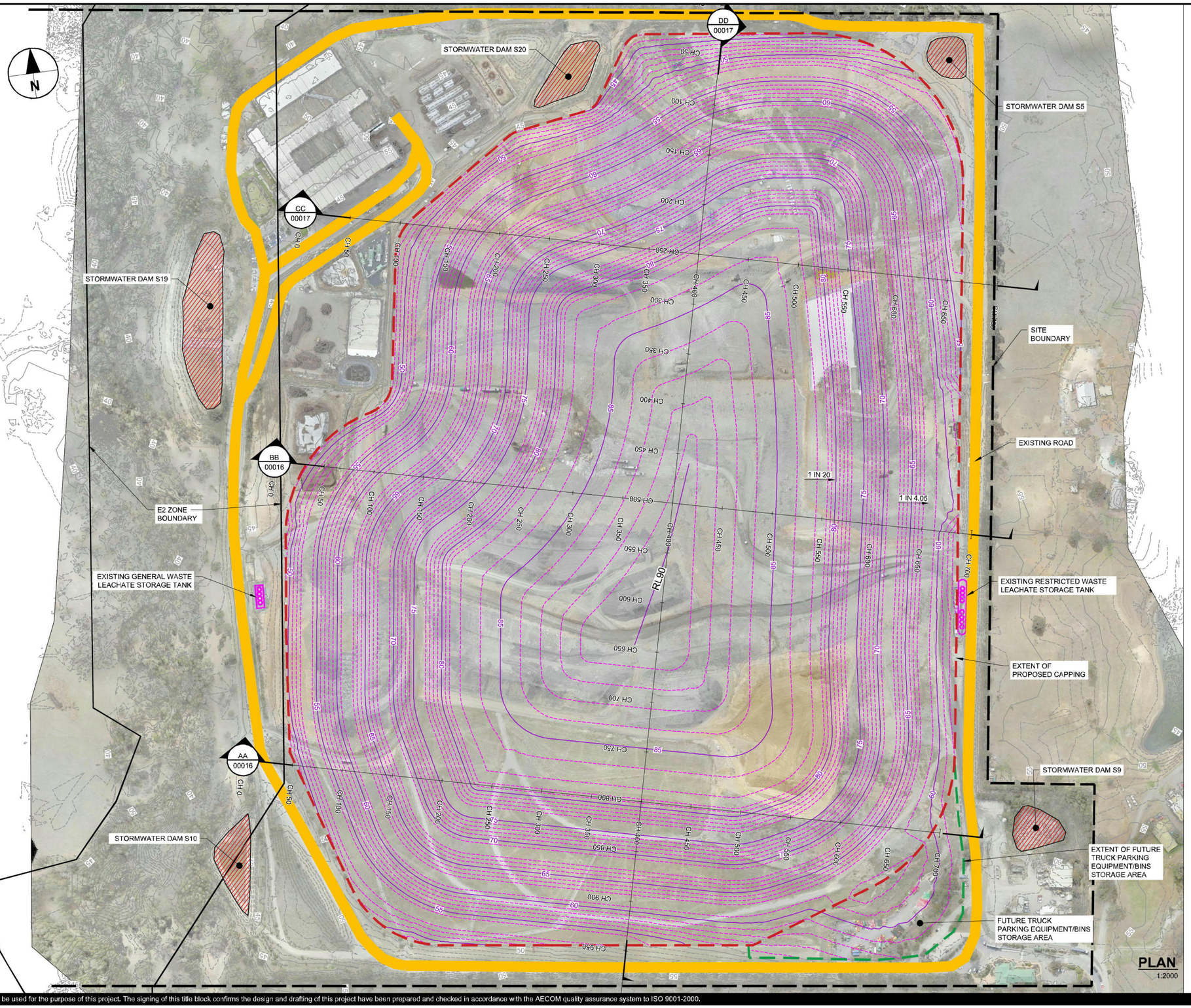
SHEET TITLE

BADGERYS CREEK LANDFILL
PROPOSED FINAL ACCESS ROAD
LONG SECTION

SHEET NUMBER

60571292-SHT-CI-00014

ISO A1 594mm x 841mm



PLAN
1:2000

LEGEND:

- EXISTING GROUND CONTOURS MAJOR (5m)
- EXISTING GROUND CONTOURS MINOR (1m)
- PROPOSED DESIGN CAP CONTOURS MAJOR (5m)
- PROPOSED DESIGN CAP CONTOURS MINOR (1m)
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- EXISTING ROAD
- EXISTING STORMWATER POND
- EXISTING LEACHATE STORAGE TANKS
- EXTENT OF PROPOSED NEW CAPPING
- EXTENT OF FUTURE PARKING/STORAGE AREA
- EXTENT OF APPROXIMATE CATCHMENT
- EXTENT OF STAGE FILLING BOUNDARY
- PROPOSED ROAD
- DIRECTION OF SHEET FLOW
- BENCH DRAIN
- SLOPE / SWALE DRAIN

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PROJECT

SUEZ BADGERYS CREEK LANDFILL EXPANSION PROJECT

CLIENT

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0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS		
QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA			
DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION		
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

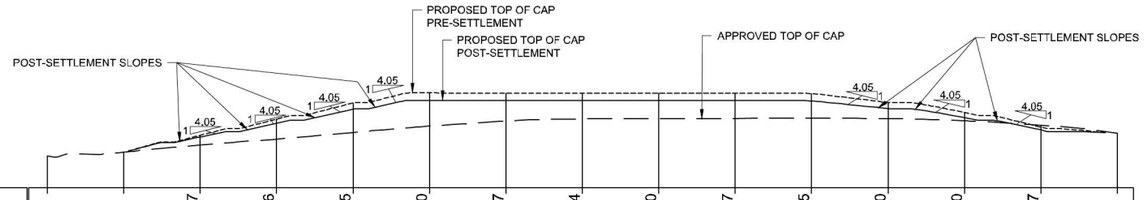
60571292

SHEET TITLE

BADGERYS CREEK LANDFILL
PROPOSED FINAL LANDFORM
POST-SETTLEMENT CONTOURS

SHEET NUMBER

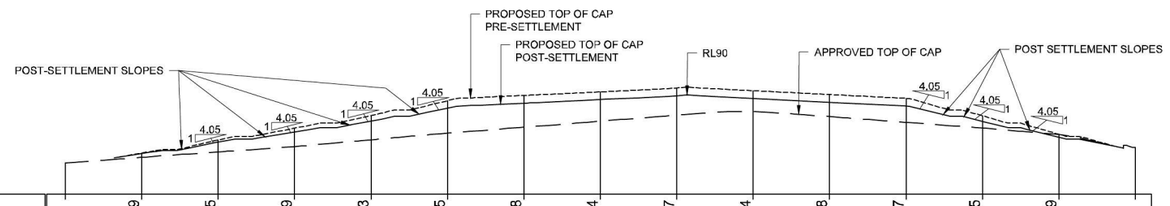
60571292-SHT-CI-00015



DATUM 24.0

CHAINAGES	PROPOSED TOP OF CAP PRE-SETTLEMENT	PROPOSED TOP OF CAP POST-SETTLEMENT	APPROVED TOP OF CAP
0			44.947
50			47.464
100	58.467	57.327	52.065
150	69.056	66.449	56.063
200	79.645	75.613	60.365
250	86.230	81.394	64.486
300	86.217	81.382	67.802
350	86.204	81.371	69.245
400	86.190	81.359	69.363
450	86.177	81.347	69.554
500	85.705	80.932	69.642
550	80.000	75.920	69.343
600	73.260	70.089	67.944
650	63.837	61.929	65.065
700			59.939

SECTION AA
SCALE 1:2000 @A1



DATUM 25.0

CHAINAGES	PROPOSED TOP OF CAP PRE-SETTLEMENT	PROPOSED TOP OF CAP POST-SETTLEMENT	APPROVED TOP OF CAP
0			45.319
50	51.799	51.502	49.013
100	60.375	58.957	52.535
150	68.109	65.629	56.087
200	76.333	72.748	60.568
250	86.115	81.293	64.857
300	89.578	84.578	68.768
350	91.904	86.904	72.701
400	94.427	89.427	76.655
450	92.674	87.674	79.000
500	90.178	85.178	75.685
550	87.687	82.687	71.973
600	76.195	72.628	68.175
650	64.179	62.224	63.972
700			55.647

SECTION BB
SCALE 1:2000 @A1

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

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0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

QL		
DESIGNER	CHECKED	APPROVED

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	DRAFT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

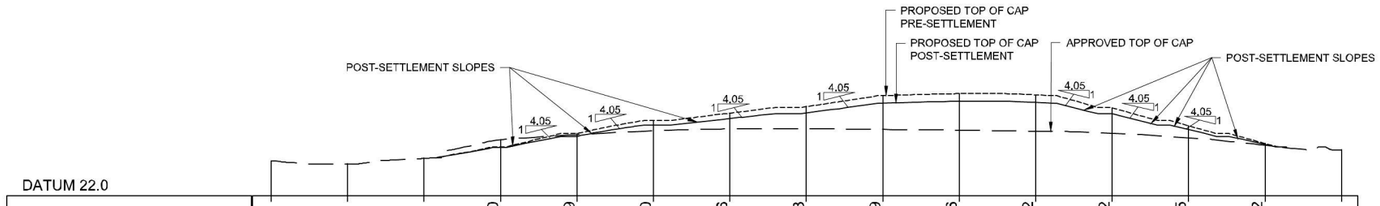
60571292

SHEET TITLE

BADGERYS CREEK LANDFILL
POST-SETTLEMENT FINAL LANDFORM SECTIONS
SECTION SHEET 01 OF 02

SHEET NUMBER

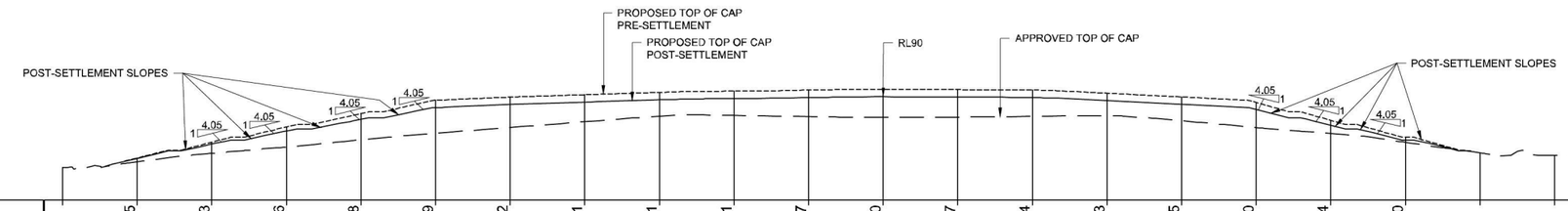
60571292-SHT-CI-00016



DATUM 22.0

CHAINAGES	PROPOSED TOP OF CAP PRE-SETTLEMENT	PROPOSED TOP OF CAP POST-SETTLEMENT	APPROVED TOP OF CAP
0			45.000
50			43.178
100			47.023
150	54.200	53.680	58.829
200	62.899	61.116	62.030
250	71.400	68.480	64.564
300	76.176	72.612	65.861
350	80.473	76.336	65.937
400	87.669	82.669	65.500
450	88.976	83.976	65.031
500	88.172	83.172	64.367
550	79.662	75.627	63.016
600	67.905	65.452	60.051
650	56.342	55.676	55.131
700			52.371

SECTION CC
SCALE 1:2000 @A1



DATUM 21.0

CHAINAGES	PROPOSED TOP OF CAP PRE-SETTLEMENT	PROPOSED TOP OF CAP POST-SETTLEMENT	APPROVED TOP OF CAP
0			42.660
50	49.005	48.734	46.404
100	59.563	58.264	52.108
150	69.736	67.039	56.349
200	78.818	74.898	61.142
250	87.669	82.669	65.500
300	89.742	84.742	69.402
350	91.331	86.331	73.312
400	92.891	87.891	76.974
450	93.731	88.731	77.436
500	94.427	89.427	76.655
550	94.990	89.990	76.231
600	94.717	89.717	76.304
650	94.494	89.494	76.921
700	92.333	87.333	77.205
750	89.835	84.835	73.967
800	86.190	81.359	69.363
850	74.164	70.871	65.331
900	62.800	61.030	59.442
950			52.376
1000			50.791
1019			50.992

SECTION DD
SCALE 1:2000 @A1

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PROJECT

SUEZ BADGERYS CREEK
LANDFILL EXPANSION
PROJECT

CLIENT

SUEZ

0 50 100 m
1:2000

PROJECT MANAGEMENT INITIALS

DESIGNER	CHECKED	APPROVED
QL		

PROJECT DATA

DATUM	AHD	SURVEY	MGA 56

ISSUE/REVISION

I/R	DATE	DESCRIPTION
B	04.02.2019	FINAL DRAFT REVISED
A	01.11.2018	DRAFT

PROJECT NUMBER

60571292

SHEET TITLE

BADGERYS CREEK LANDFILL
POST-SETTLEMENT FINAL LANDFORM SECTIONS
SECTION SHEET 02 OF 02

SHEET NUMBER

60571292-SHT-CI-00017

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Annexure B – Water balance results

Approved Design

Water Balance - Approval Design Final Cap (1978)

90th Percentile Year

Final Cap Area (m^2) 516,640.00

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	mm	m3	Percent
Precipitation (Taken from BOM Data)															
	228	19.6	327.7	84.6	64.6	187.1	9.2	21.5	37.6	50.1	138.1	115.7	1,283.80	663,339	100%
Runoff (Calculated using HELP)															
Final Cap Area	104.41	0	251.62	40.9	6.82	128.38	0	0	0	0	36.48	47.23	615.84	318,204	47.97%
Evapotranspiration (Calculated using HELP)															
Final Cap Area	99.58	34.76	60.04	59.2	30.42	59.94	22.37	10.76	44.29	46.84	89.32	52.79	610.31	315,343	47.54%
Drainage (calculated using HELP)															
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Total Excess Leachate (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-		
Leakage (calculated using HELP)															
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Total Leakage (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-		
Average head on top of basal liner (calculated using HELP)															
Final Cap Area													0		

Water Balance - Approval Design Final Cap (1967-1986)

Annual Average

Final Cap Area (m^2) 516,640.00

Parameter	mm	m3	Percent
Precipitation (Calculated using HELP)			
	1359.96	702,689	100%
Runoff (Calculated using HELP)			
Final Cap Area	730.477	377,438	53.71%
Evapotranspiration (Calculated using HELP)			
Final Cap Area	582.378	300,914	42.82%
Drainage (calculated using HELP)			
Final Cap Area	0	0	0%
Total Excess Leachate			
Leakage (calculated using HELP)			
Final Cap Area	0	0	0%
Total Leakage (m^3)	-		
Average head on top of basal liner (calculated using HELP)			
Final Cap Area	0		

Water Balance - Approval Design Final Cap (1967-1986)

Daily Peak

Final Cap Area (m^2) 516,640.00

Parameter	mm	m3
Precipitation (Calculated using HELP)		
	220	113,674
Runoff (Calculated using HELP)		
Final Cap Area	220	113,674
Drainage (calculated using HELP)		
Final Cap Area	0	0
Total Excess Leachate	0	0
Leakage (calculated using HELP)		
Final Cap Area	0	0
Total Leakage (m^3)	0	0
Average head on top of basal liner (calculated using HELP)		
Final Cap Area	0	

Water Balance - Approval Design Final Cap (1967-1986)

Average Monthly

Final Cap Area (m^2) 516,640.00

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	mm
Precipitation (Calculated using HELP)													
	145.63	118.5	146.64	89.34	90.62	75.82	78.51	102.8	101.46	127.7	151.2	131.71	1,359.93
Pan Evaporation (Taken from BOM Data)													
													0
Runoff (Calculated using HELP)													
Final Cap Area	71.13	54.196	81.097	49.091	48.183	40.97	49.359	68.733	55.869	62.24	78.486	71.123	730.48
Evapotranspiration (Calculated using HELP)													
Final Cap Area	66.59	61.769	64.297	37.295	36.908	33.077	28.375	30.214	39.967	61.152	69.063	53.672	582.38
Drainage (calculated using HELP)													
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	-
Total Excess Leachate (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-
Leakage (calculated using HELP)													
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	-
Total Leakage (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-
Average head on top of basal liner (calculated using HELP)													
Final Cap Area													0

Proposed Design

Water Balance - Proposed Design Final Cap (1978)

90th Percentile Year

Final Cap Area (m^2) 516,640.00

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	mm	m3	Percent
Precipitation (Taken from BOM Data)															
	228	19.6	327.7	84.6	64.6	187.1	9.2	21.5	37.6	50.1	138.1	115.7	1283.8	662,697	100%
Runoff (Calculated using HELP)															
Final Cap Area	104.41	0	251.62	40.9	6.82	128.38	0	0	0	0	36.48	47.23	615.84	317,897	47.97%
Evapotranspiration (Calculated using HELP)															
Final Cap Area	99.58	34.76	60.04	59.2	30.42	59.94	22.37	10.76	44.29	46.84	89.32	52.79	610.31	315,038	47.54%
Drainage (calculated using HELP)															
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Total Excess Leachate (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-		
Leakage (calculated using HELP)															
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Total Leakage (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-		
Average head on top of basal liner (calculated using HELP)															
Final Cap Area													0		

Water Balance - Proposed Design Final Cap (1967-1986)

Annual Average

Final Cap Area (m^2) 516,640.00

Parameter	mm	m3	Percent
Precipitation (Calculated using HELP)			
	1,360	702,689	100%
Runoff (Calculated using HELP)			
Final Cap Area	730	377,072	53.7%
Evapotranspiration (Calculated using HELP)			
Final Cap Area	582	300,623	42.8%
Drainage (calculated using HELP)			
Final Cap Area	0	0	0
Total Excess Leachate	0	0	0
Leakage (calculated using HELP)			
Final Cap Area	0	0	0
Total Leakage (m^2)	0	0	0
Average head on top of basal liner (calculated using HELP)			
Final Cap Area	0		

Water Balance - Proposed Design Final Cap (1967-1986)

Daily Peak

Final Cap Area (m^2) 516,640.00

Parameter	mm	m3
Precipitation (Calculated using HELP)		
	220	113,564
Runoff (Calculated using HELP)		
Final Cap Area	220	113,564
Drainage (calculated using HELP)		
Final Cap Area	0	0
Total Excess Leachate	0	0
Leakage (calculated using HELP)		
Final Cap Area	0	0
Total Leakage (m^3)	0	0
Average head on top of basal liner (calculated using HELP)		
Final Cap Area	0	

Water Balance - Proposed Design Final Cap (1967-1986)

Average Monthly

Final Cap Area (m^2) 516,640.00

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	mm
Precipitation (Calculated using HELP)													
	145.63	118.50	146.64	89.34	90.62	75.82	78.51	102.80	101.46	127.70	151.20	131.71	1,360
Runoff (Calculated using HELP)													
Final Cap Area	71.13	54.20	81.10	49.09	48.18	40.97	49.36	68.73	55.87	62.24	78.49	71.12	730
Evapotranspiration (Calculated using HELP)													
Final Cap Area	66.59	61.77	64.30	37.30	36.91	33.08	28.38	30.21	39.97	61.15	69.06	53.67	582.4
Drainage (calculated using HELP)													
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Excess Leachate (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-
Leakage (calculated using HELP)													
Final Cap Area	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Leakage (m^3)	-	-	-	-	-	-	-	-	-	-	-	-	-
Average head on top of basal liner (calculated using HELP)													
Final Cap Area													0

Intermediate Capping

Water Balance - Intermediate Cap (1978)

90th Percentile Year

Stage 1 Cap Area (m^2)	215,900
Stage 2 Cap Area (m^2)	211,000

Intermediate Cap Stage 1
Approved Final Cap Stage 2

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	mm	m3	Percent
Precipitation (Taken from BOM Data)															
Intermediate Cover Area - Stage 1	228	19.6	327.7	84.6	64.6	187.1	9.2	21.5	37.6	50.1	138.1	115.7	1283.8	276,017	100.00%
Approved Final Cap Area - Stage 2														270,882	100.00%
Total Precipitation														546,899	
Runoff (Calculated using HELP)															
Intermediate Cover Area - Stage 1	99.1	0	253.06	32.34	9.47	114.18	0	0	0	3.77	36.38	38.49	586.79	126,162	45.71%
Approved Final Cap Area - Stage 2	104.41	0	251.62	40.9	6.82	128.38	0	0	0	0	36.48	47.23	615.84	129,942	47.97%
*Stage 3 area - not applicable**															
Total Runoff	203.51	0	504.68	73.24	16.29	242.56	0	0	0	3.77	72.86	85.72	1202.63	256,105	
Evapotranspiration (Calculated using HELP)															
Intermediate Cover Area - Stage 1	96.43	29.51	59.77	55.54	25.47	59.94	17.43	4.97	34.77	44.58	87.38	51.73	567.52	122,017	44.21%
Approved Final Cap Area - Stage 2	99.58	34.76	60.04	59.2	30.42	59.94	22.37	10.76	44.29	46.84	89.32	52.79	610.31	128,774	47.54%
*Stage 3 area - not applicable**															
Total Evapotranspiration	196.01	64.27	119.81	114.74	55.89	119.88	39.8	15.73	79.06	91.42	176.7	104.52	1177.83	250,790	
Drainage (calculated using HELP)															
Intermediate Cover Area - Stage 1	0.242	0.004	0.049	0.17	0.07	0.113	0	0.012	0.306	0.199	0.19	0.093	1.448	311	0.11%
Approved Final Cap Area - Stage 2	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0.00%
*Stage 3 area - not applicable**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Excess Leachate	0.242	0.004	0.049	0.17	0.07	0.113	0	0.012	0.306	0.199	0.19	0.093	1.448	311	
Leakage (calculated using HELP)															
Intermediate Cover Area - Stage 1	1.831	0.016	0.401	1.08	0.457	0.682	0	0.186	1.889	1.264	1.211	0.609	9.626	2,070	0.75%
Approved Final Cap Area - Stage 2	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0.00%
*Stage 3 area - not applicable**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Leakage	395.31	3.45	86.58	233.17	98.67	147.24	-	40.16	407.84	272.90	261.45	131.48		2,070	
Average head on top of basal liner (calculated using HELP)															
Intermediate Cover Area - Stage 1													0.0081		
Approved Final Cap Area - Stage 2													0		
*Stage 3 area - not applicable**													-		

**The area on which Stage 3 would be placed is the restricted waste cell. Leachate from the restricted waste cell would be collected in the restricted leachate tanks therefore has not been included above.*

Annexure C – HELP model results

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 ******************************************************************************
 ******************************************************************************
 **                                                                          **
 **                                                                          **
 **              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
 **                                                                          **
 **              HELP Version 3.95 D          (10 August 2012)               **
 **                                developed at                              **
 **        Institute of Soil Science, University of Hamburg, Germany         **
 **                                  based on                                **
 **              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)               **
 **                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
 **                    USAE WATERWAYS EXPERIMENT STATION                     **
 **              FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             **
 **                                                                          **
 **                                                                          **
 ******************************************************************************
 ******************************************************************************


 TIME:  11.21     DATE:  15.02.2019


 PRECIPITATION DATA FILE:      P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Rainfall\02 Rainfall HELP Model
File\Rainfall_1967_1996.d4
 TEMPERATURE DATA FILE:        P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Temperature\02 HELP MOdel
file\Temp_1967_1986.d7
 SOLAR RADIATION DATA FILE:    P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Solar Radiation\SolarRad_1990_2017.d13
 EVAPOTRANSPIRATION DATA F. 1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Evapotranspiration\EvoData_Final Cap.d11
 SOIL AND DESIGN DATA FILE  1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01a Soil and Design Files\Final
Profiles\01_FinalCapwithBase_Approved Design.d10
 OUTPUT DATA FILE:             P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\01 Approved Design_Final
Cap\01_FinalCapwithBase_Approved Design.out
 DAILY OUTPUT DATA FILE:       P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\01 Approved Design_Final
Cap\01_FinalCapwithBase_Approved Design.DAY
 MONTHLY OUTPUT DATA FILE:     P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\01 Approved Design_Final
Cap\01_FinalCapwithBase_Approved Design.MON
 YEARLY OUTPUT DATA FILE:      P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\01 Approved Design_Final
Cap\01_FinalCapwithBase_Approved Design.YR

 COLUMNS OF DAILY OUTPUT DATA FILE:

      1    DATE (yyyymmdd)
      2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
```

```
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
    10    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
    11    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  7 (CM)
    12    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
    13    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
     7    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     8    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  7 (CM)
     9    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
    10    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
     8    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)
     9    CHANGE IN TOTAL WATER STORAGE (MM)
    10    CHANGE IN SOIL WATER STORAGE (MM)
    11    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    12    CHANGE IN SNOW WATER STORAGE (MM)
    13    ANNUAL WATER BUDGET BALANCE (MM)

WARNING:  SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967


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     TITLE:  Elizabeth Drive Approved Design - Final Cap

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                            WEATHER DATA SOURCES
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NOTE: PRECIPITATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

NOTE: TEMPERATURE DATA FOR Badgerys Creek NSW
WAS ENTERED FROM A TEXT FILE.

NOTE: SOLAR RADIATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

****

LAYER DATA 1

VALID FOR 20 YEARS

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 8

THICKNESS	=	30.00	CM
POROSITY	=	0.4630	VOL/VOL
FIELD CAPACITY	=	0.2320	VOL/VOL
WILTING POINT	=	0.1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3700E-03	CM/SEC

LAYER 2

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	50.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL

INITIAL SOIL WATER CONTENT	=	0.4270 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 28

THICKNESS	=	30.00 CM
POROSITY	=	0.4520 VOL/VOL
FIELD CAPACITY	=	0.4110 VOL/VOL
WILTING POINT	=	0.3110 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4110 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1200E-05 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION 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	=	0.0320 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	5000.00 CM
POROSITY	=	0.3025 VOL/VOL
FIELD CAPACITY	=	0.0890 VOL/VOL
WILTING POINT	=	0.0330 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0800 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1350E-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	=	0.0320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000	CM/SEC
SLOPE	=	5.00	PERCENT
DRAINAGE LENGTH	=	50.0	METERS

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	100.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06	CM/SEC

****

GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 20 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 5.% AND A SLOPE LENGTH OF 380. METERS.

