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Your ref:
Our ref: 831d

Chief Executive Officer
Shire of Serpentine-Jarrahdale
6 Paterson Street
MUNDIJONG WA 6123

Attn: Mr Andrew Trosic, Director Development Services

By Email: atrosic@sjshire.wa.gov.au

Dear Sir/Madam

Development Application – Austral Bricks Cardup Factory Expansion
Response to Request for Further Information

I refer to the minutes of the Metro Outer Joint Development Assessment Panel of 1 September 2020 pertaining to the above-mentioned Development Application, where the application was deferred as follows:

- to allow the applicant the opportunity to address the concerns raised by the Shire in the RAR on the information/reporting provided on the impacts of the proposal regarding:
  - dust and emissions
  - Vegetation / groundwater

  And concerns raised by Main Roads WA regarding:
  - traffic and intersection treatment at Kiln Road and South West Highway

Following the JDAP meeting, the Shire provided a further request for information addressing the following points:

1. New Health and Safety Plan
2. Updated Environmental Noise Assessment
3. New Environmental and Water Management Plan
4. Updated Dust Management Plan
5. Updated Air Emissions Plan
6. New Compliance Auditing Strategy.

A further request was made on the 12th October 2020 for an Odour Impact Assessment.

A meeting was held with Shire Officers on the 8th October 2020 to discuss and clarify the requirements stipulated by the JDAP. At that meeting, Austral Bricks again committed to providing relevant further information to the Shire to assist with their assessment of the application. This letter and attachments are provided in this regard.

Plant design and site layout

The Shire sought some clarification regarding the design and layout of the site, specifically relating to where the factory expansion was proposed.

Prior to lodging the application with the Shire, there were several iterations of the plant expansion plans considered. In designing the layout of the plant, consideration must be given to ensuring the clay brick production process is efficient and that major internal infrastructure is appropriately located.

From a purely engineering perspective, a northern expansion was the preferred option, resulting in the proposed factory being elongated in a north-south configuration. This option was reviewed and discounted for several reasons, primarily related to the need for increased vegetation clearing and increased proximity to Cardup Brook. There would have also been a slight reduction in the distance to the closest residential house under this option.

Consideration was also given to expanding the plant to the east however this was quickly dismissed given there would also then be a need to relocate and adjust the existing milling and conveyor equipment already present on the site.

Placing the proposed expansion to the west of the site was determined as the best position as it:

- Limited the need to relocate other existing infrastructure on the site
- Maintained proximity from Cardup Brook
- Minimised vegetation clearing required for the development and associated fire management purposes.

In addition to the plant expansion, it should be noted that Austral Bricks is proposing to upgrade other elements of the site to improve environmental and amenity performance where possible, by, for instance, the development of a new improved scrubber, sealing of internal access roads and committing to updating and consolidating management plans for the site.

New Health and Safety Plan

It is assumed that this requirement came about as a result of the DWER comment on contaminated sites, as outlined in the Responsible Authority Report ("the RAR").

Austral Bricks has an existing *Work, Health and Safety Policy* (attached). This policy is read in conjunction with a range of specific Occupational Health and Safety Management System procedures (developed to AS/NZS 4801) appropriate to the range of activities Austral Bricks undertakes at its quarries, factories and transport operations. In this regard, specific procedures will be required during the construction stage of the project, which will address health and safety of the Austral Bricks (and any contractor) workforce.

Given Occupational Health and Safety is regulated under other legislation it is questioned whether a *Health and Safety Plan* is in fact a valid planning consideration. Nevertheless, and as discussed at our meeting of the 8th October, Austral Bricks will commit to the preparation of a *Construction Management Plan* to guide the construction of the project, as a condition of Development Approval. Such a plan would address both workforce safety and environmental management during the construction phase of the project.

Updated Environmental Noise Assessment

Shire requirement: Why? Need to base on site-specific meteorological conditions; needs to include the crusher; needs an updated noise contour map as a result; need to identify design changes (if necessary) to demonstrate how noise impact on sensitive receptors has been reduced to be as low as practically possible.

The meteorological conditions used in the assessment are stipulated in DWER's *Draft Guidelines on Noise for Prescribed Premises.* These guidelines are used by DWER to *approximate the typical worst-case weather conditions for enhancement of sound propagation.* As such, the assessment provided already complies with DWER requirements for worst-case weather conditions. It should be noted that the model can be run with alternative weather conditions, the Shire would need to specify the condition they would seek to use (including wind speed, Pasquill stability, temperature and relative humidity for day and night).

It should be noted that the proposed crusher is already included in Scenario 7 and 8 of the Acoustic Report (March 2020).

Regarding the requirement to demonstrate noise impact has been reduced to be as low as practically possible, the *Environmental Noise Regulations 1997* do not require noise emissions to be as low as practicable, instead Regulation 7 requires noise emissions to comply with the applicable assigned noise levels, and this is the basis of the Acoustic Assessment.

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New Environmental and Water Management Plan

Shire Requirement: Why? Demonstrate stormwater and drainage management which prevents runoff potential to Cardup Brook; Foreshore rehabilitation for cleared or degraded areas along Cardup Brook within the site boundary, in order to mitigate the impacts associated with the works required to accommodate the upgraded crossings of Cardup Brook.

The applicant provided the following advice to the Shire via email in May 2020:

> ***Sediment***
>
> *There has been considerable discussion regarding stormwater and sediment management for the site. There are three current stormwater management documents for the site which outline stormwater and sediment control as requested in the Shire's email of the 8th May. We are agreeable to the updating of these as a condition of approval and having them consolidated into one single management plan. As has been previously discussed, it is important to note that the proposed development will facilitate* ***improved*** *stormwater, sediment and drainage management of the site, with, for instance, stormwater runoff from the sealed access roads to be captured, and water used for dust suppression across the site. In regards to the 'critical control areas' identified by the Shire by email of the 8th May, we provide the following advice:*
>
> - ***Pit floor product stockpiling.*** *The 2010 Stormwater Management Plan shows catchment areas for the pit floor. This will not change as a result of this application. The key change will be the use of water from the basins for dust management, resulting in the water levels in in the relevant basin being lower.*
> - ***Primary crusher and hopper operation.*** *As per the point above regarding water management. The conveyor is covered and dust management will continue as per the attached Dust Management Plan.*
> - ***Transport of clay product along the existing conveyor.*** *This is existing development and does not form part of this application. Nevertheless management will occur as outlined in the attached documents.*
> - ***Clay Brick storage area.*** *Runoff will be directed to the proposed stormwater basin.*
> - ***Transport of Clay product and trucks*** *– runoff from proposed sealed access roads will be directed to the proposed stormwater basin.*

Existing Management Plans were attached to that email. In regard to the information provided, it was requested that *the existing stormwater and dust management documents are not released for public review as part of the advertising process. These documents don't form part of the official application and provided to provide context to the Shire officers when considering the proposed development.*

Nevertheless, a revised Water Management Plan has now been prepared within the context described above. This combines the key elements of the existing documents, as well as undertaking a detailed water balance for the site (including pit areas). This is attached.

Updated Dust Management Plan

Shire Requirement: Why? identify dust sources and any required design upgrades in order to minimise dust impacts on sensitive receptors, in order for such impacts to be as low as practically possible.

The applicant provided the following advice to the Shire via email in May 2020:

> *There is an existing Dust Management Plan for the site, attached for your information. This obviously relates to existing operations however we are agreeable to updating this as a condition of approval. I note XXX's email regarding 'sediment and dust' however I understand that there have been no dust problems on the site. While the Dust Management Plan will be upgraded the mechanisms to manage dust will remain the same.*

A revised Dust Management Plan has been prepared and is attached. This provides a risk assessment for dust generators, along with 33 Actions to control dust on the site. Austral Bricks is agreeable to having this document reviewed in consultation with Shire staff as a condition of approval, if required. It should be noted that the DWER Works Approval (once issues) will also likely contain dust management conditions and a review of the Dust Management Plan may also be required to address requirements of DWER.

Updated Air Emissions Assessment

Shire Requirement: Why? Use site-specific meteorological conditions; updated emission impact maps based on this; design changes to demonstrate how emission impacts on sensitive receptors have been reduced to be as low as practically possible; modelling of consequence and likelihood of bypass events; measures to limit the risk of emission treatment systems being by-passed as a result of adverse events (such as planned maintenance and asset renewal programs).

Comment on the Air Emissions Assessment is attached. Further information on bypass events is provided below.

<u>Bypass events</u>

The site currently utilises a cascade scrubber. This style of scrubber focusses on the removal of Hydrogen Fluoride ("HF") from stack emissions. The ability of the existing scrubber in removing HCl and SO_2 is minimal, however (even with limited HCl and SO_2 removal) modelling prepared and accepted by the DWER in previous Works Approval/Licence applications accept that any impact from the existing scrubber will not exceed any relevant limits. Monitoring to this effect was placed on the DWER Licence for the site.

The existing cascade scrubber will be replaced with a Dry Injection Fabric Filter ("DIFF"), which consists of a sorbent injection system, reaction chamber and fabric filter. Acid gases are controlled by addition of hydrated lime into the reaction chamber where the lime reacts with the acid gases to form salt particulates that are then removed by the fabric filter. Additional acid gas removal occurs when unreacted gas contacts hydrated lime that coated the fabric filter bags. This style of scrubber will also reduce HCl and SO_2 emissions significantly, in addition to capturing HF emissions. This technology is considered best practice and is a clear improvement over the existing emissions technology.

It should be noted that emissions are only produced from the kiln when it is operational and clay product is being fired by moving through the kiln from one end to the other. Emissions from the kiln are routed to the scrubber.

It is acknowledged that, from time to time, the scrubber may be required to enter bypass mode. It should be noted that the term *bypass* is used to describe all instances when the scrubber is not operational, however it cannot be assumed that a bypass event will result in emissions from the site that will affect the environment, health or safety. For example, the following are three most likely scenarios where a 'bypass' event may occur:

1. Power failure whereby the Kiln and Scrubber shut down – (there will be no emissions in this scenario);
2. If the kiln door closure mechanism fails, or the kiln is stalled, the temperature may get too high, resulting in the scrubber turning off to protect the bags. In this scenario the push rate (movement of product through the kiln) of the kiln is reduced to ensure emissions standard are maintained (using mass balance calculations) until the temperature has returned to normal to allow the scrubber to turn back on.
3. Any other breakdown scenario (for example, a car blockage, fans fail, or no cars being available will eventuate in either a kiln stall or a reduction of the push rate of the kiln to ensure emissions standard are maintained.

In scenarios where the kiln remains operational during a bypass event lasting longer than 30 minutes, it is slowed to a pre-calculated push rate that will ensure emissions remain compliant with the DWER licence emission limits. This is a requirement of the current DWER licence and any bypass events are required to be reported to DWER.

Austral Bricks manages occurrences of system bypass through the Bypass Management Procedure. This procedure is supported by annual clay analysis and review of mass balance calculations as and when required (i.e. if a product mix changes, new product is developed or on receipt of annual clay analysis). It is important to note that Austral Bricks allows for redundancy in the push rate calculations and takes a conservative approach to ensure the emissions do not exceed the limit and ensures the protection of health and safety of its employees and local community members.

In general terms, this procedure requires the Kiln Manager to:

1. Notify the Works Manager of the issue who will in turn notify the Operations Manager and Environmental Manager.

2. Complete the Bypass Logbook, containing the following information:

- Bypass start date and time
- Reason for bypass
- Action taken
- Bypass finish date and time
- Duration of bypass

3. Initiate the procedure to slow the push rates to the calculated mass balance rates as already calculated by the Environment Manager.

Point 3 of the above procedure is critical in minimising air emission events due to scrubber bypass. The slower the push rate (the speed at which clay bricks pass through the kiln), the lower the air emission.

Slowing the push rate to an appropriate level will ensure that the emissions from the plant will remain within acceptable DWER limits. Austral Bricks has pre-calculated the required push rates for the various clay types in use at Cardup to ensure that the push-rate can be altered appropriately. The push rates of the kiln can be slowed almost immediately once the need is established.

In regards to maintenance, the proposed baghouse style scrubber proposed for this site comprises four separate chambers. This allows for the continued use of the scrubber during maintenance events, where one of the chambers can be maintained while the other three continue to operate.

It is noted that the RAR refers to Bellevue operations. This is in response to the Air Emissions Report using data from Bellevue as inputs to the air emission model. Using the inputs/outputs from the Bellevue scrubber is considered appropriate for the purposes of the model, as these inputs and outputs would be relatively static during normal operation and are representative of emissions from an operating DIFF scrubber.

New Compliance Auditing Strategy

Shire Requirement: Why? Depict how compliance will be measured, including Improvement Plans to identify and implement plant and/or process improvements, based upon advice of suitably qualified consultants who have expertise specific to any identified failures that occur

Any conditions attached to a Development Approval will be entered into the Austral Bricks Environmental Management System. This system is developed to ISO 14001 and guides the operating procedures of the company. This includes:

- Identifying key requirements of compliance
- Assigning timeframes and responsibilities to key compliance tasks
- Informing the relevant work crews of their responsibilities
- Undertaking independent audits of compliance with all regulatory requirements.

Austral Bricks currently provide Annual Compliance Reports to relevant authorities and would be amenable to the provision of a similar report to the Shire, addressing compliance with conditions over the preceding 12-month period. Austral Bricks would also welcome Shire staff to the site to assist with any compliance-related matters.

Traffic Assessment

MRWA requirement: review traffic and intersection treatment of Kiln Road and South West Highway.

Further consideration of the Traffic Impact Statement and intersection treatment has now been undertaken. It should be noted that there was no error in the traffic volumes used in the auxiliary lane assessment were actually correct – rather, the SIDRA assessment outputs factor up the input volumes which is why they appear different to those calculated by MRWA. The TIS has been updated to reflect the factored-up numbers for consistency.

An intersection design has also been prepared and discussed with MRWA. The intersection upgrade can be accommodated solely on land owned by Austral Bricks (where outside of the existing road reserve).

The revised TIS and intersection design are attached. These have also been provided to MRWA already.

Odour Assessment

As mentioned above, a further request was made on the 12th October 2020 for an Odour Impact Assessment. Odour was not specifically mentioned in the Shire's original RAR, however the Odour Assessment (prepared to support the DWER Works Approval application) is attached for information.

Conclusion

This information is provided in good faith with a view of progressing the application. Austral are happy to continue working with the Shire to update and implement as conditions of approval if required, or if further clarification is required.

Yours sincerely,

Michael Taylforth
Land Insights
Planning – Design – Environment

28 October 2020

Enc (via OneDrive Link):

1. Austral Bricks Worth, Health and Safety Policy
2. Water Management Plan
3. Dust Management Plan
4. Information regarding Air Emissions Assessment
5. Environmental Policy
6. Traffic Impact Statement and Intersection Design
7. Works Approval Odour Impact Assessment

BRICKWORKS
LIMITED

WORK, HEALTH AND SAFETY POLICY STATEMENT

Our mission: People return from Brickworks workplaces in the same mental and physical condition as they left to go to work.

Our behaviour: There is no task that we undertake that is so important that we can't take the time to find a safe way to do it.

Our Values: We don't want to make a profit by hurting anyone.

It is Brickworks' Policy to ensure that all our activities and processes are performed in a systematic manner that does not put at risk the health and safety of employees, contractors, labour hire workers, trainees, apprentices, visitors, suppliers, customers and/or the general public.

To achieve our Policy objectives the Brickworks Management Team commits to:

- Compliance with applicable laws, regulations, standards, codes of practice and requirements to which Brickworks subscribes
- Consulting with workers about health and safety matters and give workers the opportunity to express their views and be involved in decision making about those matters
- Consulting, cooperating and coordinating activities with other persons conducting business or undertaking, persons in control of the workplace or plant, designers, manufacturers, suppliers, importers and installers of plant or structures and other persons at the workplace in relation to health and safety matters
- Providing appropriate health and safety advice, information, education and training to our workers, contractors, labour hire workers and visitors
- Minimising risk to health and safety by implementing risk management processes consistent with the level of risk exposure
- Meeting the requirements of AS/ NZS 4801 OHS Management Systems – Specification with guidance for use
- Monitoring and regularly reviewing Brickworks' Health and Safety Management System to ensure that it complies with prescribed and subscribed requirements
- Providing processes for all levels of management to be held accountable for health and safety matters within their responsibility whilst at the same time recognising that each worker has a duty to take reasonable care that their acts do not adversely affect the health and safety of themselves or others
- Establishing measurable objectives and targets to regularly evaluate Brickworks' Health and Safety Management System's effectiveness
- Taking steps to make sure that the Health and Safety Management System is effectively implemented in accordance with this Work Health and Safety Policy, and
- Undertaking continuous improvement activity through rigorous monitoring processes and strategic review.

Providing a safe work environment is fundamental to the Brickworks' beliefs and our behaviour as a first class corporate citizen.

Lindsay Partridge
Managing Director

1st January 2016

australbricks bristileroofing australmasonry auswesttimbers australprecast

COTERRA
ENVIRONMENT

Water Management Report

Austral Bricks – Cardup Pit

Revision 0

October 2020

CALIBRE | COMMITMENT | COLLABORATION

This report was prepared by:	Coterra Pty Ltd trading as COTERRA ENVIRONMENT	**This report was prepared for:**
ABN:	ABN: 92 143 411 456	Austral Bricks
Our Ref:	AUBCAR18	Harper Street
Author(s):	R Murray / R Epworth	Caversham, WA 6055
Reviewer:	R Epworth	
Report Version:	Revision 0	
Date:	October 2020	

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Executive Summary

Key Elements	
Site Conditions (Section 2)	• Cardup Brickworks is located on a 132-ha land parcel (the site). • The site has been used for brick manufacturing since the 1890s. Now manufacturing and excavation activities are undertaken on the site. • The manufacturing area is south of Cardup Brook and the excavation area is north of Cardup Brook. • The topography of the excavation pit varies between 80mAHD and 115mAHD. • The topography of the manufacturing area varies between 72mAHD and 86mAHD. • The site predominantly consists of shale and clay. • The site predominantly has no risk of Acid Sulfate Soils (ASS) within 3m of the natural surface, with the exception of a small portion of the northern corner which is shown to have a low to medium risk of ASS. • No part of the site is registered within the Department of Environment and Conservation Contaminated Sites Database. • The site is on the edge of the darling fault (western edge of the site) and is underlain by 'Combined Fractured Rock West – Fractured Rock'. • There are no aquifers of significance over most of the site due as the shale and granite bedrock and clayey weathering profile are not conducive to large groundwater resources and productive aquifer systems. • Regional groundwater information (WIN bores) suggests that peak groundwater levels in the middle of the site may vary between 70 and 84mAHD. • Site specific bores to the west of the manufacturing area indicate peak levels at approx. 61 - 67.5mAHD. • Cardup Brook runs through the site (from east to west) separating the extraction and manufacturing area. • 1% AEP flood levels in this portion of the brook are estimated to range between 67.8mAHD (west) to 79.0mAHD (east). • Surface water flows and quality have been measured since 2011 – turbidity/ total suspended solids and hydrocarbons are the primary parameters of concern. • A very small portion in the south-west of the site (manufacturing area) forms part of a palusplain multiple use wetland. • The foreshore of the Cardup Brook downstream of the main pit is classified as a Conservation Category Wetland (CCW) (Unique Identifier 14541). This is located outside of the site boundary. • Bush Forever sites and Aboriginal Heritage sites are located on site.
Stormwater Quantity Management – Excavation Area (Section 3)	• There are currently five catchments within the excavation area. • Each catchment has settlement basins to settle solids. • Three of the catchments have no discharge to Cardup Brook – they rely on evaporation and infiltration. • Of the two remaining catchments that discharge to Cardup Brook, Catchment 1/ Basin 1 constitute the majority of the current discharge to Cardup Brook. • Future management therefore focuses on the water balance of Basin 1. • Modelling was undertaken to determine the predicted overflow in the current scenario (predevelopment), and the anticipated scenario post development.

Key Elements	
	• The post development scenario includes reusing water for dust suppression and increasing the size of Basin 1. • The current scenario estimates that discharge occurs 45 days/ annum (12% of the year) with overflow occurring intermittently between May and October. • The post development scenario estimates discharge will occur 23 days/annum (6% of the year) which is a 50% reduction to the current scenario, with overflow occurring intermittently between June and October. • The post development scenario estimates the average volume of discharge will be reduced by 56% compared to the current scenario.
Stormwater Quality Management – Excavation Area (Section 4)	• Prior to any discharge from Basin 1, flocculation treatment will occur to remove fine sediments from the stormwater. • A flocculation trial was undertaken at the nearby Brickworks site (Shale Road in 2013). This was undertaken in consultation with the Shire and approved discharge was undertaken. • The proposed treatment system and process at Cardup would be the same as the Shale Road pit treatment system. • This includes a staged process of adding aluminium sulphate to enable flocculation of the sediments and settling, followed by adding hydrated lime putty to enable a second flocculation and corrects the pH. • Basin 1 will be segmented to allow different areas of the pond to address the two staged process.
Stormwater Quantity Management – Manufacturing Area (Section 5)	• The current manufacturing area consists of five catchments. All of these have connections to Cardup Brook and overflow may occur to the Brook in some capacity (dependant on rainfall etc). • Future stormwater management proposes one retention basin to collect and treat runoff from most of the manufacturing area (roof areas and road areas). • The basin will be located in cleared land to the west of the manufacturing area. • Water from the basin will be used to supplement the water supply to the kilns and be reused in the production process. This will reduce the demand on the groundwater supply by approx. 14-15%. • The basin has been designed so that on average 96% of the runoff volumes are attenuated with no overflow to Cardup Brook. • The basin base has sufficient separation distance to groundwater (approx. 2m) to allow infiltration and ensure no groundwater ingress.
Stormwater Quality Management – Manufacturing Area (Section 6)	• Water quality within the basin will be treated in a water quality treatment area within the basin to treat the first flush (first 15mm of runoff). • The water quality treatment area of the basin will be vegetated and have soil amendment layers. • These elements will filter out/ adhere suspended solids and hydrocarbons, as well as reduce nutrients. • There is a fuel storage area on site. As part of the original Works Approval assessment process DWER advised that bunding around fuel storage should be designed and maintained to contain a 5% annual exceedance probability (AEP) 72-hour event plus 110% of tank contents. The existing fuel storage facilities are sized sufficiently to meet this requirement.
Flood Management (Section7	• There are two existing vehicular creek crossings on site. These crossings will be upgraded as part of the proposed works.

Key Elements	
	• Finished road crossings/ bridge crossings will be at least 0.5m above the 1% AEP flood level in those locations. • Minimum level requirements at Crossing 1 and Crossing 2 are approx. 77.3mAHD and 70.2mAHD respectively.
Monitoring (Section 8)	• Surface water monitoring has been undertaken at the site since 2011 for velocity rates and water quality. • Post development, monitoring will occur at 10 locations in the Brook and across the site in accordance with the DWER Licence number L9025/2017/1 requirements. • Analysis will include in-situ parameters and turbidity, TSS and hydrocarbons.

1 Introduction

Cardup Brickworks is located on a 132-ha land parcel comprised of lots 7, 10, 12, 21, 50, 51, 53, 100, 101, 801 and 802 Kiln Road, Byford within the Serpentine-Jarrahdale Shire (Figure 1). This land has been historically used for brick manufacturing commencing in the 1890s, with some excavation activities undertaken since this time. The site was put into care and maintenance in May 2012 until 2017 when manufacturing recommenced.

In accordance with previous studies, the site has been divided into two broad areas according to the dominant land use. These areas include:

- The manufacturing area - located to the south of Cardup Brook, and
- The excavation area - located to the north of the Brook.

These areas are shown in Figure 2. Works recommenced in the Manufacturing Area in 2017.

This document has been prepared to address water management within both areas.

1.1 Recent Environmental Licences and Approvals

1.1.1 Current DWER Licence

The Department of Water and Environmental Regulation (DWER) is responsible for the administration of Part V, Division 3 of the *Environmental Protection Act 1986* (WA) (EP Act). Licence number L9025/2017/1 has been issued for the site from 18 June 2019 through to 17 June 2029 (10 years). The licence is provided in Appendix 1.

1.1.2 Previous Licences

1.1.2.1 Extractive Industries Licence Background

An Extractive Industries Licence (EIL) was approved by the Shire in July 2011 to facilitate excavation within Lots 7, 50 and 101. The EIL expired on the 31st of December 2015.

Condition 11 of that licence states:

> *The landowner shall submit to the Shire a Water Management Plan by 30 November 2011. Once approved by the Director Engineering, the Water Management Plan is to be implemented in its entirety.*

A Water Management Plan (WMP) (Coterra Environment, 2010 & 2012) and a Stormwater Discharge Assessment Report (SDAR) (Coterra Environment, 2011) were previously submitted and approved by the Shire to satisfy Condition 11 of that EIL.

1.1.2.2 Works Approval

In January 2016, a Works Approval was granted by the Department of Environmental Regulation (DER) to undertake commissioning of plant and manufacturing of clay bricks and ceramic products. A Stormwater Management Plan (SMP) (Coterra Environment, 2016) was prepared and submitted to the DER in July 2016 as a condition of this approval.

The works approval expired in January 2019 and the new DWER licence (Section 1.1.1) now supersedes the 2016 Works Approval Licence. The works approval and amendments are also provided in Appendix 1.

1.1.3 Shire Request

As part of the new Development Application, the Shire of Serpentine Jarrahdale (the Shire) requested a new Environmental and Water Management Plan to address the following:

- Demonstrate stormwater and drainage management which prevents runoff potential to Cardup Brook; Foreshore rehabilitation for cleared or degraded areas along Cardup Brook within the site boundary, in order to mitigate the impacts associated with the works required to accommodate the upgraded crossings of Cardup Brook.

This report satisfies the Water Management Plan component of the request. The foreshore rehabilitation for cleared or degraded areas along Cardup Brook will be dealt with in a separate document.

2 Existing Environment

2.1 Land Use

The immediate surrounding land is primarily used for agricultural and grazing purposes. To the north and west of the site are existing residential areas. To the east of the site lies Midgegooroo National Park, and to the north-east lies Darling Range Regional Park.

At the south of the site, there are a range of uses included the Shale Road excavation pit (Brickworks), the old Suez Shale Road Landfill site, a timber processing centre, and mixed agricultural uses.

The Shale Road excavation pit has been in operation since 2008 and currently has active excavation stages. The Shale Road landfill previously accepted Class II waste which comprises mostly of municipal, industrial and commercial solid waste. The landfill started operations in September 1999, and closed in November 2016 (Golder Associates, 2017).

Within the Cardup site boundary, the site is divided into an excavation area, and a manufacturing area as shown in Figure 2.

2.2 Climate

The region has a Mediterranean climate with warm dry summers and cool wet winters. Annual average rainfall and evaporation for the closest Bureau of Meteorology weather stations to the site are summarised in Table 2-1.

Table 2-1 Climate Averages

Location	Annual Rainfall	Annual Evaporation
Cardup Station (9137)	859 mm	-
Jandakot (17km NW of site)	821 mm	-
Medina Research Station (21km west of site)	746 mm	1,715 mm
Karnet (22km south of site)	1,153 mm	1,460 mm

Source: (Bureau of Meteorology, 2020)

2.3 Topography

2.3.1 Regional Topographic Data

Regional topographic contours of the site indicate that the topography rages from 68 mAHD within the Cardup Brook channel towards the western edge of the site to 123 mAHD towards the Darling Scarp in the east (Landgate, 2020).

2.3.2 Site-Specific Surveys

Ground levels within the excavation pit have been modified over time to reflect resource extraction since the 1940s. The excavation area is currently elevated to the west, north and east with a high point at approximately 115 mAHD in the west and east, and a low point of approximately 80 mAHD in the large basin (Basin 1) in the middle of the area.

Topography within the manufacturing area follows an overall downwards slope from south east to north west, with localised downward slopes from south to north towards Cardup Brook near the site's western boundary. Topography ranges from 86 mAHD in the east to 72 mAHD in the west (Figure 3).

Recent surveys of Cardup Brook crossover contours indicate the topography of the Brook lies at 75.66 mAHD in the east and exits the site at a low point of 65.48 mAHD. These surveys have been provided in Appendix 2.

2.4 Geology and Soils

2.4.1 Soil Description

Regional soil and geology mapping (DMIRS, 2020) shows the excavation area to be mostly underlain by shale, which is the resource being excavated:

- Shale (SH) - brown-green to black, silty, thinly bedded with interbeds of siltstone and fine-grained sandstone (Jordan, 1986).

The remainder of the site is underlain by:

- Gravelly Sandy Clay (C_{sg}) – variable with lenses of silt and gravel, quartz sand, subangular, with eolian rounded component, heavy minerals common, gravel rounded, of colluvial origin (across most of the manufacturing area).
- Gravelley Clayey Sand (S_{cg}) – decomposed bedrock, gravel rock fragments, angular quartz / feldspar sand, clay minerals matte flocculate to silt/sand size, of colluvial origin (approximately 10% in the south-eastern corner).
- S12 – yellow, fine to medium grained, sub-angular to rounded quartz, with some feldspar, well sorted, variable silt content, of colluvial origin (approximately 5% in the northern-most corner).

Figure 4 shows the regional geology mapping of the site.

A geotechnical investigation was undertaken for a portion of the site as part of development investigations undertaken in 2013 (Golder Associates, 2013). The study mainly focused on an area north-west of the site which extended over the excavation area. This investigation included geotechnical logging and constant head permeability testing at nine locations (see Figure 4). The following soils were encountered:

- BH4 – Sandy soils with less than 5% silt or clay. Design permeability of around 5m/day.
- BH5 and 7 – Sands and gravels with 5-12% silt or clay content. Design permeability of around 1m/day.
- BH1, 2, 3, 6, 8, and 9 – Clayey soils with greater than 12% clay content. Design permeability of around <0.06m/day.

The results of the site-specific soil investigations were reasonably consistent with the broad categories within the regional soil mapping. A copy of the geotechnical investigation has been provided in Appendix 3.

2.4.2 PRI Rating

The likely Phosphorus Retention Index (PRI) has been inferred from soil types and Department of Environment and Department of Agriculture standard guidelines (Table 2-2 and Table 2-3).

Table 2-2 Relative permeability and PRI for various substrates

Substrate	Permeability (m/day)	PRI
Bassendean Sands	30+	0-0.5

Substrate	Permeability (m/day)	PRI
Karrakatta Sands	10+	2-4
Cottesloe Sands	10+	5-12
Crushed limestone or lime sands	2-5	5-20
Natural clay or loam soils	<0.4	30-1,000+

Source: Department of Environment

Table 2-3 PRI Fixation Properties

PRI	Description
Negative	desorbing
0–2	weakly adsorbing
2–20	moderately adsorbing
20–100	strongly adsorbing
>100	very strongly adsorbing

Source: Department of Agriculture and Food

The sandy clay and clayey sand soils in the west and manufacturing portion of the site are estimated to have a PRI greater than 30 (strongly to very strongly adsorbing).

The eastern portion of the site which is underlain by shale geology features shallow soils. The soils likely have a high PRI (>30).

2.4.3 Acid Sulfate Soils

Department of Environment and Conservation (DEC) mapping indicates the site predominantly has no risk of Acid Sulfate Soils (ASS) within 3m of the natural surface.

A small portion of the northern corner is shown to have a low to medium risk of ASS occurring within 3m of the natural soil surface.

2.5 Contamination

No part of the site is registered within the DEC Contaminated Sites Database (DWER, 2020a).

2.6 Groundwater

The site is on the edge of the darling fault (western edge of the site) and is underlain by the 'Combined Fractured Rock West – Fractured Rock' (DWER, 2020).

There are no aquifers of significance over most of the site as the presence of shale and granite bedrock and the clayey weathering profile are not conducive to large groundwater resources and productive aquifer systems.

2.6.1 Regional Groundwater Levels

Regional groundwater information from 1977 suggests that peak groundwater levels in the middle of the site may vary between 70 and 84mAHD. The three WIN bores closest to the site are shown on Figure 5 and summarised in Table 2-4.

Table 2-4 Regional Groundwater Levels

Bore ID (WIN)	Groundwater Level (mAHD) - Max. recorded
20038852 (Agricultural land upstream of brick manufacturing area)	83.8
20038857 (Cardup main pit)	82.3
20038853 (Brick manufacturing area)	70.9

Note: This data was collected in 1977 at 20038852 and 20038853, and at an unknown date at 20038857

Source: (DWER, 2020b)

2.6.2 Site-Specific Groundwater Monitoring Data

Groundwater monitoring was conducted at two bores during the 2013 peak period (August – October) in an area to the south west of the site to provide additional information on peak groundwater levels during development investigations at the time. Figure 5 shows the location of the bores and Table 2-5 contains a summary of site-specific groundwater level data.

Table 2-5 Site Groundwater Levels

Bore ID	Minimum Depth to Groundwater (m)	Approximate Topographic Level (mAHD)	Indicative Peak Groundwater Level (mAHD) - max. recorded
CARGW01	1.55	69*	67.45
CARGW02	1.89	63*	61.11

*Notes: * Topographic Level estimated from DWER 1m topographic contour dataset (DWER, 2020a)*

2.6.3 Groundwater Quality

Within the vicinity of the site, there are two bores with groundwater quality data recorded since the 1970s (DWER, 2020b). The data is presented in Table 2-6 and compared to the ANZECC (2000) Freshwater guidelines.

Table 2-6 Regional Groundwater Quality

Parameter	Units	ANZECC Guidelines (Freshwater)	20038852	20038853
Collection Date	-	-	20-Feb-79	20-Feb-79
Alkalinity	mg/l	-	107	102

B	mg/l	0.37	<0.1	0.1
Ca	mg/l	-	13	7
Cl	mg/l	0.03	95	340
Conductivity	µS/cm	-	57	139
F	mg/l	-	0.5	0.3
Hardness	mg/l	-	90	112
K	mg/l	-	3	1
Mg	mg/l	-	14	23
NO3	mg/l	0.7	17	-
Na	mg/l	-	82	230
SO4-S	mg/l	-	31	58
SiO2	mg/l	-	46	39
TDSolids	mg/l	-	-	-
Temperature	deg C	-	25	25
pH	-	6.5-8.5	7.8	6.7

Orange shading indicates result exceeds ANZECC guidelines

Water quality monitoring has been completed at the two onsite groundwater bores to the south-west of the site in the 2013 peak period. The results of the water quality monitoring are summarised in Table 2-7.

Table 2-7 Site Groundwater Quality

Parameter	Units	ANZECC Guidelines (Freshwater)	CARGW01	CARGW02
Temperature	C	-	18.2	18.8
pH	-	6.5-8.5	5.4	5.6
Conductivity	µS/cm	-	1417	299
TDSolids	mg/l	-	1059	221
Redox		-	222	134
Ammonia-N	mg/L	0.08	-	0.3
NOx-N	mg/L	0.15	-	0.07
Nitrate-N	mg/L	-	-	0.07
Total N	mg/L	1.2	-	1.5
FRP	mg/L	0.04	-	<0.01
Total P	mg/L	0.065	-	5.7
TKN	mg/L	-	-	1.5

Orange shading indicates result exceeds ANZECC guidelines

2.7 Surface Water

Cardup Brook is an ephemeral watercourse which flows through the site east to west (separating the manufacturing area and the excavation area). The headwaters of Cardup Brook are in the Darling Scarp approximately 6km south east of the site, with numerous on and offline small farm dams along its length. The brook and its' tributaries are shown in Figure 6.

Downstream of the site, the brook flows in a generally westerly direction through a series of natural and man-made channels before eventually discharging into the Serpentine River system, which links to the Peel-Harvey Estuary.

The hydrological catchment of Cardup Brook upstream of South Western Highway is approximately 20 to 25km^2 in size. The 1% AEP peak flow is estimated at 23.5m^3/s in Cardup Brook just after the South Western Highway bridge. This reflects a 1% AEP flood level of 57.1 mAHD at that point (approx. 1km downstream of the site) (DoW, 2008).

2.7.1 Cardup Brook Flood Modelling

The flood extent of the Cardup Brook adjacent to the site was modelled as part of a 2013 investigation to provide a more accurate estimation of peak flood flows, levels, and extents. The modelling results showed;

- The maximum 1% AEP flood level in the Brook on the eastern end of the site is approximately 78.988mAHD.
- The maximum 1% AEP flood level in the Brook on the western end of the site is approximately 67.806mAHD.

Within the majority of the site area, the 1% AEP flood extent is contained within the brook itself. There are some outbreaks on the eastern edge and the western edge of the manufacturing area. The extent of the 1% AEP flood modelling is shown in Figure 7 and the management discussed in more detail in Section 7.

2.7.2 Surface Water Flows

Surface water monitoring has been undertaken at the site since 2001 and is ongoing. In-channel velocity has been measured, along with surface water quality in line with licence requirements.

Monitoring has used an in-channel velocity meter. Table 2-8 provides a summary of the velocity measured at each of the monitoring locations as shown in Figure 6. All surface water flow results from 2011 to present (2020) have been provided in Appendix 4.

Table 2-8 Surface Water Flows

Sampling Location	Average Observed Velocity (m/s)	Observed Velocity Range (m/s)
CAR01	0.34	0 – 1.43
CAR02	0.14	0.01 – 0.53
CAR05	0.05	0.05
CAR06	0.35	0.0 – 2.40
CAR09	0.06	0.01 – 0.20
CAR12	0.02	0.01 – 0.03
CAR13	0.10	0.01 – 0.55
CAR15	0.20	0.2

Note: CAR10 had no flow readings for all events.

2.7.3 Surface Water Quality

Since 2011 Coterra has monitored for the following parameters:

- In-situ parameters including appearance, colour, temperature, pH, Electrical Conductivity (EC), in-situ Total Dissolved Solids (TDS), redox (ORP), dissolved oxygen (%)
- Laboratory TDS
- Total Suspended Solids (TSS)
- Total Petroleum Hydrocarbons (TPH)

A summary of TSS and Turbidity concentrations at CAR01 (upstream sampling point in Cardup Brook) and CAR06 (downstream monitoring point in Cardup Brook) has been provided in Table 2-9 below. Full surface water quality data at all locations has been provided in Appendix 5.

Table 2-9 Summary of TSS and Turbidity Concentrations (2011 to Present)

Location	TSS (mg/L)			Turbidity (NTU)		
	Min	Max	Average	Min	Max	Average
CAR01	<5	350	38.48	3.30	310	43.21
CAR06	<5	620	70.19	4.10	1900	126.96

2.7.4 Conservation Category Wetlands

A very small portion in the south-west of the site (manufacturing area) forms part of a palusplain multiple use wetland (Unique Identifier 15382) (Landgate, 2020) (Figure 6). MUWs are wetlands with few important ecological attributes and functions remaining. The use, development and management of these areas should be considered in the context of ecologically sustainable development and best management practice catchment planning (EPA, 2008). There are no legislative buffer requirements for MUW, and the land adjoining the site which falls within the MUW category has been developed.

The foreshore of the Cardup Brook downstream of the main pit is classified as a Conservation Category Wetland (CCW) (Unique Identifier 14541). This is located approximately 350m to the west of the manufacturing area (Figure 6).

2.8 Environment and Heritage

The site is surrounded by remnant vegetation on the western and northern boundary and cleared land to the east and south. Cardup Brook is vegetated.

The remnant vegetation in the north-western portion and along the reach of the Cardup Brook downstream of the main pit, is designated 'Bush Forever' (Figure 8).

A Level 1 Fauna Survey and Targeted Cockatoo Habitat Survey was conducted in 2019 by Western Wildlife in support of the DA. A Level 2 Flora and Vegetation Assessment was conducted in 2019 by Del Botanics. No water dependent ecosystems were reported at the site.

A 30m buffer along the Cardup Brook is designated an Aboriginal Heritage Site (ID 16108) for its mythological value (Department of Indigenous Affairs, 2013) (Figure 8). Section 16 of the Aboriginal Heritage Act (1972) states:

Excavation of Aboriginal sites

(1) Subject to section 18, the right to excavate or to remove anything from an Aboriginal site is reserved to the Registrar.

(2) The Registrar, on the advice of the Committee, may authorise the entry upon and excavation of an Aboriginal site and the examination or removal of anything on or under the site in such manner and subject to such conditions as the Committee may advise.

A Section 18 approval under the Aboriginal Heritage Act 1978 would be required prior to disturbance of the 30m buffer along the Cardup Brook.

Several locations within the Bush Forever portion of the site are also designed Aboriginal Heritage Sites (ID 16101, 16100, 16091, 16090, 16089 & 16092). These are designated for the potential of scattered artefacts (Figure 8).

3 Stormwater Quantity Management of Excavation Area

3.1 Stormwater Management Overview

The current on-site catchment areas and runoff flow paths are shown in Figure 9. There are seven sedimentation/settlement basins currently within the excavation area of the site. These basins have been constructed periodically throughout the excavation periods to detain and treat stormwater runoff. The locations of the features within the excavation area are shown in Figure 10.

There are three drainage channels within the excavation pit. The most significant is 'Railway Gully' (Figure 10) which conveys stormwater from Basin 1 to Cardup Brook. Railway Gully is vegetated and traversed by V-notch weirs. The V-notch weirs treat the stormwater further by allowing heavier suspended solids to settle out and be retained onsite prior to the overflow to Cardup Brook. The vegetation within the gully removes the finer suspended solids and soluble pollutants through the process of enhanced sedimentation, filtration, adhesion and biological uptake.

The excavation area is divided into various catchments, each of which has a settlement basin or two settlement basins. There is one main basin in the centre of the site (Basin 1) which treats a predominant catchment on site.

Cardup Brook runs adjacent to the southern boundary of the site (Figure 10). Stormwater overflow points from the excavation area occur at two locations along Cardup Brook; one overflow from Railway Gully and one from Basin 5.

The flow routes and stormwater treatments are summarised in Table 3-1 below.

Table 3-1 Summary of Onsite Stormwater Catchment Flow Paths – Excavation Area

Catchment	Stormwater Routes	Stormwater Disposal
Catchment 1	Drainage channel D1 and overland runoff directed to Basin 1, then piped overflow to Railway Gully.	Overflow discharge to Cardup Brook (generally only in winter).
Catchment 2	Overland runoff to Basin 2.	Infiltration to groundwater/ evaporation.
Catchment 3	Overland runoff to Basin 3.	Infiltration to groundwater/ evaporation.
Catchment 4	Overland runoff to Basin 4 and overflow directed overland to Basin 5.	Overflow pipe/ discharge to Cardup Brook (sometimes in winter).
Catchment 5	Overland and roof runoff from clay storage area directed to drainage channel D2, leads to Basins 6 and 7.	Infiltration to groundwater/ evaporation (no piped outlet or record of overtopping)

Appendix 6 provides an indication of whether, and when, discharge to Cardup Brook has occurred from the overflow location in the excavation area. At the overflow/discharge locations, the corresponding sampling locations are CAR12 in Basin 5, CAR13 in Railway Gully and CAR15 in Basin 1 (Figure 6).

3.1.1 Current Settlement Basin Sizes

In 2004, McDowall Affleck Pty Ltd (consulting engineers) produced a stormwater management plan which investigated the capacity required for detention basins to retain and treat surface water runoff from the site. This plan was submitted to the Shire.

The main basin (Basin 1) has an area of approximately 9,919m^2 (or 0.9919ha) with a varied depth to a maximum of 4m (*pers comm.*, Tanya Gilders, Austral Bricks, October 2020). The estimated total volume in Basin 1 is 22,274m^3 (Appendix 7). Overall, the site has settlement basins totalling a volume of approximately 26,335m^3. Table 3-2 below illustrates the individual basin sizes.

Table 3-2 Settlement Basin Sizes – Excavation Area

	Approximate Average Depth (m)	Approximate Area (m^2)	Approximate Volume (m^3)	Feeding Catchment (m^2)
Basin 1	2.5	9,919	22,274	188,800
Basin 2	1.5	661	992	23,200
Basin 3	2	1,124	2,248	69,300
Basin 4	1.5	321	482	58,600
Basin 5	1.5	115	173	
Basin 6	1	93	93	14,200
Basin 7	1	73	73	

3.2 Future Stormwater Management – Excavation Area

3.2.1 Future Management of Small Catchments

As detailed above, there are a number of smaller settlement basins within the excavation area retaining stormwater from the five catchments.

Three of the catchments do not have a discharge to Cardup Brook (Table 3-1) and rely on evaporation and infiltration for stormwater dispersal. There is the opportunity to enlarge any number of these settlement basins to detain a larger volume of stormwater if required. This will be monitored and corrected if or when required.

Of the two remaining catchments, Catchment 1 is a large catchment and addressed below (Section 3.2.2), Catchment 4 is a smaller catchment with less discharge. There is the opportunity to enlarge the basins, or add additional basins in this catchment if a discharge is noted. This would allow for further settlement opportunities as well as further retention, thereby reducing the amount of stormwater discharging to the brook and therefore reducing the TSS loading.

3.2.2 Future Management of the Main Catchment

As part of this revised stormwater management strategy, a comprehensive water balance model has been created for Basin 1 (which contributes to the majority of discharge volumes to Cardup Brook from the site). The purpose of this modelling was to determine how this catchment and Basin 1 could be managed post development to minimise stormwater discharge to Cardup Brook.

Basin 1 and its' catchment runoff will be managed through a combination of the following;

- Water quantity management
  - Expansion of Basin 1 to include additional volume able to be detained (this is discussed in Section 3.2.3.2.1). Figure 11 shows the additional storage area in comparison to the original Basin 1 area.
  - Reuse of water for dust suppression (This is discussed in Section 3.2.3.1).
  - Installation of a staff gauge in Basin 1 to monitor water levels. When water levels get to within 0.3m of the overflow pipe to Railway Gully, this will trigger the requirement for flocculation treatment (refer to Section 4).
- Water quality management
  - Flocculation treatment (refer to Section 4) to be implemented prior to overflow to Railway Gully.
  - Vegetation and V-notch weirs within Railway Gully providing further polishing treatment prior to discharge to Cardup Brook.

3.2.3 Water Balance Modelling of Basin 1

3.2.3.1 Method

Two water balances were created during this analysis;

- Scenario 1 - Determine the overflow of Basin 1 (and therefore the estimated volume of stormwater discharging to the Cardup Brook) in the current (predevelopment) scenario.
- Scenario 2 - Determine the overflow of Basin 1 and feasibility of reusing stormwater for dust suppression, and an additional basin volume.

The water balance model for the pre- and post-development options are provided in Appendix 7. The models are set on a daily timestep over a recent 6-year period (1st of January 2013 – 31st of December 2018). The models are excel-based models of the water volume inputs and outputs. The inputs and outputs are identified below.

3.2.3.1.1 Water Inputs

- Rainfall across the Basin 1 catchment area is the only water input for both the current (predevelopment) and post-development scenarios. This data was available via the Bureau of Meteorology Bungendore Station (BOM, 2020), and included rainfall from several larger storm events towards the end of the water balance period.
- Stormwater catchment areas and runoff – catchment areas within the excavation area are shown in Figure 9. Stormwater runoff volumes have assumed a 0.9 runoff coefficient (90%) to account for the relatively impervious nature of the geology and the relatively steep slopes in the excavation area.
- Rainfall to the basin area itself is applied as a direct rainfall input.

3.2.3.2 Water Outputs

- Evaporative losses – This was based on Perth Metro BOM daily evaporation rates (BOM, 2020) and the basin surface areas. An adjustment was applied to account for the reduction in surface area that occurs as the pond empties (in 25% increments). This reduces evaporative losses as the volume in the basin decreases.
- Absorption and wetting – a 2mm initial loss and a runoff coefficient of 90% was applied to all rainfall inputs.
- Losses due to infiltration:

   - The geotechnical investigation noted an infiltration rate of 1.09 m/day near to Basin 1 (BH9 in Figure 4).
   - But the geotechnical investigation recommended using less than 0.06 m/day taking into account the soil type.
   - Sensitivity analysis of the model to the infiltration rate was undertaken. This was compared to anecdotal evidence of the level fluctuations in Basin 1 over time. Applying the in-situ geotechnical data resulted in a relatively high volume loss through infiltration. This was thought to be misrepresentative of reality (anecdotal evidence), so the infiltration rate was reduced and a clogging factor was applied. The resulting water level fluctuations corresponded more closely to the anecdotal evidence of the current scenario.
   - The final current (predevelopment) scenario model therefore assumes an infiltration rate of 0.012 m/day (including 50% clogging factor). This same rate was applied to the post development model to ensure consistency. This is a conservative estimate compared to the geotechnical recommendation (less than 0.06m/day).
   - An adjustment was applied to account for the reduction in the base area available for infiltration (in 25% increments) which occurs as the pond empties. This reduces infiltration losses as the basin empties.
- Water demand from dust suppression – this has been predicted from existing usage data (pro rata based on existing tonnage versus predicted tonnage) provided by Austral Bricks, and seasonal climate fluctuations:
   - A water demand of 100 kL/day for the area north of Cardup Brook occurs during 8 dry months per year. "Drier months" were determined by analysing BOM average monthly rainfall data and include January to April and October to December.
   - A water demand of 45 kL/day for the area south of Cardup Brook occurs during dry months outside of winter. This included January to May, and September to December.
   - No dust suppression is expected during winter months.

3.2.3.2.1 Model Assumptions

Some key assumptions were made, including:

- The basin starts with an initial volume of 50%, as the basin is existing with water already present.
- Existing Basin 1 was assumed to have the dimensions and shape as presented in Appendix 7 for both pre-development and post-development scenarios.
- The additional basin (yet to be created) was assumed to have a semi-circular cross section and a regular shape for volume calculations. This is shown in Appendix 7.

3.2.4 Basin 1 Model Results

3.2.4.1 Current (Pre-development) Scenario

The predevelopment results indicate;

- Overflow from Basin 1 occurs an average of 45 days per year (12% of the year).
- The results also indicate Basin 1 is never dry/empty (which is the same as the patterns observed during monitoring and by Austral Bricks staff onsite).

- Minimum basin levels usually occur in March before the wet period (excluding years which received very large cyclonic storm events in January/February (2017 and 2018)).
- Maximum basin water levels and the sporadic overflow/discharges usually occurs from May to October.

3.2.4.2 Post-development Scenario

The post-development scenario includes existing Basin 1 (22,274m^3) and an additional storage area of approximately 11,310m^3. This scenario increases the storage capacity of Basin 1 by approximately 50%. These areas are shown in Figure 11.

The post-development results indicate;

- Overflow from Basin 1 and the additional pond occurs an average of 23 days per year (6% of the year). This is half the amount of time as the current (pre-development) scenario.
- The results also indicate that the basin empty (or close to empty) each year by about February. The model indicates that Basin 1 and the additional basin may get dry between a period of February to April. This is due to dust suppression reuse, and increased pond area resulting in more evaporation and infiltration.
  - The combined capacities of Basin 1 and the additional basin can accommodate approximately 88% of the demand required for dust suppression in this water balance.
- Maximum basin water levels and sporadic overflow/discharges usually occur from June to October. This is slightly less than the pre-development scenario.
- The post-development basin reduces the volume of stormwater overflowing to Railway Gully by approximately 56% compared to the pre-development scenario.

Table 3-3 below shows a comparison of the predevelopment and post-development data.

Table 3-3 Comparison of Current (Predevelopment) and Post-development Water Balance Data

Parameter	Average overflow days per year	Average overflow volume per year (kL)
Predevelopment Water Balance	45	90,713
Post-development Water Balance	23	39,607
Summary		
Reduction in Overflow	-49%	-56.3%

Graphs showing the fluctuations in water levels in the current (pre-development) scenario (existing Basin 1 capacity) compared to the post development scenario (enlarged basin capacity) are presented in **Error! Reference source not found.** below.

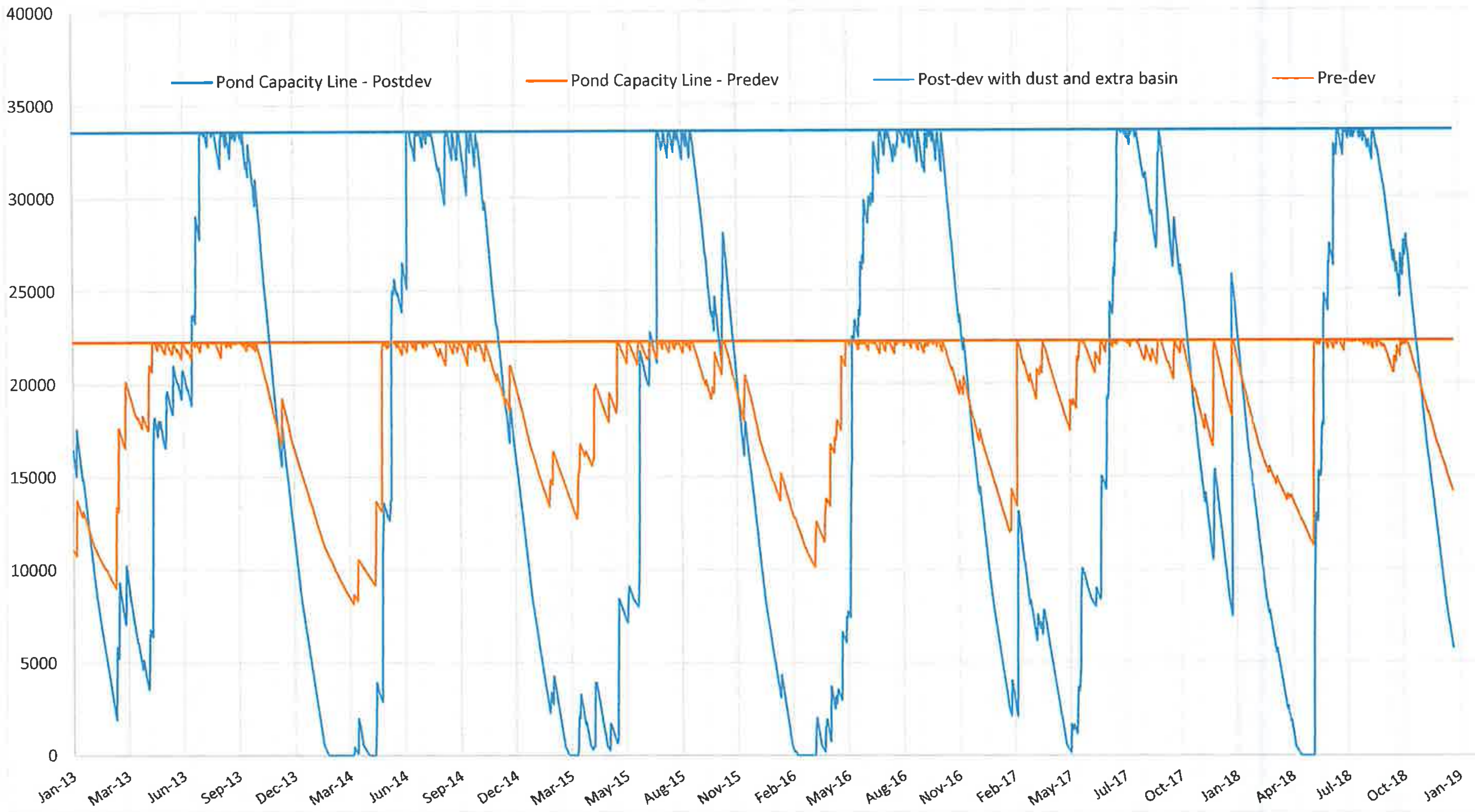


Plate 3-1 **Water Balance Model – Predicted Water Level Fluctuations**

4 Stormwater Quality Management of Excavation Area

Turbidity in water is caused by sub-micron particles which remain in suspension due to their size and colloidal nature. Suspended material can be particles of clay, silt, sand, algae, plankton, micro-organisms and other substances. These particles are referred to as Total Suspended Solids (TSS) and are measured in Nephelometric Turbidity Units (NTU). Due to the geology on site and the nature of the activities, turbidity and TSS are the main parameter of water quality concern.

Particles finer than 0.1 µm in water remain continuously in motion due to electrostatic charge which causes them to repel each other. To group fine sediments, a flocculant or coagulant may be required to provide a positive charge to encourage fine particles to attract and combine under the influence of Van der Walls' forces. These larger and heavier particles are called flocs and subsequently settle due to the increased mass.

Flocculants are chemicals or agents used to improve the sedimentation or filterability of small particles. Many flocculants are multivalent cations such as aluminium, iron, calcium or magnesium. These are positively charged molecules which interact with negatively charged suspended particles to allow the particles to attract and bond. In addition, many of these chemicals, can react with water to form insoluble hydroxides which link together to form chains or meshes, physically trapping small particles into the larger floc.

Flocculation is an effective mechanism for removal of finer particles and the combination of the settlement ponds and flocculation would be effective at treating both TSS and hydrocarbons.

In 2014, a flocculation trial was undertaken at the nearby Brickworks site, Shale Road pit (Figure 2). This led to the development of the flocculation treatment system. Full consultation with the Shire on the flocculation treatment was conducted through the process and approved by the Shire. Details of the trial process is presented in Appendix 8.

Should the water levels in Basin 1 trigger the requirement for an overflow discharge to Cardup Brook, Austral Bricks would propose the same flocculation treatment system to be implemented at this Cardup site. The flocculation tretament system is described below.

4.1 Flocculation System Operation and Maintenance

4.1.1 Equipment Background

Water Treatment Systems Australia (WTSA) has proprietary and patented water treatment units (WTU) that have the ability to deal with water management issues such as pH, total acidity, toxic metal reduction such as Iron, Aluminium, Zinc, Lead, Arsenic and sediment reduction.

WTSA mobile water treatment units are easy to operate and maintain. The units recognise changes in water quality and water flow rates and respond automatically to deliver pre-programmed targets in the delivery of desired outcomes. This automation minimises operator intervention, decreases downtime and makes for a more efficient means of water treatment.

Water pumps will be installed which pump water from the settlement pond into WTUs. The WTUs are an enclosed environment where the Alum is added in the required dose and mixed thoroughly to aid flocculation. This is detailed further in Section 4.1.2.

4.1.2 Flocculation Process

As detailed in Appendix 8, results of the flocculation trial indicated that a two-stage process should be employed. These are summarised below;

- Stage 1 - Aluminium Sulphate (0.01%) is added and mixed into the water, which will enable flocculation and subsequent settling of the suspended solids.
- Stage 2 – Hydrated Lime Putty (0.00026%) is added and mixed into the water which enables secondary flocculation of the particles and corrects the pH. This is the secondary flocculation process to ensure that any remaining particles will be removed from the water column and enables the most efficient form of flocculation.

In order for the two-staged process to occur, an area of the enlarged Basin 1 (Figure 11) would need to be separated/ bunded into separate sections (a northern and southern section) to enable treatment and recirculation before discharge.

4.1.2.1 Detailed Process

The proposed treatment process is detailed below (derived from WTSA, 2012).

- Water from one portion of the pond would be extracted, pumped through the WTU, treated with Alum and returned to another portion of the pond.
- Stormwater will overflow back into the other pond.
- This process of treatment and recirculation will continue until sufficient Alum Sulphate has been dispensed at an estimated ratio of 0.01% to 0.02% of the total water volume to be treated.
- Once clarification has been reached and complete settlement of suspended solids is achieved in both ponds, pH correction can start.
- The water clarity can be measured by monitoring influent water from the southern area by automated turbidimetric measurement from within the WTU and data logged for graphical representation. It is envisaged to target turbidity measurement of less than 20 NTU (ANZECC guideline).
- As a second stage, Hydrated Lime Putty will be added. Lime putty will aid the flocculation process with further clarification predicted as well as pH adjustment. It is recommended that a target pH of 7.5 be attained before completion of the water treatment process. It is expected that at the pH of 7.5 there will be acceptable discharge water quality analysis for clarity, pH, Total Titratable Acid and dissolved metals.
- Following treatment of the water to acceptable water quality levels, stormwater will be discharged to Railway Gully.

4.1.3 Water Treatment Unit Details

The WTU is fitted with standard 8 inch Table SD flanges and has the physical dimensions of 3.1m in length, 1.75m wide and 2.2m in height. The net weight of an empty unit is 1,100 kg. A WTU has the ability to treat up to the rate of 90 l/s or 324 m3/hour (WTSA, 2012).

4.1.3.1 Power Supply

Power would be supplied by quality assured WTSA generators. The generators are noise suppressed to comply with regulations for acceptable usage in residential areas. The WTSA 8 KVA 10 amp single phase generator has the physical dimensions of 1.6m in length, 0.8m wide and 1.3m in height. Its net weight when empty is 465Kg and both the WTU and generator can be moved by forklift, loader or excavator (WTSA, 2012).

An indicative schematic layout of the treatment infrastructure is provided below.

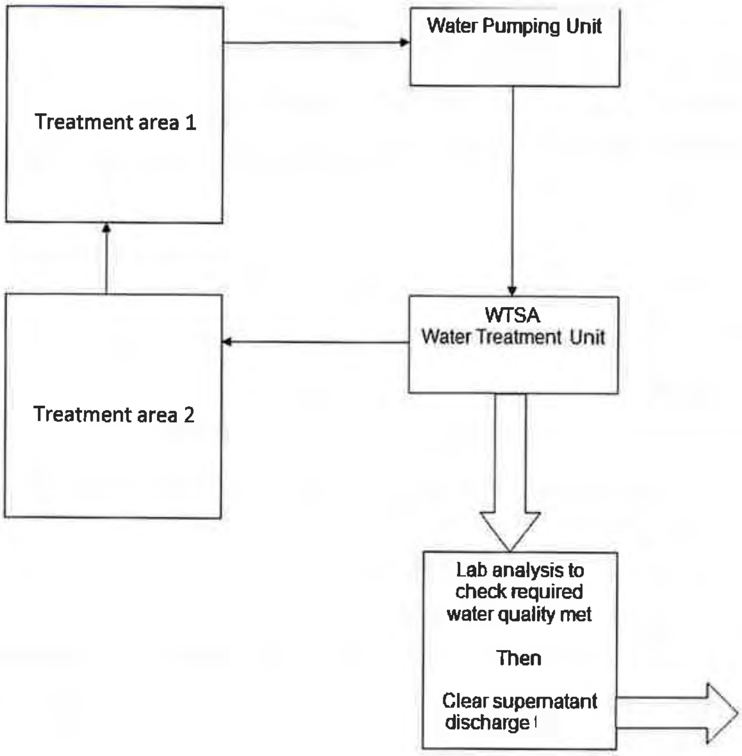


Plate 4-1 Treatment System Schematic Layout (WTSA, 2012)

5 Stormwater Quantity Management of Manufacturing Area

5.1 Current Stormwater Management

Within the manufacturing area there is currently one settlement basin, five drainage channels and two V-notch weir retention systems.

The locations of the stormwater features within the manufacturing area are shown in Figure 12 and the observed catchments are presented in Figure 9. All stormwater from the manufacturing area ultimately overflows into Cardup Brook apart from Catchment 9. The flow routes and stormwater treatments in the manufacturing area are summarised in Table 5-1 below.

Table 5-1 Summary of On-site Stormwater Treatment Systems – Manufacturing Area

Catchment	Stormwater Treatment System	Stormwater Disposal
Catchment 6	Overland flow to vegetated drainage channel D9, then flow through settlement basin B8 and subsequent overflow to Cardup Brook via vegetated drainage channel D5.	Overflow to Cardup Brook.
Catchment 7	Overland flow to drainage channel D6, subsequent overflow to Cardup Brook via heavily vegetated area at the northern end of D6.	Overflow to Cardup Brook.
Catchment 8	Overland flow to drainage grate and drainage channel D9. Underground piping to drainage channel D4 and D9, then flow through settlement basin B8 and subsequent overflow to Cardup Brook via vegetated drainage channel D5.	Overflow to Cardup Brook.
Catchment 9	Overland flow directed offsite via a small drainage channel D8. Local infiltration offsite.	Overflow off site and infiltration to groundwater.
Catchment 10	Overland flow to two areas with V notch weirs. Overflow to Cardup Brook.	Overflow to Cardup Brook.

5.2 Future Stormwater Management

5.2.1 Water Balance Modelling for Stormwater Reuse and Discharge Assessment

An expansion of the existing kiln is proposed within the manufacturing area which will increase the roof water catchment area but also affect the current stormwater sub catchments and existing drainage swales/ channels. The current catchment is shown in Figure 9 and the proposed new catchments for the manufacturing area are shown in Figure 13.

As part of the proposed kiln expansion, Coterra has undertaken water balance modelling to assess the feasibility of constructing a new stormwater detention basin adjacent to the Austral Bricks Cardup Main Pit Manufacturing Area and to reuse stormwater in processing. The basin is shown in Figure 14.

The purpose of this detention basin would be two-fold:

- To collect and store kiln roof water runoff and stormwater runoff to then reuse as far as possible within the clay making process in the kiln on site. This would reduce to demand on groundwater supply (which is the current water use supply for the manufacturing process).
- To detain and treat stormwater onsite and reduce/ prevent discharge to Cardup Brook from most of the manufacturing area.

5.3 Method

5.3.1 Water Balance Model – Manufacturing Area Basin

The water balance model for the recommended basin size is provided in Appendix 9. The model is set on a daily timestep over a recent 5 year period (2013-2018). The model is an excel based model of the water volume inputs and outputs. The model included the following components;

5.3.1.1 Water Inputs

- Roof catchment area and runoff – proposed catchment areas are shown in Figure 13. This assumes the proposed new kiln roof size and runoff volumes generated based on daily rainfall (BOM, 2019), considering runoff coefficients and wetting losses.
- Stormwater catchment areas and runoff – sub catchment areas within the manufacturing area are shown in Figure 13. These catchments are delineated from the current topography and the proposed future catchment areas. There are some small sub catchments on the eastern side of the manufacturing area that naturally drain away to the north-east (and away from the harvestable sub catchments) and are therefore not included in the water balance.

5.3.1.2 Water Outputs

- Losses due to evaporation – based on daily evaporation rates (BOM, 2019) and the basin surface area at different rates of basin fill volumes (empty, 25%, 50%, 75%, full) based on the basin size being assessed (refer to Section 5.3.1.3).
- Losses due to infiltration – based on an infiltration rate of 0.1m/day based on the geology.
- Water demand/ reuse in the manufacturing process – based on a predicted annual usage of 111,871 kL/annum which is derived from the existing usage, and then a proportional increase based on the increase in tonnage throughput (an upper limit estimation has been used to be conservative).
  - The water usage per day has been altered slightly between the seasons to account for wetter clay in the winter (less water required) and drier clay in the summer (more water required).

5.3.1.3 Basin Sizing

A number of different basin sizes were assessed to determine the optimum basin size to achieve maximum water reuse and minimise potential discharge to Cardup Brook. The basin model sizing is shown in Appendix 10. This sizing assessed a number of key considerations for the site, namely;

- Basin depth in respect to groundwater - A desktop assessment of regional groundwater and topography was undertaken.
  - Figure 14 shows that groundwater levels in the location of the proposed basin varies from 66 – 67mAHD. This corresponds to onsite monitoring levels (Section 2.6.2). Topography in the same location varies from 70 – 71mAHD. This is a separation distance of 3 - 4m.

- The basin top level was theoretically set at 71mAHD (discussed further in 'Model Assumptions' below).
- The basin depth was set at 2m (for water quality purposes to prevent stratification). This equates to a basin invert level of approximately 69mAHD which is well above the groundwater level (2m separation) to ensure there is no ingress of groundwater.

- Various base widths (and therefore basin volumes) were assessed to determine the recommended basin size based on a compromise of water reuse function and detention function.

5.3.1.4 Model Assumptions

Some key assumptions were made with regards to the basin location and stormwater management. These were;

- It was assumed that the basin lip level would be set at (on the upper side of the catchment) or above (on the low point of the catchment) the current topographical levels. Bunding will ensure there is no localised catchment runoff into the basin. This is represented in the cross section in Figure 15.
- It is assumed that all swale and drainage channels currently within the sub catchment areas on site will be removed and all stormwater and roof water will be piped directly to the basin. The model has therefore not accounted for any losses through infiltration or evaporation in surface water channels.

5.4 Proposed Basin Size and Assessment Results

The water balance modelling indicated that the volume able to be harvested for reuse is not overly sensitive to variations in basin sizing. This is because most of the rainfall occurs over three months of the year, combined with the increased losses associated with a bigger basin if more of the winter volumes are attempted to be contained. Most options showed a reuse volume potential of 14-15% (approximately 16,000 – 17,000 kL/annum) of the total annual water requirement.

The amount of stormwater discharged from the site, and the number of days of discharge, was more sensitive to basin size variations than the reuse function.

It was determined that Option 3 (Appendix 10) was the most ideal basin size based. The results are shown in Table 5-2 below. This option harvests 14.3% of the water usage requirement from stormwater for manufacturing processes, while ensuring that 96% of runoff from the harvestable manufacturing catchments are contained on site (in comparison to a direct discharge from site and no detention basin).

Table 5-2 Basin Size and Dimensions

	Option 3 Results
Basin Dimensions	
Base width (square)	30m
Top of basin width (square)	54m
Depth	2m
Side slopes	1:6
Volume	3,624 m^3
Maximum area	2,916 m^2

	Option 3 Results
Harvestable/Reuse Results	
Volume able to be reused in manufacturing / annum	16,612 m^3
As a % of total process usage requirements / annum	14.3%
Overflow/ Discharge Results	
Average number of days overflowing / annum	1 day
Volume discharge / annum	2,056 m^3
% reduction in runoff to Cardup Brook compared to no detention	96%
Basin Behaviour	
Days empty / annum	299
As a % per annum	82%

The area requirements for this option have also be compared to the cleared land available in the proposed location. The proposed basin can be constructed within the indicative location proposed. A larger basin would require some clearing which is not desirable. The basin footprint and location are shown in Figure 14.

The fluctuations in water levels within the basin during the course of the modelling period (5 years) is shown in Plate 5-1 below.

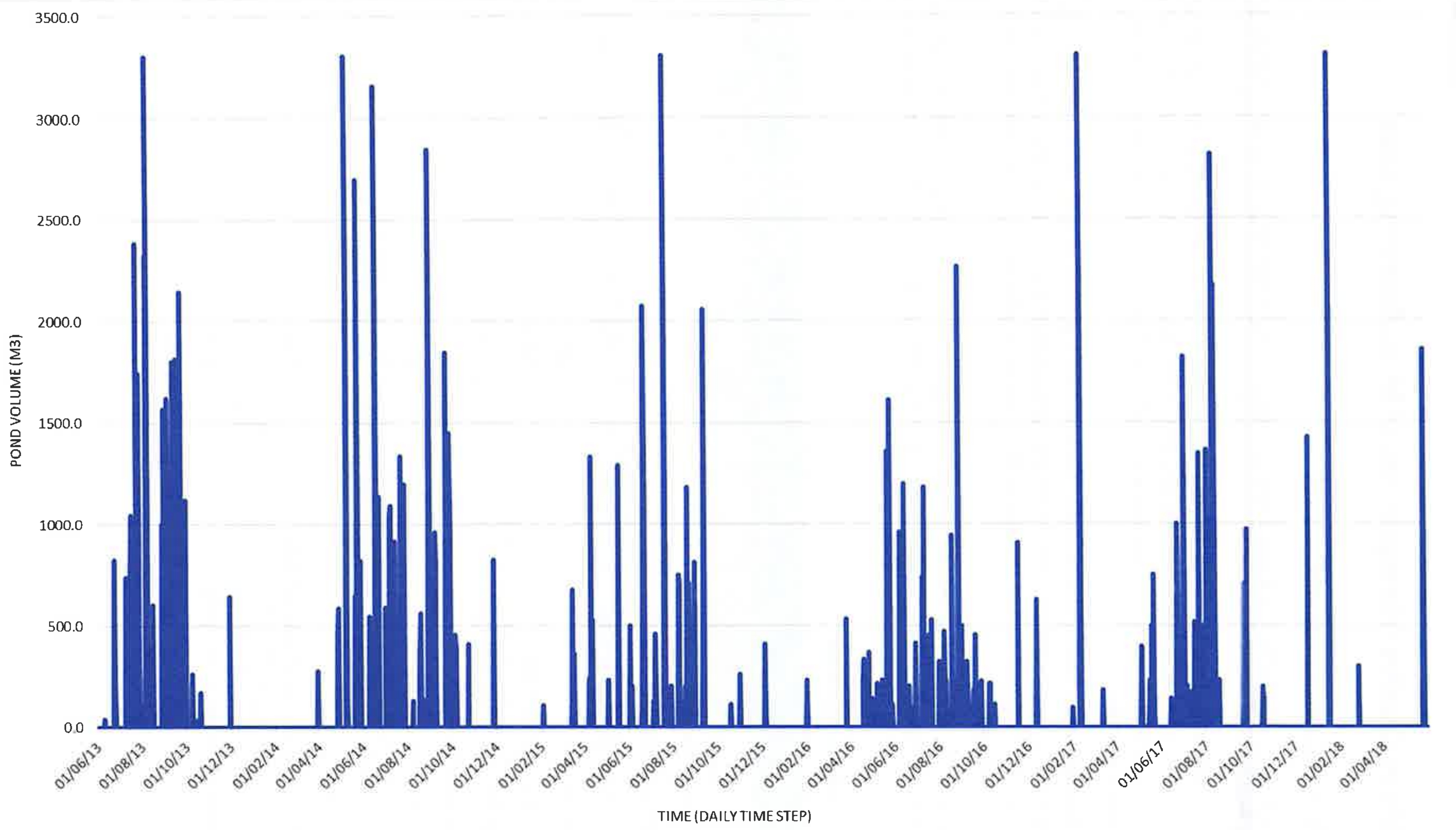


Plate 5-1 **Basin Level Fluctuations**

6 Water Quality Management of Manufacturing Area

6.1 Point Source Emissions

No point source emissions to surface or groundwater are proposed during commissioning or operation of the manufacturing facilities.

The site contains a single fuel storage area, located to the west of Kiln 3. The fuel storage area comprises a 26 m^3 fuel storage tank used to fuel site vehicles and machinery. An 11 m^3 water tank is also located within the fuel storage area. The fuel storage area is bunded on all sides by a 1.7 m high concrete and brick storage bund built on a concrete slab.

As part of the original Works Approval assessment process DWER advised that bunding around fuel storage should be designed and maintained to contain a 5% annual exceedance probability (AEP) 72-hour event plus 110% of tank contents. The existing fuel storage facilities are sized sufficiently to meet this requirement, as shown in Table 6-1 below.

It is noted that the 5% AEP 72-hour event has been applied in the table below consistent with updated Australian Rainfall and Runoff (AR&R) (2015) standards. The bund is sufficiently sized to contain the required volumes.

Table 6-1 Fuel Storage Area

Item	Value
Fuel Tank	
Fuel storage tank capacity (m^3)	26
Fuel storage tank capacity +10% (m^3) (A)	28.6
Water Tank	
Water tank capacity (m^3)	11
Water tank capacity +10% (m^3) (B)	12.1
Total Tank Capacity	
Total tank capacity (m^3) (A + B)	37
Total tank capacity +10% (m^3) (C)	40.7
Storm Event	
5% 72 hour AEP (mm)	140.2
5% 72 hour AEP volume over bund area (m^3) (D)	17.6
Total	
Total storage volume required (C + D) (m^3)	58.3
Bund capacity (m^3)	188

6.2 Diffuse Source Emissions

Potential water quality parameters of concern include:

- Suspended solids (and turbidity) – originating from clay stock pile areas, unsealed trafficable areas, un-vegetated non-trafficable areas, un-vegetated steep gradient conveyance swales
- Hydrocarbons – originating from vehicles and machinery on site.

Diffuse source emissions will be managed using the treatment measures proposed in the Manufacturing area treatment basin. Road runoff generated in the 'first flush' event generally contains the highest concentration of contaminants. All road runoff from the first 15 mm of runoff (first flush) will be collected and treated in a 'water quality treatment area' of the basin. Roof water is considered clean and will be piped directly into the main basin storage area.

The 'water quality treatment area' will typically comprise of the following profile (see Plate 6-1 for biofiltration treatment):

- Vegetation: at least 50% of the plants to be effective at nutrient removal (Monash University, 2014). Remainder to be local, native, ephemeral plants. Plant density 6 per m^2.
- Protective surface layer: 100-150 mm deep overlying the biofilter media consisting of a coarser particle size than the media. Plants will be planted at a density of 6 per m^2 to reduce likelihood of erosion and soil evaporation.
- Filter: 300 mm amended soil layer. PRI > 10. Saturated K 100-300 mm/hr.
- Transition and Drainage: >300 mm of sand above underlying clay layer.
- Where possible, this will equate to a depth of 650 mm of biofiltration layers beneath the base of the swales above the clay layer.

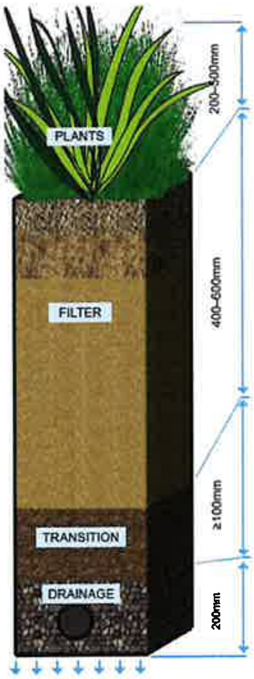


Plate 6-1 Typical Biofilter Vertical Profile Applicable to this Site (DoW, 2011)

The 'water quality treatment area' will be designed to overspill into the main basin area in events greater than the first flush. Detailed basin design will be provided in subsequent design stages.

6.3 Operational Measures and Maintenance

In addition to the stormwater treatment measures proposed in Section 6.1 and 6.2, the following operational measures are proposed to prevent contamination of stormwater:

- Street sweeping – street sweeping of bitumen paved areas will be undertaken on an 'as needed' basis.
- Drainage maintenance.
- Annual review of lost storage capacity due to sedimentation and rectifying as required.
- Removal of litter from drainage infrastructure.
- Frequent winter checks of remaining storage capacity when significant rainfall is forecast.
- Maintain fuel storage bunding to ensure leak-proof.
- Maintain on-site vehicles and machinery, and address oil or fluid leakages as soon as possible.
- Monthly review of contents of site spill-kits and replacement of missing items as part of the site Safety Health Environment Management System (SHEMS).
- Dust suppression of un-vegetated, un-paved areas during summer.
- Installation of cattle grids at exit points from the clay store to 'shake down' vehicles.
- Education – educate site staff on the importance of reporting and immediately remedying any spills and or discharges from the site to the drainage network or Brook.
- Waste management – all waste for off-site disposal to be stored in appropriate receptacles.
- Reject bricks (grog) to be stored in stockpiles free of plastic straps, and to be reused in the manufacturing process

7 Flood Management

The Cardup Brook runs through the proposed development site in a westerly direction. Flood modelling was undertaken as part of a study to estimate the peak flow flows, levels and extents expected along Cardup Brook during a 1% AEP flood event (Coterra, 2013). The flood extent is shown in Figure 7.

The flood model was prepared using XPSWMM software. A 1D model was prepared for the entire reach of the Cardup Brook and a 2D model was prepared within the brick manufacturing area which was the main focus of the investigation.

The following sections provide a summary of the modelling outcomes. The model log is provided in Appendix 11.

7.1 Flood Model

Hydrological inflows were taken from the Byford Townsite Drainage and Water Management Plan (Department of Water, 2008b). A sensibility check of the peak flow value was undertaken using the Rational Method outlined in Australian Rainfall and Runoff guidelines (Institution of Engineers Australia, 2000).

A one-dimensional model of the Cardup Brook was prepared with the following assumptions:

- Topographic data was obtained from LiDAR data supplied by the (then) Department of Water, regional data shown in Figure 3, and field observations.
- The downstream boundary was established downstream of the South West Highway and assumed to be free-flowing.

7.2 Flood Management Measures

The existing ground levels are more than 0.5m above the modelling 1% AEP flood level on the Cardup Brook for most of the site. Some encroachment of the flood extent is shown in the north east corner of the brick manufacturing area and on the western end of the manufacturing area.

There are two existing vehicular creek crossings on site. These are shown in Figure 7. These crossings will be upgraded as part of the proposed works. Finished road crossings/ bridge crossings will be at least 0.5m above the 1% AEP flood level in those location. Estimated level requirements are shown in Table 7-1 below. Detailed design of the crossings and levels will be provided in subsequent design stages.

Table 7-1 Creek Crossing Minimum Levels

	Approx. 1% AEP Level at Location (mAHD)	Minimum Required Crossing Level (mAHD)
Crossing 1	76.8	77.3
Crossing 2	69.7	70.2

8 Current Monitoring Program

8.1 Current Monitoring Frequency

Sampling is required to be undertaken monthly from May to August (four events) in accordance with the DWER Licence number L9025/2017/1 requirements. In addition to those four events, sampling is also to be undertaken when "high rainfall events cause the potential for discharge", however no definition of a "high rainfall event" (in mm) was provided. To address this requirement, Austral Bricks staff are required to observe and notify whether a discharge to the Brook is occurring after large rainfall events.

8.2 Current Monitoring Locations

Sampling will occur at three main locations within Cardup Brook (CAR01, CAR06 and CAR09) and various locations on the site for every event, unless some locations are dry. CAR01 and CAR06 are mandatory licence sampling locations. The upstream location is CAR01, which represents the quality of water entering the site. CAR06 is the downstream sample location and is downstream of all the sites' stormwater discharge points. The licence has been provided in Appendix 1.

All other monitoring locations additional to CAR01 and CAR06 will be observed and photographed to record whether a discharge is occurring from the location. If discharge is occurring at the additional locations, a sample will also be taken. All locations are shown in Figure 6 and detailed below:

- CAR01: Cardup Brook (upstream - east entry to factory area).
- CAR02: Cardup Brook (midway through the site).
- CAR05: Manufacturing area - within drainage channel 5.
- CAR06: Cardup Brook (downstream - west exit from factory area).
- CAR09: Manufacturing area - within drainage channel 6.
- CAR10: Manufacturing area - within drainage channel 7.
- CAR12: Excavation area - with settling pond (Basin 5).
- CAR13: Excavation area - within the settling pond Railway Gully constructed in 2013.
- CAR15: Excavation area - Cardup Pit main settling pond (Basin 1).
- CAR18: Stream draining to Cardup Brook, upstream of CAR01

8.3 Current Water Quality Parameters

8.3.1 In-Situ Analysis

With each sample, the following parameters are to be measured during discharge:

- pH
- Dissolved oxygen (DO)
- Electrical conductivity (EC)
- Total Dissolved Solids (TDS)
- Redox (ORP)

- Temperature

Photographs of water presence and their respective samples collected at each location were also taken for comparison of aesthetic quality.

8.3.2 Laboratory Analysis

The following parameters are to be tested on water samples from each location during discharge:

- Total Petroleum Hydrocarbons (TPH).
- Total Suspended Solids (TSS).
- Turbidity.

Water samples are to be analysed by a NATA accredited laboratory and followed QAQC standards.

8.4 Future Monitoring Program

A future monitoring program will need to be devised to accommodate the proposed changes to the stormwater management strategy. This will be done in consultation with DWER and SJS.

9 References

ANZECC (2000). Australian and New Zealand Guidelines for Irrigation Water Quality.

Beek (1979) Phosphate Retention by Soil in Relation to Waste Disposal, Ph. D, Thesis, Agricultural University of Wageningen, Netherlands.

BOM (2020) Climate Statistics for Australian Locations [online] http://www.bom.gov.au/climate/averages

Department of Environment and Conservation (2011). Treatment and management of soils and water in acid sulphate soil landscapes - July 2011.

Department of Environment (DoE) and Swan River Trust (SRT) (2005) Decision Process for Stormwater Management in WA

Department of Mines, Industry Regulation and Safety (DMIRS) (2020). GeoVIEW. WA mapping. [online] https://geoview.dmp.wa.gov.au/geoview/?Viewer=GeoView

Department of Water (DoW) (2008). Byford townsite drainage and water management plan. Prepared by GHD for DoW.

Department of Water and Environmental Regulation (DWER) (2020a). Nationalmap – Various Database Mapping. [online] https://nationalmap.gov.au/

Department of Water and Environmental Regulation (DWER) (2020b). Water Information Reporting [online] http://wir.water.wa.gov.au/Pages/Water-Information-Reporting.aspx

Golder Associates (2017). Shale Road Landfill Post Decommissioning and Post Closure Management Plan. Prepared for West Australian Landfill Services.

Gozzard (1986) Perth Metropolitan Region Environmental Geology Series, Geological Survey of Western Australia.

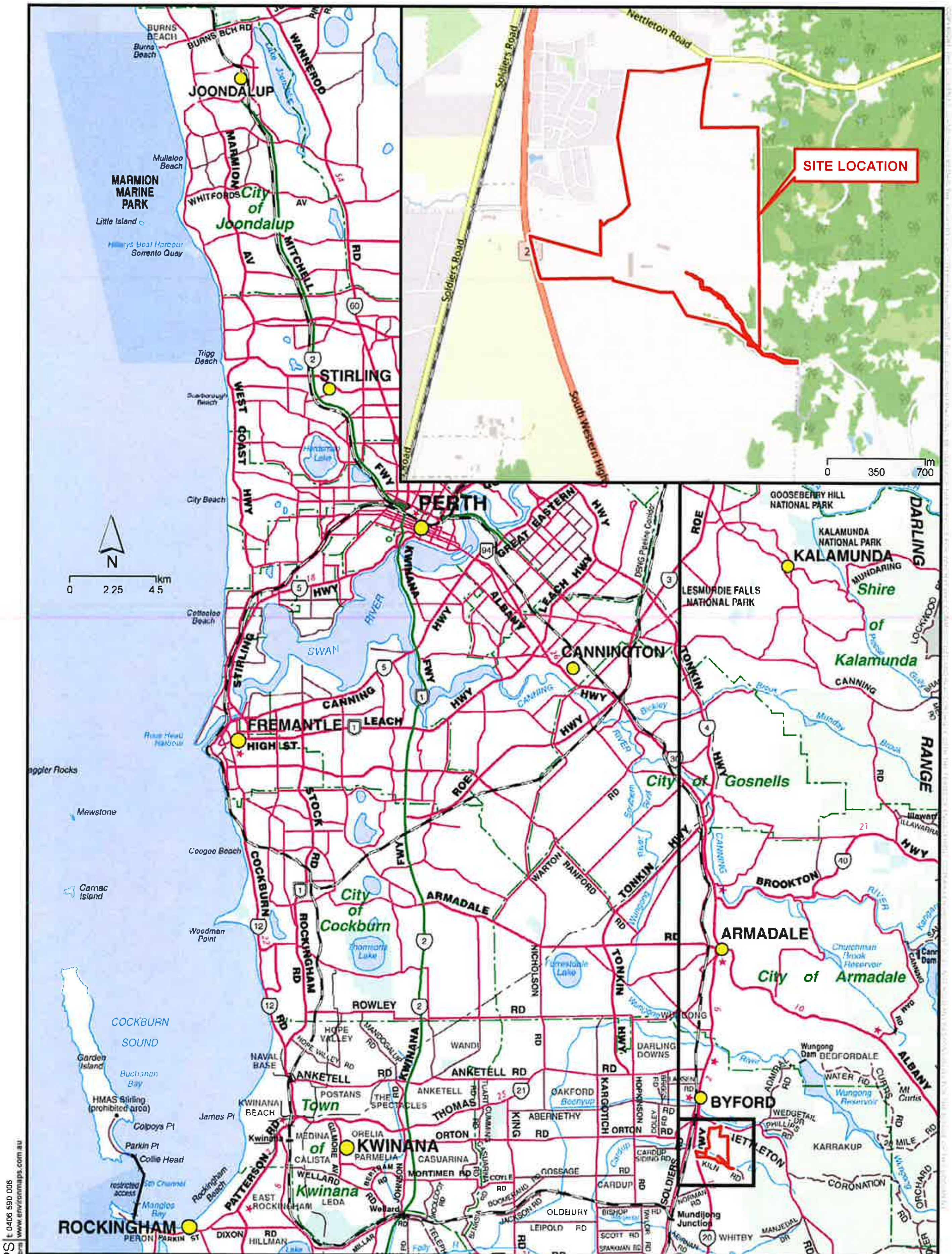
Heal, K.V., Scholz, M., Willby, N. and Homer, B. (2005). The Caw Burn SUDS: performance of a settlement pond/wetland SUDS retrofit. In: Newman, A.P. Pratt, C.J., Davies, J.W., and Blakeman, J.M. (Eds.), Proc. 3rd National Conf. on Sustainable Drainage, pp.19-29. ISBN 1846000076.

Landgate (2020). Shared Location Information Platform (SLIP) mapping. [online] https://maps.slip.wa.gov.au/landgate/locate/

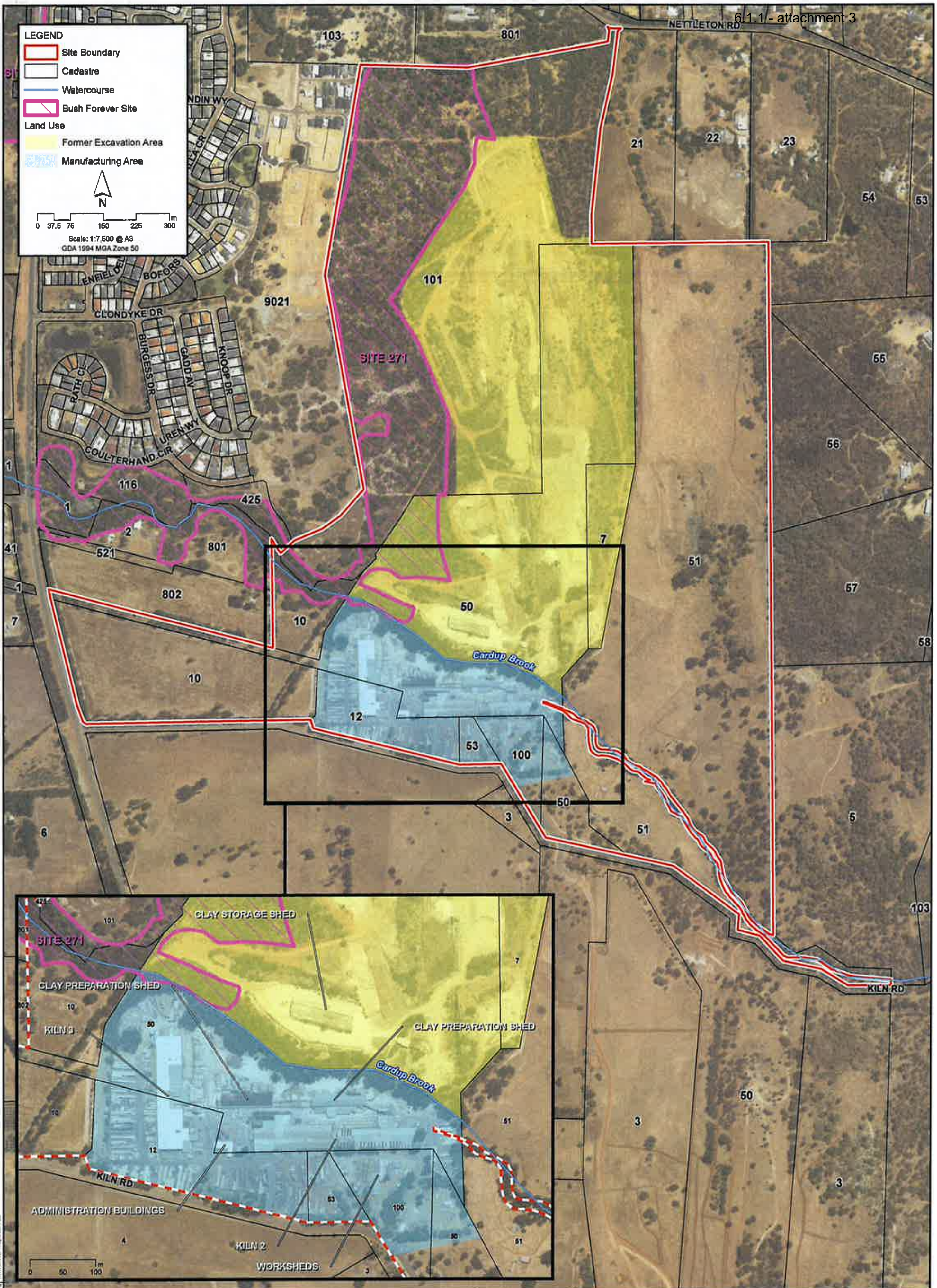
Melbourne Water (2005). Water Sensitive Urban Design Engineering Procedures: Stormwater. CSIRO Publishing.

Water Treatment Systems Australia (WTSA) (2012). Proposed Pond Water Discharge Treatment at Lot 6 Shale Road Cardup – DRAFT. February 2012. (A Division of Lime Industries Pty Ltd).

Figures



COTERRA ENVIRONMENT	Job: AUBCAR18 Doc: 001 Date: 22/10/2020 Ph: (08) 9381 5513 Fax: (08) 9381 5514 E: info@coterra.com.au	Austral Bricks WATER MANAGEMENT PLAN CARDUP MAIN PIT **SITE LOCATION**	**Figure 1**



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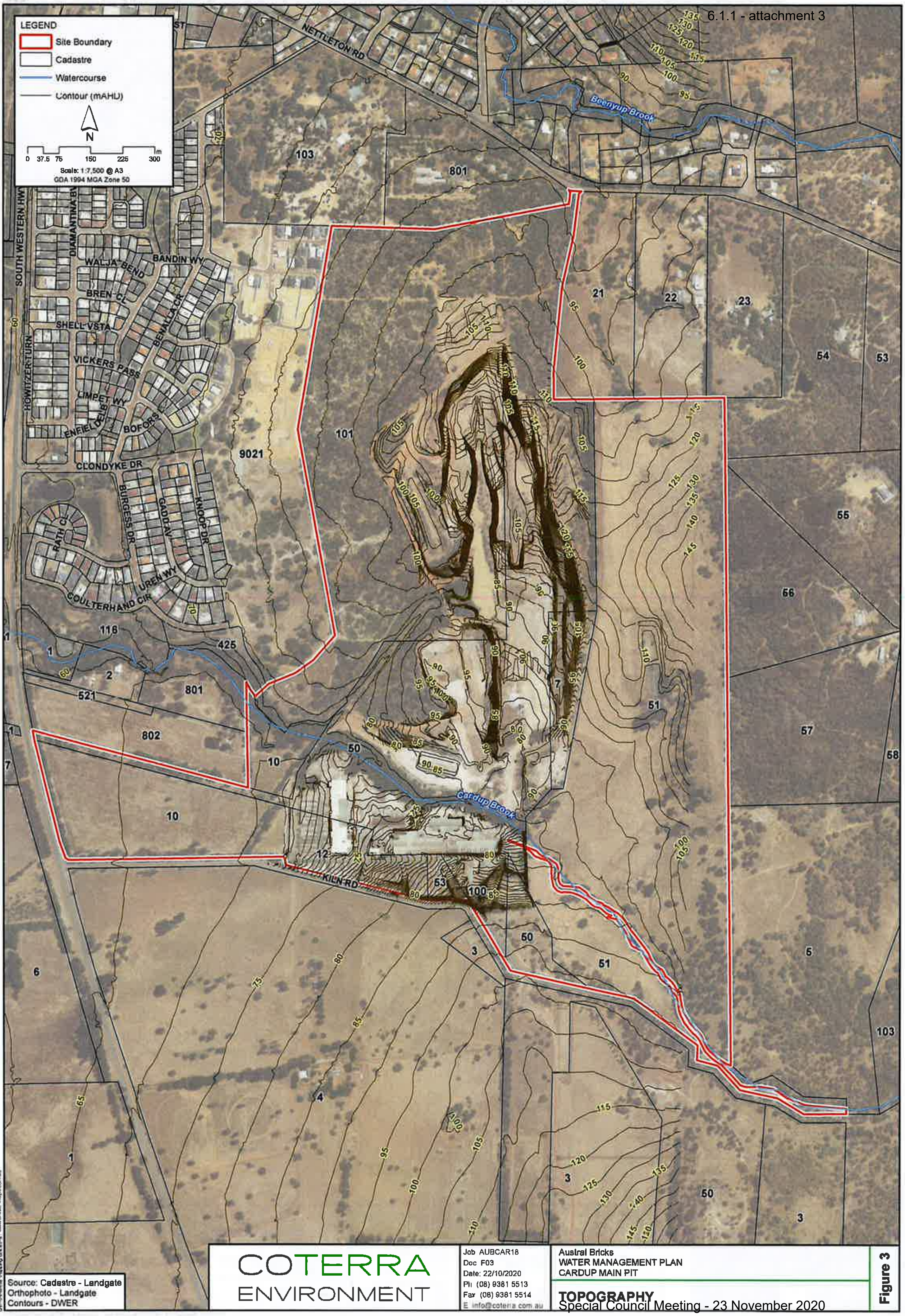
LAND USE

Figure 2


LEGEND
Site Boundary
Cadastre
Watercourse
Contour (mAHD)
N
0 37.5 75 150 225 300 m
Scale: 1:7,500 @ A3
GDA 1994 MGA Zone 50
NETTLETON RD
Beenyup Brook
SOUTH WESTERN HWY
DIAMANTINA BV
WALJA BEND
BANDIN WY
BREN CL
SHELL VSTA
BENALLA CR
VICKERS PASS
HOWITZER TURN
LIMPET WY
ENFIELD
BOFORS
CLONDYKE DR
BURGESS DR
GADD AV
KNOOP DR
RATH CL
UREN WY
COULTERHAND CIR
Cardup Brook
KILN RD
103
801
9021
101
21
22
23
54
53
55
56
57
58
51
118
425
521
802
10
12
53
100
50
3
6
5
103
4
1
Source: Cadastre - Landgate
Orthophoto - Landgate
Contours - DWER
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Austral Bricks
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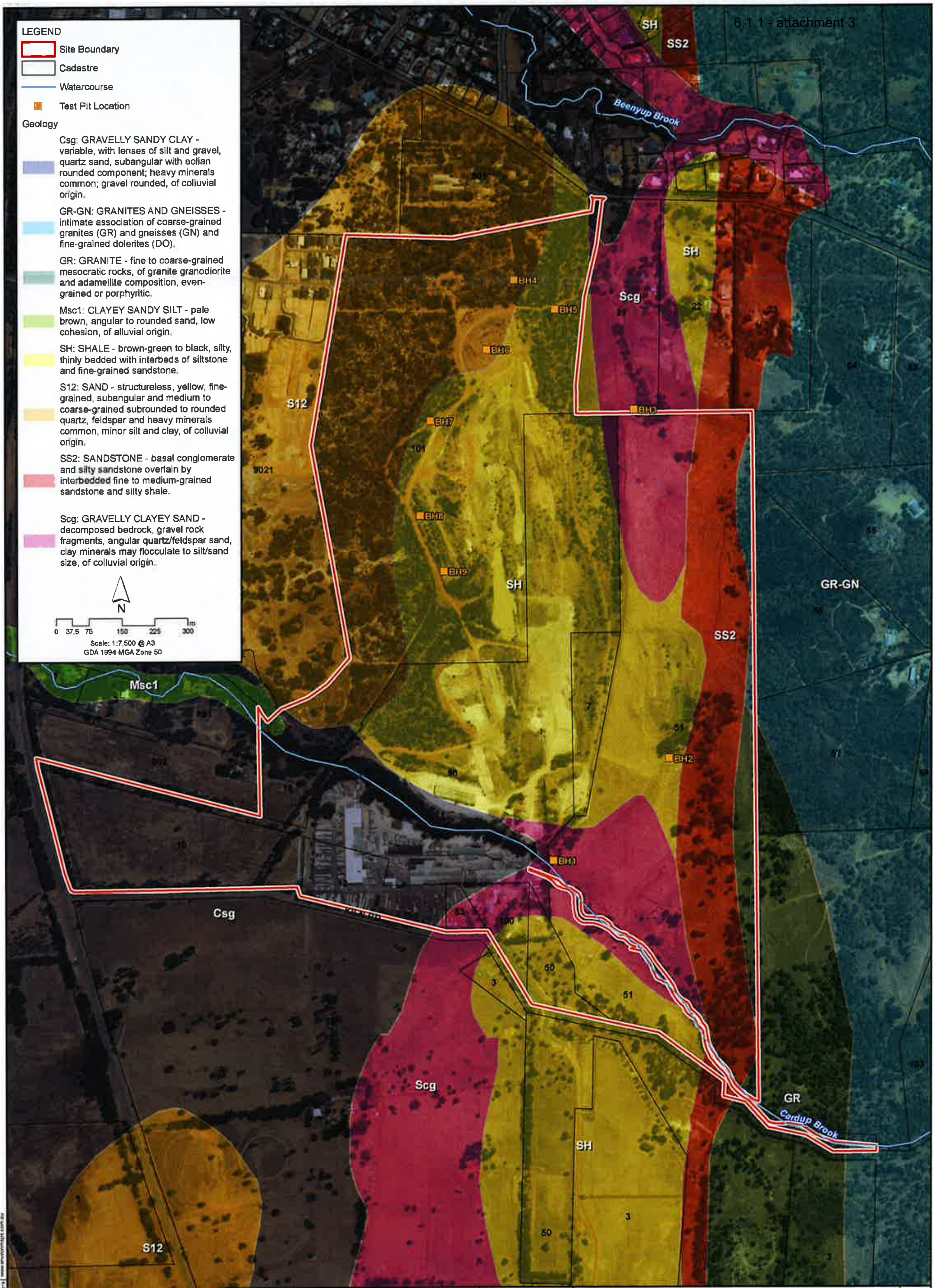
TOPOGRAPHY
Figure 3



Source: Cadastre - Landgate
Orthophoto - Landgate
Geology - DoIR: Geological Survey of W.A., 1999

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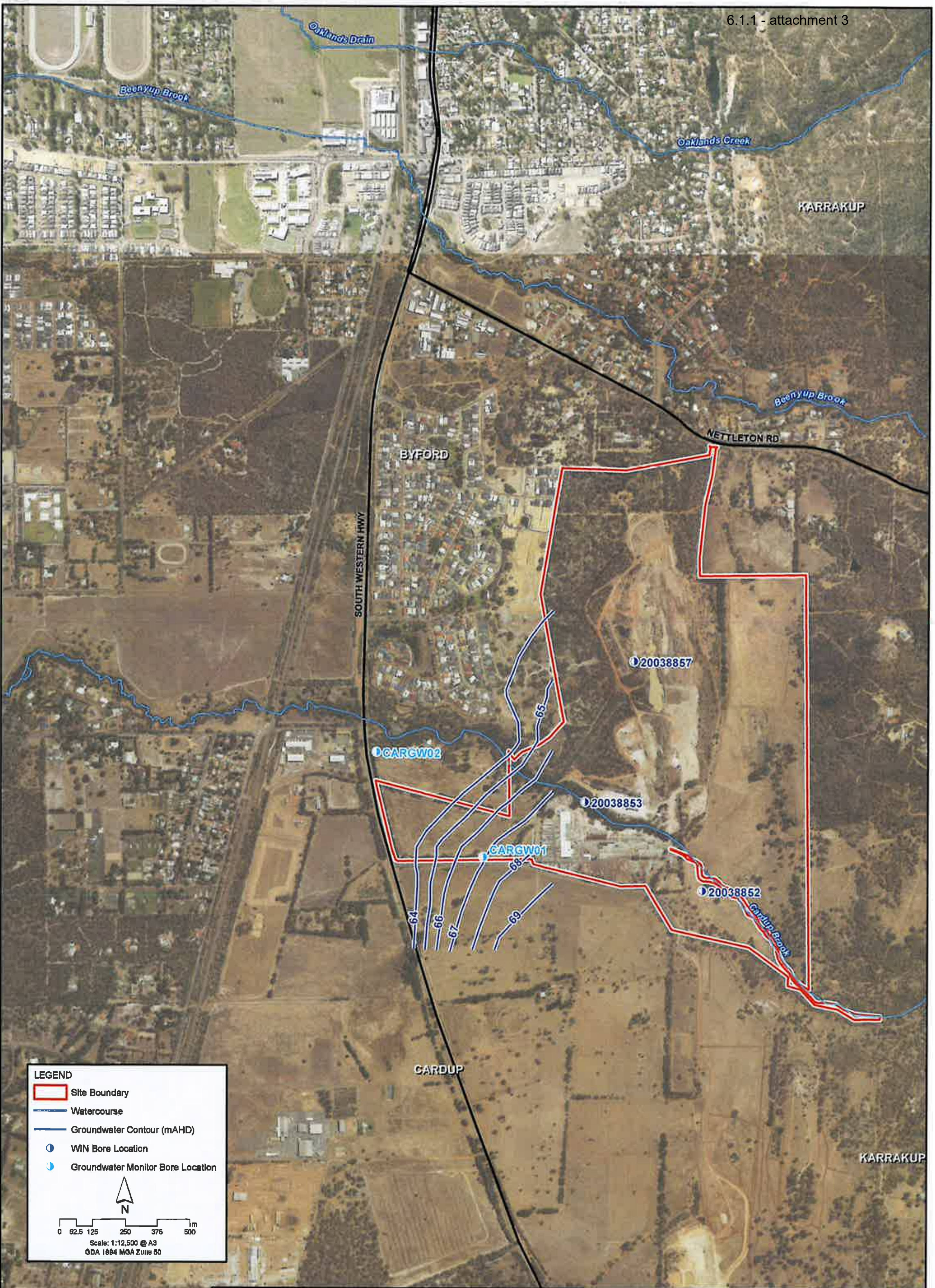
SOILS AND TEST PIT LOCATIONS

Figure 4



ENVIRONMAPS

Source: Orthophoto - Landgate
Groundwater Features - DWER

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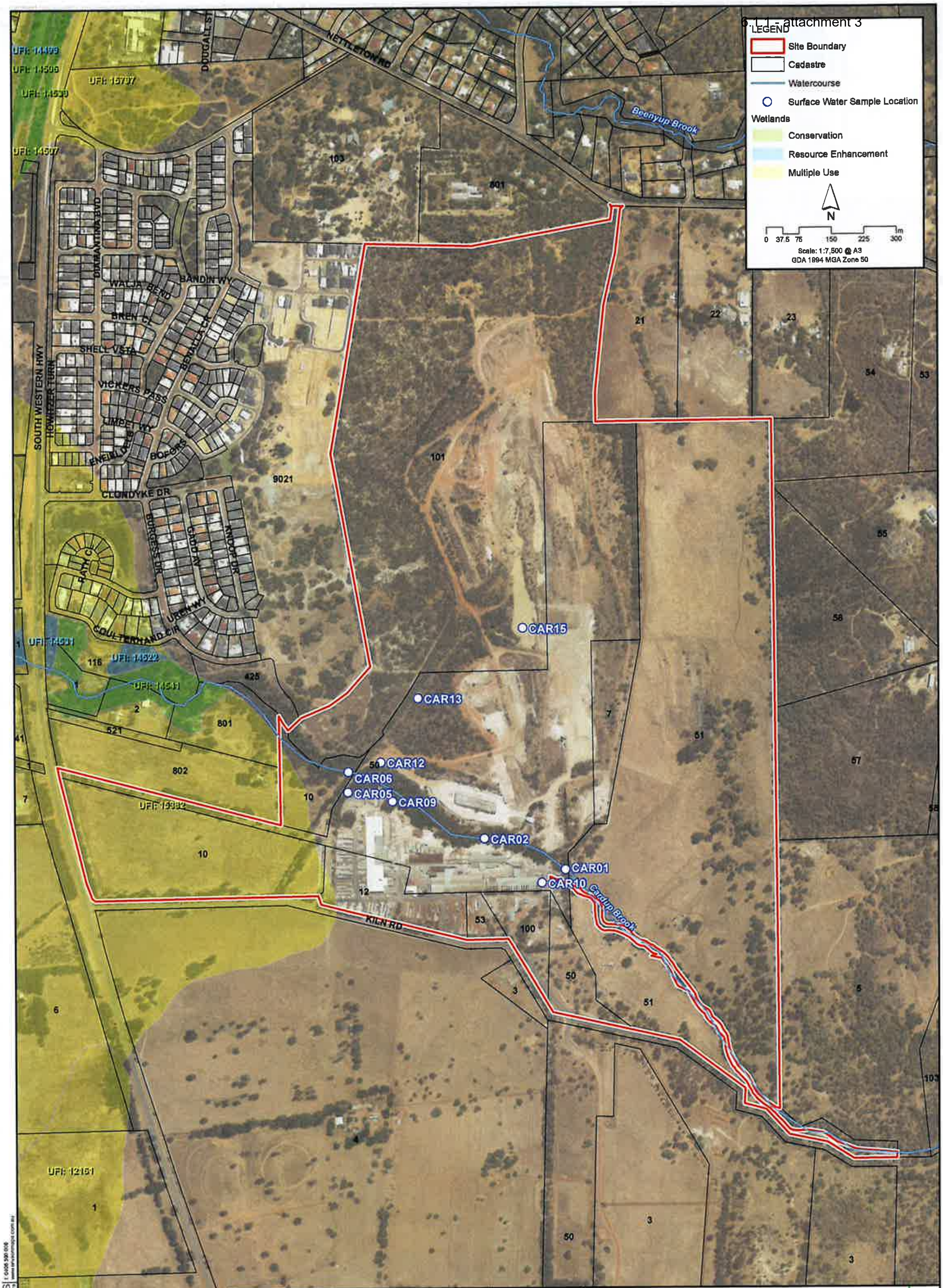
GROUNDWATER FEATURES

Figure 5



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Source: Cadastre - Landgate
Orthophoto - Landgate
Wetlands - DBCA, 2020

ENVIRONMAPS

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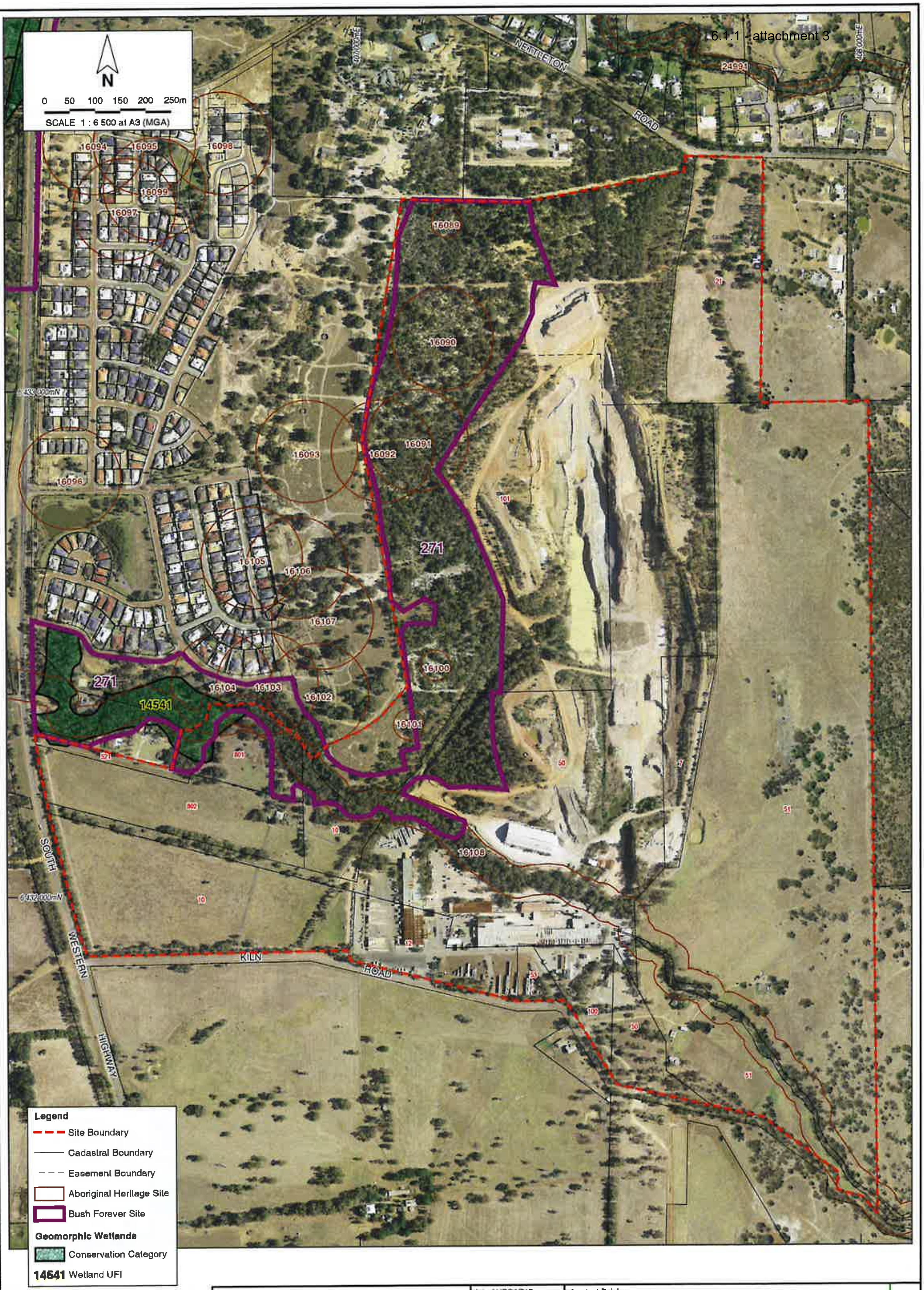
CARDUP MAIN PIT

CARDUP BROOK 1% AEP MODELLED FLOOD EXTENT

Figure 7



HERITAGE SOURCE: DIA, June 2013
BUSH FOREVER SOURCE: DoP, 2007
WETLANDS SOURCE: DEC, June 2013
AERIAL PHOTOGRAPH SOURCE: Landgate

ENVIROMAP

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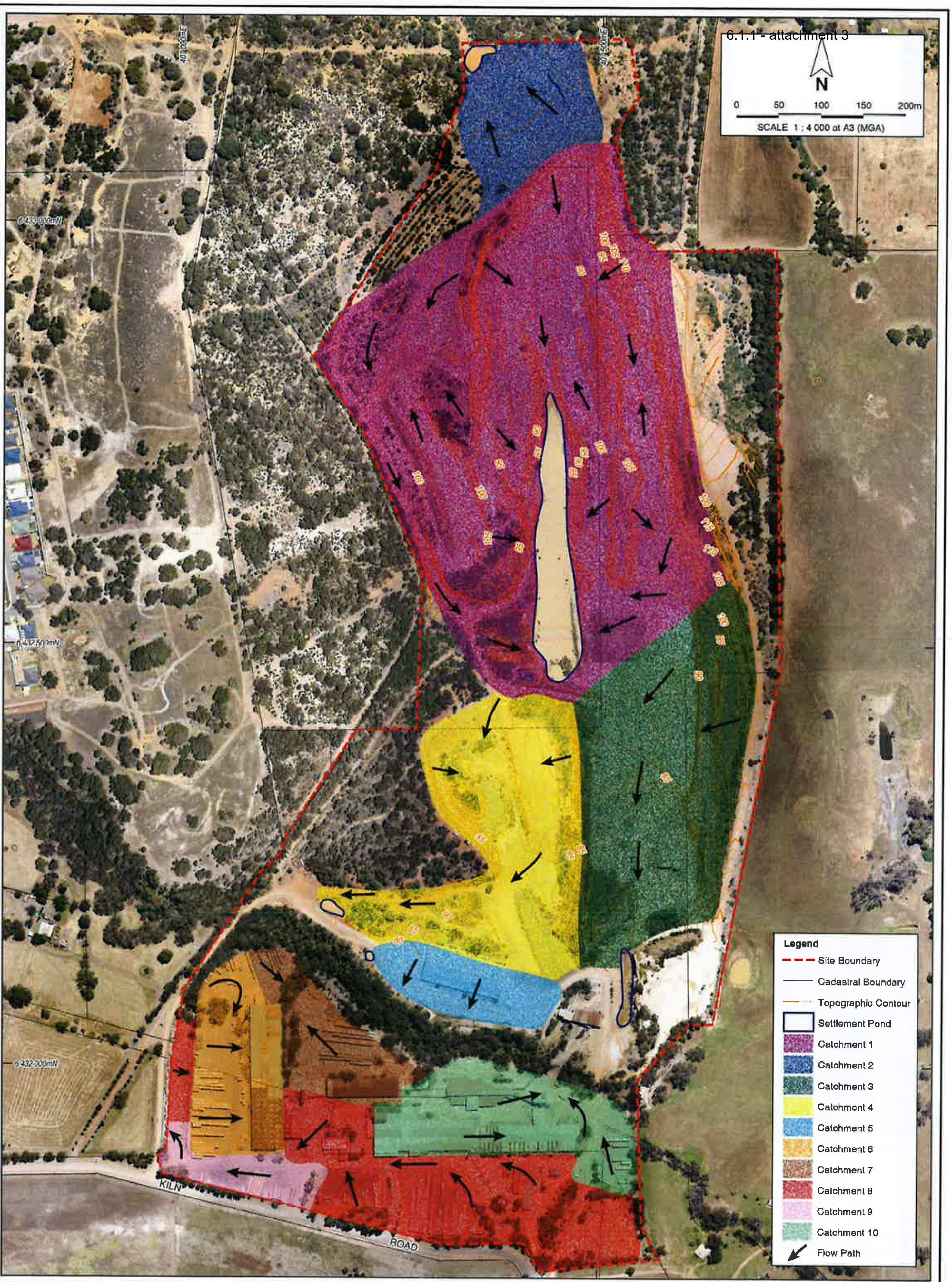
ENVIRONMENT AND HERITAGE

Figure 8



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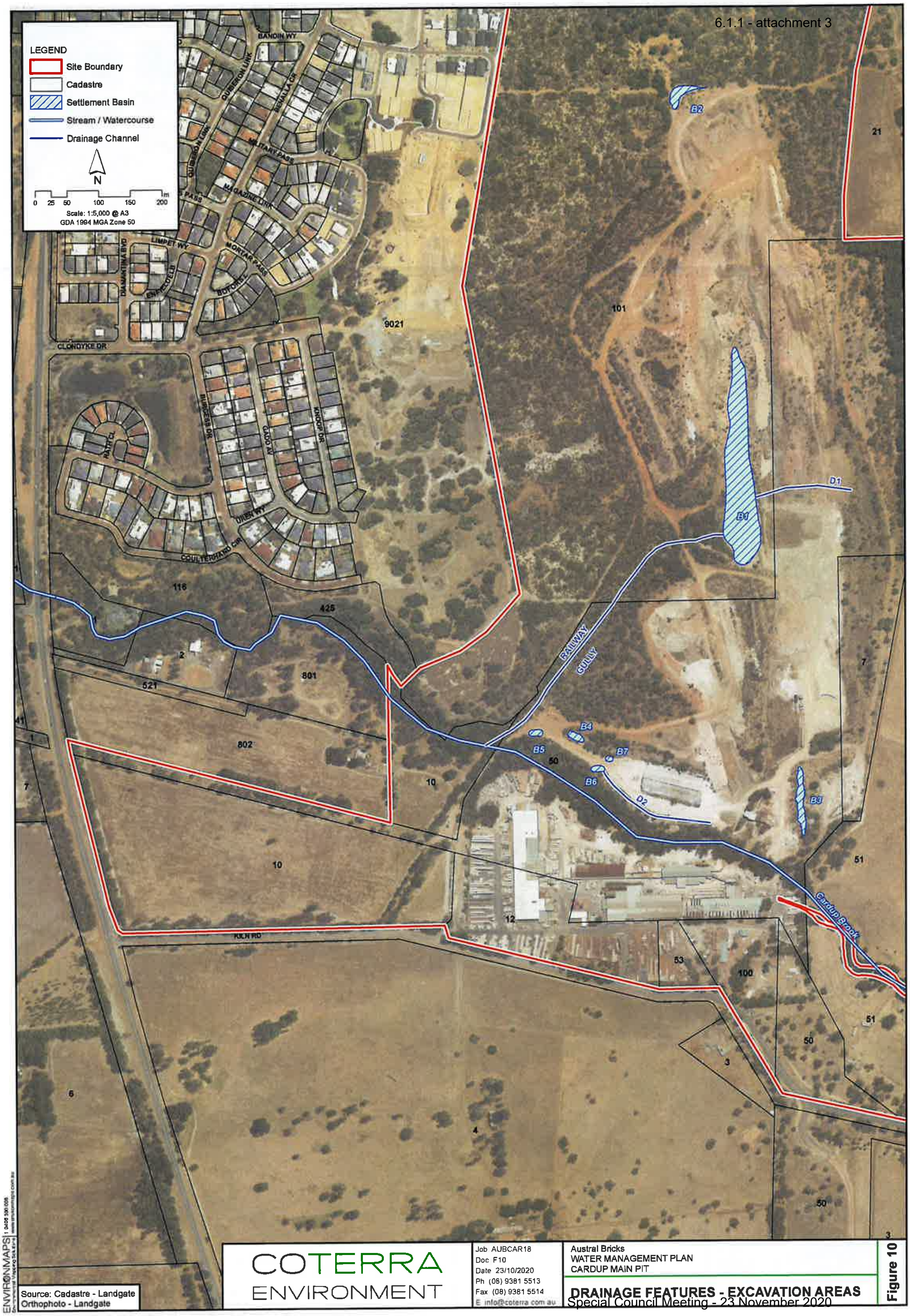
CARDUP MAIN PIT
CURRENT CATCHMENT AREAS

Figure 9

ENVIROMAP



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CARDUP MAIN PIT

DRAINAGE FEATURES - EXCAVATION AREAS

Figure 10

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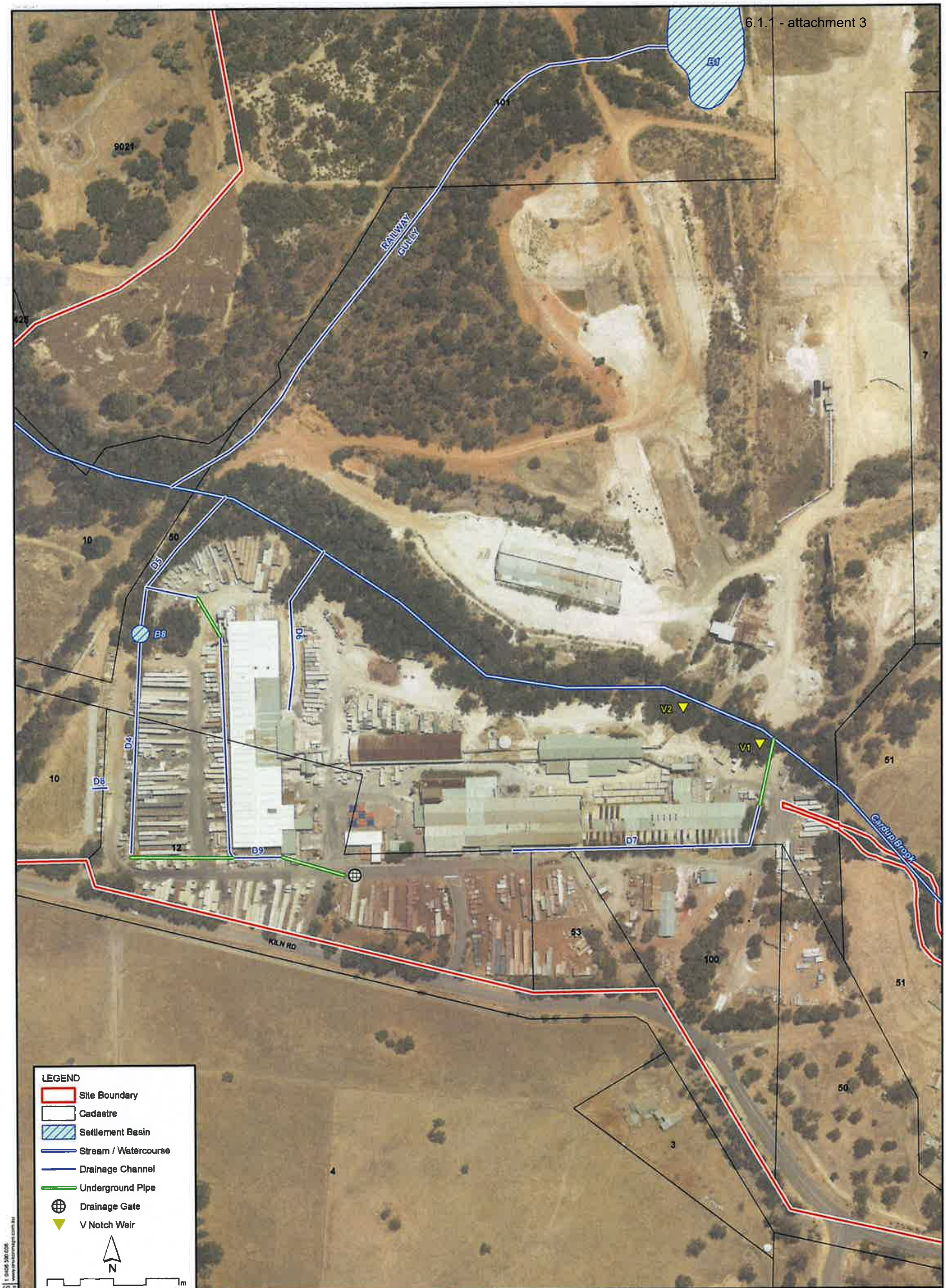
ADDITIONAL BASIN 1 STORAGE AREA

Figure 11



ENVIRONMAPS

Source: Cadastre - Landgate
Orthophoto - Landgate

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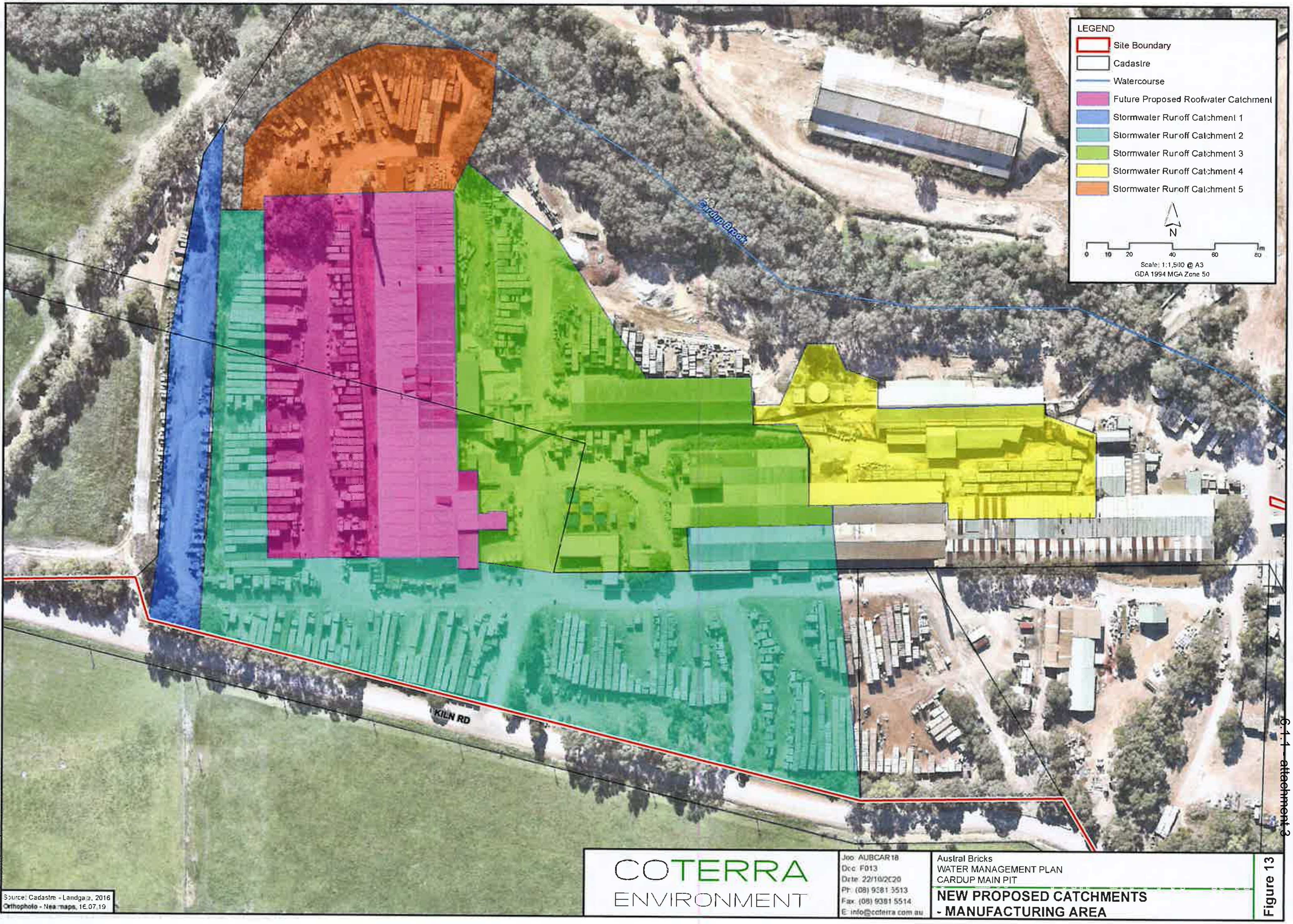
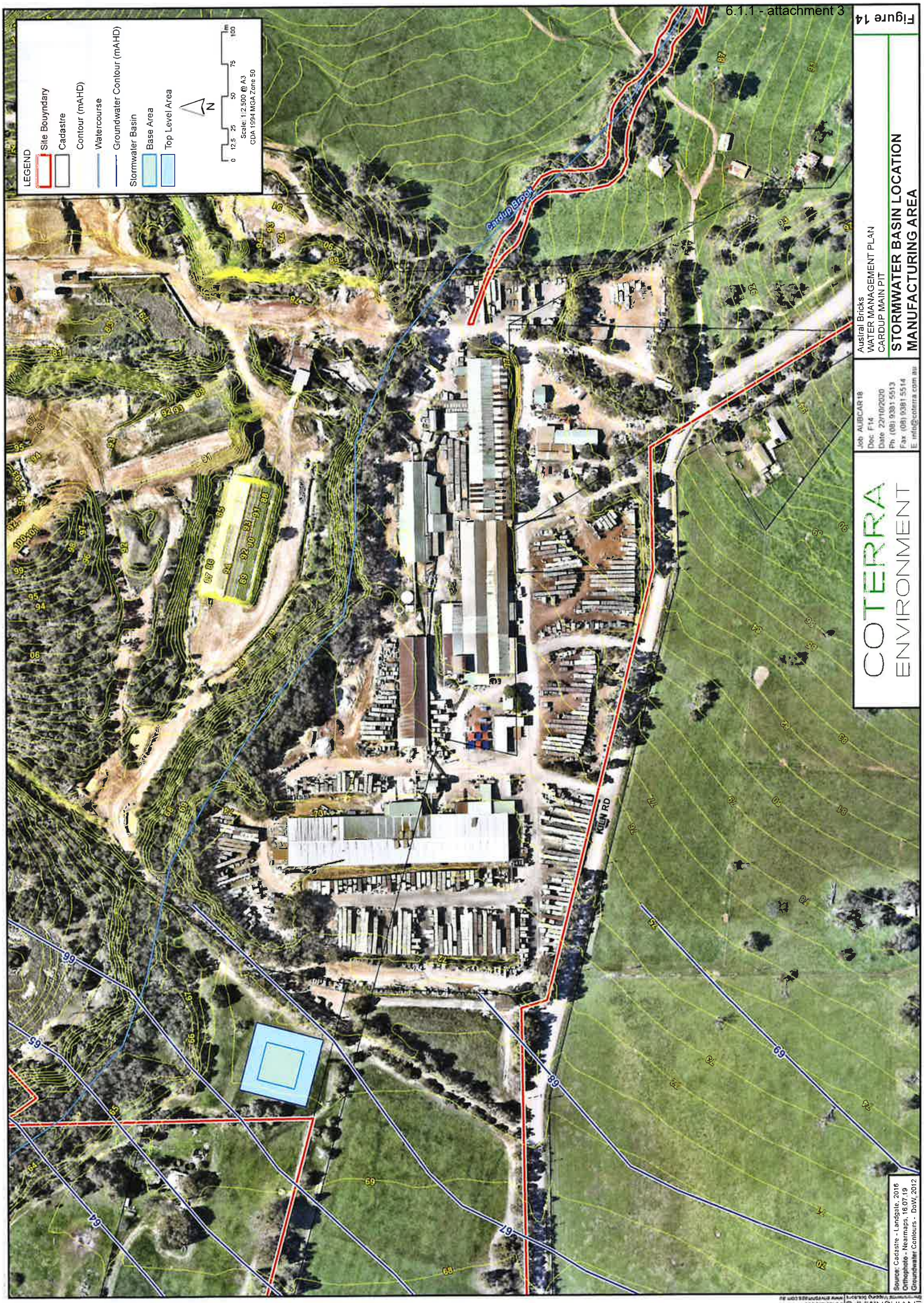
CARDUP MAIN PIT

DRAINAGE FEATURES MANUFACTURING AREA

Figure 12


LEGEND
Site Boundary
Cadastre
Watercourse
Future Proposed Roofwater Catchment
Stormwater Runoff Catchment 1
Stormwater Runoff Catchment 2
Stormwater Runoff Catchment 3
Stormwater Runoff Catchment 4
Stormwater Runoff Catchment 5
N
0 10 20 40 60 80 m
Scale: 1:1,500 @ A3
GDA 1994 MGA Zone 50
Cardup Brook
KILN RD
Source: Cadastre - Landgate, 2016
Orthophoto - Nearmaps, 16.07.19
ENVIRONMAPS
COTERRA
ENVIRONMENT
Job: AUBCAR18
Doc: F013
Date: 22/10/2020
Ph: (08) 9381 3513
Fax: (08) 9381 5514
E: info@coterra.com.au
Austral Bricks
WATER MANAGEMENT PLAN
CARDUP MAIN PIT
NEW PROPOSED CATCHMENTS
- MANUFACTURING AREA
Figure 13



LEGEND
Site Bouyndary
Cadastre
Contour (mAHD)
Watercourse
Groundwater Contour (mAHD)
Stormwater Basin
Base Area
Top Level Area
N
Scale: 1:2,500 @ A3
GDA 1994 MGA Zone 50
Cardup Brook
KILN RD
COTERRA
ENVIRONMENT
Job AUBCAR18
Doc F14
Date 22/10/2020
Ph (08) 9381 5513
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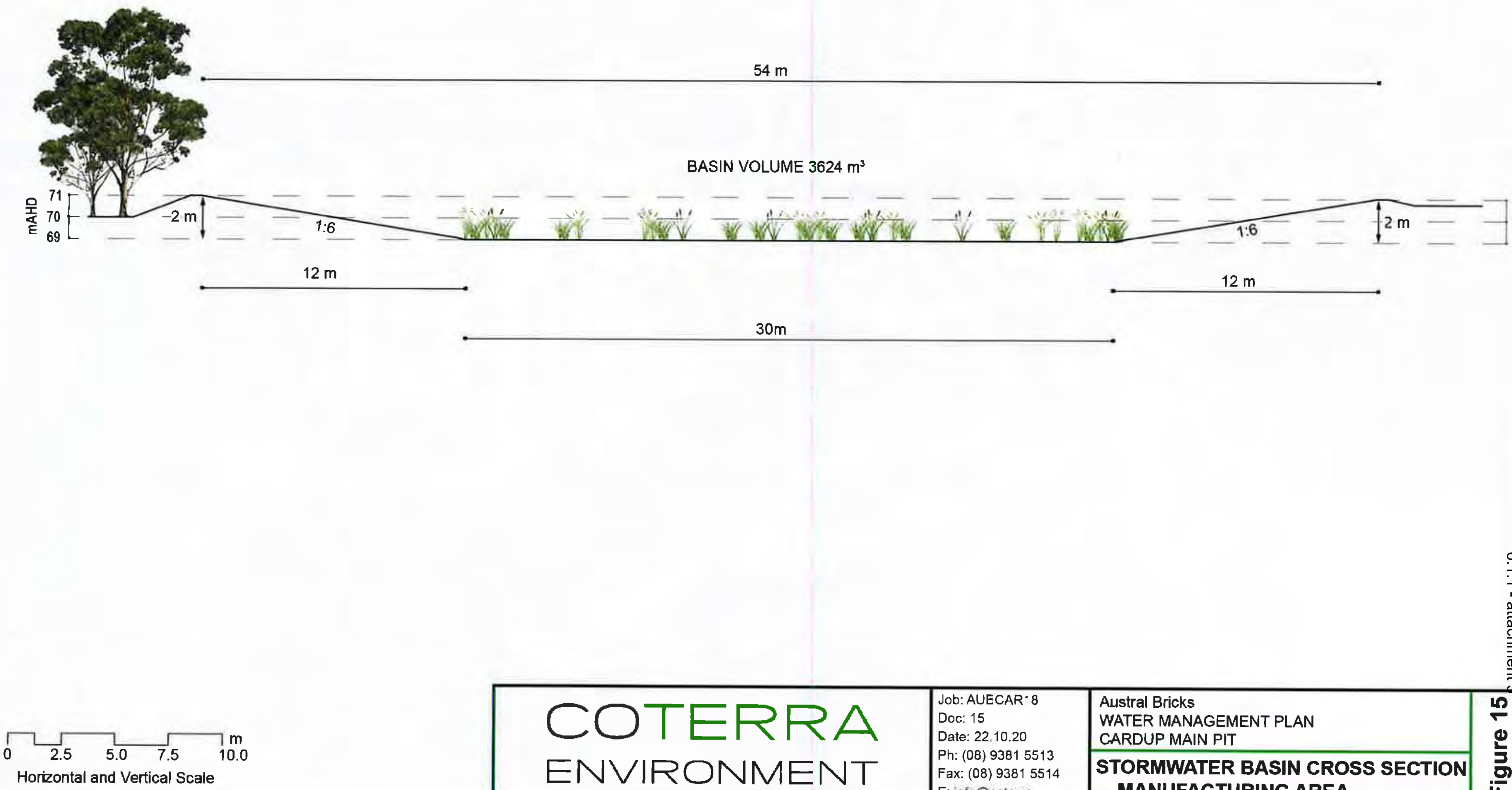
E info@coterra.com.au
Austral Bricks
WATER MANAGEMENT PLAN
CARDUP MAIN PIT
STORMWATER BASIN LOCATION
MANUFACTURING AREA
Figure 14
Source: Cadastre - Landgate, 2016
Orthophoto - Nearmaps, 18.07.19
Groundwater Contours - DoW, 2012
ENVIRONMAPS



COTERRA ENVIRONMENT

Job: AUECAR˙8
Doc: 15
Date: 22.10.20
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E: info@coterra.com.au

Austral Bricks
WATER MANAGEMENT PLAN
CARDUP MAIN PIT

STORMWATER BASIN CROSS SECTION – MANUFACTURING AREA

Figure 15

ENVIRONMAPS Environmental Mapping Solutions

Appendix 1 Licences

Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence Number	L9025/2017/1
Licence Holder	Austral Bricks (WA) Pty Ltd
ACN	079 711 603
Registered business address	738-780 Wallgrove Road HORSLEY PARK NSW 2175
File Number	DER2017/000089
Duration	18/06/2019 to 17/06/2029
Date of issue	18 June 2019
Prescribed Premises	Category 41: Clay bricks or ceramic products manufacturing
Premises	Cardup Brickworks Lot 101 on Plan 42930 Byford 6122 Lot 21 on Diagram 49238 Nettleton Road Byford 6122 Lot 7 on Diagram 10840, Byford 6122 Lot 51 on Diagram 52746, Kiln Road Byford 6122 Lot 50 on Diagram 52748, Byford 6122 Lot 10 on Diagram 26892, Byford 6122 Lot 12 on Diagram 52677, Kiln Road Byford 6122 Lot 53 on Diagram 4790, Byford 6122 Lot 30 on Plan 404710, Byford 6122

This Licence is granted to the Licence Holder, subject to the following conditions, on 18 June 2019, by:

Manager, Process Industries
Regulatory Services
an officer delegated under section 20 of the *n ironmenta rotection ct* (WA

Explanatory notes

These explanatory notes do not form part of this Licence.