SCS RUNOFF CURVE NUMBER	=	70.62	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	51.6700	HECTARES
EVAPORATIVE ZONE DEPTH	=	12.5	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	2.900	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.787	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	2.900	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.450	CM
SOIL EVAPORATION ZONE DEPTH	=	12.5	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.000	CM
INITIAL WATER IN LAYER MATERIALS	=	485.260	CM
TOTAL INITIAL WATER	=	485.260	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

****

EVAPOTRANSPIRATION DATA 1

VALID FOR 20 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Sydney New South Wales

STATION LATITUDE	=	-33.87 DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00
START OF GROWING SEASON (JULIAN DATE)	=	0
END OF GROWING SEASON (JULIAN DATE)	=	367
EVAPORATIVE ZONE DEPTH	=	12.5 CM
AVERAGE ANNUAL WIND SPEED	=	10.00 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	57.7 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	62.2 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	57.5 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	49.0 %

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WARNING: SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967

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MONTHLY TOTALS (MM) FOR YEAR 1967

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	172.4	68.0	146.6	17.9	18.2	141.1
	9.5	179.3	70.8	55.7	28.6	17.5
RUNOFF	52.57	0.00	98.14	0.00	0.00	57.49
	0.30	130.19	42.98	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	181.30	148.52	142.38	100.20	87.64	67.86
	78.30	93.72	120.23	181.33	227.02	220.31
ACTUAL EVAPOTRANSPIRATION	49.41	76.92	61.88	12.47	11.02	54.98
	33.50	36.48	41.40	47.35	22.16	10.21
PERCOLATION/LEAKAGE THROUGH	1.120	3.608	3.979	3.654	3.725	3.936
LAYER 2	3.939	3.921	3.755	3.812	3.637	3.689
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	4.776	24.566	24.276	20.481	19.547	25.921
TOP OF LAYER 2	23.532	23.203	22.437	21.171	20.162	18.860
STD. DEVIATION OF DAILY	10.201	2.385	2.416	0.438	0.866	3.394
HEAD ON TOP OF LAYER 2	2.301	2.340	2.809	3.080	0.538	0.511
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1967

	MM	CU. METERS	PERCENT
PRECIPITATION	925.60	478257.531	100.00
RUNOFF	381.674	197210.859	41.24
POTENTIAL EVAPOTRANSPIRATION	1648.789	851929.062	
ACTUAL EVAPOTRANSPIRATION	457.770	236529.953	49.46
PERC./LEAKAGE THROUGH LAYER 2	42.774494	22101.578	4.62
AVG. HEAD ON TOP OF LAYER 2	207.4422		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	86.155	44516.391	9.31
SOIL WATER AT START OF YEAR	4852.599	2507337.500	

SOIL WATER AT END OF YEAR	4938.754	2551854.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.300	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1991 USED WITH PRECIPITATION FOR YEAR 1968

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MONTHLY TOTALS (MM) FOR YEAR 1968

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	171.9	19.3	106.3	17.3	96.0	6.9
	25.0	20.6	1.3	1.3	16.2	83.1
RUNOFF	84.58	0.00	4.30	0.00	48.47	0.00
	0.00	0.00	0.00	0.00	0.00	10.11
POTENTIAL EVAPOTRANSPIRATION	208.63	189.96	183.33	128.39	83.76	64.31
	78.01	106.02	137.94	186.13	228.18	210.86
ACTUAL EVAPOTRANSPIRATION	82.42	19.65	90.63	20.03	39.14	14.93
	9.92	27.00	8.32	2.57	5.33	43.81
PERCOLATION/LEAKAGE THROUGH	3.951	3.612	3.903	3.633	3.924	3.636
LAYER 2	3.655	3.733	3.503	3.525	3.335	3.780
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	23.751	22.076	22.867	20.085	23.246	20.136
TOP OF LAYER 2	18.231	19.683	17.572	15.813	14.329	20.572
STD. DEVIATION OF DAILY	3.182	0.940	3.179	1.263	3.993	1.302
HEAD ON TOP OF LAYER 2	1.282	0.446	0.748	0.448	0.424	3.490
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1968

	MM	CU. METERS	PERCENT
PRECIPITATION	565.20	292038.938	100.00
RUNOFF	147.462	76193.625	26.09
POTENTIAL EVAPOTRANSPIRATION	1805.524	932914.375	
ACTUAL EVAPOTRANSPIRATION	363.736	187942.391	64.36
PERC./LEAKAGE THROUGH LAYER 2	44.189240	22832.578	7.82
AVG. HEAD ON TOP OF LAYER 2	198.6335		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	54.002	27902.896	9.55
SOIL WATER AT START OF YEAR	4938.754	2551854.000	
SOIL WATER AT END OF YEAR	4992.756	2579756.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	

SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1992 USED WITH PRECIPITATION FOR YEAR 1969

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MONTHLY TOTALS (MM) FOR YEAR 1969

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	37.3	223.9	133.6	181.8	14.1	66.4
	14.9	90.9	39.0	92.1	263.3	28.2
RUNOFF	5.35	138.77	55.04	151.73	0.00	18.97
	0.00	13.44	0.00	12.34	179.25	0.00
POTENTIAL EVAPOTRANSPIRATION	211.32	147.35	163.27	120.63	84.00	68.12
	81.33	104.62	116.68	167.01	188.89	223.16
ACTUAL EVAPOTRANSPIRATION	48.51	61.61	58.16	55.48	14.93	30.01
	19.35	55.37	47.92	53.09	101.23	23.90
PERCOLATION/LEAKAGE THROUGH	3.874	3.510	3.871	3.845	3.694	3.720
LAYER 2	3.815	3.898	3.761	3.832	3.932	3.870
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.325	22.537	22.268	24.167	18.959	21.762
TOP OF LAYER 2	21.225	22.768	22.548	21.542	25.858	22.236
STD. DEVIATION OF DAILY	2.809	3.840	2.473	2.401	1.072	4.172
HEAD ON TOP OF LAYER 2	1.089	3.897	1.631	1.358	2.009	0.583

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1969

	MM	CU. METERS	PERCENT
PRECIPITATION	1185.50	612547.938	100.00
RUNOFF	574.894	297047.875	48.49
POTENTIAL EVAPOTRANSPIRATION	1676.374	866182.250	
ACTUAL EVAPOTRANSPIRATION	569.569	294296.406	48.04
PERC./LEAKAGE THROUGH LAYER 2	45.622112	23572.943	3.85
AVG. HEAD ON TOP OF LAYER 2	223.4960		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	41.036	21203.230	3.46
SOIL WATER AT START OF YEAR	4992.756	2579756.750	
SOIL WATER AT END OF YEAR	5033.792	2600960.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0007	0.350	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1993 USED WITH PRECIPITATION FOR YEAR 1970

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MONTHLY TOTALS (MM) FOR YEAR 1970

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	33.9	72.9	23.7	20.5	17.8
	0.3	10.7	120.5	29.2	90.7	201.1
RUNOFF	0.00	0.00	0.39	0.00	0.00	0.00
	0.00	0.00	39.76	0.00	6.14	110.89
POTENTIAL EVAPOTRANSPIRATION	189.21	178.75	158.54	123.33	84.61	70.20
	80.14	99.20	121.38	194.46	191.15	223.10
ACTUAL EVAPOTRANSPIRATION	84.49	38.25	74.68	18.92	25.74	13.93
	9.65	7.76	46.44	37.15	78.70	80.22
PERCOLATION/LEAKAGE THROUGH	3.864	3.487	3.954	3.703	3.820	3.559
LAYER 2	3.629	3.545	3.790	3.855	3.774	4.015
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.138	22.061	23.809	21.442	21.318	18.653
TOP OF LAYER 2	17.752	16.172	23.112	21.973	22.808	24.952
STD. DEVIATION OF DAILY	1.871	1.253	2.182	1.211	0.937	0.379
HEAD ON TOP OF LAYER 2	0.489	0.450	2.613	0.972	2.334	2.199
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1970

	MM	CU. METERS	PERCENT
PRECIPITATION	722.80	373470.781	100.00
RUNOFF	157.178	81213.711	21.75
POTENTIAL EVAPOTRANSPIRATION	1714.050	885649.750	
ACTUAL EVAPOTRANSPIRATION	515.929	266580.625	71.38
PERC./LEAKAGE THROUGH LAYER 2	44.995773	23249.314	6.23
AVG. HEAD ON TOP OF LAYER 2	213.4905		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	49.693	25676.617	6.88
SOIL WATER AT START OF YEAR	5033.792	2600960.000	
SOIL WATER AT END OF YEAR	5083.485	2626636.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.175	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1994 USED WITH PRECIPITATION FOR YEAR 1971

MONTHLY TOTALS (MM) FOR YEAR 1971

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.5	149.5	58.8	32.2	25.2	3.4
	8.1	43.2	33.8	2.3	75.5	172.0
RUNOFF	3.49	62.47	0.31	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	71.01
POTENTIAL EVAPOTRANSPIRATION	227.77	167.65	151.88	120.20	85.53	66.71
	78.71	107.77	137.91	191.49	198.93	225.55
ACTUAL EVAPOTRANSPIRATION	32.21	97.09	58.86	36.02	16.62	9.38
	7.81	36.19	35.49	8.90	32.14	114.89
PERCOLATION/LEAKAGE THROUGH	3.799	3.621	3.953	3.818	3.792	3.674
LAYER 2	3.697	3.714	3.595	3.602	3.618	3.989
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.918	24.844	23.792	23.641	20.790	20.866
TOP OF LAYER 2	19.012	19.336	19.358	17.240	19.784	24.461
STD. DEVIATION OF DAILY	1.582	1.914	1.858	1.817	1.014	0.574
HEAD ON TOP OF LAYER 2	0.505	2.851	1.102	0.719	3.716	2.416
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 1971

	MM	CU. METERS	PERCENT
PRECIPITATION	659.50	340763.562	100.00
RUNOFF	137.282	70933.812	20.82
POTENTIAL EVAPOTRANSPIRATION	1760.094	909440.438	
ACTUAL EVAPOTRANSPIRATION	485.584	250901.031	73.63
PERC./LEAKAGE THROUGH LAYER 2	44.870499	23184.584	6.80
AVG. HEAD ON TOP OF LAYER 2	211.7022		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	36.634	18928.688	5.55
SOIL WATER AT START OF YEAR	5083.485	2626636.750	
SOIL WATER AT END OF YEAR	5120.119	2645565.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1995 USED WITH PRECIPITATION FOR YEAR 1972

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MONTHLY TOTALS (MM) FOR YEAR 1972

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

PRECIPITATION	311.2	64.7	85.2	58.2	20.3	46.2
	0.5	33.5	21.4	157.7	61.6	30.7
RUNOFF	179.33	5.94	44.75	16.26	0.00	5.59
	0.00	0.00	0.00	59.86	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	167.25	172.71	151.98	115.89	81.31	67.52
	81.78	109.67	134.36	175.05	171.78	232.00
ACTUAL EVAPOTRANSPIRATION	116.65	65.12	46.96	37.97	12.05	24.60
	21.98	10.76	12.51	89.07	71.96	26.61
PERCOLATION/LEAKAGE THROUGH	4.065	3.681	3.910	3.715	3.641	3.607
LAYER 2	3.779	3.644	3.617	3.926	3.832	3.781
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	25.891	23.459	23.000	21.664	17.963	19.574
TOP OF LAYER 2	20.553	18.018	19.771	23.282	23.929	20.580
STD. DEVIATION OF DAILY	2.583	1.728	2.808	2.689	0.690	4.561
HEAD ON TOP OF LAYER 2	1.991	1.225	0.249	3.290	1.164	0.552
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1972

	MM	CU. METERS	PERCENT
PRECIPITATION	891.20	460482.656	100.00

RUNOFF	311.731	161071.375	34.98
POTENTIAL EVAPOTRANSPIRATION	1661.302	858394.688	
ACTUAL EVAPOTRANSPIRATION	536.237	277073.719	60.17
PERC./LEAKAGE THROUGH LAYER 2	45.197464	23353.527	5.07
AVG. HEAD ON TOP OF LAYER 2	214.7374		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	43.232	22338.098	4.85
SOIL WATER AT START OF YEAR	5120.119	2645565.250	
SOIL WATER AT END OF YEAR	5163.352	2667903.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0010	-0.526	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1996 USED WITH PRECIPITATION FOR YEAR 1973

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MONTHLY TOTALS (MM) FOR YEAR 1973

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	99.0	280.5	45.3	30.8	21.1	17.4
	62.6	42.6	21.8	83.7	124.8	27.2
RUNOFF	59.36	116.15	16.30	0.00	3.37	0.00
	0.00	0.00	0.00	9.57	15.43	0.00

POTENTIAL EVAPOTRANSPIRATION	187.12	166.74	161.89	126.72	89.06	69.16
	81.39	101.33	141.58	176.31	206.52	225.58
ACTUAL EVAPOTRANSPIRATION	27.55	151.47	40.47	14.14	41.12	10.87
	48.26	28.26	26.69	78.15	92.04	26.28
PERCOLATION/LEAKAGE THROUGH	3.796	3.740	3.858	3.605	3.879	3.475
LAYER 2	3.881	3.834	3.698	3.894	3.822	3.778
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.872	27.300	22.018	19.545	22.410	17.043
TOP OF LAYER 2	22.449	21.575	21.331	22.687	23.738	20.527
STD. DEVIATION OF DAILY	2.393	1.812	2.472	0.350	3.185	0.563
HEAD ON TOP OF LAYER 2	3.360	1.693	1.435	2.187	2.898	1.210
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1973

	MM	CU. METERS	PERCENT
PRECIPITATION	856.80	442708.656	100.00
RUNOFF	220.179	113766.719	25.70
POTENTIAL EVAPOTRANSPIRATION	1733.405	895650.188	
ACTUAL EVAPOTRANSPIRATION	585.293	302421.031	68.31
PERC./LEAKAGE THROUGH LAYER 2	45.260376	23386.033	5.28

AVG. HEAD ON TOP OF LAYER 2	217.9122			
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00	
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00	
AVG. HEAD ON TOP OF LAYER 7	0.0000			
CHANGE IN WATER STORAGE	51.327	26520.508	5.99	
SOIL WATER AT START OF YEAR	5163.352	2667903.500		
SOIL WATER AT END OF YEAR	5214.678	2694424.000		
INTERCEPTION WATER AT START OF YEAR	0.000	0.000		
INTERCEPTION WATER AT END OF YEAR	0.000	0.000		
SNOW WATER AT START OF YEAR	0.000	0.000	0.00	
SNOW WATER AT END OF YEAR	0.000	0.000	0.00	
ANNUAL WATER BUDGET BALANCE	0.0008	0.401	0.00	

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WARNING: SOLAR RADIATION FOR YEAR 1997 USED WITH PRECIPITATION FOR YEAR 1974

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MONTHLY TOTALS (MM) FOR YEAR 1974

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	126.7	93.3	239.8	114.6	168.0	100.8
	5.0	65.2	20.8	72.0	48.2	2.4
RUNOFF	66.44	52.79	147.83	45.04	114.56	56.69
	0.00	8.27	3.24	3.93	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	191.44	169.05	162.24	122.83	86.70	67.92
	80.07	104.40	118.76	187.25	185.27	204.27
ACTUAL EVAPOTRANSPIRATION	63.64	32.92	86.17	60.78	47.76	54.95
	14.93	17.71	39.78	49.86	45.23	11.88
PERCOLATION/LEAKAGE THROUGH	3.855	3.425	3.981	3.864	4.043	3.890

LAYER 2	3.679	3.628	3.759	3.840	3.709	3.794
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.961	20.798	24.327	24.538	25.468	25.037
TOP OF LAYER 2	18.687	17.733	22.507	21.677	21.539	20.821
STD. DEVIATION OF DAILY	2.697	3.036	2.550	2.412	2.189	2.506
HEAD ON TOP OF LAYER 2	1.256	3.742	2.912	2.841	2.035	0.609
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1974

	MM	CU. METERS	PERCENT
PRECIPITATION	1056.80	546048.438	100.00
RUNOFF	498.803	257731.641	47.20
POTENTIAL EVAPOTRANSPIRATION	1680.220	868169.500	
ACTUAL EVAPOTRANSPIRATION	525.600	271577.531	49.74
PERC./LEAKAGE THROUGH LAYER 2	45.466141	23492.354	4.30
AVG. HEAD ON TOP OF LAYER 2	220.9100		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00

AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	32.396	16739.256	3.07
SOIL WATER AT START OF YEAR	5214.678	2694424.000	
SOIL WATER AT END OF YEAR	5247.075	2711163.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1998 USED WITH PRECIPITATION FOR YEAR 1975

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MONTHLY TOTALS (MM) FOR YEAR 1975

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	811.0	724.2	790.0	662.2	651.3	531.5
	588.5	565.5	619.8	680.9	751.0	810.8
RUNOFF	598.50	545.36	618.51	549.26	564.26	459.96
	498.98	469.36	488.19	495.53	562.46	590.15
POTENTIAL EVAPOTRANSPIRATION	189.94	173.88	165.26	108.96	85.48	67.19
	82.92	96.03	129.35	177.02	186.96	223.89
ACTUAL EVAPOTRANSPIRATION	181.26	172.02	164.08	108.82	85.43	67.15
	82.87	95.96	128.97	175.58	184.45	220.67
PERCOLATION/LEAKAGE THROUGH	4.216	3.819	4.236	4.120	4.266	4.131
LAYER 2	4.266	4.262	4.112	4.231	4.090	4.221
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	28.697	28.927	29.080	29.480	29.630	29.692
TOP OF LAYER 2	29.646	29.560	29.329	28.994	28.900	28.790
STD. DEVIATION OF DAILY	1.721	0.281	0.254	0.177	0.090	0.074
HEAD ON TOP OF LAYER 2	0.092	0.105	0.240	0.254	0.289	0.274
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 1975

	MM	CU. METERS	PERCENT
PRECIPITATION	8186.70	4230070.000	100.00
RUNOFF	6440.506	3327809.000	78.67
POTENTIAL EVAPOTRANSPIRATION	1686.871	871606.062	
ACTUAL EVAPOTRANSPIRATION	1667.266	861476.062	20.37
PERC./LEAKAGE THROUGH LAYER 2	49.969921	25819.455	0.61
AVG. HEAD ON TOP OF LAYER 2	292.2697		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	78.929	40782.559	0.96
SOIL WATER AT START OF YEAR	5247.075	2711163.250	
SOIL WATER AT END OF YEAR	5326.003	2751945.750	

INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0047	2.403	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1999 USED WITH PRECIPITATION FOR YEAR 1976

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MONTHLY TOTALS (MM) FOR YEAR 1976

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	231.8	100.6	199.4	26.6	13.6	67.2
	41.0	7.4	44.8	195.6	83.0	40.3
RUNOFF	142.79	18.22	115.56	0.00	0.00	13.32
	0.90	0.00	0.00	68.77	45.50	0.00
POTENTIAL EVAPOTRANSPIRATION	192.10	160.67	150.72	110.75	89.98	69.67
	80.86	103.41	120.97	156.11	188.76	205.29
ACTUAL EVAPOTRANSPIRATION	103.22	66.33	81.29	40.18	16.13	32.71
	40.02	14.93	34.85	96.07	56.47	42.33
PERCOLATION/LEAKAGE THROUGH	4.025	3.735	4.055	3.807	3.734	3.696
LAYER 2	3.937	3.772	3.753	3.958	3.820	3.839
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	25.148	24.541	25.692	23.445	19.715	21.289
TOP OF LAYER 2	23.491	20.410	22.394	23.893	23.684	21.662
STD. DEVIATION OF DAILY	2.710	1.712	2.342	1.330	0.838	4.494
HEAD ON TOP OF LAYER 2	2.168	0.950	1.719	2.536	2.345	0.884
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1976

	MM	CU. METERS	PERCENT
PRECIPITATION	1051.30	543206.875	100.00
RUNOFF	405.054	209291.281	38.53
POTENTIAL EVAPOTRANSPIRATION	1629.282	841849.812	
ACTUAL EVAPOTRANSPIRATION	624.535	322697.406	59.41
PERC./LEAKAGE THROUGH LAYER 2	46.130581	23835.668	4.39
AVG. HEAD ON TOP OF LAYER 2	229.4693		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	21.711	11217.912	2.07
SOIL WATER AT START OF YEAR	5326.003	2751945.750	
SOIL WATER AT END OF YEAR	5347.714	2763163.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.275	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2000 USED WITH PRECIPITATION FOR YEAR 1977

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MONTHLY TOTALS (MM) FOR YEAR 1977

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	46.4	166.5	130.4	8.3	109.3	50.5
	0.2	14.1	37.3	4.6	11.0	29.4
RUNOFF	0.00	73.85	73.62	0.00	42.19	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	199.88	176.14	142.13	111.61	87.41	68.34
	80.04	104.63	127.43	177.82	167.08	234.03
ACTUAL EVAPOTRANSPIRATION	50.14	66.21	67.98	12.08	40.74	52.75
	19.35	8.90	17.91	18.75	8.83	8.30
PERCOLATION/LEAKAGE THROUGH	3.851	3.525	3.963	3.605	3.881	3.881
LAYER 2	3.760	3.567	3.496	3.634	3.408	3.662
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.884	22.857	23.980	19.544	22.448	24.876
TOP OF LAYER 2	20.191	16.592	17.439	17.845	15.750	18.361
STD. DEVIATION OF DAILY	1.068	3.401	3.008	0.677	4.444	1.751
HEAD ON TOP OF LAYER 2	1.892	0.453	1.402	1.379	0.433	1.131
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000

TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1977

	MM	CU. METERS	PERCENT
PRECIPITATION	608.00	314153.594	100.00
RUNOFF	189.655	97994.500	31.19
POTENTIAL EVAPOTRANSPIRATION	1676.533	866264.750	
ACTUAL EVAPOTRANSPIRATION	371.931	192176.859	61.17
PERC./LEAKAGE THROUGH LAYER 2	44.233662	22855.531	7.28
AVG. HEAD ON TOP OF LAYER 2	201.4724		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	46.414	23982.225	7.63
SOIL WATER AT START OF YEAR	5347.714	2763163.750	
SOIL WATER AT END OF YEAR	5394.128	2787146.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.038	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2001 USED WITH PRECIPITATION FOR YEAR 1978

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MONTHLY TOTALS (MM) FOR YEAR 1978

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	228.0	19.6	327.7	84.6	64.6	187.1
	9.2	21.5	37.6	50.1	138.1	115.7
RUNOFF	104.41	0.00	251.62	40.90	6.82	128.38
	0.00	0.00	0.00	0.00	36.48	47.23
POTENTIAL EVAPOTRANSPIRATION	202.09	165.69	154.53	118.42	88.39	66.36
	76.17	102.20	127.77	187.86	188.46	223.03
ACTUAL EVAPOTRANSPIRATION	99.58	34.76	60.04	59.20	30.42	59.94
	22.37	10.76	44.29	46.84	89.32	52.79
PERCOLATION/LEAKAGE THROUGH	3.983	3.444	3.861	3.833	3.826	3.980
LAYER 2	3.879	3.731	3.620	3.751	3.833	3.914
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	24.356	21.183	22.073	23.934	21.425	26.776
TOP OF LAYER 2	22.422	19.652	19.828	20.020	23.949	23.067
STD. DEVIATION OF DAILY	3.529	2.194	4.556	2.477	3.509	2.228
HEAD ON TOP OF LAYER 2	1.167	0.791	2.101	2.566	2.730	2.337
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1978

	MM	CU. METERS	PERCENT
PRECIPITATION	1283.80	663339.188	100.00
RUNOFF	615.840	318204.406	47.97
POTENTIAL EVAPOTRANSPIRATION	1700.963	878887.688	
ACTUAL EVAPOTRANSPIRATION	610.302	315342.812	47.54
PERC./LEAKAGE THROUGH LAYER 2	45.655041	23589.957	3.56
AVG. HEAD ON TOP OF LAYER 2	223.9034		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	57.658	29792.143	4.49
SOIL WATER AT START OF YEAR	5394.128	2787146.000	
SOIL WATER AT END OF YEAR	5451.787	2816938.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.225	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2002 USED WITH PRECIPITATION FOR YEAR 1979

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MONTHLY TOTALS (MM) FOR YEAR 1979

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	21.0	14.4	65.4	21.2	69.0	67.2
	23.0	2.8	18.8	34.6	77.4	5.8
RUNOFF	0.00	0.00	0.00	0.00	12.92	30.95
	0.00	0.00	0.00	0.00	8.49	0.00
POTENTIAL EVAPOTRANSPIRATION	239.77	160.88	159.35	116.88	84.21	69.70
	81.03	103.98	138.41	191.44	204.69	255.30
ACTUAL EVAPOTRANSPIRATION	20.44	17.17	74.12	14.57	42.94	27.68
	18.48	10.42	12.40	34.53	58.09	19.35
PERCOLATION/LEAKAGE THROUGH	3.873	3.467	3.861	3.504	3.884	3.746
LAYER 2	3.802	3.814	3.618	3.658	3.562	3.749
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.305	21.667	22.072	17.589	22.499	22.259
TOP OF LAYER 2	20.985	21.209	19.794	18.290	18.714	19.988
STD. DEVIATION OF DAILY	1.254	0.410	1.925	0.553	3.376	3.145
HEAD ON TOP OF LAYER 2	1.502	0.623	0.303	1.147	3.650	1.266
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1979

	MM	CU. METERS	PERCENT
PRECIPITATION	420.60	217324.125	100.00
RUNOFF	52.361	27054.965	12.45
POTENTIAL EVAPOTRANSPIRATION	1805.641	932974.812	
ACTUAL EVAPOTRANSPIRATION	350.180	180937.766	83.26
PERC./LEAKAGE THROUGH LAYER 2	44.538631	23013.109	10.59
AVG. HEAD ON TOP OF LAYER 2	206.1409		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	18.059	9331.071	4.29
SOIL WATER AT START OF YEAR	5451.787	2816938.250	
SOIL WATER AT END OF YEAR	5469.846	2826269.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.325	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2003 USED WITH PRECIPITATION FOR YEAR 1980

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MONTHLY TOTALS (MM) FOR YEAR 1980

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	70.8	39.0	32.4	3.0	160.0	12.0

	17.4	2.8	1.4	48.4	43.2	46.1
RUNOFF	18.70	0.00	1.61	0.00	53.70	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	232.55	163.16	171.69	115.09	84.17	68.85
	79.01	109.76	150.08	187.18	208.36	218.94
ACTUAL EVAPOTRANSPIRATION	40.81	22.99	41.19	8.29	63.17	29.43
	11.42	8.58	6.96	41.29	45.26	18.26
PERCOLATION/LEAKAGE THROUGH	3.843	3.619	3.880	3.498	4.016	3.777
LAYER 2	3.733	3.680	3.480	3.585	3.544	3.775
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.746	22.210	22.425	17.478	24.979	22.865
TOP OF LAYER 2	19.682	18.693	17.124	16.929	18.370	20.479
STD. DEVIATION OF DAILY	2.189	1.590	2.278	0.887	2.984	1.842
HEAD ON TOP OF LAYER 2	0.781	0.427	0.447	1.972	2.040	1.989
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1980

	MM	CU. METERS	PERCENT
PRECIPITATION	476.50	246207.594	100.00
RUNOFF	74.003	38237.336	15.53

POTENTIAL EVAPOTRANSPIRATION	1788.847	924297.188	
ACTUAL EVAPOTRANSPIRATION	337.654	174465.844	70.86
PERC./LEAKAGE THROUGH LAYER 2	44.429825	22956.889	9.32
AVG. HEAD ON TOP OF LAYER 2	202.4835		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	64.843	33504.344	13.61
SOIL WATER AT START OF YEAR	5469.846	2826269.250	
SOIL WATER AT END OF YEAR	5534.689	2859773.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.050	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2004 USED WITH PRECIPITATION FOR YEAR 1981

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MONTHLY TOTALS (MM) FOR YEAR 1981

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	34.6	155.8	29.2	158.0	103.1	21.0
	33.0	3.2	2.9	133.3	111.8	100.8
RUNOFF	0.00	46.73	0.00	104.74	39.64	8.54
	0.00	0.00	0.00	58.79	47.20	17.08
POTENTIAL EVAPOTRANSPIRATION	224.72	170.26	160.32	122.86	89.62	68.72
	79.13	99.93	137.21	183.07	195.17	227.49

ACTUAL EVAPOTRANSPIRATION	38.06	99.31	37.74	50.68	28.44	34.89
	16.87	25.23	3.38	45.55	60.24	73.09
PERCOLATION/LEAKAGE THROUGH	3.798	3.604	3.766	3.792	3.793	3.818
LAYER 2	3.697	3.712	3.435	3.712	3.810	3.957
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.899	24.487	20.298	23.157	20.808	23.658
TOP OF LAYER 2	19.008	19.300	16.256	19.293	23.492	23.868
STD. DEVIATION OF DAILY	0.377	3.434	2.470	3.608	3.751	2.653
HEAD ON TOP OF LAYER 2	1.697	2.030	0.436	5.617	1.627	2.648
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1981

	MM	CU. METERS	PERCENT
PRECIPITATION	886.70	458157.906	100.00
RUNOFF	322.729	166753.984	36.40
POTENTIAL EVAPOTRANSPIRATION	1758.488	908610.562	
ACTUAL EVAPOTRANSPIRATION	513.478	265314.156	57.91
PERC./LEAKAGE THROUGH LAYER 2	44.893196	23196.312	5.06
AVG. HEAD ON TOP OF LAYER 2	212.1049		

DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	50.493	26089.551	5.69
SOIL WATER AT START OF YEAR	5534.689	2859773.750	
SOIL WATER AT END OF YEAR	5585.182	2885863.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0004	0.225	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2005 USED WITH PRECIPITATION FOR YEAR 1982

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MONTHLY TOTALS (MM) FOR YEAR 1982