Defined terms

Definition of terms used in this Licence can be found at the start of this Licence. Terms which are defined have the first letter of each word capitalised throughout this Licence.

Department of Water and Environmental Regulation

The Department of Water and Environmental Regulation (DWER) is established under section 35 of the *u ic Sector anagement ct* and designated as responsible for the administration of Part V, Division 3 of the *n ironmenta rotection ct* (WA) (EP Act). The Department also monitors and audits compliance with licences, takes enforcement action and develops and implements licensing and industry regulation policy.

Licence

Section 56 of the EP Act provides that an occupier of Prescribed Premises commits an offence if Emissions are caused or increased, or permitted to be caused or increased, or Waste, noise, odour or electromagnetic radiation is altered, or permitted to be altered, from Prescribed Premises, except in accordance with a works approval or licence.

Categories of Prescribed Premises are defined in Schedule 1 of the *n ironment rotection egu ations* (WA) (EP Regulations).

This Licence does not authorise any activity which may be a breach of the requirements of another statutory authority including, but not limited to the following:

- conditions imposed by the Minister for Environment under Part IV of the EP Act;
- conditions imposed by DWER for the clearing of native vegetation under Part V, Division 2 of the EP Act;
- any requirements under the *aste oidance and esource eco er ct*
- any requirements under the *n ironmenta rotection ontro ed aste egu ations* ; and
- any other requirements specified through State legislation.

It is the responsibility of the Licence Holder to ensure that any action or activity referred to in this Licence is permitted by, and is carried out in compliance with, other statutory requirements.

The Licence Holder must comply with the Licence. Contravening a Licence Condition is an offence under s.58 of the EP Act.

Responsibilities of a Licence Holder

Separate to the requirements of this Licence, general obligations of Licence Holders are set out in the EP Act and the regulations made under the EP Act. For example, the Licence Holder must comply with the following provisions of the EP Act:

- the duties of an occupier under section 61; and
- restrictions on making certain changes to Prescribed Premises unless the changes are in accordance with a works approval, Licence, closure notice or environmental protection notice (s.53).

Strict penalties apply for offences under the EP Act.

Reporting of incidents

The Licence Holder has a duty to report to DWER all discharges of waste that have caused or are likely to cause Pollution, Material Environmental Harm or Serious Environmental Harm, in accordance with s.72 of the EP Act.

Offences and defences

The EP Act and its regulations set out a number of offences, including:

- Offence of emitting an Unreasonable Emission from any Premises under s.49.
- Offence of causing Pollution under s.49.
- Offence of dumping Waste under s.49A.
- Offence of discharging Waste in circumstances likely to cause Pollution under s.50.
- Offence of causing Serious Environmental Harm (s.50A) or Material Environmental Harm (s.50B).
- Offence of causing Emissions which do not comply with prescribed standards (s.51).
- Offences relating to Emissions or Discharges under regulations prescribed under the EP Act, including materials discharged under the *n ironmenta rotection naut orised isc arges egu ations*
- Offences relating to noise under the *n ironmenta rotection oise egu ations*

Section 53 of the EP Act provides that a Licence Holder commits an offence if Emissions are caused, or altered from a Prescribed Premises unless done in accordance with a Works Approval, Licence or the requirements of a Closure Notice or an Environmental Protection Notice.

Defences to certain offences may be available to a Licence Holder and these are set out in the EP Act. Section 74A(b)(iv) provides that it is a defence to an offence for causing Pollution, in respect of an Emission, or for causing Serious Environmental Harm or Material Environmental Harm, or for discharging or abandoning Waste in water to which the public has access, if the Licence Holder can prove that an Emission or Discharge occurred in accordance with a Licence.

This Licence specifies the Emissions and Discharges, and the limits and Conditions which must be satisfied in respect of Specified Emissions and Discharges, in order for the defence to offence provision to be available.

Authorised Emissions and Discharges

The Specified and General Emissions and Discharges from Primary Activities conducted on the Prescribed Premises are authorised to be conducted in accordance with the Conditions of this Licence.

Emissions and Discharges caused from other activities not related to the Primary Activities at the Premises have not been conditioned in this Licence. Emissions and Discharges from other activities at the Premises are subject to the general provisions of the EP Act.

Amendment of licence

The Licence Holder can apply to amend the Conditions of this Licence under s.59 of the EP Act. An application form for this purpose is available from DWER.

The CEO may also amend the Conditions of this Licence at any time on the initiative of the CEO without an application being made.

Amendment Notices constitute written notice of the amendment in accordance with Section 59B(9) of the EP Act.

Duration of Licence

The Licence will remain in force for the duration set out on the first page of this Licence or until it is surrendered, suspended or revoked in accordance with s.59A of the EP Act.

Suspension or revocation

The CEO may suspend or revoke this Licence in accordance with s.59A of the EP Act.

Fees

The Licence Holder must pay an annual licence fee. Late payment of annual licence fees may result in the licence ceasing to have effect.

Definitions and interpretation

Definitions

In this Licence, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Annual Period	means a 12 month period commencing from 1 July until 30 June in the following year.
ARI	Average Recurrence Interval
AS 4323.1	means AS/NZS 4323.1: Stationary source emissions Selection of sampling positions
AS5667.1	means AS/NZS 5667.1:1998 Water quality - Sampling Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples
AS5667.6	means AS/NZ 5667.6: 1998 Water quality - Sampling Guidance on sampling of rivers and streams
Condition	means a condition to which this Licence is subject under s.62 of the EP Act.
combined acid gas	means total of the concentrations of hydrogen fluoride (HF), hydrogen chloride (HCl), sulphur dioxide (SO_2) and sulfuric acid mist (SO_3 and H_2SO_4)
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *n ironmenta rotection ct* Locked Bag 10, Joondalup DC, WA 6919 info@dwer.wa.gov.au
Compliance Report	means a report in a format approved by the CEO as presented by the Licence Holder or as specified by the CEO (guidelines and templates may be available on the Department's website).
Department	means the department established under section 35 of the *u ic Sector anagement ct* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
Department Request	means a request for Books or other sources of information to be produced, made by an Inspector or the CEO to the Licence Holder in writing and sent to the Licence Holder's address for notifications, as described at the front of this Licence, in relation to: (a) compliance with the EP Act or this Licence; (b) the Books or other sources of information maintained in accordance with this Licence; or (c) the Books or other sources of information relating to Emissions from the Premises.
DWER	Department of Water and Environmental Regulation.
EP Act	means the *n ironmenta rotection ct* (WA).
EP Regulations	means the *n ironmenta rotection egu ations* (WA).
HCl	means Hydrogen Chloride
HF	means Hydrogen Fluoride
H_2SO_4	means Sulfuric Acid
Inspector	means an inspector appointed by the CEO in accordance with s.88 of the EP Act.
Licence	refers to this document, which evidences the grant of a Licence by the CEO under s.57 of the EP Act, subject to the Conditions.

Term	Definition
Licence Holder	refers to the occupier of the premises being the person to whom this Licence has been granted, as specified at the front of this Licence.
mV	millivolts
NATA	means National Association of Testing Authorities
NTU	Nephelometric Turbidity Unit
PM	means Particulate Matter
Premises	refers to the premises to which this Licence applies, as specified at the front of this Licence and as shown on the map in Schedule 1 to this Licence.
Quarterly	means the four inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September and 1 October to 31 December in any year.
SO_2	means Sulfur Dioxide
STP	Standard Temperature (273 K or 0° C) and Pressure (101.3 kPa)
USEPA	means United States (of America) Environmental Protection Agency
USEPA Method 1	USEPA Method 1 – Sample/Velocity Traverses
USEPA Method 2	USEPA Method 2 – Velocity – S – type Pitot
USEPA Method 5	USEPA Method 5 - Particulate Matter
USEPA Method 8	USEPA Method 8 – Determination of Sulfuric Acid and Sulfur Dioxide
USEPA Method 26	USEPA Method 26 – Hydrogen Chloride, Halides, Halogens
USEPA Method 26A	USEPA Method 26A – Hydrogen Halide and Halogen – Isokinetic Method

Interpretation

In this Licence:

(a) the words ‘including’, ‘includes’ and ‘include’ will be read as if followed by the words ‘without limitation’;

(a) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(b) where tables are used in a Condition, each row in a table constitutes a separate Condition;

(c) any reference to an Australian or other standard, guideline or code of practice in this Licence means the version of the standard, guideline or code of practice in force at the time of granting of this Licence and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the Licence; and

(d) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act.

Conditions

Emissions

1. The Licence Holder must not cause any Emissions from the Primary Activities on the Premises except for specified Emissions and general Emissions described in Column 1 of Table 2 subject to the exclusions, limitations or requirements specified in Column 2 of Table 2.

Table 2: Authorised Emissions table

Column 1	**Column 2**
Emission type	**Exclusions/Limitations/Requirements**
Specified Emissions	
Point source emissions from the Kiln Stack S1, Dryer Stacks S2 and S3, and Hot Air Exhaust	Subject to compliance with Conditions 2, 4, 5, and 6.
General Emissions (excluding Specified Emissions)	
Emissions which: • arise from the Primary Activities set out in Schedule 2	Emissions excluded from General Emissions are: • Unreasonable Emissions; or • Emissions that result in, or are likely to result in, Pollution, Material Environmental Harm or Serious Environmental Harm; or • Discharges of Waste in circumstances likely to cause Pollution; or • Emissions that result, or are likely to result in, the Discharge or abandonment of Waste in water to which the public has access; or • Emissions or Discharges which do not comply with an Approved Policy; or • Emissions or Discharges which do not comply with a prescribed standard; or • Emissions or Discharges which do not comply with the conditions in an Implementation Agreement or Decision; or • Emissions or Discharges the subject of offences under regulations prescribed under the EP Act, including materials discharged under the Environmental *rotection naut orised isc arges egu ations* .

Infrastructure and equipment

2. The Licence Holder must ensure that the infrastructure and equipment specified in Column 1 of Table 3 is maintained in good working order and in accordance with manufacturers' specifications and operated in accordance with the requirements specified in Column 2 of Table 3.

Table 3: Infrastructure and equipment controls table

Column 1	Column 2
Site infrastructure and equipment	**Operational requirements**
Clay storage stockpiles located on in-situ soils.	Raw materials are to be stored in former excavation area including the clay storage shed as described in Map 1 of Schedule 1.
Clay grinding sheds	Clay blending activities are to occur in the clay grinding sheds. 1. .
2 x Dryers with hot air flues	Air emissions through flues as shown in Map 2 of Schedule 1.
Gas fired tunnel kiln	1. The Licence Holder must ensure air from the Combustion Zone of the kiln is treated by the Cascade Limestone Scrubber and discharged via the Kiln Exhaust Stack 2. The Cascade Lime Scrubber may be bypassed pursuant to Condition 5.
Cascade limestone scrubber	Maintained in accordance with the manufacturers specifications.
Kiln Exhaust Stack	Not less than 29.5 metres in height
Water catchment, swales and settling ponds	1. Design capacity of 10 year ARI 2 hour rainfall event to be maintained by removal of sediment. 2. Prevent and repair erosion of banks and spillways.
Roads and storage areas	To be swept and wetted down to prevent dust lift off.

Materials Handling

3. The Licence Holder must ensure that dust emissions from any operational, unsealed areas are controlled with water or other dust suppression materials.

Discharges to air

4. The Licence Holder must ensure that the emissions specified in Table 4 are discharged only from the corresponding discharge point and only at the corresponding discharge point location set out in Table 4.

Table 4: Authorised discharge points

Emissions	Discharge point	Discharge point location on Schedule 1, Map 2: Manufacturing area layout
HCl, HF, PM and, Total oxides of sulphur (as SO_2)	Kiln Stack S1	S1
	Dryer Stacks S2	S2
	Dryer Stack S3	S3

5. In the event the Cascade Scrubber is bypassed for more than 30 consecutive minutes, the Licence Holder must implement the bypass procedure in Schedule 4 and demonstrate compliance with the emission limits in Table 5.

Emission Limits

6. The Licence Holder must ensure that emissions from the discharge point listed in Table 5 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with Condition 7.

Table 5: Discharges to air limits

Discharge Point	Parameter[1]	Averaging Period	Limit[2]
Kiln Stack S1	HF	30 minutes minimum	1 g/s
	HCl	30 minutes minimum	200 mg/m³
	PM	1-hour	50 mg/m³

Note 1: concentrations are to be reported at STP, corrected to 18% O_2; and
2: limits do not apply for the first 30 minutes following start-up.

Monitoring of discharges to air

7. The Licence Holder must monitor discharges to air:

(a) from the specified discharge point;
(b) at the corresponding monitoring location;
(c) for the corresponding parameters;
(d) at the corresponding frequency;
(e) for the corresponding averaging period;
(f) in the corresponding units; and
(g) using the corresponding method,

set out in Table 9 of Schedule 3.

8. The Licence Holder must ensure that sampling required by Condition 7 is undertaken at sampling locations in accordance with the current version of AS 4323.1.

9. The Licence Holder must ensure that all non-continuous sampling and analysis undertaken required by Condition 7 is undertaken by a holder of NATA accreditation for the relevant methods of sampling and analysis.

Ambient Monitoring – Surface Water

10. The Licence Holder must monitor the surface water:

(a) for the parameters;
(b) at the corresponding monitoring location;
(c) in the corresponding unit;
(d) at no less than the corresponding frequency;
(e) for the corresponding averaging period; and
(f) using the corresponding methods,

set out in Table 6.

Table 6: Ambient Monitoring of Surface Water

Parameter	Monitoring location	Unit	Frequency	Averaging period	Method	
					Sampling	Analysis
pH	**CAR01** upstream of discharge point F1, and **CAR06** downstream of discharge point A as shown in Map 3 of Schedule 1	-	During the months of May, June, July and August and at other times when high rainfall events cause the potential for discharge.	Spot sample	AS5667.1 AS5667.6	Field measured parameter
Dissolved oxygen		mg/L				
Total dissolved salts from conductivity		mg/L				
Redox		mV				
Temperature		°C				
Flow		m/s				
Turbidity		NTU				
Total suspended solids (TSS)		mg/L				NATA accredited
Total Petroleum Hydrocarbons (TPH)		mg/L				

Record-keeping

11. The Licence Holder must maintain accurate and auditable Books including the following records, information, reports and data required by this Licence:

(a) the calculation of fees payable in respect of this Licence;
(b) the maintenance of infrastructure required to ensure that it is kept in good working order in accordance with Condition 2 of this Licence;
(c) monitoring undertaken in accordance with Conditions 7 and 10 of this Licence;
(d) complaints received under Condition 12 of this Licence; and

In addition, the Books must:

(e) be legible;
(f) if amended, be amended in such a way that the original and subsequent amendments remain legible and are capable of retrieval;
(g) be retained for at least 3 years from the date the Books were made; and
(h) be available to be produced to an Inspector or the CEO.

12. The Licence Holder must record the number and details of any complaints received by the Licence Holder relating to its obligations under this Licence and its compliance with Part V of the EP Act at the Premises, and any action taken by the Licence Holder in response to the complaint. Details of complaints must include:

(a) an accurate record of the concerns or issues raised, for example a copy of any written complaint or a written note of any verbal complaints made;
(b) the name and contact details of the complainant, if provided by the complainant;
(c) the date of the complaint; and
(d) the details and dates of the actions taken by the Licence Holder in response to the complaints.

Air emission investigations

13. The Licence Holder must by 31 July 2019 retain the services of a person qualified and experienced in the area of modelling of air emissions to predict ground level concentrations to:

(a) update the model submitted in *ustra ric s – ardu ric wor s or s ro a and icence Su orting ocument* Strategen October 2015;
(b) compile and submit to the Licence Holder by 27 September 2019 a report of the updated modelling conducted in accordance with condition 13(a)

14. The report prepared pursuant to Condition 13 must include:

(a) measured emission rates for HF, HCl and Oxides of Sulphur from the kiln stack exhaust under normal operating conditions and during bypass as input data and clearly stating which emission rates are adopted for the model;
(b) the contribution of emission of acid gas emissions from dryer stacks on predicted ground level concentrations;
(c) predicted ground level concentrations and contours of the gases individually and as a total acid gas level;
(d) defined terminology when reporting results for the modelling grid and sensitive receptors; and
(e) an assessment of predicted ambient concentrations of acid gases at sensitive receptors and grid points against the following standards:

(i) combined acid gas concentration of 500 µg/m^3 as a 10-minute average;
(ii) combined acid gas concentration of 100 µg/m^3 as a 24 hour average;
(iii) HCl concentrations of 100 µg/m^3 as a 24 hour average;
(iv) HCl concentrations of 140 µg/m^3 as a 1 hour average;
(v) HF concentrations of 100 µg/m^3 as a 24 hour average: and,
(vi) HF concentrations of 1.7 µg/m^3 as a 7 day average.

15. The Licence Holder must submit the report required by condition 13 to the CEO by 19 October 2019.

Reporting

16. The Licence Holder must, within 7 days of becoming aware of any non-compliance with condition 2, 3, 4, 0, **Error Reference source not found.** and 6 of this Licence, notify the CEO in writing of that non-compliance and include in that notification the following information:

(a) which condition was not complied with;
(b) the time and date when the non-compliance occurred;
(c) if any environmental impact occurred as a result of the non-compliance and if so what that impact is and where the impact occurred;
(d) the details and result of any investigation undertaken into the cause of the non-compliance;
(e) what action has been taken and the date on which it was taken to prevent the non-compliance occurring again; and
(f) what action will be taken and the date by which it will be taken to prevent the non-compliance occurring again.

17. The Licence Holder must submit to the CEO, no later than 31 July in each year, a Compliance Report indicating the extent to which the Licence Holder has complied with the Conditions in this Licence for the preceding Annual Period.

18. The Licence Holder must comply with a Department Request, within 14 days from the date of the Department Request or such other period as agreed to by the Inspector or the CEO.

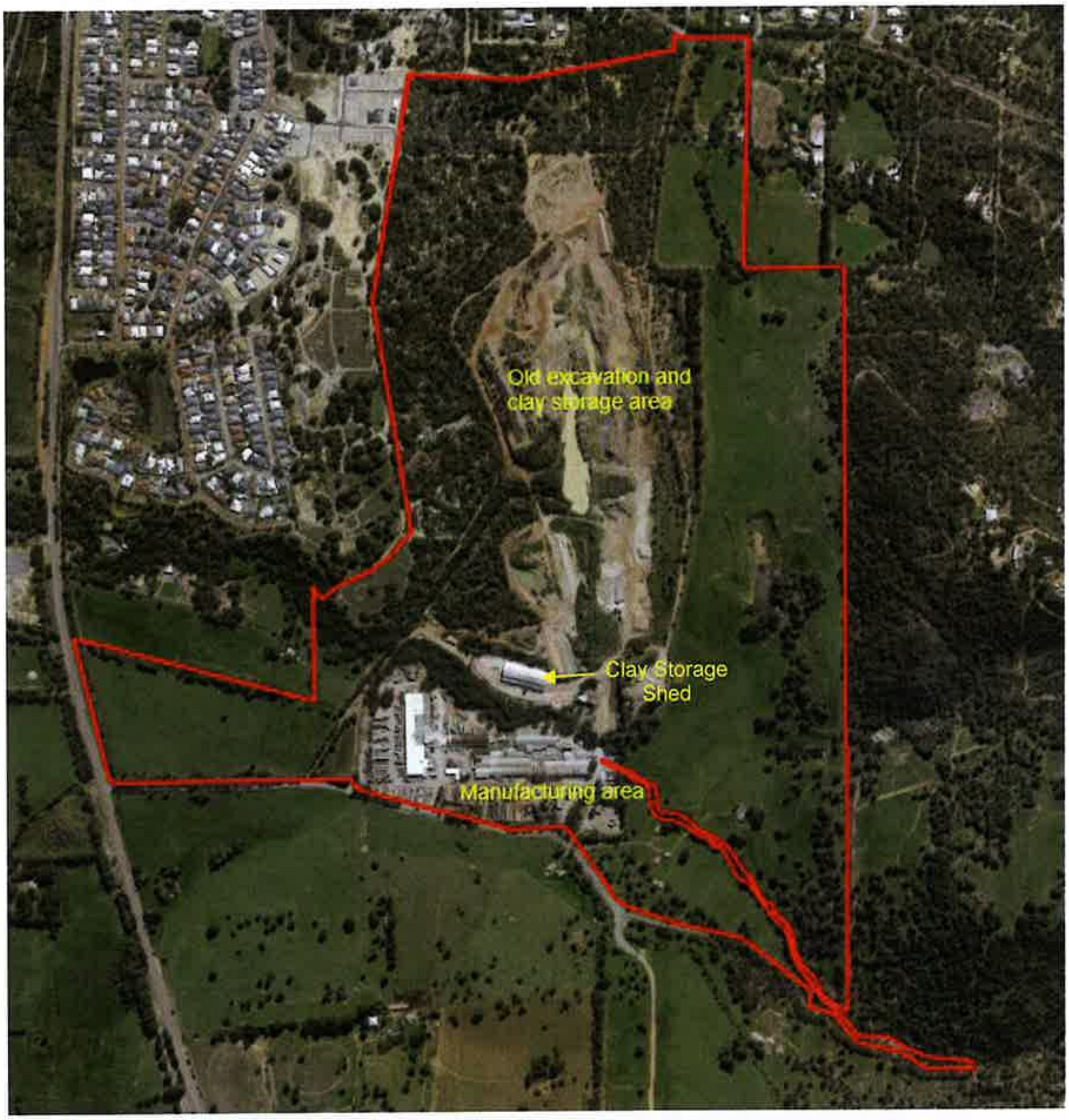
19. The Licence Holder must submit to the CEO by no later than 31 days after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 7, and which provides information in accordance with the corresponding requirements set out in Table 7.

Table 7: Annual Environment Report

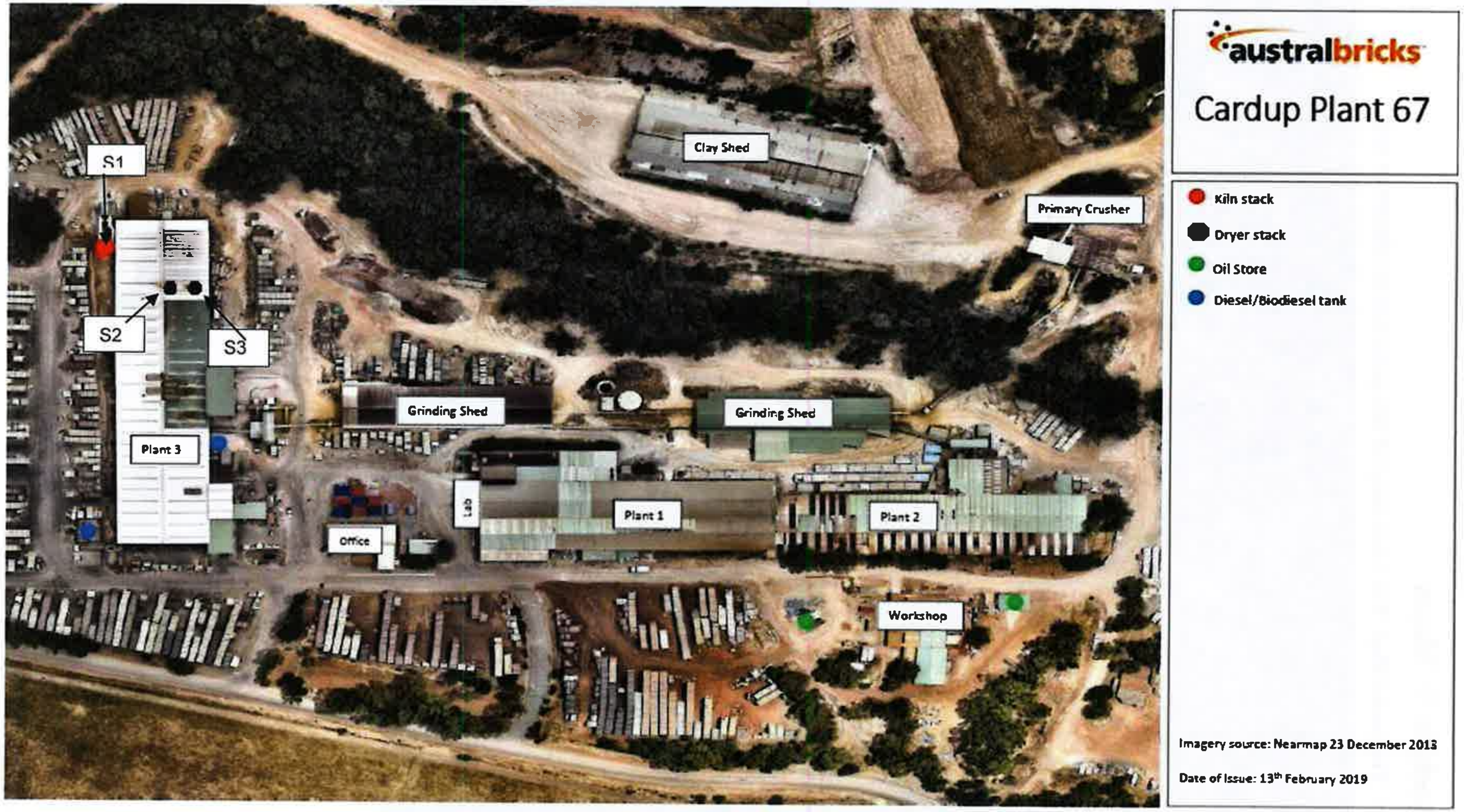
Condition	Requirement
10	Tabulated surface water monitoring data and time series graphs for each monitoring point.
6	Tabulated monitoring data results and time-series graphs in Microsoft Excel format for each monitoring location showing concentrations of all parameters over a minimum three year period (where sufficient data allows). An interpretation of the monitoring data including comparison to historical trends and emission limits. Copies of original monitoring, laboratory and analysis reports submitted by third parties
12	Summary of complaints data

Schedule 1: Maps

Map 1: Premises Map. The boundary of the premises is shown in red

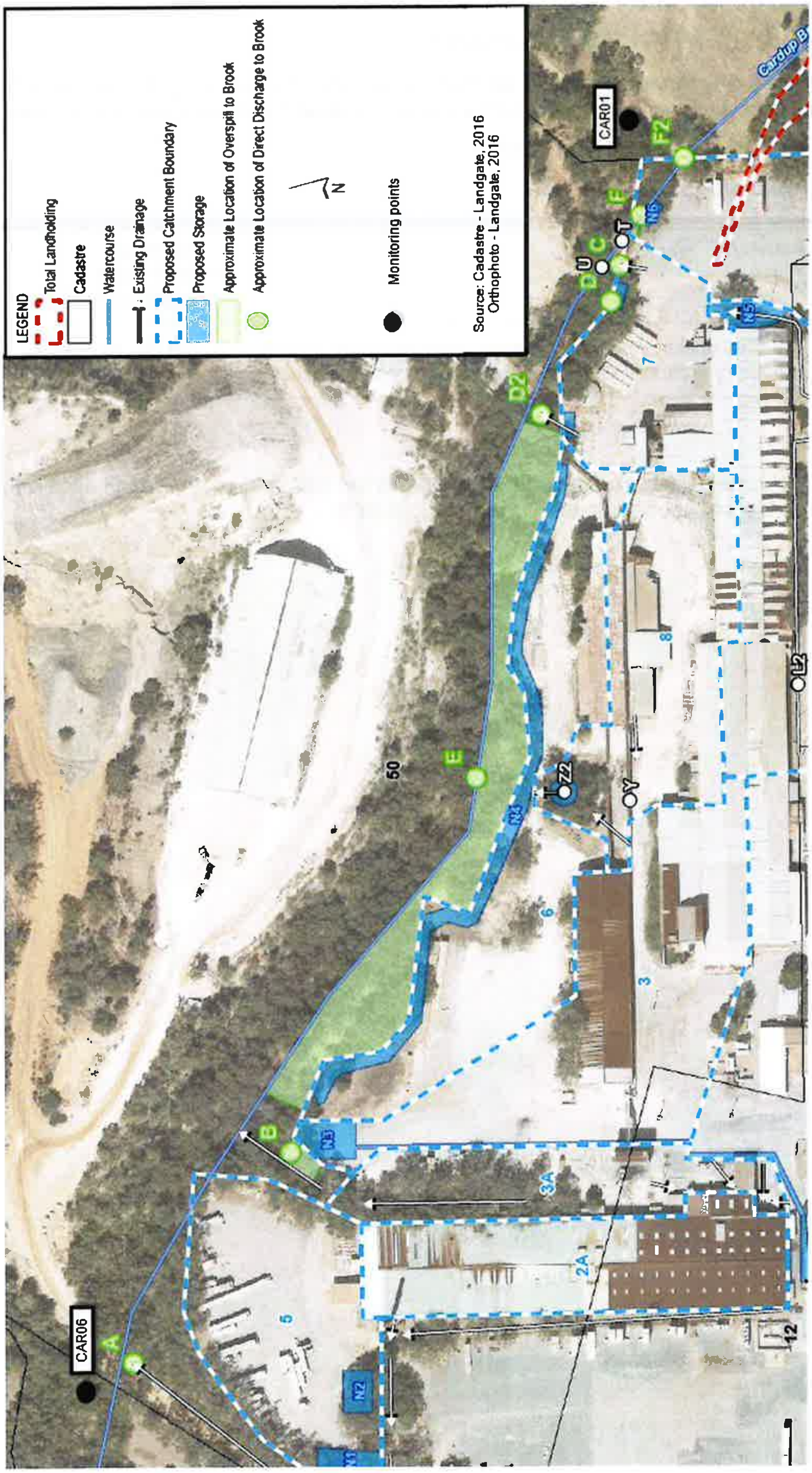


Map 2: Manufacturing area layout.



L9025/2017/1

Map 3: Direct Discharge Points and Monitoring Points for Surface Water



Adapted from Coterra Environment Stormwater Management Plan

L9025/2017/1

Schedule 2: Primary Activities

At the time of assessment, Emissions and Discharges from the following Primary Activities were considered in the determination of the risk and related Conditions for the Premises.

The Primary Activities are listed in Table 8:

Table 8: Primary Activities

Primary Activity	Premises production or design capacity
Category 41: Clay bricks or ceramic products manufacturing. Premises on which refractory products, tiles, pipes or pottery are manufactured.	200,000 tonnes per annual period

Site layout

The Primary Activity infrastructure and equipment is set out on the Premises in accordance with the site layout specified on the maps in Schedule 1.

Schedule 3: Monitoring

Monitoring of discharges to air

Table 9: Monitoring of discharges to air

Discharge Point	Monitoring Location on Map 2 in Schedule 1	Parameters	Frequency	Averaging period	Unit[1]	Method[2,3]
Kiln Stack S1	S1	Flow rate	Quarterly	60 minutes	m^3/s	USEPA Method 2
		PM			mg/m^3 and g/s	USEPA Method 5
		Total oxides of sulphur (as SO_2)				USEPA Method 8
		HCl		30 minutes minimum		USEPA Method 26 or 26A
		HF				

Note 1: Concentrations to be corrected to STP at 18% oxygen on a dry basis.
2: Duplicate runs to be completed consecutively on the same sampling day;
3: Where USEPA methods refer to USEPA Method 1 for the sampling plane, this should be read as a referral to AS/NZS 4323.1:2001.

Schedule 4 Bypass Management Procedure

If the Licence Holder identifies an issue that requires the scrubber to be placed into bypass, they must initiate the following procedure if the bypass is anticipated to last for more than 30 minutes:

1. Complete a record or log containing the following information:
   a) Bypass start date and time
   b) Reason for bypass
   c) Action taken
   d) Bypass finish date and time
   e) Duration of bypass
2. Slow the push rates to the calculated rates based on the following formula:

$$ER = T \times C \times (1 - r) \times (1 - e)$$

ER = emission rate in grams per second
T = throughput of tonnes per second
C = concentration of fluoride in the clay as grams per tonne (as appropriate for each clay mix in the current product)
r = % retention of fluoride in the fired brick (typically - 40%)
e = % efficiency of scrubber = 0 when scrubber is in bypass

Government of **Western Australia**
Department of **Environment Regulation**

Your ref W5925/2015/1
Our ref DER2015/002438
Enquiries Gargi Joshi
Phone 9333 7421
Email Gargi.Joshi@der.wa.gov.au

Ms Jessica French
Environmental Manager
Austral Bricks (WA) Pty Ltd
Harper Street
CAVERSHAM WA 6005

Dear Ms French

***ENVIRONMENTAL PROTECTION ACT 1986*: WORKS APPROVAL GRANTED**

Premises:
Cardup Brickworks, Kiln Road, BYFORD
Works Approval Number: W5925/2015/1

A works approval under the *Environmental Protection Act 1986* (the Act) has been granted for the above premises. The Department of Environment Regulation will advertise the issuing of this works approval in the public notices section of *The West Australian* newspaper.

The works approval includes attached conditions. Under section 55(1) of the Act, it is an offence to contravene a condition of a works approval. This offence carries a penalty of up to $125,000 and a daily penalty of up to $25,000

In accordance with section 102(1)(c) of the Act, you have 21 days to appeal the conditions of the works approval. Under section 102(3)(a) of the Act, any other person may also appeal the conditions of the works approval. To lodge an appeal contact the Office of the Appeals Convenor on 6467 5190 or by email at admin@appealsconvenor.wa.gov.au.

Emissions from the premises that are the subject of a works approval are not authorised until or unless a licence is issued or unless the emissions are in accordance with the works approval and while that works approval is in force.

If you have any queries, please contact Licensing Officer, Ms Gargi Joshi, on phone 9333 7421 or by email gargi.joshi@der.wa.gov.au.

Yours sincerely

Jonathan Bailes
MANAGER LICENSING (PROCESS INDUSTRIES)
LICENSING AND APPROVALS

Officer delegated under section 20
of the Environmental Protection Act 1986

28 January 2016

enc: *Environmental Protection Act 1986* Works Approval W5925/2015/1

TL0102 v2.0

The Atrium, 168 St Georges Terrace, Perth WA 6000
Phone (08) 6467 5000 Fax (08) 6467 5562
Postal Address: Locked Bag 33, Cloisters Square, Perth WA 6850
www.der.wa.gov.au

Government of **Western Australia**
Department of **Environment Regulation**

Works Approval

Environmental Protection Act 1986, Part V

Works Approval Holder: Austral Bricks (WA) Pty Ltd

Works Approval Number: W5925/2015/1

Registered office: 738-780 Wallgrove Road
HORSLEY PARK NSW 2175

ACN: 079 711 603

Premises address: Cardup Brickworks
Lot 101 on Plan 42930; Lot 21 Diagram 49238; Lot 7 Diagram 10840, Lot 51 Diagram 52746; Lot 50 Diagram 52748; Lot 801 and 802 on Plan 302499; Lot 10 Diagram 26892;Lot 12 Diagram 52677;Lot 53 Diagram 4790; Lot 100 Diagram 7854; Lot 50 Diagram 7928
BYFORD WA 6122
as depicted in Schedule 1

Issue date: Thursday, 28 January 2016

Commencement date: Monday, 1 February 2016

Expiry date: Thursday, 31 January 2019

The following category/s from the *Environmental Protection Regulations 1987* cause this Premises to be a prescribed premises for the purposes of the *Environmental Protection Act 1986*:

Category number	Category description	Category production or design capacity	Approved premises production or design capacity
41	Clay bricks or ceramic products manufacturing: premises on which refractory products, tiles, pipes or pottery are manufactured.	1000 tonnes or more per year	Not more than 200 000 tonnes per annual period

Conditions
This Works Approval is subject to the conditions set out in the attached pages.

Jonathan Bailes
Manager Licensing (Process Industries)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Government of **Western Australia**
Department of **Environment Regulation**

Works Approval Conditions

1 General

1.1 Interpretation

1.1.1 In the Works Approval, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 In the Works Approval, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986;*

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means:

Chief Executive Officer
The Department Administering the *Environmental Protection Act 1986*
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au;

'kiln' means 'Kiln 3' as indicated on the layout of premises in Schedule 1;

'Commissioning' means the process of operation and testing that verifies the works and all relevant systems, plant, machinery and equipment, including the cascade limestone scrubber, have been installed and are performing in accordance with the design specification set out in the works approval application;

'NATA' means the National Association of Testing Authorities, Australia;

'NATA accredited' means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

'Premises'means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Works Approval;

'Sampling period 'means the time over which a monitoring result is obtained;

'Schedule 1' means Schedule 1 of this Works Approval unless otherwise stated;

'Works Approval' means this Works Approval numbered W5925/2015/1 and issued under the Act;

'Works Approval Holder' means the person or organisation named as the Works Approval Holder on page 1 of the Works Approval;

1.1.3 Any reference to an Australian or other standard in the Works Approval means the relevant parts of the standard in force from time to time during the term of this Works Approval.

1.1.4 Any reference to a guideline or code of practice in the Works Approval means the current version of the guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Works Approval.

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Department of **Environment Regulation**

1.2 General conditions

1.2.1 The Works Approval Holder shall construct the works in accordance with the documentation detailed in Table 1.2.1:

Table 1.2.1: Construction Requirements[1]

Document	Parts	Date of Document
Austral Bricks- Cardup Brickworks: Works Approval and Licence Supporting Document, authored by Strategen Environmental Consultants Pty Ltd, dated October 2015	All, including Appendices	October 2015

Note 1: Where the details and commitments of the documents listed in condition 1.2.1 are inconsistent with any other condition of this works approval, the conditions of this works approval shall prevail.

1.2.2 The Works Approval Holder shall commission the brick manufacturing plant and the cascade limestone scrubber for a period not exceeding 6 months.

2 Monitoring

2.1.1 The Works Approval Holder shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this works approval is calibrated in accordance with the manufacturer's specifications.

2.1.2 The Works Approval Holder shall undertake the monitoring specified in Table 2.1.1 during the commissioning period.

Table 2.1.1: Monitoring of point source emissions to air

Emission point reference	Parameter	Units[(1)]	Method	Sampling period
A1- Cascade limestone scrubber exhaust	Hydrogen fluoride	mg/m^3 g/s	USEPA Method 26 or 26A	Stack test (minimum 60 minutes) [(3)]
	Hydrogen chloride			
	Oxides of sulphur (as SO_2)		USEPA Method 8	
	Carbon monoxide		USEPA Method 10	
	Particulate Matter		USEPA Method 5 or 17	
	Oxides of nitrogen (as NO_2)		USEPA Method 7D or 7E	
A2- Dryer vent	Hydrogen fluoride		USEPA Method 26 or 26A	Stack test (minimum 60 minutes) [(3)]
	Hydrogen chloride			
	Oxides of sulphur (as SO_2)		USEPA Method 8	

Note 1 All concentration units are referenced to STP dry and 18% O_2.
Note 2: Monitoring shall be undertaken to reflect normal operating conditions.
Note 3: Non-concurrent duplicate samples to be collected during each sampling event.
Note 4: Sampling at A2 must be undertaken when scrubber is operational.
Note 5: Frequency of testing to be outlined in Commissioning Plan (IR1).

2.1.3 The Works Approval Holder shall ensure that sampling required under Condition 2.1.2 is undertaken at sampling locations in accordance with AS 4323.1.

2.1.4 The Works Approval Holder shall ensure that all non-continuous sampling and analysis is undertaken by a holder of NATA accreditation for the relevant methods of sampling and analysis.

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3 Improvements

3.1.1 The Works Approval Holder shall complete the improvements in Table 3.1.1 by the date of completion in Table 3.1.1.

Table 3.1.1: Improvement program		
Improvement reference	**Improvement**	**Date of completion**
IR1	The Works Approval Holder shall, prior to commencing commissioning, submit a Commissioning Plan to the CEO. The Commissioning Plan shall include, but not be limited to: (a) commissioning stages and expected timeframes; (b) expected emissions and discharges during commissioning; (c) monitoring that will be undertaken during the commissioning period at the cascade limestone scrubber stack and dryer vent, including details on monitoring frequency (refer Table 2.1.1); (d) how emissions to air will be managed during commissioning; (e) how accidents or malfunctions will be managed; (f) start up and shut down procedures; (g) reporting proposals including accidents, malfunctions and reporting against the Commissioning Plan. (h) the extent of the data which will be presented in the Emissions Verification Report (refer C4.1.3).	At least 20 business days prior to commencing commissioning
IR2	The Works Approval Holder shall submit to the CEO a Stormwater Management Plan. The Stormwater Management Plan shall include, but not be limited to: (a) identification of activities on the Premises that could cause stormwater to become contaminated and any potential contaminants; (b) operational measures to prevent contamination of stormwater; (c) measures for containment or treatment of contaminated or potentially contaminated stormwater generated from activities on the Premises; (d) diagram or plan identifying existing stormwater management drains, containment ponds and discharge basins on the premises; (e) information on containment capacity of each stormwater containment basin which demonstrates adequacy to contain stormwater flows and rainfall that may be generated from a design storm event and justification of design criteria chosen; (f) information on maintenance schedule and procedures for existing infrastructure for stormwater conveyance and containment; and (g) where stormwater system is designed to discharge to Cardup Brook via engineered discharge points, a map identifying location of discharge points; (h) where stormwater system is designed to discharge to Cardup Brook via engineered discharge points, a risk assessment identifying potential impacts on surface water quality of the Cardup brook and any downstream	1 August 2016

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Table 3.1.1: Improvement program		
Improvement reference	**Improvement**	**Date of completion**
	receptors and proposals for monitoring surface water quality; and (i) identification of improvements required to stormwater management practices or stormwater management infrastructure on the Premises, including requirement of any monitoring regimen, implementation proposal for the improvements identified and timeframe for the same.	

4 Information

4.1 Reporting

4.1.1 The Works Approval Holder shall submit a Compliance Document to the CEO, following the construction of the works and prior to commissioning of the same.

4.1.2 The Compliance Document shall:
(a) certify that the works were constructed in accordance with the conditions of the works approval;
(b) be signed by a person authorised to represent the Works Approval Holder and contain the printed name and position of that person within the company.

4.1.3 The Works Approval Holder shall submit to the CEO an Emissions Verification Report within 30 days of completion of monitoring specified in Condition 2.1.2 and in accordance with the Commissioning Plan (IR1).

4.1.4 The Emissions Verification Report shall include but not be limited to:
(a) monitoring results for stack emissions monitoring undertaken for parameters specified in Table 2.1.1 and in accordance to the Commissioning Plan (IR1);
(b) copies of monitoring reports submitted to the Works Approval Holder by a NATA accredited service-provider demonstrating that monitoring was undertaken in accordance with the methods specified in Table 2.1.1;
(c) information demonstrating that commissioning was undertaken in accordance with the Commissioning Plan submitted; and
(d) where they have not been met, measures proposed to meet the design specification of the cascade limestone scrubber and/or works approval conditions, together with timescales for implementing the proposed measures.

4.1.5 The Works Approval Holder shall submit to the CEO a noise emissions assessment report for the Premises within 60 days of completion of commissioning. The report shall be prepared in accordance with Part 3 of the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) and shall include:
(a) methods used for monitoring noise;
(b) an assessment of whether noise emissions from the Premises comply with the assigned noise level in the Noise Regulations, in particular an assessment of the impact at the nearest sensitive receptors; and
(c) where they are not met, proposed measures to reduce noise emissions to assigned levels together with timescales for implementing the proposed measures.

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4.2 Notification

4.2.1 The Works Approval Holder shall ensure that the parameters listed in Table 4.2.1 are notified to the CEO and are in accordance with the notification requirements of the table.

Table 4.2.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement	Format or form
1.2.4	Commencement of commissioning	At least 7 usual business days prior to start	None specified
	Completion of commissioning	Within 7 usual business days after completion	

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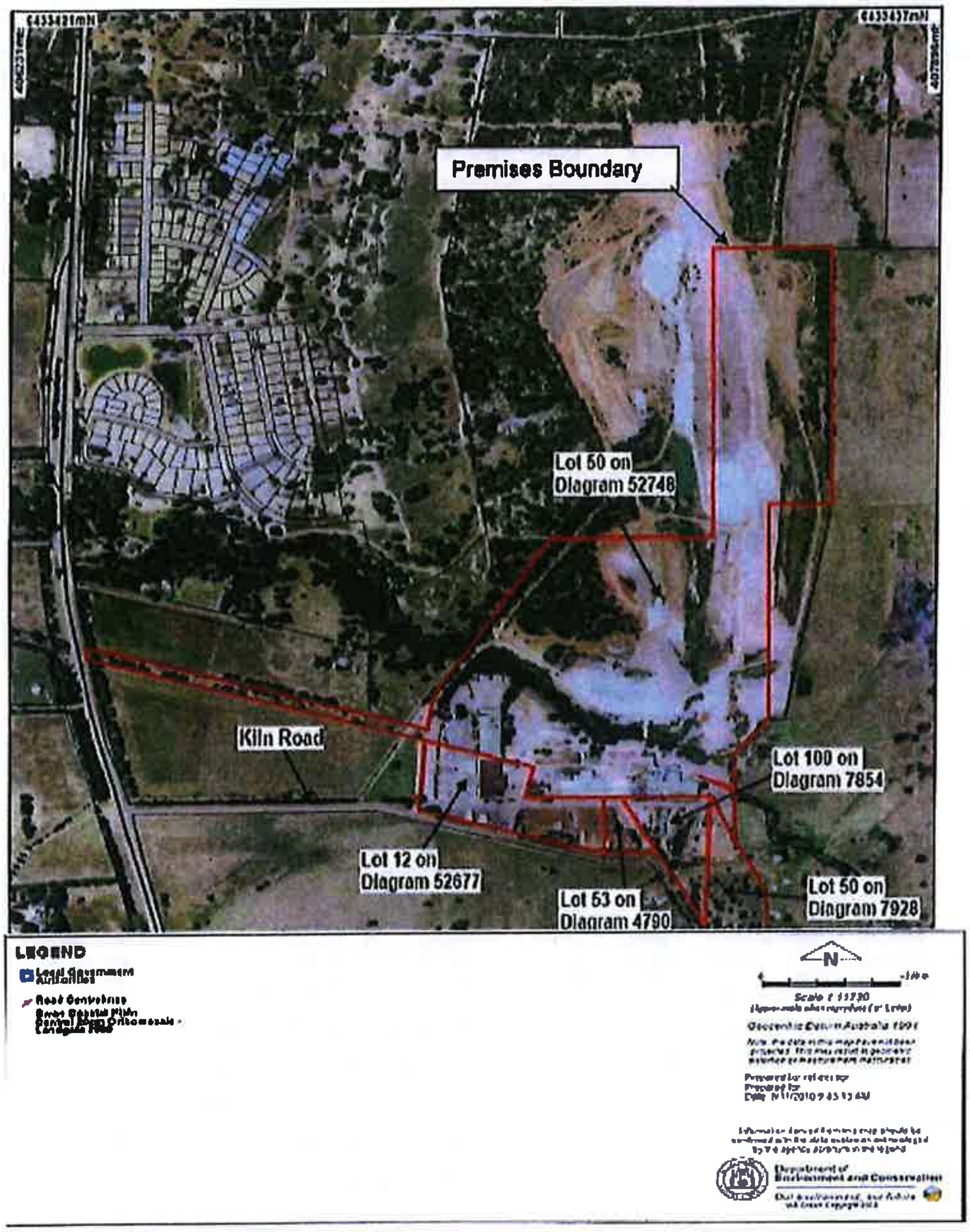
Schedule 1: Maps

Premises map

The Premises is shown in the map below. The red line depicts the Premises boundary.



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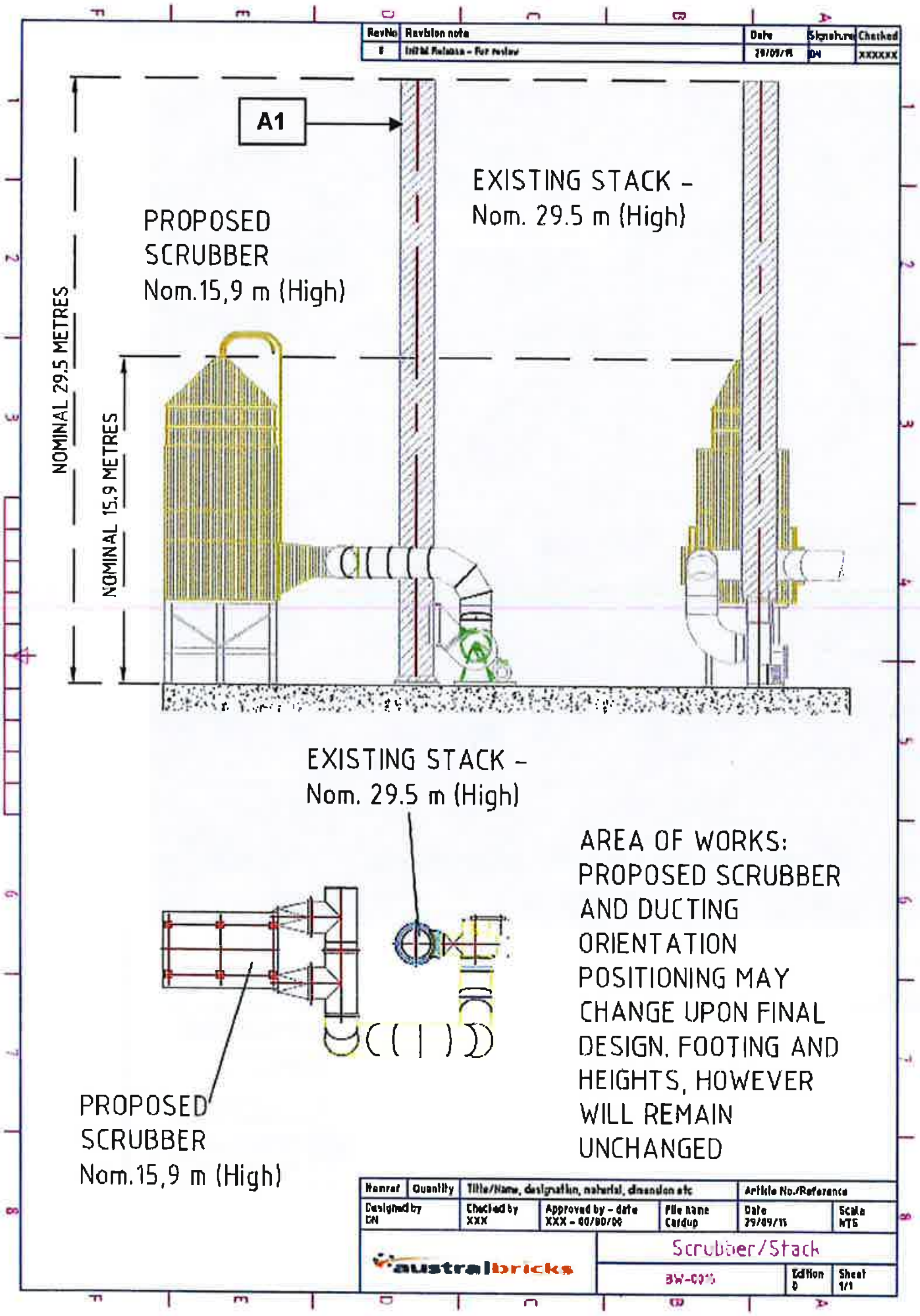
Map of emission points

The location of emission point A1 specified in Table 2.1.1 is shown below.



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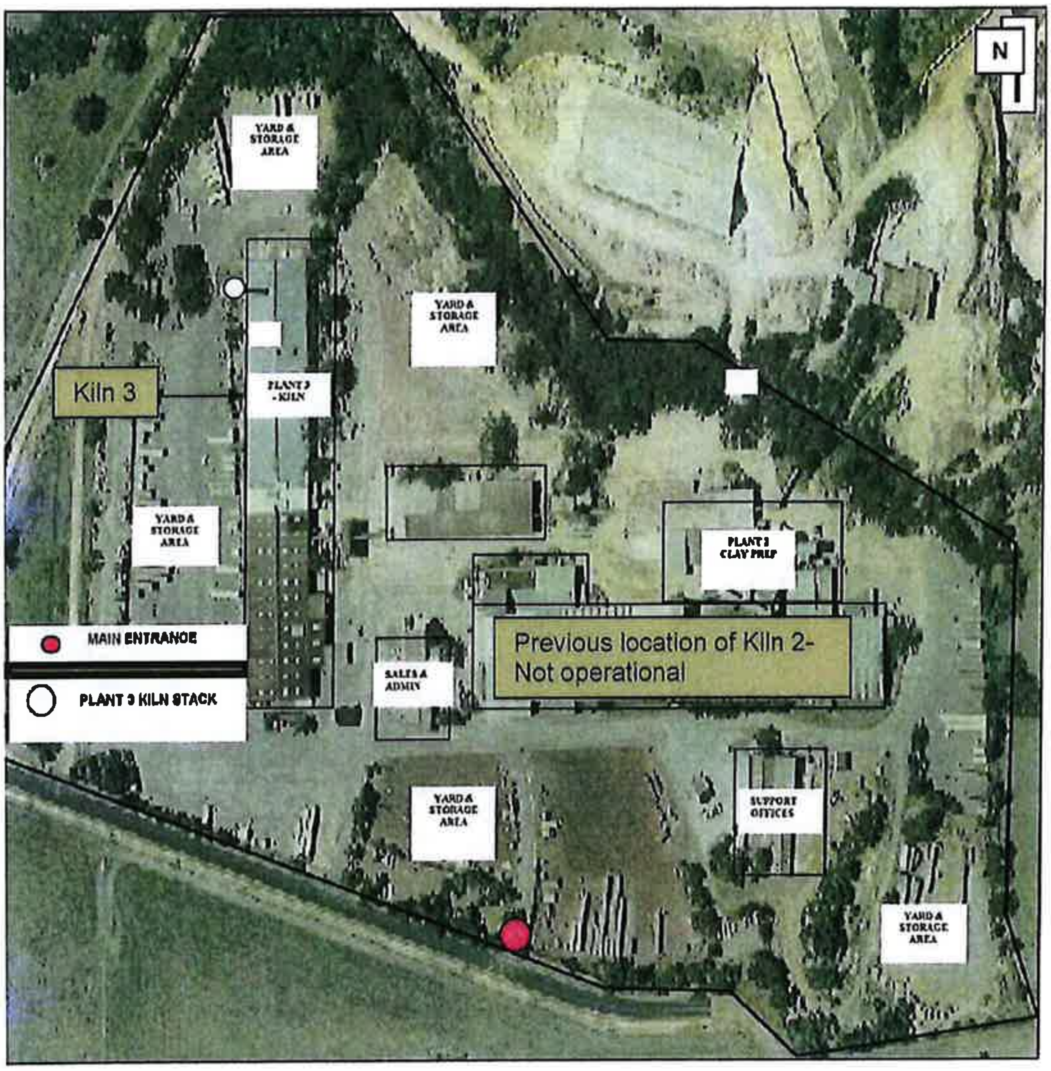
Layout of premises

The location of Kiln 3 proposed to be commissioned through this works approval defined in Section 1 is shown below.



Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: **Austral Bricks (WA) Pty Ltd**

Works Approval: **W5925/2015/1**

Registered office:	738-780 Wallgrove Road HORSLEY PARK NSW 2175
ACN:	079711603
Premises address:	Cardup Brickworks Lot 101 on Plan 42930; Lot 21 Diagram 49238; Lot 7 Diagram 10840, Lot 51 Diagram 52746; Lot 50 Diagram 52748; Lot 801 and 802 on Plan 302499; Lot 10 Diagram 26892;Lot 12 Diagram 52677;Lot 53 Diagram 4790; Lot 100 Diagram 7854; Lot 50 Diagram 7928 BYFORD WA 6122
Issue date:	Thursday, 28 January 2016
Commencement date:	Monday, 1 February 2016
Expiry date:	Thursday, 31 January 2019

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER) has decided to issue a works approval. DER considers that in reaching this decision, it has taken into account all relevant considerations.

Decision Document prepared by:	Gargi Joshi Licensing Officer
Decision Document authorised by:	Jonathan Bailes Delegated Officer

Government of **Western Australia**
Department of **Environment Regulation**

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986*. Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

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2 Administrative summary

Administrative details		
Application type	Works Approval ☒ New Licence ☐ Licence amendment ☐ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	41	Not more than 200,000 tonnes per annual period
Application verified Application fee paid	Date: 30 October 2015 Date: 11 November 2015	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes☐ No☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☐ No☒	Referral decision No: Managed under Part V☐ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes☐ No☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☒ No☐ Department of Water consulted Yes ☒ No ☐ The Premises is located within Serpentine Groundwater Area. Cardup Brook, a tributary of Serpentine River, flows through the premises. Fugitive emissions of suspended solids and discharge into the brook from sediment ponds on site are possible. DoW has been consulted.	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒		
Is the Premises subject to any EPP requirements? Yes☐ No☒		

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3 Executive summary of proposal and assessment

Austral Bricks (WA) Pty Ltd (Austral) manufacture clay bricks, pavers, terracotta floor tiles and roof tiles. Cardup Brickworks were previously licensed (L6407/1967/9) under the EP Act. The licence has ceased to have effect and the premises has been under care and maintenance since May 2012. Austral intends to re-start the brick manufacturing process at the site.

The premises is located adjacent to Bush Forever Site No. 271- Cardup Brook Bushland, Cardup/Peel Estate, which is 35.8 hectares in size. Cardup Brook, a minor perennial watercourse which is a tributary of the Serpentine River, runs through the premises (Lot 50 on Diagram 52748) in a north-westerly direction. Several wetlands of varying conservation status are located in the vicinity of the premises. A multiple use category wetland is located adjacent to the activity area and within the premises boundary. A conservation category wetland, associated with a section of the Cardup Brook, is located approximately 410 m to the north-west. The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary.

Key stages in brick manufacturing process involve:

- Clay preparation: raw material (clay) storage, crushing, grinding, blending, addition of water and additives (such as sugar, colour, calcium, textures);
- Extrusion (shaping); and
- Product drying and firing.

Product drying typically uses hot air recovered from the kiln and will be carried out at a maximum temperature of approximately 2100°C. Dryer emissions will be vented to atmosphere through a scrubber. The maximum kiln firing temperature is approximately 1180°C.

This works approval application is for construction and commissioning of a cascade limestone scrubber and commissioning of an existing kiln (Kiln 3) and associated plant equipment on the premises.

Austral is proposing to 'pre-commission' the kiln on natural gas for approximately three months to assist the identification of any issues of concern. Repairs or replacement of worn/faulty/damaged elements in the kiln will be carried out. Once the kiln is brought online and the scrubber installed, the process of full commissioning will commence. At this stage, the operation of the kiln and scrubber will be assessed to ensure optimisation. The commissioning process is expected to take approximately six months. Austral intends to subsequently operate Kiln 3 for 20 years at an expected throughput of 200,000 tonnes of clay products per year.

Key emissions during construction may include noise and dust emissions. Key emissions during commissioning and operation will include emissions to air (hydrogen fluoride, hydrogen chloride, sulphur oxides and other elements naturally present in clay), fugitive emissions to stormwater from raw material (clay) storage areas, emissions to surface water, dust emissions, noise emissions, and potential odour emissions due to shale or organic matter associated with clay that is used in the process.

The works approval includes conditions to manage potential emissions and discharges during construction and commissioning. Austral will be required to submit a compliance document subsequent to completion of construction works and prior to commissioning. Conditions regarding undertaking verification monitoring, noise monitoring and submission of a stormwater management plan have also been included in the works approval.

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4 Decision table

All applications are assessed in line with the *Environmental Protection Act1986*, the *Environmental Protection Regulations 1987*and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number** **W = Works Approval** **L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	W1.2.1	**Construction** DER has assessed the risk of emissions and discharges from the premises based on the information provided in the works approval application document submitted by the proponent and stipulated regulatory controls accordingly. In order to ensure that the proponent undertakes works only as authorised under the works approval, condition 1.2.1 has been added.	Austral Bricks-Cardup Brickworks: Works Approval and Licence Supporting Document, authored by Strategen Environmental Consultants Pty Ltd, dated October 2015
	Licence	See Appendix A- Emissions to stormwater for details of DER's risk assessment and decision making.	
Premises operation	-	**Construction, Commissioning and Operation** No premises specific conditions relating to construction, commissioning or operation have been recommended.	
Emissions general	Licence	Descriptive limits may be set through the licence, and therefore, conditions regarding recording and investigation of exceedances of limits may be included. See *Appendix A-Point source emissions to air* for details of DER's risk assessment and decision making.	N/A
Point source emissions to air including monitoring	-	**Construction** No significant point source emissions to air are expected during construction. No conditions relating to point source emissions to air during construction are specified in the works approval.	Ambient Air Assessment Criteria, National

DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
	W 2.1.1 – W2.1.4	**Commissioning and Operation** See *Appendix A- Point source emissions to air* for details of DER's risk assessment and decision making.	Environmental Protection Measure (Ambient Air Quality) Department of Health internal document (*Acid Gas Criteria, Internal document, Toxicology WA Department of Health*, Shenton Park, WA)
Point source emissions to surface water including monitoring	-	**Construction** No point source emissions to surface water have been proposed during construction. **Commissioning and Operation** Information available on file indicates that stormwater retention basins may discharge to Cardup Brook during periods of heavy rainfall. *See Appendix A – Emissions to surface water* for details of DER's risk assessment and decision making.	-
Point source emissions to groundwater including monitoring	-	**Construction, Commissioning and Operation** No point source emissions to groundwater have been proposed during construction, commissioning or operation.	-

DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Emissions to land including monitoring	-	**Construction, Commissioning and Operation** No point source emissions to land have been proposed during construction, commissioning or operation.	-
Fugitive emissions		**Construction** <u>Emissions Description</u> *Emission:* Fugitive dust emissions associated with construction activities such as earthworks and civil works on site. Construction will involve the installation of the cascade limestone scrubber equipment and repairs or replacement of worn/faulty/damaged elements in the existing kiln on the premises. *Impact:* The nearest residential receptor (a property owned by Austral) is located 234m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary. There is potential for limited impact due to dust emissions during construction. *Control:* No specific controls to manage potential fugitive dust emissions during construction have been proposed. <u>Risk Assessment</u> *Consequence:* Insignificant *Likelihood*: Unlikely *Risk Rating:* Low <u>Regulatory controls</u> General provisions of the EP Act are considered appropriate to manage fugitive emissions during construction. No further works approval conditions are considered necessary. <u>Residual Risk</u> *Consequence:* Insignificant *Likelihood*: Unlikely *Risk Rating:* Low	-

DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		Commissioning and Operation See *Appendix A- Fugitive dust emissions* for details of DER's risk assessment and decision making.	
Odour	-	**Construction** Proposed construction work will involve installation of the cascade limestone scrubber equipment, repairs or replacement of worn/faulty/damaged elements in the existing kiln on the premises. Odour emissions associated with construction activities are not likely. **Commissioning and Operation** Emissions Description *Emission:* Odour emissions during brick manufacturing associated with the use of odour generating raw materials. *Impact:* The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary. Previous Environmental Assessment Report (for licence L6407/1967/8) for the premises noted receipt of odour complaints when molasses was used in the firing processes. There is potential for limited impact during commissioning and operation. *Control:* Austral has committed to substituting molasses with sugars which have a lower odour generation potential. Austral has committed not to store or process any material that has the potential to generate unreasonable odours. Risk Assessment *Consequence:* Minor *Likelihood*: Possible *Risk Rating:* Moderate	Environmental Assessment Report for previous licence L6407/1967/8 for Cardup brickworks, dated 2009

DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<u>Regulatory controls</u> General provisions of the EP Act are considered appropriate to manage odour emissions. <u>Residual Risk</u> *Consequence:* Minor *Likelihood*: Unlikely *Risk Rating:* Moderate	
Noise	-	**Construction** <u>Emissions Description</u> *Emission:* Noise emissions associated with construction activities such as earthworks and civil works on site. Construction will involve the installation of the cascade limestone scrubber equipment, repairs or replacement of worn/faulty/damaged elements in the existing kiln on the premises. *Impact:* The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary. There is potential for limited impact due to noise emissions during construction. *Control:* No specific controls to manage potential noise emissions during construction have been proposed. <u>Risk Assessment</u> *Consequence:* Insignificant *Likelihood*: Unlikely *Risk Rating:* Low	*Environmental Protection (Noise) Regulations 1997*

DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
	4.1.5	<u>Regulatory controls</u> The *Environmental Protection (Noise) Regulations 1997* are considered appropriate to manage noise emissions during construction. No further works approval conditions are considered necessary. <u>Residual Risk</u> *Consequence:* Insignificant *Likelihood*: Unlikely *Risk Rating:* Low **Commissioning and Operation** See *Appendix A- Noise emissions* for details of DER's risk assessment and decision making.	
Monitoring general	W2.1.1- 2.1.4 Licence	**Construction and Commissioning** See *Appendix A-Point Source Emissions to Air including Monitoring* for details of DER's risk assessment and decision making. **Operation** This Decision Document recommends inclusion of point source air emission limits on a licence should Austral seek a licence for ongoing operations. General monitoring conditions may be included in the licence requiring investigation of any limit exceedance. See *Appendix A- Emissions to Air* for details of DER's risk assessment and decision making.	-
Monitoring of inputs and outputs	-	**Construction, Commissioning and Operation** No conditions relating to monitoring of inputs and outputs have been specified in the works approval or are recommended to be added to the licence.	-

DECISION TABLE

Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Process monitoring	-	**Construction, Commissioning and Operation** See *Appendix A- Emissions to air (abnormal operations)* for proposed regulatory controls for management of scrubber bypass events.	-
Ambient quality monitoring	-	**Construction, Commissioning and Operation** No conditions relating to ambient monitoring have been specified in the works approval or are recommended to be added to the licence.	-
Meteorological monitoring	-	**Construction, Commissioning and Operation** No conditions relating to meteorological monitoring have been specified in the works approval or are recommended to be added to the licence.	-
Improvements	IR1 IR2	Austral is proposing to commission Kiln 3 and the cascade limestone scrubber. IR1 requires submission of commissioning plan. See Appendix A- Emissions to air for details. *See Appendix A- Emissions to stormwater and Emissions to Surface water* for details.	-
Information	W4.1.1-4.1.2 W4.1.3-4.1.5	**Construction** Condition W4.1.1 has been added requiring submission of a compliance document following construction and prior to commissioning. Condition W4.1.2 specifies information and authorisation requirements for a compliance document to be submitted. **Commissioning** Condition 4.1.3 requires submission of an Emissions Verification Report. Condition 4.1.4 details information requirements for the Emissions Verification Report. Condition 4.1.5 requires submission of Noise Emissions Assessment Report. See Noise emissions section of this document for details of DER's risk assessment and decision making.	
Works approval Duration	-	The works approval has been granted for three years duration.	

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
23/11/2015	Application advertised in West Australian (or other relevant newspaper)	No comments received.	Not applicable.
23/11/2015	Application referred to Shire of Serpentine Jarrahdale	No comments received.	Not applicable.
27/11/2015	Application referred to Department of Water (DoW)	DoW's advice recommends that a Stormwater Management Plan should be prepared and implemented with advice from DoW. DOW's advice notes that the Plan should show how runoff within and from the site will be managed to ensure that turbidity and pollutants are appropriately managed prior to stormwater discharging to Cardup Brook. • Runoff from disturbed areas should pass through settling pits designed and maintained to provide storage for a minimum of 2 hours runoff resulting from a 10 years average return interval (ARI) storm event; • Bunding used to control potential spills around facilities such as fuel storage should be designed and maintained to provide storage for a 20 year 72 hours ARI storm event plus 110% of tank contents; • Runoff upto the 10 year 2 hour ARI storm event from disturbed areas should be managed to prevent mobilisation of sediments; • Runoff from undisturbed areas should be diverted away from disturbed areas.	A Stormwater Management Plan is required through conditions of works approval. DER will consult with DoW once the proponent submits the stormwater management plan. Austral Bricks should consider DoW recommendations.
7/01/ 2016	Proponent sent a copy of draft instrument	Comments received on 14/1/16 regarding duration of commissioning, monitoring regimen during commissioning, and emission limits during commissioning.	Comments considered and updated draft was sent to proponent on 20/01/16. Proponent confirmed acceptance of proposed condition on 21/01/16.

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6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

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Appendix A

Emissions to surface water

Construction
Emission Description

Emission: Stormwater runoff from manufacturing area containing elevated concentrations of suspended solids, entering Cardup Brook. The Proponent has indicated that clay stocks will be replenished during the cartage season to ensure a sufficient supply for commissioning and impending operation of the site.

Impact: Cardup Brook, a tributary of Serpentine River, flows through the premises. Stormwater flows in the direction of the brook. The release of contaminated or potentially contaminated stormwater, including higher suspended solids and hydrocarbons, into the Brook may impact surface water quality and potentially affect aquatic ecosystem health. There is potential for short-term localised impact.

Control: Construction activities will include installation of the cascade limestone scrubber and repair and maintenance of the existing Kiln 3 on the premises.

The Proponent has committed to developing a Stormwater Management Plan and Hydrocarbon Management Plan.

Risk Assessment
Consoquence: Minor
Likelihood: Possible
Risk: Moderate

Regulatory controls
Potential emissions to stormwater during construction can be managed under general provisions of the *Environmental Protection Act 1986* (EP Act) and *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

Residual Risk
Consequence: Minor
Likelihood: Possible
Risk: Moderate

Commissioning and Operation
Emission Description

Emission: Discharge of stormwater runoff with elevated suspended solids or hydrocarbon concentration to Cardup Brook. Raw material (clay) stockpile areas, by-product/ waste stockpile areas, and unsealed trafficable areas can contaminate stormwater runoff with suspended solids.

Impact: Cardup Brook, a tributary of Serpentine River, flows through the premises. The previous assessment noted that the screening, crushing and clay storage area is located within 100 metres to the north of the Brook. There is also clay storage to the south of the brook. The premises has had a history of incidents where activities onsite have led to sediment discharge into the Cardup Brook during wet weather periods. The release of contaminated or potentially contaminated stormwater, including elevated levels of suspended solids and hydrocarbons, into the Brook may impact surface water quality and potentially affect aquatic ecosystem health.

Past records indicate that the Department of Environment Conservation had consulted with the proponent for improving stormwater management practices at the premises.

Review of the report titled *'Stormwater Discharge Assessment Report, Austral Bricks- Cardup Main pit'*, numbered *AUBCAR01-Rev 0, March 2011, authored by Coterra Environment* (referred to as the *Coterra Report* hereafter) identifies that the manufacturing area could be the major source of the TSS loading to Cardup Brook.

The *Coterra Report* reviewed stormwater management practices in the excavation area (not a prescribed activity) and the manufacturing area. The *Coterra Report* noted the following with regards to stormwater containment infrastructure in the manufacturing area:

- The manufacturing area discharges via four points to Cardup Brook. Catchment 6, 7 and 8 discharge via drainage channels D5 and 6, while catchment 10 discharges via V-notch weirs V1 and V2.
- Stormwater from drain D5, which collects from the western side of the manufacturing area, was discharging fairly regularly during the winter months. This contributed towards 2-5% of the Cardup flow and on certain occasions accounted for higher TSS concentrations at the exit location of Cardup Brook;
- Drainage channels within these catchments act mainly as a conveyance system. Further filtration and treatment could be achieved in these drains by planting the channels with appropriate vegetation prior to discharge.
- Settlement Basin B8 is largely undefined and does not currently offer much retention capacity;
- Catchment 9 currently drains offsite via a small drainage channel;
- V-notch weirs V1 and V2 that discharge into Cardup Brook were not performing as effectively as designed.

The *Coterra Report* had recommended a number of improvement options including vegetation of conveyance drains, re-contouring and definition of stormwater detention basins, and improving sediment retention efficiency using techniques including the use of flocculants. As part of the works approval application, the proponent has not demonstrated that deficiencies in stormwater infrastructure at the premises as identified in the *Coterra Report* have been addressed.

There is potential for alteration of the environment and localised impact if stormwater discharge from the premises is not appropriately managed.

Control: The proponent has indicated that existing stormwater collection infrastructure at the premises includes three smaller interconnected ponds, located south of the clay store shed, a drainage channel connected to two sediment pond located to the west of the yard and storage area and three ponds located west of the clay store shed.

The *Coterra Report* had identified deficiencies in retention capacity of existing stormwater basins on the premises and recommended improvements.
As part of the works approval application, the proponent has not demonstrated that deficiencies in stormwater infrastructure at the premises as identified in the *Coterra Report* have been addressed. See Appendix B for a map of stormwater infrastructure as included in the *Coterra Report*.

The proponent has committed that:

- A stormwater management plan will be prepared;

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- the capacity of each of the ponds will be monitored each day rain is forecast and maintained to ensure sufficient capacity. Weather conditions will be monitored daily using on-line weather forecasts;
- portable pumps will be used to pump water into the large pond or water tanks;
- uncontaminated stormwater from rooftops and sealed discharged into Cardup Brook will flow through series of v-notch weirs to reduce the risk of erosion and turbid water discharges;
- All waste intended for offsite disposal will be stored in an appropriate receptacle such as skip bins, bulk bags, wheelie bins and three-sided bins;
- Waste management contractors will be employed to deliver solid waste that is not suitable for onsite re-use to the applicable waste-disposal facility; and
- Reject bricks known as "grog" will be stored in stockpiles, free of contaminants such as plastic straps. The grog will be used in the brick making process.

No specific controls regarding the frequency of discharge into Cardup Brook or to monitor or minimise suspended solids load that may be discharged to the brook have been proposed.

Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk: Moderate

Regulatory controls

Review of *Coterra Report* for Cardup Brickworks has identified deficiencies in existing stormwater containment infrastructure at the site. This may be significant during operation stage.

The proponent has not demonstrated the adequacy of existing stormwater collection and drainage infrastructure on the premises. Information including design capacity of existing ponds on the premises to accommodate expected storm events (10 year ARI), design freeboard that will be maintained during normal operations, proposed monitoring regimen or methodology to determine potential impact of premises operations and discharges from the premises on surface water quality of the Cardup Brook has not been provided.

IR2 has been included in the works approval requiring the proponent to submit a Stormwater Management Plan, which reviews stormwater management measures on the premises, containment capacity of stormwater infrastructure and identifies potential impacts on surface water quality where discharge to Cardup Brook is proposed.

DER will review the Stormwater Management Plan and consider whether regulatory controls are required to manage potential impacts during operations.

Hydrocarbon Storage on the premises, at current storage volumes, is not a prescribed activity. Potential unauthorised emissions from hydrocarbon storage can be managed under general provisions of the EP Act.

Residual Risk
Consequence: Moderate
Likelihood: Possible
Risk: Moderate

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Point source emissions to air including monitoring

Key emissions associated with brick manufacturing include hydrogen fluoride (HF), hydrogen chloride (HCl), sulphur dioxide (SO_2), nitrogen oxide (NOx), carbon monoxide (CO) and particulates (PM).

Austral is proposing to install a cascade limestone scrubber to reduce potential air emissions from the kiln stack. Austral have undertaken air emissions modelling for key parameters listed above using emission rates data from Cardup's previous operations and the expected reduction from the scrubber proposed to be installed through this works approval.

The predicted Ground Level Concentrations (GLCs) for these emission rates and other parameters of
interest are shown in Table 1. The modelling study has assumed background concentrations of these pollutants not to be significantly contributing to the air shed at Cardup given the paucity of industry in the area.

Table 1: Modelled ground level concentrations for key air emission parameters

Parameter	Guideline (µg/m³ and averaging time)[a]	Highest concentration on the modelling grid (µg/m³ and averaging time)	Percentage of guideline
HF with scrubber	100, 1 hour	7.5, 1 hour	7.5%
HF scrubber in bypass	*100, 1 hour*	*41.5, 1 hour*	*41.5%*
HCl	100, 1 hour	66, 1 hour	66%
NO_2	246, 1 hour	7, 1 hour	2.8%
	61.6, annual	0.06, annual	0.01%
SO_2	571.8, 1 hour	8.8, 1 hour	1.5%
	228.7, 24 hour	1.3, 24 hour	0.6%
	57.2, annual	0.07, annual	0.1%
CO	11 249, 8 hour	10, 8 hour	0.1%
PM_{10}	50, 24 hour	0.3, 24 hour	0.6%
$PM_{2.5}$	25, 24 hour	5.2, 24 hour	21%
	8, annual	0.3, annual	3.8%

a. all standards from the NEPM (NEPC 2003) except HF and HCl which are the WA health guidelines for acid gases (DoH 2007)

The WA Health Guideline (2007) concentrations referenced by Austral are based on a Department of Health internal document (*Acid Gas Criteria, Internal document, Toxicology WA Department of Health*, Shenton Park, WA) which has been previously referenced in other air quality assessments submitted to DER. The air emissions modelling data submitted by Austral has been reviewed by DER's air quality technical experts and modelled results deemed acceptable.

The contribution of other smaller emission points, such as dryer vents, to emissions to air, has not been included in the air emissions modelling assessment. These emissions are not treated through the scrubber. During normal operations, emissions from dryer vents are not expected to be significant. A condition has been added to the works approval requiring dryer vent monitoring during commissioning to validate this assumption.

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Commissioning and normal operation

Emission Description – Nitrogen oxide (NOx) and Carbon monoxide (CO)
Commissioning will be undertaken in two stages. Pre-commissioning the kiln using natural gas for approximately three months and full commissioning of the kiln for approximately three months once scrubber installation is complete.

Emission: Emissions to air during pre-commissioning will include natural gas combustion products (NOx, CO).

Impact: Key environmental impacts associated with NO_2 emissions arise due to their potential photochemical activity. Nitrogen oxides and sulphur dioxide are also known irritant gases. CO above recommended criteria can be toxic.

Air emissions modelling assessment shows that NO_2 emissions are not likely to exceed 2.8% of the NEPM (1 hour) guideline and CO emissions are not likely to exceed 0.1% of the NEPM (8 hour) guideline during normal operations. Air emissions modelling data indicates that NOx and CO emissions during normal operations are not likely to cause significant localised impact during operations.

No estimation of potential NOx and CO stack concentrations during commissioning has been provided. However, given the short duration of commissioning and based on the fact that no significant concerns relating to NOx or CO emissions have been based on previous operations on the site, potential impact during commissioning are not expected to be significant.

Control: No specific end of pipe controls has been proposed. A complaints register will be implemented.

Risk Assessment
Consequence: Insignificant
Likelihood: Likely
Risk: Moderate

Regulatory controls

Condition 1.2.2 and 1.2.3 limit duration for which commissioning can be undertaken. Condition 2.1.2 requires point source air emissions monitoring. Condition 2.1.3 requires that sampling is undertaken in accordance with AS 4323.1. Condition 2.1.4 requires that point source emissions sampling and analysis is undertaken using NATA accredited laboratory and in accordance with the test methods specified.

Improvement requirement IR1 has been added requiring submission of commissioning plan. Upon completion of commissioning, Austral will be required to submit to the CEO an Emissions Verification Report that would include analysis results and copies of monitoring reports. DER will review the results presented in the Emissions Verification Report. Should Austral seek a licence to operate, the following conditions may be specified in the licence to manage point source emissions to air:

- Conditions requiring ongoing monitoring for NO_x and CO;
- Recordkeeping and reporting requirements for submission of Annual Environmental Report and Annual Audit Compliance Report;
- Notification requirements for scrubber bypass events;
- Recordkeeping requirements for bypass start and end time, and investigation into root cause and preventative measures.

Risk Assessment
Consequence: Insignificant
Likelihood: Likely
Risk: Moderate

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Commissioning

Emission Description – Acid gases

Emissions: Emissions to air during commissioning will include acid gas emissions (HF, HCl and SO_2) from the kiln stack.

Impact: Key environmental impacts associated with acid gas emissions include the potential for leaf burn to vegetation and irritation to humans. HF can impact on vegetation health at low concentrations.

Australian and New Zealand Environment Council's report on National Goals for fluoride in ambient air and forage, March 1990 notes that investigations on native species under experimental conditions have identified that a three-month average exposure of 0.5μg/m^3 would result in little significant visible injury. The report, however, identifies that Australian native plant species including *Acacia saligna, Eucalyptus citriodora, Eucalyptus tessellaris and Xanthorrhoea preissii* may be impacted at ambient HF concentrations of 0.6 μg/m^3 and above.

The premises is located adjacent to Bush Forever Site No. 271- Cardup Brook Bushland, Cardup/Peel Estate, which is 35.8 hectares in size. Several wetlands of varying conservation status are located in the vicinity of the Brickworks. A multiple use category wetland is located adjacent to the activity area and within the premises boundary. A conservation category wetland, associated with a section of the Cardup Brook, is located approximately 410 m to the north-west.

The report titled *'Vegetation health Survey at Cardup, WA, 12 January 2005, Austral Bricks Limited', authored by D.Doley dated February 2005* notes that visible injury attributable to fluoride emissions from Cardup brickworks appeared to be contained within the Austral Bricks property. The extent and patterns of distribution of visible injury to plant species is consistent with prevailing wind directions during summer growing season. The Report notes evidence of visible injury to vegetation north-east of the brickworks. The report notes that structural elements of vegetation on the north-west of the premises do not appear to be at risk and that south-east portion of the Bush Forever reserve appeared to be in a reasonable condition, however, recommended that long-term management plan is in place to ensure the Reserve continues to meet its objectives.

Acid gases can interact in the atmosphere to form fine sulphate and nitrate particles that can be transported by the wind and have the potential to impact human health when inhaled. The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary.

Air emissions modelling information submitted by Austral indicates that during operations, HCl emissions are likely to be 66% of the DoH-2007 (1 hour) ambient air quality criteria referenced by the proponent, SO_2 emissions are likely to be 1.5% of the NEPM (1 hour) criteria and HF emissions are likely to be 41.5% of the DoH-2007 criteria during worst case scenario. Once the stable scrubber performance is achieved, HF emissions are likely to be 7.5% of the DoH criteria. Given the short duration of commissioning, potential impacts are likely to be localised.

Control: A cascade limestone scrubber will be installed and operational during commissioning. The scrubber may not operate at its design specifications for the whole duration of commissioning. HCl and SO_2 removal efficiency of the cascade limestone scrubber, during normal operations, is minimal. Accordingly, during commissioning, the HCl and SO_2 emissions profile is not expected to be significantly different to those from normal operations. HF emissions may be higher until stable scrubber performance is achieved.

Austral has committed to undertake air quality monitoring during commissioning. Preliminary vegetation monitoring will be undertaken to establish the baseline. A complaints register will be implemented.

Risk Assessment
Consequence: Minor
Likelihood: Likely
Risk: Moderate

Regulatory controls

Condition 2.1.2 requires point source air emissions monitoring. Condition 2.1.3 requires that sampling is undertaken in accordance with AS 4323.1. Condition 2.1.4 requires that point source emissions sampling and analysis is undertaken using NATA accredited laboratory and in accordance with the test methods specified.

Condition 1.2 limits duration for which commissioning can be undertaken.

Improvement requirement IR1 has been added requiring submission of commissioning plan. Upon completion of commissioning, Austral will be required to submit to the CEO a commissioning report that would include analysis results and copies of monitoring reports. The point source emissions monitoring results will also be used to verify modelling assumptions and will be considered in assessing potential impacts of operations.

Residual Risk
Consequence: Minor
Likelihood: Likely
Risk: Moderate

Normal Operation – Considered to be when cascade limestone scrubber is operational

Emission Description

Emission: Acid gas emissions (HF, HCl and SO_2) from kiln stack.

Impact: Key environmental impacts associated with acid gas emissions include potential for potential for leaf burn and irritation to humans. HF even at low concentrations can impact on vegetation health. Acid gases can interact in the atmosphere to form fine sulphate and nitrate particles that can be transported by the wind and have the potential to impact human health when inhaled.

The premises is located adjacent to Bush Forever Site No. 271- Cardup Brook Bushland, Cardup/Peel Estate, which is 35.8 hectares in size. Several wetlands of varying conservation status are located in the vicinity of the Brickworks. A multiple use category wetland is located adjacent to the activity area and within the premises boundary. A conservation category wetland, associated with a section of the Cardup Brook, is located approximately 410 m to the north-west.

The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary.

Modelling contours included in the air emissions modelling assessment show that the highest concentrations can be expected to the east of the kiln. This area contains farmland and some remnant bushland, leading to the potential for vegetation to be affected by emissions, particularly HF emissions.

Air emissions modelling information submitted by Austral indicates that during normal operations, HCl emissions are likely to be 66% of the DoH-2007 (1 hour) ambient air quality criteria, SO_2 emissions are likely to be 1.5% of the NEPM (1 hour) criteria and HF emissions are likely to be 7.5% of DoH-2007 criteria.

There is potential for localised impact on vegetation health and potential for alteration of the environment.

Control: The cascade limestone scrubber to be installed is estimated to achieve 82% reduction in HF, 12% reduction in HCl and 20% reduction in SO_2 concentrations.

Austral has indicated that acid gas emission rates as below can be achieved during normal operations of the scrubber.

- HF 1 g/s (or 130 mg/m^3 at 18% O_2);
- HCl 200 mg/m^3 at 18% O_2; and
- SO_2 200 mg/m^3 at 18% O_2.

The proposed scrubber technology is similar to the one used at Austral's Armadale operations. Austral Bricks proposes to monitor its acid gas emissions quarterly, consistent with all the other brick manufacturing premises in Western Australia.

During the first year of operation, monthly monitoring of surrounding vegetation within the potential impact zone will be undertaken. Austral has indicated that this check would include searching for signs of vegetation degradation (such as marginal necrosis) as outlined in the Australian and New Zealand Environment Council (ANZECC) guideline, National Goals for Fluoride in Ambient Air and Forage (ANZECC 1990).

Austral has indicated that it has not identified evidence of offsite vegetation degradation in the area that could be attributed to previous brickmaking operations at Cardup.

Risk Assessment
Consequence: Minor
Likelihood: Likely
Risk: Moderate

Regulatory controls

Scrubber efficiency can be dependent on a number of parameters including the availability of appropriate quantities of limestone, operating temperature, etc. Considering the proximity of receptors and given the potential ground level concentrations of acid gas emissions (based on air emissions modelling data provided) ongoing stack emissions monitoring for acid gases is considered appropriate.

Should Austral seek a licence to operate, the following conditions may be specified in the licence to manage point source emissions to air:

- Emission limits for HF, HCl and sulphur oxides;
- Conditions requiring quarterly monitoring for acid gases;
- Recordkeeping and reporting requirements for submission of Annual Environmental Report and Annual Audit Compliance Report;
- Notification requirements for scrubber bypass events;
- Recordkeeping requirements for bypass start and end time, investigation into root cause and preventative measures

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The contribution of other smaller emission points, such as dryer vents, to emissions to air, has not been included in the air emissions modelling assessment. These emissions are not treated through the scrubber. During normal operations, emissions from dryer vents are not expected to be significant. The condition has been added to the works approval requiring dryer vent monitoring during commissioning to verify this assumption.

DER will re-assess potential risks during operation once monitoring results from commissioning are available. Reporting mechanisms such as National Pollutant Inventory could be considered to review reported emissions from dryer vents.

Residual Risk
Consequence: Minor
Likelihood: Likely
Risk: Moderate

Emission Description – Abnormal Operation (Scrubber failure/ Bypass)

Apart from the unexpected failure of abatement, the scrubber may need to be bypassed for plant maintenance, operational or safety reasons. Scrubber will be bypassed during start-up events.

Emission: HF, HCl and SO_2 emissions from kiln stack.

Impact: Key environmental impacts associated with acid gas emissions include potential for potential for leaf burn and irritation to humans. HF even at low concentrations can impact on vegetation health.

The premises is located adjacent to Bush Forever Site No. 271- Cardup Brook Bushland, Cardup/Peel Estate, which is 35.8 hectares in size. Several wetlands of varying conservation status are located in the vicinity of the Brickworks. A multiple use category wetland is located adjacent to the activity area and within the premises boundary. A conservation category wetland, associated with a section of the Cardup Brook, is located approximately 410 m to the north-west.

The report titled *'Vegetation health Survey at Cardup, WA, 12 January 2005, Austral Bricks Limited', authored by D.Doley dated and February 2005* notes that visible injury attributable to fluoride emissions from Cardup brickworks appeared to be contained within the Austral Bricks property. The extent and patterns of distribution of visible injury to plant species is consistent with prevailing wind directions during summer growing season. The Report notes evidence of visible injury to vegetation north-east of the brickworks. The report notes that structural elements of vegetation on the north-west of the premises do not appear to be at risk and that south-east portion of the Bush Forever reserve appeared to be in a reasonable condition, however, recommended that long-term management plan is in place to ensure the Reserve continues to meet its objectives.

The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary.

Air emissions modelling information submitted by Austral indicates that during normal operations, HCl emissions are likely to be 66% of the NEPM (1 hour) ambient air quality criteria, SO_2 emissions are likely to be 1.5% of the NEPM (1 hour) criteria and HF emissions (with no end of pipe control) are likely to be 41.5% of the HF criteria.

HCl and SO_2 removal efficiency of the cascade limestone scrubber, during normal operations, is minimal. Accordingly, during scrubber bypass events, HCl and SO_2

emissions profile is not expected to be significantly different to those from normal operations.

Modelling contours included in the air emissions modelling assessment show that the highest HF concentrations can be expected to the east of the kiln. This area contains farmland and some remnant bushland, leading to the potential for vegetation to be affected by emissions, particularly HF emissions.

There is potential for localised impact on vegetation health and potential for alteration of the environment.

Control: Bypass events will be managed by reducing the push rate (amount of cars containing bricks fired in the kiln). Austral has indicated that the push rate can be slowed within approximately 30 minutes of the bypass occurring. Austral has indicated that stopping the production is not feasible due to the potential for damage to kiln structure and burners.

Austral has indicated that the push rate calculation derived from the *National Pollution Inventory (NPI) Emission Estimation Technique Manual for Bricks, Ceramics, and Clay Product Manufacturing,* (NPI 1998) will be used.

Risk Assessment
Consequence: Minor
Likelihood: Likely
Risk: Moderate

Regulatory controls

Should Austral seek a licence to operate, following conditions may be added to manage potential emissions during abnormal operations:

- The requirement that Austral takes relevant measures to ensure HF limits on the licence are not exceeded. This may include reducing the push rate during bypass events;
- Notification requirement when a scrubber bypass event occurs for 30 minutes or more;
- Requirement to investigate scrubber bypass events and report details through Annual Environmental Report including information on date, time, duration, reason for by-pass, action taken, estimation of quantity of each contaminant that may have been emitted (concentration and mass flow rate); and
- Notification requirement for potential breach of licence limit.

Austral has indicated that the cascade limestone scrubber has been chosen due to its reliability and as such bypass events are expected to be rare.

Once the premises is in operation, scrubber bypass events frequency and duration will be monitored and implications considered in determining the appropriateness of regulatory controls.

Residual Risk
Consequence: Minor
Likelihood: Likely
Risk: Moderate

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Emission Description – Normal Operation

Emission: Particulate emissions (PM_{10} and $PM_{2.5}$) from kiln stack when scrubber is operational. The application document states that particulate emissions from the cascade limestone scrubber are not likely to be significant. However, the performance data submitted by Austral indicates that particulate emission concentrations from the existing scrubber stack are higher than the inlet concentrations. PM emissions exiting the cascade limestone scrubber are likely to be lime particles.

Table 2: Cascade limestone scrubber inlet and outlet concentrations data submitted by Austral

Atmospheric Contaminant	Concentration (mg/Nm³)		Mass Rate (g/min)		Removal Efficiency (%)
	Inlet	Outlet	Inlet	Outlet	
Carbon monoxide	419	419	622	622	NA
Total nitrogen oxides (as NO_2)	52	52	77	77	NA
Fluorine compounds (as HF)	170	30	252	45	82
Total sulphur oxides (as SO_2)	44	35	65	52	20
Chlorine compounds (as HCl)	239	210	355	312	12
Total solid particulate matter	4	50	6	74	NA

Note: NA - Not applicable

Impact: Lime is known to be corrosive and an irritant to eyes and when inhaled. The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary.

Air emissions modelling assessment shows that during normal operations, ground level concentrations of PM_{10} concentrations are likely to be 0.6% of the NEPM (8 hour) Guidelines and $PM_{2.5}$ emissions are likely to be 21% of the NEPM (8 hour) Guidelines. There is potential for localised impact, minor reversible health effects and potential local complaints.

Control: No specific controls for PM emissions have been proposed. Reliance on the cascade limestone scrubber operating in accordance with the design specifications is the only control.

Risk Assessment

Consequence: Insignificant
Likelihood: Likely
Risk: Moderate

Regulatory controls

Should Austral seek a licence to operate, following conditions may be specified in the licence to manage point source emissions to air:

- Quarterly monitoring of particulates;
- Conditions specifying that sampling and analysis are undertaken by a NATA accredited laboratory;
- Recordkeeping and reporting requirements; and
- The requirement to implement a complaints management system.

Residual Risk

Consequence: Insignificant
Likelihood: Likely
Risk: Moderate

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Fugitive Dust Emissions
Fugitive dust emissions are expected from raw material handling, storage activities on the premises. The activity of clay extraction is not a prescribed activity and is not included within the premises boundary.

Commissioning and Operation
Emission Description

Emission: Fugitive dust (particulate) emissions from clay stockpiles and truck movements on haul roads. Dust emissions from clay stockpiles, trafficable areas, machinery and conveyors.

Impact: Potential for dust deposition on vegetation. Fugitive dust emissions have the potential to cause respiratory issues. The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary

Austral has undertaken dust emissions modelling using a conservative estimation of truck movements (5 trucks per hour, 10 hours per day which is the largest expected material movement in a month). The results indicate that PM_{10} concentrations at receptors, in worst case scenario, are likely to be 53.4% of the NEPM Guideline (50µg/m3, 24-hour average). There is potential for localised impact and local concern if fugitive dust emissions are not appropriately managed.

Control: Dust management measures to be employed at the site will include:

- watering stockpiles using water carts;
- all conveyors will be covered;
- all transfer points will be enclosed;
- a roll crusher will be used as the primary crushing unit, low dust generating technology;
- grinding/clay preparation sheds will be enclosed with shade cloth walls
- crushing screens will include curtains and will be enclosed;
- a mechanical sweeper will regularly be used for sweeping the plant;
- all kiln cars will be swept or vacuumed;
- areas associated with brick manufacturing that are not under cover will be watered using water carts and swept regularly. Exposed areas will be covered with crushed aggregate;
- a wet-type street sweeper and water cart would be used on site to reduce potential dust impacts on Kiln Road.

Risk Assessment
Consequence: Minor
Likelihood: Unlikely
Risk: Moderate

Regulatory Controls
Unauthorised dust emissions from the premises during construction, commissioning and operation can be managed under general provisions of the EP Act. Should Austral seek a licence to operate, conditions requiring implementation of dust management procedures, stockpile management and implementation of complaint register may be specified.

Risk Assessment
Consequence: Minor
Likelihood: Unlikely
Risk: Moderate

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Noise emissions

Commissioning and Operation

Emission: Noise emissions associated with the operation of the plant and machinery.

Impact: Noise emissions can cause nuisance and potential health impacts if not appropriately managed.

The nearest residential receptor (a property owned by Austral) is located 234 m from the premises boundary. Another residential receptor (a privately owned property) is located 400m from the premises boundary. A search of DER's complaints management system did not identify noise complaints associated with previous operations of Cardup brickworks.

The application document does not include data to ascertain potential noise emissions during commissioning and operation. Austral has indicated that predictive modelling is not considered appropriate for the site as standard power levels might not be representative of the machinery on site, given the age of the plant.

Considering the proximity of receptors, localised impact and potential breach of legal requirements may occur during commissioning and operation if noise emissions from the premises are not appropriately managed.

Control: Noise monitoring will be undertaken during commissioning to ascertain noise emission levels at receptors.

Austral has committed that noise mitigation strategies will be investigated should noise monitoring identify any issues or noise equipment/ plant components. Any vehicle fitted with reversing beepers that have the potential to exceed noise regulation limits will be retrofitted with broadband or visual alarms. All machinery will be kept in good working order.

Risk Assessment
Consequence: Minor
Likelihood: Possible
Risk: Moderate

Regulatory Controls

Condition 4.1.5 has been added to the works approval requiring Austral to submit a noise emissions assessment report demonstrating compliance with *Environmental Protection (Noise) Regulations 1997*, identifying any improvements required and timeframes for completion of any improvements identified.

DER will consider the outcome of the noise emissions assessment in future licensing decisions to determine whether any improvements are warranted at the premises. The Premises will be required to comply with the EP (Noise) Regulations 1997. Should Austral seek a licence to operate, a condition requiring Austral to implement a complaints management system may be included.

Residual Risk
Consequence: Minor
Likelihood: Possible
Risk: Moderate

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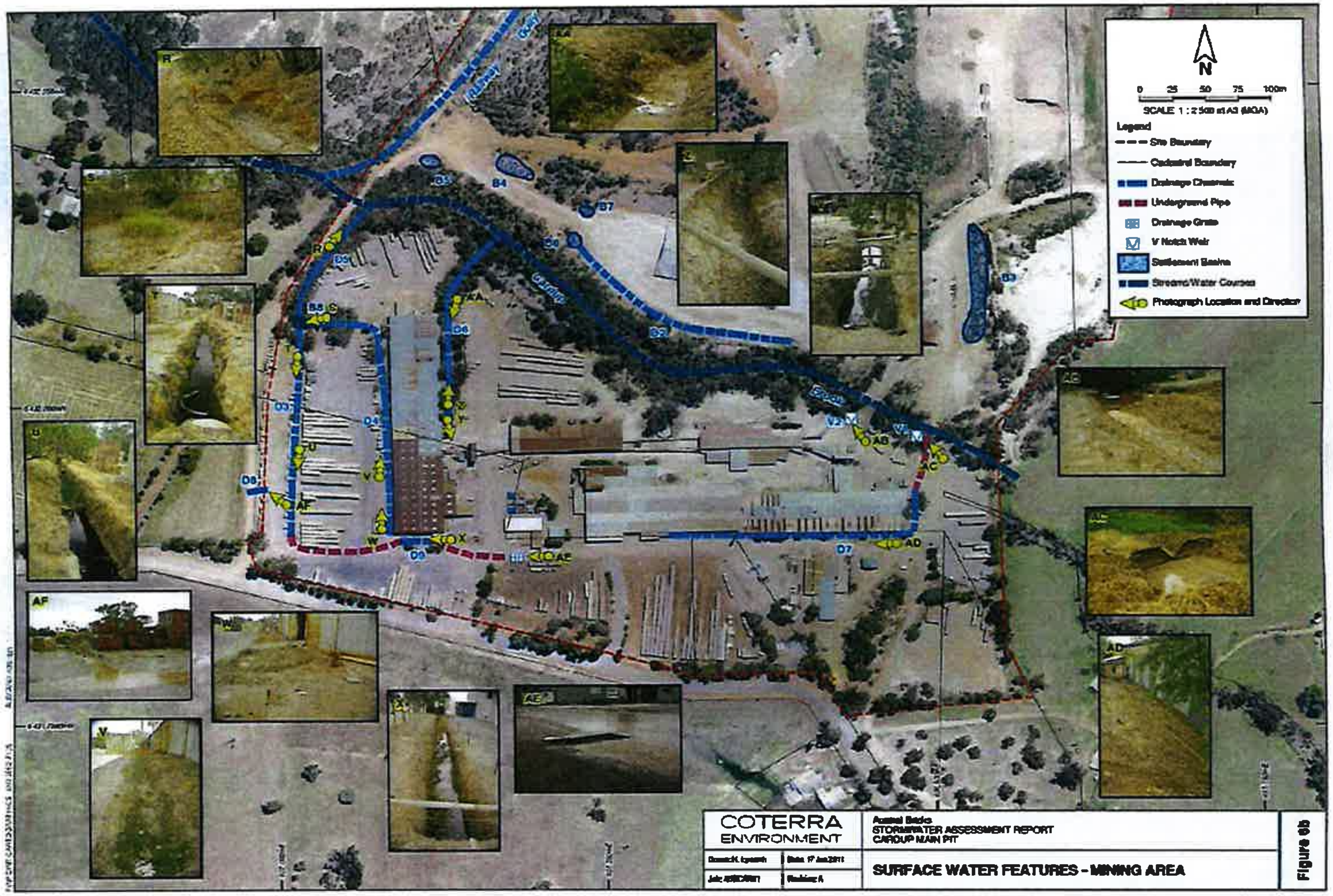
Appendix B – Map of stormwater infrastructure at Cardup brickworks



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Appendix B- Location of Bush forever site- 271 within premises boundary- Cardup brickworks

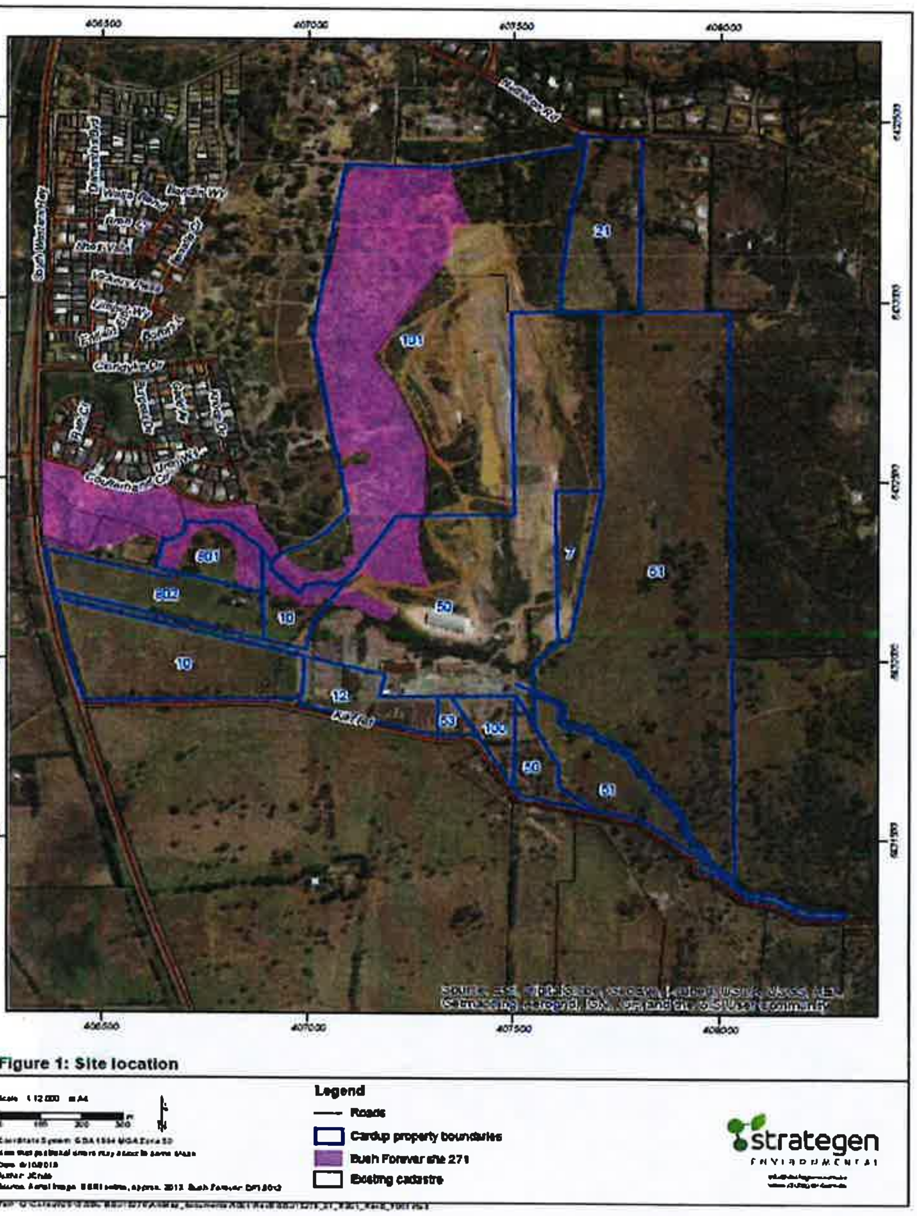

Figure 1: Site location

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Your ref:	W5925/2015/1
Our ref:	DER2015/002438
Enquiries:	Manager Licensing Process Industries
Phone:	9724 6135
Email:	info@der.wa.gov.au

Ms Tanya Gilders
WA Environmental Manager
Austral Bricks (WA) Pty Ltd
Locked Bag 100
MIDLAND WA 6936

Via email: tanya.gilders@brickworks.com.au

Dear Ms Gilders,

APPLICATION FOR AN AMENDMENT TO WORKS APPROVAL W5925/2015/1 UNDER THE *ENVIRONMENTAL PROTECTION ACT 1986* – NOTICE OF DECISION TO GRANT

I refer to your application for an amendment to works approval W5925/2015/1 received on 12 May 2017 relating to extending the commissioning period at the Cardup Brickworks, Byford, WA 6122.

As set out in our letter to you dated 6 June 2017, the Department of Environment Regulation considered your application in detail, including undertaking a risk assessment, and provided a preliminary recommendation that I grant the works approval amendment sought under section 59 of the *Environmental Protection Act 1986* (EP Act). After considering the representations you provided on 12 June 2017, I have decided to grant the works approval amendment subject to the condition in the attached amendment notice. The attached amendment notice sets out the reasons for my decision.

In accordance with section *for amendments* - 102(2) of the EP Act, if you are aggrieved by my decision to amend the works approval you may lodge an appeal with the Minister for Environment in writing, setting out the grounds of that appeal, within 21 days of this notification. Should you wish to lodge an appeal, please contact the Office of the Appeals Convenor on 6567 5190 or by email at admin@appealsconvenor.wa.gov.au.

If you have any queries regarding the above information, please contact Manager Licensing as listed above.

Yours sincerely

Caron Goodbourn
ACTING MANAGER LICENSING – PROCESS INDUSTRIES
LICENSING AND APPROVALS

Officer delegated under Section 20 of the Environmental Protection Act 1986

14 June 2017

Att: Amendment Notice 1

The Atrium, 168 St Georges Terrace, Perth WA 6000
Postal address: Locked Bag 33, Cloisters Square, Western Australia 6850
Phone: (08) 6467 5000 Fax (08) 6467 5562
www.der.wa.gov.au

Government of Western Australia
Department of Environment Regulation

Amendment Notice 1

Works Approval Number	W5925/2015/1
Works Approval Holder	Austral Bricks (WA) Pty Ltd
ACN	079 711 603
File Number:	DER2015/002438
Premises	Cardup Brickworks Lot 101 on Plan 42930; Lot 21 Diagram 49238; Lot 7 Diagram 10840, Lot 51 Diagram 52746; Lot 50 Diagram 52748; Lot 801 and 802 on Plan 302499; Lot 10 Diagram 26892;Lot 12 Diagram 52677;Lot 53 Diagram 4790; Lot 100 Diagram 7854; Lot 50 Diagram 7928 BYFORD WA 6122
Date of Amendment	14 June 2017

Amendment

The Chief Executive Officer (CEO) of the Department of Environment Regulation (DER) has amended the above Works Approval in accordance with section 59 of the *Environmental Protection Act 1986* as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Caron Goodbourn
MANAGER – PROCESS INDUSTRIES
an officer delegated under section 20
of the *Environmental Protection Act 1986* (WA).

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Works Approval W5925/2015/1 issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment to condition 1.2.2 of works approval W5925/2015/1 issued 28 January 2016. No other changes to any aspects of the original works approval relating to category 41 have been requested by the Works Approval Holder.

The following DER guidance statements have informed the decision made on this amendment:

- *Guidance Statement: Regulatory Principles* (July 2015)
- *Guidance Statement: Setting Conditions* (October 2015)
- *Guidance Statement: Decision Making* (November 2016)
- *Guidance Statement: Licence Duration* (August 2016)

Amendment description

On 12 May 2017, the Works Approval Holder submitted an application to amend W5925/2015/1 condition 1.2.2, which relates to extending the commissioning period of Kiln 3 (the Kiln) firing and the cascade limestone scrubber from six months to nine months.

In the application, the Works Approval Holder stated that the Kiln was fired on 9 January 2017 however there had been significant delays and operational issues with the commissioning of the plant and equipment which had delayed the anticipated completion date of commissioning to 30 September 2017. This means the commissioning period will need to be extended from six to nine months.

Amendment history

Table 2 provides the amendment history for W5925/2015/1.

Table 1: Works Approval amendments

Instrument	Issued	Amendment
W5925/2015/1	14 June 2017	Amendment Notice 1: extend the commissioning timeframe of Kiln 3 from six to nine months

Decision

The Delegated Officer has granted the amendment sought by the Works Approval Holder. In determining to extend the commissioning period from six months to nine months, the Delegated Officer did not impose additional regulatory controls on the Works Approval.

The Delegated Officer has also considered that the extension of commissioning period is driven primarily through logistics associated with plant and equipment and the decision not to impose any additional regulatory controls is consistent with the *Guidance Statement: Regulatory Principles* on the basis that there is no expected change to the risk profile of emissions.

The Delegated Officer noted the Works Approval Holder was not proposing to carry out any actions that fall within sections 53(1)(a) to (e) or section 53(2)(a) to (b) of the EP Act in order to achieve the proposed timeframe for commissioning.

The Delegated Officer has extended the approved six months commissioning to nine months with the completion date being 30 September 2017.

Works Approval Holder's comments

The Works Approval Holder was provided with the draft Amendment Notice on 06/06/2017. Comments received from the Works Approval Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. Condition 1.2.2 of the Works Approval is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

1.2.2 The Works Approval Holder shall commission the brick manufacturing plant and the cascade limestone scrubber, for a period not exceeding ~~6 months~~ 9 months.

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Works Approval: W5925/2015/1 – Cardup Brickworks	W5925/2015/1	accessed at www.der.wa.gov.au
2	Works Approval amendment application and supporting documents	The application	DER records (A1429124)
3	Works Approval amendment clarification		DER records (A1432509)
4	Works Approval amendment clarification for exemption		DER records (A1432954)
5	DER, July 2015. *Guidance Statement: Regulatory Principles.* Department of Environment Regulation, Perth.	accessed at www.der.wa.gov.au	
6	DER, October 2015. *Guidance Statement: Setting Conditions.* Department of Environment Regulation, Perth.		
7	DER, November 2016. *Guidance Statement: Decision Making.* Department of Environment Regulation, Perth.		

Appendix 2: Summary of Licence Holder comments

The Works Approval Holder was provided with the draft Amendment Notice on 06/06/2017 for review and comment. The Works Approval Holder responded on 12/06/2017 and no comments were submitted on the draft Amendment Notice.

Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 2

Works Approval Number	W5925/2015/1
Works Approval Holder	Austral Bricks (WA) Pty Ltd
ACN	079 711 603
File Number:	DER2015/002438
Premises	Cardup Brickworks Lot 101 on Plan 42930; Lot 21 Diagram 49238; Lot 7 Diagram 10840, Lot 51 Diagram 52746; Lot 50 Diagram 52748; Lot 801 and 802 on Plan 302499; Lot 10 Diagram 26892;Lot 12 Diagram 52677;Lot 53 Diagram 4790; Lot 100 Diagram 7854; Lot 50 Diagram 7928 BYFORD WA 6122
Date of Amendment	16 October 2017

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Works Approval in accordance with section 59 of the *n ironmenta rotection ct* (EP Act), as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Date signed: 16 October 2017

Caron Goodbourn

ACTING MANAGER LICENSING – PROCESS INDUSTRIES

an officer delegated under section 20 of the *n ironmenta rotection ct* (WA

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Amendment Notice	refers to this document
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *u ic Sector anagement ct* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	*n ironmenta rotection ct* (WA)
EP Regulations	*n ironmenta rotection egu ations* (WA)
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in *uidance Statement is ssessment*
Works Approval Holder	Austral Bricks (WA) Pty Ltd

Amendment Notice

This amendment is made pursuant to section 59 of the *n ironmenta rotection ct* (EP Act) to amend the Works Approval W5925/2015/1 issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment to condition 1.2.2 of works approval W5925/2015/1 issued 28 January 2016. No other changes to any aspects of the original works approval relating to category 41 have been requested by the Works Approval Holder.

The following DER guidance statements have informed the decision made on this amendment

- *uidance Statement egu ator rinci es* (July 2015)
- *uidance Statement Setting onditions* (October 2015)
- *uidance Statement ecision a ing* (November 2016)
- *uidance Statement icence uration* (August 2016)

Amendment description

Condition 1.2.2 was previously amended by notice (Amendment Notice 1) to extend the commissioning period from 6 to 9 months.

On 18 September 2017, the Works Approval Holder submitted an application to amend W5925/2015/1 condition 1.2.2, to extend the commissioning period of Kiln 3 (the Kiln) firing and the cascade limestone scrubber from 9 months to 15 months.

In the application, the Works Approval Holder stated that the Kiln was fired on 9 January 2017 however there had been significant delays and operational issues with the commissioning of the plant and equipment which had delayed the anticipated completion date of commissioning 31 March 2018.

The Works Approval Holder has amended the works approval commissioning plan to account for the change in duration of commissioning. This plan includes a commitment to conduct quarterly stack monitoring to confirm the Kiln emissions and scrubber efficiency.

Amendment history

Table 2 provides the amendment history for W5925/2015/1.

Table 2: Works approval amendments

Instrument	Issued	Amendment
W5925/2015/1	14 June 2017	Amendment Notice 1 extending the commissioning period from 6 months to nine months
W5925/2015/1	16 October 2017	This Notice

Decision

The Delegated Officer has granted the amendment sought by the Works Approval Holder. In determining to extend the commissioning period from 9 months to 15 months, the Delegated Officer did not impose additional regulatory controls on the Works Approval.

The Delegated Officer has also considered that the extension of commissioning period is driven primarily through logistics associated with plant and equipment and the decision not to impose any additional regulatory controls is consistent with the *uidance Statement egu ator rinci es* on the basis that there is no expected change to the risk profile of emissions.

The Delegated Officer noted the Works Approval Holder was not proposing to carry out any actions that fall within sections 53(1)(a) to (e) or section 53(2)(a) to (b) of the EP Act in order to achieve the proposed timeframe for commissioning.

The Delegated Officer has extended the approved 9 months commissioning to 15 months with the completion date being 31 March 2018.

Works Approval Holder's comments

The Works Approval Holder was provided with the draft Amendment Notice on 28 September 2017 for review and comment. The Works Approval Holder responded on 29 September 2017 waiving the remaining comment period. No comments were submitted on the draft Amendment Notice.

Amendment

1. Condition 1.2.2 of the Works Approval is amended by deletion of the text shown in strikethrough below and insertion of the red text shown in underline below:

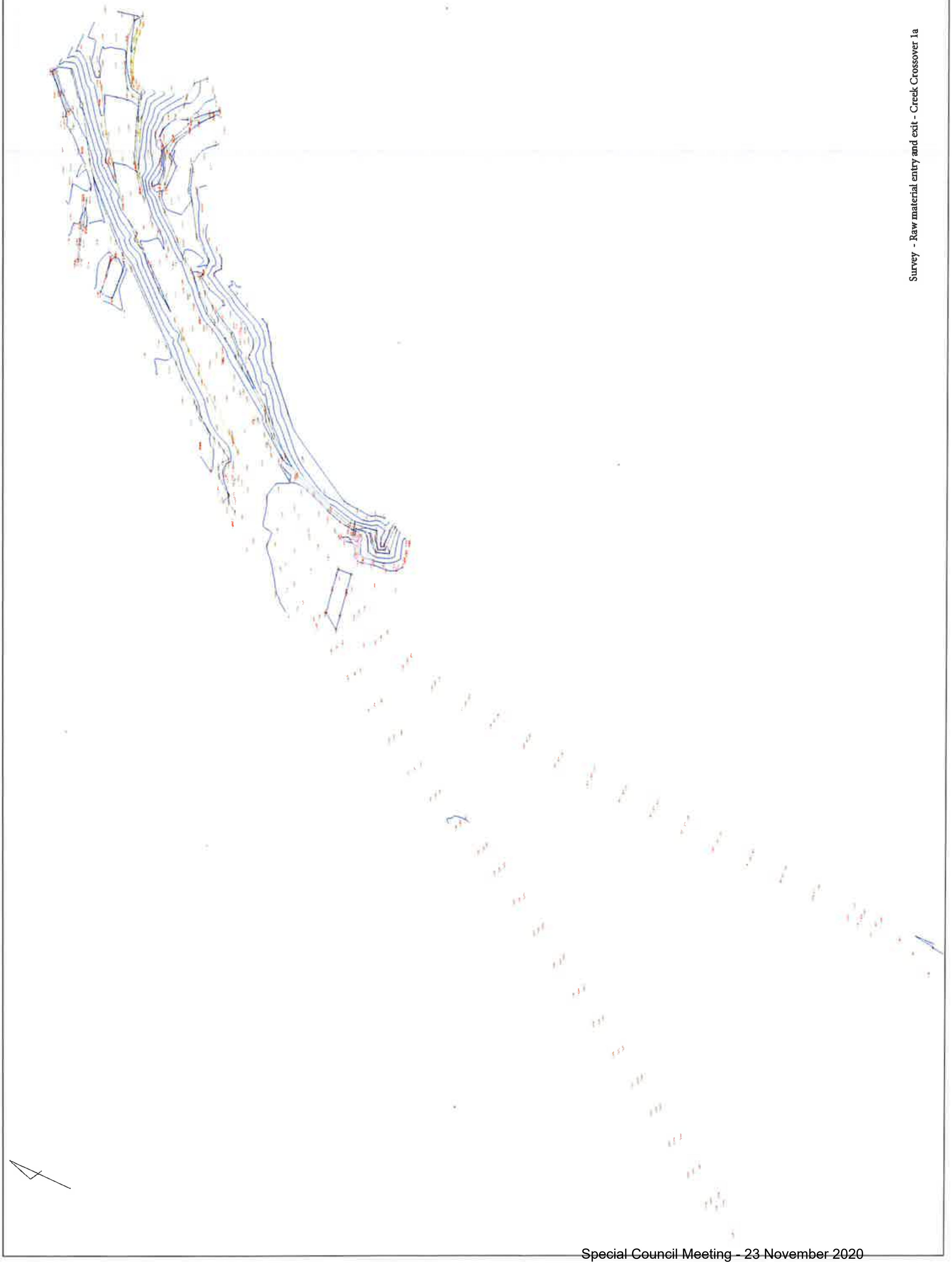
   e or s ro a o der s a commission t e ric manu acturing ant and t e cascade imestone scru er or a eriod not e ceeding ~~mont s~~ mont s

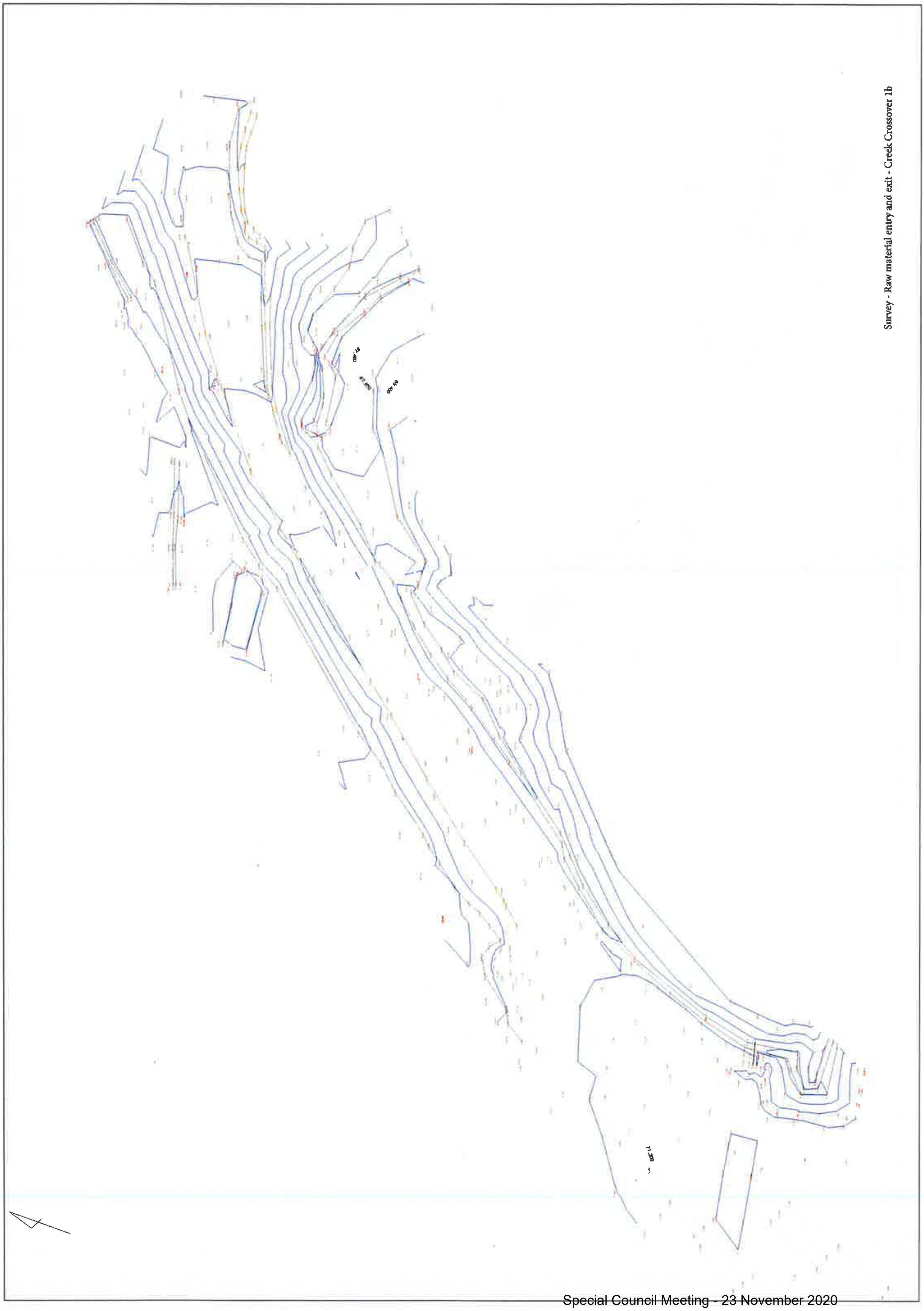
Appendix 1: Key documents

<table>
<tr><th></th><th>Document title</th><th>In text ref</th><th>Availability</th></tr>
<tr><td>1</td><td>Works Approval:
W5925/2015/1 – Cardup Brickworks</td><td>W5925/2015/1</td><td>accessed at www.der.wa.gov.au</td></tr>
<tr><td>2</td><td>Works Approval W5925/2015/1 Amendment Notice #1</td><td>Amendment Notice 1</td><td>accessed at www.der.wa.gov.au</td></tr>
<tr><td>3</td><td>Works Approval amendment application and supporting documents</td><td>The application</td><td>DWER records (A1525770, A1525771 and A1525773)</td></tr>
<tr><td>4</td><td>July 2015. uidance Statement egu ator rinci es Department of Environment Regulation, Perth</td><td colspan="2" rowspan="3">accessed at www.dwer.wa.gov.au</td></tr>
<tr><td>5</td><td>October 2015. uidance Statement Setting onditions Department of Environment Regulation, Perth</td></tr>
<tr><td>6</td><td>November 2016. uidance Statement ecision a ing. Department of Environment Regulation, Perth</td></tr>
</table>

Appendix 2 Crossover Surveys

Survey - Raw material entry and exit - Creek Crossover 1a




Survey - Raw material entry and exit - Creek Crossover 1b

Survey - Secondary Creek Crossover

Appendix 3 Geotechnical Report (Golder Associates, 2013)

June 2013

GEOTECHNICAL INVESTIGATION

Proposed Residential Subdivision, Nettleton Road, Cardup

Submitted to:
MGA Town Planners
26 Mayfair Street
WEST PERTH WA 6005

REPORT

Report Number. 137642057-001-R-Rev0

Distribution:

1 Copy- MGA Town Planners (+1 Electronic)
1 Copy - Golder Associates Pty Ltd

Golder Associates

Table of Contents

1.0 INTRODUCTION

This report presents the outcomes of a geotechnical investigation for the proposed residential subdivision to be constructed at the Austral Quarry Brickworks site south of Nettleton Road in Cardup. The location of the site is shown on Figure 1. Golder Associates Pty Ltd (Golder) carried out the work in accordance with our proposal P37642083-001-L-Rev0, dated 7 March 2013. Approval to proceed with the work was given by Megan Kublins of Brickworks Ltd via a signed client authorisation form dated 9 April 2013.

The site is currently occupied by the Austal Quarry Brickworks, and consists of the following areas:

- Offices
- Warehouses
- Sealed and unsealed internal access roads
- Laydown areas
- Material stockpiles
- Quarry pits
- Grazing pastures to the east, which we understand are currently leased.

Ground levels across the proposed development area range from about RL 85 m AHD to RL 150 m AHD.

Based on discussions between Golder and MGA Town Planners (MGA), it is understood that the proposed development will comprise a residential subdivision with about 30 residential lots each with a septic tank.

Golder has previously undertaken a geotechnical assessment of the site, with the outcomes of this assessment presented in our report 06642592-R01, dated April 2007.

2.0 OBJECTIVES

The geotechnical investigation had the following objectives:

- Assess subsurface conditions across the site, including depth to groundwater (within the limitations of the investigation).
- Assess near surface sub-soil drainage characteristics for the potential disposal of effluent.

3.0 FIELDWORK

The fieldwork for the current investigation was conducted on 24 May 2013 and comprised:

- Visual assessment of the site to assess land surface features such as topography and slope.
- Drilling of nine air-core boreholes, BH1 to BH9, extending to a maximum depth of about 2 m for geotechnical logging and sampling.
- Drilling of nine air-core boreholes, one adjacent to each geotechnical borehole, to depths ranging from about 0.3 m to 0.65 m for constant head permeability testing.
- Soil permeability testing using the constant head method (in accordance with AS 1547 – 2012, Appendix G) at each of the nine permeability borehole locations.
- Collection of soil samples for geotechnical laboratory testing.

The test locations are shown on Figure 2 and a summary of the locations and details of the testing are provided in Table 1. The test locations were positioned using a hand held GPS accurate to about ±5 m horizontally. Approximate surface levels have been estimated from site contours provided by MGA.

Table 1: Summary of Investigation Locations

Test Location	Approx. Coordinates (MGA94)		Approximate Elevation[1] (m AHD)	Test Depth (m)	Termination Remark
	Easting	Northing			
BH1	407563	6431955	78	2	Target depth
BH2	407838	6432182	100	2	Target depth
BH3	407736	6432980	98	2	Target depth
BH4	407470	6433278	100	2	Target depth
BH5	407567	6433205	101	2	Target depth
BH6	407402	6433107	109	2	Target depth
BH7	407286	6432955	104	2	Target depth
BH8	407257	6432751	99	2	Target depth
BH9	407311	6432619	101	2	Target depth

Note: [(1)]Approximate elevation estimated from information supplied by MGA.

The air-core boreholes were drilled using a Comacchio Geo 305 track mounted drill rig supplied and operated by Proline Drilling. Borehole reports are presented as Appendix A, along with a list of notes and abbreviations and a description of the soil classification system used on the reports.

Constant head permeability testing was conducted at each borehole location using the method outlined in AS 1547 – 2012 (Appendix G). The results of the permeability testing are included in Table 2. Please refer to Section 6.0 for discussion on the limitations of this testing and interpretation of the permeability results.

Table 2: Summary of Constant Head Permeability Test Results

Test Location	Depth of Test (m)	Permeability (m/day)
BH1	0.40	0.9
BH2	0.40	1.0
BH3	0.30	2.2
BH4	0.50	20.2
BH5	0.40	2.4
BH6	0.40	0.2
BH7	0.40	1.1
BH8	0.65	0.7
BH9	0.40	1.0

A geotechnical engineer from Golder located the test positions, observed the drilling, logged the materials encountered in the boreholes, conducted the constant head permeability testing and collected samples for inspection and laboratory testing.

4.0 LABORATORY TESTING

To assist in the evaluation of geotechnical design parameters and for confirmation of visual classification of the soils, laboratory tests were carried out at Golder's NATA accredited laboratory. Geotechnical laboratory testing comprised the following tests:

- Particle size distribution on four samples
- Atterberg limits and linear shrinkage on four samples.

Laboratory test certificates listing the test methods followed are presented as Appendix B. A summary of the laboratory testing is also provided in Table 3.

Table 3: Summary of Geotechnical Laboratory Testing

Test Location	Sample Depth (m)	Material Classification	Particle Size Distribution (% passing)			Plasticity Index (%)	Liquid Limit (%)	Linear Shrinkage (%)
			Gravel	Sand	Fines			
BH2	1.1-1.5	CLAY	1	14	85	83	105	20.0
BH3	0.5-1.0	CLAY	14	20	66	38	56	16.0
BH5	1.0-1.5	Clayey SAND	33	45	22	17	36	6.5
BH8	0.0-0.5	Sandy CLAY	14	22	64	28	47	9.5

5.0 SUBSURFACE CONDITIONS

5.1 Geology

The Armadale sheet of the 1:50,000 scale Environmental Geology Series of maps indicates that the site may be underlain by a number of soils. These soils are summarised in Table 4 below:

Table 4: Geological Units

Map unit	Description
S_{12}	SAND - structureless yellow, fine grained, sub-angular and medium to coarse grained sub-rounded to rounded quartz, feldspar and heavy minerals common, minor silt and clay, of colluvial origin. This unit is indicated to underlie the northern and western portions of the site.
SH (Armadale Shale)	SHALE - brown-green to black, silty, thinly bedded with interbeds of siltstone and fine grained sandstone. This unit is indicated to underlie the majority of the investigated area, extending across most of the central and southern portions of the site.
Scg (Colluvium)	Gravelly Clayey SAND - decomposed bedrock, gravel rock fragments, angular quartz/feldspar, clay minerals may flocculate to silt/sand size, of colluvial origin. This unit is indicated to underlie the northeastern and far southern portions of the site.
SS_2 (Neerigen Formation, Whitby Sandstone)	SANDSTONE - basal conglomerate and silty sandstone overlain by interbedded fine to medium grained sandstone and silty shale. This unit is indicated to underlie the eastern portion of the site.
GR-GN (Migmatite)	GRANITES AND GNEISSES - intimate association of coarse grained granites (GR) and Gneisses (GN) and fine grained dolerites. This unit is indicated to underlie the far eastern portion of the site.

The geology of the Site has been previously reviewed by Golder in 2004 and 2006 by observation of surface features at several locations across the Site. The Darling Scarp and westward drainage lines dominate the local topography.

North-south-trending surface exposures comprise in order from east to west across the Site:

- Granite type rocks (gneiss) on higher sections
- Shale on flanks of pit
- Dolerite – area within deeper sections of pit previously mined

- Quartz ridges now exposed in pit area
- Groundwater is expected to be present at approximately the level of the creek beds.

5.2 Subsurface Conditions

Based on the results of the investigation, subsurface conditions varied across the site can be generalised as comprising:

Northern Portion (Region A)

- **CLAY (CH)**: not encountered at all test locations, high plasticity, brown, with some fine to coarse grained sand with some fine to coarse grained gravel, trace cobbles, dry, firm to stiff, extending from the ground surface to about 0.8 m depth, overlying
- **SAND/Gravelly SAND/Gravelly Clayey SAND/GRAVEL (SP/SC/GP)**: fine to medium grained sand, fine to coarse grained gravel, orange, yellow, grey and brown, up to approximately 30% high plasticity clay, dry to moist, medium dense to dense, extending to the maximum depth investigated of 2 m.

Central and Western Portion (Region B)

- **Gravelly SAND (SP)**: encountered at BH5 only, fine to medium grained, orange, approximately 40% fine to coarse grained, sub-rounded gravel, with some low plasticity fines, trace organics, dry, dense, extending from the ground surface to about 0.4 m depth.
- **CLAY/Sandy CLAY/Clayey SAND/SILT (CL-CH/SC/ML-MH)**: low to high plasticity clay, medium to high liquid limit silt, fine to coarse grained sand, green, grey, white, red, orange, purple and brown, none to trace fine to coarse grained gravel, dry, stiff to very stiff, extending to the maximum depth investigated of 2 m.

Eastern Portion (Region C)

- **TOPSOIL: Sandy CLAY/Clayey SAND/Gravelly SAND(SC)**: high plasticity clay, fine to medium grained sand, brown, trace organics, dry to moist, firm to stiff, extending from the ground surface to depths ranging from about 0.2 m to 0.3 m, overlying
- **CLAY/Sandy CLAY (CH/SC)**: high plasticity clay, fine to coarse grained sand, brown, red, green, orange and grey, none to trace fine to medium grained gravel, dry to moist, stiff to very stiff, extending to the maximum depth investigated of 2 m.

Variations to the above generalised profile do occur. The individual borehole logs included as Appendix A should be referred to for further detail.

The approximate extent of Region A, Region B and Region C is shown on Figure 2. These regions are indicative only and do not necessarily indicate changes in soil type or site geology.

5.3 Groundwater

Groundwater was not observed in any of the boreholes drilled during the investigation.

6.0 DISCUSSION

6.1 Limitations of *In Situ* Permeability Testing

We have assessed the site investigation methods used to evaluate the permeability of the *in situ* soils and consider that the following considerations should be taken into account when interpreting the data contained in this report:

- The boreholes were drilling using air core techniques as hand excavation methods would not have been appropriate given the soil types at the site. The drilling may have altered the soil structure near the borehole walls and base during drilling.