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.1	29.9	104.2	27.8	4.6	11.2
	9.4	1.2	121.0	32.8	5.5	23.4
RUNOFF	16.52	0.00	13.62	0.00	0.00	0.00
	0.00	0.00	25.92	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	221.61	186.79	158.39	117.90	89.89	68.12
	79.45	114.95	131.86	174.52	212.62	233.41
ACTUAL EVAPOTRANSPIRATION	42.99	38.09	71.35	34.47	12.66	8.20
	7.60	6.25	46.65	55.58	12.68	6.87
PERCOLATION/LEAKAGE THROUGH	3.934	3.379	3.891	3.763	3.670	3.428
LAYER 2	3.462	3.383	3.473	3.867	3.496	3.526

LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	23.445	19.831	22.629	22.583	18.512	16.120
TOP OF LAYER 2	14.629	13.147	16.997	22.194	17.435	15.830
STD. DEVIATION OF DAILY	1.623	2.107	3.297	1.568	1.402	0.436
HEAD ON TOP OF LAYER 2	0.440	0.429	7.309	2.411	0.561	0.448
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1982

	MM	CU. METERS	PERCENT
PRECIPITATION	427.10	220682.594	100.00
RUNOFF	56.059	28965.770	13.13
POTENTIAL EVAPOTRANSPIRATION	1789.508	924638.812	
ACTUAL EVAPOTRANSPIRATION	343.393	177430.953	80.40
PERC./LEAKAGE THROUGH LAYER 2	43.270668	22357.951	10.13
AVG. HEAD ON TOP OF LAYER 2	186.1275		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		

CHANGE IN WATER STORAGE	27.648	14285.881	6.47
SOIL WATER AT START OF YEAR	5585.182	2885863.250	
SOIL WATER AT END OF YEAR	5612.831	2900149.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2006 USED WITH PRECIPITATION FOR YEAR 1983

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MONTHLY TOTALS (MM) FOR YEAR 1983

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	33.0	18.4	178.0	72.6	102.7	60.8
	516.4	561.5	653.4	661.6	710.3	776.1
RUNOFF	0.00	0.00	117.13	9.62	44.26	19.30
	418.67	453.38	508.99	490.19	518.38	563.47
POTENTIAL EVAPOTRANSPIRATION	201.63	183.81	172.57	117.43	87.53	63.85
	77.69	100.86	140.78	175.24	190.68	203.38
ACTUAL EVAPOTRANSPIRATION	35.55	10.34	52.51	31.90	59.63	52.78
	76.12	100.80	140.31	173.79	188.57	201.04
PERCOLATION/LEAKAGE THROUGH	3.686	3.203	3.767	3.741	4.042	3.913
LAYER 2	4.256	4.261	4.107	4.235	4.092	4.228
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	18.810	16.194	20.317	22.164	25.459	25.487
TOP OF LAYER 2	29.458	29.541	29.235	29.063	28.939	28.935
STD. DEVIATION OF DAILY	2.510	0.407	5.544	1.985	3.676	2.045
HEAD ON TOP OF LAYER 2	1.095	0.090	0.248	0.288	0.307	0.369
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1983

	MM	CU. METERS	PERCENT
PRECIPITATION	4344.80	2244958.250	100.00
RUNOFF	3143.367	1624177.375	72.35
POTENTIAL EVAPOTRANSPIRATION	1715.459	886377.812	
ACTUAL EVAPOTRANSPIRATION	1123.337	580428.062	25.85
PERC./LEAKAGE THROUGH LAYER 2	47.531708	24559.631	1.09
AVG. HEAD ON TOP OF LAYER 2	253.0004		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	78.096	40352.203	1.80
SOIL WATER AT START OF YEAR	5612.831	2900149.250	
SOIL WATER AT END OF YEAR	5690.927	2940501.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	

INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0015	0.751	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2007 USED WITH PRECIPITATION FOR YEAR 1984

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MONTHLY TOTALS (MM) FOR YEAR 1984

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	128.2	116.7	112.3	92.7	45.1	48.6
	125.8	28.6	35.2	26.6	150.0	78.2
RUNOFF	15.37	23.64	63.09	30.98	0.00	2.10
	60.00	2.50	0.00	0.00	85.01	12.53
POTENTIAL EVAPOTRANSPIRATION	217.50	165.62	154.60	113.69	87.98	68.13
	78.41	102.92	131.82	188.69	197.38	213.26
ACTUAL EVAPOTRANSPIRATION	113.75	102.61	49.01	59.00	48.59	32.35
	50.97	45.03	30.70	13.70	74.20	30.24
PERCOLATION/LEAKAGE THROUGH	3.990	3.783	3.909	3.868	3.935	3.703
LAYER 2	3.987	3.952	3.652	3.651	3.794	3.801
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	24.477	25.500	22.983	24.618	23.459	21.432
TOP OF LAYER 2	24.435	23.769	20.457	18.156	23.180	20.949

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 2	2.596	2.034	2.963	2.525	2.144	4.181
	1.828	2.214	1.481	1.142	3.461	2.550
AVERAGE DAILY HEAD ON TOP OF 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
STD. DEVIATION OF DAILY HEAD ON TOP OF 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

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ANNUAL TOTALS FOR YEAR 1984

	MM	CU. METERS	PERCENT
PRECIPITATION	988.00	510499.688	100.00
RUNOFF	295.231	152545.594	29.88
POTENTIAL EVAPOTRANSPIRATION	1719.996	888722.000	
ACTUAL EVAPOTRANSPIRATION	650.159	335936.938	65.81
PERC./LEAKAGE THROUGH LAYER 2	46.024811	23781.018	4.66
AVG. HEAD ON TOP OF LAYER 2	227.8454		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	42.611	22017.084	4.31
SOIL WATER AT START OF YEAR	5690.927	2940501.500	
SOIL WATER AT END OF YEAR	5733.538	2962518.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0001	0.050	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2008 USED WITH PRECIPITATION FOR YEAR 1985

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MONTHLY TOTALS (MM) FOR YEAR 1985

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	8.8	28.2	65.0	117.7	83.0	54.6
	59.6	14.4	79.5	126.2	79.4	34.0
RUNOFF	0.00	0.00	0.11	33.28	33.47	18.09
	8.34	0.00	7.57	36.88	2.38	0.00
POTENTIAL EVAPOTRANSPIRATION	196.19	145.10	170.89	111.26	88.75	67.03
	78.97	99.67	128.21	172.52	178.92	226.38
ACTUAL EVAPOTRANSPIRATION	33.17	16.38	56.24	64.36	68.89	39.06
	42.70	14.93	61.93	79.02	66.77	46.09
PERCOLATION/LEAKAGE THROUGH	3.869	3.391	3.909	3.859	4.050	3.844
LAYER 2	3.939	3.727	3.777	3.958	3.791	3.923
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.229	20.085	22.973	24.439	25.602	24.149
TOP OF LAYER 2	23.536	19.576	22.851	23.885	23.127	23.230
STD. DEVIATION OF DAILY	1.936	1.029	2.231	2.712	2.498	2.758
HEAD ON TOP OF LAYER 2	3.340	0.929	4.303	2.905	2.681	1.348
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1985

	MM	CU. METERS	PERCENT
PRECIPITATION	750.40	387731.750	100.00
RUNOFF	140.124	72401.984	18.67
POTENTIAL EVAPOTRANSPIRATION	1663.893	859733.625	
ACTUAL EVAPOTRANSPIRATION	589.530	304610.219	78.56
PERC./LEAKAGE THROUGH LAYER 2	46.035500	23786.541	6.13
AVG. HEAD ON TOP OF LAYER 2	229.7352		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	20.746	10719.668	2.76
SOIL WATER AT START OF YEAR	5733.538	2962518.500	
SOIL WATER AT END OF YEAR	5754.284	2973238.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.125	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2009 USED WITH PRECIPITATION FOR YEAR 1986

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MONTHLY TOTALS (MM) FOR YEAR 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	167.4	23.7	10.4	35.6	22.8	4.8
	20.8	347.0	48.2	65.4	154.3	11.4
RUNOFF	75.19	0.00	0.00	0.00	0.00	0.00
	0.00	297.52	0.74	8.96	63.01	0.00
POTENTIAL EVAPOTRANSPIRATION	218.94	158.77	158.26	111.42	88.24	68.16
	80.14	103.86	134.96	170.54	190.71	209.32
ACTUAL EVAPOTRANSPIRATION	67.90	46.16	12.60	6.55	32.72	10.97
	13.33	42.95	12.47	76.23	87.59	16.61
PERCOLATION/LEAKAGE THROUGH	3.910	3.487	3.626	3.414	3.791	3.571
LAYER 2	3.608	3.907	3.590	3.952	3.811	3.759
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.993	22.074	17.695	15.854	20.776	18.894
TOP OF LAYER 2	17.352	22.945	19.261	23.770	23.522	20.177
STD. DEVIATION OF DAILY	3.292	1.913	0.913	0.434	0.743	0.500
HEAD ON TOP OF LAYER 2	0.322	3.659	0.457	2.985	3.355	0.683
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1986

	MM	CU. METERS	PERCENT
PRECIPITATION	911.80	471127.125	100.00
RUNOFF	445.416	230146.594	48.85
POTENTIAL EVAPOTRANSPIRATION	1693.311	874933.938	
ACTUAL EVAPOTRANSPIRATION	426.067	220148.906	46.73
PERC./LEAKAGE THROUGH LAYER 2	44.427818	22955.852	4.87
AVG. HEAD ON TOP OF LAYER 2	204.4275		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	40.315	20830.949	4.42
SOIL WATER AT START OF YEAR	5754.284	2973238.250	
SOIL WATER AT END OF YEAR	5794.600	2994069.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0014	0.701	0.00

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FINAL WATER STORAGE AT END OF YEAR 1986

LAYER	(CM)	(VOL/VOL)

1	10.6083	0.3536
2	21.3500	0.4270
3	12.6094	0.4203
4	1.7325	0.0577
5	489.4998	0.0979
6	0.9600	0.0320
7	42.7000	0.4270
TOTAL WATER IN LAYERS	579.460	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	579.460	

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PEAK DAILY VALUES FOR YEARS 1967 THROUGH 1986

	(MM)	(CU. METERS)
PRECIPITATION	220.00	113673.984
RUNOFF	220.000	113673.9844
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.138237	71.42699
AVERAGE HEAD ON TOP OF LAYER 2	299.995	
DRAINAGE COLLECTED FROM LAYER 6	0.00000	0.00000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	
MAXIMUM HEAD ON TOP OF LAYER 7	0.000	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	0.0 METERS	
SNOW WATER	0.00	0.0000

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4630

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1160

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

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

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AVERAGE MONTHLY VALUES (MM) FOR YEARS 1967 THROUGH 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	145.63	118.50	146.64	89.34	90.62	75.82
	78.51	102.80	101.46	127.70	151.20	131.71
STD. DEVIATIONS	176.75	161.28	170.15	144.14	140.88	117.24
	165.16	177.10	186.16	193.14	207.29	232.68
RUNOFF						
TOTALS	71.130	54.196	81.097	49.091	48.183	40.970
	49.359	68.733	55.869	62.240	78.486	71.123
STD. DEVIATIONS	134.725	122.834	142.865	124.310	125.019	103.440
	141.273	151.674	152.027	149.001	164.026	175.428
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	205.048	167.575	159.711	116.723	86.713	67.795
	79.678	103.446	131.384	180.052	195.376	221.927
STD. DEVIATIONS	18.933	12.318	10.043	6.698	2.439	1.614
	1.613	4.854	8.839	9.601	15.840	12.310
ACTUAL EVAPOTRANSPIRATION						
TOTALS	66.589	61.769	64.297	37.295	36.908	33.077
	28.375	30.214	39.967	61.152	69.063	53.672

STD. DEVIATIONS	40.221	44.545	29.906	25.788	20.988	18.691
	22.043	27.344	36.374	46.662	49.189	60.405

PERCOLATION/LEAKAGE THROUGH LAYER 2

TOTALS	3.7651	3.5570	3.9066	3.7320	3.8703	3.7492
	3.8201	3.7842	3.6795	3.8239	3.7356	3.8524
STD. DEVIATIONS	0.6331	0.1543	0.1205	0.1623	0.1560	0.1782
	0.2009	0.2144	0.1851	0.1937	0.2001	0.1715

LATERAL DRAINAGE COLLECTED FROM 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 2

AVERAGES	21.9810	22.8598	22.9287	21.9924	22.2507	22.3244
	21.3137	20.6441	20.9800	21.3858	22.0604	21.9173
STD. DEVIATIONS	4.5802	2.7943	2.2489	3.1309	2.9130	3.4381
	3.7510	4.0025	3.5701	3.6156	3.8595	3.2012

DAILY AVERAGE HEAD ON TOP OF LAYER 7

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

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1967 THROUGH 1986

	MM		CU. METERS	PERCENT
PRECIPITATION	1359.96	(1805.843)	702688.8	100.00
RUNOFF	730.477	(********)	377437.62	53.713
POTENTIAL EVAPOTRANSPIRATION	1715.427	(53.5927)	886361.38	
ACTUAL EVAPOTRANSPIRATION	582.378	(308.1226)	300914.44	42.823
PERCOLATION/LEAKAGE THROUGH LAYER 2	45.27588	(1.52533)	23394.043	3.32922
AVERAGE HEAD ON TOP OF LAYER 2	218.865	(22.493)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.00000	(0.00000)	0.000	0.00000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00000	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	(0.000)		
CHANGE IN WATER STORAGE	47.100	(0.7564)	24336.56	3.463

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 **                                                                          **
 **              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
 **                                                                          **
 **              HELP Version 3.95 D          (10 August 2012)               **
 **                                developed at                              **
 **        Institute of Soil Science, University of Hamburg, Germany         **
 **                                  based on                                **
 **              US 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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 TIME:  11.32     DATE:  15.02.2019


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Design\01 HELP Model\01 Weather Data\Temperature\02 HELP MOdel
file\Temp_1967_1986.d7
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 EVAPOTRANSPIRATION DATA F. 1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
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 COLUMNS OF DAILY OUTPUT DATA FILE:

      1    DATE (yyyymmdd)
      2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
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     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
    10    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
    11    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  7 (CM)
    12    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
    13    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
     7    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     8    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  7 (CM)
     9    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
    10    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
     8    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)
     9    CHANGE IN TOTAL WATER STORAGE (MM)
    10    CHANGE IN SOIL WATER STORAGE (MM)
    11    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    12    CHANGE IN SNOW WATER STORAGE (MM)
    13    ANNUAL WATER BUDGET BALANCE (MM)

WARNING:  SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967


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     TITLE:  Elizabeth Drive_Proposed Final Landform

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                            WEATHER DATA SOURCES
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NOTE: PRECIPITATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

NOTE: TEMPERATURE DATA FOR Badgerys Creek NSW
WAS ENTERED FROM A TEXT FILE.

NOTE: SOLAR RADIATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

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LAYER DATA 1

VALID FOR 20 YEARS

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 8

THICKNESS	=	30.00	CM
POROSITY	=	0.4630	VOL/VOL
FIELD CAPACITY	=	0.2320	VOL/VOL
WILTING POINT	=	0.1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3700E-03	CM/SEC

LAYER 2

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	50.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL

INITIAL SOIL WATER CONTENT	=	0.4270 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 28

THICKNESS	=	30.00 CM
POROSITY	=	0.4520 VOL/VOL
FIELD CAPACITY	=	0.4110 VOL/VOL
WILTING POINT	=	0.3110 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4110 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1200E-05 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION 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	=	0.0320 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	7000.00 CM
POROSITY	=	0.3025 VOL/VOL
FIELD CAPACITY	=	0.0890 VOL/VOL
WILTING POINT	=	0.0330 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0800 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1350E-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	=	0.0320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000	CM/SEC
SLOPE	=	5.00	PERCENT
DRAINAGE LENGTH	=	50.0	METERS

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	100.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06	CM/SEC

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 20 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 5.% AND A SLOPE LENGTH OF 380. METERS.

SCS RUNOFF CURVE NUMBER	=	70.62	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	51.6200	HECTARES
EVAPORATIVE ZONE DEPTH	=	12.5	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	2.900	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.787	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	2.900	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.450	CM
SOIL EVAPORATION ZONE DEPTH	=	12.5	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.000	CM
INITIAL WATER IN LAYER MATERIALS	=	645.260	CM
TOTAL INITIAL WATER	=	645.260	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 20 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Sydney New South Wales

STATION LATITUDE	=	-33.87 DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00
START OF GROWING SEASON (JULIAN DATE)	=	0
END OF GROWING SEASON (JULIAN DATE)	=	367
EVAPORATIVE ZONE DEPTH	=	12.5 CM
AVERAGE ANNUAL WIND SPEED	=	10.00 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	57.7 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	62.2 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	57.5 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	49.0 %

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WARNING: SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967

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MONTHLY TOTALS (MM) FOR YEAR 1967

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	172.4	68.0	146.6	17.9	18.2	141.1
	9.5	179.3	70.8	55.7	28.6	17.5
RUNOFF	52.57	0.00	98.14	0.00	0.00	57.49
	0.30	130.19	42.98	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	181.30	148.52	142.38	100.20	87.64	67.86
	78.30	93.72	120.23	181.33	227.02	220.31
ACTUAL EVAPOTRANSPIRATION	49.41	76.92	61.88	12.47	11.02	54.98
	33.50	36.48	41.40	47.35	22.16	10.21
PERCOLATION/LEAKAGE THROUGH	1.120	3.608	3.979	3.654	3.725	3.936
LAYER 2	3.939	3.921	3.755	3.812	3.637	3.689
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	4.776	24.566	24.276	20.481	19.547	25.921
TOP OF LAYER 2	23.532	23.203	22.437	21.171	20.162	18.860
STD. DEVIATION OF DAILY	10.201	2.385	2.416	0.438	0.866	3.394
HEAD ON TOP OF LAYER 2	2.301	2.340	2.809	3.080	0.538	0.511
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1967

	MM	CU. METERS	PERCENT
PRECIPITATION	925.60	477794.781	100.00
RUNOFF	381.674	197020.047	41.24
POTENTIAL EVAPOTRANSPIRATION	1648.789	851104.750	
ACTUAL EVAPOTRANSPIRATION	457.770	236301.094	49.46
PERC./LEAKAGE THROUGH LAYER 2	42.774494	22080.195	4.62
AVG. HEAD ON TOP OF LAYER 2	207.4422		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	86.156	44473.520	9.31
SOIL WATER AT START OF YEAR	6452.599	3330831.500	

SOIL WATER AT END OF YEAR	6538.754	3375305.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.100	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1991 USED WITH PRECIPITATION FOR YEAR 1968

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MONTHLY TOTALS (MM) FOR YEAR 1968

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	171.9	19.3	106.3	17.3	96.0	6.9
	25.0	20.6	1.3	1.3	16.2	83.1
RUNOFF	84.58	0.00	4.30	0.00	48.47	0.00
	0.00	0.00	0.00	0.00	0.00	10.11
POTENTIAL EVAPOTRANSPIRATION	208.63	189.96	183.33	128.39	83.76	64.31
	78.01	106.02	137.94	186.13	228.18	210.86
ACTUAL EVAPOTRANSPIRATION	82.42	19.65	90.63	20.03	39.14	14.93
	9.92	27.00	8.32	2.57	5.33	43.81
PERCOLATION/LEAKAGE THROUGH	3.951	3.612	3.903	3.633	3.924	3.636
LAYER 2	3.655	3.733	3.503	3.525	3.335	3.780
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	23.751	22.076	22.867	20.085	23.246	20.136
TOP OF LAYER 2	18.231	19.683	17.572	15.813	14.329	20.572
STD. DEVIATION OF DAILY	3.182	0.940	3.179	1.263	3.993	1.302
HEAD ON TOP OF LAYER 2	1.282	0.446	0.748	0.448	0.424	3.490
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1968

	MM	CU. METERS	PERCENT
PRECIPITATION	565.20	291756.375	100.00
RUNOFF	147.462	76119.906	26.09
POTENTIAL EVAPOTRANSPIRATION	1805.524	932011.750	
ACTUAL EVAPOTRANSPIRATION	363.736	187760.547	64.36
PERC./LEAKAGE THROUGH LAYER 2	44.189240	22810.486	7.82
AVG. HEAD ON TOP OF LAYER 2	198.6335		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	54.001	27875.500	9.55
SOIL WATER AT START OF YEAR	6538.754	3375305.000	
SOIL WATER AT END OF YEAR	6592.756	3403180.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	

SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0008	0.425	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1992 USED WITH PRECIPITATION FOR YEAR 1969

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MONTHLY TOTALS (MM) FOR YEAR 1969

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	37.3	223.9	133.6	181.8	14.1	66.4
	14.9	90.9	39.0	92.1	263.3	28.2
RUNOFF	5.35	138.77	55.04	151.73	0.00	18.97
	0.00	13.44	0.00	12.34	179.25	0.00
POTENTIAL EVAPOTRANSPIRATION	211.32	147.35	163.27	120.63	84.00	68.12
	81.33	104.62	116.68	167.01	188.89	223.16
ACTUAL EVAPOTRANSPIRATION	48.51	61.61	58.16	55.48	14.93	30.01
	19.35	55.37	47.92	53.09	101.23	23.90
PERCOLATION/LEAKAGE THROUGH	3.874	3.510	3.871	3.845	3.694	3.720
LAYER 2	3.815	3.898	3.761	3.832	3.932	3.870
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.325	22.537	22.268	24.167	18.959	21.762
TOP OF LAYER 2	21.225	22.768	22.548	21.542	25.858	22.236
STD. DEVIATION OF DAILY	2.809	3.840	2.473	2.401	1.072	4.172
HEAD ON TOP OF LAYER 2	1.089	3.897	1.631	1.358	2.009	0.583

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1969

	MM	CU. METERS	PERCENT
PRECIPITATION	1185.50	611955.250	100.00
RUNOFF	574.894	296760.469	48.49
POTENTIAL EVAPOTRANSPIRATION	1676.374	865344.188	
ACTUAL EVAPOTRANSPIRATION	569.569	294011.656	48.04
PERC./LEAKAGE THROUGH LAYER 2	45.622112	23550.135	3.85
AVG. HEAD ON TOP OF LAYER 2	223.4960		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	41.036	21182.916	3.46
SOIL WATER AT START OF YEAR	6592.756	3403180.750	
SOIL WATER AT END OF YEAR	6633.792	3424363.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.150	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1993 USED WITH PRECIPITATION FOR YEAR 1970

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MONTHLY TOTALS (MM) FOR YEAR 1970

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	33.9	72.9	23.7	20.5	17.8
	0.3	10.7	120.5	29.2	90.7	201.1
RUNOFF	0.00	0.00	0.39	0.00	0.00	0.00
	0.00	0.00	39.76	0.00	6.14	110.89
POTENTIAL EVAPOTRANSPIRATION	189.21	178.75	158.54	123.33	84.61	70.20
	80.14	99.20	121.38	194.46	191.15	223.10
ACTUAL EVAPOTRANSPIRATION	84.49	38.25	74.68	18.92	25.74	13.93
	9.65	7.76	46.44	37.15	78.70	80.22
PERCOLATION/LEAKAGE THROUGH	3.864	3.487	3.954	3.703	3.820	3.559
LAYER 2	3.629	3.545	3.790	3.855	3.774	4.015
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.138	22.061	23.809	21.442	21.318	18.653
TOP OF LAYER 2	17.752	16.172	23.112	21.973	22.808	24.952
STD. DEVIATION OF DAILY	1.871	1.253	2.182	1.211	0.937	0.379
HEAD ON TOP OF LAYER 2	0.489	0.450	2.613	0.972	2.334	2.199
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1970

	MM	CU. METERS	PERCENT
PRECIPITATION	722.80	373109.438	100.00
RUNOFF	157.178	81135.133	21.75
POTENTIAL EVAPOTRANSPIRATION	1714.050	884792.875	
ACTUAL EVAPOTRANSPIRATION	515.929	266322.688	71.38
PERC./LEAKAGE THROUGH LAYER 2	44.995773	23226.818	6.23
AVG. HEAD ON TOP OF LAYER 2	213.4905		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	49.693	25651.572	6.88
SOIL WATER AT START OF YEAR	6633.792	3424363.500	
SOIL WATER AT END OF YEAR	6683.485	3450015.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1994 USED WITH PRECIPITATION FOR YEAR 1971

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MONTHLY TOTALS (MM) FOR YEAR 1971

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.5	149.5	58.8	32.2	25.2	3.4
	8.1	43.2	33.8	2.3	75.5	172.0
RUNOFF	3.49	62.47	0.31	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	71.01
POTENTIAL EVAPOTRANSPIRATION	227.77	167.65	151.88	120.20	85.53	66.71
	78.71	107.77	137.91	191.49	198.93	225.55
ACTUAL EVAPOTRANSPIRATION	32.21	97.09	58.86	36.02	16.62	9.38
	7.81	36.19	35.49	8.90	32.14	114.89
PERCOLATION/LEAKAGE THROUGH	3.799	3.621	3.953	3.818	3.792	3.674
LAYER 2	3.697	3.714	3.595	3.602	3.618	3.989
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.918	24.844	23.792	23.641	20.790	20.866
TOP OF LAYER 2	19.012	19.336	19.358	17.240	19.784	24.461
STD. DEVIATION OF DAILY	1.582	1.914	1.858	1.817	1.014	0.574
HEAD ON TOP OF LAYER 2	0.505	2.851	1.102	0.719	3.716	2.416
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1971

	MM	CU. METERS	PERCENT
PRECIPITATION	659.50	340433.844	100.00
RUNOFF	137.282	70865.180	20.82
POTENTIAL EVAPOTRANSPIRATION	1760.094	908560.500	
ACTUAL EVAPOTRANSPIRATION	485.584	250658.266	73.63
PERC./LEAKAGE THROUGH LAYER 2	44.870499	23162.152	6.80
AVG. HEAD ON TOP OF LAYER 2	211.7022		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	36.634	18910.572	5.55
SOIL WATER AT START OF YEAR	6683.485	3450015.000	
SOIL WATER AT END OF YEAR	6720.119	3468925.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.175	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1995 USED WITH PRECIPITATION FOR YEAR 1972

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MONTHLY TOTALS (MM) FOR YEAR 1972

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

PRECIPITATION	311.2	64.7	85.2	58.2	20.3	46.2
	0.5	33.5	21.4	157.7	61.6	30.7
RUNOFF	179.33	5.94	44.75	16.26	0.00	5.59
	0.00	0.00	0.00	59.86	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	167.25	172.71	151.98	115.89	81.31	67.52
	81.78	109.67	134.36	175.05	171.78	232.00
ACTUAL EVAPOTRANSPIRATION	116.65	65.12	46.96	37.97	12.05	24.60
	21.98	10.76	12.51	89.07	71.96	26.61
PERCOLATION/LEAKAGE THROUGH	4.065	3.681	3.910	3.715	3.641	3.607
LAYER 2	3.779	3.644	3.617	3.926	3.832	3.781
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	25.891	23.459	23.000	21.664	17.963	19.574
TOP OF LAYER 2	20.553	18.018	19.771	23.282	23.929	20.580
STD. DEVIATION OF DAILY	2.583	1.728	2.808	2.689	0.690	4.561
HEAD ON TOP OF LAYER 2	1.991	1.225	0.249	3.290	1.164	0.552
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1972

	MM	CU. METERS	PERCENT
PRECIPITATION	891.20	460037.125	100.00

RUNOFF	311.731	160915.531	34.98
POTENTIAL EVAPOTRANSPIRATION	1661.302	857564.125	
ACTUAL EVAPOTRANSPIRATION	536.237	276805.625	60.17
PERC./LEAKAGE THROUGH LAYER 2	45.197464	23330.932	5.07
AVG. HEAD ON TOP OF LAYER 2	214.7374		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	43.232	22316.484	4.85
SOIL WATER AT START OF YEAR	6720.119	3468925.500	
SOIL WATER AT END OF YEAR	6763.352	3491242.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0010	-0.525	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1996 USED WITH PRECIPITATION FOR YEAR 1973

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MONTHLY TOTALS (MM) FOR YEAR 1973

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	99.0	280.5	45.3	30.8	21.1	17.4
	62.6	42.6	21.8	83.7	124.8	27.2
RUNOFF	59.36	116.15	16.30	0.00	3.37	0.00
	0.00	0.00	0.00	9.57	15.43	0.00