- Localised, relatively high permeability fissures, cracks and preferential flow paths may have been present in the soil. These structures may become blocked with fine grained material over the life of an effluent disposal system and result in lower long term permeability than achieved with a short term test using relatively clean water.
- Fissures, cracks or preferential flow paths (if present) may be localised and not encountered at the location of effluent disposal systems.
- Permeability testing was completed at relatively shallow depths (generally 0.4 m) as prescribed by AS 1547 (2012) requirements. If the upper 0.5 m of soils are removed during site development then the permeability of deeper soils, or replacement materials should be re-evaluated.
- Even relatively permeable soil such as sand will experience a decrease in permeability over time as fine grained material migrates through the soil and obstructs pore spaces.
- Infiltration rates will decrease within close proximity of the groundwater table. This would need to be taken into account for low-lying lots.

6.2 Soil Permeability

Permeability testing was conducted at nine locations across the site to assess the suitability of the *in situ* soils for disposal of treated effluent. The permeability results shown in Table 2 were compared to Table 5.2 of Australian Standard AS 1547 (2012) *On-site domestic wastewater management*. The suitability of the soil types, based on this standard, for disposal of treated effluent are indicated in Table 5 below.

Table 5: Summary of Soil Categories and Design Loading Rates According to AS 1547 (2012)

Borehole	Soil Category of Top 0.5 m According to AS 1547 (2012)[1]	Design Irrigation/Loading Rate (mm/day)	
		Beds and Trenches	ETA Beds and Trenches
BH1	6	Refer to AS 1547 (2012) Table L1 Notes 2 and 3	5
BH2	6		5
BH3	6		5
BH4	1	20	-
BH5	3	15	-
BH6	6	Refer to AS 1547 (2012) Table L1 Notes 2 and 3	5
BH7	3	10	-
BH8	6	Refer to AS 1547 (2012) Table L1 Notes 2 and 3	5
BH9	6		5

Note: ETA – evapotranspiration-absorption
[1] not including topsoil layer.

We have compared the permeability test results presented in Table 2 with typical soil permeability values for the soil types encountered and consider that the following permeability values would be appropriate for the design of effluent disposal systems at the site:

- Sands and gravels with less than 5% fines (BH4): 5 m/day
- Sands and gravels with 5-12% fines (BH5, BH7): 1 m/day
- Sandy clays, clayey sands and clays (BH1, BH2, BH3, BH6, BH9): < 0.06 m/day.

As the soils encountered on site during the investigation generally consist of high plasticity clayey soils of low permeability, we consider that the majority of the site's soils should be classified as 'Class 6' according to AS 1547 (2012).

7.0 LIMITATIONS

Your attention is drawn to the document - "Limitations", which is included as Appendix C to this report. This document is intended to assist you in ensuring that your expectations of this report are realistic, and that you understand the inherent limitations of a report of this nature. If you are uncertain as to whether this report is appropriate for any particular purpose please discuss this issue with us.

Report Signature Page

GOLDER ASSOCIATES PTY LTD

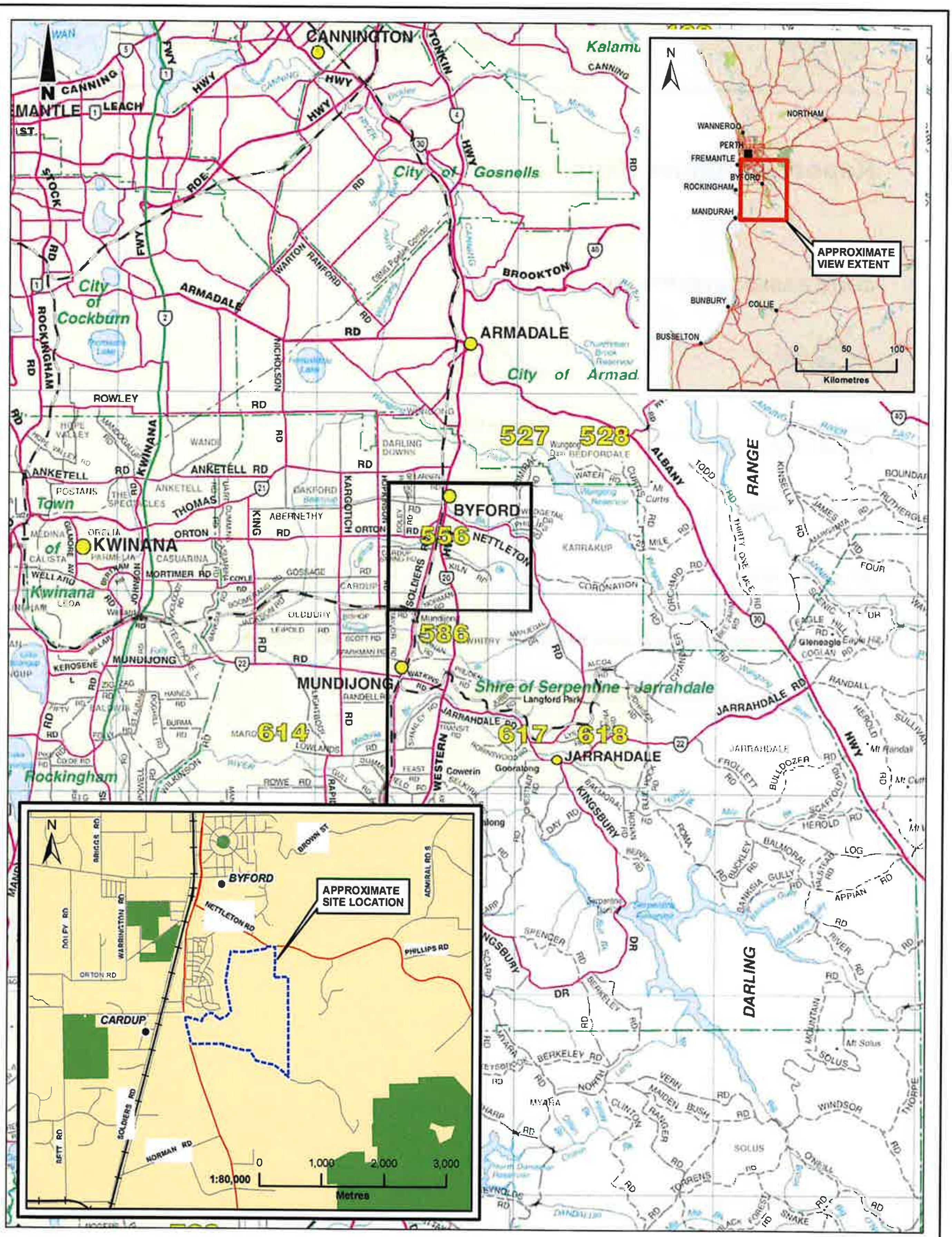
Ben Harvey
Geotechnical Engineer

Andrew Cray
Principal

BMH/ARC-DMT/slj

A.B.N. 64 006 107 857

j:\geo\2013\137642057 - mga cardup\03 correspondence & report\137642057-001-r-rev0.docx



Golder Associates

CLIENT	MGA Town Planners
DOCUMENT	137642057-001-R-Rev0
DATE	17 Jun 2013
COMPILED	JRP
APPROVED	BMH

0 2,500 5,000 7,500 10,000
Metres

SCALE (at A4) 1:250,000

NOTES
Coordinate System: GDA 1994 MGA Zone 50

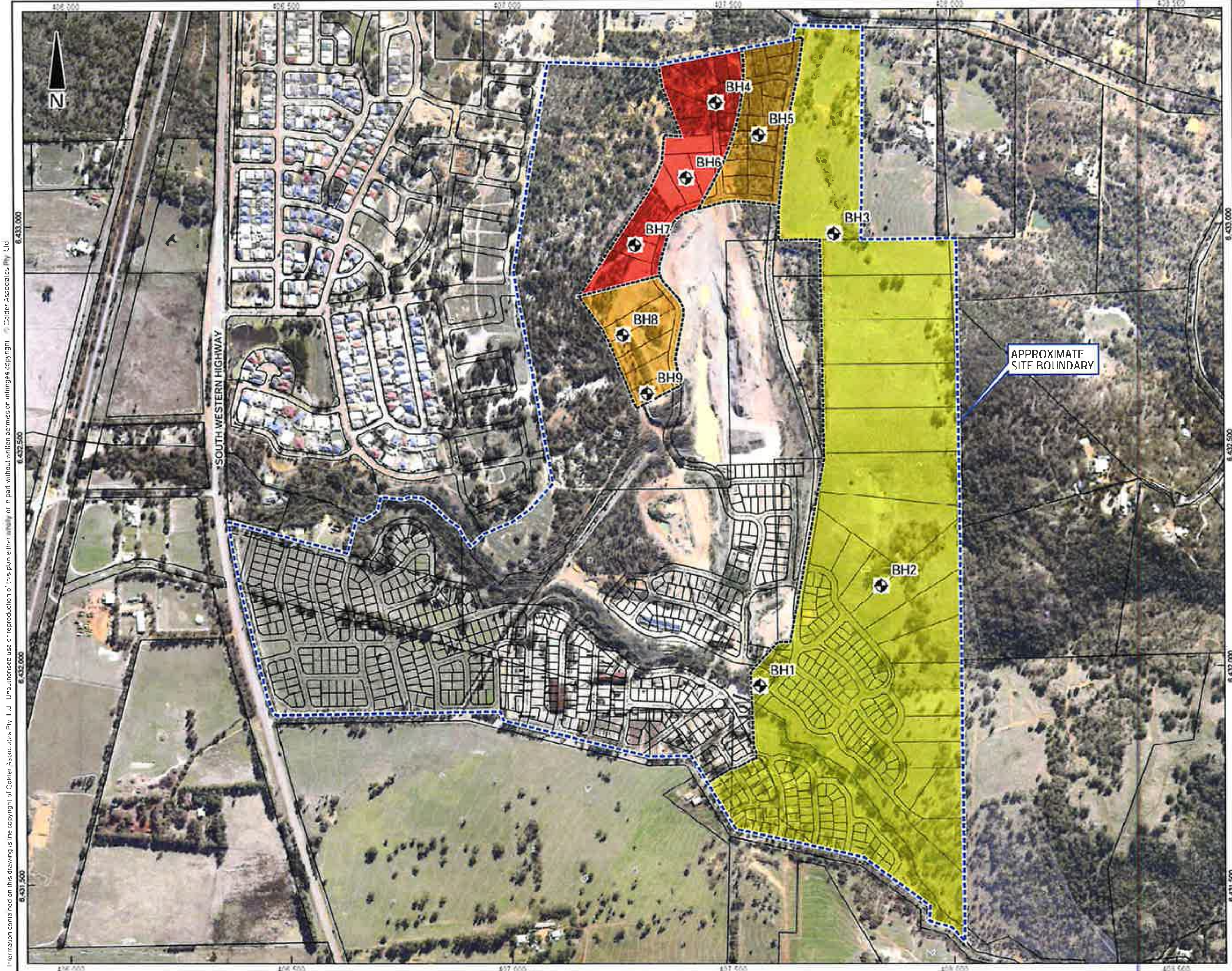
COPYRIGHT
Image sourced from Metro Streetsmart 2009.
Inset Base Data/Roads sourced from Street Pro Data 2009.

Proposed Residential Subdivision, Nettleton Road, Cardup

LOCATION PLAN

FIGURE 1

File Location G:\Spatial_Information_Group\GIS_WORKSPACE_AUSTRALIA\01_WA\M6122_BYFORD\137642057\Projects\137642057-001-R-F001-Rev0.mxd



LEGEND

- Borehole and permeability test location
- Region A
- Region B
- Region C

NOTES

Coordinate System: GDA 1994 MGA Zone 50

COPYRIGHT

Site layout provided by client

Aerial photograph sourced from Nearmap

Inset Base Data/Roads sourced from Street Pro Data 2009

SCALE (at A3) 1:8,000

Golder Associates

CLIENT MGA Town Planners
DOCUMENT 137642057-001-R-Rev0
DATE 17 Jun 2013
COMPILED JRP
APPROVED RMU

Proposed Residential Subdivision
Nettleton Road, Cardup

SITE PLAN

FIGURE 2

File Location: G:\Spatial_Information_Group\GIS_WORKSPACE_AUSTRALIA\01_WA\M6122_BYFORD\137642057\Projects\137642057-001-R-F002-Rev0.mxd

APPENDIX A

Borehole Reports

Golder Associates

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT REPORTS

FILL

GRAVEL (GP or GW)

SAND (SP or SW)

SILT (ML or MH)

CLAY (CL, CI or CH)

ORGANIC SOILS (OL or OH or Pt)

COBBLES or BOULDERS

Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay.

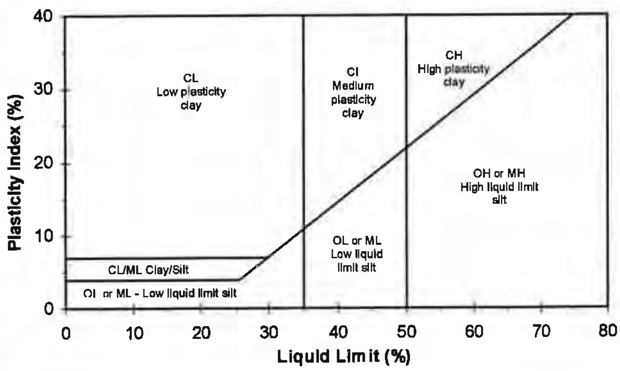
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. The material properties are assessed in the field by visual/tactile methods.

Particle Size

Major Division	Sub Division	Particle Size
BOULDERS		> 200 mm
COBBLES		63 to 200 mm
GRAVEL	Coarse	20 to 63 mm
	Medium	6.0 to 20 mm
	Fine	2.0 to 6.0 mm
SAND	Coarse	0.6 to 2.0 mm
	Medium	0.2 to 0.6 mm
	Fine	0.075 to 0.2 mm
SILT		0.002 to 0.075 mm
CLAY		< 0.002 mm

Plasticity Properties



MOISTURE CONDITION

AS1726 - 1993

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

CONSISTENCY AND DENSITY

AS1726 - 1993

Symbol	Term	Undrained Shear Strength
VS	Very Soft	0 to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa
H	Hard	Above 200 kPa

Symbol	Term	Density Index %	SPT "N" #
VL	Very Loose	Less than 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Dense	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.

SPT correlations are not stated in AS1726 – 1993, and may be subject to corrections for overburden pressure and equipment type.

GAP Form No 5
RL8

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EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS

DRILLING/EXCAVATION METHOD

AS*	Auger Screwing	RD	Rotary blade or drag bit	NQ	Diamond Core - 47 mm
AD*	Auger Drilling	RT	Rotary Tricone bit	NMLC	Diamond Core - 52 mm
*V	V-Bit	RAB	Rotary Air Blast	HQ	Diamond Core - 63 mm
*T	TC-Bit, e.g. ADT	RC	Reverse Circulation	HMLC	Diamond Core – 63mm
HA	Hand Auger	PT	Push Tube	BH	Tractor Mounted Backhoe
ADH	Hollow Auger	CT	Cable Tool Rig	EX	Tracked Hydraulic Excavator
DTC	Diatube Coring	JET	Jetting	EE	Existing Excavation
WB	Washbore or Bailer	NDD	Non-destructive digging	HAND	Excavated by Hand Methods

PENETRATION/EXCAVATION RESISTANCE

L **Low resistance.** Rapid penetration possible with little effort from the equipment used.

M **Medium resistance.** Excavation/possible at an acceptable rate with moderate effort from the equipment used.

H **High resistance** to penetration/excavation. Further penetration is possible at a slow rate and requires significant effort from the equipment.

R **Refusal or Practical Refusal.** No further progress possible without the risk of damage or unacceptable wear to the digging implement or machine.

These assessments are subjective and are dependent on many factors including the equipment power, weight, condition of excavation or drilling tools, and the experience of the operator.

WATER

▼	Water level at date shown	◁	Partial water loss
▷	Water inflow	◀	Complete water loss

GROUNDWATER NOT OBSERVED — The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.

GROUNDWATER NOT ENCOUNTERED — The borehole/test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following 150mm seating
30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under the rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
DS	Disturbed sample
BDS	Bulk disturbed sample
G	Gas Sample
W	Water Sample
FP	Field permeability test over section noted
FV	Field vane shear test expressed as uncorrected shear strength (s_v = peak value, s_r = residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket penetrometer test expressed as instrument reading in kPa
U63	Thin walled tube sample - number indicates nominal sample diameter in millimetres
WPT	Water pressure tests
DCP	Dynamic cone penetration test
CPT	Static cone penetration test
CPTu	Static cone penetration test with pore pressure (u) measurement

Ranking of Visually Observable Contamination and Odour (for specific soil contamination assessment projects)

R = 0	No visible evidence of contamination	R = A	No non-natural odours identified
R = 1	Slight evidence of visible contamination	R = B	Slight non-natural odours identified
R = 2	Visible contamination	R = C	Moderate non-natural odours identified
R = 3	Significant visible contamination	R = D	Strong non-natural odours identified

ROCK CORE RECOVERY

TCR = Total Core Recovery (%)

$$= \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$$

SCR = Solid Core Recovery (%)

$$= \frac{\sum \text{Length of cylindrical core recovered}}{\text{Length of core run}} \times 100$$

RQD = Rock Quality Designation (%)

$$= \frac{\sum \text{Axial lengths of core} > 100\text{ mm}}{\text{Length of core run}} \times 100$$

GAP Form No. 6 RL7
August 2010

TERMS FOR ROCK MATERIAL STRENGTH & WEATHERING AND ABBREVIATIONS FOR DEFECT DESCRIPTIONS

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STRENGTH

Symbol	Term	Point Load Index, $Is_{(50)}$ (MPa)	Field Guide
EL	Extremely Low	< 0.03	Easily remoulded by hand to a material with soil properties.
VL	Very Low	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm can be broken by finger pressure.
L	Low	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.
VH	Very High	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

ROCK STRENGTH TEST RESULTS

Point Load Strength Index, $I_s(50)$, Axial test (MPa)

Point Load Strength Index, $I_s(50)$, Diametral test (MPa)

Relationship between $I_s(50)$ and UCS (unconfined compressive strength) will vary with rock type and strength, and should be determined on a site-specific basis. UCS is typically 10 to 30 x $I_s(50)$, but can be as low as 5.

ROCK MATERIAL WEATHERING

Symbol		Term	Field Guide
RS		Residual Soil	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
EW		Extremely Weathered	Rock is weathered to such an extent that it has soil properties - i.e. it either disintegrates or can be remoulded, in water.
DW	HW	Distinctly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores. In some environments it is convenient to subdivide into Highly Weathered and Moderately Weathered, with the degree of alteration typically less for MW
	MW		
SW		Slightly Weathered	Rock is slightly discoloured but shows little or no change of strength relative to fresh rock.
FR		Fresh	Rock shows no sign of decomposition or staining.

ABBREVIATIONS FOR DEFECT TYPES AND DESCRIPTIONS

Defect Type

B	Bedding parting
X	Foliation
C	Contact
L	Cleavage
J	Joint
SS/SZ	Sheared seam/zone (Fault)
CS/CZ	Crushed seam/zone (Fault)
DS/DZ	Decomposed seam/zone
IS/IZ	Infilled seam/zone
S	Schistocity
V	Vein

Coating or Infilling

Cn	Clean
Sn	Stain
Vr	Veneer
Ct	Coating or Infill

Planarity

Pl	Planar
Un	Undulating
St	Stepped

Roughness

Sl	Slickensided
Sm	Smooth
Ro	Rough

Vertical Boreholes – The dip (inclination from horizontal) of the defect is given.
Inclined Boreholes – The inclination is measured as the acute angle to the core axis.

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REPORT OF BOREHOLE: BH1

CLIENT: MGA Town Planners	COORDS: 407563 m E 6431955 m N MGA94 50	SHEET: 1 OF 1	
PROJECT: Residential Subdivision	SURFACE RL: DATUM: AHD	DRILL RIG: Comacchio Geo 305	
LOCATION: Cardup	INCLINATION: -90°	CONTRACTOR: Proline Drilling	
JOB NO: 137642057	HOLE DEPTH: 2.00 m	LOGGED: BMH	DATE: 24/5/13
		CHECKED: SVK	DATE: 11/6/13

METHOD	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE	0.0			SC	TOPSOIL: Sandy CLAY high plasticity, brown, approx. 30% fine to medium grained sand, trace organics	D		Density inferred from observations Drilling Advance Rates Depth (m) Time (sec) 0.0-0.5 10 0.5-1.0 37 1.0-1.5 16 1.5-2.0 40
		0.20		CH	CLAY high plasticity, dark red, with some fine to medium grained sand		St	
	0.5	0.50		GP	GRAVEL fine to coarse grained, sub-rounded, brown, trace fine to medium grained sand, trace fines		VD	
	1.0	1.00	BH1-1 DS 1.00-1.50 m Rec = 500/500 mm 1 bag	CH	CLAY high plasticity, mottled green and orange, with some fine to medium grained sand		VSt	
	1.5	1.60		CH	Sandy CLAY high plasticity, green and grey, approx. 30% fine to coarse grained sand, trace fine to medium grained, sub-rounded gravel			
	2.0				END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			
	2.5							
	3.0							

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GAP gINT FN. F01a RL3

REPORT OF BOREHOLE: BH2

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CLIENT: MGA Town Planners
PROJECT: Residential Subdivision
LOCATION: Cardup
JOB NO: 137642057

COORDS: 407838 m E 6432182 m N MGA94 50
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.00 m

SHEET: 1 OF 1
DRILL RIG: Comacchio Geo 305
CONTRACTOR: Proline Drilling
LOGGED: BMH DATE: 24/5/13
CHECKED: SVK DATE: 11/6/13

Drilling					Sampling	Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0					SC	TOPSOIL: Clayey SAND fine to medium grained, dark brown, approx. 40% high plasticity clay, trace organics, trace sub-angular gravel and cobbles scattered on ground surface		MD - F	Density inferred from observations **Drilling Advance Rates** Depth (m) Time (sec) 0.0-0.5 21 0.5-1.0 18 1.0-1.5 19 1.5-2.0 31
				0.20				CH	CLAY high plasticity, dark orange to red, trace fine to coarse grained sand	M		
			0.5		BH2-1 DS 0.50-1.00 m Rec = 500/500 mm 1 bag							
			1.0	1.10	BH2-2 DS 1.10-1.50 m Rec = 400/400 mm 1 bag			CH	CLAY high plasticity, dark green, with some fine to medium grained sand		St	
			1.5							D		
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			
			2.5									
			3.0									

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REPORT OF BOREHOLE: BH3

CLIENT: MGA Town Planners
PROJECT: Residential Subdivision
LOCATION: Cardup
JOB NO: 137642057

COORDS: 407736 m E 6432980 m N MGA94 50
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.00 m

SHEET: 1 OF 1
DRILL RIG: Comacchio Geo 305
CONTRACTOR: Proline Drilling
LOGGED: BMH DATE: 24/5/13
CHECKED: SVK DATE: 11/6/13

METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0					CH	TOPSOIL: Sandy CLAY high plasticity, dark brown, approx. 30% fine to medium grained sand, trace organics	M	F	Density inferred from observations **Drilling Advance Rates** Depth (m) Time (sec) 0.0-0.5 15 0.5-1.0 25 1.0-1.5 27 1.5-2.0 31
				0.30	BH3-1 DS 0.50-1.00 m Rec = 500/500 mm 1 bag			CH	CLAY high plasticity, brown, with some fine to medium grained sand, trace fine to medium grained gravel		VSt	
				1.80				CH	Sandy CLAY high plasticity, brown, approx. 30% fine to medium grained sand			
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			

Depth scale: 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0

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REPORT OF BOREHOLE: BH4

CLIENT: MGA Town Planners	COORDS: 407470 m E 6433278 m N MGA94 50	SHEET: 1 OF 1
PROJECT: Residential Subdivision	SURFACE RL: DATUM: AHD	DRILL RIG: Comacchio Geo 305
LOCATION: Cardup	INCLINATION: -90°	CONTRACTOR: Proline Drilling
JOB NO: 137642057	HOLE DEPTH: 2.00 m	LOGGED: BMH DATE: 24/5/13
		CHECKED: SVK DATE: 11/6/13

Drilling					Sampling	Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0					SP	SAND fine to medium grained, brown, trace fines	M	MD	Density inferred from observations **Drilling Advance Rates** Depth (m) Time (sec) 0.0-0.5 14 0.5-1.0 10 1.0-1.5 12 1.5-2.0 22
				0.20					orange, with some medium plasticity clay			
			1.5	1.50					without clay	D		
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			

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REPORT OF BOREHOLE: BH5

SHEET: 1 OF 1

CLIENT: MGA Town Planners	COORDS: 407567 m E 6433205 m N MGA94 50	DRILL RIG: Comacchio Geo 305	
PROJECT: Residential Subdivision	SURFACE RL: DATUM: AHD	CONTRACTOR: Proline Drilling	
LOCATION: Cardup	INCLINATION: -90°	LOGGED: BMH	DATE: 24/5/13
JOB NO: 137642057	HOLE DEPTH: 2.00 m	CHECKED: SVK	DATE: 11/6/13

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0					SP	Gravelly SAND fine to medium grained, orange, approx. 40% fine to coarse grained, sub-rounded gravel, with some low plasticity fines, trace organics	D	D	Density inferred from observations
			0.5	0.40	BH5-1 DS 0.50-1.00 m Rec = 500/500 mm 1 bag			CH	CLAY high plasticity, green and red, with some fine to medium grained sand		St - VSt	
			1.0	1.00	BH5-2 DS 1.00-1.50 m Rec = 500/500 mm 1 bag			SC	Clayey SAND fine to coarse grained, orange, approx. 20% medium plasticity clay, with some fine to medium grained gravel		D	
			1.5									
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			
			2.5									
			3.0									

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REPORT OF BOREHOLE: BH6

SHEET: 1 OF 1

CLIENT: MGA Town Planners	COORDS: 407402 m E 6433107 m N MGA94 50	DRILL RIG: Comacchio Geo 305	
PROJECT: Residential Subdivision	SURFACE RL: DATUM: AHD	CONTRACTOR: Proline Drilling	
LOCATION: Cardup	INCLINATION: -90°	LOGGED: BMH	DATE: 24/5/13
JOB NO: 137642057	HOLE DEPTH: 2.00 m	CHECKED: SVK	DATE: 11/6/13

METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0					CH	CLAY high plasticity, pale brown, with some fine to coarse grained sand, with some fine to coarse grained gravel, trace cobbles	D	F - St	Density inferred from observations Gravel and cobbles more concentrated on ground surface
				0.20				CH	CLAY high plasticity, pale red, trace fine to coarse grained sand, trace fine to coarse grained grave			
				0.80				SP	Gravelly SAND fine to medium grained, pale orange, approx. 35% fine to coarse grained, rounded gravel, trace clay		D	
				1.50				SP	SAND fine to medium grained, orange, with some fine to coarse grained, sub-rounded to rounded gravel	D - M		
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			

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REPORT OF BOREHOLE: BH7

CLIENT: MGA Town Planners
PROJECT: Residential Subdivision
LOCATION: Cardup
JOB NO: 137642057

COORDS: 407286 m E 6432955 m N MGA94 50
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.00 m

SHEET: 1 OF 1
DRILL RIG: Comacchio Geo 305
CONTRACTOR: Proline Drilling
LOGGED: BMH DATE: 24/5/13
CHECKED: SVK DATE: 11/6/13

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0		BH7-1 DS 0.00-0.50 m Rec = 500/500 mm 1 bag			SP	Gravelly SAND fine to medium grained, orange, approx. 40% fine to coarse grained, rounded gravel, with some low plasticity clay	D	D - VD	Density inferred from observations **Drilling Advance Rates** Depth (m) / Time (sec) 0.0-0.5 / 26 0.5-1.0 / 27 1.0-1.5 / 78 1.5-2.0 / 60
			0.5	0.50				SC	Gravelly Clayey SAND fine to medium grained, orange, approx. 30% high plasticity clay, approx. 30% fine to coarse grained, rounded gravel			
				0.80					orange, grey and brown			
			1.0	1.10				GP	GRAVEL fine to coarse grained, rounded to sub-rounded, orange, with some fine to coarse grained sand, trace fines, well to very well cemented			
				1.30					increasing sand content, approx. 30% sand, weakly cemented			
			1.5		BH7-2 DS 1.50-2.00 m Rec = 500/500 mm 1 bag							
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			
			2.5									
			3.0									

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Golder Associates

REPORT OF BOREHOLE: BH8

SHEET: 1 OF 1

CLIENT: MGA Town Planners	COORDS: 407257 m E 6432751 m N MGA94 50	DRILL RIG: Comacchio Geo 305
PROJECT: Residential Subdivision	SURFACE RL: DATUM: AHD	CONTRACTOR: Proline Drilling
LOCATION: Cardup	INCLINATION: -90°	LOGGED: BMH DATE: 24/5/13
JOB NO: 137642057	HOLE DEPTH: 2.00 m	CHECKED: SVK DATE: 11/6/13

METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0		BH8-1 DS 0.00-0.50 m Rec = 500/500 mm 1 bag			CI	CLAY medium plasticity, brown, with some sand, trace fine to coarse grained grave			Density inferred from observations Drilling Advance Rates Depth (m) Time (sec) 0.0-0.5 39 0.5-1.0 39 1.0-1.5 23 1.5-2.0 25 0.6 m: Siltstone cobble encountered approx. 100 mm in diameter
			1.0	1.00					grey	D	St - VSt	
				1.30				ML-MH	SILT medium to high liquid limit, pale grey to white, trace fine to medium grained sand, trace fine to medium grained gravel			
			1.5	1.50				CL-CI	Sandy CLAY low to medium plasticity, dark red, approx. 35% fine to medium grained sanc			
				1.80					brown			
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			
			2.5									
			3.0									

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GAP gINT FN. F01a RL3

GAP 8_07.13 LIB.GLB Log GAP NON-CORED FULL PAGE 137642057 LOGS.GPJ <<DrawingFile>> 11/06/2013 14:59 8.30.003 Datgel Tools

Golder Associates

REPORT OF BOREHOLE: BH9

SHEET: 1 OF 1

CLIENT: MGA Town Planners	COORDS: 407311 m E 6432619 m N MGA94 50	DRILL RIG: Comacchio Geo 305	
PROJECT: Residential Subdivision	SURFACE RL: DATUM: AHD	CONTRACTOR: Proline Drilling	
LOCATION: Cardup	INCLINATION: -90°	LOGGED: BMH	DATE: 24/5/13
JOB NO: 137642057	HOLE DEPTH: 2.00 m	CHECKED: SVK	DATE: 11/6/13

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AIRCORE			0.0					CI-CH	CLAY high plasticity, purple, with some fine to medium grained sand	D	St - VSt	Density inferred from observations **Drilling Advance Rates** Depth (m) Time (sec) 0.0-0.5 23 0.5-1.0 25 1.0-1.5 25 1.5-2.0 26
				0.20				SC	Clayey SAND fine to medium grained, orange, approx. 30% medium plasticity clay, trace fine to medium gravel size weakly cemented pockets		D - VD	
			0.5									
			1.0									
			1.5									
			2.0						END OF BOREHOLE @ 2.00 m TARGET DEPTH GROUNDWATER NOT ENCOUNTERED BACKFILLED			
			2.5									
			3.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F01a RL3

GAP 8_07.13 LIB.GLB Log GAP NON-CORED FULL PAGE 137642057 LOGS.GPJ <<DrawingFile>> 11/06/2013 14:59 8.30.003 Datgel Tools

APPENDIX B

Laboratory Test Certificates

Particle Size Distribution & Plasticity Index Test Report

Golder Associates

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www.golder.com
perthlab@golder.com.au

Client: MGA Town Planners
26 Mayfair Street WEST PERTH WA 6005

Project: Residential Subdivision

Date: 17/06/13

Location: Cardup

Project No.: 137642057

Lab Reference Number: 13440967

Sample Identification: BH2-2
1.1-1.5m

Laboratory Specimen Description: CLAY (trace of sand, trace of gravel)

AS 1726 - Soil Classification: CH

Particle Size Distribution AS 1289.3.6.1

Sieve Size		% Passing	Specification
150.0	mm	100	
75.0	mm	100	
53.0	mm	100	
37.5	mm	100	
26.5	mm	100	
19.0	mm	100	
9.5	mm	100	
4.75	mm	99	
2.36	mm	99	
1.18	mm	97	
0.600	mm	94	
0.425	mm	93	
0.300	mm	91	
0.150	mm	88	
0.075	mm	85	

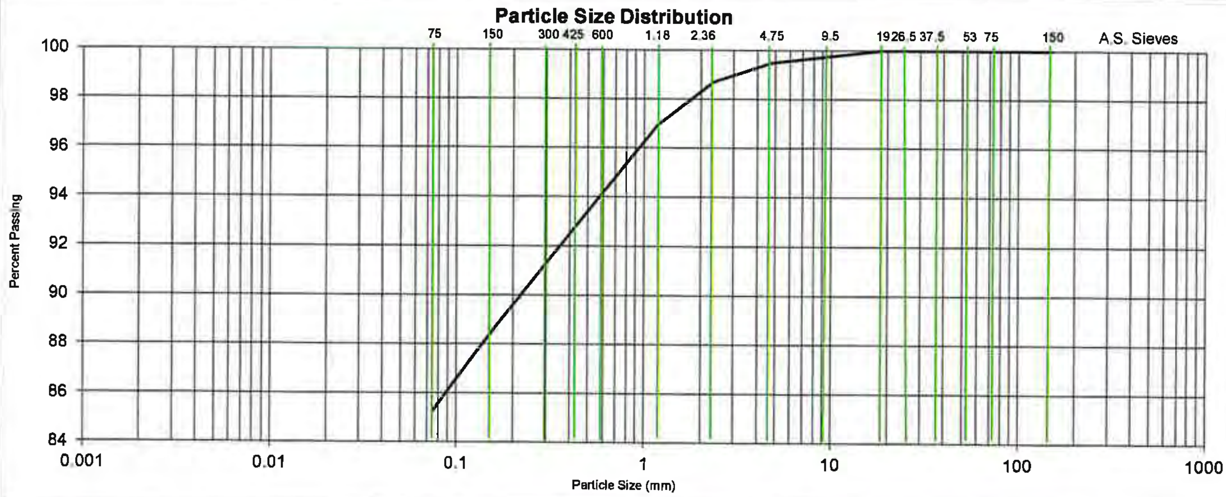
Plasticity Index and Moisture Content

Test		Method	Result	Specification
Liquid Limit	%	AS 1289.3.1.2	105	
Plastic Limit	%	AS 1289.3.2.1	22	
Plasticity Index	%	AS 1289.3.3.1	83	
Linear Shrinkage	%	AS 1289.3.4.1	20.0	
Moisture Content	%	AS 1289.2.1.1	ND	

Sample History: Air Dried
Preparation Method: Dry Sieved
Cracking/Crumbling/Curling of linear shrinkage: Yes
Linear shrinkage mould length (mm): 125

ND = not determined NO = not obtainable NP = non plastic

Notes:



Tested as received

PLF1-003 RL0 27/11/12

Certificate Reference: 137642057_13440967_TR-130120_Class_Rev0

NATA

NATA Accreditation No: 1961 Perth

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[illegible]

Stephen Abbey - Senior Laboratory Technician

Particle Size Distribution & Plasticity Index Test Report

Golder Associates

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Client: MGA Town Planners
26 Mayfair Street WEST PERTH WA 6005

Project: Residential Subdivision
Location: Cardup
Date: 17/06/13
Project No.: 137642057

Lab Reference Number: 13440968
Sample Identification: BH3-1 0.5-1.0m

Laboratory Specimen Description: CLAY (with sand, trace of gravel)
AS 1726 - Soil Classification: CH

Particle Size Distribution AS 1289.3.6.1

Sieve Size	% Passing	Specification
150.0 mm	100	
75.0 mm	100	
53.0 mm	100	
37.5 mm	100	
26.5 mm	100	
19.0 mm	100	
9.5 mm	96	
4.75 mm	90	
2.36 mm	86	
1.18 mm	83	
0.600 mm	81	
0.425 mm	77	
0.300 mm	74	
0.150 mm	70	
0.075 mm	66	

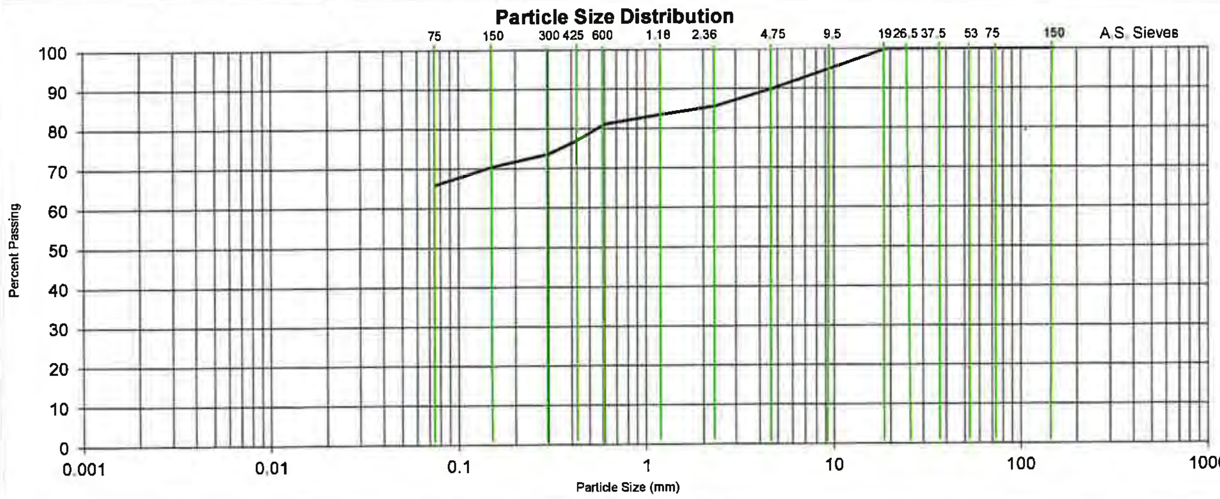
Plasticity Index and Moisture Content

Test		Method	Result	Specification
Liquid Limit	%	AS 1289.3.1.2	56	
Plastic Limit	%	AS 1289.3.2.1	18	
Plasticity Index	%	AS 1289.3.3.1	38	
Linear Shrinkage	%	AS 1289.3.4.1	16.0	
Moisture Content	%	AS 1289.2.1.1	ND	

Sample History:	Air Dried
Preparation Method:	Dry Sieved
Cracking/Crumbling/Curling of linear shrinkage:	No
Linear shrinkage mould length (mm):	125

ND = not determined NO = not obtainable NP = non plastic

Notes:



Tested as received

PLF1-003 RL0 27/11/12

Certificate Reference: 137642057_1344096[illegible]_TR-130120_Class_Rev0

NATA

NATA Accreditation No: 1961 Perth

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Stephen Abbey - Senior Laboratory Technician

Particle Size Distribution & Plasticity Index Test Report

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Client:	MGA Town Planners 26 Mayfair Street WEST PERTH WA 6005		
Project:	Residential Subdivision	**Date:**	17/06/13
Location:	Cardup	**Project No.:**	137642057
Lab Reference Number:	13440969	**Sample Identification:**	BH5 1.0-1.5m

Laboratory Specimen Description: Clayey SAND (with gravel, trace of organics)
AS 1726 - Soil Classification: SC

Particle Size Distribution AS 1289.3.6.1

Sieve Size		% Passing	Specification
150.0	mm	100	
75.0	mm	100	
53.0	mm	100	
37.5	mm	100	
26.5	mm	100	
19.0	mm	100	
9.5	mm	94	
4.75	mm	81	
2.36	mm	67	
1.18	mm	56	
0.600	mm	45	
0.425	mm	40	
0.300	mm	36	
0.150	mm	28	
0.075	mm	22	

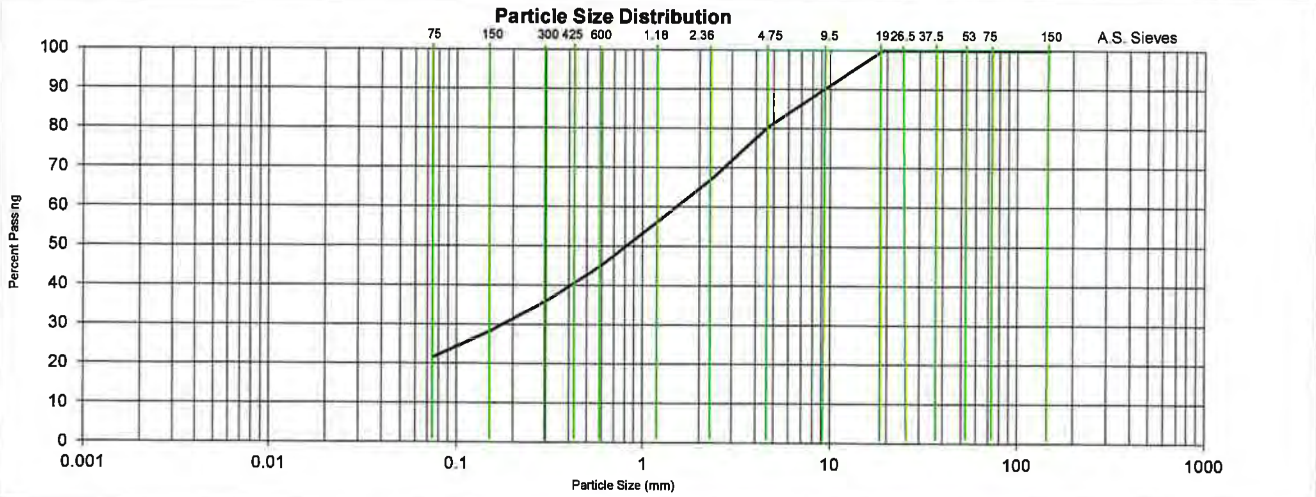
Plasticity Index and Moisture Content

Test		Method	Result	Specification
Liquid Limit	%	AS 1289.3.1.2	36	
Plastic Limit	%	AS 1289.3.2.1	19	
Plasticity Index	%	AS 1289.3.3.1	17	
Linear Shrinkage	%	AS 1289.3.4.1	6.5	
Moisture Content	%	AS 1289.2.1.1	ND	

Sample History:	Air Dried
Preparation Method:	Dry Sieved
Cracking/Crumbling/Curling of linear shrinkage:	No
Linear shrinkage mould length (mm):	125

ND = not determined NO = not obtainable NP = non plastic

Notes:



Tested as received **PLF1-003 RL0 27/11/12**

Certificate Reference: 137642057_13440969_TR-130120_Class_Rev0

NATA

NATA Accreditation No: 1961 Perth

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[illegible]

Stephen Abbey - Senior Laboratory Technician

Particle Size Distribution & Plasticity Index Test Report

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www.golder.com
perthlab@golder.com.au

Client:	MGA Town Planners 26 Mayfair Street WEST PERTH WA 6005		
Project:	Residential Subdivision	**Date:**	17/06/13
Location:	Cardup	**Project No.:**	137642057
Lab Reference Number:	13440970	**Sample Identification:**	BH8 0.0-0.5m

Laboratory Specimen Description: Sandy CLAY (trace of gravel, trace of organics)
AS 1726 - Soil Classification: CI

Particle Size Distribution AS 1289.3.6.1

Sieve Size		% Passing	Specification
150.0	mm	100	
75.0	mm	100	
53.0	mm	100	
37.5	mm	100	
26.5	mm	100	
19.0	mm	100	
9.5	mm	96	
4.75	mm	91	
2.36	mm	86	
1.18	mm	82	
0.600	mm	78	
0.425	mm	74	
0.300	mm	71	
0.150	mm	67	
0.075	mm	64	

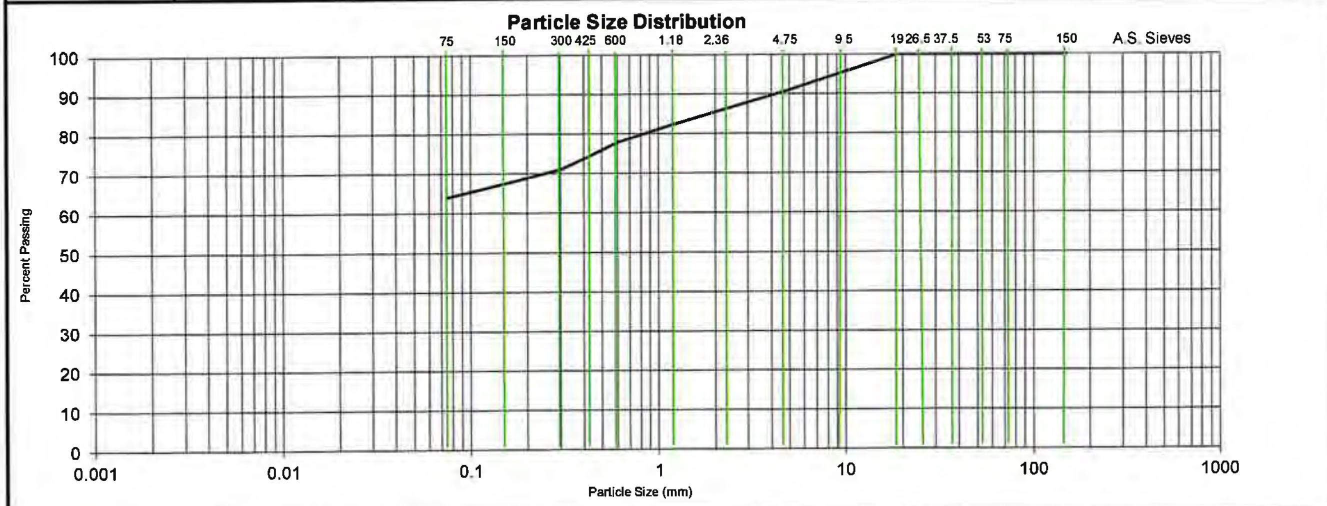
Plasticity Index and Moisture Content

Test		Method	Result	Specification
Liquid Limit	%	AS 1289.3.1.2	47	
Plastic Limit	%	AS 1289.3.2.1	19	
Plasticity Index	%	AS 1289.3.3.1	28	
Linear Shrinkage	%	AS 1289.3.4.1	9.5	
Moisture Content	%	AS 1289.2.1.1	ND	

Sample History:	Air Dried
Preparation Method:	Dry Sieved
Cracking/Crumbling/Curling of linear shrinkage:	No
Linear shrinkage mould length (mm):	125

ND = not determined NO = not obtainable NP = non plastic

Notes:



Tested as received PLF1-003 RL0 27/11/12

Certificate Reference:	137642057_13440970_TR-130120_Class_Rev0
NATA	**NATA Accreditation No: 1961 Perth**
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Stephen Abbey - Senior Laboratory Technician

APPENDIX C

Limitations

Golder Associates

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Golder Associates

Appendix 4 Surface Water Flow Results

Month	Location	2011		2012		2013		2014		2015		2016		2017		2018		2019		2020	
		Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)	Discharging?	Flow (m/s)
May	CAR01	Yes	0.03	Yes	0.03	No	0					Y	0.01-0.03	Yes	0.05 - 0.1			No		No	NA
	CAR02	Yes	0.00 - 0.01	Yes	0.02	Yes	0 - 0.07					N		No				No		No	NA
	CAR05	No	-	No	-	No						N	Stagnant	No				No		No	NA
	CAR06	Yes	0.1	Yes	0.01	Yes	0 - 0.1					Y	0.01 - 0.09	Yes	0.03			No		No	NA
	CAR09	Yes	0.01	No	-	No						N		No				No		No	NA
	CAR10	No	0	No	-	No						N		No				No		No	NA
	CAR12	Yes	0.01	No	-	No						N		No				No		No	NA
	CAR13	No	-	No	-	No						N		No				No		No	NA
	CAR15	No	-	No	-	No						N		Overflow Yes				No		No	NA
	CAR17	Yes	n/a	Yes	0.02	No	0 - 0.05					Y	0.15-0 3								
	CAR18													No				No		No	NA
June	CAR01	Yes	0.6	Yes	0.13	No	stagnant	Yes	0-0.05	N		N				Yes	0.05 - 0.1	Yes	0.018	No	NA
	CAR02	Yes	0.35	Yes	0.09	Yes	0.00-0.05	No	Stagnant	N		N	stagnant			No		No	-	No	NA
	CAR05	no	-	No	-	No	stagnant	No	Stagnant	N		N				No		No	-	No	NA
	CAR06	Yes	0.55	Yes	0.09	Yes	0.00-0.15	Yes	0-0.09	Y	0.04	Y	ffles, 0.0/0.1			Yes	0.03	Yes	0.02-0.05	Yes	0.013
	CAR09	Yes	0.03	No	-	No		No	-	N		N	NA			No		No	-	No	NA
	CAR10	no	-	No	-	No		No	-	N		N	NA			No		No	-	No	NA
	CAR12	Yes	0.03	No	-	No		No		N		N	NA			No		No		No	NA
	CAR13	Yes	0.05	Yes	0.02	No		No		N		N	NA			No		No	-	No	NA
	CAR15	no	-	Yes	-	No		Yes		N		Y	NA			Overflow Yes		No	-	No	NA
	CAR17	Yes	n/a	Yes	0.13	Yes	0.00-0.15	Yes	0.01-0.21	Y	0.1-0.3	Y	0.1 main								
	CAR18															No	NA	No	-	No	NA
July	CAR01	Yes	0.6 m/s	Yes	0.26	Yes	0.1-0.6	Yes	0.03-0.48	N		Y	0.5	Yes	0.1 - 0.3	Yes	0.5-1.6	Yes	0.503-1.206	Yes	0.451
	CAR02	Yes	0.09 m/s	Yes	0.06	Yes	0.00-0.1	Yes	0.02	N		Y	0.01	Yes	0.1	Yes	0.2-0.46	Yes	0.190-0.261	Yes	0.041
	CAR05	No	-	No	-	No	na	No	-	N		N		No		No		No	-	No	NA
	CAR06	Yes	0.15 m/s	Yes	0.04	Yes	0.15-0.25	Yes	0.07-0.45	Y	0.07-0.1	Y	0.1	Yes	0.1 - 0.2	Yes	0.2-1.9	Yes	1.184-2.802	Yes	0.765
	CAR09	No	-	No	-	Y/N	0.00-0.01	No	-	N		N		No		No		No	-	No	NA
	CAR10	No	-	No	-	No	stagnant	No	-	N		N		No		No		No	-	No	NA
	CAR12	No	-	No	-	No	na	No		N		N		No		No		No	-	No	NA
	CAR13	Yes	0.03	No	-	Yes	0.02-0.07	Yes	0.25-0.61	N		Y	0.05	No		No		Yes	0.01-0.012	Yes	0.005
	CAR15	No	-	Yes	-	Yes	na	Yes		N		N		No		No		No	-	No	NA
	CAR17	Yes	n/a	Yes	0.05	Yes	0.1-0.3	Yes	0.34-0.48	Y	0.15-0.17	Y	0.2								
	CAR18													No				No	-	No	NA
August	CAR01	Yes	1.2	Yes	0.4	Yes	0.4-0.6	Yes	0.04-0.37	Y	0.22-0.31	Y	0.1	Yes	0.5 (0.2-0.9)	Yes	1.43	Yes	0.069-0.1	Yes	0.337
	CAR02	Yes	0.35	Yes	0.46	Yes	0.2-0.3	Yes	0.01-0.06	Y	0.08-0.13	Y	0.1-0.2	Yes	0.1 (0.1-0.2)			Yes	0.24-0.27	Yes	0.214
	CAR05	No	-	No	-	Yes	0.0-0.1	No	Stagnant	N		N		No		No		No	-	No	NA
	CAR06	Yes	0.7	Yes	0.35	Yes	0.5-0.6	Yes	0.01-0.24	Y	0.16-0.34	Y	0.2-0.4	Yes	0.3 (0.1-0.5)	Yes	1.38	Yes	0.2-0.5	Yes	1.172
	CAR09	No	-	Yes	Near stagnant	Yes	~0.2	No	Stagnant	N		N		No		No		No	-	No	NA
	CAR10	No	-	No		no	0	No		N		N		No		No		No	-	No	NA
	CAR12	No	-	No	-	Yes		No		N		N		No		No		No	-	No	NA
	CAR13	Yes	0.55	Yes	0.04	Yes		Yes		N		N		No		Yes	0.01	Yes	0.02-0	Yes	0.01
	CAR15	Yes	0.2	Yes	-	Yes		No		N		N		No		No		No	-	No	NA
	CAR17	Yes	n/a	Yes	0.36	Yes	0.4-0.5m/s	Yes	0.11-0.47	Y	0.11-0.25	Y	0.1-0.3								
	CAR18													No		No		No	-	No	NA
September	CAR01							Yes	0.14-0.70	Y	0.05-0.14			Yes	0.1 - 0.7	Yes	0.05 to 0.08				
	CAR02							Yes		N	N/A			Yes	0.1 - 0.3	Yes	0.53				
	CAR05							No	Stagnant	N/A	N/A			No	N/A	No	NA				
	CAR06							Yes	0.03-0.70	Y	0.05-0.26			Yes	0.1 - 0.5	Yes	0.49 to 0.55				
	CAR09							No	Stagnant	N/A	N/A			N/A	N/A	No	NA				
	CAR10							No	NA	N/A	N/A			No	N/A	No	NA				
	CAR12							No	NA	N	N/A			No	N/A	No	NA				
	CAR13							Yes		N	N/A			No	N/A	Yes	too low				
	CAR15							No	NA	N	N/A			No	N/A	No	NA				
	CAR17							Yes	0.06-0.65	Y	0.03-0.29										
	CAR18													N/A	N/A	No	NA				

Appendix 5 Surface Water Quality Results

		In Situ Parameters					TSS	Turbidity	TPHs				
		pH	DO	TDS	Redox	EC			C6-9	C10-14	C15-28	C29-36	C>36
Triggers (ANZECC FWG)		6.5-8.5					25[1]	20					
31-May-11	CAR01	5.3	47.8	864	104	-	88	130	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR02	5.24	60.9	559	112.8	-	150	260	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR05	5.87	7.55	86	131.4	-	110	780	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR06	5.34	7.75	422	140.7	-	200	600	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR09	5.38	7.6	100	138.1	-	100	520	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.88	70.8	138	53.5	-	40	360	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	5.81	8.1	81	118.3	-	950	3600	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	5.81	8.4	154	117.9	-	140	1500	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	5.45	8.76	213	98.5	-	96	750	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	-	-	-	-	-	98	380	-	-	-	-	-
29-Jun-11	CAR01	8.45	9.18	247.6	0.3	-	7	19	<0.02	<0.02	6	3	<0.04
	CAR02	7.55	8.54	253.5	49.9	-	7	25	<0.02	<0.02	1.8	1.1	<0.04
	CAR05	7.61	7.4	197.6	41.6	-	32	150	<0.02	<0.02	0.98	0.16	<0.04
	CAR06	7.52	8.5	274.9	-2.9	-	22	100	<0.02	<0.02	3.3	1.8	<0.04
	CAR09	7.76	8.45	107.9	57.3	-	100	380	<0.02	<0.02	1.9	1.2	<0.04
	CAR10	8.21	8.4	141.7	36.4	-	54	120	<0.02	<0.02	2.4	1.5	<0.04
	CAR12	7.98	8.41	4704	64.7	-	88	1100	<0.02	<0.02	2.7	1.1	<0.04
	CAR13	8.02	8.6	163.1	58.4	-	88	800	<0.02	<0.02	6.4	3.4	<0.04
	CAR15	8.24	8.41	115.7	39.9	-	120	1100	<0.02	<0.02	0.12	0.31	<0.04
	CAR17	-	-	-	-	-	27	110	-	-	-	-	-
25-Jul-11	CAR01	7.75	8.1	278	-77.3	341	14	4.2	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR02	7.48	7.63	282	4.9	347	58	80	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR05	7.65	6.3	96.2	65.6	120	82	300	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR06	7.6	7.86	313	1.2	384	8	13	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR09	7.42	3.05	128	54.6	159	17	54	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	8.14	4.39	643	59.4	786	5	11	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.95	7.51	77.3	64.7	93	310	1000	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.33	4.6	268	77.5	320	84	460	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	8.23	7.43	114	12.8	140	150	850	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	-	-	-	-	-	16	17	-	-	-	-	-
25-Aug-11	CAR01	7.18	10.2	173	91.2	213	5	6.4	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR02	7.08	9.53	174	138	217	< 5	8.7	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR05	7.03	7.53	113	126	139	7	3.1	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR06	6.93	10.02	183	118	226	< 5	8.4	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR09	6.89	6.44	131	145	158	< 5	8.5	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR10	6.71	5.78	299	88.3		< 5	5.1	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR12	6.86	8.61	92	135	118	120	700	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR13	7.32	9.47	118	120.7	146	18	600	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR15	7.76	7.79	102	97.3	132	60	590	< 0.02	< 0.02	< 0.04	< 0.04	< 0.04
	CAR17	-	-	-	-		14	29	-	-	-	-	-

29-May-12	CAR1	7.55	5.38	461.5	-35.5		<5	38	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	8.02	7.66	507	23.1		50	15	0.47	2.8	<0.04	<0.04	<0.04
	CAR5	Dry											
	CAR6	7.89	9.12	630.5	64		<5	20	0.26	1.4	<0.04	<0.04	<0.04
	CAR9	Dry											
	CAR10	Dry											
	CAR12	8.55	8.38	55.9	31.3		380	740	0.15	0.65	<0.04	<0.04	<0.04
	CAR13	.7.99	7.18	461.5	73.9		12	75	0.19	1.1	<0.04	<0.04	<0.04
	CAR15	8.36	8.68	148.85	15.9		36	1300	0.13	0.64	<0.04	<0.04	<0.04
	CAR17	7.99	9.09	624	22.2		<5	13	0.19	1.2	<0.04	<0.04	<0.04
14-Jun-12	CAR1	6.96	8.83	317.85	70.1		9	9	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	8.71	9.03	343.85	20.2		18	18	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.79	6.04	182	86.8		22	54	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.79	9.6	293.15	71.9		27	50	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.08	6.54	168.35	163.1		65	130	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.25	8.68	219.05	93.2		10	11	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.65	9.47	78	89.9		120	800	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	8.17	9.34	139.75	87.3		87	910	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.28	9.29	134.55	134.4		210	940	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.81	9.58	295.75	82.5		67	340	<0.02	<0.02	<0.04	<0.04	<0.04
26-Jul-12	CAR1	8.1	9.48	318.5	-12.7		31	5.9	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.76	10.14	360.75	-1.9		41	4	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	Dry											
	CAR6	7.72	10.09	420.55	-4.4		80	17	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	8.51	9.25	48.1	46.5		100	28	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	Dry											
	CAR12	7.89	8.7	91	26.5		43	28	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.71	11.56	513.5	55.8		65	69	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	8.19	10.08	141.7	45.3		190	920	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.57	10.5	448.5	54.7		78	6.8	<0.02	<0.02	<0.04	<0.04	<0.04
8-Aug-12	CAR1	7.45	9.31	217.1	39.3		17	21	<0.02	<0.02	0.21	<0.04	<0.04
	CAR2	7.25	9.63	221	65.8		30	27	<0.02	<0.02	0.2	<0.04	<0.04
	CAR5	7.7	5.54	113.1	100.6		36	300	<0.02	<0.02	0.2	<0.04	<0.04
	CAR6	7.61	10.05	226.85	23.1		44	100	<0.02	<0.02	0.22	<0.04	<0.04
	CAR9	7.29	7.07	82.55	142.6		7	100	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.31	11.93	291.2	84.4		21	10	<0.02	<0.02	0.27	<0.04	<0.04
	CAR12	7.68	8.84	53.95	91.2		300	1400	<0.02	<0.02	0.19	<0.04	<0.04
	CAR13	8.18	9.77	137.15	88.5		73	910	<0.02	<0.02	0.35	<0.04	<0.04
	CAR15	9.01	9.82	163.5	51.6		61	880	<0.02	<0.02	0.42	<0.04	<0.04
	CAR17	7.54	9.59	247	68.1		49	86	<0.02	<0.02	0.34	<0.04	<0.04

	CAR1	6.57	2.67	859	96	1234	22	69	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.83	5.75	467.5	36	690	12	38	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.32	3.4	69.8	93.3	101.5	10	34	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.8	7.23	649	13.4	943	7	32	<0.02	<0.02	<0.04	<0.04	<0.04
22-May-13	CAR9	7.1	5.52	85.8	119.8	124.7	<5	68	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	Dry											
	CAR12	7.13	7.6	91.8	108.6	138.8	6	36	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.58	6.45	125.9	35.9	197.4	200	1500	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.23	8	148.5	75.9	221	64	900	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	8	7.15	440	0.6	639	6	26	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR1	6.6	8.37	522.5	-33.6	738	48	170	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.56	6.8	467.5	18.6	671	<5	24	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.45	5.9	60.5	12.5	86.5	24	94	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.96	9.32	550	-5.4	772	<5	32	<0.02	<0.02	<0.04	<0.04	<0.04
27-Jun-13	CAR9	6.82	6.3	77	88.4	106.9	<5	55	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	Dry											
	CAR12	6.9	10.12	120.4	82	175.8	22	14	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.08	10.6	226.6	66.7	323.4	50	380	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.06	8.86	144.1	36.5	209.8	54	690	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.88	9.95	341	16.3	476	16	32	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR1	8.23	8.83	337	-32	469	10	12	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.94	7.71	334	38	463	40	55	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.79	7.32	50	82.9	70.4	9	56	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.13	9.59	368	25	505	30	74	<0.02	<0.02	<0.04	<0.04	<0.04
25-Jul-13	CAR9	7.53	8.44	61	49.9	84.5	5	40	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	Dry											
	CAR12	8.14	8.94	58.3	50.1	87.4	84	240	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.91	8.97	195	70.7	282	70	400	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	8.35	9.71	135	32	191	47	600	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.92	9.2	368	4.3	516	18	70					
	CAR1	7.86	8.79	224	27	269	10	44	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.12	8.5	167.7	48.1	200	110	170	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.55	7.26	56.6	29	68.5	26	110	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.47	8.98	147	34.5	177	140	240	<0.02	<0.02	<0.04	<0.04	<0.04
27-Aug-13	CAR9	7.35	9.14	27.9	48.5	33.7	24	120	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	8.91	8.71	40.3	10.7	48	10	61	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.88	8.05	63.7	24.4	76.6	150	260	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	8.08	8.84	164	14	201	10	520	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	8.2	8.61	156	6.9	184	68	670	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	Equpment Fail											

12-Jun-14	CAR1	7.66	6.81	780	49.2	945	11	110	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.16	3.1	695	-32	861	53	160	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	8.32	5.59	53.6	-12.1	63.5	9	35	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.78	7.68	734	-18.3	902	<5	11	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	DRY											
	CAR12	8.62	8.08	66.3	-14.7	78.8	95	800	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	8.13	8.38	326	-14.9	391	74	250	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	8.36	8.6	170.95	-17.4	262	77	630	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.09	8.81	663	6.3	770	<5	19	<0.02	<0.02	<0.04	<0.04	<0.04
21-Jul-14	CAR1	6.52	9.44	221.65	123	341	19	13	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.01	8.2	221	170.3	341	15	18	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.26	6.31	100.1	250	154	13	37	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.89	7.7	253.5	137.9	390	5	8.2	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.93	3.67	88.4	261.4	136	20	32	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	6.55	4.58	191.1	244.5	294	9	5.6	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.73	9.6	68.9	350.4	108	67	390	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.73	7.21	161.2	347	248	27	400	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.98	9.32	131.95	319.2	203	45	450	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.18	8.35	274.3	123.9	422	7	16	<0.02	<0.02	<0.04	<0.04	<0.04
26-Aug-14	CAR1	6.7	8.74	221.85	83.8	230.7	<5	8	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.73	5.58	237.9	63.9	304.5	70	79	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	6.38	3.57	93.6	64.4	121.8	20	51	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.75	7.06	261.95	80.4	331.5	<5	9.1	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.7	6.43	70.85	80.6	92.3	78	60	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	9.96	6.2	98.13	105.3	125.4	7	3.6	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.04	7.73	64.34	104.8	80.4	54	370	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.58	6.84	177.45	91.5	225.1	15	350	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.34	8.99	128.5	99.8	164.4	24	410	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	6.94	7.8	278.5	77	354.7	6	18	<0.02	<0.02	<0.04	<0.04	<0.04
23-Sep-14	CAR1	6.74	10.3	216.8	42.9	0.332	<5	6.6	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	No access											
	CAR5	7.3	9.78	79.3	108.8	122	13	20	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.91	9.4	244.4	49.3	376	13	15	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.63	5.27	53.95	131.7	83	84	72	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	6.99	5.94	190.45	194.5	292	<5	4.5	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.12	7.1	99.7	170.9	138	130	440	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.83	7.86	176.8	161.4	272	34	350	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.6	7.99	130.65	137.5	201	18	370	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.29	10.79	237.6	30.8	388	<5	18	<0.02	<0.02	<0.04	<0.04	<0.04

17-Jun-15	CAR1	DRY											
	CAR2	6.39	1.85	650	-20.6	1	190	4600	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	DRY											
	CAR6	7.32	4.8	617.5	114.7	0.95	<5	6.5	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	DRY											
	CAR12	6.91	5.32	110.5	190.4	0.17	75	430	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.14	5.03	120.9	166.1	0.187	16	270	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.29	4.87	213.2	154	0.328	28	530	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.53	5.99	643.5	23.1	0.99	5	5.5	<0.02	<0.02	<0.04	<0.04	<0.04
15-Jul-15	CAR1	3.28	6.91	1332.5	422.5	2.05	19	63	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.09	1.36	624	-6.3	0.96	1200	3000	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	6.7	2.84	40.3	-14.1	0.062	<5	30	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.48	6.52	598	3.7	0.92	<5	4.1	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	DRY											
	CAR12	5.51	7.21	33.8	24.3	0.052	97	720	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	5.69	6.13	128.05	11.6	0.197	34	330	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	5.39	8.05	162.5	42.4	0.249	<5	480	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.04	8.48	637	-10.9	0.98	<5	5.5	<0.02	<0.02	<0.04	<0.04	<0.04
26-Aug-15	CAR1	7.03	9.04	[NT]	106.7	0.429	<5	5.2	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.09	7.63		136.7	0.44	7	20	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	5.99	2.34		197.2	0.099	<5	28	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.38	8.4		98	0.577	<5	6.8	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.11	6.68		218.5	0.139	28	120	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	DRY											
	CAR12	6.25	8.69	[NT]	259.6	0.077	120	1300	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.37	7.03		247.3	0.296	6	290	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.09	9.13		231	0.207	17	380	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	6.83	8.44		74	0.68	<5	8.9	<0.02	<0.02	<0.04	<0.04	<0.04
30-Sep-15	CAR1	7.24	5.15	409.5	41.1	558	13	9	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.48	0.89	650	-54.2	855	3400	890	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	DRY											
	CAR6	6.97	8.53	572	21.9	763	<5	7.1	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	DRY											
	CAR12	7.05	7.39	76.7	101.8	106.1	80	520	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7	7.71	247.65	115.3	333.8	18	140	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.44	8.66	150.15	67.9	212.1	18	320	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.32	8.89	604.5	29.9	806	<5	2.2	<0.02	<0.02	<0.04	<0.04	<0.04