POTENTIAL EVAPOTRANSPIRATION	187.12	166.74	161.89	126.72	89.06	69.16
	81.39	101.33	141.58	176.31	206.52	225.58
ACTUAL EVAPOTRANSPIRATION	27.55	151.47	40.47	14.14	41.12	10.87
	48.26	28.26	26.69	78.15	92.04	26.28
PERCOLATION/LEAKAGE THROUGH	3.796	3.740	3.858	3.605	3.879	3.475
LAYER 2	3.881	3.834	3.698	3.894	3.822	3.778
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.872	27.300	22.018	19.545	22.410	17.043
TOP OF LAYER 2	22.449	21.575	21.331	22.687	23.738	20.527
STD. DEVIATION OF DAILY	2.393	1.812	2.472	0.350	3.185	0.563
HEAD ON TOP OF LAYER 2	3.360	1.693	1.435	2.187	2.898	1.210
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1973

	MM	CU. METERS	PERCENT
PRECIPITATION	856.80	442280.312	100.00
RUNOFF	220.179	113656.641	25.70
POTENTIAL EVAPOTRANSPIRATION	1733.405	894783.562	
ACTUAL EVAPOTRANSPIRATION	585.293	302128.438	68.31
PERC./LEAKAGE THROUGH LAYER 2	45.260376	23363.406	5.28

AVG. HEAD ON TOP OF LAYER 2	217.9122		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	51.327	26495.049	5.99
SOIL WATER AT START OF YEAR	6763.352	3491242.250	
SOIL WATER AT END OF YEAR	6814.679	3517737.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0004	0.200	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1997 USED WITH PRECIPITATION FOR YEAR 1974

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MONTHLY TOTALS (MM) FOR YEAR 1974

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	126.7	93.3	239.8	114.6	168.0	100.8
	5.0	65.2	20.8	72.0	48.2	2.4
RUNOFF	66.44	52.79	147.83	45.04	114.56	56.69
	0.00	8.27	3.24	3.93	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	191.44	169.05	162.24	122.83	86.70	67.92
	80.07	104.40	118.76	187.25	185.27	204.27
ACTUAL EVAPOTRANSPIRATION	63.64	32.92	86.17	60.78	47.76	54.95
	14.93	17.71	39.78	49.86	45.23	11.88
PERCOLATION/LEAKAGE THROUGH	3.855	3.425	3.981	3.864	4.043	3.890

LAYER 2	3.679	3.628	3.759	3.840	3.709	3.794
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.961	20.798	24.327	24.538	25.468	25.037
TOP OF LAYER 2	18.687	17.733	22.507	21.677	21.539	20.821
STD. DEVIATION OF DAILY	2.697	3.036	2.550	2.412	2.189	2.506
HEAD ON TOP OF LAYER 2	1.256	3.742	2.912	2.841	2.035	0.609
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1974

	MM	CU. METERS	PERCENT
PRECIPITATION	1056.80	545520.062	100.00
RUNOFF	498.803	257482.281	47.20
POTENTIAL EVAPOTRANSPIRATION	1680.220	867329.500	
ACTUAL EVAPOTRANSPIRATION	525.600	271314.781	49.74
PERC./LEAKAGE THROUGH LAYER 2	45.466141	23469.623	4.30
AVG. HEAD ON TOP OF LAYER 2	220.9100		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00

AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	32.396	16723.061	3.07
SOIL WATER AT START OF YEAR	6814.679	3517737.250	
SOIL WATER AT END OF YEAR	6847.075	3534460.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1998 USED WITH PRECIPITATION FOR YEAR 1975

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MONTHLY TOTALS (MM) FOR YEAR 1975

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	811.0	724.2	790.0	662.2	651.3	531.5
	588.5	565.5	619.8	680.9	751.0	810.8
RUNOFF	598.50	545.36	618.51	549.26	564.26	459.96
	498.98	469.36	488.19	495.53	562.46	590.15
POTENTIAL EVAPOTRANSPIRATION	189.94	173.88	165.26	108.96	85.48	67.19
	82.92	96.03	129.35	177.02	186.96	223.89
ACTUAL EVAPOTRANSPIRATION	181.26	172.02	164.08	108.82	85.43	67.15
	82.87	95.96	128.97	175.58	184.45	220.67
PERCOLATION/LEAKAGE THROUGH	4.216	3.819	4.236	4.120	4.266	4.131
LAYER 2	4.266	4.262	4.112	4.231	4.090	4.221
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	28.697	28.927	29.080	29.480	29.630	29.692
TOP OF LAYER 2	29.646	29.560	29.329	28.994	28.900	28.790
STD. DEVIATION OF DAILY	1.721	0.281	0.254	0.177	0.090	0.074
HEAD ON TOP OF LAYER 2	0.092	0.105	0.240	0.254	0.289	0.274
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 1975

	MM	CU. METERS	PERCENT
PRECIPITATION	8186.70	4225977.000	100.00
RUNOFF	6440.506	3324589.250	78.67
POTENTIAL EVAPOTRANSPIRATION	1686.871	870762.750	
ACTUAL EVAPOTRANSPIRATION	1667.266	860642.562	20.37
PERC./LEAKAGE THROUGH LAYER 2	49.969921	25794.475	0.61
AVG. HEAD ON TOP OF LAYER 2	292.2697		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	78.929	40742.898	0.96
SOIL WATER AT START OF YEAR	6847.075	3534460.250	
SOIL WATER AT END OF YEAR	6926.003	3575203.000	

INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0050	2.601	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1999 USED WITH PRECIPITATION FOR YEAR 1976

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MONTHLY TOTALS (MM) FOR YEAR 1976

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	231.8	100.6	199.4	26.6	13.6	67.2
	41.0	7.4	44.8	195.6	83.0	40.3
RUNOFF	142.79	18.22	115.56	0.00	0.00	13.32
	0.90	0.00	0.00	68.77	45.50	0.00
POTENTIAL EVAPOTRANSPIRATION	192.10	160.67	150.72	110.75	89.98	69.67
	80.86	103.41	120.97	156.11	188.76	205.29
ACTUAL EVAPOTRANSPIRATION	103.22	66.33	81.29	40.18	16.13	32.71
	40.02	14.93	34.85	96.07	56.47	42.33
PERCOLATION/LEAKAGE THROUGH	4.025	3.735	4.055	3.807	3.734	3.696
LAYER 2	3.937	3.772	3.753	3.958	3.820	3.839
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	25.148	24.541	25.692	23.445	19.715	21.289
TOP OF LAYER 2	23.491	20.410	22.394	23.893	23.684	21.662
STD. DEVIATION OF DAILY	2.710	1.712	2.342	1.330	0.838	4.494
HEAD ON TOP OF LAYER 2	2.168	0.950	1.719	2.536	2.345	0.884
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1976

	MM	CU. METERS	PERCENT
PRECIPITATION	1051.30	542681.312	100.00
RUNOFF	405.054	209088.781	38.53
POTENTIAL EVAPOTRANSPIRATION	1629.282	841035.250	
ACTUAL EVAPOTRANSPIRATION	624.535	322385.188	59.41
PERC./LEAKAGE THROUGH LAYER 2	46.130581	23812.605	4.39
AVG. HEAD ON TOP OF LAYER 2	229.4693		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	21.710	11206.858	2.07
SOIL WATER AT START OF YEAR	6926.003	3575203.000	
SOIL WATER AT END OF YEAR	6947.714	3586410.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0009	0.475	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2000 USED WITH PRECIPITATION FOR YEAR 1977

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MONTHLY TOTALS (MM) FOR YEAR 1977

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	46.4	166.5	130.4	8.3	109.3	50.5
	0.2	14.1	37.3	4.6	11.0	29.4
RUNOFF	0.00	73.85	73.62	0.00	42.19	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	199.88	176.14	142.13	111.61	87.41	68.34
	80.04	104.63	127.43	177.82	167.08	234.03
ACTUAL EVAPOTRANSPIRATION	50.14	66.21	67.98	12.08	40.74	52.75
	19.35	8.90	17.91	18.75	8.83	8.30
PERCOLATION/LEAKAGE THROUGH	3.851	3.525	3.963	3.605	3.881	3.881
LAYER 2	3.760	3.567	3.496	3.634	3.408	3.662
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.884	22.857	23.980	19.544	22.448	24.876
TOP OF LAYER 2	20.191	16.592	17.439	17.845	15.750	18.361
STD. DEVIATION OF DAILY	1.068	3.401	3.008	0.677	4.444	1.751
HEAD ON TOP OF LAYER 2	1.892	0.453	1.402	1.379	0.433	1.131
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000

TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1977

	MM	CU. METERS	PERCENT
PRECIPITATION	608.00	313849.625	100.00
RUNOFF	189.655	97899.688	31.19
POTENTIAL EVAPOTRANSPIRATION	1676.533	865426.562	
ACTUAL EVAPOTRANSPIRATION	371.931	191990.906	61.17
PERC./LEAKAGE THROUGH LAYER 2	44.233662	22833.416	7.28
AVG. HEAD ON TOP OF LAYER 2	201.4724		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	46.415	23959.422	7.63
SOIL WATER AT START OF YEAR	6947.714	3586410.000	
SOIL WATER AT END OF YEAR	6994.129	3610369.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0007	-0.363	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2001 USED WITH PRECIPITATION FOR YEAR 1978

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MONTHLY TOTALS (MM) FOR YEAR 1978

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	228.0	19.6	327.7	84.6	64.6	187.1
	9.2	21.5	37.6	50.1	138.1	115.7
RUNOFF	104.41	0.00	251.62	40.90	6.82	128.38
	0.00	0.00	0.00	0.00	36.48	47.23
POTENTIAL EVAPOTRANSPIRATION	202.09	165.69	154.53	118.42	88.39	66.36
	76.17	102.20	127.77	187.86	188.46	223.03
ACTUAL EVAPOTRANSPIRATION	99.58	34.76	60.04	59.20	30.42	59.94
	22.37	10.76	44.29	46.84	89.32	52.79
PERCOLATION/LEAKAGE THROUGH	3.983	3.444	3.861	3.833	3.826	3.980
LAYER 2	3.879	3.731	3.620	3.751	3.833	3.914
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	24.356	21.183	22.073	23.934	21.425	26.776
TOP OF LAYER 2	22.422	19.652	19.828	20.020	23.949	23.067
STD. DEVIATION OF DAILY	3.529	2.194	4.556	2.477	3.509	2.228
HEAD ON TOP OF LAYER 2	1.167	0.791	2.101	2.566	2.730	2.337
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1978

	MM	CU. METERS	PERCENT
PRECIPITATION	1283.80	662697.375	100.00
RUNOFF	615.840	317896.531	47.97
POTENTIAL EVAPOTRANSPIRATION	1700.963	878037.312	
ACTUAL EVAPOTRANSPIRATION	610.302	315037.719	47.54
PERC./LEAKAGE THROUGH LAYER 2	45.655041	23567.133	3.56
AVG. HEAD ON TOP OF LAYER 2	223.9034		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	57.658	29763.316	4.49
SOIL WATER AT START OF YEAR	6994.129	3610369.500	
SOIL WATER AT END OF YEAR	7051.787	3640132.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.225	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2002 USED WITH PRECIPITATION FOR YEAR 1979

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MONTHLY TOTALS (MM) FOR YEAR 1979

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	21.0	14.4	65.4	21.2	69.0	67.2
	23.0	2.8	18.8	34.6	77.4	5.8
RUNOFF	0.00	0.00	0.00	0.00	12.92	30.95
	0.00	0.00	0.00	0.00	8.49	0.00
POTENTIAL EVAPOTRANSPIRATION	239.77	160.88	159.35	116.88	84.21	69.70
	81.03	103.98	138.41	191.44	204.69	255.30
ACTUAL EVAPOTRANSPIRATION	20.44	17.17	74.12	14.57	42.94	27.68
	18.48	10.42	12.40	34.53	58.09	19.35
PERCOLATION/LEAKAGE THROUGH	3.873	3.467	3.861	3.504	3.884	3.746
LAYER 2	3.802	3.814	3.618	3.658	3.562	3.749
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.305	21.667	22.072	17.589	22.499	22.259
TOP OF LAYER 2	20.985	21.209	19.794	18.290	18.714	19.988
STD. DEVIATION OF DAILY	1.254	0.410	1.925	0.553	3.376	3.145
HEAD ON TOP OF LAYER 2	1.502	0.623	0.303	1.147	3.650	1.266
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1979

	MM	CU. METERS	PERCENT
PRECIPITATION	420.60	217113.859	100.00
RUNOFF	52.361	27028.789	12.45
POTENTIAL EVAPOTRANSPIRATION	1805.641	932072.062	
ACTUAL EVAPOTRANSPIRATION	350.180	180762.703	83.26
PERC./LEAKAGE THROUGH LAYER 2	44.538631	22990.842	10.59
AVG. HEAD ON TOP OF LAYER 2	206.1409		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	18.059	9322.243	4.29
SOIL WATER AT START OF YEAR	7051.787	3640132.500	
SOIL WATER AT END OF YEAR	7069.847	3649455.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.125	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2003 USED WITH PRECIPITATION FOR YEAR 1980

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MONTHLY TOTALS (MM) FOR YEAR 1980

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	70.8	39.0	32.4	3.0	160.0	12.0

	17.4	2.8	1.4	48.4	43.2	46.1
RUNOFF	18.70	0.00	1.61	0.00	53.70	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	232.55	163.16	171.69	115.09	84.17	68.85
	79.01	109.76	150.08	187.18	208.36	218.94
ACTUAL EVAPOTRANSPIRATION	40.81	22.99	41.19	8.29	63.17	29.43
	11.42	8.58	6.96	41.29	45.26	18.26
PERCOLATION/LEAKAGE THROUGH	3.843	3.619	3.880	3.498	4.016	3.777
LAYER 2	3.733	3.680	3.480	3.585	3.544	3.775
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.746	22.210	22.425	17.478	24.979	22.865
TOP OF LAYER 2	19.682	18.693	17.124	16.929	18.370	20.479
STD. DEVIATION OF DAILY	2.189	1.590	2.278	0.887	2.984	1.842
HEAD ON TOP OF LAYER 2	0.781	0.427	0.447	1.972	2.040	1.989
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1980

	MM	CU. METERS	PERCENT
PRECIPITATION	476.50	245969.375	100.00
RUNOFF	74.003	38200.340	15.53

POTENTIAL EVAPOTRANSPIRATION	1788.847	923402.875	
ACTUAL EVAPOTRANSPIRATION	337.654	174297.047	70.86
PERC./LEAKAGE THROUGH LAYER 2	44.429825	22934.676	9.32
AVG. HEAD ON TOP OF LAYER 2	202.4835		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	64.843	33471.727	13.61
SOIL WATER AT START OF YEAR	7069.847	3649455.000	
SOIL WATER AT END OF YEAR	7134.689	3682926.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.250	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2004 USED WITH PRECIPITATION FOR YEAR 1981

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MONTHLY TOTALS (MM) FOR YEAR 1981

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	34.6	155.8	29.2	158.0	103.1	21.0
	33.0	3.2	2.9	133.3	111.8	100.8
RUNOFF	0.00	46.73	0.00	104.74	39.64	8.54
	0.00	0.00	0.00	58.79	47.20	17.08
POTENTIAL EVAPOTRANSPIRATION	224.72	170.26	160.32	122.86	89.62	68.72
	79.13	99.93	137.21	183.07	195.17	227.49

ACTUAL EVAPOTRANSPIRATION	38.06	99.31	37.74	50.68	28.44	34.89
	16.87	25.23	3.38	45.55	60.24	73.09
PERCOLATION/LEAKAGE THROUGH	3.798	3.604	3.766	3.792	3.793	3.818
LAYER 2	3.697	3.712	3.435	3.712	3.810	3.957
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.899	24.487	20.298	23.157	20.808	23.658
TOP OF LAYER 2	19.008	19.300	16.256	19.293	23.492	23.868
STD. DEVIATION OF DAILY	0.377	3.434	2.470	3.608	3.751	2.653
HEAD ON TOP OF LAYER 2	1.697	2.030	0.436	5.617	1.627	2.648
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1981

	MM	CU. METERS	PERCENT
PRECIPITATION	886.70	457714.625	100.00
RUNOFF	322.729	166592.641	36.40
POTENTIAL EVAPOTRANSPIRATION	1758.488	907731.438	
ACTUAL EVAPOTRANSPIRATION	513.478	265057.469	57.91
PERC./LEAKAGE THROUGH LAYER 2	44.893196	23173.869	5.06
AVG. HEAD ON TOP OF LAYER 2	212.1049		

DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	50.493	26064.510	5.69
SOIL WATER AT START OF YEAR	7134.689	3682926.500	
SOIL WATER AT END OF YEAR	7185.182	3708991.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.025	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2005 USED WITH PRECIPITATION FOR YEAR 1982

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MONTHLY TOTALS (MM) FOR YEAR 1982

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.1	29.9	104.2	27.8	4.6	11.2
	9.4	1.2	121.0	32.8	5.5	23.4
RUNOFF	16.52	0.00	13.62	0.00	0.00	0.00
	0.00	0.00	25.92	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	221.61	186.79	158.39	117.90	89.89	68.12
	79.45	114.95	131.86	174.52	212.62	233.41
ACTUAL EVAPOTRANSPIRATION	42.99	38.09	71.35	34.47	12.66	8.20
	7.60	6.25	46.65	55.58	12.68	6.87
PERCOLATION/LEAKAGE THROUGH	3.934	3.379	3.891	3.763	3.670	3.428
LAYER 2	3.462	3.383	3.473	3.867	3.496	3.526

LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	23.445	19.831	22.629	22.583	18.512	16.120
TOP OF LAYER 2	14.629	13.147	16.997	22.194	17.435	15.830
STD. DEVIATION OF DAILY	1.623	2.107	3.297	1.568	1.402	0.436
HEAD ON TOP OF LAYER 2	0.440	0.429	7.309	2.411	0.561	0.448
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1982

	MM	CU. METERS	PERCENT
PRECIPITATION	427.10	220469.078	100.00
RUNOFF	56.059	28937.744	13.13
POTENTIAL EVAPOTRANSPIRATION	1789.508	923744.125	
ACTUAL EVAPOTRANSPIRATION	343.393	177259.281	80.40
PERC./LEAKAGE THROUGH LAYER 2	43.270668	22336.320	10.13
AVG. HEAD ON TOP OF LAYER 2	186.1275		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		

CHANGE IN WATER STORAGE	27.648	14271.859	6.47
SOIL WATER AT START OF YEAR	7185.182	3708991.000	
SOIL WATER AT END OF YEAR	7212.830	3723263.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.175	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2006 USED WITH PRECIPITATION FOR YEAR 1983

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MONTHLY TOTALS (MM) FOR YEAR 1983

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	33.0	18.4	178.0	72.6	102.7	60.8
	516.4	561.5	653.4	661.6	710.3	776.1
RUNOFF	0.00	0.00	117.13	9.62	44.26	19.30
	418.67	453.38	508.99	490.19	518.38	563.47
POTENTIAL EVAPOTRANSPIRATION	201.63	183.81	172.57	117.43	87.53	63.85
	77.69	100.86	140.78	175.24	190.68	203.38
ACTUAL EVAPOTRANSPIRATION	35.55	10.34	52.51	31.90	59.63	52.78
	76.12	100.80	140.31	173.79	188.57	201.04
PERCOLATION/LEAKAGE THROUGH	3.686	3.203	3.767	3.741	4.042	3.913
LAYER 2	4.256	4.261	4.107	4.235	4.092	4.228
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	18.810	16.194	20.317	22.164	25.459	25.487
TOP OF LAYER 2	29.458	29.541	29.235	29.063	28.939	28.935
STD. DEVIATION OF DAILY	2.510	0.407	5.544	1.985	3.676	2.045
HEAD ON TOP OF LAYER 2	1.095	0.090	0.248	0.288	0.307	0.369
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1983

	MM	CU. METERS	PERCENT
PRECIPITATION	4344.80	2242786.250	100.00
RUNOFF	3143.367	1622605.875	72.35
POTENTIAL EVAPOTRANSPIRATION	1715.459	885520.188	
ACTUAL EVAPOTRANSPIRATION	1123.337	579866.438	25.85
PERC./LEAKAGE THROUGH LAYER 2	47.531708	24535.867	1.09
AVG. HEAD ON TOP OF LAYER 2	253.0004		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	78.097	40313.559	1.80
SOIL WATER AT START OF YEAR	7212.830	3723263.000	
SOIL WATER AT END OF YEAR	7290.927	3763576.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	

INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0007	0.350	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2007 USED WITH PRECIPITATION FOR YEAR 1984

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MONTHLY TOTALS (MM) FOR YEAR 1984

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	128.2	116.7	112.3	92.7	45.1	48.6
	125.8	28.6	35.2	26.6	150.0	78.2
RUNOFF	15.37	23.64	63.09	30.98	0.00	2.10
	60.00	2.50	0.00	0.00	85.01	12.53
POTENTIAL EVAPOTRANSPIRATION	217.50	165.62	154.60	113.69	87.98	68.13
	78.41	102.92	131.82	188.69	197.38	213.26
ACTUAL EVAPOTRANSPIRATION	113.75	102.61	49.01	59.00	48.59	32.35
	50.97	45.03	30.70	13.70	74.20	30.24
PERCOLATION/LEAKAGE THROUGH	3.990	3.783	3.909	3.868	3.935	3.703
LAYER 2	3.987	3.952	3.652	3.651	3.794	3.801
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	24.477	25.500	22.983	24.618	23.459	21.432
TOP OF LAYER 2	24.435	23.769	20.457	18.156	23.180	20.949

STD. DEVIATION OF DAILY	2.596	2.034	2.963	2.525	2.144	4.181
HEAD ON TOP OF LAYER 2	1.828	2.214	1.481	1.142	3.461	2.550
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1984

	MM	CU. METERS	PERCENT
PRECIPITATION	988.00	510005.750	100.00
RUNOFF	295.231	152398.000	29.88
POTENTIAL EVAPOTRANSPIRATION	1719.996	887862.125	
ACTUAL EVAPOTRANSPIRATION	650.159	335611.906	65.81
PERC./LEAKAGE THROUGH LAYER 2	46.024811	23758.008	4.66
AVG. HEAD ON TOP OF LAYER 2	227.8454		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	42.611	21995.580	4.31
SOIL WATER AT START OF YEAR	7290.927	3763576.500	
SOIL WATER AT END OF YEAR	7333.538	3785572.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0005	0.250	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2008 USED WITH PRECIPITATION FOR YEAR 1985

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MONTHLY TOTALS (MM) FOR YEAR 1985

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	8.8	28.2	65.0	117.7	83.0	54.6
	59.6	14.4	79.5	126.2	79.4	34.0
RUNOFF	0.00	0.00	0.11	33.28	33.47	18.09
	8.34	0.00	7.57	36.88	2.38	0.00
POTENTIAL EVAPOTRANSPIRATION	196.19	145.10	170.89	111.26	88.75	67.03
	78.97	99.67	128.21	172.52	178.92	226.38
ACTUAL EVAPOTRANSPIRATION	33.17	16.38	56.24	64.36	68.89	39.06
	42.70	14.93	61.93	79.02	66.77	46.09
PERCOLATION/LEAKAGE THROUGH	3.869	3.391	3.909	3.859	4.050	3.844
LAYER 2	3.939	3.727	3.777	3.958	3.791	3.923
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.229	20.085	22.973	24.439	25.602	24.149
TOP OF LAYER 2	23.536	19.576	22.851	23.885	23.127	23.230
STD. DEVIATION OF DAILY	1.936	1.029	2.231	2.712	2.498	2.758
HEAD ON TOP OF LAYER 2	3.340	0.929	4.303	2.905	2.681	1.348
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1985

	MM	CU. METERS	PERCENT
PRECIPITATION	750.40	387356.594	100.00
RUNOFF	140.124	72331.930	18.67
POTENTIAL EVAPOTRANSPIRATION	1663.893	858901.812	
ACTUAL EVAPOTRANSPIRATION	589.530	304315.500	78.56
PERC./LEAKAGE THROUGH LAYER 2	46.035500	23763.525	6.13
AVG. HEAD ON TOP OF LAYER 2	229.7352		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	20.746	10709.096	2.76
SOIL WATER AT START OF YEAR	7333.538	3785572.250	
SOIL WATER AT END OF YEAR	7354.284	3796281.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.075	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2009 USED WITH PRECIPITATION FOR YEAR 1986

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MONTHLY TOTALS (MM) FOR YEAR 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	167.4	23.7	10.4	35.6	22.8	4.8
	20.8	347.0	48.2	65.4	154.3	11.4
RUNOFF	75.19	0.00	0.00	0.00	0.00	0.00
	0.00	297.52	0.74	8.96	63.01	0.00
POTENTIAL EVAPOTRANSPIRATION	218.94	158.77	158.26	111.42	88.24	68.16
	80.14	103.86	134.96	170.54	190.71	209.32
ACTUAL EVAPOTRANSPIRATION	67.90	46.16	12.60	6.55	32.72	10.97
	13.33	42.95	12.47	76.23	87.59	16.61
PERCOLATION/LEAKAGE THROUGH	3.910	3.487	3.626	3.414	3.791	3.571
LAYER 2	3.608	3.907	3.590	3.952	3.811	3.759
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.993	22.074	17.695	15.854	20.776	18.894
TOP OF LAYER 2	17.352	22.945	19.261	23.770	23.522	20.177
STD. DEVIATION OF DAILY	3.292	1.913	0.913	0.434	0.743	0.500
HEAD ON TOP OF LAYER 2	0.322	3.659	0.457	2.985	3.355	0.683
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1986

	MM	CU. METERS	PERCENT
PRECIPITATION	911.80	470671.281	100.00
RUNOFF	445.416	229923.906	48.85
POTENTIAL EVAPOTRANSPIRATION	1693.311	874087.375	
ACTUAL EVAPOTRANSPIRATION	426.067	219935.891	46.73
PERC./LEAKAGE THROUGH LAYER 2	44.427818	22933.641	4.87
AVG. HEAD ON TOP OF LAYER 2	204.4275		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	40.316	20811.193	4.42
SOIL WATER AT START OF YEAR	7354.284	3796281.250	
SOIL WATER AT END OF YEAR	7394.600	3817092.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.300	0.00

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FINAL WATER STORAGE AT END OF YEAR 1986

LAYER	(CM)	(VOL/VOL)

1	10.6083	0.3536
2	21.3500	0.4270
3	12.6094	0.4203
4	1.7325	0.0577
5	649.4998	0.0928
6	0.9600	0.0320
7	42.7000	0.4270
TOTAL WATER IN LAYERS	739.460	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	739.460	

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PEAK DAILY VALUES FOR YEARS 1967 THROUGH 1986

	(MM)	(CU. METERS)
PRECIPITATION	220.00	113563.984
RUNOFF	220.000	113563.9844
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.138237	71.35789
AVERAGE HEAD ON TOP OF LAYER 2	299.995	
DRAINAGE COLLECTED FROM LAYER 6	0.00000	0.00000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	
MAXIMUM HEAD ON TOP OF LAYER 7	0.000	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	0.0 METERS	
SNOW WATER	0.00	0.0000

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4630

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1160

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

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

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AVERAGE MONTHLY VALUES (MM) FOR YEARS 1967 THROUGH 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	145.63	118.50	146.64	89.34	90.62	75.82
	78.51	102.80	101.46	127.70	151.20	131.71
STD. DEVIATIONS	176.75	161.28	170.15	144.14	140.88	117.24
	165.16	177.10	186.16	193.14	207.29	232.68
RUNOFF						
TOTALS	71.130	54.196	81.097	49.091	48.183	40.970
	49.359	68.733	55.869	62.240	78.486	71.123
STD. DEVIATIONS	134.725	122.834	142.865	124.310	125.019	103.440
	141.273	151.674	152.027	149.001	164.026	175.428
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	205.048	167.575	159.711	116.723	86.713	67.795
	79.678	103.446	131.384	180.052	195.376	221.927
STD. DEVIATIONS	18.933	12.318	10.043	6.698	2.439	1.614
	1.613	4.854	8.839	9.601	15.840	12.310
ACTUAL EVAPOTRANSPIRATION						
TOTALS	66.589	61.769	64.297	37.295	36.908	33.077
	28.375	30.214	39.967	61.152	69.063	53.672

STD. DEVIATIONS	40.221	44.545	29.906	25.788	20.988	18.691
	22.043	27.344	36.374	46.662	49.189	60.405

PERCOLATION/LEAKAGE THROUGH LAYER 2

TOTALS	3.7651	3.5570	3.9066	3.7320	3.8703	3.7492
	3.8201	3.7842	3.6795	3.8239	3.7356	3.8524
STD. DEVIATIONS	0.6331	0.1543	0.1205	0.1623	0.1560	0.1782
	0.2009	0.2144	0.1851	0.1937	0.2001	0.1715

LATERAL DRAINAGE COLLECTED FROM 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 2

AVERAGES	21.9810	22.8598	22.9287	21.9924	22.2507	22.3244
	21.3137	20.6441	20.9800	21.3858	22.0604	21.9173
STD. DEVIATIONS	4.5802	2.7943	2.2489	3.1309	2.9130	3.4381
	3.7510	4.0025	3.5701	3.6156	3.8595	3.2012

DAILY AVERAGE HEAD ON TOP OF LAYER 7

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

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1967 THROUGH 1986

	MM		CU. METERS	PERCENT
PRECIPITATION	1359.96	(1805.843)	702008.9	100.00
RUNOFF	730.477	(********)	377072.41	53.713
POTENTIAL EVAPOTRANSPIRATION	1715.427	(53.5927)	885503.69	
ACTUAL EVAPOTRANSPIRATION	582.378	(308.1226)	300623.25	42.823
PERCOLATION/LEAKAGE THROUGH LAYER 2	45.27588	(1.52533)	23371.408	3.32922
AVERAGE HEAD ON TOP OF LAYER 2	218.865	(22.493)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.00000	(0.00000)	0.000	0.00000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00000	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	(0.000)		
CHANGE IN WATER STORAGE	47.100	(0.7564)	24313.04	3.463

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 **                                                                          **
 **                                                                          **
 **              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
 **                                                                          **
 **              HELP Version 3.95 D          (10 August 2012)              **
 **                                developed at                              **
 **        Institute of Soil Science, University of Hamburg, Germany         **
 **                                  based on                                **
 **              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)               **
 **                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
 **                    USAE WATERWAYS EXPERIMENT STATION                     **
 **             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
 **                                                                          **
 **                                                                          **
 ******************************************************************************
 ******************************************************************************


 TIME:  14.00     DATE:  15.02.2019


 PRECIPITATION DATA FILE:      P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Rainfall\02 Rainfall HELP Model
File\Rainfall_1967_1996.d4
 TEMPERATURE DATA FILE:        P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Temperature\02 HELP MOdel
file\Temp_1967_1986.d7
 SOLAR RADIATION DATA FILE:    P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Solar Radiation\SolarRad_1990_2017.d13
 EVAPOTRANSPIRATION DATA F. 1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Evapotranspiration\EvoData_Intermediate
Cover.d11
 SOIL AND DESIGN DATA FILE  1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01a Soil and Design Files\Final
Profiles\ElizabethDrive_Proposed Design_IntermediateCoverwithBase_S1.d10
 OUTPUT DATA FILE:             P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\A Intermediate Cap Stage 1\03a_Proposed Design_Intermediate Cap_Stage1
Only.out
 DAILY OUTPUT DATA FILE:       P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\A Intermediate Cap Stage 1\03a_Proposed Design_Intermediate Cap_Stage1
Only.DAY
 MONTHLY OUTPUT DATA FILE:     P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\A Intermediate Cap Stage 1\03a_Proposed Design_Intermediate Cap_Stage1
Only.MON
 YEARLY OUTPUT DATA FILE:      P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\A Intermediate Cap Stage 1\03a_Proposed Design_Intermediate Cap_Stage1
Only.YR
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COLUMNS OF DAILY OUTPUT DATA FILE:

```
 1    DATE (yyyymmdd)
 2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
 3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
 4    PRECIPITATION (MM)
 5    RUNOFF (MM)
 6    POTENTIAL EVAPOTRANSPIRATION (MM)
 7    ACTUAL EVAPOTRANSPIRATION (MM)
 8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
 9    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
10    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
11    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  5 (CM)
12    DRAIN #2: LATERAL DRAINAGE FROM LAYER  4 (MM)
13    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  5 (MM)
```

COLUMNS OF MONTHLY OUTPUT DATA FILE:

```
 1    DATE OF ULTIMO (yyyymmdd)
 2    PRECIPITATION (MM)
 3    RUNOFF (MM)
 4    POTENTIAL EVAPOTRANSPIRATION (MM)
 5    ACTUAL EVAPOTRANSPIRATION (MM)
 6    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
 7    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
 8    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  5 (CM)
 9    DRAIN #2: LATERAL DRAINAGE FROM LAYER  4 (MM)
10    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  5 (MM)
```

COLUMNS OF YEARLY OUTPUT DATA FILE:

```
 1    DATE OF ULTIMO (yyyy1231)
 2    PRECIPITATION (MM)
 3    RUNOFF (MM)
 4    POTENTIAL EVAPOTRANSPIRATION (MM)
 5    ACTUAL EVAPOTRANSPIRATION (MM)
 6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
 7    DRAIN #2: LATERAL DRAINAGE FROM LAYER  4 (MM)
 8    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  5 (MM)
 9    CHANGE IN TOTAL WATER STORAGE (MM)
10    CHANGE IN SOIL WATER STORAGE (MM)
11    CHANGE IN INTERCEPTION WATER STORAGE (MM)
12    CHANGE IN SNOW WATER STORAGE (MM)
13    ANNUAL WATER BUDGET BALANCE (MM)
```

WARNING: SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967

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TITLE: Elizabeth Drive_Proposed Final Landform_Intermediate cap_S1

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WEATHER DATA SOURCES

NOTE: PRECIPITATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

NOTE: TEMPERATURE DATA FOR Badgerys Creek NSW
WAS ENTERED FROM A TEXT FILE.

NOTE: SOLAR RADIATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

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LAYER DATA 1

VALID FOR 20 YEARS

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 8

THICKNESS	=	10.00	CM
POROSITY	=	0.4630	VOL/VOL
FIELD CAPACITY	=	0.2320	VOL/VOL
WILTING POINT	=	0.1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3700E-03	CM/SEC

LAYER 2

TYPE 3 - BARRIER SOIL LINER

MATERIAL TEXTURE NUMBER 29

THICKNESS	=	50.00	CM
POROSITY	=	0.4510	VOL/VOL
FIELD CAPACITY	=	0.4190	VOL/VOL
WILTING POINT	=	0.3220	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4510	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.6800E-06	CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 0

THICKNESS	=	7000.00	CM
POROSITY	=	0.3025	VOL/VOL
FIELD CAPACITY	=	0.0890	VOL/VOL
WILTING POINT	=	0.0330	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0800	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1350E-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	=	0.0320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000	CM/SEC
SLOPE	=	5.00	PERCENT
DRAINAGE LENGTH	=	50.0	METERS

LAYER 5

TYPE 3 - BARRIER SOIL LINER

MATERIAL TEXTURE NUMBER 16

THICKNESS	=	100.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 20 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 5.% AND A SLOPE LENGTH OF 380. METERS.

SCS RUNOFF CURVE NUMBER	=	70.62	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	21.5000	HECTARES
EVAPORATIVE ZONE DEPTH	=	10.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	2.320	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4.630	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	2.320	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.160	CM
SOIL EVAPORATION ZONE DEPTH	=	10.0	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.000	CM
INITIAL WATER IN LAYER MATERIALS	=	628.530	CM
TOTAL INITIAL WATER	=	628.530	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

EVAPOTRANSPIRATION DATA 1

VALID FOR 20 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Sydney New South Wales

STATION LATITUDE	= -33.87	DEGREES
MAXIMUM LEAF AREA INDEX	= 0.00	
START OF GROWING SEASON (JULIAN DATE)	= 0	
END OF GROWING SEASON (JULIAN DATE)	= 365	
EVAPORATIVE ZONE DEPTH	= 10.0	CM
AVERAGE ANNUAL WIND SPEED	= 10.00	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	= 57.7	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	= 62.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	= 57.5	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	= 49.0	%

WARNING: SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967

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MONTHLY TOTALS (MM) FOR YEAR 1967

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	172.4	68.0	146.6	17.9	18.2	141.1
	9.5	179.3	70.8	55.7	28.6	17.5
RUNOFF	101.11	0.00	84.17	0.00	0.00	44.13
	0.30	127.22	36.92	0.02	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	181.30	148.52	142.38	100.20	87.64	67.86
	78.30	93.72	120.23	181.33	227.02	220.31
ACTUAL EVAPOTRANSPIRATION	41.52	75.94	58.89	11.94	11.02	54.98
	30.80	35.46	35.26	43.95	19.23	10.21
PERCOLATION/LEAKAGE THROUGH	6.671	14.567	15.729	0.000	5.026	15.398
LAYER 2	11.006	9.861	7.178	11.243	5.439	0.000
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	1.379	2.758	2.858	0.000	0.280	5.349
TOP OF LAYER 2	2.052	1.868	1.613	2.640	0.331	0.000
STD. DEVIATION OF DAILY	2.578	2.318	2.996	0.000	0.550	3.456
HEAD ON TOP OF LAYER 2	2.849	2.799	2.721	2.995	0.600	0.000
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1967

	MM	CU. METERS	PERCENT
PRECIPITATION	925.60	199004.016	100.00
RUNOFF	393.877	84683.656	42.55
POTENTIAL EVAPOTRANSPIRATION	1648.789	354489.562	
ACTUAL EVAPOTRANSPIRATION	429.200	92278.023	46.37
PERC./LEAKAGE THROUGH LAYER 2	102.117096	21955.176	11.03
AVG. HEAD ON TOP OF LAYER 2	17.6058		
DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		
CHANGE IN WATER STORAGE	102.522	22042.236	11.08
SOIL WATER AT START OF YEAR	6285.297	1351338.875	
SOIL WATER AT END OF YEAR	6387.819	1373381.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0004	0.094	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1991 USED WITH PRECIPITATION FOR YEAR 1968

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MONTHLY TOTALS (MM) FOR YEAR 1968

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	171.9	19.3	106.3	17.3	96.0	6.9
	25.0	20.6	1.3	1.3	16.2	83.1
RUNOFF	83.86	0.00	5.24	0.00	49.65	0.00
	0.00	0.00	0.00	0.00	0.00	26.48
POTENTIAL EVAPOTRANSPIRATION	208.63	189.96	183.33	128.39	83.76	64.31
	78.01	106.02	137.94	186.13	228.18	210.86
ACTUAL EVAPOTRANSPIRATION	80.77	19.15	81.20	15.09	39.14	6.06
	8.74	27.00	2.60	2.56	5.57	42.09
PERCOLATION/LEAKAGE THROUGH	15.143	4.280	9.574	4.020	12.455	0.431
LAYER 2	4.986	5.959	0.000	0.000	0.780	7.709
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	3.421	0.226	2.497	0.201	3.146	0.005
TOP OF LAYER 2	0.785	0.292	0.000	0.000	0.001	1.406
STD. DEVIATION OF DAILY	3.287	0.451	3.235	0.521	3.528	0.029
HEAD ON TOP OF LAYER 2	1.382	0.578	0.000	0.000	0.004	2.491
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1968

	MM	CU. METERS	PERCENT
PRECIPITATION	565.20	121518.055	100.00
RUNOFF	165.234	35525.270	29.23
POTENTIAL EVAPOTRANSPIRATION	1805.524	388187.750	
ACTUAL EVAPOTRANSPIRATION	329.970	70943.516	58.38
PERC./LEAKAGE THROUGH LAYER 2	65.338165	14047.705	11.56
AVG. HEAD ON TOP OF LAYER 2	9.9847		
DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		
CHANGE IN WATER STORAGE	69.996	15049.165	12.38
SOIL WATER AT START OF YEAR	6387.819	1373381.125	
SOIL WATER AT END OF YEAR	6457.815	1388430.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.099	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1992 USED WITH PRECIPITATION FOR YEAR 1969

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MONTHLY TOTALS (MM) FOR YEAR 1969

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	37.3	223.9	133.6	181.8	14.1	66.4

	14.9	90.9	39.0	92.1	263.3	28.2
RUNOFF	1.44	142.96	51.05	145.46	0.00	19.17
	0.00	7.23	0.00	8.63	174.81	0.00
POTENTIAL EVAPOTRANSPIRATION	211.32	147.35	163.27	120.63	84.00	68.12
	81.33	104.62	116.68	167.01	188.89	223.16
ACTUAL EVAPOTRANSPIRATION	42.44	58.35	50.58	54.94	7.50	29.81
	16.59	54.83	44.68	52.40	97.74	21.56
PERCOLATION/LEAKAGE THROUGH	10.087	9.650	10.216	15.453	0.000	14.774
LAYER 2	3.476	10.660	8.438	5.157	19.457	4.582
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	1.886	2.545	1.838	3.246	0.000	3.161
TOP OF LAYER 2	0.235	2.945	1.214	0.530	5.195	0.168
STD. DEVIATION OF DAILY	2.646	3.418	2.391	2.894	0.000	2.863
HEAD ON TOP OF LAYER 2	0.572	3.652	1.695	1.123	2.456	0.345
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1969

	MM	CU. METERS	PERCENT
PRECIPITATION	1185.50	254882.547	100.00
RUNOFF	550.751	118411.391	46.46

POTENTIAL EVAPOTRANSPIRATION	1676.374	360420.375	
ACTUAL EVAPOTRANSPIRATION	531.406	114252.359	44.83
PERC./LEAKAGE THROUGH LAYER 2	111.950012	24069.252	9.44
AVG. HEAD ON TOP OF LAYER 2	19.1373		
DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		
CHANGE IN WATER STORAGE	103.343	22218.727	8.72
SOIL WATER AT START OF YEAR	6457.815	1388430.375	
SOIL WATER AT END OF YEAR	6561.158	1410649.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.062	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1993 USED WITH PRECIPITATION FOR YEAR 1970

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MONTHLY TOTALS (MM) FOR YEAR 1970

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	33.9	72.9	23.7	20.5	17.8
	0.3	10.7	120.5	29.2	90.7	201.1
RUNOFF	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	52.43	0.00	1.73	88.96
POTENTIAL EVAPOTRANSPIRATION	189.21	178.75	158.54	123.33	84.61	70.20
	80.14	99.20	121.38	194.46	191.15	223.10

ACTUAL EVAPOTRANSPIRATION	81.74	35.54	73.45	10.21	20.82	13.47
	8.85	6.03	45.72	30.96	75.83	80.37
PERCOLATION/LEAKAGE THROUGH	6.907	4.959	11.836	3.538	4.909	2.255
LAYER 2	0.000	0.000	11.501	7.103	8.846	17.259
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.817	0.472	1.580	0.452	0.190	0.061
TOP OF LAYER 2	0.000	0.000	2.164	0.489	1.763	3.430
STD. DEVIATION OF DAILY	1.504	1.016	2.027	0.950	0.431	0.179
HEAD ON TOP OF LAYER 2	0.000	0.000	2.711	0.808	2.522	2.375
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1970

	MM	CU. METERS	PERCENT
PRECIPITATION	722.80	155402.031	100.00
RUNOFF	143.118	30770.277	19.80
POTENTIAL EVAPOTRANSPIRATION	1714.050	368520.844	
ACTUAL EVAPOTRANSPIRATION	482.989	103842.562	66.82
PERC./LEAKAGE THROUGH LAYER 2	79.111298	17008.930	10.95
AVG. HEAD ON TOP OF LAYER 2	9.5135		

DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		
CHANGE IN WATER STORAGE	96.694	20789.230	13.38
SOIL WATER AT START OF YEAR	6561.158	1410649.000	
SOIL WATER AT END OF YEAR	6657.853	1431438.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.052	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1994 USED WITH PRECIPITATION FOR YEAR 1971

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MONTHLY TOTALS (MM) FOR YEAR 1971

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.5	149.5	58.8	32.2	25.2	3.4
	8.1	43.2	33.8	2.3	75.5	172.0
RUNOFF	3.50	56.29	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	6.69	56.43
POTENTIAL EVAPOTRANSPIRATION	227.77	167.65	151.88	120.20	85.53	66.71
	78.71	107.77	137.91	191.49	198.93	225.55
ACTUAL EVAPOTRANSPIRATION	37.00	97.03	56.08	33.58	9.69	9.38
	6.05	35.58	30.75	3.68	31.87	110.85
PERCOLATION/LEAKAGE THROUGH	5.943	17.659	7.277	6.114	5.186	2.364
LAYER 2	0.000	7.838	6.676	0.000	12.188	18.063

LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.823	3.672	0.854	0.973	0.526	0.073
TOP OF LAYER 2	0.000	1.444	0.632	0.000	2.076	3.361
STD. DEVIATION OF DAILY	1.685	2.469	1.479	1.836	0.904	0.219
HEAD ON TOP OF LAYER 2	0.000	2.570	1.130	0.000	2.398	2.401
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1971

	MM	CU. METERS	PERCENT
PRECIPITATION	659.50	141792.469	100.00
RUNOFF	122.902	26424.027	18.64
POTENTIAL EVAPOTRANSPIRATION	1760.094	378420.188	
ACTUAL EVAPOTRANSPIRATION	461.513	99225.203	69.98
PERC./LEAKAGE THROUGH LAYER 2	89.308380	19201.301	13.54
AVG. HEAD ON TOP OF LAYER 2	12.0294		
DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		

CHANGE IN WATER STORAGE	75.085	16143.347	11.39
SOIL WATER AT START OF YEAR	6657.853	1431438.250	
SOIL WATER AT END OF YEAR	6732.938	1447581.625	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.094	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1995 USED WITH PRECIPITATION FOR YEAR 1972

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MONTHLY TOTALS (MM) FOR YEAR 1972

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	311.2	64.7	85.2	58.2	20.3	46.2
	0.5	33.5	21.4	157.7	61.6	30.7
RUNOFF	169.10	0.00	40.18	16.10	0.00	11.60
	0.00	0.00	0.00	55.76	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	167.25	172.71	151.98	115.89	81.31	67.52
	81.78	109.67	134.36	175.05	171.78	232.00
ACTUAL EVAPOTRANSPIRATION	114.19	64.42	41.57	32.65	9.48	24.59
	11.06	9.44	12.51	84.89	70.82	19.33
PERCOLATION/LEAKAGE THROUGH	20.250	12.776	10.026	6.979	0.000	8.612
LAYER 2	4.137	8.577	5.957	13.739	12.507	4.264
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	5.593	1.755	2.121	1.465	0.000	1.857
TOP OF LAYER 2	0.423	0.966	0.179	3.099	1.876	0.133
STD. DEVIATION OF DAILY	2.613	2.168	3.006	2.501	0.000	3.228
HEAD ON TOP OF LAYER 2	0.942	1.258	0.354	3.112	1.704	0.264
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1972

	MM	CU. METERS	PERCENT
PRECIPITATION	891.20	191607.859	100.00
RUNOFF	292.739	62938.961	32.85
POTENTIAL EVAPOTRANSPIRATION	1661.302	357179.938	
ACTUAL EVAPOTRANSPIRATION	494.946	106413.492	55.54
PERC./LEAKAGE THROUGH LAYER 2	107.823624	23182.078	12.10
AVG. HEAD ON TOP OF LAYER 2	16.2209		
DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		
CHANGE IN WATER STORAGE	103.515	22255.641	11.62
SOIL WATER AT START OF YEAR	6732.938	1447581.625	
SOIL WATER AT END OF YEAR	6836.452	1469837.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	

INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0011	-0.229	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1996 USED WITH PRECIPITATION FOR YEAR 1973

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MONTHLY TOTALS (MM) FOR YEAR 1973

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	99.0	280.5	45.3	30.8	21.1	17.4
	62.6	42.6	21.8	83.7	124.8	27.2
RUNOFF	60.38	105.21	10.96	0.00	3.10	0.00
	2.91	0.00	0.00	3.36	10.86	0.00
POTENTIAL EVAPOTRANSPIRATION	187.12	166.74	161.89	126.72	89.06	69.16
	81.39	101.33	141.58	176.31	206.52	225.58
ACTUAL EVAPOTRANSPIRATION	27.00	151.24	37.92	14.02	33.33	6.52
	48.26	28.26	22.55	75.48	88.96	23.01
PERCOLATION/LEAKAGE THROUGH	2.989	18.657	8.189	1.678	8.975	1.862
LAYER 2	15.796	3.032	5.075	13.216	14.681	2.192
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	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 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.860	6.707	1.513	0.027	2.060	0.040
TOP OF LAYER 2	3.446	0.535	0.464	2.008	3.187	0.154

STD. DEVIATION OF DAILY	2.326	2.094	2.470	0.134	3.021	0.129
HEAD ON TOP OF LAYER 2	2.937	1.543	1.004	2.260	2.894	0.524
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	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 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1973

	MM	CU. METERS	PERCENT
PRECIPITATION	856.80	184212.062	100.00
RUNOFF	196.776	42306.840	22.97
POTENTIAL EVAPOTRANSPIRATION	1733.405	372682.031	
ACTUAL EVAPOTRANSPIRATION	556.558	119659.977	64.96
PERC./LEAKAGE THROUGH LAYER 2	96.341614	20713.447	11.24
AVG. HEAD ON TOP OF LAYER 2	17.5000		
DRAINAGE COLLECTED FROM LAYER 4	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 5	0.0000		
CHANGE IN WATER STORAGE	103.466	22245.141	12.08
SOIL WATER AT START OF YEAR	6836.452	1469837.250	
SOIL WATER AT END OF YEAR	6939.918	1492082.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE	0.0005	0.104	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1997 USED WITH PRECIPITATION FOR YEAR 1974

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MONTHLY TOTALS (MM) FOR YEAR 1974

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	126.7	93.3	239.8	114.6	168.0	100.8
	5.0	65.2	20.8	72.0	48.2	2.4
RUNOFF	62.18	54.77	138.38	31.91	101.82	52.20
	0.00	24.43	0.00	3.94	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	191.44	169.05	162.24	122.83	86.70	67.92
	80.07	104.40	118.76	187.25	185.27	204.27
ACTUAL EVAPOTRANSPIRATION	61.28	31.14	83.69	63.40	47.76	50.30
	4.47	17.08	32.13	48.76	37.91	11.88
PERCOLATION/LEAKAGE THROUGH	10.897	5.489	15.905	16.079	15.300	14.953
LAYER 2	0.000	2.897	7.741	12.084	5.561	3.905
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	0.000	0.000	0.055	0.086	0.000	0.067
PERCOLATION/LEAKAGE THROUGH	0.000	0.000	0.000	0.000	0.000	0.000
LAYER 5	0.000	0.000	0.373	0.574	0.000	0.440

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	1.563	1.505	3.342	3.947	3.418	3.252
TOP OF LAYER 2	0.000	1.099	1.545	1.637	0.496	0.180
STD. DEVIATION OF DAILY	2.477	2.523	2.781	3.030	3.424	2.965
HEAD ON TOP OF LAYER 2	0.000	2.855	2.400	2.289	0.889	0.411
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	0.000	0.000	0.000	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 5	0.000	0.000	0.001	0.001	0.000	0.001

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ANNUAL TOTALS FOR YEAR 1974

	MM	CU. METERS	PERCENT
PRECIPITATION	1056.80	227211.953	100.00
RUNOFF	469.610	100966.086	44.44
POTENTIAL EVAPOTRANSPIRATION	1680.220	361247.281	
ACTUAL EVAPOTRANSPIRATION	489.789	105304.633	46.35
PERC./LEAKAGE THROUGH LAYER 2	110.811516	23824.477	10.49
AVG. HEAD ON TOP OF LAYER 2	18.3202		
DRAINAGE COLLECTED FROM LAYER 4	0.2087	44.873	0.02
PERC./LEAKAGE THROUGH LAYER 5	1.386764	298.154	0.13
AVG. HEAD ON TOP OF LAYER 5	0.0011		
CHANGE IN WATER STORAGE	95.805	20598.074	9.07
SOIL WATER AT START OF YEAR	6939.918	1492082.375	
SOIL WATER AT END OF YEAR	7035.723	1512680.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0007	0.140	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1998 USED WITH PRECIPITATION FOR YEAR 1975

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MONTHLY TOTALS (MM) FOR YEAR 1975

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	811.0	724.2	790.0	662.2	651.3	531.5
	588.5	565.5	619.8	680.9	751.0	810.8
RUNOFF	583.30	530.93	601.79	532.74	547.39	443.07
	480.98	452.56	472.01	478.91	547.07	574.86
POTENTIAL EVAPOTRANSPIRATION	189.94	173.88	165.26	108.96	85.48	67.19
	82.92	96.03	129.35	177.02	186.96	223.89
ACTUAL EVAPOTRANSPIRATION	179.71	170.99	162.97	108.55	85.43	67.15
	82.87	95.94	128.34	174.49	183.19	219.32
PERCOLATION/LEAKAGE THROUGH	20.766	19.373	21.497	20.915	21.697	21.017
LAYER 2	21.700	21.641	20.856	21.465	20.736	21.395
LATERAL DRAINAGE COLLECTED	0.082	0.000	0.000	0.000	0.000	0.000
FROM LAYER 4	0.000	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	0.526	0.000	0.000	0.000	0.000	0.000
LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	8.622	8.883	9.017	9.331	9.564	9.622
TOP OF LAYER 2	9.573	9.412	9.163	8.928	8.826	8.737
STD. DEVIATION OF DAILY	1.625	0.250	0.236	0.218	0.099	0.077
HEAD ON TOP OF LAYER 2	0.098	0.182	0.235	0.216	0.232	0.248
AVERAGE DAILY HEAD ON	0.001	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY	0.001	0.000	0.000	0.000	0.000	0.000
HEAD ON TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1975

	MM	CU. METERS	PERCENT
PRECIPITATION	8186.70	1760141.500	100.00
RUNOFF	6245.606	1342805.250	76.29
POTENTIAL EVAPOTRANSPIRATION	1686.871	362677.219	
ACTUAL EVAPOTRANSPIRATION	1658.932	356670.344	20.26
PERC./LEAKAGE THROUGH LAYER 2	253.057831	54407.434	3.09
AVG. HEAD ON TOP OF LAYER 2	91.3979		
DRAINAGE COLLECTED FROM LAYER 4	0.0815	17.533	0.00
PERC./LEAKAGE THROUGH LAYER 5	0.526180	113.129	0.01
AVG. HEAD ON TOP OF LAYER 5	0.0004		
CHANGE IN WATER STORAGE	281.554	60534.141	3.44
SOIL WATER AT START OF YEAR	7035.723	1512680.500	
SOIL WATER AT END OF YEAR	7317.277	1573214.625	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0052	1.122	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1999 USED WITH PRECIPITATION FOR YEAR 1976

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MONTHLY TOTALS (MM) FOR YEAR 1976

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	231.8	100.6	199.4	26.6	13.6	67.2
	41.0	7.4	44.8	195.6	83.0	40.3
RUNOFF	132.03	2.99	100.72	0.00	0.00	17.20
	0.00	0.00	0.00	55.51	44.37	0.00
POTENTIAL EVAPOTRANSPIRATION	192.10	160.67	150.72	110.75	89.98	69.67
	80.86	103.41	120.97	156.11	188.76	205.29
ACTUAL EVAPOTRANSPIRATION	100.62	67.44	83.45	36.56	12.50	28.22
	39.93	8.37	34.70	93.53	55.37	41.71
PERCOLATION/LEAKAGE THROUGH	19.073	14.001	19.925	11.525	0.000	8.081
LAYER 2	11.215	0.000	13.072	12.564	11.127	4.502
LATERAL DRAINAGE COLLECTED	0.000	0.017	0.021	0.036	0.005	0.021
FROM LAYER 4	0.243	0.025	0.127	0.203	0.014	0.043
PERCOLATION/LEAKAGE THROUGH	0.000	0.122	0.150	0.248	0.082	0.284
LAYER 5	1.616	0.223	0.820	1.214	0.101	0.277