24-May-16	CAR1	6.02	100.3	Not measure	57.3	0.78	65	150	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.07	74.8		25.1	0.566	190	280	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	6.47	92.3		31.6	0.138	40	62	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	5.95	105.2		42.9	0.465	220	1000	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.48	63.1		21.3	0.147	310	450	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.49	114.4		-3.5	0.277	47	44	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.17	104.2		37.5	0.118	720	2100	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.14	98.5		46	0.138	280	850	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.23	109.6		33.6	0.281	98	300	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	6.44	106.4		15.1	0.66	500	1300	<0.02	<0.02	<0.04	<0.04	<0.04
23-Jun-16	CAR1	5.47	24.1	1105	48.5	1.38	31	28	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.06	31.2	604	51.9	0.76	67	57	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7	40.6	74.1	52.9	0.087	39	120	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.83	89	539	24.3	0.69	5	15	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.67	75.4	133.9	125	0.162	16	130	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.82	48.5	97.5	113.5	0.115	5	19	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.4	84.7	79.9	80.3	0.095	94	510	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.23	52	180.1	111.5	0.21	21	210	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.33	97.1	170.9	53.5	0.2	15	230	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	6.88	86.3	624	13.5	0.959	6	17	<0.02	<0.02	<0.04	<0.04	<0.04
27-Jul-16	CAR1	7.54	86.4	342.55	46.5	0.393	<5	11	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	8.19	28.9	343.2	22	0.397	<5	12	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.81	27.1	88.4	51.9	0.098	18	120	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.23	90.9	419.9	57.1	0.494	<5	15	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.15	85.3	500.5	68.8	0.576	16	10	<0.02	<0.02	0.09	0.05	<0.04
	CAR10	9.05	151.6	262.6	34.3	0.294	<5	2.1	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.05	82.6	124.8	63.5	0.142	54	900	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.52	76.2	206.05	80.8	0.232	42	220	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.87	83.1	171.6	55.2	0.198	38	230	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	7.71	96.7	507	34.6	0.598	8	23	<0.02	<0.02	<0.04	<0.04	<0.04
25-Aug-16	CAR1	6.6	91.5	263.25	120.7	0.2982	<5	15	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.36	86.6	265.8	133.2	0.3006	<5	16	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	6.75	6.1	117	0.9	0.1291	2500	1200	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.5	88.6	310.7	137.2	0.3541	<5	17	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.57	83.2	378.3	32	0.4388	33	33	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	5.97	63.6	344.5	164.5	0.3638	<5	3.5	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.75	91.4	111.15	165.2	0.1238	120	1100	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.73	76.6	188.5	166.8	0.2089	15	220	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	6.72	86.7	164.45	151.2	0.1917	23	240	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR17	8.12	96.2	363.35	34.9	0.4137	5	25	<0.02	<0.02	<0.04	<0.04	<0.04

30-May-17	CAR1	8.22	15.5	747	48.1	969	32	60	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.19	74.5	604.5	95.9	930	94	96	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.51	1.3	120	11.7	186	50	230	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.19	74.5	604.5	95.9	930	<5	16	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	DRY											
	CAR12	8.14	72.6	104	151.8	124.7	100	1400	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	8.25	56.9	117.65	151	135.9	54	430	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	8.15	80.4	191	111	294	18	240	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											
6-Jul-17	CAR1	7.03	77.1	455	88.4	699	<5	55	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.62	64.7	442	100.1	682	1000	360	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	6.83	81	104	224.9	159.6	40	210	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.53	84.6	539.5	128	824	27	130	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	8.01	35.6	125.45	154.7	193	65	430	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.07	91.3	94.9	216.1	146	290	1800	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.91	75.1	150.15	217.9	230.9	76	340	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.15	82.7	189.8	183.9	292.2	28	240	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											
7-Aug-17	CAR1	7.21	91.4	228.8	56.3	274.3	24	29	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.02	75.5	231.4	68.6	281.4	130	110	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.15	55.5	89.05	175.4	107.9	930	960	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.97	93.7	248.95	87.7	299.6	33	32	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	7.53	45.2	187.2	119.3	227.4	<5	13	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.41	80.8	83.85	166.2	101.9	30	380	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.22	78.7	167.7	168.9	206.5	12	220	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.44	76.8	141.7	140.8	169.5	46	250	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											
5-Sep-17	CAR1	6.86	86.4	266.5	87.5	338.5	7	12	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.82	85	268.1	86.2	343.4	11	21	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.37	73.9	137.8	187.5	180.4	1900	1800	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.11	95	305.5	97.3	374.2	62	90	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	DRY											
	CAR10	7.27	94.3	226.85	168.2	305.4	16	9.8	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.33	68.8	159.65	170.4	212.4	30	50	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.38	69.5	312.65	182.1	359.1	52	200	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.02	91.3	155.35	192.6	221.7	34	240	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											

18-Jun-18	CAR1	6.47	55.4	341	38.9	427	25	67	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.61	62	345	41.5	426	120	230	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.19	85.8	46.1	88.1	56.6	61	140	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.84	75.7	266.5	95.3	326.4	620	1900	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.26	79.7	91.6	107.1	113	910	1900	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.26	62.9	118.3	92	144.8	5	35	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.96	84.1	89	102	111	450	1700	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.86	77.3	219	112.2	262.4	51	210	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.15	84.2	140.4	60.1	170.6	30	310	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	6.5	49.8	302	60.6	381	340	510	<0.02	<0.02	<0.04	<0.04	<0.04
17-Jul-18	CAR1	6.71	81.7	210.6	43.4	249.1	<5	13	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	6.45	79.9	211.25	39.1	251.3	7	18	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.09	63.3	170	34.7	203.4	810	980	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	6.6	78.6	234	42.6	278.2	10	22	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.19	67.5	193.7	110	232.7	1000	520	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.32	52.3	159.6	115.5	185.7	8	20	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.99	42.3	138.45	109.1	163.8	60	220	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.82	69.8	133.25	126.6	157.8	35	280	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.08	82.3	120.9	100.1	144.7	63	290	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											
15-Aug-18	CAR1	7.42	89.8	150.15	29	182.2	81	29	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2												
	CAR5	7.16	55.5	176.15	75.3	215.3	26	64	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.23	78.9	162.5	48.2	198.9	12	32	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.2	46.8	429	76.5	519	32	62	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	7.9	52.1	228.8	59.5	208.1	6	17	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	6.9	77.9	128.7	84.4	154	140	290	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	6.68	68.5	122.2	83	148.6	74	270	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.72	76.9	108.55	39.5	131.9	60	290	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											
10-Sep-18	CAR1	8.5	104.8	193.05	8.1	239.7	19	16	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.45	85	191.75	5.9	241	<5	14	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5	7.51	77.3	161.85	56.6	206	220	440	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR6	7.45	80.9	215.8	18.5	270.8	12	31	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.82	82.5	141.05	53.9	177.7	1000	2300	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10	8.01	75.5	87.75	58.2	110.3	28	47	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR12	7.5	80.3	212.65	54.7	288	24	39	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR13	7.59	78.2	196.3	58.5	242.7	36	240	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15	7.96	85.9	112.45	54.8	152.1	44	270	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR18	DRY											

21-May-19	CAR1								DRY				
	CAR2								DRY				
	CAR5								Not discharging				
	CAR6	9.36	77.7	604.5	24	938	110	130	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	8.02	11.2	120.9	-6.8	186.6	410	270	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10								DRY				
	CAR12								DRY				
	CAR13								DRY				
	CAR15								DRY				
	CAR18								DRY				
13-Jun-19	CAR1	6.89	26.2	864.5	15.5	1333	350	310	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2								not flowing				
	CAR5								Not discharging				
	CAR6	7.04	81.2	546	73.2	840	76	82	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.13	71.3	232.4	54.1	357	390	270	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10								Not discharging				
	CAR12								Not discharging				
	CAR13								Not discharging				
	CAR15								Not discharging				
	CAR18								Not discharging				
11-Jul-19	CAR1	3.96	83.6	253.5	60.6	390.1	<5	4.6	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	8.3	82.5	256.1	37.4	394	<5	6.2	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5								Not discharging				
	CAR6	6.78	100.4	280.15	88	430.6	19	41	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.97	25.4	401.7	27.7	617.8	87	34	<0.02	0.05	10	7.6	2.3
	CAR10								Not discharging				
	CAR12								Not discharging				
	CAR13	7.17	75	159.25	81.5	245.4	75	260	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15								Not discharging				
	CAR18								Not discharging				
12-Aug-19	CAR1	5.9	97.9	257.4	160.1	396.7	<5	4.2	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	5.99	96.1	255.45	108.9	393.2	<5	6	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5												
	CAR6	6.25	122	289.25	95.7	445.2	<5	12	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.33	0.3	151.45	16.1	233.7	370	370	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10												
	CAR12												
	CAR13	6.48	68.9	168.35	92.7	259.4	39	190	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15												
	CAR18												

20-May-20	CAR1								Not flowing				
	CAR2								Not flowing				
	CAR5								Not flowing				
	CAR6	7.19	54.3	474.5	110.9	727	20	40	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9								Not flowing				
	CAR10								Not flowing				
	CAR12								Not flowing				
	CAR13								Not flowing				
	CAR15								Not flowing				
	CAR18								Not flowing				
16-Jun-20	CAR1												
	CAR2												
	CAR5												
	CAR6	5.14	75.6	565.5	139.8	869	59	47	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	5.82	30.1	107.9	175.5	165.6	34	15	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10												
	CAR12												
	CAR13												
	CAR15												
	CAR18												
22-Jul-20	CAR1	6.42	77.9	255.45	100.7	392.6	5	3.3	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	5.73	81	261.3	82.1	402.9	21	10	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5												
	CAR6	6.2	87.6	289.9	104	445.3	8	12	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	6.82	17.3	422.5	125	652	58	30	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10												
	CAR12												
	CAR13	6.15	71.8	202.15	132.2	311.5	34	150	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15												
	CAR18												
20-Aug-20	CAR1	7.63	84.6	220.35	46	339.3	<5	5	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR2	7.95	88.4	222.95	26.5	343.3	<5	6.5	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR5								Not flowing				
	CAR6	7.47	90.7	231.4	39.3	356.7	6	30	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR9	7.04	58.9	239.85	60.2	368.8	63	16	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR10								DRY				
	CAR12								Not flowing				
	CAR13	8.64	66.1	168.35	18.1	259.5	22	150	<0.02	<0.02	<0.04	<0.04	<0.04
	CAR15								Not flowing				
	CAR18								DRY				

Appendix 6 Monitoring of Discharge to Cardup Brook

Summary of Flow/Discharge to the Brook During all Coterra Monitoring Events (once per month)

Month	Location	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
May	CAR01	Yes	Yes	No	Not monitored	Not monitored	Yes	Yes	Not monitored	No	No
	CAR02	Yes	Yes	Yes			No	No		No	No
	CAR05	No	No	No			No	No		No	No
	CAR06	Yes	Yes	Yes			Yes	Yes		No	No
	CAR09	Yes	No	No			No	No		No	No
	CAR10	No	No	No			No	No		No	No
	CAR12	Yes	No	No			No	No		No	No
	CAR13	No	No	No			No	No		No	No
	CAR15	No	No	No			No	Overflow Yes		No	No
	CAR18	No	No	No			No	No		No	No
June	CAR01	Yes	Yes	No	Yes	No	No	Not monitored	Yes	Yes	No
	CAR02	Yes	Yes	Yes	No	No	No		No	No	No
	CAR05	no	No	No	No	No	No		No	No	No
	CAR06	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
	CAR09	Yes	No	No	No	No	No		No	No	No
	CAR10	no	No	No	No	No	No		No	No	No
	CAR12	Yes	No	No	No	No	No		No	No	No
	CAR13	Yes	Yes	No	No	No	No		No	No	No
	CAR15	No	Yes	No	Yes	No	Yes		Yes	No	No
	CAR18	No	No	No	No	No	No		No	No	No

Month	Location	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
July	CAR01	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	CAR02	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	CAR05	No	No	No	No	No	No	No	No	No	No
	CAR06	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CAR09	No	No	No	No	No	No	No	No	No	No
	CAR10	No	No	No	No	No	No	No	No	No	No
	CAR12	No	No	No	No	No	No	No	No	No	No
	CAR13	Yes	No	Yes	Yes	No	Yes	No	No	Yes	Yes
	CAR15	No	Yes	Yes	Yes	No	No	No	No	No	No
	CAR18	No	No	No	No	No	No	No	No	No	No
August	CAR01	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CAR02	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	CAR05	No	No	Yes	No	No	No	No	No	No	No
	CAR06	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CAR09	No	Yes	Yes	No	No	No	No	No	No	No
	CAR10	No	No	no	No	No	No	No	No	No	No
	CAR12	No	No	Yes	No	No	No	No	No	No	No
	CAR13	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
	CAR15	Yes	Yes	Yes	No	No	No	No	No	No	No
	CAR18	No	No	No	No	No	No	No	No	No	No
Sept	CAR01	Not monitored			Yes	Yes	Not monitored	Yes	Yes	Not monitored	
	CAR02				Yes	No		Yes	Yes		

Month	Location	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	CAR05				No			No	No		
	CAR06				Yes	Yes		Yes	Yes		
	CAR09				No	No		No	No		
	CAR10				No	No		No	No		
	CAR12				No	No		No	No		
	CAR13				Yes	No		No	Yes		
	CAR15				No	No		No	No		
	CAR18				No	No		No	No		

A summary of how often each location flows/discharges to the Brook has been provided in Table **Error! No text of specified style in document.**-1 below. These are given as a percentage of total events in each month. For example, CAR01 has been observed to flow for 57.1% of all May monitoring events (i.e., this location was flowing 4 out of 7 May monitoring events).

Table Error! No text of specified style in document.**-1** **Summary of Location Flows/Discharges in Percentages**

Location	Percentage of time that each location is flowing/discharging during each month				
	May %	June %	July %	August %	September %
CAR01	57.10%	55.6%	90.0%	100.0%	100.0%
CAR02	42.90%	33.3%	90.0%	90.0%	75.0%
CAR05	0.00%	0.0%	0.0%	10.0%	0.0%
CAR06	71.40%	100.0%	100.0%	100.0%	100.0%
CAR09	14.30%	11.1%	0.0%	20.0%	0.0%
CAR10	0.00%	0.0%	0.0%	0.0%	0.0%
CAR12	14.30%	11.1%	0.0%	10.0%	0.0%
CAR13	0.00%	22.2%	60.0%	70.0%	50.0%

Location	Percentage of time that each location is flowing/discharging during each month				
	May %	June %	July %	August %	September %
CAR15	14.30%	44.4%	30.0%	30.0%	0.0%
CAR18	42.90%	66.7%	60.0%	60.0%	50.0%

Appendix 7 Basin 1 Water Balance Model

Objective:
- Determine if an overflow occurs from basin B1, which is of a known/fixed size and capacity.
- figure out how much water can actually be used for dust supression, and any effect this may have on the basin emptying/overflowing
-determine if a second basin may be feasible

DUST USAGE DATA (from Austral Bricks)		
Detail	**Volume (L/day)**	**Volume (kL or m3)**
Pit:	100000	100
PIT Assumptions:	For 7/8 months a year. During clay movement OUTSIDE of winter (specified to be 7/8 months per year)	
Plant:	45000	45
PLANT Assumptions:	Only during dry months (ie, excludes June til August)	

Proposed development operation - usage for :
Clay movement for PIT USAGE occurs 7/8 months a year (outside of winter)
PLANT USAGE occurs only during dry months in general
Operation will be 7 days a week

Basin Assumptions:
Pond doesn't start at empty to mimic real life, as its already constructed.
Pond needs at least 15cm of water in order for water to be able to be abstracted (otherwise too shallow)

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
Formula Description			Raw data	Raw data	Raw data	Raw data	Raw data						
01/01/13	Tuesday	1	6.8	0	181020.8298	0.9	2	0	0	0.0			
02/01/13	Wednesday	1	6.4	0.8	181020.8298	0.9	2	0	7.9352	7.9			
03/01/13	Thursday	1	5.8	0	181020.8298	0.9	2	0	0	0.0			
04/01/13	Friday	1	6.7	0	181020.8298	0.9	2	0	0	0.0			
05/01/13	Saturday	1	8.4	0	181020.8298	0.9	2	0	0	0.0			
06/01/13	Sunday	1	5.8	1	181020.8298	0.9	2	0	9.919	9.9			
07/01/13	Monday	1	5.3	19.8	181020.8298	0.9	2	17.8	196.3962	3096.3			
08/01/13	Tuesday	1	8.5	0.4	181020.8298	0.9	2	0	3.9676	4.0			
09/01/13	Wednesday	1	6.3	0	181020.8298	0.9	2	0	0	0.0			
10/01/13	Thursday	1	6.3	0	181020.8298	0.9	2	0	0	0.0			
11/01/13	Friday	1	7	0	181020.8298	0.9	2	0	0	0.0			
12/01/13	Saturday	1	8.2	0	181020.8298	0.9	2	0	0	0.0			
13/01/13	Sunday	1	4.5	0	181020.8298	0.9	2	0	0	0.0			
14/01/13	Monday	1	7.5	1.6	181020.8298	0.9	2	0	15.8704	15.9			
15/01/13	Tuesday	1	6.9	0	181020.8298	0.9	2	0	0	0.0			
16/01/13	Wednesday	1	4.4	0	181020.8298	0.9	2	0	0	0.0			
17/01/13	Thursday	1	6.9	4.4	181020.8298	0.9	2	2.4	43.6436	434.6			
18/01/13	Friday	1	7.3	0	181020.8298	0.9	2	0	0	0.0			
19/01/13	Saturday	1	8.3	0	181020.8298	0.9	2	0	0	0.0			
20/01/13	Sunday	1	7.6	0	181020.8298	0.9	2	0	0	0.0			
21/01/13	Monday	1	7.4	0	181020.8298	0.9	2	0	0	0.0			
22/01/13	Tuesday	1	8.4	0	181020.8298	0.9	2	0	0	0.0			
23/01/13	Wednesday	1	6.8	0	181020.8298	0.9	2	0	0	0.0			
24/01/13	Thursday	1	7.2	0	181020.8298	0.9	2	0	0	0.0			
25/01/13	Friday	1	7.6	0	181020.8298	0.9	2	0	0	0.0			
26/01/13	Saturday	1	7.9	0	181020.8298	0.9	2	0	0	0.0			
27/01/13	Sunday	1	8.1	0	181020.8298	0.9	2	0	0	0.0			
28/01/13	Monday	1	7.7	0	181020.8298	0.9	2	0	0	0.0			
29/01/13	Tuesday	1	8	0	181020.8298	0.9	2	0	0	0.0			
30/01/13	Wednesday	1	7.4	0	181020.8298	0.9	2	0	0	0.0			
31/01/13	Thursday	1	8.6	0	181020.8298	0.9	2	0	0	0.0			
01/02/13	Friday	2	8.6	0	181020.8298	0.9	2	0	0	0.0			
02/02/13	Saturday	2	8.1	0	181020.8298	0.9	2	0	0	0.0			
03/02/13	Sunday	2	7.6	0	181020.8298	0.9	2	0	0	0.0			
04/02/13	Monday	2	6	0	181020.8298	0.9	2	0	0	0.0			
05/02/13	Tuesday	2	5.7	0	181020.8298	0.9	2	0	0	0.0			
06/02/13	Wednesday	2	7	0	181020.8298	0.9	2	0	0	0.0			
07/02/13	Thursday	2	6.6	0	181020.8298	0.9	2	0	0	0.0			
08/02/13	Friday	2	7.4	0	181020.8298	0.9	2	0	0	0.0			
09/02/13	Saturday	2	8.5	0	181020.8298	0.9	2	0	0	0.0			
10/02/13	Sunday	2	8.9	0	181020.8298	0.9	2	0	0	0.0			
11/02/13	Monday	2	7	0	181020.8298	0.9	2	0	0	0.0			
12/02/13	Tuesday	2	7.4	0	181020.8298	0.9	2	0	0	0.0			
13/02/13	Wednesday	2	6.8	0	181020.8298	0.9	2	0	0	0.0			
14/02/13	Thursday	2	5	0	181020.8298	0.9	2	0	0	0.0			
15/02/13	Friday	2	7	0	181020.8298	0.9	2	0	0	0.0			
16/02/13	Saturday	2	6.1	0	181020.8298	0.9	2	0	0	0.0			
17/02/13	Sunday	2	5.5	0	181020.8298	0.9	2	0	0	0.0			
18/02/13	Monday	2	7.1	0	181020.8298	0.9	2	0	0	0.0			
19/02/13	Tuesday	2	7.4	0	181020.8298	0.9	2	0	0	0.0			
20/02/13	Wednesday	2	7.8	0	181020.8298	0.9	2	0	0	0.0			
21/02/13	Thursday	2	6.4	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
22/02/13	Friday	2	4.5	0	181020.8298	0.9	2	0	0	0.0			
23/02/13	Saturday	2	5.3	1	181020.8298	0.9	2	0	9.919	9.9			
24/02/13	Sunday	2	5.9	0	181020.8298	0.9	2	0	0	0.0			
25/02/13	Monday	2	7.4	0	181020.8298	0.9	2	0	0	0.0			
26/02/13	Tuesday	2	7.1	0	181020.8298	0.9	2	0	0	0.0			
27/02/13	Wednesday	2	7.7	0	181020.8298	0.9	2	0	0	0.0			
28/02/13	Thursday	2	7.1	0	181020.8298	0.9	2	0	0	0.0			
01/03/13	Friday	3	7.3	0	181020.8298	0.9	2	0	0	0.0			
02/03/13	Saturday	3	5.5	0	181020.8298	0.9	2	0	0	0.0			
03/03/13	Sunday	3	5.2	0	181020.8298	0.9	2	0	0	0.0			
04/03/13	Monday	3	3.9	0	181020.8298	0.9	2	0	0	0.0			
05/03/13	Tuesday	3	4.1	0.4	181020.8298	0.9	2	0	3.9676	4.0			
06/03/13	Wednesday	3	5.6	0	181020.8298	0.9	2	0	0	0.0			
07/03/13	Thursday	3	6.1	0	181020.8298	0.9	2	0	0	0.0			
08/03/13	Friday	3	6.6	0	181020.8298	0.9	2	0	0	0.0			
09/03/13	Saturday	3	5.7	0	181020.8298	0.9	2	0	0	0.0			
10/03/13	Sunday	3	2.8	0	181020.8298	0.9	2	0	0	0.0			
11/03/13	Monday	3	4.3	27.6	181020.8298	0.9	2	25.6	273.7644	4444.5			
12/03/13	Tuesday	3	5.5	1	181020.8298	0.9	2	0	9.919	9.9			
13/03/13	Wednesday	3	5.7	0	181020.8298	0.9	2	0	0	0.0			
14/03/13	Thursday	3	2.4	0	181020.8298	0.9	2	0	0	0.0			
15/03/13	Friday	3	3.9	28.8	181020.8298	0.9	2	26.8	285.6672	4651.9			
16/03/13	Saturday	3	5.2	0	181020.8298	0.9	2	0	0	0.0			
17/03/13	Sunday	3	5	0	181020.8298	0.9	2	0	0	0.0			
18/03/13	Monday	3	4.4	0	181020.8298	0.9	2	0	0	0.0			
19/03/13	Tuesday	3	4	0	181020.8298	0.9	2	0	0	0.0			
20/03/13	Wednesday	3	3.5	0	181020.8298	0.9	2	0	0	0.0			
21/03/13	Thursday	3	4.3	0	181020.8298	0.9	2	0	0	0.0			
22/03/13	Friday	3	4.7	0	181020.8298	0.9	2	0	0	0.0			
23/03/13	Saturday	3	4.3	0	181020.8298	0.9	2	0	0	0.0			
24/03/13	Sunday	3	4.7	0	181020.8298	0.9	2	0	0	0.0			
25/03/13	Monday	3	2.6	0	181020.8298	0.9	2	0	0	0.0			
26/03/13	Tuesday	3	3.9	23.2	181020.8298	0.9	2	21.2	230.1208	3684.0			
27/03/13	Wednesday	3	3.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
28/03/13	Thursday	3	3.5	0	181020.8298	0.9	2	0	0	0.0			