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	3.951	2.403	4.701	1.386	0.000	2.923
TOP OF LAYER 2	1.756	0.000	1.629	2.638	2.139	0.314
STD. DEVIATION OF DAILY	3.081	2.471	3.140	1.574	0.000	3.806
HEAD ON TOP OF LAYER 2	2.226	0.000	1.605	2.983	3.117	0.768
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 5	0.002	0.000	0.001	0.001	0.000	0.000
STD. DEVIATION OF DAILY	0.000	0.000	0.000	0.001	0.000	0.000
HEAD ON TOP OF LAYER 5	0.001	0.000	0.001	0.001	0.000	0.001

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ANNUAL TOTALS FOR YEAR 1976

	MM	CU. METERS	PERCENT

PRECIPITATION	1051.30	226029.594	100.00
RUNOFF	352.830	75858.477	33.56
POTENTIAL EVAPOTRANSPIRATION	1629.282	350295.562	
ACTUAL EVAPOTRANSPIRATION	602.398	129515.586	57.30
PERC./LEAKAGE THROUGH LAYER 2	125.084732	26893.217	11.90
AVG. HEAD ON TOP OF LAYER 2	19.8678		
DRAINAGE COLLECTED FROM LAYER 4	0.7542	162.157	0.07
PERC./LEAKAGE THROUGH LAYER 5	5.137100	1104.477	0.49
AVG. HEAD ON TOP OF LAYER 5	0.0044		
CHANGE IN WATER STORAGE	90.181	19388.982	8.58
SOIL WATER AT START OF YEAR	7317.277	1573214.625	
SOIL WATER AT END OF YEAR	7407.458	1592603.625	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.076	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2000 USED WITH PRECIPITATION FOR YEAR 1977

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MONTHLY TOTALS (MM) FOR YEAR 1977

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	46.4	166.5	130.4	8.3	109.3	50.5
	0.2	14.1	37.3	4.6	11.0	29.4

RUNOFF	0.00	73.47	68.92	0.00	42.27	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	199.88	176.14	142.13	111.61	87.41	68.34
	80.04	104.63	127.43	177.82	167.08	234.03
ACTUAL EVAPOTRANSPIRATION	42.12	61.39	67.51	8.90	42.60	52.55
	0.20	7.79	17.95	12.89	9.32	8.36
PERCOLATION/LEAKAGE THROUGH	5.186	11.814	12.332	0.000	10.668	12.587
LAYER 2	0.000	0.000	11.724	2.613	0.000	14.623
LATERAL DRAINAGE COLLECTED	0.211	0.141	0.082	0.017	0.081	0.256
FROM LAYER 4	0.042	0.014	0.513	0.346	0.039	0.352
PERCOLATION/LEAKAGE THROUGH	1.272	0.851	0.530	0.225	0.423	1.724
LAYER 5	0.343	0.240	1.223	1.989	0.416	1.183

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.273	3.319	2.987	0.000	3.079	1.229
TOP OF LAYER 2	0.000	0.000	1.112	0.222	0.000	1.737
STD. DEVIATION OF DAILY	0.475	3.388	3.414	0.000	3.679	1.187
HEAD ON TOP OF LAYER 2	0.000	0.000	1.116	0.635	0.000	1.651
AVERAGE DAILY HEAD ON	0.001	0.001	0.001	0.000	0.001	0.002
TOP OF LAYER 5	0.000	0.000	0.003	0.002	0.001	0.002
STD. DEVIATION OF DAILY	0.001	0.001	0.001	0.000	0.001	0.001
HEAD ON TOP OF LAYER 5	0.001	0.000	0.004	0.001	0.000	0.003

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ANNUAL TOTALS FOR YEAR 1977

	MM	CU. METERS	PERCENT
PRECIPITATION	608.00	130720.016	100.00
RUNOFF	184.651	39699.902	30.37
POTENTIAL EVAPOTRANSPIRATION	1676.533	360454.688	

ACTUAL EVAPOTRANSPIRATION	331.572	71287.898	54.53
PERC./LEAKAGE THROUGH LAYER 2	81.547150	17532.637	13.41
AVG. HEAD ON TOP OF LAYER 2	11.6311		
DRAINAGE COLLECTED FROM LAYER 4	2.0941	450.235	0.34
PERC./LEAKAGE THROUGH LAYER 5	10.419245	2240.138	1.71
AVG. HEAD ON TOP OF LAYER 5	0.0120		
CHANGE IN WATER STORAGE	79.264	17041.793	13.04
SOIL WATER AT START OF YEAR	7407.458	1592603.625	
SOIL WATER AT END OF YEAR	7486.723	1609645.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.057	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2001 USED WITH PRECIPITATION FOR YEAR 1978

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MONTHLY TOTALS (MM) FOR YEAR 1978

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	228.0	19.6	327.7	84.6	64.6	187.1
	9.2	21.5	37.6	50.1	138.1	115.7
RUNOFF	99.10	0.00	253.06	32.34	9.47	114.18
	0.00	0.00	0.00	3.77	36.38	38.49
POTENTIAL EVAPOTRANSPIRATION	202.09	165.69	154.53	118.42	88.39	66.36
	76.17	102.20	127.77	187.86	188.46	223.03
ACTUAL EVAPOTRANSPIRATION	96.43	29.51	59.77	55.54	25.47	59.94

	17.43	4.97	34.77	44.58	87.38	51.73
PERCOLATION/LEAKAGE THROUGH	16.463	5.455	8.907	14.452	8.806	19.653
LAYER 2	5.356	6.964	4.700	7.052	13.759	11.199
LATERAL DRAINAGE COLLECTED	0.242	0.004	0.049	0.170	0.070	0.113
FROM LAYER 4	0.000	0.012	0.306	0.199	0.190	0.093
PERCOLATION/LEAKAGE THROUGH	1.831	0.016	0.401	1.080	0.457	0.682
LAYER 5	0.000	0.186	1.889	1.264	1.211	0.609

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	4.230	0.957	2.861	2.665	1.946	5.751
TOP OF LAYER 2	0.373	0.571	0.587	1.358	3.355	1.696
STD. DEVIATION OF DAILY	3.368	1.842	3.817	2.540	2.878	2.753
HEAD ON TOP OF LAYER 2	0.734	0.857	1.152	2.584	3.197	2.329
AVERAGE DAILY HEAD ON	0.002	0.000	0.000	0.001	0.000	0.001
TOP OF LAYER 5	0.000	0.000	0.002	0.001	0.001	0.001
STD. DEVIATION OF DAILY	0.001	0.000	0.001	0.001	0.001	0.001
HEAD ON TOP OF LAYER 5	0.000	0.000	0.001	0.001	0.001	0.001

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ANNUAL TOTALS FOR YEAR 1978

	MM	CU. METERS	PERCENT
PRECIPITATION	1283.80	276016.906	100.00
RUNOFF	586.802	126162.367	45.71
POTENTIAL EVAPOTRANSPIRATION	1700.963	365707.125	
ACTUAL EVAPOTRANSPIRATION	567.519	122016.539	44.21
PERC./LEAKAGE THROUGH LAYER 2	122.766029	26394.697	9.56
AVG. HEAD ON TOP OF LAYER 2	21.9587		
DRAINAGE COLLECTED FROM LAYER 4	1.4488	311.489	0.11

PERC./LEAKAGE THROUGH LAYER 5	9.626379	2069.671	0.75
AVG. HEAD ON TOP OF LAYER 5	0.0081		
CHANGE IN WATER STORAGE	118.404	25456.779	9.22
SOIL WATER AT START OF YEAR	7486.723	1609645.375	
SOIL WATER AT END OF YEAR	7605.126	1635102.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.059	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2002 USED WITH PRECIPITATION FOR YEAR 1979

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MONTHLY TOTALS (MM) FOR YEAR 1979

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	21.0	14.4	65.4	21.2	69.0	67.2
	23.0	2.8	18.8	34.6	77.4	5.8
RUNOFF	0.00	0.00	0.00	0.00	20.41	31.12
	0.00	0.00	0.00	0.00	16.38	0.00
POTENTIAL EVAPOTRANSPIRATION	239.77	160.88	159.35	116.88	84.21	69.70
	81.03	103.98	138.41	191.44	204.69	255.30
ACTUAL EVAPOTRANSPIRATION	18.47	16.67	62.81	13.46	42.94	23.66
	11.84	10.42	11.64	28.06	55.39	10.96
PERCOLATION/LEAKAGE THROUGH	7.935	3.809	7.653	0.000	10.127	6.408
LAYER 2	5.680	5.644	1.855	2.787	10.667	1.648
LATERAL DRAINAGE COLLECTED	0.105	0.124	0.195	0.109	0.289	0.132
FROM LAYER 4	0.260	0.196	0.082	0.108	0.526	0.550

PERCOLATION/LEAKAGE THROUGH	0.643	0.782	1.295	0.729	1.283	0.874
LAYER 5	1.746	1.369	0.608	0.753	1.273	2.106

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.847	0.100	0.940	0.000	2.398	1.929
TOP OF LAYER 2	0.594	0.382	0.027	0.091	1.341	0.090
STD. DEVIATION OF DAILY	1.344	0.253	1.280	0.000	3.158	3.028
HEAD ON TOP OF LAYER 2	1.039	0.713	0.094	0.251	2.160	0.320
AVERAGE DAILY HEAD ON	0.001	0.001	0.001	0.001	0.002	0.001
TOP OF LAYER 5	0.002	0.001	0.001	0.001	0.003	0.003
STD. DEVIATION OF DAILY	0.001	0.001	0.001	0.001	0.002	0.001
HEAD ON TOP OF LAYER 5	0.001	0.001	0.001	0.001	0.005	0.003

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ANNUAL TOTALS FOR YEAR 1979

	MM	CU. METERS	PERCENT
PRECIPITATION	420.60	90429.055	100.00
RUNOFF	67.917	14602.060	16.15
POTENTIAL EVAPOTRANSPIRATION	1805.641	388212.906	
ACTUAL EVAPOTRANSPIRATION	306.326	65860.117	72.83
PERC./LEAKAGE THROUGH LAYER 2	64.212334	13805.651	15.27
AVG. HEAD ON TOP OF LAYER 2	7.2826		
DRAINAGE COLLECTED FROM LAYER 4	2.6757	575.273	0.64
PERC./LEAKAGE THROUGH LAYER 5	13.459149	2893.717	3.20
AVG. HEAD ON TOP OF LAYER 5	0.0150		
CHANGE IN WATER STORAGE	30.223	6497.937	7.19

SOIL WATER AT START OF YEAR	7605.126	1635102.250	
SOIL WATER AT END OF YEAR	7635.349	1641600.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.051	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2003 USED WITH PRECIPITATION FOR YEAR 1980

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MONTHLY TOTALS (MM) FOR YEAR 1980

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	70.8	39.0	32.4	3.0	160.0	12.0
	17.4	2.8	1.4	48.4	43.2	46.1
RUNOFF	25.12	0.00	0.00	0.00	58.20	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	232.55	163.16	171.69	115.09	84.17	68.85
	79.01	109.76	150.08	187.18	208.36	218.94
ACTUAL EVAPOTRANSPIRATION	37.23	21.20	33.83	1.78	57.60	29.43
	4.95	8.58	6.85	37.53	41.99	17.73
PERCOLATION/LEAKAGE THROUGH	8.446	10.403	5.964	0.000	16.903	8.725
LAYER 2	2.072	1.418	0.000	6.310	5.764	14.449
LATERAL DRAINAGE COLLECTED	0.222	0.178	0.220	0.051	0.412	0.209
FROM LAYER 4	0.008	0.226	0.140	1.553	2.308	0.419
PERCOLATION/LEAKAGE THROUGH	1.423	1.289	1.326	0.429	1.407	1.396
LAYER 5	0.116	1.244	1.073	2.679	2.344	1.871

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	1.356	1.360	1.051	0.000	4.873	1.448
TOP OF LAYER 2	0.044	0.010	0.000	1.193	1.124	2.437
STD. DEVIATION OF DAILY	2.262	1.570	2.065	0.000	3.516	2.209
HEAD ON TOP OF LAYER 2	0.130	0.041	0.000	2.102	2.375	2.269
AVERAGE DAILY HEAD ON	0.001	0.001	0.001	0.000	0.003	0.001
TOP OF LAYER 5	0.000	0.002	0.001	0.010	0.015	0.003
STD. DEVIATION OF DAILY	0.001	0.001	0.001	0.001	0.003	0.001
HEAD ON TOP OF LAYER 5	0.000	0.001	0.000	0.004	0.010	0.003

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ANNUAL TOTALS FOR YEAR 1980

	MM	CU. METERS	PERCENT
PRECIPITATION	476.50	102447.523	100.00
RUNOFF	83.325	17914.795	17.49
POTENTIAL EVAPOTRANSPIRATION	1788.847	384602.125	
ACTUAL EVAPOTRANSPIRATION	298.700	64220.398	62.69
PERC./LEAKAGE THROUGH LAYER 2	80.453735	17297.553	16.88
AVG. HEAD ON TOP OF LAYER 2	12.4133		
DRAINAGE COLLECTED FROM LAYER 4	5.9475	1278.720	1.25
PERC./LEAKAGE THROUGH LAYER 5	16.597387	3568.438	3.48
AVG. HEAD ON TOP OF LAYER 5	0.0321		
CHANGE IN WATER STORAGE	71.930	15465.055	15.10
SOIL WATER AT START OF YEAR	7635.349	1641600.000	
SOIL WATER AT END OF YEAR	7707.280	1657065.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	

SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.119	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2004 USED WITH PRECIPITATION FOR YEAR 1981

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MONTHLY TOTALS (MM) FOR YEAR 1981

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	34.6	155.8	29.2	158.0	103.1	21.0
	33.0	3.2	2.9	133.3	111.8	100.8
RUNOFF	0.00	41.73	0.00	111.37	44.83	3.80
	0.00	0.00	0.00	75.71	43.73	6.75
POTENTIAL EVAPOTRANSPIRATION	224.72	170.26	160.32	122.86	89.62	68.72
	79.13	99.93	137.21	183.07	195.17	227.49
ACTUAL EVAPOTRANSPIRATION	37.83	95.47	23.52	45.33	26.12	32.61
	8.95	17.86	3.26	40.11	58.97	72.42
PERCOLATION/LEAKAGE THROUGH	6.369	14.058	4.569	11.392	5.627	10.682
LAYER 2	2.942	5.990	0.000	8.204	13.239	9.765
LATERAL DRAINAGE COLLECTED	0.239	0.175	0.065	0.179	0.049	0.354
FROM LAYER 4	0.047	0.554	0.044	0.752	2.128	0.269
PERCOLATION/LEAKAGE THROUGH	1.422	1.122	0.469	1.225	0.393	1.954
LAYER 5	0.349	1.842	0.484	1.993	2.401	1.519

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	0.194	4.336	0.447	3.151	1.739	2.387
TOP OF LAYER 2	0.414	0.801	0.000	1.958	1.669	2.277
STD. DEVIATION OF DAILY	0.318	3.327	0.894	3.759	2.958	2.979

HEAD ON TOP OF LAYER 2	1.526	1.486	0.000	2.909	2.385	3.018
AVERAGE DAILY HEAD ON	0.002	0.001	0.000	0.001	0.000	0.002
TOP OF LAYER 5	0.000	0.003	0.001	0.005	0.014	0.002
STD. DEVIATION OF DAILY	0.001	0.001	0.001	0.001	0.001	0.002
HEAD ON TOP OF LAYER 5	0.001	0.004	0.000	0.004	0.011	0.002

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ANNUAL TOTALS FOR YEAR 1981

	MM	CU. METERS	PERCENT
PRECIPITATION	886.70	190640.531	100.00
RUNOFF	327.920	70502.773	36.98
POTENTIAL EVAPOTRANSPIRATION	1758.488	378074.875	
ACTUAL EVAPOTRANSPIRATION	462.422	99420.688	52.15
PERC./LEAKAGE THROUGH LAYER 2	92.837761	19960.119	10.47
AVG. HEAD ON TOP OF LAYER 2	16.1448		
DRAINAGE COLLECTED FROM LAYER 4	4.8560	1044.044	0.55
PERC./LEAKAGE THROUGH LAYER 5	15.171715	3261.919	1.71
AVG. HEAD ON TOP OF LAYER 5	0.0265		
CHANGE IN WATER STORAGE	76.330	16410.998	8.61
SOIL WATER AT START OF YEAR	7707.280	1657065.125	
SOIL WATER AT END OF YEAR	7783.610	1673476.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.098	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2005 USED WITH PRECIPITATION FOR YEAR 1982

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MONTHLY TOTALS (MM) FOR YEAR 1982

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.1	29.9	104.2	27.8	4.6	11.2
	9.4	1.2	121.0	32.8	5.5	23.4
RUNOFF	5.30	0.00	9.44	0.00	0.00	0.00
	0.00	0.00	43.07	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	221.61	186.79	158.39	117.90	89.89	68.12
	79.45	114.95	131.86	174.52	212.62	233.41
ACTUAL EVAPOTRANSPIRATION	47.94	19.22	80.31	30.71	0.43	8.85
	7.75	6.52	46.48	44.82	10.29	6.15
PERCOLATION/LEAKAGE THROUGH	15.402	6.402	10.876	9.940	0.000	0.000
LAYER 2	0.000	0.000	6.871	9.845	0.000	0.000
LATERAL DRAINAGE COLLECTED	0.260	0.047	0.101	0.229	0.129	0.078
FROM LAYER 4	2.072	3.158	3.060	2.680	0.066	0.554
PERCOLATION/LEAKAGE THROUGH	1.793	0.332	0.875	1.744	0.796	0.541
LAYER 5	2.679	2.679	2.592	2.679	0.623	1.830

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	2.304	0.409	2.196	1.254	0.000	0.000
TOP OF LAYER 2	0.000	0.000	2.409	1.454	0.000	0.000
STD. DEVIATION OF DAILY	2.444	0.674	2.538	1.593	0.000	0.000
HEAD ON TOP OF LAYER 2	0.000	0.000	3.532	1.883	0.000	0.000
AVERAGE DAILY HEAD ON	0.002	0.000	0.001	0.001	0.001	0.001
TOP OF LAYER 5	0.013	0.020	0.020	0.017	0.001	0.004
STD. DEVIATION OF DAILY	0.001	0.001	0.001	0.001	0.001	0.001
HEAD ON TOP OF LAYER 5	0.006	0.000	0.000	0.013	0.001	0.004

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ANNUAL TOTALS FOR YEAR 1982

	MM	CU. METERS	PERCENT
PRECIPITATION	427.10	91826.523	100.00
RUNOFF	57.808	12428.783	13.54
POTENTIAL EVAPOTRANSPIRATION	1789.508	384744.250	
ACTUAL EVAPOTRANSPIRATION	309.481	66538.328	72.46
PERC./LEAKAGE THROUGH LAYER 2	59.334969	12757.019	13.89
AVG. HEAD ON TOP OF LAYER 2	8.3543		
DRAINAGE COLLECTED FROM LAYER 4	12.4332	2673.147	2.91
PERC./LEAKAGE THROUGH LAYER 5	19.162762	4119.994	4.49
AVG. HEAD ON TOP OF LAYER 5	0.0659		
CHANGE IN WATER STORAGE	28.215	6066.296	6.61
SOIL WATER AT START OF YEAR	7783.610	1673476.125	
SOIL WATER AT END OF YEAR	7811.825	1679542.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.029	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2006 USED WITH PRECIPITATION FOR YEAR 1983

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MONTHLY TOTALS (MM) FOR YEAR 1983

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	33.0	18.4	178.0	72.6	102.7	60.8
	516.4	561.5	653.4	661.6	710.3	776.1
RUNOFF	3.38	0.00	124.35	3.97	40.11	10.40
	396.65	435.46	493.04	474.44	502.86	546.88
POTENTIAL EVAPOTRANSPIRATION	201.63	183.81	172.57	117.43	87.53	63.85
	77.69	100.86	140.78	175.24	190.68	203.38
ACTUAL EVAPOTRANSPIRATION	31.55	10.69	52.37	31.37	56.73	50.20
	76.12	100.80	139.53	172.77	187.44	199.94
PERCOLATION/LEAKAGE THROUGH	8.189	1.492	13.008	4.935	15.128	16.589
LAYER 2	21.594	21.621	20.828	21.482	20.748	21.444
LATERAL DRAINAGE COLLECTED	3.157	0.213	1.701	0.679	0.406	0.240
FROM LAYER 4	0.018	0.000	0.000	0.000	0.000	0.000
PERCOLATION/LEAKAGE THROUGH	2.679	1.325	1.849	1.861	1.858	1.605
LAYER 5	0.133	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	1.514	0.008	2.624	0.950	4.838	3.810
TOP OF LAYER 2	9.282	9.358	9.085	8.974	8.859	8.870
STD. DEVIATION OF DAILY	2.488	0.033	3.514	1.991	4.057	2.645
HEAD ON TOP OF LAYER 2	1.345	0.172	0.192	0.243	0.268	0.349
AVERAGE DAILY HEAD ON	0.020	0.002	0.011	0.004	0.003	0.002
TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATION OF DAILY	0.010	0.001	0.010	0.005	0.002	0.001
HEAD ON TOP OF LAYER 5	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1983

	MM	CU. METERS	PERCENT
PRECIPITATION	4344.80	934132.188	100.00
RUNOFF	3031.542	651781.500	69.77
POTENTIAL EVAPOTRANSPIRATION	1715.459	368823.781	
ACTUAL EVAPOTRANSPIRATION	1109.519	238546.641	25.54
PERC./LEAKAGE THROUGH LAYER 2	187.057938	40217.457	4.31
AVG. HEAD ON TOP OF LAYER 2	56.8094		
DRAINAGE COLLECTED FROM LAYER 4	6.4131	1378.812	0.15
PERC./LEAKAGE THROUGH LAYER 5	11.311188	2431.905	0.26
AVG. HEAD ON TOP OF LAYER 5	0.0338		
CHANGE IN WATER STORAGE	186.015	39993.227	4.28
SOIL WATER AT START OF YEAR	7811.825	1679542.375	
SOIL WATER AT END OF YEAR	7997.840	1719535.625	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.133	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2007 USED WITH PRECIPITATION FOR YEAR 1984

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MONTHLY TOTALS (MM) FOR YEAR 1984

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

PRECIPITATION	128.2	116.7	112.3	92.7	45.1	48.6
	125.8	28.6	35.2	26.6	150.0	78.2
RUNOFF	12.70	15.51	62.63	21.53	0.00	10.39
	47.43	0.00	0.00	0.00	89.13	12.29
POTENTIAL EVAPOTRANSPIRATION	217.50	165.62	154.60	113.69	87.98	68.13
	78.41	102.92	131.82	188.69	197.38	213.26
ACTUAL EVAPOTRANSPIRATION	105.38	98.23	42.41	57.82	44.15	21.53
	50.97	39.87	29.22	3.42	68.87	23.19
PERCOLATION/LEAKAGE THROUGH	15.589	18.721	10.356	16.919	7.754	6.797
LAYER 2	13.471	12.538	5.963	2.177	13.010	11.997
LATERAL DRAINAGE COLLECTED	0.000	0.116	0.024	0.253	0.097	0.003
FROM LAYER 4	2.011	0.445	0.308	0.627	2.897	1.101
PERCOLATION/LEAKAGE THROUGH	0.000	0.725	0.178	1.785	0.682	0.030
LAYER 5	2.151	2.164	0.304	1.342	2.516	1.264

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	3.073	4.940	2.222	3.829	1.108	2.199
TOP OF LAYER 2	1.511	2.165	0.667	0.332	3.407	2.289
STD. DEVIATION OF DAILY	2.838	2.509	2.955	2.822	1.812	3.334
HEAD ON TOP OF LAYER 2	2.601	2.267	1.132	1.015	3.448	2.306
AVERAGE DAILY HEAD ON	0.000	0.001	0.000	0.002	0.001	0.000
TOP OF LAYER 5	0.013	0.003	0.002	0.004	0.019	0.007
STD. DEVIATION OF DAILY	0.000	0.001	0.001	0.001	0.001	0.000
HEAD ON TOP OF LAYER 5	0.009	0.002	0.006	0.006	0.015	0.010

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ANNUAL TOTALS FOR YEAR 1984

	MM	CU. METERS	PERCENT
PRECIPITATION	988.00	212420.047	100.00

RUNOFF	271.608	58395.758	27.49
POTENTIAL EVAPOTRANSPIRATION	1719.996	369799.219	
ACTUAL EVAPOTRANSPIRATION	585.074	125790.875	59.22
PERC./LEAKAGE THROUGH LAYER 2	135.292343	29087.854	13.69
AVG. HEAD ON TOP OF LAYER 2	23.1176		
DRAINAGE COLLECTED FROM LAYER 4	7.8811	1694.443	0.80
PERC./LEAKAGE THROUGH LAYER 5	13.141217	2825.362	1.33
AVG. HEAD ON TOP OF LAYER 5	0.0420		
CHANGE IN WATER STORAGE	110.296	23713.553	11.16
SOIL WATER AT START OF YEAR	7997.840	1719535.625	
SOIL WATER AT END OF YEAR	8108.136	1743249.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.055	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2008 USED WITH PRECIPITATION FOR YEAR 1985

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MONTHLY TOTALS (MM) FOR YEAR 1985

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	8.8	28.2	65.0	117.7	83.0	54.6
	59.6	14.4	79.5	126.2	79.4	34.0
RUNOFF	0.00	0.00	0.00	24.94	32.16	8.42
	9.05	0.00	7.16	31.65	2.10	0.00

POTENTIAL EVAPOTRANSPIRATION	196.19	145.10	170.89	111.26	88.75	67.03
	78.97	99.67	128.21	172.52	178.92	226.38
ACTUAL EVAPOTRANSPIRATION	27.65	14.92	56.59	56.92	66.74	34.39
	38.60	9.04	61.62	75.61	57.35	43.48
PERCOLATION/LEAKAGE THROUGH	8.741	6.583	11.783	8.958	17.446	11.793
LAYER 2	11.948	0.000	11.899	13.918	8.507	11.158
LATERAL DRAINAGE COLLECTED	0.597	0.112	2.629	0.738	0.625	0.224
FROM LAYER 4	0.387	0.067	2.958	2.616	0.334	0.592
PERCOLATION/LEAKAGE THROUGH	2.055	0.531	1.987	1.949	2.182	1.519
LAYER 5	1.187	0.626	2.284	2.201	1.738	2.027

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	1.209	0.464	1.317	1.827	3.923	2.623
TOP OF LAYER 2	2.897	0.000	3.340	2.726	1.699	1.560
STD. DEVIATION OF DAILY	1.867	0.836	1.956	3.207	3.323	2.866
HEAD ON TOP OF LAYER 2	3.283	0.000	3.521	2.855	2.651	1.761
AVERAGE DAILY HEAD ON	0.004	0.001	0.016	0.005	0.004	0.001
TOP OF LAYER 5	0.002	0.000	0.019	0.016	0.002	0.004
STD. DEVIATION OF DAILY	0.004	0.002	0.012	0.005	0.004	0.001
HEAD ON TOP OF LAYER 5	0.003	0.001	0.021	0.011	0.002	0.004

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ANNUAL TOTALS FOR YEAR 1985

	MM	CU. METERS	PERCENT
PRECIPITATION	750.40	161336.047	100.00
RUNOFF	115.472	24826.445	15.39
POTENTIAL EVAPOTRANSPIRATION	1663.893	357737.094	
ACTUAL EVAPOTRANSPIRATION	542.906	116724.727	72.35

PERC./LEAKAGE THROUGH LAYER 2	122.732887	26387.570	16.36
AVG. HEAD ON TOP OF LAYER 2	19.6541		
DRAINAGE COLLECTED FROM LAYER 4	11.8786	2553.900	1.58
PERC./LEAKAGE THROUGH LAYER 5	20.287439	4361.799	2.70
AVG. HEAD ON TOP OF LAYER 5	0.0629		
CHANGE IN WATER STORAGE	59.857	12869.215	7.98
SOIL WATER AT START OF YEAR	8108.136	1743249.125	
SOIL WATER AT END OF YEAR	8167.993	1756118.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.038	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2009 USED WITH PRECIPITATION FOR YEAR 1986

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MONTHLY TOTALS (MM) FOR YEAR 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	167.4	23.7	10.4	35.6	22.8	4.8
	20.8	347.0	48.2	65.4	154.3	11.4
RUNOFF	77.77	0.00	0.00	0.00	0.00	0.00
	0.00	303.02	2.83	4.87	56.64	0.00
POTENTIAL EVAPOTRANSPIRATION	218.94	158.77	158.26	111.42	88.24	68.16
	80.14	103.86	134.96	170.54	190.71	209.32
ACTUAL EVAPOTRANSPIRATION	55.86	40.04	6.95	6.41	32.51	9.72
	12.88	40.47	6.98	73.50	86.45	15.08

PERCOLATION/LEAKAGE THROUGH	9.896	6.788	0.000	0.157	17.580	0.000
LAYER 2	1.873	10.184	4.087	12.843	13.646	0.442
LATERAL DRAINAGE COLLECTED	1.021	1.586	0.622	4.803	6.528	0.392
FROM LAYER 4	3.015	5.528	1.507	2.962	1.583	0.441
PERCOLATION/LEAKAGE THROUGH	0.590	1.922	1.339	2.593	2.679	1.045
LAYER 5	2.654	2.679	1.685	2.434	1.236	1.092

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	2.570	0.988	0.000	0.030	2.789	0.000
TOP OF LAYER 2	0.011	2.567	0.216	2.999	3.295	0.004
STD. DEVIATION OF DAILY	3.117	1.368	0.000	0.164	2.197	0.000
HEAD ON TOP OF LAYER 2	0.039	3.358	0.630	3.142	3.153	0.024
AVERAGE DAILY HEAD ON	0.006	0.011	0.004	0.031	0.041	0.003
TOP OF LAYER 5	0.019	0.034	0.010	0.018	0.010	0.003
STD. DEVIATION OF DAILY	0.015	0.010	0.006	0.008	0.015	0.004
HEAD ON TOP OF LAYER 5	0.012	0.015	0.013	0.016	0.013	0.004

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ANNUAL TOTALS FOR YEAR 1986

	MM	CU. METERS	PERCENT
PRECIPITATION	911.80	196037.047	100.00
RUNOFF	445.138	95704.641	48.82
POTENTIAL EVAPOTRANSPIRATION	1693.311	364061.938	
ACTUAL EVAPOTRANSPIRATION	386.844	83171.453	42.43
PERC./LEAKAGE THROUGH LAYER 2	77.494164	16661.246	8.50
AVG. HEAD ON TOP OF LAYER 2	12.8911		
DRAINAGE COLLECTED FROM LAYER 4	29.9874	6447.295	3.29
PERC./LEAKAGE THROUGH LAYER 5	21.947313	4718.672	2.41

AVG. HEAD ON TOP OF LAYER 5	0.1586		
CHANGE IN WATER STORAGE	27.883	5994.801	3.06
SOIL WATER AT START OF YEAR	8167.993	1756118.375	
SOIL WATER AT END OF YEAR	8195.876	1762113.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0009	0.184	0.00

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FINAL WATER STORAGE AT END OF YEAR 1986

LAYER	(CM)	(VOL/VOL)
1	1.3939	0.1394
2	22.5500	0.4510
3	751.9839	0.1074
4	0.9600	0.0320
5	42.7000	0.4270
TOTAL WATER IN LAYERS	819.588	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	819.588	

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PEAK DAILY VALUES FOR YEARS 1967 THROUGH 1986

	(MM)	(CU. METERS)
PRECIPITATION	220.00	47299.996
RUNOFF	220.000	47299.9961
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.705014	151.57799
AVERAGE HEAD ON TOP OF LAYER 2	100.000	
DRAINAGE COLLECTED FROM LAYER 4	0.37357	80.31744
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.086461	18.58912
AVERAGE HEAD ON TOP OF LAYER 5	0.722	
MAXIMUM HEAD ON TOP OF LAYER 5	1.489	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	0.0 METERS	
SNOW WATER	0.00	0.0000
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4630	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1160	

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

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

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1967 THROUGH 1986

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

TOTALS	145.63	118.50	146.64	89.34	90.62	75.82
	78.51	102.80	101.46	127.70	151.20	131.71
STD. DEVIATIONS	176.75	161.28	170.15	144.14	140.88	117.24
	165.16	177.10	186.16	193.14	207.29	232.68

RUNOFF

TOTALS	71.014	51.192	77.545	46.017	47.470	38.285
	46.866	67.496	55.373	59.828	76.638	67.558
STD. DEVIATIONS	131.166	120.204	139.718	121.057	120.904	99.149
	135.159	147.252	147.002	144.354	159.281	170.408

POTENTIAL EVAPOTRANSPIRATION

TOTALS	205.048	167.575	159.711	116.723	86.713	67.795
	79.678	103.446	131.384	180.052	195.376	221.927
STD. DEVIATIONS	18.933	12.318	10.043	6.698	2.439	1.614
	1.613	4.854	8.839	9.601	15.840	12.310

ACTUAL EVAPOTRANSPIRATION

TOTALS	63.336	58.930	60.793	34.458	33.598	30.668
	24.365	28.215	37.376	57.198	66.497	51.469
STD. DEVIATIONS	39.952	45.295	31.581	26.386	22.458	19.293
	24.204	28.027	36.826	47.926	49.231	60.736

PERCOLATION/LEAKAGE THROUGH LAYER 2

TOTALS	11.0471	10.3468	10.7810	7.6527	9.1794	9.1491
	6.8626	6.7413	7.7210	9.1899	10.5330	9.0299
STD. DEVIATIONS	5.3557	5.6405	4.9817	6.6578	6.6699	6.6364
	7.0613	6.5094	5.9477	6.2221	6.2544	7.1253

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	0.3067	0.1356	0.2854	0.3632	0.4345	0.1012
	0.4051	0.5113	0.4550	0.6066	0.5042	0.2241
STD. DEVIATIONS	0.7173	0.3494	0.6756	1.0670	1.4452	0.1315
	0.8714	1.3747	0.9386	1.0007	0.9205	0.3035

PERCOLATION/LEAKAGE THROUGH LAYER 5

TOTALS	0.7117	0.4509	0.5199	0.6934	0.6121	0.5827
	0.6487	0.6626	0.6667	0.9561	0.6929	0.7108
STD. DEVIATIONS	0.8748	0.5882	0.6755	0.8612	0.8327	0.7081
	0.9671	0.9626	0.8463	1.0396	0.9232	0.8086

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (CM)

DAILY AVERAGE HEAD ON TOP OF LAYER 2

AVERAGES	2.3241	2.3905	2.3482	1.7367	2.2939	2.3859
	1.6698	1.7207	1.8024	2.1637	2.5319	1.9423
STD. DEVIATIONS	2.0590	2.3723	1.9160	2.2434	2.3625	2.4305
	2.8412	2.7728	2.6657	2.5462	2.5508	2.6107

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0019	0.0009	0.0018	0.0024	0.0027	0.0007
	0.0025	0.0032	0.0030	0.0038	0.0033	0.0014
STD. DEVIATIONS	0.0045	0.0024	0.0042	0.0069	0.0090	0.0009
	0.0054	0.0086	0.0060	0.0062	0.0059	0.0019

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1967 THROUGH 1986

	MM		CU. METERS	PERCENT
PRECIPITATION	1359.96	(1805.843)	292390.4	100.00
RUNOFF	705.281	(********)	151635.45	51.861
POTENTIAL EVAPOTRANSPIRATION	1715.427	(53.5927)	368816.91	
ACTUAL EVAPOTRANSPIRATION	546.903	(315.5351)	117584.16	40.215
PERCOLATION/LEAKAGE THROUGH LAYER 2	108.23368	(45.22777)	23270.242	7.95862
AVERAGE HEAD ON TOP OF LAYER 2	21.092	(19.516)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	4.33300	(7.23984)	931.596	0.31861
PERCOLATION/LEAKAGE THROUGH LAYER 5	7.90869	(8.03539)	1700.369	0.58154
AVERAGE HEAD ON TOP	0.023	(0.038)		

OF LAYER 5

CHANGE IN WATER STORAGE 95.529 (2.2254) 20538.72 7.024

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 **                                                                          **
 **                                                                          **
 **              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
 **                                                                          **
 **              HELP Version 3.95 D          (10 August 2012)               **
 **                                developed at                              **
 **        Institute of Soil Science, University of Hamburg, Germany         **
 **                                  based on                                **
 **              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)               **
 **                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
 **                    USAE WATERWAYS EXPERIMENT STATION                     **
 **             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
 **                                                                          **
 **                                                                          **
 ******************************************************************************
 ******************************************************************************


 TIME:  13.57     DATE:  15.02.2019


 PRECIPITATION DATA FILE:      P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Rainfall\02 Rainfall HELP Model
File\Rainfall_1967_1996.d4
 TEMPERATURE DATA FILE:        P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Temperature\02 HELP MOdel
file\Temp_1967_1986.d7
 SOLAR RADIATION DATA FILE:    P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Solar Radiation\SolarRad_1990_2017.d13
 EVAPOTRANSPIRATION DATA F. 1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01 Weather Data\Evapotranspiration\EvoData_Final Cap.d11
 SOIL AND DESIGN DATA FILE  1: P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\01a Soil and Design Files\Final
Profiles\03b_ElizabethDrive_Approved Design_FinalCapwithBase_S2 Only.d10
 OUTPUT DATA FILE:             P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\b_Approved Design_FinalCap_Stage 2 Only.out
 DAILY OUTPUT DATA FILE:       P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\b_Approved Design_FinalCap_Stage 2 Only.DAY
 MONTHLY OUTPUT DATA FILE:     P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\b_Approved Design_FinalCap_Stage 2 Only.MON
 YEARLY OUTPUT DATA FILE:      P:\605X\60571292\4. Tech Work Area\4.8 Concept
Design\01 HELP Model\02 HELP Model Runs\Results\a03 Proposed Design_Intermediate
Cap\b_Approved Design_FinalCap_Stage 2 Only.YR

 COLUMNS OF DAILY OUTPUT DATA FILE:

      1    DATE (yyyymmdd)
      2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
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     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
    10    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
    11    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  7 (CM)
    12    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
    13    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    HEAD  #1: AVERAGE HEAD ON TOP OF LAYER  2 (CM)
     7    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     8    HEAD  #2: AVERAGE HEAD ON TOP OF LAYER  7 (CM)
     9    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
    10    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    DRAIN #2: LATERAL DRAINAGE FROM LAYER  6 (MM)
     8    LEAK  #2: PERCOLATION/LEAKAGE THROUGH LAYER  7 (MM)
     9    CHANGE IN TOTAL WATER STORAGE (MM)
    10    CHANGE IN SOIL WATER STORAGE (MM)
    11    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    12    CHANGE IN SNOW WATER STORAGE (MM)
    13    ANNUAL WATER BUDGET BALANCE (MM)

WARNING:  SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967


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     TITLE:  Elizabeth Drive Approved Design - Final Cap

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                            WEATHER DATA SOURCES
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NOTE: PRECIPITATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

NOTE: TEMPERATURE DATA FOR Badgerys Creek NSW
WAS ENTERED FROM A TEXT FILE.

NOTE: SOLAR RADIATION DATA FOR Sydney New South Wales
WAS ENTERED FROM A TEXT FILE.

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LAYER DATA 1

VALID FOR 20 YEARS

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 8

THICKNESS	=	30.00	CM
POROSITY	=	0.4630	VOL/VOL
FIELD CAPACITY	=	0.2320	VOL/VOL
WILTING POINT	=	0.1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3700E-03	CM/SEC

LAYER 2

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	50.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL

INITIAL SOIL WATER CONTENT	=	0.4270 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 28

THICKNESS	=	30.00 CM
POROSITY	=	0.4520 VOL/VOL
FIELD CAPACITY	=	0.4110 VOL/VOL
WILTING POINT	=	0.3110 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4110 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1200E-05 CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION 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	=	0.0320 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000 CM/SEC

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	5000.00 CM
POROSITY	=	0.3025 VOL/VOL
FIELD CAPACITY	=	0.0890 VOL/VOL
WILTING POINT	=	0.0330 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0800 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1350E-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	=	0.0320	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3000	CM/SEC
SLOPE	=	5.00	PERCENT
DRAINAGE LENGTH	=	50.0	METERS

LAYER 7

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	100.00	CM
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-06	CM/SEC

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 20 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 8 WITH A GOOD STAND OF GRASS, A SURFACE SLOPE OF 5.% AND A SLOPE LENGTH OF 380. METERS.

SCS RUNOFF CURVE NUMBER	=	70.62	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	21.1000	HECTARES
EVAPORATIVE ZONE DEPTH	=	12.5	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	2.900	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.787	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	2.900	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.450	CM
SOIL EVAPORATION ZONE DEPTH	=	12.5	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.000	CM
INITIAL WATER IN LAYER MATERIALS	=	485.260	CM
TOTAL INITIAL WATER	=	485.260	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 20 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Sydney New South Wales

STATION LATITUDE	=	-33.87 DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00
START OF GROWING SEASON (JULIAN DATE)	=	0
END OF GROWING SEASON (JULIAN DATE)	=	367
EVAPORATIVE ZONE DEPTH	=	12.5 CM
AVERAGE ANNUAL WIND SPEED	=	10.00 KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	57.7 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	62.2 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	57.5 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	49.0 %

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WARNING: SOLAR RADIATION FOR YEAR 1990 USED WITH PRECIPITATION FOR YEAR 1967

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MONTHLY TOTALS (MM) FOR YEAR 1967

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	172.4	68.0	146.6	17.9	18.2	141.1
	9.5	179.3	70.8	55.7	28.6	17.5
RUNOFF	52.57	0.00	98.14	0.00	0.00	57.49
	0.30	130.19	42.98	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	181.30	148.52	142.38	100.20	87.64	67.86
	78.30	93.72	120.23	181.33	227.02	220.31
ACTUAL EVAPOTRANSPIRATION	49.41	76.92	61.88	12.47	11.02	54.98
	33.50	36.48	41.40	47.35	22.16	10.21
PERCOLATION/LEAKAGE THROUGH	1.120	3.608	3.979	3.654	3.725	3.936
LAYER 2	3.939	3.921	3.755	3.812	3.637	3.689
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	4.776	24.566	24.276	20.481	19.547	25.921
TOP OF LAYER 2	23.532	23.203	22.437	21.171	20.162	18.860
STD. DEVIATION OF DAILY	10.201	2.385	2.416	0.438	0.866	3.394
HEAD ON TOP OF LAYER 2	2.301	2.340	2.809	3.080	0.538	0.511
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1967

	MM	CU. METERS	PERCENT
PRECIPITATION	925.60	195301.625	100.00
RUNOFF	381.674	80533.188	41.24
POTENTIAL EVAPOTRANSPIRATION	1648.789	347894.406	
ACTUAL EVAPOTRANSPIRATION	457.770	96589.555	49.46
PERC./LEAKAGE THROUGH LAYER 2	42.774494	9025.418	4.62
AVG. HEAD ON TOP OF LAYER 2	207.4422		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	86.155	18178.748	9.31
SOIL WATER AT START OF YEAR	4852.599	1023898.312	

SOIL WATER AT END OF YEAR	4938.754	1042077.062	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.123	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1991 USED WITH PRECIPITATION FOR YEAR 1968

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MONTHLY TOTALS (MM) FOR YEAR 1968

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	171.9	19.3	106.3	17.3	96.0	6.9
	25.0	20.6	1.3	1.3	16.2	83.1
RUNOFF	84.58	0.00	4.30	0.00	48.47	0.00
	0.00	0.00	0.00	0.00	0.00	10.11
POTENTIAL EVAPOTRANSPIRATION	208.63	189.96	183.33	128.39	83.76	64.31
	78.01	106.02	137.94	186.13	228.18	210.86
ACTUAL EVAPOTRANSPIRATION	82.42	19.65	90.63	20.03	39.14	14.93
	9.92	27.00	8.32	2.57	5.33	43.81
PERCOLATION/LEAKAGE THROUGH	3.951	3.612	3.903	3.633	3.924	3.636
LAYER 2	3.655	3.733	3.503	3.525	3.335	3.780
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	23.751	22.076	22.867	20.085	23.246	20.136
TOP OF LAYER 2	18.231	19.683	17.572	15.813	14.329	20.572
STD. DEVIATION OF DAILY	3.182	0.940	3.179	1.263	3.993	1.302
HEAD ON TOP OF LAYER 2	1.282	0.446	0.748	0.448	0.424	3.490
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1968

	MM	CU. METERS	PERCENT
PRECIPITATION	565.20	119257.258	100.00
RUNOFF	147.462	31114.490	26.09
POTENTIAL EVAPOTRANSPIRATION	1805.524	380965.656	
ACTUAL EVAPOTRANSPIRATION	363.736	76748.305	64.36
PERC./LEAKAGE THROUGH LAYER 2	44.189240	9323.930	7.82
AVG. HEAD ON TOP OF LAYER 2	198.6335		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	54.002	11394.449	9.55
SOIL WATER AT START OF YEAR	4938.754	1042077.062	
SOIL WATER AT END OF YEAR	4992.756	1053471.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	

SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.010	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1992 USED WITH PRECIPITATION FOR YEAR 1969

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MONTHLY TOTALS (MM) FOR YEAR 1969

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	37.3	223.9	133.6	181.8	14.1	66.4
	14.9	90.9	39.0	92.1	263.3	28.2
RUNOFF	5.35	138.77	55.04	151.73	0.00	18.97
	0.00	13.44	0.00	12.34	179.25	0.00
POTENTIAL EVAPOTRANSPIRATION	211.32	147.35	163.27	120.63	84.00	68.12
	81.33	104.62	116.68	167.01	188.89	223.16
ACTUAL EVAPOTRANSPIRATION	48.51	61.61	58.16	55.48	14.93	30.01
	19.35	55.37	47.92	53.09	101.23	23.90
PERCOLATION/LEAKAGE THROUGH	3.874	3.510	3.871	3.845	3.694	3.720
LAYER 2	3.815	3.898	3.761	3.832	3.932	3.870
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.325	22.537	22.268	24.167	18.959	21.762
TOP OF LAYER 2	21.225	22.768	22.548	21.542	25.858	22.236
STD. DEVIATION OF DAILY	2.809	3.840	2.473	2.401	1.072	4.172
HEAD ON TOP OF LAYER 2	1.089	3.897	1.631	1.358	2.009	0.583

AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1969

	MM	CU. METERS	PERCENT
PRECIPITATION	1185.50	250140.547	100.00
RUNOFF	574.894	121302.711	48.49
POTENTIAL EVAPOTRANSPIRATION	1676.374	353714.875	
ACTUAL EVAPOTRANSPIRATION	569.569	120179.117	48.04
PERC./LEAKAGE THROUGH LAYER 2	45.622112	9626.266	3.85
AVG. HEAD ON TOP OF LAYER 2	223.4960		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	41.036	8658.567	3.46
SOIL WATER AT START OF YEAR	4992.756	1053471.500	
SOIL WATER AT END OF YEAR	5033.792	1062130.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0007	0.143	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1993 USED WITH PRECIPITATION FOR YEAR 1970

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MONTHLY TOTALS (MM) FOR YEAR 1970

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	33.9	72.9	23.7	20.5	17.8
	0.3	10.7	120.5	29.2	90.7	201.1
RUNOFF	0.00	0.00	0.39	0.00	0.00	0.00
	0.00	0.00	39.76	0.00	6.14	110.89
POTENTIAL EVAPOTRANSPIRATION	189.21	178.75	158.54	123.33	84.61	70.20
	80.14	99.20	121.38	194.46	191.15	223.10
ACTUAL EVAPOTRANSPIRATION	84.49	38.25	74.68	18.92	25.74	13.93
	9.65	7.76	46.44	37.15	78.70	80.22
PERCOLATION/LEAKAGE THROUGH	3.864	3.487	3.954	3.703	3.820	3.559
LAYER 2	3.629	3.545	3.790	3.855	3.774	4.015
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.138	22.061	23.809	21.442	21.318	18.653
TOP OF LAYER 2	17.752	16.172	23.112	21.973	22.808	24.952
STD. DEVIATION OF DAILY	1.871	1.253	2.182	1.211	0.937	0.379
HEAD ON TOP OF LAYER 2	0.489	0.450	2.613	0.972	2.334	2.199
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1970

	MM	CU. METERS	PERCENT
PRECIPITATION	722.80	152510.828	100.00
RUNOFF	157.178	33164.496	21.75
POTENTIAL EVAPOTRANSPIRATION	1714.050	361664.625	
ACTUAL EVAPOTRANSPIRATION	515.929	108861.070	71.38
PERC./LEAKAGE THROUGH LAYER 2	44.995773	9494.108	6.23
AVG. HEAD ON TOP OF LAYER 2	213.4905		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	49.693	10485.324	6.88
SOIL WATER AT START OF YEAR	5033.792	1062130.125	
SOIL WATER AT END OF YEAR	5083.485	1072615.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.072	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1994 USED WITH PRECIPITATION FOR YEAR 1971

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MONTHLY TOTALS (MM) FOR YEAR 1971

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.5	149.5	58.8	32.2	25.2	3.4
	8.1	43.2	33.8	2.3	75.5	172.0
RUNOFF	3.49	62.47	0.31	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	71.01
POTENTIAL EVAPOTRANSPIRATION	227.77	167.65	151.88	120.20	85.53	66.71
	78.71	107.77	137.91	191.49	198.93	225.55
ACTUAL EVAPOTRANSPIRATION	32.21	97.09	58.86	36.02	16.62	9.38
	7.81	36.19	35.49	8.90	32.14	114.89
PERCOLATION/LEAKAGE THROUGH	3.799	3.621	3.953	3.818	3.792	3.674
LAYER 2	3.697	3.714	3.595	3.602	3.618	3.989
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.918	24.844	23.792	23.641	20.790	20.866
TOP OF LAYER 2	19.012	19.336	19.358	17.240	19.784	24.461
STD. DEVIATION OF DAILY	1.582	1.914	1.858	1.817	1.014	0.574
HEAD ON TOP OF LAYER 2	0.505	2.851	1.102	0.719	3.716	2.416
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1971

	MM	CU. METERS	PERCENT
PRECIPITATION	659.50	139154.469	100.00
RUNOFF	137.282	28966.588	20.82
POTENTIAL EVAPOTRANSPIRATION	1760.094	371379.812	
ACTUAL EVAPOTRANSPIRATION	485.584	102458.141	73.63
PERC./LEAKAGE THROUGH LAYER 2	44.870499	9467.675	6.80
AVG. HEAD ON TOP OF LAYER 2	211.7022		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	36.634	7729.733	5.55
SOIL WATER AT START OF YEAR	5083.485	1072615.375	
SOIL WATER AT END OF YEAR	5120.119	1080345.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.010	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1995 USED WITH PRECIPITATION FOR YEAR 1972

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MONTHLY TOTALS (MM) FOR YEAR 1972

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

PRECIPITATION	311.2	64.7	85.2	58.2	20.3	46.2
	0.5	33.5	21.4	157.7	61.6	30.7
RUNOFF	179.33	5.94	44.75	16.26	0.00	5.59
	0.00	0.00	0.00	59.86	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	167.25	172.71	151.98	115.89	81.31	67.52
	81.78	109.67	134.36	175.05	171.78	232.00
ACTUAL EVAPOTRANSPIRATION	116.65	65.12	46.96	37.97	12.05	24.60
	21.98	10.76	12.51	89.07	71.96	26.61
PERCOLATION/LEAKAGE THROUGH	4.065	3.681	3.910	3.715	3.641	3.607
LAYER 2	3.779	3.644	3.617	3.926	3.832	3.781
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	25.891	23.459	23.000	21.664	17.963	19.574
TOP OF LAYER 2	20.553	18.018	19.771	23.282	23.929	20.580
STD. DEVIATION OF DAILY	2.583	1.728	2.808	2.689	0.690	4.561
HEAD ON TOP OF LAYER 2	1.991	1.225	0.249	3.290	1.164	0.552
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1972

	MM	CU. METERS	PERCENT
PRECIPITATION	891.20	188043.062	100.00

RUNOFF	311.731	65775.234	34.98
POTENTIAL EVAPOTRANSPIRATION	1661.302	350534.719	
ACTUAL EVAPOTRANSPIRATION	536.237	113146.047	60.17
PERC./LEAKAGE THROUGH LAYER 2	45.197464	9536.665	5.07
AVG. HEAD ON TOP OF LAYER 2	214.7374		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	43.232	9122.003	4.85
SOIL WATER AT START OF YEAR	5120.119	1080345.125	
SOIL WATER AT END OF YEAR	5163.352	1089467.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0010	-0.215	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1996 USED WITH PRECIPITATION FOR YEAR 1973

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MONTHLY TOTALS (MM) FOR YEAR 1973

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	99.0	280.5	45.3	30.8	21.1	17.4
	62.6	42.6	21.8	83.7	124.8	27.2
RUNOFF	59.36	116.15	16.30	0.00	3.37	0.00
	0.00	0.00	0.00	9.57	15.43	0.00

POTENTIAL EVAPOTRANSPIRATION	187.12	166.74	161.89	126.72	89.06	69.16
	81.39	101.33	141.58	176.31	206.52	225.58
ACTUAL EVAPOTRANSPIRATION	27.55	151.47	40.47	14.14	41.12	10.87
	48.26	28.26	26.69	78.15	92.04	26.28
PERCOLATION/LEAKAGE THROUGH	3.796	3.740	3.858	3.605	3.879	3.475
LAYER 2	3.881	3.834	3.698	3.894	3.822	3.778
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.872	27.300	22.018	19.545	22.410	17.043
TOP OF LAYER 2	22.449	21.575	21.331	22.687	23.738	20.527
STD. DEVIATION OF DAILY	2.393	1.812	2.472	0.350	3.185	0.563
HEAD ON TOP OF LAYER 2	3.360	1.693	1.435	2.187	2.898	1.210
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1973

	MM	CU. METERS	PERCENT
PRECIPITATION	856.80	180784.859	100.00
RUNOFF	220.179	46457.867	25.70
POTENTIAL EVAPOTRANSPIRATION	1733.405	365748.406	
ACTUAL EVAPOTRANSPIRATION	585.293	123496.891	68.31
PERC./LEAKAGE THROUGH LAYER 2	45.260376	9549.939	5.28

AVG. HEAD ON TOP OF LAYER 2	217.9122		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	51.327	10829.936	5.99
SOIL WATER AT START OF YEAR	5163.352	1089467.125	
SOIL WATER AT END OF YEAR	5214.678	1100297.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0008	0.164	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1997 USED WITH PRECIPITATION FOR YEAR 1974

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MONTHLY TOTALS (MM) FOR YEAR 1974

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	126.7	93.3	239.8	114.6	168.0	100.8
	5.0	65.2	20.8	72.0	48.2	2.4
RUNOFF	66.44	52.79	147.83	45.04	114.56	56.69
	0.00	8.27	3.24	3.93	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	191.44	169.05	162.24	122.83	86.70	67.92
	80.07	104.40	118.76	187.25	185.27	204.27
ACTUAL EVAPOTRANSPIRATION	63.64	32.92	86.17	60.78	47.76	54.95
	14.93	17.71	39.78	49.86	45.23	11.88
PERCOLATION/LEAKAGE THROUGH	3.855	3.425	3.981	3.864	4.043	3.890

LAYER 2	3.679	3.628	3.759	3.840	3.709	3.794
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.961	20.798	24.327	24.538	25.468	25.037
TOP OF LAYER 2	18.687	17.733	22.507	21.677	21.539	20.821
STD. DEVIATION OF DAILY	2.697	3.036	2.550	2.412	2.189	2.506
HEAD ON TOP OF LAYER 2	1.256	3.742	2.912	2.841	2.035	0.609
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1974

	MM	CU. METERS	PERCENT
PRECIPITATION	1056.80	222984.766	100.00
RUNOFF	498.803	105247.500	47.20
POTENTIAL EVAPOTRANSPIRATION	1680.220	354526.375	
ACTUAL EVAPOTRANSPIRATION	525.600	110901.617	49.74
PERC./LEAKAGE THROUGH LAYER 2	45.466141	9593.355	4.30
AVG. HEAD ON TOP OF LAYER 2	220.9100		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00

AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	32.396	6835.656	3.07
SOIL WATER AT START OF YEAR	5214.678	1100297.125	
SOIL WATER AT END OF YEAR	5247.075	1107132.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.010	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1998 USED WITH PRECIPITATION FOR YEAR 1975

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MONTHLY TOTALS (MM) FOR YEAR 1975

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	811.0	724.2	790.0	662.2	651.3	531.5
	588.5	565.5	619.8	680.9	751.0	810.8
RUNOFF	598.50	545.36	618.51	549.26	564.26	459.96
	498.98	469.36	488.19	495.53	562.46	590.15
POTENTIAL EVAPOTRANSPIRATION	189.94	173.88	165.26	108.96	85.48	67.19
	82.92	96.03	129.35	177.02	186.96	223.89
ACTUAL EVAPOTRANSPIRATION	181.26	172.02	164.08	108.82	85.43	67.15
	82.87	95.96	128.97	175.58	184.45	220.67
PERCOLATION/LEAKAGE THROUGH	4.216	3.819	4.236	4.120	4.266	4.131
LAYER 2	4.266	4.262	4.112	4.231	4.090	4.221
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	28.697	28.927	29.080	29.480	29.630	29.692
TOP OF LAYER 2	29.646	29.560	29.329	28.994	28.900	28.790
STD. DEVIATION OF DAILY	1.721	0.281	0.254	0.177	0.090	0.074
HEAD ON TOP OF LAYER 2	0.092	0.105	0.240	0.254	0.289	0.274
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

ANNUAL TOTALS FOR YEAR 1975

	MM	CU. METERS	PERCENT
PRECIPITATION	8186.70	1727394.625	100.00
RUNOFF	6440.506	1358946.750	78.67
POTENTIAL EVAPOTRANSPIRATION	1686.871	355929.750	
ACTUAL EVAPOTRANSPIRATION	1667.266	351793.062	20.37
PERC./LEAKAGE THROUGH LAYER 2	49.969921	10543.653	0.61
AVG. HEAD ON TOP OF LAYER 2	292.2697		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	78.929	16653.998	0.96
SOIL WATER AT START OF YEAR	5247.075	1107132.750	
SOIL WATER AT END OF YEAR	5326.003	1123786.750	

INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0047	0.981	0.00

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WARNING: SOLAR RADIATION FOR YEAR 1999 USED WITH PRECIPITATION FOR YEAR 1976

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MONTHLY TOTALS (MM) FOR YEAR 1976

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	231.8	100.6	199.4	26.6	13.6	67.2
	41.0	7.4	44.8	195.6	83.0	40.3
RUNOFF	142.79	18.22	115.56	0.00	0.00	13.32
	0.90	0.00	0.00	68.77	45.50	0.00
POTENTIAL EVAPOTRANSPIRATION	192.10	160.67	150.72	110.75	89.98	69.67
	80.86	103.41	120.97	156.11	188.76	205.29
ACTUAL EVAPOTRANSPIRATION	103.22	66.33	81.29	40.18	16.13	32.71
	40.02	14.93	34.85	96.07	56.47	42.33
PERCOLATION/LEAKAGE THROUGH	4.025	3.735	4.055	3.807	3.734	3.696
LAYER 2	3.937	3.772	3.753	3.958	3.820	3.839
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	25.148	24.541	25.692	23.445	19.715	21.289
TOP OF LAYER 2	23.491	20.410	22.394	23.893	23.684	21.662
STD. DEVIATION OF DAILY	2.710	1.712	2.342	1.330	0.838	4.494
HEAD ON TOP OF LAYER 2	2.168	0.950	1.719	2.536	2.345	0.884
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1976

	MM	CU. METERS	PERCENT
PRECIPITATION	1051.30	221824.391	100.00
RUNOFF	405.054	85466.352	38.53
POTENTIAL EVAPOTRANSPIRATION	1629.282	343778.438	
ACTUAL EVAPOTRANSPIRATION	624.535	131776.969	59.41
PERC./LEAKAGE THROUGH LAYER 2	46.130581	9733.553	4.39
AVG. HEAD ON TOP OF LAYER 2	229.4693		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	21.711	4580.956	2.07
SOIL WATER AT START OF YEAR	5326.003	1123786.750	
SOIL WATER AT END OF YEAR	5347.714	1128367.750	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.112	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2000 USED WITH PRECIPITATION FOR YEAR 1977

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MONTHLY TOTALS (MM) FOR YEAR 1977

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	46.4	166.5	130.4	8.3	109.3	50.5
	0.2	14.1	37.3	4.6	11.0	29.4
RUNOFF	0.00	73.85	73.62	0.00	42.19	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	199.88	176.14	142.13	111.61	87.41	68.34
	80.04	104.63	127.43	177.82	167.08	234.03
ACTUAL EVAPOTRANSPIRATION	50.14	66.21	67.98	12.08	40.74	52.75
	19.35	8.90	17.91	18.75	8.83	8.30
PERCOLATION/LEAKAGE THROUGH	3.851	3.525	3.963	3.605	3.881	3.881
LAYER 2	3.760	3.567	3.496	3.634	3.408	3.662
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.884	22.857	23.980	19.544	22.448	24.876
TOP OF LAYER 2	20.191	16.592	17.439	17.845	15.750	18.361
STD. DEVIATION OF DAILY	1.068	3.401	3.008	0.677	4.444	1.751
HEAD ON TOP OF LAYER 2	1.892	0.453	1.402	1.379	0.433	1.131
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000

TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1977

	MM	CU. METERS	PERCENT
PRECIPITATION	608.00	128288.016	100.00
RUNOFF	189.655	40017.113	31.19
POTENTIAL EVAPOTRANSPIRATION	1676.533	353748.562	
ACTUAL EVAPOTRANSPIRATION	371.931	78477.492	61.17
PERC./LEAKAGE THROUGH LAYER 2	44.233662	9333.303	7.28
AVG. HEAD ON TOP OF LAYER 2	201.4724		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	46.414	9793.400	7.63
SOIL WATER AT START OF YEAR	5347.714	1128367.750	
SOIL WATER AT END OF YEAR	5394.128	1138161.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.015	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2001 USED WITH PRECIPITATION FOR YEAR 1978

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MONTHLY TOTALS (MM) FOR YEAR 1978

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	228.0	19.6	327.7	84.6	64.6	187.1
	9.2	21.5	37.6	50.1	138.1	115.7
RUNOFF	104.41	0.00	251.62	40.90	6.82	128.38
	0.00	0.00	0.00	0.00	36.48	47.23
POTENTIAL EVAPOTRANSPIRATION	202.09	165.69	154.53	118.42	88.39	66.36
	76.17	102.20	127.77	187.86	188.46	223.03
ACTUAL EVAPOTRANSPIRATION	99.58	34.76	60.04	59.20	30.42	59.94
	22.37	10.76	44.29	46.84	89.32	52.79
PERCOLATION/LEAKAGE THROUGH	3.983	3.444	3.861	3.833	3.826	3.980
LAYER 2	3.879	3.731	3.620	3.751	3.833	3.914
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	24.356	21.183	22.073	23.934	21.425	26.776
TOP OF LAYER 2	22.422	19.652	19.828	20.020	23.949	23.067
STD. DEVIATION OF DAILY	3.529	2.194	4.556	2.477	3.509	2.228
HEAD ON TOP OF LAYER 2	1.167	0.791	2.101	2.566	2.730	2.337
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1978

	MM	CU. METERS	PERCENT
PRECIPITATION	1283.80	270881.719	100.00
RUNOFF	615.840	129942.203	47.97
POTENTIAL EVAPOTRANSPIRATION	1700.963	358903.281	
ACTUAL EVAPOTRANSPIRATION	610.302	128773.648	47.54
PERC./LEAKAGE THROUGH LAYER 2	45.655041	9633.214	3.56
AVG. HEAD ON TOP OF LAYER 2	223.9034		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	57.658	12165.942	4.49
SOIL WATER AT START OF YEAR	5394.128	1138161.125	
SOIL WATER AT END OF YEAR	5451.787	1150327.125	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.092	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2002 USED WITH PRECIPITATION FOR YEAR 1979

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MONTHLY TOTALS (MM) FOR YEAR 1979

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	21.0	14.4	65.4	21.2	69.0	67.2
	23.0	2.8	18.8	34.6	77.4	5.8
RUNOFF	0.00	0.00	0.00	0.00	12.92	30.95
	0.00	0.00	0.00	0.00	8.49	0.00
POTENTIAL EVAPOTRANSPIRATION	239.77	160.88	159.35	116.88	84.21	69.70
	81.03	103.98	138.41	191.44	204.69	255.30
ACTUAL EVAPOTRANSPIRATION	20.44	17.17	74.12	14.57	42.94	27.68
	18.48	10.42	12.40	34.53	58.09	19.35
PERCOLATION/LEAKAGE THROUGH	3.873	3.467	3.861	3.504	3.884	3.746
LAYER 2	3.802	3.814	3.618	3.658	3.562	3.749
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.305	21.667	22.072	17.589	22.499	22.259
TOP OF LAYER 2	20.985	21.209	19.794	18.290	18.714	19.988
STD. DEVIATION OF DAILY	1.254	0.410	1.925	0.553	3.376	3.145
HEAD ON TOP OF LAYER 2	1.502	0.623	0.303	1.147	3.650	1.266
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1979

	MM	CU. METERS	PERCENT
PRECIPITATION	420.60	88746.656	100.00
RUNOFF	52.361	11048.188	12.45
POTENTIAL EVAPOTRANSPIRATION	1805.641	380990.312	
ACTUAL EVAPOTRANSPIRATION	350.180	73887.891	83.26
PERC./LEAKAGE THROUGH LAYER 2	44.538631	9397.651	10.59
AVG. HEAD ON TOP OF LAYER 2	206.1409		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	18.059	3810.444	4.29
SOIL WATER AT START OF YEAR	5451.787	1150327.125	
SOIL WATER AT END OF YEAR	5469.846	1154137.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0006	0.133	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2003 USED WITH PRECIPITATION FOR YEAR 1980

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MONTHLY TOTALS (MM) FOR YEAR 1980

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	70.8	39.0	32.4	3.0	160.0	12.0

	17.4	2.8	1.4	48.4	43.2	46.1
RUNOFF	18.70	0.00	1.61	0.00	53.70	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	232.55	163.16	171.69	115.09	84.17	68.85
	79.01	109.76	150.08	187.18	208.36	218.94
ACTUAL EVAPOTRANSPIRATION	40.81	22.99	41.19	8.29	63.17	29.43
	11.42	8.58	6.96	41.29	45.26	18.26
PERCOLATION/LEAKAGE THROUGH	3.843	3.619	3.880	3.498	4.016	3.777
LAYER 2	3.733	3.680	3.480	3.585	3.544	3.775
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	21.746	22.210	22.425	17.478	24.979	22.865
TOP OF LAYER 2	19.682	18.693	17.124	16.929	18.370	20.479
STD. DEVIATION OF DAILY	2.189	1.590	2.278	0.887	2.984	1.842
HEAD ON TOP OF LAYER 2	0.781	0.427	0.447	1.972	2.040	1.989
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1980

	MM	CU. METERS	PERCENT
PRECIPITATION	476.50	100541.523	100.00
RUNOFF	74.003	15614.630	15.53

POTENTIAL EVAPOTRANSPIRATION	1788.847	377446.719	
ACTUAL EVAPOTRANSPIRATION	337.654	71245.008	70.86
PERC./LEAKAGE THROUGH LAYER 2	44.429825	9374.693	9.32
AVG. HEAD ON TOP OF LAYER 2	202.4835		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	64.843	13681.860	13.61
SOIL WATER AT START OF YEAR	5469.846	1154137.500	
SOIL WATER AT END OF YEAR	5534.689	1167819.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.020	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2004 USED WITH PRECIPITATION FOR YEAR 1981

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MONTHLY TOTALS (MM) FOR YEAR 1981

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	34.6	155.8	29.2	158.0	103.1	21.0
	33.0	3.2	2.9	133.3	111.8	100.8
RUNOFF	0.00	46.73	0.00	104.74	39.64	8.54
	0.00	0.00	0.00	58.79	47.20	17.08
POTENTIAL EVAPOTRANSPIRATION	224.72	170.26	160.32	122.86	89.62	68.72
	79.13	99.93	137.21	183.07	195.17	227.49

ACTUAL EVAPOTRANSPIRATION	38.06	99.31	37.74	50.68	28.44	34.89
	16.87	25.23	3.38	45.55	60.24	73.09
PERCOLATION/LEAKAGE THROUGH	3.798	3.604	3.766	3.792	3.793	3.818
LAYER 2	3.697	3.712	3.435	3.712	3.810	3.957
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	20.899	24.487	20.298	23.157	20.808	23.658
TOP OF LAYER 2	19.008	19.300	16.256	19.293	23.492	23.868
STD. DEVIATION OF DAILY	0.377	3.434	2.470	3.608	3.751	2.653
HEAD ON TOP OF LAYER 2	1.697	2.030	0.436	5.617	1.627	2.648
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1981

	MM	CU. METERS	PERCENT
PRECIPITATION	886.70	187093.734	100.00
RUNOFF	322.729	68095.789	36.40
POTENTIAL EVAPOTRANSPIRATION	1758.488	371040.938	
ACTUAL EVAPOTRANSPIRATION	513.478	108343.906	57.91
PERC./LEAKAGE THROUGH LAYER 2	44.893196	9472.465	5.06
AVG. HEAD ON TOP OF LAYER 2	212.1049		

DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	50.493	10653.950	5.69
SOIL WATER AT START OF YEAR	5534.689	1167819.500	
SOIL WATER AT END OF YEAR	5585.182	1178473.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0004	0.092	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2005 USED WITH PRECIPITATION FOR YEAR 1982

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MONTHLY TOTALS (MM) FOR YEAR 1982

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.1	29.9	104.2	27.8	4.6	11.2
	9.4	1.2	121.0	32.8	5.5	23.4
RUNOFF	16.52	0.00	13.62	0.00	0.00	0.00
	0.00	0.00	25.92	0.00	0.00	0.00
POTENTIAL EVAPOTRANSPIRATION	221.61	186.79	158.39	117.90	89.89	68.12
	79.45	114.95	131.86	174.52	212.62	233.41
ACTUAL EVAPOTRANSPIRATION	42.99	38.09	71.35	34.47	12.66	8.20
	7.60	6.25	46.65	55.58	12.68	6.87
PERCOLATION/LEAKAGE THROUGH	3.934	3.379	3.891	3.763	3.670	3.428
LAYER 2	3.462	3.383	3.473	3.867	3.496	3.526

LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	23.445	19.831	22.629	22.583	18.512	16.120
TOP OF LAYER 2	14.629	13.147	16.997	22.194	17.435	15.830
STD. DEVIATION OF DAILY	1.623	2.107	3.297	1.568	1.402	0.436
HEAD ON TOP OF LAYER 2	0.440	0.429	7.309	2.411	0.561	0.448
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1982

	MM	CU. METERS	PERCENT
PRECIPITATION	427.10	90118.117	100.00
RUNOFF	56.059	11828.484	13.13
POTENTIAL EVAPOTRANSPIRATION	1789.508	377586.219	
ACTUAL EVAPOTRANSPIRATION	343.393	72455.844	80.40
PERC./LEAKAGE THROUGH LAYER 2	43.270668	9130.111	10.13
AVG. HEAD ON TOP OF LAYER 2	186.1275		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		

CHANGE IN WATER STORAGE	27.648	5833.794	6.47
SOIL WATER AT START OF YEAR	5585.182	1178473.375	
SOIL WATER AT END OF YEAR	5612.831	1184307.250	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.010	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2006 USED WITH PRECIPITATION FOR YEAR 1983

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MONTHLY TOTALS (MM) FOR YEAR 1983

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	33.0	18.4	178.0	72.6	102.7	60.8
	516.4	561.5	653.4	661.6	710.3	776.1
RUNOFF	0.00	0.00	117.13	9.62	44.26	19.30
	418.67	453.38	508.99	490.19	518.38	563.47
POTENTIAL EVAPOTRANSPIRATION	201.63	183.81	172.57	117.43	87.53	63.85
	77.69	100.86	140.78	175.24	190.68	203.38
ACTUAL EVAPOTRANSPIRATION	35.55	10.34	52.51	31.90	59.63	52.78
	76.12	100.80	140.31	173.79	188.57	201.04
PERCOLATION/LEAKAGE THROUGH	3.686	3.203	3.767	3.741	4.042	3.913
LAYER 2	4.256	4.261	4.107	4.235	4.092	4.228
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	18.810	16.194	20.317	22.164	25.459	25.487
TOP OF LAYER 2	29.458	29.541	29.235	29.063	28.939	28.935
STD. DEVIATION OF DAILY	2.510	0.407	5.544	1.985	3.676	2.045
HEAD ON TOP OF LAYER 2	1.095	0.090	0.248	0.288	0.307	0.369
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1983

	MM	CU. METERS	PERCENT
PRECIPITATION	4344.80	916752.938	100.00
RUNOFF	3143.367	663250.375	72.35
POTENTIAL EVAPOTRANSPIRATION	1715.459	361961.938	
ACTUAL EVAPOTRANSPIRATION	1123.337	237024.062	25.85
PERC./LEAKAGE THROUGH LAYER 2	47.531708	10029.190	1.09
AVG. HEAD ON TOP OF LAYER 2	253.0004		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	78.096	16478.258	1.80
SOIL WATER AT START OF YEAR	5612.831	1184307.250	
SOIL WATER AT END OF YEAR	5690.927	1200785.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	

INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0015	0.307	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2007 USED WITH PRECIPITATION FOR YEAR 1984

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MONTHLY TOTALS (MM) FOR YEAR 1984

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	128.2	116.7	112.3	92.7	45.1	48.6
	125.8	28.6	35.2	26.6	150.0	78.2
RUNOFF	15.37	23.64	63.09	30.98	0.00	2.10
	60.00	2.50	0.00	0.00	85.01	12.53
POTENTIAL EVAPOTRANSPIRATION	217.50	165.62	154.60	113.69	87.98	68.13
	78.41	102.92	131.82	188.69	197.38	213.26
ACTUAL EVAPOTRANSPIRATION	113.75	102.61	49.01	59.00	48.59	32.35
	50.97	45.03	30.70	13.70	74.20	30.24
PERCOLATION/LEAKAGE THROUGH	3.990	3.783	3.909	3.868	3.935	3.703
LAYER 2	3.987	3.952	3.652	3.651	3.794	3.801
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	24.477	25.500	22.983	24.618	23.459	21.432
TOP OF LAYER 2	24.435	23.769	20.457	18.156	23.180	20.949

STD. DEVIATION OF DAILY HEAD ON TOP OF LAYER 2	2.596	2.034	2.963	2.525	2.144	4.181
	1.828	2.214	1.481	1.142	3.461	2.550
AVERAGE DAILY HEAD ON TOP OF 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
STD. DEVIATION OF DAILY HEAD ON TOP OF 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

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ANNUAL TOTALS FOR YEAR 1984

	MM	CU. METERS	PERCENT
PRECIPITATION	988.00	208468.047	100.00
RUNOFF	295.231	62293.641	29.88
POTENTIAL EVAPOTRANSPIRATION	1719.996	362919.219	
ACTUAL EVAPOTRANSPIRATION	650.159	137183.469	65.81
PERC./LEAKAGE THROUGH LAYER 2	46.024811	9711.235	4.66
AVG. HEAD ON TOP OF LAYER 2	227.8454		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	42.611	8990.914	4.31
SOIL WATER AT START OF YEAR	5690.927	1200785.500	
SOIL WATER AT END OF YEAR	5733.538	1209776.375	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00

ANNUAL WATER BUDGET BALANCE 0.0001 0.020 0.00

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WARNING: SOLAR RADIATION FOR YEAR 2008 USED WITH PRECIPITATION FOR YEAR 1985

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MONTHLY TOTALS (MM) FOR YEAR 1985

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	8.8	28.2	65.0	117.7	83.0	54.6
	59.6	14.4	79.5	126.2	79.4	34.0
RUNOFF	0.00	0.00	0.11	33.28	33.47	18.09
	8.34	0.00	7.57	36.88	2.38	0.00
POTENTIAL EVAPOTRANSPIRATION	196.19	145.10	170.89	111.26	88.75	67.03
	78.97	99.67	128.21	172.52	178.92	226.38
ACTUAL EVAPOTRANSPIRATION	33.17	16.38	56.24	64.36	68.89	39.06
	42.70	14.93	61.93	79.02	66.77	46.09
PERCOLATION/LEAKAGE THROUGH	3.869	3.391	3.909	3.859	4.050	3.844
LAYER 2	3.939	3.727	3.777	3.958	3.791	3.923
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.229	20.085	22.973	24.439	25.602	24.149
TOP OF LAYER 2	23.536	19.576	22.851	23.885	23.127	23.230
STD. DEVIATION OF DAILY	1.936	1.029	2.231	2.712	2.498	2.758
HEAD ON TOP OF LAYER 2	3.340	0.929	4.303	2.905	2.681	1.348
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1985

	MM	CU. METERS	PERCENT
PRECIPITATION	750.40	158334.438	100.00
RUNOFF	140.124	29566.131	18.67
POTENTIAL EVAPOTRANSPIRATION	1663.893	351081.500	
ACTUAL EVAPOTRANSPIRATION	589.530	124390.875	78.56
PERC./LEAKAGE THROUGH LAYER 2	46.035500	9713.490	6.13
AVG. HEAD ON TOP OF LAYER 2	229.7352		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	20.746	4377.492	2.76
SOIL WATER AT START OF YEAR	5733.538	1209776.375	
SOIL WATER AT END OF YEAR	5754.284	1214154.000	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.051	0.00

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WARNING: SOLAR RADIATION FOR YEAR 2009 USED WITH PRECIPITATION FOR YEAR 1986

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MONTHLY TOTALS (MM) FOR YEAR 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	167.4	23.7	10.4	35.6	22.8	4.8
	20.8	347.0	48.2	65.4	154.3	11.4
RUNOFF	75.19	0.00	0.00	0.00	0.00	0.00
	0.00	297.52	0.74	8.96	63.01	0.00
POTENTIAL EVAPOTRANSPIRATION	218.94	158.77	158.26	111.42	88.24	68.16
	80.14	103.86	134.96	170.54	190.71	209.32
ACTUAL EVAPOTRANSPIRATION	67.90	46.16	12.60	6.55	32.72	10.97
	13.33	42.95	12.47	76.23	87.59	16.61
PERCOLATION/LEAKAGE THROUGH	3.910	3.487	3.626	3.414	3.791	3.571
LAYER 2	3.608	3.907	3.590	3.952	3.811	3.759
LATERAL DRAINAGE COLLECTED	0.000	0.000	0.000	0.000	0.000	0.000
FROM LAYER 6	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 7	0.000	0.000	0.000	0.000	0.000	0.000

MONTHLY SUMMARIES FOR DAILY HEADS (CM)

AVERAGE DAILY HEAD ON	22.993	22.074	17.695	15.854	20.776	18.894
TOP OF LAYER 2	17.352	22.945	19.261	23.770	23.522	20.177
STD. DEVIATION OF DAILY	3.292	1.913	0.913	0.434	0.743	0.500
HEAD ON TOP OF LAYER 2	0.322	3.659	0.457	2.985	3.355	0.683
AVERAGE DAILY HEAD ON	0.000	0.000	0.000	0.000	0.000	0.000
TOP OF LAYER 7	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 7	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 1986

	MM	CU. METERS	PERCENT
PRECIPITATION	911.80	192389.844	100.00
RUNOFF	445.416	93982.844	48.85
POTENTIAL EVAPOTRANSPIRATION	1693.311	357288.719	
ACTUAL EVAPOTRANSPIRATION	426.067	89900.180	46.73
PERC./LEAKAGE THROUGH LAYER 2	44.427818	9374.270	4.87
AVG. HEAD ON TOP OF LAYER 2	204.4275		
DRAINAGE COLLECTED FROM LAYER 6	0.0000	0.000	0.00
PERC./LEAKAGE THROUGH LAYER 7	0.000000	0.000	0.00
AVG. HEAD ON TOP OF LAYER 7	0.0000		
CHANGE IN WATER STORAGE	40.315	8506.543	4.42
SOIL WATER AT START OF YEAR	5754.284	1214154.000	
SOIL WATER AT END OF YEAR	5794.600	1222660.500	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0014	0.286	0.00

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FINAL WATER STORAGE AT END OF YEAR 1986

LAYER	(CM)	(VOL/VOL)

1	10.6083	0.3536
2	21.3500	0.4270
3	12.6094	0.4203
4	1.7325	0.0577
5	489.4998	0.0979
6	0.9600	0.0320
7	42.7000	0.4270
TOTAL WATER IN LAYERS	579.460	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	579.460	

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PEAK DAILY VALUES FOR YEARS 1967 THROUGH 1986

	(MM)	(CU. METERS)
PRECIPITATION	220.00	46419.996
RUNOFF	220.000	46419.9961
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.138237	29.16798
AVERAGE HEAD ON TOP OF LAYER 2	299.995	
DRAINAGE COLLECTED FROM LAYER 6	0.00000	0.00000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.000000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	
MAXIMUM HEAD ON TOP OF LAYER 7	0.000	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	0.0 METERS	
SNOW WATER	0.00	0.0000

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4630

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1160

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

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

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AVERAGE MONTHLY VALUES (MM) FOR YEARS 1967 THROUGH 1986

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	145.63	118.50	146.64	89.34	90.62	75.82
	78.51	102.80	101.46	127.70	151.20	131.71
STD. DEVIATIONS	176.75	161.28	170.15	144.14	140.88	117.24
	165.16	177.10	186.16	193.14	207.29	232.68
RUNOFF						
TOTALS	71.130	54.196	81.097	49.091	48.183	40.970
	49.359	68.733	55.869	62.240	78.486	71.123
STD. DEVIATIONS	134.725	122.834	142.865	124.310	125.019	103.440
	141.273	151.674	152.027	149.001	164.026	175.428
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	205.048	167.575	159.711	116.723	86.713	67.795
	79.678	103.446	131.384	180.052	195.376	221.927
STD. DEVIATIONS	18.933	12.318	10.043	6.698	2.439	1.614
	1.613	4.854	8.839	9.601	15.840	12.310
ACTUAL EVAPOTRANSPIRATION						
TOTALS	66.589	61.769	64.297	37.295	36.908	33.077
	28.375	30.214	39.967	61.152	69.063	53.672

STD. DEVIATIONS	40.221	44.545	29.906	25.788	20.988	18.691
	22.043	27.344	36.374	46.662	49.189	60.405

PERCOLATION/LEAKAGE THROUGH LAYER 2

TOTALS	3.7651	3.5570	3.9066	3.7320	3.8703	3.7492
	3.8201	3.7842	3.6795	3.8239	3.7356	3.8524
STD. DEVIATIONS	0.6331	0.1543	0.1205	0.1623	0.1560	0.1782
	0.2009	0.2144	0.1851	0.1937	0.2001	0.1715

LATERAL DRAINAGE COLLECTED FROM 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 2

AVERAGES	21.9810	22.8598	22.9287	21.9924	22.2507	22.3244
	21.3137	20.6441	20.9800	21.3858	22.0604	21.9173
STD. DEVIATIONS	4.5802	2.7943	2.2489	3.1309	2.9130	3.4381
	3.7510	4.0025	3.5701	3.6156	3.8595	3.2012

DAILY AVERAGE HEAD ON TOP OF LAYER 7

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

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1967 THROUGH 1986

	MM		CU. METERS	PERCENT
PRECIPITATION	1359.96	(1805.843)	286950.6	100.00
RUNOFF	730.477	(********)	154130.72	53.713
POTENTIAL EVAPOTRANSPIRATION	1715.427	(53.5927)	361955.22	
ACTUAL EVAPOTRANSPIRATION	582.378	(308.1226)	122881.66	42.823
PERCOLATION/LEAKAGE THROUGH LAYER 2	45.27588	(1.52533)	9553.210	3.32922
AVERAGE HEAD ON TOP OF LAYER 2	218.865	(22.493)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.00000	(0.00000)	0.000	0.00000
PERCOLATION/LEAKAGE THROUGH LAYER 7	0.00000	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	(0.000)		
CHANGE IN WATER STORAGE	47.100	(0.7564)	9938.10	3.463

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