Date	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty during winter flag
Formula Description	volume inflow from previous day								final pond volume			
01/01/13	11,137	10998.0	4959.5	2990.0	69.6	-69.6	11067.6	11067.6	11067.6	0.0	0	0
02/01/13	11067.6	10940.3	4959.5	2990.0	67.6	-67.6	11007.9	11007.9	11007.9	0.0	0	0
03/01/13	11007.9	10878.7	4959.5	2990.0	64.6	-64.6	10943.3	10943.3	10943.3	0.0	0	0
04/01/13	10943.3	10805.1	4959.5	2990.0	69.1	-69.1	10874.2	10874.2	10874.2	0.0	0	0
05/01/13	10874.2	10719.1	4959.5	2990.0	77.5	-77.5	10796.7	10796.7	10796.7	0.0	0	0
06/01/13	10796.7	10677.3	4959.5	2990.0	64.6	-64.6	10741.9	10741.9	10741.9	0.0	0	0
07/01/13	10741.9	13713.9	7439.3	4485.0	93.2	-31.1	13745.0	13745.0	13745.0	0.0	0	0
08/01/13	13745.0	13592.9	7439.3	4485.0	117.1	-39.0	13631.9	13631.9	13631.9	0.0	0	0
09/01/13	13631.9	13497.7	7439.3	4485.0	100.7	-33.6	13531.3	13531.3	13531.3	0.0	0	0
10/01/13	13531.3	13397.0	7439.3	4485.0	100.7	-33.6	13430.6	13430.6	13430.6	0.0	0	0
11/01/13	13430.6	13289.4	7439.3	4485.0	105.9	-35.3	13324.7	13324.7	13324.7	0.0	0	0
12/01/13	13324.7	13171.6	7439.3	4485.0	114.8	-38.3	13209.9	13209.9	13209.9	0.0	0	0
13/01/13	13209.9	13093.5	7439.3	4485.0	87.3	-29.1	13122.6	13122.6	13122.6	0.0	0	0
14/01/13	13122.6	12992.3	7439.3	4485.0	109.6	-36.5	13028.8	13028.8	13028.8	0.0	0	0
15/01/13	13028.8	12888.6	7439.3	4485.0	105.2	-35.1	12923.7	12923.7	12923.7	0.0	0	0
16/01/13	12923.7	12808.3	7439.3	4485.0	86.6	-28.9	12837.1	12837.1	12837.1	0.0	0	0
17/01/13	12837.1	13131.6	7439.3	4485.0	105.2	-35.1	13166.6	13166.6	13166.6	0.0	0	0
18/01/13	13166.6	13022.4	7439.3	4485.0	108.1	-36.0	13058.5	13058.5	13058.5	0.0	0	0
19/01/13	13058.5	12904.4	7439.3	4485.0	115.6	-38.5	12942.9	12942.9	12942.9	0.0	0	0
20/01/13	12942.9	12795.8	7439.3	4485.0	110.4	-36.8	12832.6	12832.6	12832.6	0.0	0	0
21/01/13	12832.6	12687.4	7439.3	4485.0	108.9	-36.3	12723.7	12723.7	12723.7	0.0	0	0
22/01/13	12723.7	12568.6	7439.3	4485.0	116.3	-38.8	12607.4	12607.4	12607.4	0.0	0	0
23/01/13	12607.4	12468.2	7439.3	4485.0	104.4	-34.8	12503.0	12503.0	12503.0	0.0	0	0
24/01/13	12503.0	12359.8	7439.3	4485.0	107.4	-35.8	12395.6	12395.6	12395.6	0.0	0	0
25/01/13	12395.6	12248.4	7439.3	4485.0	110.4	-36.8	12285.2	12285.2	12285.2	0.0	0	0
26/01/13	12285.2	12135.1	7439.3	4485.0	112.6	-37.5	12172.6	12172.6	12172.6	0.0	0	0
27/01/13	12172.6	12020.5	7439.3	4485.0	114.1	-38.0	12058.6	12058.6	12058.6	0.0	0	0
28/01/13	12058.6	11910.4	7439.3	4485.0	111.1	-37.0	11947.5	11947.5	11947.5	0.0	0	0
29/01/13	11947.5	11796.3	7439.3	4485.0	113.3	-37.8	11834.1	11834.1	11834.1	0.0	0	0
30/01/13	11834.1	11689.0	7439.3	4485.0	108.9	-36.3	11725.3	11725.3	11725.3	0.0	0	0
31/01/13	11725.3	11568.2	7439.3	4485.0	117.8	-39.3	11607.5	11607.5	11607.5	0.0	0	0
01/02/13	11607.5	11450.4	7439.3	4485.0	117.3	-39.3	11489.7	11489.7	11489.7	0.0	0	0
02/02/13	11489.7	11337.6	7439.3	4485.0	114.1	-38.0	11375.6	11375.6	11375.6	0.0	0	0
03/02/13	11375.6	11228.4	7439.3	4485.0	110.4	-36.8	11265.2	11265.2	11265.2	0.0	0	0
04/02/13	11265.2	11133.9	4959.5	2990.0	65.6	-65.6	11199.6	11199.6	11199.6	0.0	0	0
05/02/13	11199.6	11071.3	4959.5	2990.0	64.1	-64.1	11135.4	11135.4	11135.4	0.0	0	0
06/02/13	11135.4	10994.2	4959.5	2990.0	70.6	-70.6	11064.8	11064.8	11064.8	0.0	0	0
07/02/13	11064.8	10927.6	4959.5	2990.0	68.6	-68.6	10996.2	10996.2	10996.2	0.0	0	0
08/02/13	10996.2	10851.1	4959.5	2990.0	72.6	-72.6	10923.6	10923.6	10923.6	0.0	0	0
09/02/13	10923.6	10767.6	4959.5	2990.0	78.0	-78.0	10845.6	10845.6	10845.6	0.0	0	0
10/02/13	10845.6	10685.6	4959.5	2990.0	80.0	-80.0	10765.6	10765.6	10765.6	0.0	0	0
11/02/13	10765.6	10624.4	4959.5	2990.0	70.6	-70.6	10695.0	10695.0	10695.0	0.0	0	0
12/02/13	10695.0	10549.8	4959.5	2990.0	72.6	-72.6	10622.4	10622.4	10622.4	0.0	0	0
13/02/13	10622.4	10483.2	4959.5	2990.0	69.6	-69.6	10552.8	10552.8	10552.8	0.0	0	0
14/02/13	10552.8	10431.5	4959.5	2990.0	60.7	-60.7	10492.1	10492.1	10492.1	0.0	0	0
15/02/13	10492.1	10350.9	4959.5	2990.0	70.6	-70.6	10421.5	10421.5	10421.5	0.0	0	0
16/02/13	10421.5	10289.3	4959.5	2990.0	66.1	-66.1	10355.4	10355.4	10355.4	0.0	0	0
17/02/13	10355.4	10229.1	4959.5	2990.0	63.2	-63.2	10292.2	10292.2	10292.2	0.0	0	0
18/02/13	10292.2	10150.1	4959.5	2990.0	71.1	-71.1	10221.2	10221.2	10221.2	0.0	0	0
19/02/13	10221.2	10076.0	4959.5	2990.0	72.5	-72.6	10148.6	10148.6	10148.6	0.0	0	0
20/02/13	10148.6	9999.4	4959.5	2990.0	74.5	-74.6	10074.0	10074.0	10074.0	0.0	0	0
21/02/13	10074.0	10027.7	4959.5	2990.0	67.5	-67.6	10095.4	10095.4	10095.4	0.0	0	0
22/02/13	10095.4	9979.0	4959.5	2990.0	58.2	-58.2	10037.2	10037.2	10037.2	0.0	0	0
23/02/13	10037.2	9922.8	4959.5	2990.0	62.2	-62.2	9984.9	9984.9	9984.9	0.0	0	0
24/02/13	9984.9	9854.6	4959.5	2990.0	65.1	-65.1	9919.8	9919.8	9919.8	0.0	0	0
25/02/13	9919.8	9774.6	4959.5	2990.0	72.5	-72.6	9847.2	9847.2	9847.2	0.0	0	0
26/02/13	9847.2	9705.0	4959.5	2990.0	71.1	-71.1	9776.1	9776.1	9776.1	0.0	0	0
27/02/13	9776.1	9628.0	4959.5	2990.0	74.1	-74.1	9702.0	9702.0	9702.0	0.0	0	0
28/02/13	9702.0	9559.9	4959.5	2990.0	71.1	-71.1	9630.9	9630.9	9630.9	0.0	0	0
01/03/13	9630.9	9486.8	4959.5	2990.0	72.1	-72.1	9558.9	9558.9	9558.9	0.0	0	0
02/03/13	9558.9	9432.5	4959.5	2990.0	63.2	-63.2	9495.7	9495.7	9495.7	0.0	0	0
03/03/13	9495.7	9372.4	4959.5	2990.0	61.7	-61.7	9434.0	9434.0	9434.0	0.0	0	0
04/03/13	9434.0	9323.6	4959.5	2990.0	55.2	-55.2	9378.8	9378.8	9378.8	0.0	0	0
05/03/13	9378.8	9270.3	4959.5	2990.0	56.2	-56.2	9326.6	9326.6	9326.6	0.0	0	0
06/03/13	9326.6	9199.3	4959.5	2990.0	63.7	-63.7	9262.9	9262.9	9262.9	0.0	0	0
07/03/13	9262.9	9130.6	4959.5	2990.0	66.1	-66.1	9196.8	9196.8	9196.8	0.0	0	0
08/03/13	9196.8	9059.6	4959.5	2990.0	68.6	-68.6	9128.2	9128.2	9128.2	0.0	0	0
09/03/13	9128.2	8999.9	4959.5	2990.0	64.1	-64.1	9064.0	9064.0	9064.0	0.0	0	0
10/03/13	9064.0	8964.5	4959.5	2990.0	49.8	-49.8	9014.2	9014.2	9014.2	0.0	0	0
11/03/13	9014.2	13344.3	7439.3	4485.0	85.8	-28.6	13372.9	13372.9	13372.9	0.0	0	0
12/03/13	13372.9	13256.5	7439.3	4485.0	94.7	-31.6	13288.1	13288.1	13288.1	0.0	0	0
13/03/13	13288.1	13159.8	7439.3	4485.0	96.2	-32.1	13191.9	13191.9	13191.9	0.0	0	0
14/03/13	13191.9	13096.3	7439.3	4485.0	71.7	-23.9	13120.2	13120.2	13120.2	0.0	0	0
15/03/13	13120.2	17661.7	9919.0	5980.0	110.4	0.0	17661.7	17661.7	17661.7	0.0	0	0
16/03/13	17661.7	17538.3	9919.0	5980.0	123.3	0.0	17538.3	17538.3	17538.3	0.0	0	0
17/03/13	17538.3	17417.0	9919.0	5980.0	121.4	0.0	17417.0	17417.0	17417.0	0.0	0	0
18/03/13	17417.0	17301.6	9919.0	5980.0	115.4	0.0	17301.6	17301.6	17301.6	0.0	0	0
19/03/13	17301.6	17190.1	9919.0	5980.0	111.4	0.0	17190.1	17190.1	17190.1	0.0	0	0
20/03/13	17190.1	17083.6	9919.0	5980.0	106.5	0.0	17083.6	17083.6	17083.6	0.0	0	0
21/03/13	17083.6	16969.2	9919.0	5980.0	114.4	0.0	16969.2	16969.2	16969.2	0.0	0	0
22/03/13	16969.2	16850.9	9919.0	5980.0	118.4	0.0	16850.9	16850.9	16850.9	0.0	0	0
23/03/13	16850.9	16736.4	9919.0	5980.0	114.4	0.0	16736.4	16736.4	16736.4	0.0	0	0
24/03/13	16736.4	16618.1	7439.3	4485.0	88.8	-29.6	16647.7	16647.7	16647.7	0.0	0	0
25/03/13	16647.7	16550.1	7439.3	4485.0	73.2	-24.4	16574.5	16574.5	16574.5	0.0	0	0
26/03/13	16574.5	20148.1	9919.0	5980.0	110.4	0.0	20148.1	20148.1	20148.1	0.0	0	0
27/03/13	20148.1	20043.6	9919.0	5980.0	106.5	0.0	20043.6	20043.6	20043.6	0.0	0	0
28/03/13	20043.6	19937.1	9919.0	5980.0	106.5	0.0	19937.1	19937.1	19937.1	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
29/03/13	Friday	3	3.5	0	181020.8298	0.9	2	0	0	0.0				19937.1	19830.6	9919.0	5980.0	106.5	0.0	19830.6	19830.6	19830.6	0.0	0	0
30/03/13	Saturday	3	3.5	0	181020.8298	0.9	2	0	0	0.0				19830.6	19724.1	9919.0	5980.0	106.5	0.0	19724.1	19724.1	19724.1	0.0	0	0
31/03/13	Sunday	3	3.5	0	181020.8298	0.9	2	0	0	0.0				19724.1	19617.7	9919.0	5980.0	106.5	0.0	19617.7	19617.7	19617.7	0.0	0	0
01/04/13	Monday	4	5	0	181020.8298	0.9	2	0	0	0.0				19617.7	19496.3	9919.0	5980.0	121.4	0.0	19496.3	19496.3	19496.3	0.0	0	0
02/04/13	Tuesday	4	4.8	0	181020.8298	0.9	2	0	0	0.0				19496.3	19376.9	9919.0	5980.0	119.4	0.0	19376.9	19376.9	19376.9	0.0	0	0
03/04/13	Wednesday	4	5.5	0	181020.8298	0.9	2	0	0	0.0				19376.9	19250.6	9919.0	5980.0	126.3	0.0	19250.6	19250.6	19250.6	0.0	0	0
04/04/13	Thursday	4	4.8	0	181020.8298	0.9	2	0	0	0.0				19250.6	19131.2	9919.0	5980.0	119.4	0.0	19131.2	19131.2	19131.2	0.0	0	0
05/04/13	Friday	4	4.1	0	181020.8298	0.9	2	0	0	0.0				19131.2	19018.8	9919.0	5980.0	112.4	0.0	19018.8	19018.8	19018.8	0.0	0	0
06/04/13	Saturday	4	4.6	0	181020.8298	0.9	2	0	0	0.0				19018.8	18901.4	9919.0	5980.0	117.4	0.0	18901.4	18901.4	18901.4	0.0	0	0
07/04/13	Sunday	4	4.9	0	181020.8298	0.9	2	0	0	0.0				18901.4	18781.1	9919.0	5980.0	120.4	0.0	18781.1	18781.1	18781.1	0.0	0	0
08/04/13	Monday	4	4.8	0	181020.8298	0.9	2	0	0	0.0				18781.1	18661.7	9919.0	5980.0	119.4	0.0	18661.7	18661.7	18661.7	0.0	0	0
09/04/13	Tuesday	4	3.9	0	181020.8298	0.9	2	0	0	0.0				18661.7	18551.2	9919.0	5980.0	110.4	0.0	18551.2	18551.2	18551.2	0.0	0	0
10/04/13	Wednesday	4	3.4	0	181020.8298	0.9	2	0	0	0.0				18551.2	18445.8	9919.0	5980.0	105.5	0.0	18445.8	18445.8	18445.8	0.0	0	0
11/04/13	Thursday	4	4.6	0	181020.8298	0.9	2	0	0	0.0				18445.8	18328.4	9919.0	5980.0	117.4	0.0	18328.4	18328.4	18328.4	0.0	0	0
12/04/13	Friday	4	1.6	0.6	181020.8298	0.9	2	0	5.9514	6.0				18328.4	18246.7	9919.0	5980.0	87.6	0.0	18246.7	18246.7	18246.7	0.0	0	0
13/04/13	Saturday	4	2.4	2	181020.8298	0.9	2	0	19.838	19.8				18246.7	18171.0	9919.0	5980.0	95.6	0.0	18171.0	18171.0	18171.0	0.0	0	0
14/04/13	Sunday	4	2.9	3	181020.8298	0.9	2	1	29.757	192.7				18171.0	18263.1	9919.0	5980.0	100.5	0.0	18263.1	18263.1	18263.1	0.0	0	0
15/04/13	Monday	4	2.7	0.6	181020.8298	0.9	2	0	5.9514	6.0				18263.1	18170.5	9919.0	5980.0	98.5	0.0	18170.5	18170.5	18170.5	0.0	0	0
16/04/13	Tuesday	4	2.1	0.7	181020.8298	0.9	2	0	1.9838	2.0				18170.5	18079.9	9919.0	5980.0	92.6	0.0	18079.9	18079.9	18079.9	0.0	0	0
17/04/13	Wednesday	4	2.2	0	181020.8298	0.9	2	0	0	0.0				18079.9	17986.3	9919.0	5980.0	93.6	0.0	17986.3	17986.3	17986.3	0.0	0	0
18/04/13	Thursday	4	2.2	0	181020.8298	0.9	2	0	0	0.0				17986.3	17892.8	9919.0	5980.0	93.6	0.0	17892.8	17892.8	17892.8	0.0	0	0
19/04/13	Friday	4	2.5	1.4	181020.8298	0.9	2	0	13.8866	13.9				17892.8	17810.1	9919.0	5980.0	96.6	0.0	17810.1	17810.1	17810.1	0.0	0	0
20/04/13	Saturday	4	2.8	0	181020.8298	0.9	2	0	0	0.0				17810.1	17710.6	9919.0	5980.0	99.5	0.0	17710.6	17710.6	17710.6	0.0	0	0
21/04/13	Sunday	4	2.4	0	181020.8298	0.9	2	0	0	0.0				17710.6	17615.0	9919.0	5980.0	95.6	0.0	17615.0	17615.0	17615.0	0.0	0	0
22/04/13	Monday	4	2.4	6.4	181020.8298	0.9	2	4.4	63.4816	780.3				17615.0	18299.7	9919.0	5980.0	95.6	0.0	18299.7	18299.7	18299.7	0.0	0	0
23/04/13	Tuesday	4	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				18299.7	18204.2	9919.0	5980.0	97.5	0.0	18204.2	18204.2	18204.2	0.0	0	0
24/04/13	Wednesday	4	3	0.2	181020.8298	0.9	2	0	1.9838	2.0				18204.2	18104.6	9919.0	5980.0	101.5	0.0	18104.6	18104.6	18104.6	0.0	0	0
25/04/13	Thursday	4	2.1	0	181020.8298	0.9	2	0	0	0.0				18104.6	18012.1	9919.0	5980.0	92.6	0.0	18012.1	18012.1	18012.1	0.0	0	0
26/04/13	Friday	4	2.7	0	181020.8298	0.9	2	0	0	0.0				18012.1	17913.5	9919.0	5980.0	98.5	0.0	17913.5	17913.5	17913.5	0.0	0	0
27/04/13	Saturday	4	2.5	0	181020.8298	0.9	2	0	0	0.0				17913.5	17817.0	9919.0	5980.0	96.6	0.0	17817.0	17817.0	17817.0	0.0	0	0
28/04/13	Sunday	4	2.8	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				17817.0	17806.4	9919.0	5980.0	99.5	0.0	17806.4	17806.4	17806.4	0.0	0	0
29/04/13	Monday	4	2.8	0	181020.8298	0.9	2	0	0	0.0				17806.4	17706.9	9919.0	5980.0	99.5	0.0	17706.9	17706.9	17706.9	0.0	0	0
30/04/13	Tuesday	4	2.9	0	181020.8298	0.9	2	0	0	0.0				17706.9	17606.3	9919.0	5980.0	100.5	0.0	17606.3	17606.3	17606.3	0.0	0	0
01/05/13	Wednesday	5	2.7	0	181020.8298	0.9	2	0	0	0.0				17606.3	17507.8	9919.0	5980.0	98.5	0.0	17507.8	17507.8	17507.8	0.0	0	0
02/05/13	Thursday	5	2.3	19.2	181020.8298	0.9	2	17.2	190.4448	2992.6				17507.8	20405.9	9919.0	5980.0	94.6	0.0	20405.9	20405.9	20405.9	0.0	0	0
03/05/13	Friday	5	2.2	6	181020.8298	0.9	2	4	59.514	711.2				20405.9	21023.5	9919.0	5980.0	93.6	0.0	21023.5	21023.5	21023.5	0.0	0	0
04/05/13	Saturday	5	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				21023.5	20928.9	9919.0	5980.0	96.6	0.0	20928.9	20928.9	20928.9	0.0	0	0
05/05/13	Sunday	5	2.4	0	181020.8298	0.9	2	0	0	0.0				20928.9	20833.3	9919.0	5980.0	95.6	0.0	20833.3	20833.3	20833.3	0.0	0	0
06/05/13	Monday	5	1.7	0	181020.8298	0.9	2	0	0	0.0				20833.3	20744.7	9919.0	5980.0	88.6	0.0	20744.7	20744.7	20744.7	0.0	0	0
07/05/13	Tuesday	5	1.9	0	181020.8298	0.9	2	0	0	0.0				20744.7	20654.1	9919.0	5980.0	90.6	0.0	20654.1	20654.1	20654.1	0.0	0	0
08/05/13	Wednesday	5	2.5	42	181020.8298	0.9	2	40	416.598	6933.3				20654.1	27490.9	9919.0	5980.0	96.6	0.0	27490.9	22274.5	22274.5	5216.4	1	0
09/05/13	Thursday	5	2.9	26.8	181020.8298	0.9	2	24.8	265.8292	4306.2				22274.5	26480.2	9919.0	5980.0	100.5	0.0	26480.2	22274.5	22274.5	4205.7	1	0
10/05/13	Friday	5	2.5	11.6	181020.8298	0.9	2	9.6	115.0604	1679.1				22274.5	23857.0	9919.0	5980.0	96.6	0.0	23857.0	22274.5	22274.5	1582.5	1	0
11/05/13	Saturday	5	2.2	4.6	181020.8298	0.9	2	2.6	45.6274	469.2				22274.5	22650.1	9919.0	5980.0	93.6	0.0	22650.1	22274.5	22274.5	375.6	1	0
12/05/13	Sunday	5	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22188.8	9919.0	5980.0	87.6	0.0	22188.8	22188.8	22188.8	0.0	0	0
13/05/13	Monday	5	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22188.8	22101.2	9919.0	5980.0	89.6	0.0	22101.2	22101.2	22101.2	0.0	0	0
14/05/13	Tuesday	5	2.2	0	181020.8298	0.9	2	0	0	0.0				22101.2	22007.6	9919.0	5980.0	93.6	0.0	22007.6	22007.6	22007.6	0.0	0	0
15/05/13	Wednesday	5	2	0	181020.8298	0.9	2	0	0	0.0				22007.6	21916.0	9919.0	5980.0	91.6	0.0	21916.0	21916.0	21916.0	0.0	0	0
16/05/13	Thursday	5	2.3	0	181020.8298	0.9	2	0	0	0.0				21916.0	21821.4	9919.0	5980.0	94.6	0.0	21821.4	21821.4	21821.4	0.0	0	0
17/05/13	Friday	5	1.7	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0				21821.4	22858.8	9919.0	5980.0	88.6	0.0	22858.8	22274.5	22274.5	584.3	1	0
18/05/13	Saturday	5	1.5	0	181020.8298	0.9	2	0	0	0.0				22274.5	22187.8	9919.0	5980.0	86.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
19/05/13	Sunday	5	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22187.8	22100.2	9919.0	5980.0	89.6	0.0	22100.2	22100.2	22100.2	0.0	0	0
20/05/13	Monday	5	2	5.6	181020.8298	0.9	2	3.6	55.5464	642.1				22100.2	22650.7	9919.0	5980.0	91.6	0.0	22650.7	22274.5	22274.5	376.2	1	0
21/05/13	Tuesday	5	1.9	0.4	181020.8298	0.9	2	0	3.9676	4.0				22274.5	22187.8	9919.0	5980.0	90.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
22/05/13	Wednesday	5	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22187.8	22102.2	9919.0	5980.0	87.6	0.0	22102.2	22102.2	22102.2	0.0	0	0
23/05/13	Thursday	5	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22102.2	22014.6	9919.0	5980.0	89.6	0.0	22014.6	22014.6	22014.6	0.0	0	0
24/05/13	Friday	5	1.9	0	181020.8298	0.9	2	0	0	0.0				22014.6	21924.0	9919.0	5980.0	90.6	0.0	21924.0	21924.0	21924.0	0.0	0	0
25/05/13	Saturday	5	2.1	0	181020.8298	0.9	2	0	0	0.0				21924.0	21831.4	9919.0	5980.0	92.6	0.0	21831.4	21831.4	21831.4	0.0	0	0
26/05/13	Sunday	5	1.8	0	181020.8298	0.9	2	0	0	0.0				21831.4	21741.8	9919.0	5980.0	89.6	0.0	21741.8	21741.8	21741.8	0.0	0	0
27/05/13	Monday	5	2	1.8	181020.8298	0.9	2	0	17.8542	17.9				21741.8	21668.0	9919.0	5980.0	91.6	0.0	21668.0	21668.0	21668.0	0.0	0	0
28/05/13	Tuesday	5	1.6	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				21668.0	21634.8	9919.0	5980.0	87.6	0.0	21634.8	21634.8	21634.8	0.0	0	0
29/05/13	Wednesday	5	1.9	7.2	181020.8298	0.9	2	5.2	71.4168	918.6				21634.8	22462.8	9919.0	5980.0	90.6	0.0	22462.8	22274.5	22274.5	188.3	1	0
30/05/13	Thursday	5	1.6	17	181020.8298	0.9	2	15	168.623	2612.4				22274.5	24799.3	9919.0	5980.0	87.6	0.0	24799.3	22274.5	22274.5	2524.8	1	0
31/05/13	Friday	5	1.7	4.4	181020.8298	0.9	2	2.4	43.6436	434.6				22274.5	22620.5	9919.0	5980.0	88.6	0.0	22620.5	22274.5	22274.5	346.0	1	0
01/06/13	Saturday	6	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22186.8	9919.0	5980.0	89.6	0.0	22186.8	22186.8	22186.8	0.0	0	0
02/06/13	Sunday	6	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22186.8	22101.2	9919.0	5980.0	87.6	0.0	22101.2	22101.2	22101.2	0.0	0	0
03/06/13	Monday	6	2	0	181020.8298	0.9	2	0	0	0.0				22101.2	22009.6	9919.0	5980.0	91.6	0.0	22009.6	22009.6	22009.6	0.0	0	0
04/06/13	Tuesday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22009.6	21926.9	9919.0	5980.0	84.7	0.0	21926.9	21926.9	21926.9	0.0	0	0
05/06/13	Wednesday	6	1.6	1.2	181020.8298	0.9	2	0	11.9028	11.9				21926.9	21851.2	9919.0	5980.0	87.6	0.0	21851.2	21851.2	21851.2	0.0	0	0
06/06/13	Thursday	6	1.6	0	181020.8298	0.9	2	0	0	0.0				21851.2	21763.6	9919.0	5980.0	87.6	0.0	21763.6	21763.6	21763.6	0.0	0	0
07/06/13	Friday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				21763.6	21678.9	9919.0	5980.0	86.6	0.0	21678.9	21678.9	21678.9	0.0	0	0
08/06/13	Saturday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21678.9	21596.2	9919.0	5980.0	84.7	0.0	21596.2	21596.2	21596.2	0.0	0	0
09/06/13	Sunday	6	1.4	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				21596.2	21634.1	9919.0	5980.0	85.6	0.0	21634.1	21634.1	21634.1	0.0	0	0
10/06/13	Monday	6	1.4	19	181020.8298	0.9	2	17	188.461	2958.1				21634.1	24506.6	9919.0	5980.0	85.6	0.0	24506.6	22274.5	22274.5	2232.1	1	0
11/06/13	Tuesday	6	1.9	0	181020.8298	0.9	2	0	0	0.0				22274.5	22183.9	9919.0	5980.0	90.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
12/06/13	Wednesday	6	2.1	0	181020.8298	0.9	2	0	0	0.0				22183.9	22091.3	9919.0	5980.0	92.6	0.0	22091.3	22091.3	22091.3	0.0	0	0
13/06/13	Thursday	6	1.9	0	181020.8298	0.9	2	0	0	0.0				22091.3	22000.7	9919.0	5980.0	90.6	0.0	22000.7	22000.7	22000.7	0.0	0	0
14/06/13	Friday	6	2	0	181020.8298	0.9	2	0	0	0.0				22000.7	21909.1	9919.0	5980.0	91.6	0.0	21909.1	21909.1	21909.1	0.0	0	0
15/06/13	Saturday	6	1.1	0	181020.8298	0.9	2	0	0	0.0				21909.1	21826.4	9919.0	5980.0	82.7	0.0	21826.4	21826.4	21826.4	0.0	0	0
16/06/13	Sunday	6	1.1	0	181020.8298	0.9	2	0	0	0.0				21826.4	21743.7	9919.0	5980.0	82.7	0.0	21743.7	21743.7	21743.7	0.0	0	0
17/06/13	Monday	6	1.3	3.2	181020.8298	0.9	2	1.2	31.7408	227.2				21743.7	21886.3	9919.0	5980.0	84.7	0.0	21886.3	21886.3	21886.3	0.0	0	0
18/06/13	Tuesday	6	1.1	0	181020.8298	0.9	2	0	0	0.0				21886.3	21803.7	9919.0	5980.0	82.7	0.0	21803.7	21803.7	21803.7	0.0	0	0
19/06/13	Wednesday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				21803.7	21720.0	9919.0	5980.0	85.6	0.0	21720.0	21720.0	21720.0	0.0	0	0
20/06/13	Thursday	6	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21720.0	21638.3	9919.0	5980.0	83.7	0.0	21638.3	21638.3	21638.3	0.0	0	0
21/06/13	Friday	6	1.6	0	181020.8298	0.9	2	0	0	0.0				21638.3	21550.7	9919.0	5980.0	87.6	0.0	21550.7	21550.7	21550.7	0.0	0	0
22/06/13	Saturday	6	2.3	0	181020.8298	0.9	2	0	0	0.0				21550.7	21456.1	9919.0	5980.0	94.6	0.0	21456.1	21456.1	21456.1	0.0	0	0
23/06/13	Sunday	6	2.3	0	181020.8298	0.9	2	0	0	0.0				21456.1	21361.5	9919.0	5980.0	94.6	0.0	21361.5	21361.5	21361.5	0.0	0	0
24/06/13	Monday	6	1.8	11.4	181020.8298	0.9	2	9.4	113.0766	1644.5				21361.5	22916.4	9919.0	5980.0	89.6	0.0	22916.4	22274.5	22274.5	642.0	1	0
25/06/13	Tuesday	6	1.4	4	181020.8298	0.9	2	2	39.676	365.5				22274.5	22554.3	9919.0	5980.0	85.6	0.0	22554.3	22274.5	22274.5	279.9	1	0
26/06/13	Wednesday	6	1	1.6	181020.8298	0.9	2	0	15.8704	15.9				22274.5	22208.7	9919.0	5980.0	81.7	0.0	22208.7	22208.7	22208.7	0.0	0	0
27/06/13	Thursday	6	1.2	0	181020.8298	0.9	2	0	0	0.0				22208.7	22125.0	9919.0	5980.0	83.7	0.0	22125.0	22125.0	22125.0	0.0	0	0
28/06/13	Friday	6	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				22125.0	22043.3	9919.0	5980.0	83.7	0.0	22043.3	22043.3	22043.3	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Adjustments: Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow Calcs: Overflow (m^3)	Overflow flag	Pond Empty during winter flag
29/06/13	Saturday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22043.3	21960.7	9919.0	5980.0	84.7	0.0	21960.7	21960.7	21960.7	0.0	0	0
30/06/13	Sunday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				21960.7	21876.0	9919.0	5980.0	86.6	0.0	21876.0	21876.0	21876.0	0.0	0	0
01/07/13	Monday	7	1.9	0.2	181020.8298	0.9	2	0	1.9838	2.0				21876.0	21787.4	9919.0	5980.0	90.6	0.0	21787.4	21787.4	21787.4	0.0	0	0
02/07/13	Tuesday	7	1.5	0	181020.8298	0.9	2	0	0	0.0				21787.4	21700.7	9919.0	5980.0	86.6	0.0	21700.7	21700.7	21700.7	0.0	0	0
03/07/13	Wednesday	7	1.3	3.2	181020.8298	0.9	2	1.2	31.7408	227.2				21700.7	21843.3	9919.0	5980.0	84.7	0.0	21843.3	21843.3	21843.3	0.0	0	0
04/07/13	Thursday	7	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21843.3	21760.7	9919.0	5980.0	84.7	0.0	21760.7	21760.7	21760.7	0.0	0	0
05/07/13	Friday	7	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21760.7	21679.0	9919.0	5980.0	83.7	0.0	21679.0	21679.0	21679.0	0.0	0	0
06/07/13	Saturday	7	1.7	0	181020.8298	0.9	2	0	0	0.0				21679.0	21590.4	9919.0	5980.0	88.6	0.0	21590.4	21590.4	21590.4	0.0	0	0
07/07/13	Sunday	7	1.5	0	181020.8298	0.9	2	0	0	0.0				21590.4	21503.7	9919.0	5980.0	86.6	0.0	21503.7	21503.7	21503.7	0.0	0	0
08/07/13	Monday	7	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				21503.7	21420.1	9919.0	5980.0	85.6	0.0	21420.1	21420.1	21420.1	0.0	0	0
09/07/13	Tuesday	7	1.5	0	181020.8298	0.9	2	0	0	0.0				21420.1	21333.4	9919.0	5980.0	86.6	0.0	21333.4	21333.4	21333.4	0.0	0	0
10/07/13	Wednesday	7	1.3	32.6	181020.8298	0.9	2	30.6	323.3594	5308.7				21333.4	26557.4	9919.0	5980.0	84.7	0.0	26557.4	22274.5	22274.5	4283.0	1	0
11/07/13	Thursday	7	0.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22197.8	9919.0	5980.0	78.7	0.0	22197.8	22197.8	22197.8	0.0	0	0
12/07/13	Friday	7	1.5	4	181020.8298	0.9	2	2	39.676	365.5				22197.8	22476.6	9919.0	5980.0	86.6	0.0	22476.6	22274.5	22274.5	202.2	1	0
13/07/13	Saturday	7	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22186.8	9919.0	5980.0	89.6	0.0	22186.8	22186.8	22186.8	0.0	0	0
14/07/13	Sunday	7	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22186.8	22099.2	9919.0	5980.0	89.6	0.0	22099.2	22099.2	22099.2	0.0	0	0
15/07/13	Monday	7	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22099.2	22013.6	9919.0	5980.0	87.6	0.0	22013.6	22013.6	22013.6	0.0	0	0
16/07/13	Tuesday	7	2.1	12.8	181020.8298	0.9	2	10.8	126.9632	1886.5				22013.6	23807.5	9919.0	5980.0	92.6	0.0	23807.5	22274.5	22274.5	1533.0	1	0
17/07/13	Wednesday	7	2	28.8	181020.8298	0.9	2	26.8	285.6672	4651.9				22274.5	26834.8	9919.0	5980.0	91.6	0.0	26834.8	22274.5	22274.5	4560.3	1	0
18/07/13	Thursday	7	1.3	0	181020.8298	0.9	2	0	0	0.0				22274.5	22189.8	9919.0	5980.0	84.7	0.0	22189.8	22189.8	22189.8	0.0	0	0
19/07/13	Friday	7	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22189.8	22104.2	9919.0	5980.0	87.6	0.0	22104.2	22104.2	22104.2	0.0	0	0
20/07/13	Saturday	7	1.6	0	181020.8298	0.9	2	0	0	0.0				22104.2	22016.5	9919.0	5980.0	87.6	0.0	22016.5	22016.5	22016.5	0.0	0	0
21/07/13	Sunday	7	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				22016.5	21931.9	9919.0	5980.0	86.6	0.0	21931.9	21931.9	21931.9	0.0	0	0
22/07/13	Monday	7	2.3	0	181020.8298	0.9	2	0	0	0.0				21931.9	21837.3	9919.0	5980.0	94.6	0.0	21837.3	21837.3	21837.3	0.0	0	0
23/07/13	Tuesday	7	3.2	0	181020.8298	0.9	2	0	0	0.0				21837.3	21733.8	9919.0	5980.0	103.5	0.0	21733.8	21733.8	21733.8	0.0	0	0
24/07/13	Wednesday	7	2.1	45.2	181020.8298	0.9	2	43.2	448.3388	7486.4				21733.8	29127.7	9919.0	5980.0	92.6	0.0	29127.7	22274.5	22274.5	6853.2	1	0
25/07/13	Thursday	7	2.2	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				22274.5	22304.4	9919.0	5980.0	93.6	0.0	22304.4	22274.5	22274.5	30.0	1	0
26/07/13	Friday	7	2.2	13	181020.8298	0.9	2	11	128.947	1921.1				22274.5	24101.9	9919.0	5980.0	93.6	0.0	24101.9	22274.5	22274.5	1827.5	1	0
27/07/13	Saturday	7	1.9	18.8	181020.8298	0.9	2	16.8	186.4772	2923.5				22274.5	25107.4	9919.0	5980.0	90.6	0.0	25107.4	22274.5	22274.5	2832.9	1	0
28/07/13	Sunday	7	1.6	5.4	181020.8298	0.9	2	3.4	53.5626	607.5				22274.5	22794.3	9919.0	5980.0	87.6	0.0	22794.3	22274.5	22274.5	519.9	1	0
29/07/13	Monday	7	1.5	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				22274.5	22449.6	9919.0	5980.0	86.6	0.0	22449.6	22274.5	22274.5	175.2	1	0
30/07/13	Tuesday	7	2	1.4	181020.8298	0.9	2	0	13.8866	13.9				22274.5	22196.8	9919.0	5980.0	91.6	0.0	22196.8	22196.8	22196.8	0.0	0	0
31/07/13	Wednesday	7	1.7	17.2	181020.8298	0.9	2	15.2	170.6068	2647.0				22196.8	24755.1	9919.0	5980.0	88.6	0.0	24755.1	22274.5	22274.5	2480.6	1	0
01/08/13	Thursday	8	1.8	6.8	181020.8298	0.9	2	4.8	67.4492	849.5				22274.5	23034.3	9919.0	5980.0	89.6	0.0	23034.3	22274.5	22274.5	759.8	1	0
02/08/13	Friday	8	1.9	0.6	181020.8298	0.9	2	0	5.9514	6.0				22274.5	22189.8	9919.0	5980.0	90.6	0.0	22189.8	22189.8	22189.8	0.0	0	0
03/08/13	Saturday	8	2.1	0	181020.8298	0.9	2	0	0	0.0				22189.8	22097.2	9919.0	5980.0	92.6	0.0	22097.2	22097.2	22097.2	0.0	0	0
04/08/13	Sunday	8	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22097.2	22003.7	9919.0	5980.0	95.6	0.0	22003.7	22003.7	22003.7	0.0	0	0
05/08/13	Monday	8	2.5	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				22003.7	21996.1	9919.0	5980.0	96.6	0.0	21996.1	21996.1	21996.1	0.0	0	0
06/08/13	Tuesday	8	1.7	20.4	181020.8298	0.9	2	18.4	202.3476	3200.1				21996.1	25107.5	9919.0	5980.0	88.6	0.0	25107.5	22274.5	22274.5	2833.0	1	0
07/08/13	Wednesday	8	1.9	7	181020.8298	0.9	2	5	69.433	884.0				22274.5	23067.9	9919.0	5980.0	90.6	0.0	23067.9	22274.5	22274.5	793.4	1	0
08/08/13	Thursday	8	1.6	58	181020.8298	0.9	2	56	575.302	9698.8				22274.5	31885.6	9919.0	5980.0	87.6	0.0	31885.6	22274.5	22274.5	9611.1	1	0
09/08/13	Friday	8	1.6	11	181020.8298	0.9	2	9	109.109	1575.4				22274.5	23762.2	9919.0	5980.0	87.6	0.0	23762.2	22274.5	22274.5	1487.7	1	0
10/08/13	Saturday	8	2	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				22274.5	22479.3	9919.0	5980.0	91.6	0.0	22479.3	22274.5	22274.5	204.8	1	0
11/08/13	Sunday	8	2.8	11.2	181020.8298	0.9	2	9.2	111.0928	1609.9				22274.5	23784.9	9919.0	5980.0	99.5	0.0	23784.9	22274.5	22274.5	1510.4	1	0
12/08/13	Monday	8	2.5	0.6	181020.8298	0.9	2	0	5.9514	6.0				22274.5	22183.9	9919.0	5980.0	96.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
13/08/13	Tuesday	8	2.2	4.4	181020.8298	0.9	2	2.4	43.6436	434.6				22183.9	22524.9	9919.0	5980.0	93.6	0.0	22524.9	22274.5	22274.5	250.5	1	0
14/08/13	Wednesday	8	2.2	3.8	181020.8298	0.9	2	1.8	37.6922	330.9				22274.5	22511.8	9919.0	5980.0	93.6	0.0	22511.8	22274.5	22274.5	237.4	1	0
15/08/13	Thursday	8	2.6	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				22274.5	22473.3	9919.0	5980.0	97.5	0.0	22473.3	22274.5	22274.5	198.8	1	0
16/08/13	Friday	8	2.2	14.4	181020.8298	0.9	2	12.4	142.8336	2163.0				22274.5	24343.9	9919.0	5980.0	93.6	0.0	24343.9	22274.5	22274.5	2069.4	1	0
17/08/13	Saturday	8	2.2	1	181020.8298	0.9	2	0	9.919	9.9				22274.5	22190.8	9919.0	5980.0	93.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
18/08/13	Sunday	8	1.9	0.2	181020.8298	0.9	2	0	1.9838	2.0				22190.8	22102.2	9919.0	5980.0	90.6	0.0	22102.2	22102.2	22102.2	0.0	0	0
19/08/13	Monday	8	2.8	0	181020.8298	0.9	2	0	0	0.0				22102.2	22002.7	9919.0	5980.0	99.5	0.0	22002.7	22002.7	22002.7	0.0	0	0
20/08/13	Tuesday	8	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22002.7	21909.1	9919.0	5980.0	95.6	0.0	21909.1	21909.1	21909.1	0.0	0	0
21/08/13	Wednesday	8	2.8	0.8	181020.8298	0.9	2	0	7.9352	7.9				21909.1	21817.5	9919.0	5980.0	99.5	0.0	21817.5	21817.5	21817.5	0.0	0	0
22/08/13	Thursday	8	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				21817.5	21721.9	9919.0	5980.0	97.5	0.0	21721.9	21721.9	21721.9	0.0	0	0
23/08/13	Friday	8	3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21721.9	21622.4	9919.0	5980.0	101.5	0.0	21622.4	21622.4	21622.4	0.0	0	0
24/08/13	Saturday	8	3.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21622.4	21520.9	9919.0	5980.0	103.5	0.0	21520.9	21520.9	21520.9	0.0	0	0
25/08/13	Sunday	8	2.1	0	181020.8298	0.9	2	0	0	0.0				21520.9	21428.3	9919.0	5980.0	92.6	0.0	21428.3	21428.3	21428.3	0.0	0	0
26/08/13	Monday	8	2.4	13	181020.8298	0.9	2	11	128.947	1921.1				21428.3	23253.8	9919.0	5980.0	95.6	0.0	23253.8	22274.5	22274.5	979.3	1	0
27/08/13	Tuesday	8	1.6	4.8	181020.8298	0.9	2	2.8	47.6112	503.8				22274.5	22690.6	9919.0	5980.0	87.6	0.0	22690.6	22274.5	22274.5	416.2	1	0
28/08/13	Wednesday	8	2.6	34	181020.8298	0.9	2	32	337.246	5550.6				22274.5	27727.6	9919.0	5980.0	97.5	0.0	27727.6	22274.5	22274.5	5453.1	1	0
29/08/13	Thursday	8	2.5	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				22274.5	22232.3	9919.0	5980.0	96.5	0.0	22232.3	22232.3	22232.3	0.0	0	0
30/08/13	Friday	8	2.7	12.2	181020.8298	0.9	2	10.2	121.0118	1782.8				22232.3	23916.6	9919.0	5980.0	98.5	0.0	23916.6	22274.5	22274.5	1642.1	1	0
31/08/13	Saturday	8	3.2	10	181020.8298	0.9	2	8	99.19	1402.5				22274.5	23573.5	9919.0	5980.0	103.5	0.0	23573.5	22274.5	22274.5	1299.0	1	0
01/09/13	Sunday	9	2.5	0.6	181020.8298	0.9	2	0	5.9514	6.0				22274.5	22183.9	9919.0	5980.0	96.5	0.0	22183.9	22183.9	22183.9	0.0	0	0
02/09/13	Monday	9	2.6	1	181020.8298	0.9	2	0	9.919	9.9				22183.9	22096.2	9919.0	5980.0	97.5	0.0	22096.2	22096.2	22096.2	0.0	0	0
03/09/13	Tuesday	9	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22096.2	22000.7	9919.0	5980.0	97.5	0.0	22000.7	22000.7	22000.7	0.0	0	0
04/09/13	Wednesday	9	3.7	18.6	181020.8298	0.9	2	16.6	184.4934	2888.9				22000.7	24781.2	9919.0	5980.0	108.5	0.0	24781.2	22274.5	22274.5	2506.7	1	0
05/09/13	Thursday	9	3.3	0	181020.8298	0.9	2	0	0	0.0				22274.5	22170.0	9919.0	5980.0	104.5	0.0	22170.0	22170.0	22170.0	0.0	0	0
06/09/13	Friday	9	3.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22170.0	22064.5	9919.0	5980.0	107.5	0.0	22064.5	22064.5	22064.5	0.0	0	0
07/09/13	Saturday	9	2.6	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				22064.5	22263.3	9919.0	5980.0	97.5	0.0	22263.3	22263.3	22263.3	0.0	0	0
08/09/13	Sunday	9	3.3	1.4	181020.8298	0.9	2	0	13.8866	13.9				22263.3	22172.7	9919.0	5980.0	104.5	0.0	22172.7	22172.7	22172.7	0.0	0	0
09/09/13	Monday	9	3.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22172.7	22069.2	9919.0	5980.0	105.5	0.0	22069.2	22069.2	22069.2	0.0	0	0
10/09/13	Tuesday	9	2.2	0	181020.8298	0.9	2	0	0	0.0				22069.2	21975.6	9919.0	5980.0	93.6	0.0	21975.6	21975.6	21975.6	0.0	0	0
11/09/13	Wednesday	9	2.4	20.8	181020.8298	0.9	2	18.8	206.3152	3269.2				21975.6	25149.3	9919.0	5980.0	95.6	0.0	25149.3	22274.5	22274.5	2874.8	1	0
12/09/13	Thursday	9	3.1	29.4	181020.8298	0.9	2	27.4	291.6186	4755.6				22274.5	26927.6	9919.0	5980.0	102.5	0.0	26927.6	22274.5	22274.5	4653.1	1	0
13/09/13	Friday	9	2.7	0.8	181020.8298	0.9	2	0	7.9352	7.9				22274.5	22183.9	9919.0	5980.0	98.5	0.0	22183.9	22183.9	22183.9	0.0	0	0
14/09/13	Saturday	9	1.9	21.2	181020.8298	0.9	2	19.2	210.2828	3338.3				22183.9	25431.6	9919.0	5980.0	90.6	0.0	25431.6	22274.5	22274.5	3157.1	1	0
15/09/13	Sunday	9	3.6	5.2	181020.8298	0.9	2	3.2	51.5788	572.9				22274.5	22739.9	9919.0	5980.0	107.5	0.0	22739.9	22274.5	22274.5	465.5	1	0
16/09/13	Monday	9	3.7	0	181020.8298	0.9	2	0	0	0.0				22274.5	22166.0	9919.0	5980.0	108.5	0.0	22166.0	22166.0	22166.0	0.0	0	0
17/09/13	Tuesday	9	3.6	20.6	181020.8298	0.9	2	18.6	204.3314	3234.6				22166.0	25293.2	9919.0	5980.0	107.5	0.0	25293.2	22274.5	22274.5	3018.7	1	0
18/09/13	Wednesday	9	3.5	2	181020.8298	0.9	2	0	19.838	19.8				22274.5	22187.8	9919.0	5980.0	106.5	0.0	22187.8	22187.8	22187.8	0.0	0	0
19/09/13	Thursday	9	3.3	3	181020.8298	0.9	2	1	29.757	192.7				22187.8	22276.0	9919.0	5980.0	104.5	0.0	22276.0	22274.5	22274.5	1.5	1	0
20/09/13	Friday	9	3.2	10.6	181020.8298	0.9	2	8.6	105.1414	1506.2				22274.5	23677.2	9919.0	5980.0	103.5	0.0	23677.2	22274.5	22274.5	1402.7	1	0
21/09/13	Saturday	9	3.6	4.2	181020.8298	0.9	2	2.2	41.6598	400.1				22274.5	22567.1	9919.0	5980.0	107.5	0.0	22567.1	22274.5	22274.5	292.6	1	0
22/09/13	Sunday	9	3.6	22.2	181020.8298	0.9	2	20.2	220.2018	3511.2				22274.5	25678.2	9919.0	5980.0	107.5	0.0	25678.2	22274.5	22274.5	3403.7	1	0
23/09/13	Monday	9	3.4	25	181020.8298	0.9	2	23	247.975	3895.1				22274.5	26164.1	9919.0	5980.0	105.5	0.0	26164.1	22274.5	22274.5	3889.6	1	0
24/09/13	Tuesday	9	3.7	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				22274.5	22462.4	9919.0	5980.0	108.5	0.0	22462.4	22274.5	22274.5	187.9	1	0
25/09/13	Wednesday	9	4.7	4.4	181020.8298	0.9	2	2.4	43.6436	434.6				22274.5	22590.7	9919.0	5980.0	118.4	0.0	22590.7	22274.5	22274.5	316.3	1	0
26/09/13	Thursday	9	3.5	0	181020.8298	0.9	2	0	0	0.0				22274.5	22168.0	9919.0	5980.0	106.5	0.0	22168.0	22168.0	22168.0	0.0	0	0
27/09/13	Friday	9	3.9	9.6	181020.8298	0.9	2	7.6	95.2224	1333.4				22168.0	23391.0	9919.0	5980.0	110.4	0.0	23391.0	22274.5	22274.5	3116.5	1	0
28/09/13	Saturday	9	3.8	0	181020.8298	0.9	2	0	0	0.0				22274.5	22165.0	9919.0	5980.0	109.5	0.0	22165.0	22165.0	22165.0	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond Infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m³)	Overflow flag	Pond Empty during winter flag
29/09/13	Sunday	9	2.9	0.6	181020.8298	0.9	2	0	5.9514	6.0				22163.0	22070.5	9919.0	5980.0	100.5	0.0	22070.5	22070.5	22070.5	0.0	0	0
30/09/13	Monday	9	3.6	28.8	181020.8298	0.9	2	26.8	285.6672	4651.9				22070.5	26614.9	9919.0	5980.0	107.5	0.0	26614.9	22274.5	22274.5	4340.4	1	0
01/10/13	Tuesday	10	3.6	0	181020.8298	0.9	2	0	0	0.0				22274.5	22167.0	9919.0	5980.0	107.5	0.0	22167.0	22167.0	22167.0	0.0	0	0
02/10/13	Wednesday	10	5	0	181020.8298	0.9	2	0	0	0.0				22167.0	22045.7	9919.0	5980.0	121.4	0.0	22045.7	22045.7	22045.7	0.0	0	0
03/10/13	Thursday	10	5.7	0	181020.8298	0.9	2	0	0	0.0				22045.7	21917.4	9919.0	5980.0	128.3	0.0	21917.4	21917.4	21917.4	0.0	0	0
04/10/13	Friday	10	3.5	0	181020.8298	0.9	2	0	0	0.0				21917.4	21810.9	9919.0	5980.0	106.5	0.0	21810.9	21810.9	21810.9	0.0	0	0
05/10/13	Saturday	10	3.8	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				21810.9	21790.4	9919.0	5980.0	109.5	0.0	21790.4	21790.4	21790.4	0.0	0	0
06/10/13	Sunday	10	4.8	6.6	181020.8298	0.9	2	4.6	65.4654	814.9				21790.4	22485.9	9919.0	5980.0	119.4	0.0	22485.9	22274.5	22274.5	211.4	1	0
07/10/13	Monday	10	4.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22159.1	9919.0	5980.0	117.4	0.0	22159.1	22159.1	22159.1	0.0	0	0
08/10/13	Tuesday	10	3.6	0	181020.8298	0.9	2	0	0	0.0				22159.1	22051.6	9919.0	5980.0	107.5	0.0	22051.6	22051.6	22051.6	0.0	0	0
09/10/13	Wednesday	10	3.9	15.2	181020.8298	0.9	2	13.2	150.7688	2301.3				22051.6	24242.5	9919.0	5980.0	110.4	0.0	24242.5	22274.5	22274.5	1968.0	1	0
10/10/13	Thursday	10	4.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22160.1	9919.0	5980.0	116.4	0.0	22160.1	22160.1	22160.1	0.0	0	0
11/10/13	Friday	10	3.8	0	181020.8298	0.9	2	0	0	0.0				22160.1	22050.6	9919.0	5980.0	109.5	0.0	22050.6	22050.6	22050.6	0.0	0	0
12/10/13	Saturday	10	4.2	4.2	181020.8298	0.9	2	2.2	41.6598	400.1				22050.6	22337.3	9919.0	5980.0	113.4	0.0	22337.3	22274.5	22274.5	62.8	1	0
13/10/13	Sunday	10	5.5	0	181020.8298	0.9	2	0	0	0.0				22274.5	22148.2	9919.0	5980.0	126.3	0.0	22148.2	22148.2	22148.2	0.0	0	0
14/10/13	Monday	10	5.9	0	181020.8298	0.9	2	0	0	0.0				22148.2	22017.9	9919.0	5980.0	130.3	0.0	22017.9	22017.9	22017.9	0.0	0	0
15/10/13	Tuesday	10	4.1	0	181020.8298	0.9	2	0	0	0.0				22017.9	21905.5	9919.0	5980.0	112.4	0.0	21905.5	21905.5	21905.5	0.0	0	0
16/10/13	Wednesday	10	4.7	3.8	181020.8298	0.9	2	1.8	37.6922	330.9				21905.5	22118.0	9919.0	5980.0	118.4	0.0	22118.0	22118.0	22118.0	0.0	0	0
17/10/13	Thursday	10	4.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22118.0	22001.6	9919.0	5980.0	118.4	0.0	22001.6	22001.6	22001.6	0.0	0	0
18/10/13	Friday	10	5	0	181020.8298	0.9	2	0	0	0.0				22001.6	21880.3	9919.0	5980.0	121.4	0.0	21880.3	21880.3	21880.3	0.0	0	0
19/10/13	Saturday	10	2.8	1	181020.8298	0.9	2	0	9.919	9.9				21880.3	21790.7	9919.0	5980.0	99.5	0.0	21790.7	21790.7	21790.7	0.0	0	0
20/10/13	Sunday	10	4.5	13.4	181020.8298	0.9	2	11.4	132.9146	1990.2				21790.7	23664.4	9919.0	5980.0	116.4	0.0	23664.4	22274.5	22274.5	1390.0	1	0
21/10/13	Monday	10	5.6	0.6	181020.8298	0.9	2	0	5.9514	6.0				22274.5	22153.1	9919.0	5980.0	127.3	0.0	22153.1	22153.1	22153.1	0.0	0	0
22/10/13	Tuesday	10	6.3	0	181020.8298	0.9	2	0	0	0.0				22153.1	22018.9	9919.0	5980.0	134.2	0.0	22018.9	22018.9	22018.9	0.0	0	0
23/10/13	Wednesday	10	7.2	0	181020.8298	0.9	2	0	0	0.0				22018.9	21875.7	9919.0	5980.0	143.2	0.0	21875.7	21875.7	21875.7	0.0	0	0
24/10/13	Thursday	10	7.3	0.8	181020.8298	0.9	2	0	7.9352	7.9				21875.7	21739.5	9919.0	5980.0	144.2	0.0	21739.5	21739.5	21739.5	0.0	0	0
25/10/13	Friday	10	4.4	0	181020.8298	0.9	2	0	0	0.0				21739.5	21624.1	9919.0	5980.0	115.4	0.0	21624.1	21624.1	21624.1	0.0	0	0
26/10/13	Saturday	10	4.7	0	181020.8298	0.9	2	0	0	0.0				21624.1	21505.7	9919.0	5980.0	118.4	0.0	21505.7	21505.7	21505.7	0.0	0	0
27/10/13	Sunday	10	6.2	0	181020.8298	0.9	2	0	0	0.0				21505.7	21372.4	9919.0	5980.0	133.3	0.0	21372.4	21372.4	21372.4	0.0	0	0
28/10/13	Monday	10	7.1	0	181020.8298	0.9	2	0	0	0.0				21372.4	21230.2	9919.0	5980.0	142.2	0.0	21230.2	21230.2	21230.2	0.0	0	0
29/10/13	Tuesday	10	7	0	181020.8298	0.9	2	0	0	0.0				21230.2	21089.0	9919.0	5980.0	141.2	0.0	21089.0	21089.0	21089.0	0.0	0	0
30/10/13	Wednesday	10	8.8	0	181020.8298	0.9	2	0	0	0.0				21089.0	20930.0	9919.0	5980.0	159.0	0.0	20930.0	20930.0	20930.0	0.0	0	0
31/10/13	Thursday	10	5.3	0	181020.8298	0.9	2	0	0	0.0				20930.0	20805.7	9919.0	5980.0	124.3	0.0	20805.7	20805.7	20805.7	0.0	0	0
01/11/13	Friday	11	6.1	0	181020.8298	0.9	2	0	0	0.0				20805.7	20673.4	9919.0	5980.0	132.3	0.0	20673.4	20673.4	20673.4	0.0	0	0
02/11/13	Saturday	11	7.4	0	181020.8298	0.9	2	0	0	0.0				20673.4	20528.2	9919.0	5980.0	145.2	0.0	20528.2	20528.2	20528.2	0.0	0	0
03/11/13	Sunday	11	7.6	0	181020.8298	0.9	2	0	0	0.0				20528.2	20381.1	9919.0	5980.0	147.1	0.0	20381.1	20381.1	20381.1	0.0	0	0
04/11/13	Monday	11	5.9	0	181020.8298	0.9	2	0	0	0.0				20381.1	20250.8	9919.0	5980.0	130.3	0.0	20250.8	20250.8	20250.8	0.0	0	0
05/11/13	Tuesday	11	5.5	0.4	181020.8298	0.9	2	0	3.9676	4.0				20250.8	20128.5	9919.0	5980.0	126.3	0.0	20128.5	20128.5	20128.5	0.0	0	0
06/11/13	Wednesday	11	5.1	0	181020.8298	0.9	2	0	0	0.0				20128.5	20006.1	9919.0	5980.0	122.3	0.0	20006.1	20006.1	20006.1	0.0	0	0
07/11/13	Thursday	11	6.6	0	181020.8298	0.9	2	0	0	0.0				20006.1	19868.9	9919.0	5980.0	137.2	0.0	19868.9	19868.9	19868.9	0.0	0	0
08/11/13	Friday	11	7.8	0	181020.8298	0.9	2	0	0	0.0				19868.9	19719.8	9919.0	5980.0	149.1	0.0	19719.8	19719.8	19719.8	0.0	0	0
09/11/13	Saturday	11	8.5	0	181020.8298	0.9	2	0	0	0.0				19719.8	19563.7	9919.0	5980.0	156.1	0.0	19563.7	19563.7	19563.7	0.0	0	0
10/11/13	Sunday	11	9.7	0	181020.8298	0.9	2	0	0	0.0				19563.7	19395.7	9919.0	5980.0	168.0	0.0	19395.7	19395.7	19395.7	0.0	0	0
11/11/13	Monday	11	6.7	0	181020.8298	0.9	2	0	0	0.0				19395.7	19257.5	9919.0	5980.0	138.2	0.0	19257.5	19257.5	19257.5	0.0	0	0
12/11/13	Tuesday	11	6.9	0	181020.8298	0.9	2	0	0	0.0				19257.5	19117.3	9919.0	5980.0	140.2	0.0	19117.3	19117.3	19117.3	0.0	0	0
13/11/13	Wednesday	11	7.6	0	181020.8298	0.9	2	0	0	0.0				19117.3	18970.2	9919.0	5980.0	147.1	0.0	18970.2	18970.2	18970.2	0.0	0	0
14/11/13	Thursday	11	8.5	0	181020.8298	0.9	2	0	0	0.0				18970.2	18814.1	9919.0	5980.0	156.1	0.0	18814.1	18814.1	18814.1	0.0	0	0
15/11/13	Friday	11	9.1	0	181020.8298	0.9	2	0	0	0.0				18814.1	18652.1	9919.0	5980.0	162.0	0.0	18652.1	18652.1	18652.1	0.0	0	0
16/11/13	Saturday	11	8.8	0	181020.8298	0.9	2	0	0	0.0				18652.1	18493.0	9919.0	5980.0	159.0	0.0	18493.0	18493.0	18493.0	0.0	0	0
17/11/13	Sunday	11	5.8	0	181020.8298	0.9	2	0	0	0.0				18493.0	18363.7	9919.0	5980.0	129.3	0.0	18363.7	18363.7	18363.7	0.0	0	0
18/11/13	Monday	11	5.5	0	181020.8298	0.9	2	0	0	0.0				18363.7	18237.4	9919.0	5980.0	126.3	0.0	18237.4	18237.4	18237.4	0.0	0	0
19/11/13	Tuesday	11	7.5	0	181020.8298	0.9	2	0	0	0.0				18237.4	18091.3	9919.0	5980.0	146.2	0.0	18091.3	18091.3	18091.3	0.0	0	0
20/11/13	Wednesday	11	7.7	0	181020.8298	0.9	2	0	0	0.0				18091.3	17943.1	9919.0	5980.0	148.1	0.0	17943.1	17943.1	17943.1	0.0	0	0
21/11/13	Thursday	11	8.3	0	181020.8298	0.9	2	0	0	0.0				17943.1	17789.0	9919.0	5980.0	154.1	0.0	17789.0	17789.0	17789.0	0.0	0	0
22/11/13	Friday	11	6.8	0	181020.8298	0.9	2	0	0	0.0				17789.0	17649.8	9919.0	5980.0	139.2	0.0	17649.8	17649.8	17649.8	0.0	0	0
23/11/13	Saturday	11	6.2	0	181020.8298	0.9	2	0	0	0.0				17649.8	17516.6	9919.0	5980.0	133.3	0.0	17516.6	17516.6	17516.6	0.0	0	0
24/11/13	Sunday	11	5.4	0	181020.8298	0.9	2	0	0	0.0				17516.6	17391.2	9919.0	5980.0	125.3	0.0	17391.2	17391.2	17391.2	0.0	0	0
25/11/13	Monday	11	6	0.6	181020.8298	0.9	2	0	5.9514	6.0				17391.2	17265.9	9919.0	5980.0	131.3	0.0	17265.9	17265.9	17265.9	0.0	0	0
26/11/13	Tuesday	11	7.5	0	181020.8298	0.9	2	0	0	0.0				17265.9	17119.8	9919.0	5980.0	146.2	0.0	17119.8	17119.8	17119.8	0.0	0	0
27/11/13	Wednesday	11	7.2	0	181020.8298	0.9	2	0	0	0.0				17119.8	16976.6	9919.0	5980.0	143.2	0.0	16976.6	16976.6	16976.6	0.0	0	0
28/11/13	Thursday	11	7.7	0	181020.8298	0.9	2	0	0	0.0				16976.6	16828.5	9919.0	5980.0	148.1	0.0	16828.5	16828.5	16828.5	0.0	0	0
29/11/13	Friday	11	4.9	0	181020.8298	0.9	2	0	0	0.0				16828.5	16708.1	9919.0	5980.0	120.4	0.0	16708.1	16708.1	16708.1	0.0	0	0
30/11/13	Saturday	11	5.5	17.2	181020.8298	0.9	2	15.2	170.6068	2647.0				16708.1	19228.7	9919.0	5980.0	126.3	0.0	19228.7	19228.7	19228.7	0.0	0	0
01/12/13	Sunday	12	5.9	0.4	181020.8298	0.9	2	0	3.9676	4.0				19228.7	19102.4	9919.0	5980.0	130.3	0.0	19102.4	19102.4	19102.4	0.0	0	0
02/12/13	Monday	12	6.5	0	181020.8298	0.9	2	0	0	0.0				19102.4	18966.2	9919.0	5980.0	136.2	0.0	18966.2	18966.2	18966.2	0.0	0	0
03/12/13	Tuesday	12	7.2	0	181020.8298	0.9	2	0	0	0.0				18966.2	18823.0	9919.0	5980.0	143.2	0.0	18823.0	18823.0	18823.0	0.0	0	0
04/12/13	Wednesday	12	8	0	181020.8298	0.9	2	0	0	0.0				18823.0	18671.9	9919.0	5980.0	151.1	0.0	18671.9	18671.9	18671.9	0.0	0	0
05/12/13	Thursday	12	8.5	0	181020.8298	0.9	2	0	0	0.0				18671.9	18515.8	9919.0	5980.0	156.1	0.0	18515.8	18515.8	18515.8	0.0	0	0
06/12/13	Friday	12	7.4	0	181020.8298	0.9	2	0	0	0.0				18515.8	18370.7	9919.0	5980.0	145.2	0.0	18370.7	18370.7	18370.7	0.0	0	0
07/12/13	Saturday	12	5.6	0	181020.8298	0.9	2	0	0	0.0				18370.7	18243.4	9919.0	5980.0	127.3	0.0	18243.4	18243.4	18243.4	0.0	0	0
08/12/13	Sunday	12	7.1	0	181020.8298	0.9	2	0	0	0.0				18243.4	18101.2	9919.0	5980.0	142.2	0.0	18101.2	18101.2	18101.2	0.0	0	0
09/12/13	Monday	12	7.8	0	181020.8298	0.9	2	0	0	0.0				18101.2	17952.1	9919.0	5980.0	149.1	0.0	17952.1	17952.1	17952.1	0.0	0	0
10/12/13	Tuesday	12	8.6	0	181020.8298	0.9	2	0	0	0.0				17952.1	17795.0	9919.0	5980.0	157.1	0.0	17795.0	17795.0	17795.0	0.0	0	0
11/12/13	Wednesday	12	9.1	0	181020.8298	0.9	2	0	0	0.0				17795.0	17633.0	9919.0	5980.0	162.0	0.0	17633.0	17633.0	17633.0	0.0	0	0
12/12/13	Thursday	12	9.6	0	181020.8298	0.9	2	0	0	0.0				17633.0	17466.0	9919.0	5980.0	167.0	0.0	17466.0	17466.0	17466.0	0.0	0	0
13/12/13	Friday	12	10.2	0	181020.8298	0.9	2	0	0	0.0				17466.0	17293.1	9919.0	5980.0	172.9	0.0	17293.1	17293.1	17293.1	0.0	0	0
14/12/13	Saturday	12	9.8	0	181020.8298	0.9	2	0	0	0.0				17293.1	17124.1	9919.0	5980.0	169.0	0.0	17124.1	17124.1	17124.1	0.0	0	0
15/12/13	Sunday	12	8.5	0	181020.8298	0.9	2	0	0	0.0				17124.1	16968.0	9919.0	5980.0	156.1	0.0	16968.0	16968.0	16968.0	0.0	0	0
16/12/13	Monday	12	7.8	0	181020.8298	0.9	2	0	0	0.0				16968.0	16818.9	9919.0	5980.0	149.1	0.0	16818.9	16818.9	16818.9	0.0	0	0
17/12/13	Tuesday	12	5.7	0	181020.8298	0.9	2	0	0	0.0				16818.9	16690.6	7439.3	4485.0	96.2	-32.1	16722.7	16722.7	16722.7	0.0	0	0
18/12/13	Wednesday	12	6.8	0	181020.8298	0.9	2	0	0	0.0				16722.7	16583.5	7439.3	4485.0	104.4	-34.8	16618.3	16618.3	16618.3	0.0	0	0
19/12/13	Thursday	12	7.7	0	181020.8298	0.9	2	0	0	0.0				16618.3	16470.2	7439.3	4485.0	111.1	-37.0	16507.2	16507.2	16507.2	0.0	0	0
20/12/13	Friday	12	8.5	0	181020.8298	0.9	2	0	0	0.0				16507.2	16351.1	7439.3	4485.0	117.1	-39.0	16390.1	16390.1	16390.1	0.0	0	0
21/12/13	Saturday	12	8.4	0	181020.8298	0.9	2	0	0	0.0				16390.1	16235.0	7439.3	4485.0	116.3	-38.8	16273.8	16273.8	16273.8	0.0	0	0
22/12/13	Sunday	12	7.8	0	181020.8298	0.9	2	0	0	0.0				16273.8	16124.7	7439.3	4485.0	111.8	-37.3	16162.0	16162.0	16162.0	0.0	0	0
23/12/13	Monday	12	8.9	0	181020.8298	0.9	2	0	0	0.0				16162.0	16001.9	7439.3	4485.0	120.0	-40.0	16041.9	16041.9	16041.9	0.0	0	0
24/12/13	Tuesday	12	7.2	0	181020.8298	0.9	2	0	0	0.0				16041.9	15898.7	7439.3	4485.0	107.4	-35.8	15934.5	15934.5	15934.5	0.0	0	0
25/12/13	Wednesday	12	8.2	0	181020.8298	0.9	2	0	0	0.0				15934.5	15781.4	7439.3	4485.0	114.8	-38.3	15819.7	15819.7	15819.7	0.0	0	0
26/12/13	Thursday	12	7.3	0	181020.8298	0.9	2	0	0	0.0				15819.7	15675.6	7439.3	4485.0	108.1	-36.0	15711.6	15711.6	15711.6	0.0	0	0
27/12/13	Friday	12	7.2	0	181020.8298	0.9	2	0	0	0.0				15711.6	15568.4	7439.3	4485.0	107.4	-35.8	15604.2	15604.2	15604.2	0.0	0	0
28/12/13	Saturday	12	9.1	0	181020.8298	0.9	2	0	0	0.0				15604.2	15442.2	7439.3	4485.0	121.5	-40.5	15482.7	15482.7	15482.7	0.0	0	0
29/12/13	Sunday	12	8.8	0	181020.8298	0.9	2	0	0	0.0				15482.7	15323.6	7439.3	4485.0	119.3	-39.8	15363.4	15363.4	15363.4	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond Infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
30/12/13	Monday	12	8	0	181020.8298	0.9	2	0	0	0.0				15363.4	15212.3	7439.3	4485.0	113.3	-37.8	15250.1	15250.1	15250.1	0.0	0	0
31/12/13	Tuesday	12	6.5	0	181020.8298	0.9	2	0	0	0.0				15250.1	15113.8	7439.3	4485.0	102.2	-34.1	15147.9	15147.9	15147.9	0.0	0	0
01/01/14	Wednesday	1	7.4	0	181020.8298	0.9	2	0	0	0.0				15147.9	15002.7	7439.3	4485.0	108.9	-36.3	15039.0	15039.0	15039.0	0.0	0	0
02/01/14	Thursday	1	5.7	0	181020.8298	0.9	2	0	0	0.0				15039.0	14910.7	7439.3	4485.0	96.2	-32.1	14942.8	14942.8	14942.8	0.0	0	0
03/01/14	Friday	1	7	0	181020.8298	0.9	2	0	0	0.0				14942.8	14801.6	7439.3	4485.0	105.9	-35.3	14836.9	14836.9	14836.9	0.0	0	0
04/01/14	Saturday	1	7.2	0	181020.8298	0.9	2	0	0	0.0				14836.9	14693.7	7439.3	4485.0	107.4	-35.8	14729.5	14729.5	14729.5	0.0	0	0
05/01/14	Sunday	1	8	0	181020.8298	0.9	2	0	0	0.0				14729.5	14578.4	7439.3	4485.0	113.3	-37.8	14616.2	14616.2	14616.2	0.0	0	0
06/01/14	Monday	1	8.8	0	181020.8298	0.9	2	0	0	0.0				14616.2	14457.1	7439.3	4485.0	119.3	-39.8	14496.9	14496.9	14496.9	0.0	0	0
07/01/14	Tuesday	1	5.9	0	181020.8298	0.9	2	0	0	0.0				14496.9	14366.6	7439.3	4485.0	97.7	-32.6	14399.2	14399.2	14399.2	0.0	0	0
08/01/14	Wednesday	1	6.5	0	181020.8298	0.9	2	0	0	0.0				14399.2	14263.0	7439.3	4485.0	102.2	-34.1	14297.0	14297.0	14297.0	0.0	0	0
09/01/14	Thursday	1	7	0	181020.8298	0.9	2	0	0	0.0				14297.0	14155.8	7439.3	4485.0	105.9	-35.3	14191.1	14191.1	14191.1	0.0	0	0
10/01/14	Friday	1	7.6	0	181020.8298	0.9	2	0	0	0.0				14191.1	14044.0	7439.3	4485.0	110.4	-36.8	14080.8	14080.8	14080.8	0.0	0	0
11/01/14	Saturday	1	9.9	0	181020.8298	0.9	2	0	0	0.0				14080.8	13910.8	7439.3	4485.0	127.5	-42.5	13953.3	13953.3	13953.3	0.0	0	0
12/01/14	Sunday	1	10.4	0	181020.8298	0.9	2	0	0	0.0				13953.3	13778.4	7439.3	4485.0	131.2	-43.7	13822.1	13822.1	13822.1	0.0	0	0
13/01/14	Monday	1	6.3	0	181020.8298	0.9	2	0	0	0.0				13822.1	13687.9	7439.3	4485.0	100.7	-33.6	13721.4	13721.4	13721.4	0.0	0	0
14/01/14	Tuesday	1	6.7	0	181020.8298	0.9	2	0	0	0.0				13721.4	13583.2	7439.3	4485.0	103.7	-34.6	13617.8	13617.8	13617.8	0.0	0	0
15/01/14	Wednesday	1	5.8	0	181020.8298	0.9	2	0	0	0.0				13617.8	13488.5	7439.3	4485.0	97.0	-32.3	13520.8	13520.8	13520.8	0.0	0	0
16/01/14	Thursday	1	6.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				13520.8	13384.6	7439.3	4485.0	103.7	-34.6	13419.1	13419.1	13419.1	0.0	0	0
17/01/14	Friday	1	7.7	0	181020.8298	0.9	2	0	0	0.0				13419.1	13271.0	7439.3	4485.0	111.1	-37.0	13308.0	13308.0	13308.0	0.0	0	0
18/01/14	Saturday	1	8.5	0	181020.8298	0.9	2	0	0	0.0				13308.0	13151.9	7439.3	4485.0	117.1	-39.0	13191.0	13191.0	13191.0	0.0	0	0
19/01/14	Sunday	1	9.8	0	181020.8298	0.9	2	0	0	0.0				13191.0	13022.0	7439.3	4485.0	126.7	-42.2	13064.2	13064.2	13064.2	0.0	0	0
20/01/14	Monday	1	9.1	0	181020.8298	0.9	2	0	0	0.0				13064.2	12902.2	7439.3	4485.0	121.5	-40.5	12942.7	12942.7	12942.7	0.0	0	0
21/01/14	Tuesday	1	8.9	0	181020.8298	0.9	2	0	0	0.0				12942.7	12782.7	7439.3	4485.0	120.0	-40.0	12822.7	12822.7	12822.7	0.0	0	0
22/01/14	Wednesday	1	8.5	0	181020.8298	0.9	2	0	0	0.0				12822.7	12666.6	7439.3	4485.0	117.1	-39.0	12705.6	12705.6	12705.6	0.0	0	0
23/01/14	Thursday	1	8.8	0	181020.8298	0.9	2	0	0	0.0				12705.6	12546.6	7439.3	4485.0	119.3	-39.8	12586.3	12586.3	12586.3	0.0	0	0
24/01/14	Friday	1	7.7	0	181020.8298	0.9	2	0	0	0.0				12586.3	12438.2	7439.3	4485.0	111.1	-37.0	12475.2	12475.2	12475.2	0.0	0	0
25/01/14	Saturday	1	7.5	0	181020.8298	0.9	2	0	0	0.0				12475.2	12329.1	7439.3	4485.0	109.6	-36.5	12365.6	12365.6	12365.6	0.0	0	0
26/01/14	Sunday	1	7.1	0	181020.8298	0.9	2	0	0	0.0				12365.6	12223.4	7439.3	4485.0	106.6	-35.5	12259.0	12259.0	12259.0	0.0	0	0
27/01/14	Monday	1	5.5	0	181020.8298	0.9	2	0	0	0.0				12259.0	12132.7	7439.3	4485.0	94.7	-31.6	12164.3	12164.3	12164.3	0.0	0	0
28/01/14	Tuesday	1	8	0	181020.8298	0.9	2	0	0	0.0				12164.3	12013.1	7439.3	4485.0	113.3	-37.8	12050.9	12050.9	12050.9	0.0	0	0
29/01/14	Wednesday	1	8	0	181020.8298	0.9	2	0	0	0.0				12050.9	11899.8	7439.3	4485.0	113.3	-37.8	11937.6	11937.6	11937.6	0.0	0	0
30/01/14	Thursday	1	6.8	0	181020.8298	0.9	2	0	0	0.0				11937.6	11798.4	7439.3	4485.0	104.4	-34.8	11833.2	11833.2	11833.2	0.0	0	0
31/01/14	Friday	1	5.6	0	181020.8298	0.9	2	0	0	0.0				11833.2	11705.9	7439.3	4485.0	95.5	-31.8	11737.7	11737.7	11737.7	0.0	0	0
01/02/14	Saturday	2	6.8	0	181020.8298	0.9	2	0	0	0.0				11737.7	11598.5	7439.3	4485.0	104.4	-34.8	11633.3	11633.3	11633.3	0.0	0	0
02/02/14	Sunday	2	8.2	0	181020.8298	0.9	2	0	0	0.0				11633.3	11480.2	7439.3	4485.0	114.8	-38.3	11518.5	11518.5	11518.5	0.0	0	0
03/02/14	Monday	2	8.3	0	181020.8298	0.9	2	0	0	0.0				11518.5	11364.4	7439.3	4485.0	115.6	-38.5	11402.9	11402.9	11402.9	0.0	0	0
04/02/14	Tuesday	2	8.6	0	181020.8298	0.9	2	0	0	0.0				11402.9	11245.8	7439.3	4485.0	117.8	-39.3	11285.1	11285.1	11285.1	0.0	0	0
05/02/14	Wednesday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				11285.1	11146.9	7439.3	4485.0	103.7	-34.6	11181.4	11181.4	11181.4	0.0	0	0
06/02/14	Thursday	2	6.9	0	181020.8298	0.9	2	0	0	0.0				11181.4	11041.2	4959.5	2990.0	70.1	-70.1	11111.3	11111.3	11111.3	0.0	0	0
07/02/14	Friday	2	6.9	0	181020.8298	0.9	2	0	0	0.0				11111.3	10971.1	4959.5	2990.0	70.1	-70.1	11041.2	11041.2	11041.2	0.0	0	0
08/02/14	Saturday	2	7.2	0	181020.8298	0.9	2	0	0	0.0				11041.2	10898.1	4959.5	2990.0	71.6	-71.6	10969.7	10969.7	10969.7	0.0	0	0
09/02/14	Sunday	2	8.1	0	181020.8298	0.9	2	0	0	0.0				10969.7	10817.6	4959.5	2990.0	76.1	-76.1	10893.6	10893.6	10893.6	0.0	0	0
10/02/14	Monday	2	6.6	0	181020.8298	0.9	2	0	0	0.0				10893.6	10756.4	4959.5	2990.0	68.6	-68.6	10825.0	10825.0	10825.0	0.0	0	0
11/02/14	Tuesday	2	7.7	0	181020.8298	0.9	2	0	0	0.0				10825.0	10676.9	4959.5	2990.0	74.1	-74.1	10750.9	10750.9	10750.9	0.0	0	0
12/02/14	Wednesday	2	7.2	0	181020.8298	0.9	2	0	0	0.0				10750.9	10607.7	4959.5	2990.0	71.6	-71.6	10679.3	10679.3	10679.3	0.0	0	0
13/02/14	Thursday	2	7.2	0	181020.8298	0.9	2	0	0	0.0				10679.3	10536.2	4959.5	2990.0	71.6	-71.6	10607.7	10607.7	10607.7	0.0	0	0
14/02/14	Friday	2	6.6	0	181020.8298	0.9	2	0	0	0.0				10607.7	10470.5	4959.5	2990.0	68.6	-68.6	10539.1	10539.1	10539.1	0.0	0	0
15/02/14	Saturday	2	6.5	0	181020.8298	0.9	2	0	0	0.0				10539.1	10402.9	4959.5	2990.0	68.1	-68.1	10471.0	10471.0	10471.0	0.0	0	0
16/02/14	Sunday	2	5.2	0	181020.8298	0.9	2	0	0	0.0				10471.0	10347.7	4959.5	2990.0	61.7	-61.7	10409.3	10409.3	10409.3	0.0	0	0
17/02/14	Monday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				10409.3	10271.1	4959.5	2990.0	69.1	-69.1	10340.2	10340.2	10340.2	0.0	0	0
18/02/14	Tuesday	2	7.9	0	181020.8298	0.9	2	0	0	0.0				10340.2	10190.1	4959.5	2990.0	75.1	-75.1	10265.2	10265.2	10265.2	0.0	0	0
19/02/14	Wednesday	2	8.1	0	181020.8298	0.9	2	0	0	0.0				10265.2	10113.1	4959.5	2990.0	76.1	-76.1	10189.1	10189.1	10189.1	0.0	0	0
20/02/14	Thursday	2	8	0	181020.8298	0.9	2	0	0	0.0				10189.1	10038.0	4959.5	2990.0	75.6	-75.6	10113.6	10113.6	10113.6	0.0	0	0
21/02/14	Friday	2	7.9	0	181020.8298	0.9	2	0	0	0.0				10113.6	9963.5	4959.5	2990.0	75.1	-75.1	10038.5	10038.5	10038.5	0.0	0	0
22/02/14	Saturday	2	7.6	0	181020.8298	0.9	2	0	0	0.0				10038.5	9891.4	4959.5	2990.0	73.6	-73.6	9964.9	9964.9	9964.9	0.0	0	0
23/02/14	Sunday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				9964.9	9826.7	4959.5	2990.0	69.1	-69.1	9895.8	9895.8	9895.8	0.0	0	0
24/02/14	Monday	2	6.5	0	181020.8298	0.9	2	0	0	0.0				9895.8	9759.6	4959.5	2990.0	68.1	-68.1	9827.7	9827.7	9827.7	0.0	0	0
25/02/14	Tuesday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				9827.7	9689.5	4959.5	2990.0	69.1	-69.1	9758.6	9758.6	9758.6	0.0	0	0
26/02/14	Wednesday	2	6.9	0	181020.8298	0.9	2	0	0	0.0				9758.6	9618.4	4959.5	2990.0	70.1	-70.1	9688.5	9688.5	9688.5	0.0	0	0
27/02/14	Thursday	2	7.2	0	181020.8298	0.9	2	0	0	0.0				9688.5	9545.3	4959.5	2990.0	71.6	-71.6	9616.9	9616.9	9616.9	0.0	0	0
28/02/14	Friday	2	6.8	0	181020.8298	0.9	2	0	0	0.0				9616.9	9477.7	4959.5	2990.0	69.6	-69.6	9547.3	9547.3	9547.3	0.0	0	0
01/03/14	Saturday	3	7.2	0	181020.8298	0.9	2	0	0	0.0				9547.3	9404.1	4959.5	2990.0	71.6	-71.6	9475.7	9475.7	9475.7	0.0	0	0
02/03/14	Sunday	3	6.1	0	181020.8298	0.9	2	0	0	0.0				9475.7	9343.5	4959.5	2990.0	66.1	-66.1	9409.6	9409.6	9409.6	0.0	0	0
03/03/14	Monday	3	5.5	0	181020.8298	0.9	2	0	0	0.0				9409.6	9283.3	4959.5	2990.0	63.2	-63.2	9346.4	9346.4	9346.4	0.0	0	0
04/03/14	Tuesday	3	6.9	0	181020.8298	0.9	2	0	0	0.0				9346.4	9206.2	4959.5	2990.0	70.1	-70.1	9276.3	9276.3	9276.3	0.0	0	0
05/03/14	Wednesday	3	6.5	0	181020.8298	0.9	2	0	0	0.0				9276.3	9140.1	4959.5	2990.0	68.1	-68.1	9208.2	9208.2	9208.2	0.0	0	0
06/03/14	Thursday	3	6.3	0	181020.8298	0.9	2	0	0	0.0				9208.2	9074.0	4959.5	2990.0	67.1	-67.1	9141.1	9141.1	9141.1	0.0	0	0
07/03/14	Friday	3	7.4	0	181020.8298	0.9	2	0	0	0.0				9141.1	8995.9	4959.5	2990.0	72.6	-72.6	9068.5	9068.5	9068.5	0.0	0	0
08/03/14	Saturday	3	4.4	0	181020.8298	0.9	2	0	0	0.0				9068.5	8953.1	4959.5	2990.0	57.7	-57.7	9010.8	9010.8	9010.8	0.0	0	0
09/03/14	Sunday	3	5.1	0	181020.8298	0.9	2	0	0	0.0				9010.8	8888.5	4959.5	2990.0	61.2	-61.2	8949.6	8949.6	8949.6	0.0	0	0
10/03/14	Monday	3	5.5	0	181020.8298	0.9	2	0	0	0.0				8949.6	8823.3	4959.5	2990.0	63.2	-63.2	8886.5	8886.5	8886.5	0.0	0	0
11/03/14	Tuesday	3	6.6	0	181020.8298	0.9	2	0	0	0.0				8886.5	8749.3	4959.5	2990.0	68.6	-68.6	8817.9	8817.9	8817.9	0.0	0	0
12/03/14	Wednesday	3	6.7	0	181020.8298	0.9	2	0	0	0.0				8817.9	8679.6	4959.5	2990.0	69.1	-69.1	8748.8	8748.8	8748.8	0.0	0	0
13/03/14	Thursday	3	2.7	0	181020.8298	0.9	2	0	0	0.0				8748.8	8650.2	4959.5	2990.0	49.3	-49.3	8699.5	8699.5	8699.5	0.0	0	0
14/03/14	Friday	3	5.1	0	181020.8298	0.9	2	0	0	0.0				8699.5	8577.1	4959.5	2990.0	61.2	-61.2	8638.3	8638.3	8638.3	0.0	0	0
15/03/14	Saturday	3	4.5	0	181020.8298	0.9	2	0	0	0.0				8638.3	8521.9	4959.5	2990.0	58.2	-58.2	8580.1	8580.1	8580.1	0.0	0	0
16/03/14	Sunday	3	4.9	0	181020.8298	0.9	2	0	0	0.0				8580.1	8459.8	4959.5	2990.0	60.2	-60.2	8519.9	8519.9	8519.9	0.0	0	0
17/03/14	Monday	3	4.6	0	181020.8298	0.9	2	0	0	0.0				8519.9	8402.5	4959.5	2990.0	58.7	-58.7	8461.2	8461.2	8461.2	0.0	0	0
18/03/14	Tuesday	3	4.9	0	181020.8298	0.9	2	0	0	0.0				8461.2	8340.9	4959.5	2990.0	60.2	-60.2	8401.1	8401.1	8401.1	0.0	0	0
19/03/14	Wednesday	3	5.2	0	181020.8298	0.9	2	0	0	0.0				8401.1	8277.7	4959.5	2990.0	61.7	-61.7	8339.4	8339.4	8339.4	0.0	0	0
20/03/14	Thursday	3	6.2	0	181020.8298	0.9	2	0	0	0.0				8339.4	8206.1	4959.5	2990.0	66.6	-66.6	8272.8	8272.8	8272.8	0.0	0	0
21/03/14	Friday	3	4.8	0	181020.8298	0.9	2	0	0	0.0				8272.8	8153.4	4959.5	2990.0	59.7	-59.7	8213.1	8213.1	8213.1	0.0	0	0
22/03/14	Saturday	3	5.7	0	181020.8298	0.9	2	0	0	0.0				8213.1	8084.8	4959.5	2990.0	64.1	-64.1	8148.9	8148.9	8148.9	0.0	0	0
23/03/14	Sunday	3	6.5	5.2	181020.8298	0.9	2	3.2	51.5788	572.9				8148.9	8585.6	4959.5	2990.0	68.1	-68.1	8653.7	8653.7	8653.7	0.0	0	0
24/03/14	Monday	3	5.8	0	181020.8298	0.9	2	0	0	0.0				8653.7	8524.4	4959.5	2990.0	64.6	-64.6	8589.1	8589.1	8589.1	0.0	0	0
25/03/14	Tuesday	3	2.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				8589.1	8491.5	4959.5	2990.0	49.8	-49.8	8541.3	8541.3	8541.3	0.0	0	0
26/03/14	Wednesday	3	3.4	0	181020.8298	0.9	2	0	0	0.0				8541.3	8435.8	4959.5	2990.0	52.7	-52.7	8488.6	8488.6	8488.6	0.0	0	0
27/03/14	Thursday	3	4.2	0	181020.8298	0.9	2	0	0	0.0				8488.6	8375.1	4959.5	2990.0	56.7	-56.7	8431.8	8431.8	8431.8	0.0	0	0
28/03/14	Friday	3	5.2	0	181020.8298	0.9	2	0	0	0.0				8431.8	8308.5	4959.5	2990.0	61.7	-61.7	8370.2	8370.2	8370.2	0.0	0	0
29/03/14	Saturday	3	2.3	0	181020.8298	0.9	2	0	0	0.0				8370.2	8275.6	4959.5	2990.0	47.3	-47.3	8322.9	8322.9	8322.9	0.0	0	0
30/03/14	Sunday	3	3.2	15	181020.8298	0.9	2	11	148.785	2266.7				8322.9	10486.1	4959.5	2990.0	51.8	-51.8	10537.9	10537.9	10537.9	0.0	0	0
31/03/14	Monday	3	2.7	2	181020.8298	0.9	2	0	19.838	19.8				10537.9	10459.2	4959.5	2990.0	49.3	-49.3	10508.4	10508.4	10508.4	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
01/04/14	Tuesday	4	3.6	1.6	181020.8298	0.9	2	0	15.8704	15.9			
02/04/14	Wednesday	4	4.1	0	181020.8298	0.9	2	0	0	0.0			
03/04/14	Thursday	4	4.6	0	181020.8298	0.9	2	0	0	0.0			
04/04/14	Friday	4	3.6	0	181020.8298	0.9	2	0	0	0.0			
05/04/14	Saturday	4	3.7	0	181020.8298	0.9	2	0	0	0.0			
06/04/14	Sunday	4	3.4	0	181020.8298	0.9	2	0	0	0.0			
07/04/14	Monday	4	3.8	0	181020.8298	0.9	2	0	0	0.0			
08/04/14	Tuesday	4	4.2	0	181020.8298	0.9	2	0	0	0.0			
09/04/14	Wednesday	4	3.7	0	181020.8298	0.9	2	0	0	0.0			
10/04/14	Thursday	4	4.5	0	181020.8298	0.9	2	0	0	0.0			
11/04/14	Friday	4	4.6	0	181020.8298	0.9	2	0	0	0.0			
12/04/14	Saturday	4	4.3	0	181020.8298	0.9	2	0	0	0.0			
13/04/14	Sunday	4	3.5	0	181020.8298	0.9	2	0	0	0.0			
14/04/14	Monday	4	3.3	0	181020.8298	0.9	2	0	0	0.0			
15/04/14	Tuesday	4	2.9	0	181020.8298	0.9	2	0	0	0.0			
16/04/14	Wednesday	4	2.8	0	181020.8298	0.9	2	0	0	0.0			
17/04/14	Thursday	4	3	0	181020.8298	0.9	2	0	0	0.0			
18/04/14	Friday	4	3.7	0	181020.8298	0.9	2	0	0	0.0			
19/04/14	Saturday	4	3.3	0	181020.8298	0.9	2	0	0	0.0			
20/04/14	Sunday	4	2.8	0	181020.8298	0.9	2	0	0	0.0			
21/04/14	Monday	4	3.4	0	181020.8298	0.9	2	0	0	0.0			
22/04/14	Tuesday	4	3.1	0	181020.8298	0.9	2	0	0	0.0			
23/04/14	Wednesday	4	3.1	0	181020.8298	0.9	2	0	0	0.0			
24/04/14	Thursday	4	2.3	0	181020.8298	0.9	2	0	0	0.0			
25/04/14	Friday	4	2.3	0.6	181020.8298	0.9	2	0	5.9514	6.0			
26/04/14	Saturday	4	1.5	0	181020.8298	0.9	2	0	0	0.0			
27/04/14	Sunday	4	2.4	12.8	181020.8298	0.9	2	10.8	126.9632	1886.5			
28/04/14	Monday	4	2.7	17.8	181020.8298	0.9	2	15.8	176.5582	2750.7			
29/04/14	Tuesday	4	1.9	0.6	181020.8298	0.9	2	0	5.9514	6.0			
30/04/14	Wednesday	4	2.4	0	181020.8298	0.9	2	0	0	0.0			
01/05/14	Thursday	5	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
02/05/14	Friday	5	2.5	0	181020.8298	0.9	2	0	0	0.0			
03/05/14	Saturday	5	2.1	0	181020.8298	0.9	2	0	0	0.0			
04/05/14	Sunday	5	1.5	0	181020.8298	0.9	2	0	0	0.0			
05/05/14	Monday	5	1.6	1.4	181020.8298	0.9	2	0	13.8866	13.9			
06/05/14	Tuesday	5	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
07/05/14	Wednesday	5	1.3	2	181020.8298	0.9	2	0	19.838	19.8			
08/05/14	Thursday	5	2.5	53.4	181020.8298	0.9	2	51.4	529.6746	8903.7			
09/05/14	Friday	5	2.2	11.2	181020.8298	0.9	2	9.2	111.0928	1609.9			
10/05/14	Saturday	5	1.8	10	181020.8298	0.9	2	8	99.19	1402.5			
11/05/14	Sunday	5	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
12/05/14	Monday	5	2	0	181020.8298	0.9	2	0	0	0.0			
13/05/14	Tuesday	5	1.7	2.8	181020.8298	0.9	2	0.8	27.7732	158.1			
14/05/14	Wednesday	5	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
15/05/14	Thursday	5	1.5	0.6	181020.8298	0.9	2	0	5.9514	6.0			
16/05/14	Friday	5	1.6	0	181020.8298	0.9	2	0	0	0.0			
17/05/14	Saturday	5	1.8	3.6	181020.8298	0.9	2	1.6	35.7084	296.4			
18/05/14	Sunday	5	1.3	1.8	181020.8298	0.9	2	0	17.8542	17.9			
19/05/14	Monday	5	1.4	2	181020.8298	0.9	2	0	19.838	19.8			
20/05/14	Tuesday	5	1.5	6.2	181020.8298	0.9	2	4.2	61.4978	745.8			
21/05/14	Wednesday	5	1.4	6.4	181020.8298	0.9	2	4.4	63.4816	780.3			
22/05/14	Thursday	5	1.8	2.8	181020.8298	0.9	2	0.8	27.7732	158.1			
23/05/14	Friday	5	2.1	54	181020.8298	0.9	2	52	535.626	9007.4			
24/05/14	Saturday	5	2.3	17.6	181020.8298	0.9	2	15.6	174.5744	2716.1			
25/05/14	Sunday	5	2.1	7.4	181020.8298	0.9	2	5.4	73.4006	953.2			
26/05/14	Monday	5	1.5	3.6	181020.8298	0.9	2	1.6	35.7084	296.4			
27/05/14	Tuesday	5	1.1	0.6	181020.8298	0.9	2	0	5.9514	6.0			
28/05/14	Wednesday	5	1.4	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0			
29/05/14	Thursday	5	1.5	0.4	181020.8298	0.9	2	0	3.9676	4.0			
30/05/14	Friday	5	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
31/05/14	Saturday	5	1.3	0	181020.8298	0.9	2	0	0	0.0			
01/06/14	Sunday	6	1.5	1.8	181020.8298	0.9	2	0	17.8542	17.9			
02/06/14	Monday	6	1.4	3.6	181020.8298	0.9	2	1.6	35.7084	296.4			
03/06/14	Tuesday	6	1.3	0.4	181020.8298	0.9	2	0	3.9676	4.0			
04/06/14	Wednesday	6	1.5	0	181020.8298	0.9	2	0	0	0.0			
05/06/14	Thursday	6	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
06/06/14	Friday	6	2	0	181020.8298	0.9	2	0	0	0.0			
07/06/14	Saturday	6	2.4	0	181020.8298	0.9	2	0	0	0.0			
08/06/14	Sunday	6	1.7	0	181020.8298	0.9	2	0	0	0.0			
09/06/14	Monday	6	1.8	1.4	181020.8298	0.9	2	0	13.8866	13.9			
10/06/14	Tuesday	6	1.5	19.6	181020.8298	0.9	2	17.6	194.4124	3061.8			
11/06/14	Wednesday	6	1.3	0.8	181020.8298	0.9	2	0	7.9352	7.9			
12/06/14	Thursday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
13/06/14	Friday	6	1.1	0.4	181020.8298	0.9	2	0	3.9676	4.0			
14/06/14	Saturday	6	1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
15/06/14	Sunday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
16/06/14	Monday	6	2	0	181020.8298	0.9	2	0	0	0.0			
17/06/14	Tuesday	6	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
18/06/14	Wednesday	6	1.9	62.4	181020.8298	0.9	2	60.4	618.9456	10459.2			
19/06/14	Thursday	6	1	15.4	181020.8298	0.9	2	13.4	152.7526	2335.9			
20/06/14	Friday	6	1.2	5.4	181020.8298	0.9	2	3.4	53.5626	607.5			
21/06/14	Saturday	6	2	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
22/06/14	Sunday	6	1.4	38	181020.8298	0.9	2	36	376.922	6242.0			
23/06/14	Monday	6	1	1	181020.8298	0.9	2	0	9.919	9.9			
24/06/14	Tuesday	6	1.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
25/06/14	Wednesday	6	1.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
26/06/14	Thursday	6	2.1	0.4	181020.8298	0.9	2	0	3.9676	4.0			
27/06/14	Friday	6	1.4	3.6	181020.8298	0.9	2	1.6	35.7084	296.4			
28/06/14	Saturday	6	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
29/06/14	Sunday	6	1.6	0	181020.8298	0.9	2	0	0	0.0			
30/06/14	Monday	6	2.4	0	181020.8298	0.9	2	0	0	0.0			
01/07/14	Tuesday	7	2.2	0	181020.8298	0.9	2	0	0	0.0			

Date	Adjustments						Final pond volumes			Overflow Data		
	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
01/04/14	10508.4	10416.8	4959.5	2990.0	53.7	-53.7	10470.6	10470.6	10470.6	0.0	0	0
02/04/14	10470.6	10358.1	4959.5	2990.0	56.2	-56.2	10414.4	10414.4	10414.4	0.0	0	0
03/04/14	10414.4	10297.0	4959.5	2990.0	58.7	-58.7	10355.7	10355.7	10355.7	0.0	0	0
04/04/14	10355.7	10248.2	4959.5	2990.0	53.7	-53.7	10301.9	10301.9	10301.9	0.0	0	0
05/04/14	10301.9	10195.5	4959.5	2990.0	54.2	-54.2	10247.7	10247.7	10247.7	0.0	0	0
06/04/14	10247.7	10142.2	4959.5	2990.0	52.7	-52.7	10195.0	10195.0	10195.0	0.0	0	0
07/04/14	10195.0	10085.5	4959.5	2990.0	54.7	-54.7	10140.2	10140.2	10140.2	0.0	0	0
08/04/14	10140.2	10025.8	4959.5	2990.0	56.7	-56.7	10083.5	10083.5	10083.5	0.0	0	0
09/04/14	10083.5	9975.1	4959.5	2990.0	54.2	-54.2	10029.3	10029.3	10029.3	0.0	0	0
10/04/14	10029.3	9912.9	4959.5	2990.0	58.2	-58.2	9971.1	9971.1	9971.1	0.0	0	0
11/04/14	9971.1	9853.7	4959.5	2990.0	58.7	-58.7	9912.4	9912.4	9912.4	0.0	0	0
12/04/14	9912.4	9795.0	4959.5	2990.0	57.2	-57.2	9855.2	9855.2	9855.2	0.0	0	0
13/04/14	9855.2	9745.7	4959.5	2990.0	53.2	-53.2	9802.0	9802.0	9802.0	0.0	0	0
14/04/14	9802.0	9697.5	4959.5	2990.0	52.2	-52.2	9749.7	9749.7	9749.7	0.0	0	0
15/04/14	9749.7	9643.2	4959.5	2990.0	50.3	-50.3	9699.4	9699.4	9699.4	0.0	0	0
16/04/14	9699.4	9599.9	4959.5	2990.0	49.8	-49.8	9649.7	9649.7	9649.7	0.0	0	0
17/04/14	9649.7	9542.2	4959.5	2990.0	50.8	-50.8	9598.9	9598.9	9598.9	0.0	0	0
18/04/14	9598.9	9490.5	4959.5	2990.0	54.2	-54.2	9544.7	9544.7	9544.7	0.0	0	0
19/04/14	9544.7	9440.2	4959.5	2990.0	52.2	-52.2	9492.4	9492.4	9492.4	0.0	0	0
20/04/14	9492.4	9392.9	4959.5	2990.0	49.8	-49.8	9442.7	9442.7	9442.7	0.0	0	0
21/04/14	9442.7	9337.2	4959.5	2990.0	52.7	-52.7	9389.9	9389.9	9389.9	0.0	0	0
22/04/14	9389.9	9287.4	4959.5	2990.0	51.3	-51.3	9338.7	9338.7	9338.7	0.0	0	0
23/04/14	9338.7	9236.2	4959.5	2990.0	51.3	-51.3	9287.4	9287.4	9287.4	0.0	0	0
24/04/14	9287.4	9192.3	4959.5	2990.0	47.3	-47.3	9240.1	9240.1	9240.1	0.0	0	0
25/04/14	9240.1	9151.5	4959.5	2990.0	47.3	-47.3	9198.8	9198.8	9198.8	0.0	0	0
26/04/14	9198.8	9112.2	4959.5	2990.0	43.3	-43.3	9155.5	9155.5	9155.5	0.0	0	0
27/04/14	9155.5	10946.4	4959.5	2990.0	47.8	-47.8	10994.2	10994.2	10994.2	0.0	0	0
28/04/14	10994.2	13646.3	7439.3	4485.0	73.9	-24.6	13671.0	13671.0	13671.0	0.0	0	0
29/04/14	13671.0	13586.3	7439.3	4485.0	68.0	-22.7	13609.0	13609.0	13609.0	0.0	0	0
30/04/14	13609.0	13513.4	7439.3	4485.0	71.7	-23.9	13537.3	13537.3	13537.3	0.0	0	0
01/05/14	13537.3	13443.7	7439.3	4485.0	71.7	-23.9	13467.6	13467.6	13467.6	0.0	0	0
02/05/14	13467.6	13371.0	7439.3	4485.0	72.4	-24.1	13395.2	13395.2	13395.2	0.0	0	0
03/05/14	13395.2	13302.6	7439.3	4485.0	69.4	-23.1	13325.7	13325.7	13325.7	0.0	0	0
04/05/14	13325.7	13239.1	7439.3	4485.0	65.0	-21.7	13260.7	13260.7	13260.7	0.0	0	0
05/05/14	13260.7	13187.0	7439.3	4485.0	65.7	-21.9	13208.9	13208.9	13208.9	0.0	0	0
06/05/14	13208.9	13123.3	7439.3	4485.0	65.7	-21.9	13145.2	13145.2	13145.2	0.0	0	0
07/05/14	13145.2	13080.4	7439.3	4485.0	63.5	-21.2	13101.5	13101.5	13101.5	0.0	0	0
08/05/14	13101.5	21908.7	9919.0	5980.0	96.6	0.0	21908.7	21908.7	21908.7	0.0	0	0
09/05/14	21908.7	23425.0	9919.0	5980.0	93.6	0.0	23425.0	22274.5	22274.5	1150.5	1	0
10/05/14	22274.5	23587.4	9919.0	5980.0	89.6	0.0	23587.4	22274.5	22274.5	1312.9	1	0
11/05/14	22274.5	22182.9	9919.0	5980.0	93.6	0.0	22182.9	22182.9	22182.9	0.0	0	0
12/05/14	22182.9	22091.3	9919.0	5980.0	91.6	0.0	22091.3	22091.3	22091.3	0.0	0	0
13/05/14	22091.3	22160.8	9919.0	5980.0	88.6	0.0	22160.8	22160.8	22160.8	0.0	0	0
14/05/14	22160.8	22074.1	9919.0	5980.0	88.6	0.0	22074.1	22074.1	22074.1	0.0	0	0
15/05/14	22074.1	21993.4	9919.0	5980.0	86.6	0.0	21993.4	21993.4	21993.4	0.0	0	0
16/05/14	21993.4	21905.8	9919.0	5980.0	87.6	0.0	21905.8	21905.8	21905.8	0.0	0	0
17/05/14	21905.8	22112.6	9919.0	5980.0	89.6	0.0	22112.6	22112.6	22112.6	0.0	0	0
18/05/14	22112.6	22045.8	9919.0	5980.0	84.7	0.0	22045.8	22045.8	22045.8	0.0	0	0
19/05/14	22045.8	21980.0	9919.0	5980.0	85.6	0.0	21980.0	21980.0	21980.0	0.0	0	0
20/05/14	21980.0	22639.1	9919.0	5980.0	86.6	0.0	22639.1	22274.5	22274.5	364.6	1	0
21/05/14	22274.5	22969.2	9919.0	5980.0	85.6	0.0	22969.2	22274.5	22274.5	694.7	1	0
22/05/14	22274.5	22343.0	9919.0	5980.0	89.6	0.0	22343.0	22274.5	22274.5	68.5	1	0
23/05/14	22274.5	31189.3	9919.0	5980.0	92.6	0.0	31189.3	22274.5	22274.5	8914.8	1	0
24/05/14	22274.5	24896.0	9919.0	5980.0	94.6	0.0	24896.0	22274.5	22274.5	2621.5	1	0
25/05/14	22274.5	23135.0	9919.0	5980.0	92.6	0.0	23135.0	22274.5	22274.5	860.6	1	0
26/05/14	22274.5	22484.2	9919.0	5980.0	86.6	0.0	22484.2	22274.5	22274.5	209.7	1	0
27/05/14	22274.5	22197.8	9919.0	5980.0	82.7	0.0	22197.8	22197.8	22197.8	0.0	0	0
28/05/14	22197.8	23238.1	9919.0	5980.0	85.6	0.0	23238.1	22274.5	22274.5	963.6	1	0
29/05/14	22274.5	22191.8	9919.0	5980.0	86.6	0.0	22191.8	22191.8	22191.8	0.0	0	0
30/05/14	22191.8	22108.1	9919.0	5980.0	85.6	0.0	22108.1	22108.1	22108.1	0.0	0	0
31/05/14	22108.1	22023.5	9919.0	5980.0	84.7	0.0	22023.5	22023.5	22023.5	0.0	0	0
01/06/14	22023.5	21954.7	9919.0	5980.0	86.6	0.0	21954.7	21954.7	21954.7	0.0	0	0
02/06/14	21954.7	22165.4	9919.0	5980.0	85.6	0.0	22165.4	22165.4	22165.4	0.0	0	0
03/06/14	22165.4	22084.7	9919.0	5980.0	84.7	0.0	22084.7	22084.7	22084.7	0.0	0	0
04/06/14	22084.7	21998.1	9919.0	5980.0	86.6	0.0	21998.1	21998.1	21998.1	0.0	0	0
05/06/14	21998.1	21910.5	9919.0	5980.0	89.6	0.0	21910.5	21910.5	21910.5	0.0	0	0
06/06/14	21910.5	21818.9	9919.0	5980.0	91.6	0.0	21818.9	21818.9	21818.9	0.0	0	0
07/06/14	21818.9	21723.3	9919.0	5980.0	95.6	0.0	21723.3	21723.3	21723.3	0.0	0	0
08/06/14	21723.3	21634.7	9919.0	5980.0	88.6	0.0	21634.7	21634.7	21634.7	0.0	0	0
09/06/14	21634.7	21559.0	9919.0	5980.0	89.6	0.0	21559.0	21559.0	21559.0	0.0	0	0
10/06/14	21559.0	24534.1	9919.0	5980.0	86.6	0.0	24534.1	22274.5	22274.5	2259.6	1	0
11/06/14	22274.5	22197.8	9919.0	5980.0	84.7	0.0	22197.8	22197.8	22197.8	0.0	0	0
12/06/14	22197.8	22114.1	9919.0	5980.0	85.6	0.0	22114.1	22114.1	22114.1	0.0	0	0
13/06/14	22114.1	22035.4	9919.0	5980.0	82.7	0.0	22035.4	22035.4	22035.4	0.0	0	0
14/06/14	22035.4	21955.7	9919.0	5980.0	81.7	0.0	21955.7	21955.7	21955.7	0.0	0	0
15/06/14	21955.7	21873.0	9919.0	5980.0	84.7	0.0	21873.0	21873.0	21873.0	0.0	0	0
16/06/14	21873.0	21781.4	9919.0	5980.0	91.6	0.0	21781.4	21781.4	21781.4	0.0	0	0
17/06/14	21781.4	21689.8	9919.0	5980.0	93.6	0.0	21689.8	21689.8	21689.8	0.0	0	0
18/06/14	21689.8	32058.5	9919.0	5980.0	90.6	0.0	32058.5	22274.5	22274.5	9784.0	1	0
19/06/14	22274.5	24528.7	9919.0	5980.0	81.7	0.0	24528.7	22274.5	22274.5	2254.2	1	0
20/06/14	22274.5	22798.3	9919.0	5980.0	83.7	0.0	22798.3	22274.5	22274.5	523.8	1	0
21/06/14	22274.5	22513.8	9919.0	5980.0	91.6	0.0	22513.8	22274.5	22274.5	239.3	1	0
22/06/14	22274.5	28430.8	9919.0	5980.0	85.6	0.0	28430.8	22274.5	22274.5	6156.4	1	0
23/06/14	22274.5	22202.7	9919.0	5980.0	81.7	0.0	22202.7	22202.7	22202.7	0.0	0	0
24/06/14	22202.7	22122.0	9919.0	5980.0	82.7	0.0	22122.0	22122.0	22122.0	0.0	0	0
25/06/14	22122.0	22041.3	9919.0	5980.0	82.7	0.0	22041.3	22041.3	22041.3	0.0	0	0
26/06/14	22041.3	21952.7	9919.0	5980.0	92.6	0.0	21952.7	21952.7	21952.7	0.0	0	0
27/06/14	21952.7	22163.5	9919.0	5980.0	85.6	0.0	22163.5	22163.5	22163.5	0.0	0	0
28/06/14	22163.5	22081.8	9919.0	5980.0	83.7	0.0	22081.8	22081.8	22081.8	0.0	0	0
29/06/14	22081.8	21994.1	9919.0	5980.0	87.6	0.0	21994.1	21994.1	21994.1	0.0	0	0
30/06/14	21994.1	21898.6	9919.0	5980.0	95.6	0.0	21898.6	21898.6	21898.6	0.0	0	0
01/07/14	21898.6	21805.0	9919.0	5980.0	93.6	0.0	21805.0	21805.0	21805.0	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
02/07/14	Wednesday	7	2.2	29.8	181020.8298	0.9	2	27.8	295.5862	4824.7				21805.0	26536.1	9919.0	5980.0	93.6	0.0	26536.1	22274.5	22274.5	4261.7	1	0
03/07/14	Thursday	7	1.2	9.6	181020.8298	0.9	2	7.6	95.2224	1333.4				22274.5	23524.2	9919.0	5980.0	83.7	0.0	23524.2	22274.5	22274.5	1249.7	1	0
04/07/14	Friday	7	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22188.8	9919.0	5980.0	87.6	0.0	22188.8	22188.8	22188.8	0.0	0	0
05/07/14	Saturday	7	1.9	12	181020.8298	0.9	2	10	119.028	1748.2				22188.8	23846.4	9919.0	5980.0	90.6	0.0	23846.4	22274.5	22274.5	1572.0	1	0
06/07/14	Sunday	7	1.7	1.2	181020.8298	0.9	2	0	11.9028	11.9				22274.5	22197.8	9919.0	5980.0	88.6	0.0	22197.8	22197.8	22197.8	0.0	0	0
07/07/14	Monday	7	2.2	31.4	181020.8298	0.9	2	29.4	311.4566	5101.3				22197.8	27205.4	9919.0	5980.0	93.6	0.0	27205.4	22274.5	22274.5	4931.0	1	0
08/07/14	Tuesday	7	1.7	18.6	181020.8298	0.9	2	16.6	184.4934	2888.9				22274.5	25074.8	9919.0	5980.0	88.6	0.0	25074.8	22274.5	22274.5	2800.3	1	0
09/07/14	Wednesday	7	1.1	2.8	181020.8298	0.9	2	0.8	27.7732	358.1				22274.5	22349.9	9919.0	5980.0	82.7	0.0	22349.9	22274.5	22274.5	75.4	1	0
10/07/14	Thursday	7	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22192.8	9919.0	5980.0	83.7	0.0	22192.8	22192.8	22192.8	0.0	0	0
11/07/14	Friday	7	1.3	0	181020.8298	0.9	2	0	0	0.0				22192.8	22108.1	9919.0	5980.0	84.7	0.0	22108.1	22108.1	22108.1	0.0	0	0
12/07/14	Saturday	7	1.6	0	181020.8298	0.9	2	0	0	0.0				22108.1	22020.5	9919.0	5980.0	87.6	0.0	22020.5	22020.5	22020.5	0.0	0	0
13/07/14	Sunday	7	1.7	0	181020.8298	0.9	2	0	0	0.0				22020.5	21931.9	9919.0	5980.0	88.6	0.0	21931.9	21931.9	21931.9	0.0	0	0
14/07/14	Monday	7	2.3	16	181020.8298	0.9	2	14	158.704	2439.6				21931.9	24276.9	9919.0	5980.0	94.6	0.0	24276.9	22274.5	22274.5	2002.4	1	0
15/07/14	Tuesday	7	1.8	5.4	181020.8298	0.9	2	3.4	53.5626	607.5				22274.5	22792.3	9919.0	5980.0	89.6	0.0	22792.3	22274.5	22274.5	517.9	1	0
16/07/14	Wednesday	7	1.4	3	181020.8298	0.9	2	1	29.757	192.7				22274.5	22381.5	9919.0	5980.0	85.6	0.0	22381.5	22274.5	22274.5	107.0	1	0
17/07/14	Thursday	7	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22191.8	9919.0	5980.0	84.7	0.0	22191.8	22191.8	22191.8	0.0	0	0
18/07/14	Friday	7	1.6	0	181020.8298	0.9	2	0	0	0.0				22191.8	22104.2	9919.0	5980.0	87.6	0.0	22104.2	22104.2	22104.2	0.0	0	0
19/07/14	Saturday	7	2	0	181020.8298	0.9	2	0	0	0.0				22104.2	22012.6	9919.0	5980.0	91.6	0.0	22012.6	22012.6	22012.6	0.0	0	0
20/07/14	Sunday	7	1.4	13.4	181020.8298	0.9	2	11.4	132.9146	1990.2				22012.6	23917.1	9919.0	5980.0	85.6	0.0	23917.1	22274.5	22274.5	1642.6	1	0
21/07/14	Monday	7	1.1	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				22274.5	22246.2	9919.0	5980.0	82.7	0.0	22246.2	22246.2	22246.2	0.0	0	0
22/07/14	Tuesday	7	1.4	24.2	181020.8298	0.9	2	22.2	240.0398	3856.8				22246.2	26017.4	9919.0	5980.0	85.6	0.0	26017.4	22274.5	22274.5	3742.9	1	0
23/07/14	Wednesday	7	1.2	0.4	181020.8298	0.9	2	0	3.9676	4.0				22274.5	22194.8	9919.0	5980.0	83.7	0.0	22194.8	22194.8	22194.8	0.0	0	0
24/07/14	Thursday	7	1.4	4.2	181020.8298	0.9	2	2.2	41.6598	400.1				22194.8	22509.2	9919.0	5980.0	85.6	0.0	22509.2	22274.5	22274.5	234.7	1	0
25/07/14	Friday	7	1.7	1.6	181020.8298	0.9	2	0	15.8704	15.9				22274.5	22201.7	9919.0	5980.0	88.6	0.0	22201.7	22201.7	22201.7	0.0	0	0
26/07/14	Saturday	7	1.4	9.4	181020.8298	0.9	2	7.4	93.2386	1298.8				22201.7	23414.9	9919.0	5980.0	85.6	0.0	23414.9	22274.5	22274.5	1140.4	1	0
27/07/14	Sunday	7	2	16	181020.8298	0.9	2	14	158.704	2439.6				22274.5	24622.4	9919.0	5980.0	91.6	0.0	24622.4	22274.5	22274.5	2348.0	1	0
28/07/14	Monday	7	2.1	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				22274.5	22270.9	9919.0	5980.0	92.6	0.0	22270.9	22270.9	22270.9	0.0	0	0
29/07/14	Tuesday	7	1.8	1.2	181020.8298	0.9	2	0	11.9028	11.9				22270.9	22193.1	9919.0	5980.0	89.6	0.0	22193.1	22193.1	22193.1	0.0	0	0
30/07/14	Wednesday	7	1.6	0	181020.8298	0.9	2	0	0	0.0				22193.1	22105.5	9919.0	5980.0	87.6	0.0	22105.5	22105.5	22105.5	0.0	0	0
31/07/14	Thursday	7	1.7	1	181020.8298	0.9	2	0	9.919	9.9				22105.5	22026.8	9919.0	5980.0	88.6	0.0	22026.8	22026.8	22026.8	0.0	0	0
01/08/14	Friday	8	1.9	0.2	181020.8298	0.9	2	0	1.9838	2.0				22026.8	21938.2	9919.0	5980.0	90.6	0.0	21938.2	21938.2	21938.2	0.0	0	0
02/08/14	Saturday	8	1.6	0	181020.8298	0.9	2	0	0	0.0				21938.2	21850.6	9919.0	5980.0	87.6	0.0	21850.6	21850.6	21850.6	0.0	0	0
03/08/14	Sunday	8	1.8	0.4	181020.8298	0.9	2	0	3.9676	4.0				21850.6	21764.9	9919.0	5980.0	89.6	0.0	21764.9	21764.9	21764.9	0.0	0	0
04/08/14	Monday	8	2.2	0	181020.8298	0.9	2	0	0	0.0				21764.9	21671.3	9919.0	5980.0	93.6	0.0	21671.3	21671.3	21671.3	0.0	0	0
05/08/14	Tuesday	8	2.6	0	181020.8298	0.9	2	0	0	0.0				21671.3	21573.8	9919.0	5980.0	97.5	0.0	21573.8	21573.8	21573.8	0.0	0	0
06/08/14	Wednesday	8	2.9	0	181020.8298	0.9	2	0	0	0.0				21573.8	21473.3	9919.0	5980.0	100.5	0.0	21473.3	21473.3	21473.3	0.0	0	0
07/08/14	Thursday	8	1.2	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				21473.3	21513.1	9919.0	5980.0	83.7	0.0	21513.1	21513.1	21513.1	0.0	0	0
08/08/14	Friday	8	2	4.6	181020.8298	0.9	2	2.6	45.6274	469.2				21513.1	21890.8	9919.0	5980.0	91.6	0.0	21890.8	21890.8	21890.8	0.0	0	0
09/08/14	Saturday	8	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21890.8	21799.2	9919.0	5980.0	93.6	0.0	21799.2	21799.2	21799.2	0.0	0	0
10/08/14	Sunday	8	2.9	0	181020.8298	0.9	2	0	0	0.0				21799.2	21698.6	9919.0	5980.0	100.5	0.0	21698.6	21698.6	21698.6	0.0	0	0
11/08/14	Monday	8	3.1	0	181020.8298	0.9	2	0	0	0.0				21698.6	21596.1	9919.0	5980.0	102.5	0.0	21596.1	21596.1	21596.1	0.0	0	0
12/08/14	Tuesday	8	3	0	181020.8298	0.9	2	0	0	0.0				21596.1	21494.6	9919.0	5980.0	101.5	0.0	21494.6	21494.6	21494.6	0.0	0	0
13/08/14	Wednesday	8	3.6	0	181020.8298	0.9	2	0	0	0.0				21494.6	21387.1	9919.0	5980.0	107.5	0.0	21387.1	21387.1	21387.1	0.0	0	0
14/08/14	Thursday	8	3.2	0	181020.8298	0.9	2	0	0	0.0				21387.1	21283.6	9919.0	5980.0	103.5	0.0	21283.6	21283.6	21283.6	0.0	0	0
15/08/14	Friday	8	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21283.6	21191.0	9919.0	5980.0	94.6	0.0	21191.0	21191.0	21191.0	0.0	0	0
16/08/14	Saturday	8	2.2	0	181020.8298	0.9	2	0	0	0.0				21191.0	21097.5	9919.0	5980.0	93.6	0.0	21097.5	21097.5	21097.5	0.0	0	0
17/08/14	Sunday	8	3.5	0	181020.8298	0.9	2	0	0	0.0				21097.5	20991.0	9919.0	5980.0	106.5	0.0	20991.0	20991.0	20991.0	0.0	0	0
18/08/14	Monday	8	2.2	21	181020.8298	0.9	2	19	208.299	3303.8				20991.0	24201.2	9919.0	5980.0	93.6	0.0	24201.2	22274.5	22274.5	1926.7	1	0
19/08/14	Tuesday	8	1.9	16	181020.8298	0.9	2	14	158.704	2439.6				22274.5	24623.4	9919.0	5980.0	90.6	0.0	24623.4	22274.5	22274.5	2349.0	1	0
20/08/14	Wednesday	8	1.8	0.6	181020.8298	0.9	2	0	5.9514	6.0				22274.5	22190.8	9919.0	5980.0	89.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
21/08/14	Thursday	8	2.4	10.6	181020.8298	0.9	2	8.6	105.1414	1506.2				22190.8	23601.5	9919.0	5980.0	95.6	0.0	23601.5	22274.5	22274.5	1327.0	1	0
22/08/14	Friday	8	2.6	9.8	181020.8298	0.9	2	7.8	97.2062	1368.0				22274.5	23544.9	9919.0	5980.0	97.5	0.0	23544.9	22274.5	22274.5	1270.4	1	0
23/08/14	Saturday	8	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22181.9	9919.0	5980.0	94.6	0.0	22181.9	22181.9	22181.9	0.0	0	0
24/08/14	Sunday	8	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22181.9	22088.3	9919.0	5980.0	95.6	0.0	22088.3	22088.3	22088.3	0.0	0	0
25/08/14	Monday	8	2.8	0	181020.8298	0.9	2	0	0	0.0				22088.3	21988.8	9919.0	5980.0	99.5	0.0	21988.8	21988.8	21988.8	0.0	0	0
26/08/14	Tuesday	8	2.3	1.2	181020.8298	0.9	2	0	11.9028	11.9				21988.8	21906.1	9919.0	5980.0	94.6	0.0	21906.1	21906.1	21906.1	0.0	0	0
27/08/14	Wednesday	8	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				21906.1	21812.5	9919.0	5980.0	95.6	0.0	21812.5	21812.5	21812.5	0.0	0	0
28/08/14	Thursday	8	3.2	0	181020.8298	0.9	2	0	0	0.0				21812.5	21709.0	9919.0	5980.0	103.5	0.0	21709.0	21709.0	21709.0	0.0	0	0
29/08/14	Friday	8	1.9	0	181020.8298	0.9	2	0	0	0.0				21709.0	21618.4	9919.0	5980.0	90.6	0.0	21618.4	21618.4	21618.4	0.0	0	0
30/08/14	Saturday	8	1.8	46	181020.8298	0.9	2	44	456.274	7624.7				21618.4	29153.5	9919.0	5980.0	89.6	0.0	29153.5	22274.5	22274.5	6879.0	1	0
31/08/14	Sunday	8	2.1	0.6	181020.8298	0.9	2	0	5.9514	6.0				22274.5	22187.8	9919.0	5980.0	92.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
01/09/14	Monday	9	2.5	0	181020.8298	0.9	2	0	0	0.0				22187.8	22091.3	9919.0	5980.0	96.5	0.0	22091.3	22091.3	22091.3	0.0	0	0
02/09/14	Tuesday	9	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22091.3	22004.6	9919.0	5980.0	88.5	0.0	22004.6	22004.6	22004.6	0.0	0	0
03/09/14	Wednesday	9	2.3	0	181020.8298	0.9	2	0	0	0.0				22004.6	21910.1	9919.0	5980.0	94.5	0.0	21910.1	21910.1	21910.1	0.0	0	0
04/09/14	Thursday	9	2.6	0	181020.8298	0.9	2	0	0	0.0				21910.1	21812.5	9919.0	5980.0	97.5	0.0	21812.5	21812.5	21812.5	0.0	0	0
05/09/14	Friday	9	3.3	0	181020.8298	0.9	2	0	0	0.0				21812.5	21708.0	9919.0	5980.0	104.5	0.0	21708.0	21708.0	21708.0	0.0	0	0
06/09/14	Saturday	9	2.5	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				21708.0	21907.8	9919.0	5980.0	96.6	0.0	21907.8	21907.8	21907.8	0.0	0	0
07/09/14	Sunday	9	2.5	14	181020.8298	0.9	2	12	138.866	2093.9				21907.8	23905.2	9919.0	5980.0	96.6	0.0	23905.2	22274.5	22274.5	1630.7	1	0
08/09/14	Monday	9	3	12.8	181020.8298	0.9	2	10.8	126.9632	1846.5				22274.5	24059.4	9919.0	5980.0	101.5	0.0	24059.4	22274.5	22274.5	1785.0	1	0
09/09/14	Tuesday	9	2.6	7	181020.8298	0.9	2	5	69.433	884.0				22274.5	23061.0	9919.0	5980.0	97.5	0.0	23061.0	22274.5	22274.5	786.5	1	0
10/09/14	Wednesday	9	2.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22177.9	9919.0	5980.0	98.5	0.0	22177.9	22177.9	22177.9	0.0	0	0
11/09/14	Thursday	9	2.6	1.2	181020.8298	0.9	2	0	11.9028	11.9				22177.9	22092.3	9919.0	5980.0	97.5	0.0	22092.3	22092.3	22092.3	0.0	0	0
12/09/14	Friday	9	3.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22092.3	21988.8	9919.0	5980.0	105.5	0.0	21988.8	21988.8	21988.8	0.0	0	0
13/09/14	Saturday	9	3.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21988.8	21886.3	9919.0	5980.0	104.5	0.0	21886.3	21886.3	21886.3	0.0	0	0
14/09/14	Sunday	9	3.2	0	181020.8298	0.9	2	0	0	0.0				21886.3	21782.8	9919.0	5980.0	103.5	0.0	21782.8	21782.8	21782.8	0.0	0	0
15/09/14	Monday	9	3.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21782.8	21680.3	9919.0	5980.0	104.5	0.0	21680.3	21680.3	21680.3	0.0	0	0
16/09/14	Tuesday	9	4.1	0	181020.8298	0.9	2	0	0	0.0				21680.3	21567.8	9919.0	5980.0	112.4	0.0	21567.8	21567.8	21567.8	0.0	0	0
17/09/14	Wednesday	9	4.4	0	181020.8298	0.9	2	0	0	0.0				21567.8	21452.4	9919.0	5980.0	115.4	0.0	21452.4	21452.4	21452.4	0.0	0	0
18/09/14	Thursday	9	3.9	0	181020.8298	0.9	2	0	0	0.0				21452.4	21342.0	9919.0	5980.0	110.4	0.0	21342.0	21342.0	21342.0	0.0	0	0
19/09/14	Friday	9	3.5	0	181020.8298	0.9	2	0	0	0.0				21342.0	21235.5	9919.0	5980.0	106.5	0.0	21235.5	21235.5	21235.5	0.0	0	0
20/09/14	Saturday	9	6.5	0	181020.8298	0.9	2	0	0	0.0				21235.5	21099.3	9919.0	5980.0	136.2	0.0	21099.3	21099.3	21099.3	0.0	0	0
21/09/14	Sunday	9	2.3	0	181020.8298	0.9	2	0	0	0.0				21099.3	21004.7	9919.0	5980.0	94.6	0.0	21004.7	21004.7	21004.7	0.0	0	0
22/09/14	Monday	9	3.5	37.8	181020.8298	0.9	2	35.8	374.9382	6207.4				21004.7	27105.6	9919.0	5980.0	106.5	0.0	27105.6	22274.5	22274.5	4831.2	1	0
23/09/14	Tuesday	9	2	0	181020.8298	0.9	2	0	0	0.0				22274.5	22182.9	9919.0	5980.0	91.6	0.0	22182.9	22182.9	22182.9	0.0	0	0
24/09/14	Wednesday	9	3.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				22182.9	22081.4	9919.0	5980.0	103.5	0.0	22081.4	22081.4	22081.4	0.0	0	0
25/09/14	Thursday	9	3.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22081.4	21978.9	9919.0	5980.0	104.5	0.0	21978.9	21978.9	21978.9	0.0	0	0
26/09/14	Friday	9	3.9	0	181020.8298	0.9	2	0	0	0.0				21978.9	21868.4	9919.0	5980.0	110.4	0.0	21868.4	21868.4	21868.4	0.0	0	0
27/09/14	Saturday	9	2.5	11	181020.8298	0.9	2	9	109.109	1575.4				21868.4	23347.2	9919.0	5980.0	96.6	0.0	23347.2	22274.5	22274.5	1072.8	1	0
28/09/14	Sunday	9	3.3	17.8	181020.8298	0.9	2	15.8	176.5582	2750.7				22274.5	24920.7	9919.0	5980.0	104.5	0.0	24920.7	22274.5	22274.5	2646.2	1	0
29/09/14	Monday	9	2.9	5.8	181020.8298	0.9	2	3.8	57.5302	676.6				22274.5	22850.6	9919.0	5980.0	100.5	0.0	22850.6	22274.5	22274.5	576.1	1	0
30/09/14	Tuesday	9	3.7	1.4	181020.8298	0.9	2	0	13.8866	13.9				22274.5	22179.9	9919.0	5980.0	108.5	0.0	22179.9	22179.9	22179.9	0.0	0	0
01/10/14	Wednesday	10	4.1	0	181020.8298	0.9	2	0	0	0.0				22179.9	22067.5	9919.0	5980.0	112.4	0.0	22067.5	22067.5	22067.5	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)
	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting					
02/10/14	Thursday	10	3.7	0.2	181020.8298	0.9	2	0	1.9838	2.0
03/10/14	Friday	10	3.7	0	181020.8298	0.9	2	0	0	0.0
04/10/14	Saturday	10	3.9	0.6	181020.8298	0.9	2	0	5.9514	6.0
05/10/14	Sunday	10	3.1	9.6	181020.8298	0.9	2	7.6	95.2224	1333.4
06/10/14	Monday	10	3.9	19.8	181020.8298	0.9	2	17.8	196.3962	3096.3
07/10/14	Tuesday	10	3.7	0	181020.8298	0.9	2	0	0	0.0
08/10/14	Wednesday	10	3.6	0	181020.8298	0.9	2	0	0	0.0
09/10/14	Thursday	10	4.3	6.4	181020.8298	0.9	2	4.4	63.4816	780.3
10/10/14	Friday	10	4.2	0.2	181020.8298	0.9	2	0	1.9838	2.0
11/10/14	Saturday	10	3.2	0	181020.8298	0.9	2	0	0	0.0
12/10/14	Sunday	10	3.7	0	181020.8298	0.9	2	0	0	0.0
13/10/14	Monday	10	5	0	181020.8298	0.9	2	0	0	0.0
14/10/14	Tuesday	10	6	0	181020.8298	0.9	2	0	0	0.0
15/10/14	Wednesday	10	6.5	0	181020.8298	0.9	2	0	0	0.0
16/10/14	Thursday	10	5.4	0	181020.8298	0.9	2	0	0	0.0
17/10/14	Friday	10	4.2	0	181020.8298	0.9	2	0	0	0.0
18/10/14	Saturday	10	4	1.6	181020.8298	0.9	2	0	15.8704	15.9
19/10/14	Sunday	10	2.5	6.8	181020.8298	0.9	2	4.8	67.4492	849.5
20/10/14	Monday	10	3.9	3.4	181020.8298	0.9	2	1.4	33.7246	261.8
21/10/14	Tuesday	10	4.6	0.2	181020.8298	0.9	2	0	1.9838	2.0
22/10/14	Wednesday	10	6.8	0	181020.8298	0.9	2	0	0	0.0
23/10/14	Thursday	10	4.2	1	181020.8298	0.9	2	0	9.919	9.9
24/10/14	Friday	10	4.8	0	181020.8298	0.9	2	0	0	0.0
25/10/14	Saturday	10	3.5	0.4	181020.8298	0.9	2	0	3.9676	4.0
26/10/14	Sunday	10	4.6	1.6	181020.8298	0.9	2	0	15.8704	15.9
27/10/14	Monday	10	5.1	0.4	181020.8298	0.9	2	0	3.9676	4.0
28/10/14	Tuesday	10	5.2	0	181020.8298	0.9	2	0	0	0.0
29/10/14	Wednesday	10	5	0	181020.8298	0.9	2	0	0	0.0
30/10/14	Thursday	10	3.7	0	181020.8298	0.9	2	0	0	0.0
31/10/14	Friday	10	5.3	1.4	181020.8298	0.9	2	0	13.8866	13.9
01/11/14	Saturday	11	6.4	0	181020.8298	0.9	2	0	0	0.0
02/11/14	Sunday	11	3.9	0	181020.8298	0.9	2	0	0	0.0
03/11/14	Monday	11	4.9	1.8	181020.8298	0.9	2	0	17.8542	17.9
04/11/14	Tuesday	11	5.9	0.2	181020.8298	0.9	2	0	1.9838	2.0
05/11/14	Wednesday	11	5.8	0.2	181020.8298	0.9	2	0	1.9838	2.0
06/11/14	Thursday	11	3.7	0	181020.8298	0.9	2	0	0	0.0
07/11/14	Friday	11	5.3	4.8	181020.8298	0.9	2	2.8	47.6112	503.8
08/11/14	Saturday	11	6.2	0.2	181020.8298	0.9	2	0	1.9838	2.0
09/11/14	Sunday	11	7.6	0	181020.8298	0.9	2	0	0	0.0
10/11/14	Monday	11	3.3	2	181020.8298	0.9	2	0	19.838	19.8
11/11/14	Tuesday	11	5	0.4	181020.8298	0.9	2	0	3.9676	4.0
12/11/14	Wednesday	11	5	0	181020.8298	0.9	2	0	0	0.0
13/11/14	Thursday	11	5.5	0	181020.8298	0.9	2	0	0	0.0
14/11/14	Friday	11	5.5	0	181020.8298	0.9	2	0	0	0.0
15/11/14	Saturday	11	6.2	0	181020.8298	0.9	2	0	0	0.0
16/11/14	Sunday	11	6.1	0	181020.8298	0.9	2	0	0	0.0
17/11/14	Monday	11	5.6	0	181020.8298	0.9	2	0	0	0.0
18/11/14	Tuesday	11	4.6	0	181020.8298	0.9	2	0	0	0.0
19/11/14	Wednesday	11	5	0	181020.8298	0.9	2	0	0	0.0
20/11/14	Thursday	11	4.2	0	181020.8298	0.9	2	0	0	0.0
21/11/14	Friday	11	3.8	4	181020.8298	0.9	2	2	39.676	365.5
22/11/14	Saturday	11	4.8	1.2	181020.8298	0.9	2	0	11.9028	11.9
23/11/14	Sunday	11	5.8	0	181020.8298	0.9	2	0	0	0.0
24/11/14	Monday	11	6.6	0	181020.8298	0.9	2	0	0	0.0
25/11/14	Tuesday	11	7.9	0	181020.8298	0.9	2	0	0	0.0
26/11/14	Wednesday	11	4.7	0	181020.8298	0.9	2	0	0	0.0
27/11/14	Thursday	11	3.2	16.4	181020.8298	0.9	2	14.4	162.6716	2508.7
28/11/14	Friday	11	3.9	2.6	181020.8298	0.9	2	0.6	25.7894	123.5
29/11/14	Saturday	11	5.6	0	181020.8298	0.9	2	0	0	0.0
30/11/14	Sunday	11	5.8	0	181020.8298	0.9	2	0	0	0.0
01/12/14	Monday	12	5.4	0	181020.8298	0.9	2	0	0	0.0
02/12/14	Tuesday	12	6.6	0.4	181020.8298	0.9	2	0	3.9676	4.0
03/12/14	Wednesday	12	6.2	0	181020.8298	0.9	2	0	0	0.0
04/12/14	Thursday	12	6.3	0	181020.8298	0.9	2	0	0	0.0
05/12/14	Friday	12	3.5	0	181020.8298	0.9	2	0	0	0.0
06/12/14	Saturday	12	6.4	0	181020.8298	0.9	2	0	0	0.0
07/12/14	Sunday	12	6.5	0	181020.8298	0.9	2	0	0	0.0
08/12/14	Monday	12	5.9	0	181020.8298	0.9	2	0	0	0.0
09/12/14	Tuesday	12	5.7	0	181020.8298	0.9	2	0	0	0.0
10/12/14	Wednesday	12	7.2	0	181020.8298	0.9	2	0	0	0.0
11/12/14	Thursday	12	8.4	0	181020.8298	0.9	2	0	0	0.0
12/12/14	Friday	12	6.1	0	181020.8298	0.9	2	0	0	0.0
13/12/14	Saturday	12	6.6	0	181020.8298	0.9	2	0	0	0.0
14/12/14	Sunday	12	6.4	0	181020.8298	0.9	2	0	0	0.0
15/12/14	Monday	12	5.4	0	181020.8298	0.9	2	0	0	0.0
16/12/14	Tuesday	12	6	0	181020.8298	0.9	2	0	0	0.0
17/12/14	Wednesday	12	6.4	0	181020.8298	0.9	2	0	0	0.0
18/12/14	Thursday	12	7.8	0	181020.8298	0.9	2	0	0	0.0
19/12/14	Friday	12	9.1	0	181020.8298	0.9	2	0	0	0.0
20/12/14	Saturday	12	7.2	0	181020.8298	0.9	2	0	0	0.0
21/12/14	Sunday	12	7.5	0	181020.8298	0.9	2	0	0	0.0
22/12/14	Monday	12	7.2	0	181020.8298	0.9	2	0	0	0.0
23/12/14	Tuesday	12	8.3	0	181020.8298	0.9	2	0	0	0.0
24/12/14	Wednesday	12	8.4	0	181020.8298	0.9	2	0	0	0.0
25/12/14	Thursday	12	8.4	0	181020.8298	0.9	2	0	0	0.0
26/12/14	Friday	12	8.1	0	181020.8298	0.9	2	0	0	0.0
27/12/14	Saturday	12	8.7	0	181020.8298	0.9	2	0	0	0.0
28/12/14	Sunday	12	7.3	0	181020.8298	0.9	2	0	0	0.0
29/12/14	Monday	12	8.2	0	181020.8298	0.9	2	0	0	0.0
30/12/14	Tuesday	12	9.3	0	181020.8298	0.9	2	0	0	0.0
31/12/14	Wednesday	12	6.8	0	181020.8298	0.9	2	0	0	0.0
01/01/15	Thursday	1	7.1	0	181020.8298	0.9	2	0	0	0.0

Date	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m³)	Overflow flag	Pond Empty during winter flag
	Pond Losses			Adjustments						Final pond volumes			Overflow calcs		
02/10/14				22067.5	21961.0	9919.0	5980.0	108.5	0.0	21961.0	21961.0	21961.0	0.0	0	0
03/10/14				21961.0	21852.5	9919.0	5980.0	108.5	0.0	21852.5	21852.5	21852.5	0.0	0	0
04/10/14				21852.5	21748.0	9919.0	5980.0	110.4	0.0	21748.0	21748.0	21748.0	0.0	0	0
05/10/14				21748.0	22978.9	9919.0	5980.0	102.5	0.0	22978.9	22274.5	22274.5	704.5	1	0
06/10/14				22274.5	25260.4	9919.0	5980.0	110.4	0.0	25260.4	22274.5	22274.5	2985.9	1	0
07/10/14				22274.5	22166.0	9919.0	5980.0	108.5	0.0	22166.0	22166.0	22166.0	0.0	0	0
08/10/14				22166.0	22058.5	9919.0	5980.0	107.5	0.0	22058.5	22058.5	22058.5	0.0	0	0
09/10/14				22058.5	22724.5	9919.0	5980.0	114.4	0.0	22724.5	22274.5	22274.5	450.0	1	0
10/10/14				22274.5	22163.0	9919.0	5980.0	113.4	0.0	22163.0	22163.0	22163.0	0.0	0	0
11/10/14				22163.0	22059.5	9919.0	5980.0	103.5	0.0	22059.5	22059.5	22059.5	0.0	0	0
12/10/14				22059.5	21951.1	9919.0	5980.0	108.5	0.0	21951.1	21951.1	21951.1	0.0	0	0
13/10/14				21951.1	21829.7	9919.0	5980.0	121.4	0.0	21829.7	21829.7	21829.7	0.0	0	0
14/10/14				21829.7	21698.5	9919.0	5980.0	131.3	0.0	21698.5	21698.5	21698.5	0.0	0	0
15/10/14				21698.5	21562.2	9919.0	5980.0	136.2	0.0	21562.2	21562.2	21562.2	0.0	0	0
16/10/14				21562.2	21436.9	9919.0	5980.0	125.3	0.0	21436.9	21436.9	21436.9	0.0	0	0
17/10/14				21436.9	21323.5	9919.0	5980.0	113.4	0.0	21323.5	21323.5	21323.5	0.0	0	0
18/10/14				21323.5	21227.9	9919.0	5980.0	111.4	0.0	21227.9	21227.9	21227.9	0.0	0	0
19/10/14				21227.9	21980.8	9919.0	5980.0	96.6	0.0	21980.8	21980.8	21980.8	0.0	0	0
20/10/14				21980.8	22132.2	9919.0	5980.0	110.4	0.0	22132.2	22132.2	22132.2	0.0	0	0
21/10/14				22132.2	22016.8	9919.0	5980.0	117.4	0.0	22016.8	22016.8	22016.8	0.0	0	0
22/10/14				22016.8	21877.6	9919.0	5980.0	139.2	0.0	21877.6	21877.6	21877.6	0.0	0	0
23/10/14				21877.6	21774.1	9919.0	5980.0	113.4	0.0	21774.1	21774.1	21774.1	0.0	0	0
24/10/14				21774.1	21654.7	9919.0	5980.0	119.4	0.0	21654.7	21654.7	21654.7	0.0	0	0
25/10/14				21654.7	21552.2	9919.0	5980.0	106.5	0.0	21552.2	21552.2	21552.2	0.0	0	0
26/10/14				21552.2	21450.7	9919.0	5980.0	117.4	0.0	21450.7	21450.7	21450.7	0.0	0	0
27/10/14				21450.7	21332.3	9919.0	5980.0	122.3	0.0	21332.3	21332.3	21332.3	0.0	0	0
28/10/14				21332.3	21208.9	9919.0	5980.0	123.3	0.0	21208.9	21208.9	21208.9	0.0	0	0
29/10/14				21208.9	21087.6	9919.0	5980.0	121.4	0.0	21087.6	21087.6	21087.6	0.0	0	0
30/10/14				21087.6	20979.1	9919.0	5980.0	108.5	0.0	20979.1	20979.1	20979.1	0.0	0	0
31/10/14				20979.1	20868.7	9919.0	5980.0	124.3	0.0	20868.7	20868.7	20868.7	0.0	0	0
01/11/14				20868.7	20733.4	9919.0	5980.0	135.2	0.0	20733.4	20733.4	20733.4	0.0	0	0
02/11/14				20733.4	20623.0	9919.0	5980.0	110.4	0.0	20623.0	20623.0	20623.0	0.0	0	0
03/11/14				20623.0	20520.5	9919.0	5980.0	120.4	0.0	20520.5	20520.5	20520.5	0.0	0	0
04/11/14				20520.5	20392.2	9919.0	5980.0	130.3	0.0	20392.2	20392.2	20392.2	0.0	0	0
05/11/14				20392.2	20264.9	9919.0	5980.0	129.3	0.0	20264.9	20264.9	20264.9	0.0	0	0
06/11/14				20264.9	20156.4	9919.0	5980.0	108.5	0.0	20156.4	20156.4	20156.4	0.0	0	0
07/11/14				20156.4	20535.9	9919.0	5980.0	124.3	0.0	20535.9	20535.9	20535.9	0.0	0	0
08/11/14				20535.9	20404.6	9919.0	5980.0	133.3	0.0	20404.6	20404.6	20404.6	0.0	0	0
09/11/14				20404.6	20257.5	9919.0	5980.0	147.1	0.0	20257.5	20257.5	20257.5	0.0	0	0
10/11/14				20257.5	20172.8	9919.0	5980.0	104.5	0.0	20172.8	20172.8	20172.8	0.0	0	0
11/11/14				20172.8	20055.4	9919.0	5980.0	121.4	0.0	20055.4	20055.4	20055.4	0.0	0	0
12/11/14				20055.4	19934.1	9919.0	5980.0	121.4	0.0	19934.1	19934.1	19934.1	0.0	0	0
13/11/14				19934.1	19807.8	9919.0	5980.0	126.3	0.0	19807.8	19807.8	19807.8	0.0	0	0
14/11/14				19807.8	19681.4	9919.0	5980.0	126.3	0.0	19681.4	19681.4	19681.4	0.0	0	0
15/11/14				19681.4	19548.2	9919.0	5980.0	133.3	0.0	19548.2	19548.2	19548.2	0.0	0	0
16/11/14				19548.2	19415.9	9919.0	5980.0	132.3	0.0	19415.9	19415.9	19415.9	0.0	0	0
17/11/14				19415.9	19288.6	9919.0	5980.0	127.3	0.0	19288.6	19288.6	19288.6	0.0	0	0
18/11/14				19288.6	19171.2	9919.0	5980.0	117.4	0.0	19171.2	19171.2	19171.2	0.0	0	0
19/11/14				19171.2	19049.9	9919.0	5980.0	121.4	0.0	19049.9	19049.9	19049.9	0.0	0	0
20/11/14				19049.9	18936.4	9919.0	5980.0	113.4	0.0	18936.4	18936.4	18936.4	0.0	0	0
21/11/14				18936.4	19192.5	9919.0	5980.0	109.5	0.0	19192.5	19192.5	19192.5	0.0	0	0
22/11/14				19192.5	19085.0	9919.0	5980.0	119.4	0.0	19085.0	19085.0	19085.0	0.0	0	0
23/11/14				19085.0	18955.7	9919.0	5980.0	129.3	0.0	18955.7	18955.7	18955.7	0.0	0	0
24/11/14				18955.7	18818.5	9919.0	5980.0	137.2	0.0	18818.5	18818.5	18818.5	0.0	0	0
25/11/14				18818.5	18668.4	9919.0	5980.0	150.1	0.0	18668.4	18668.4	18668.4	0.0	0	0
26/11/14				18668.4	18550.0	9919.0	5980.0	118.4	0.0	18550.0	18550.0	18550.0	0.0	0	0
27/11/14				18550.0	20955.2	9919.0	5980.0	103.5	0.0	20955.2	20955.2	20955.2	0.0	0	0
28/11/14				20955.2	20968.3	9919.0	5980.0	110.4	0.0	20968.3	20968.3	20968.3	0.0	0	0
29/11/14				20968.3	20841.0	9919.0	5980.0	127.3	0.0	20841.0	20841.0	20841.0	0.0	0	0
30/11/14				20841.0	20711.7	9919.0	5980.0	129.3	0.0	20711.7	20711.7	20711.7	0.0	0	0
01/12/14				20711.7	20586.4	9919.0	5980.0	125.3	0.0	20586.4	20586.4	20586.4	0.0	0	0
02/12/14				20586.4	20453.1	9919.0	5980.0	137.2	0.0	20453.1	20453.1	20453.1	0.0	0	0
03/12/14				20453.1	20319.9	9919.0	5980.0	133.3	0.0	20319.9	20319.9	20319.9	0.0	0	0
04/12/14				20319.9	20185.6	9919.0	5980.0	134.2	0.0	20185.6	20185.6	20185.6	0.0	0	0
05/12/14				20185.6	20079.2	9919.0	5980.0	106.5	0.0	20079.2	20079.2	20079.2	0.0	0	0
06/12/14				20079.2	19943.9	9919.0	5980.0	135.2	0.0	19943.9	19943.9	19943.9	0.0	0	0
07/12/14				19943.9	19807.7	9919.0	5980.0	136.2	0.0	19807.7	19807.7	19807.7	0.0	0	0
08/12/14				19807.7	19677.4	9919.0	5980.0	130.3	0.0	19677.4	19677.4	19677.4	0.0	0	0
09/12/14				19677.4	19549.1	9919.0	5980.0	128.3	0.0	19549.1	19549.1	19549.1	0.0	0	0
10/12/14				19549.1	19405.9	9919.0	5980.0	143.2	0.0	19405.9	19405.9	19405.9	0.0	0	0
11/12/14				19405.9	19250.8	9919.0	5980.0	155.1	0.0	19250.8	19250.8	19250.8	0.0	0	0
12/12/14				19250.8	19118.6	9919.0	5980.0	132.3	0.0	19118.6	19118.6	19118.6	0.0	0	0
13/12/14				19118.6	18981.4	9919.0	5980.0	137.2	0.0	18981.4	18981.4	18981.4	0.0	0	0
14/12/14				18981.4	18846.1	9919.0	5980.0	135.2	0.0	18846.1	18846.1	18846.1	0.0	0	0
15/12/14				18846.1	18720.8	9919.0	5980.0	125.3	0.0	18720.8	18720.8	18720.8	0.0	0	0
16/12/14				18720.8	18589.5	9919.0	5980.0	131.3	0.0	18589.5	18589.5	18589.5	0.0	0	0
17/12/14				18589.5	18454.3	9919.0	5980.0	135.2	0.0	18454.3	18454.3	18454.3	0.0	0	0
18/12/14				18454.3	18305.1	9919.0	5980.0	149.1	0.0	18305.1	18305.1	18305.1	0.0	0	0
19/12/14				18305.1	18143.1	9919.0	5980.0	162.0	0.0	18143.1	18143.1	18143.1	0.0	0	0
20/12/14				18143.1	17999.9	9919.0	5980.0	143.2	0.0	17999.9	17999.9	17999.9	0.0	0	0
21/12/14				17999.9	17853.8	9919.0	5980.0	146.2	0.0	17853.8	17853.8	17853.8	0.0	0	0
22/12/14				17853.8	17710.6	9919.0	5980.0	143.2	0.0	17710.6	17710.6	17710.6	0.0	0	0
23/12/14				17710.6	17556.5	9919.0	5980.0	154.1	0.0	17556.5	17556.5	17556.5	0.0	0	0
24/12/14				17556.5	17401.5	9919.0	5980.0	155.1	0.0	17401.5	17401.5	17401.5	0.0	0	0
25/12/14				17401.5	17246.4	9919.0	5980.0	155.1	0.0	17246.4	17246.4	17246.4	0.0	0	0
26/12/14				17246.4	17094.3	9919.0	5980.0	152.1	0.0	17094.3	17094.3	17094.3	0.0	0	0
27/12/14				17094.3	16936.2	9919.0	5980.0	158.1	0.0	16936.2	16936.2	16936.2	0.0	0	0
28/12/14				16936.2	16792.0	9919.0	5980.0	144.2	0.0	16792.0	16792.0	16792.0	0.0	0	0
29/12/14				16792.0	15638.[illegible]	7439.3	4485.0	114.8	-38.3	16677.2	16677.2	16677.2	0.0	0	0
30/12/14				16677.2	15513.[illegible]	7439.3	4485.0	123.0	-41.0	16554.2	16554.2	16554.2	0.0	0	0
31/12/14				16554.2	15415.0	7439.3	4485.0	104.4	-34.8	16449.8	16449.8	16449.8	0.0	0	0
01/01/15				16449.8	15307.[illegible]	7439.3	4485.0	106.6	-35.5	16343.2	16343.2	16343.2	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m^3)	Prelim Pond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
02/01/15	Friday	1	5.6	0	181020.8298	0.9	2	0	0	0.0				16343.2	16215.9	7439.3	4485.0	95.5	-31.8	16247.7	16247.7	16247.7	0.0	0	0
03/01/15	Saturday	1	7.6	0	181020.8298	0.9	2	0	0	0.0				16247.7	16100.5	7439.3	4485.0	110.4	-36.8	16137.3	16137.3	16137.3	0.0	0	0
04/01/15	Sunday	1	8.2	0	181020.8298	0.9	2	0	0	0.0				16137.3	15984.2	7439.3	4485.0	114.8	-38.3	16022.5	16022.5	16022.5	0.0	0	0
05/01/15	Monday	1	9.5	0	181020.8298	0.9	2	0	0	0.0				16022.5	15856.5	7439.3	4485.0	124.5	-41.5	15898.0	15898.0	15898.0	0.0	0	0
06/01/15	Tuesday	1	7.2	0	181020.8298	0.9	2	0	0	0.0				15898.0	15754.8	7439.3	4485.0	107.4	-35.8	15790.6	15790.6	15790.6	0.0	0	0
07/01/15	Wednesday	1	8.8	0	181020.8298	0.9	2	0	0	0.0				15790.6	15631.6	7439.3	4485.0	119.3	-39.8	15671.4	15671.4	15671.4	0.0	0	0
08/01/15	Thursday	1	9.1	0	181020.8298	0.9	2	0	0	0.0				15671.4	15509.3	7439.3	4485.0	121.5	-40.5	15549.8	15549.8	15549.8	0.0	0	0
09/01/15	Friday	1	8.2	0	181020.8298	0.9	2	0	0	0.0				15549.8	15396.7	7439.3	4485.0	114.8	-38.3	15435.0	15435.0	15435.0	0.0	0	0
10/01/15	Saturday	1	8.2	0	181020.8298	0.9	2	0	0	0.0				15435.0	15281.9	7439.3	4485.0	114.8	-38.3	15320.2	15320.2	15320.2	0.0	0	0
11/01/15	Sunday	1	8.2	0	181020.8298	0.9	2	0	0	0.0				15320.2	15167.1	7439.3	4485.0	114.8	-38.3	15205.4	15205.4	15205.4	0.0	0	0
12/01/15	Monday	1	8.1	0	181020.8298	0.9	2	0	0	0.0				15205.4	15053.3	7439.3	4485.0	114.1	-38.0	15091.3	15091.3	15091.3	0.0	0	0
13/01/15	Tuesday	1	7.4	0	181020.8298	0.9	2	0	0	0.0				15091.3	14946.1	7439.3	4485.0	108.3	-36.3	14982.4	14982.4	14982.4	0.0	0	0
14/01/15	Wednesday	1	6.2	0	181020.8298	0.9	2	0	0	0.0				14982.4	14849.2	7439.3	4485.0	99.9	-33.3	14882.5	14882.5	14882.5	0.0	0	0
15/01/15	Thursday	1	7.1	0	181020.8298	0.9	2	0	0	0.0				14882.5	14740.3	7439.3	4485.0	106.6	-35.5	14775.8	14775.8	14775.8	0.0	0	0
16/01/15	Friday	1	7.3	0	181020.8298	0.9	2	0	0	0.0				14775.8	14631.7	7439.3	4485.0	108.1	-36.0	14667.7	14667.7	14667.7	0.0	0	0
17/01/15	Saturday	1	8.4	0	181020.8298	0.9	2	0	0	0.0				14667.7	14512.6	7439.3	4485.0	116.3	-38.8	14551.4	14551.4	14551.4	0.0	0	0
18/01/15	Sunday	1	6	0	181020.8298	0.9	2	0	0	0.0				14551.4	14420.1	7439.3	4485.0	98.5	-32.8	14452.9	14452.9	14452.9	0.0	0	0
19/01/15	Monday	1	6.1	0	181020.8298	0.9	2	0	0	0.0				14452.9	14320.7	7439.3	4485.0	99.2	-33.1	14353.7	14353.7	14353.7	0.0	0	0
20/01/15	Tuesday	1	7	0	181020.8298	0.9	2	0	0	0.0				14353.7	14212.6	7439.3	4485.0	105.9	-35.3	14247.9	14247.9	14247.9	0.0	0	0
21/01/15	Wednesday	1	7.8	0	181020.8298	0.9	2	0	0	0.0				14247.9	14098.7	7439.3	4485.0	111.8	-37.3	14136.0	14136.0	14136.0	0.0	0	0
22/01/15	Thursday	1	5.1	0	181020.8298	0.9	2	0	0	0.0				14136.0	14013.7	7439.3	4485.0	91.8	-30.6	14044.2	14044.2	14044.2	0.0	0	0
23/01/15	Friday	1	6.8	0	181020.8298	0.9	2	0	0	0.0				14044.2	13905.0	7439.3	4485.0	104.4	-34.8	13939.8	13939.8	13939.8	0.0	0	0
24/01/15	Saturday	1	7.2	0	181020.8298	0.9	2	0	0	0.0				13939.8	13796.7	7439.3	4485.0	107.4	-35.8	13832.5	13832.5	13832.5	0.0	0	0
25/01/15	Sunday	1	8.1	0	181020.8298	0.9	2	0	0	0.0				13832.5	13680.4	7439.3	4485.0	114.1	-38.0	13718.4	13718.4	13718.4	0.0	0	0
26/01/15	Monday	1	8.5	0	181020.8298	0.9	2	0	0	0.0				13718.4	13562.3	7439.3	4485.0	117.1	-39.0	13601.3	13601.3	13601.3	0.0	0	0
27/01/15	Tuesday	1	8.8	0	181020.8298	0.9	2	0	0	0.0				13601.3	13442.3	7439.3	4485.0	119.3	-39.8	13482.0	13482.0	13482.0	0.0	0	0
28/01/15	Wednesday	1	7.5	0	181020.8298	0.9	2	0	0	0.0				13482.0	13335.9	7439.3	4485.0	109.6	-36.5	13372.4	13372.4	13372.4	0.0	0	0
29/01/15	Thursday	1	6	7.2	181020.8298	0.9	2	5.2	71.4168	918.6				13372.4	14159.7	7439.3	4485.0	98.5	-32.8	14192.6	14192.6	14192.6	0.0	0	0
30/01/15	Friday	1	4.9	6.2	181020.8298	0.9	2	4.2	61.4978	745.8				14192.6	14818.0	7439.3	4485.0	90.3	-30.1	14848.0	14848.0	14848.0	0.0	0	0
31/01/15	Saturday	1	6.2	0	181020.8298	0.9	2	0	0	0.0				14848.0	14714.8	7439.3	4485.0	99.9	-33.3	14748.1	14748.1	14748.1	0.0	0	0
01/02/15	Sunday	2	6.1	0	181020.8298	0.9	2	0	0	0.0				14748.1	14615.8	7439.3	4485.0	99.2	-33.1	14648.9	14648.9	14648.9	0.0	0	0
02/02/15	Monday	2	4	0	181020.8298	0.9	2	0	0	0.0				14648.9	14537.5	7439.3	4485.0	83.6	-27.9	14565.3	14565.3	14565.3	0.0	0	0
03/02/15	Tuesday	2	6.7	12.8	181020.8298	0.9	2	10.8	126.9632	1886.5				14565.3	16313.6	7439.3	4485.0	103.7	-34.6	16348.2	16348.2	16348.2	0.0	0	0
04/02/15	Wednesday	2	6.3	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				16348.2	16302.9	7439.3	4485.0	100.7	-33.6	16336.4	16336.4	16336.4	0.0	0	0
05/02/15	Thursday	2	6.1	0	181020.8298	0.9	2	0	0	0.0				16336.4	16204.2	7439.3	4485.0	99.2	-33.1	16237.2	16237.2	16237.2	0.0	0	0
06/02/15	Friday	2	6.4	0	181020.8298	0.9	2	0	0	0.0				16237.2	16102.0	7439.3	4485.0	101.4	-33.8	16135.8	16135.8	16135.8	0.0	0	0
07/02/15	Saturday	2	7.2	0	181020.8298	0.9	2	0	0	0.0				16135.8	15992.6	7439.3	4485.0	107.4	-35.8	16028.4	16028.4	16028.4	0.0	0	0
08/02/15	Sunday	2	8	0	181020.8298	0.9	2	0	0	0.0				16028.4	15877.3	7439.3	4485.0	113.3	-37.8	15915.1	15915.1	15915.1	0.0	0	0
09/02/15	Monday	2	6.4	0	181020.8298	0.9	2	0	0	0.0				15915.1	15779.8	7439.3	4485.0	101.4	-33.8	15813.7	15813.7	15813.7	0.0	0	0
10/02/15	Tuesday	2	6.6	0	181020.8298	0.9	2	0	0	0.0				15813.7	15676.4	7439.3	4485.0	102.9	-34.3	15710.7	15710.7	15710.7	0.0	0	0
11/02/15	Wednesday	2	7.8	0	181020.8298	0.9	2	0	0	0.0				15710.7	15561.6	7439.3	4485.0	111.8	-37.3	15598.9	15598.9	15598.9	0.0	0	0
12/02/15	Thursday	2	3.8	0	181020.8298	0.9	2	0	0	0.0				15598.9	15489.4	7439.3	4485.0	82.1	-27.4	15516.8	15516.8	15516.8	0.0	0	0
13/02/15	Friday	2	3.7	0	181020.8298	0.9	2	0	0	0.0				15516.8	15408.3	7439.3	4485.0	81.3	-27.1	15435.5	15435.5	15435.5	0.0	0	0
14/02/15	Saturday	2	5.8	0	181020.8298	0.9	2	0	0	0.0				15435.5	15306.2	7439.3	4485.0	97.0	-32.3	15338.5	15338.5	15338.5	0.0	0	0
15/02/15	Sunday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				15338.5	15200.3	7439.3	4485.0	103.7	-34.6	15234.8	15234.8	15234.8	0.0	0	0
16/02/15	Monday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				15234.8	15096.6	7439.3	4485.0	103.7	-34.6	15131.2	15131.2	15131.2	0.0	0	0
17/02/15	Tuesday	2	3.7	0	181020.8298	0.9	2	0	0	0.0				15131.2	15022.7	7439.3	4485.0	81.3	-27.1	15049.8	15049.8	15049.8	0.0	0	0
18/02/15	Wednesday	2	5.5	0	181020.8298	0.9	2	0	0	0.0				15049.8	14923.5	7439.3	4485.0	94.7	-31.6	14955.1	14955.1	14955.1	0.0	0	0
19/02/15	Thursday	2	6.1	0	181020.8298	0.9	2	0	0	0.0				14955.1	14822.8	7439.3	4485.0	99.2	-33.1	14855.9	14855.9	14855.9	0.0	0	0
20/02/15	Friday	2	5.8	0	181020.8298	0.9	2	0	0	0.0				14855.9	14726.6	7439.3	4485.0	97.0	-32.3	14758.9	14758.9	14758.9	0.0	0	0
21/02/15	Saturday	2	5.7	0	181020.8298	0.9	2	0	0	0.0				14758.9	14630.6	7439.3	4485.0	96.2	-32.1	14662.7	14662.7	14662.7	0.0	0	0
22/02/15	Sunday	2	6.3	0	181020.8298	0.9	2	0	0	0.0				14662.7	14528.4	7439.3	4485.0	100.7	-33.6	14562.0	14562.0	14562.0	0.0	0	0
23/02/15	Monday	2	7.5	0	181020.8298	0.9	2	0	0	0.0				14562.0	14415.9	7439.3	4485.0	109.6	-36.5	14452.4	14452.4	14452.4	0.0	0	0
24/02/15	Tuesday	2	7.1	0	181020.8298	0.9	2	0	0	0.0				14452.4	14310.2	7439.3	4485.0	106.6	-35.5	14345.8	14345.8	14345.8	0.0	0	0
25/02/15	Wednesday	2	5.4	0	181020.8298	0.9	2	0	0	0.0				14345.8	14220.4	7439.3	4485.0	94.0	-31.3	14251.8	14251.8	14251.8	0.0	0	0
26/02/15	Thursday	2	5.3	0	181020.8298	0.9	2	0	0	0.0				14251.8	14127.4	7439.3	4485.0	93.2	-31.1	14158.5	14158.5	14158.5	0.0	0	0
27/02/15	Friday	2	5.3	0.4	181020.8298	0.9	2	0	3.9676	4.0				14158.5	14038.2	7439.3	4485.0	93.2	-31.1	14069.2	14069.2	14069.2	0.0	0	0
28/02/15	Saturday	2	6.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				14069.2	13937.0	7439.3	4485.0	100.7	-33.6	13970.5	13970.5	13970.5	0.0	0	0
01/03/15	Sunday	3	5.9	0	181020.8298	0.9	2	0	0	0.0				13970.5	13840.2	7439.3	4485.0	97.7	-32.6	13872.8	13872.8	13872.8	0.0	0	0
02/03/15	Monday	3	5.7	0	181020.8298	0.9	2	0	0	0.0				13872.8	13744.5	7439.3	4485.0	96.2	-32.1	13776.6	13776.6	13776.6	0.0	0	0
03/03/15	Tuesday	3	5.8	0	181020.8298	0.9	2	0	0	0.0				13776.6	13647.3	7439.3	4485.0	97.0	-32.3	13679.6	13679.6	13679.6	0.0	0	0
04/03/15	Wednesday	3	6.4	0	181020.8298	0.9	2	0	0	0.0				13679.6	13544.4	7439.3	4485.0	101.4	-33.8	13578.2	13578.2	13578.2	0.0	0	0
05/03/15	Thursday	3	6.7	0	181020.8298	0.9	2	0	0	0.0				13578.2	13440.0	7439.3	4485.0	103.7	-34.6	13474.5	13474.5	13474.5	0.0	0	0
06/03/15	Friday	3	6.4	0	181020.8298	0.9	2	0	0	0.0				13474.5	13339.3	7439.3	4485.0	101.4	-33.8	13373.1	13373.1	13373.1	0.0	0	0
07/03/15	Saturday	3	6.1	0	181020.8298	0.9	2	0	0	0.0				13373.1	13240.8	7439.3	4485.0	99.2	-33.1	13273.9	13273.9	13273.9	0.0	0	0
08/03/15	Sunday	3	6.2	0	181020.8298	0.9	2	0	0	0.0				13273.9	13140.6	7439.3	4485.0	99.9	-33.3	13174.0	13174.0	13174.0	0.0	0	0
09/03/15	Monday	3	5.7	0	181020.8298	0.9	2	0	0	0.0				13174.0	13045.7	7439.3	4485.0	96.2	-32.1	13077.7	13077.7	13077.7	0.0	0	0
10/03/15	Tuesday	3	5.5	0	181020.8298	0.9	2	0	0	0.0				13077.7	12951.4	7439.3	4485.0	94.7	-31.6	12983.0	12983.0	12983.0	0.0	0	0
11/03/15	Wednesday	3	5.9	0	181020.8298	0.9	2	0	0	0.0				12983.0	12852.7	7439.3	4485.0	97.7	-32.6	12885.3	12885.3	12885.3	0.0	0	0
12/03/15	Thursday	3	6.4	0	181020.8298	0.9	2	0	0	0.0				12885.3	12750.0	7439.3	4485.0	101.4	-33.8	12783.9	12783.9	12783.9	0.0	0	0
13/03/15	Friday	3	3.4	0	181020.8298	0.9	2	0	0	0.0				12783.9	12678.4	7439.3	4485.0	79.1	-26.4	12704.7	12704.7	12704.7	0.0	0	0
14/03/15	Saturday	3	3.7	5	181020.8298	0.9	2	3	49.595	538.4				12704.7	13134.6	7439.3	4485.0	81.3	-27.1	13161.7	13161.7	13161.7	0.0	0	0
15/03/15	Sunday	3	4.2	12.8	181020.8298	0.9	2	10.8	126.9632	1886.5				13161.7	14934.8	7439.3	4485.0	85.1	-28.4	14963.2	14963.2	14963.2	0.0	0	0
16/03/15	Monday	3	3.9	4.6	181020.8298	0.9	2	2.6	45.6274	469.2				14963.2	15321.9	7439.3	4485.0	82.8	-27.6	15349.6	15349.6	15349.6	0.0	0	0
17/03/15	Tuesday	3	3.7	0	181020.8298	0.9	2	0	0	0.0				15349.6	15241.1	7439.3	4485.0	81.3	-27.1	15268.2	15268.2	15268.2	0.0	0	0
18/03/15	Wednesday	3	3.5	11.2	181020.8298	0.9	2	9.2	111.0928	1609.9				15268.2	16771.7	9919.0	5980.0	106.5	0.0	16771.7	16771.7	16771.7	0.0	0	0
19/03/15	Thursday	3	3	0.8	181020.8298	0.9	2	0	7.9352	7.9				16771.7	16678.1	7439.3	4485.0	76.1	-25.4	16703.5	16703.5	16703.5	0.0	0	0
20/03/15	Friday	3	5.2	0	181020.8298	0.9	2	0	0	0.0				16703.5	16580.1	7439.3	4485.0	92.5	-30.8	16611.0	16611.0	16611.0	0.0	0	0
21/03/15	Saturday	3	3.5	0	181020.8298	0.9	2	0	0	0.0				16611.0	16504.5	7439.3	4485.0	79.9	-26.6	16531.1	16531.1	16531.1	0.0	0	0
22/03/15	Sunday	3	4.8	0	181020.8298	0.9	2	0	0	0.0				16531.1	16411.7	7439.3	4485.0	89.5	-29.8	16441.6	16441.6	16441.6	0.0	0	0
23/03/15	Monday	3	5	0	181020.8298	0.9	2	0	0	0.0				16441.6	16320.2	7439.3	4485.0	91.0	-30.3	16350.6	16350.6	16350.6	0.0	0	0
24/03/15	Tuesday	3	5.1	0	181020.8298	0.9	2	0	0	0.0				16350.6	16228.2	7439.3	4485.0	91.8	-30.6	16258.8	16258.8	16258.8	0.0	0	0
25/03/15	Wednesday	3	5.6	0	181020.8298	0.9	2	0	0	0.0				16258.8	16131.5	7439.3	4485.0	95.5	-31.8	16163.3	16163.3	16163.3	0.0	0	0
26/03/15	Thursday	3	4.9	0	181020.8298	0.9	2	0	0	0.0				16163.3	16043.0	7439.3	4485.0	90.3	-30.1	16073.1	16073.1	16073.1	0.0	0	0
27/03/15	Friday	3	4	4.2	181020.8298	0.9	2	2.2	41.6598	400.1				16073.1	16361.7	7439.3	4485.0	83.6	-27.9	16389.6	16389.6	16389.6	0.0	0	0
28/03/15	Saturday	3	3.7	0	181020.8298	0.9	2	0	0	0.0				16389.6	16281.1	7439.3	4485.0	81.3	-27.1	16308.2	16308.2	16308.2	0.0	0	0
29/03/15	Sunday	3	4.4	0	181020.8298	0.9	2	0	0	0.0				16308.2	16192.8	7439.3	4485.0	86.6	-28.9	16221.7	16221.7	16221.7	0.0	0	0
30/03/15	Monday	3	3	0	181020.8298	0.9	2	0	0	0.0				16221.7	16120.1	7439.3	4485.0	76.1	-25.4	16145.5	16145.5	16145.5	0.0	0	0
31/03/15	Tuesday	3	3.7	0	181020.8298	0.9	2	0	0	0.0				16145.5	16037.1	7439.3	4485.0	81.3	-27.1	16064.2	16064.2	16064.2	0.0	0	0
01/04/15	Wednesday	4	4.2	0	181020.8298	0.9	2	0	0	0.0				16064.2	15950.8	7439.3	4485.0	85.1	-28.4	15979.1	15979.1	15979.1	0.0	0	0
02/04/15	Thursday	4	4.5	0	181020.8298	0.9	2	0	0	0.0				15979.1	15862.7	7439.3	4485.0	87.3	-29.1	15891.8	15891.8	15891.8	0.0	0	0
03/04/15	Friday	4	4	0	181020.8298	0.9	2	0	0	0.0				15891.8	15780.4	7439.3	4485.0	83.6	-27.9	15808.2	15808.2	15808.2	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
	Weekday	Month number	loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m³)	Overflow flag	Pond Empty during winter flag
04/04/15	Saturday	4	3.2	0	181020.8298	0.9	2	0	0	0.0				15808.2	15704.7	7439.3	4485.0	77.6	-25.9	15730.6	15730.6	15730.6	0.0	0	0
05/04/15	Sunday	4	5	0	181020.8298	0.9	2	0	0	0.0				15730.6	15609.3	7439.3	4485.0	91.0	-30.3	15639.6	15639.6	15639.6	0.0	0	0
06/04/15	Monday	4	3.1	0	181020.8298	0.9	2	0	0	0.0				15639.6	15537.1	7439.3	4485.0	76.9	-25.6	15562.7	15562.7	15562.7	0.0	0	0
07/04/15	Tuesday	4	2.1	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				15562.7	15731.9	7439.3	4485.0	69.4	-23.1	15755.1	15755.1	15755.1	0.0	0	0
08/04/15	Wednesday	4	2	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				15755.1	15925.3	7439.3	4485.0	68.7	-22.9	15948.2	15948.2	15948.2	0.0	0	0
09/04/15	Thursday	4	1.3	1.2	181020.8298	0.9	2	0	11.9028	11.9				15948.2	15875.4	7439.3	4485.0	63.5	-21.2	15896.6	15896.6	15896.6	0.0	0	0
10/04/15	Friday	4	2.7	24.6	181020.8298	0.9	2	22.6	244.0074	3926.0				15896.6	19724.0	9919.0	5980.0	98.5	0.0	19724.0	19724.0	19724.0	0.0	0	0
11/04/15	Saturday	4	2.9	1.2	181020.8298	0.9	2	0	11.9028	11.9				19724.0	19635.4	9919.0	5980.0	100.5	0.0	19635.4	19635.4	19635.4	0.0	0	0
12/04/15	Sunday	4	2.8	4.4	181020.8298	0.9	2	2.4	43.6436	434.6				19635.4	19970.5	9919.0	5980.0	99.5	0.0	19970.5	19970.5	19970.5	0.0	0	0
13/04/15	Monday	4	2.7	1.4	181020.8298	0.9	2	0	13.8866	13.9				19970.5	19885.9	9919.0	5980.0	98.5	0.0	19885.9	19885.9	19885.9	0.0	0	0
14/04/15	Tuesday	4	2.6	0	181020.8298	0.9	2	0	0	0.0				19885.9	19788.3	9919.0	5980.0	97.5	0.0	19788.3	19788.3	19788.3	0.0	0	0
15/04/15	Wednesday	4	3.6	1.8	181020.8298	0.9	2	0	17.8542	17.9				19788.3	19698.7	9919.0	5980.0	107.5	0.0	19698.7	19698.7	19698.7	0.0	0	0
16/04/15	Thursday	4	3.5	0	181020.8298	0.9	2	0	0	0.0				19698.7	19592.2	9919.0	5980.0	106.5	0.0	19592.2	19592.2	19592.2	0.0	0	0
17/04/15	Friday	4	3.1	0	181020.8298	0.9	2	0	0	0.0				19592.2	19489.7	9919.0	5980.0	102.5	0.0	19489.7	19489.7	19489.7	0.0	0	0
18/04/15	Saturday	4	3.4	0	181020.8298	0.9	2	0	0	0.0				19489.7	19384.2	9919.0	5980.0	105.5	0.0	19384.2	19384.2	19384.2	0.0	0	0
19/04/15	Sunday	4	3.9	0	181020.8298	0.9	2	0	0	0.0				19384.2	19273.8	9919.0	5980.0	110.4	0.0	19273.8	19273.8	19273.8	0.0	0	0
20/04/15	Monday	4	3.2	0	181020.8298	0.9	2	0	0	0.0				19273.8	19170.3	9919.0	5980.0	103.5	0.0	19170.3	19170.3	19170.3	0.0	0	0
21/04/15	Tuesday	4	3.4	0	181020.8298	0.9	2	0	0	0.0				19170.3	19064.8	9919.0	5980.0	105.5	0.0	19064.8	19064.8	19064.8	0.0	0	0
22/04/15	Wednesday	4	3.1	0	181020.8298	0.9	2	0	0	0.0				19064.8	18962.3	9919.0	5980.0	102.5	0.0	18962.3	18962.3	18962.3	0.0	0	0
23/04/15	Thursday	4	3.1	0	181020.8298	0.9	2	0	0	0.0				18962.3	18859.8	9919.0	5980.0	102.5	0.0	18859.8	18859.8	18859.8	0.0	0	0
24/04/15	Friday	4	2.3	0	181020.8298	0.9	2	0	0	0.0				18859.8	18765.2	9919.0	5980.0	94.6	0.0	18765.2	18765.2	18765.2	0.0	0	0
25/04/15	Saturday	4	2.3	0	181020.8298	0.9	2	0	0	0.0				18765.2	18670.6	9919.0	5980.0	94.6	0.0	18670.6	18670.6	18670.6	0.0	0	0
26/04/15	Sunday	4	1.5	0	181020.8298	0.9	2	0	0	0.0				18670.6	18584.0	9919.0	5980.0	86.6	0.0	18584.0	18584.0	18584.0	0.0	0	0
27/04/15	Monday	4	2.4	0	181020.8298	0.9	2	0	0	0.0				18584.0	18488.4	9919.0	5980.0	95.6	0.0	18488.4	18488.4	18488.4	0.0	0	0
28/04/15	Tuesday	4	2.7	0	181020.8298	0.9	2	0	0	0.0				18488.4	18389.9	9919.0	5980.0	98.5	0.0	18389.9	18389.9	18389.9	0.0	0	0
29/04/15	Wednesday	4	1.9	0	181020.8298	0.9	2	0	0	0.0				18389.9	18299.3	9919.0	5980.0	90.6	0.0	18299.3	18299.3	18299.3	0.0	0	0
30/04/15	Thursday	4	2.4	0.4	181020.8298	0.9	2	0	3.9676	4.0				18299.3	18207.7	9919.0	5980.0	95.6	0.0	18207.7	18207.7	18207.7	0.0	0	0
01/05/15	Friday	5	3.1	1	181020.8298	0.9	2	0	9.919	9.9				18207.7	18115.1	9919.0	5980.0	102.5	0.0	18115.1	18115.1	18115.1	0.0	0	0
02/05/15	Saturday	5	2.8	0	181020.8298	0.9	2	0	0	0.0				18115.1	18015.6	9919.0	5980.0	99.5	0.0	18015.6	18015.6	18015.6	0.0	0	0
03/05/15	Sunday	5	2.9	0	181020.8298	0.9	2	0	0	0.0				18015.6	17915.1	9919.0	5980.0	100.5	0.0	17915.1	17915.1	17915.1	0.0	0	0
04/05/15	Monday	5	2.2	11.6	181020.8298	0.9	2	9.6	115.0604	1679.1				17915.1	19500.5	9919.0	5980.0	93.6	0.0	19500.5	19500.5	19500.5	0.0	0	0
05/05/15	Tuesday	5	2	0	181020.8298	0.9	2	0	0	0.0				19500.5	19409.0	9919.0	5980.0	91.6	0.0	19409.0	19409.0	19409.0	0.0	0	0
06/05/15	Wednesday	5	2	0.2	181020.8298	0.9	2	0	1.9838	2.0				19409.0	19319.3	9919.0	5980.0	91.6	0.0	19319.3	19319.3	19319.3	0.0	0	0
07/05/15	Thursday	5	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				19319.3	19225.8	9919.0	5980.0	95.6	0.0	19225.8	19225.8	19225.8	0.0	0	0
08/05/15	Friday	5	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				19225.8	19134.2	9919.0	5980.0	93.6	0.0	19134.2	19134.2	19134.2	0.0	0	0
09/05/15	Saturday	5	2.1	0	181020.8298	0.9	2	0	0	0.0				19134.2	19041.6	9919.0	5980.0	92.6	0.0	19041.6	19041.6	19041.6	0.0	0	0
10/05/15	Sunday	5	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				19041.6	18950.0	9919.0	5980.0	93.6	0.0	18950.0	18950.0	18950.0	0.0	0	0
11/05/15	Monday	5	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				18950.0	18856.4	9919.0	5980.0	95.6	0.0	18856.4	18856.4	18856.4	0.0	0	0
12/05/15	Tuesday	5	2.9	0	181020.8298	0.9	2	0	0	0.0				18856.4	18755.9	9919.0	5980.0	100.5	0.0	18755.9	18755.9	18755.9	0.0	0	0
13/05/15	Wednesday	5	3.3	0	181020.8298	0.9	2	0	0	0.0				18755.9	18651.4	9919.0	5980.0	104.5	0.0	18651.4	18651.4	18651.4	0.0	0	0
14/05/15	Thursday	5	3.4	0	181020.8298	0.9	2	0	0	0.0				18651.4	18545.9	9919.0	5980.0	105.5	0.0	18545.9	18545.9	18545.9	0.0	0	0
15/05/15	Friday	5	4.4	0	181020.8298	0.9	2	0	0	0.0				18545.9	18430.5	9919.0	5980.0	115.4	0.0	18430.5	18430.5	18430.5	0.0	0	0
16/05/15	Saturday	5	2.9	5	181020.8298	0.9	2	3	49.595	538.4				18430.5	18868.3	9919.0	5980.0	100.5	0.0	18868.3	18868.3	18868.3	0.0	0	0
17/05/15	Sunday	5	1.5	24	181020.8298	0.9	2	22	238.056	3822.3				18868.3	22603.9	9919.0	5980.0	86.6	0.0	22603.9	22274.5	22274.5	329.5	1	0
18/05/15	Monday	5	1.7	27.2	181020.8298	0.9	2	25.2	269.7968	4375.3				22274.5	26561.2	9919.0	5980.0	88.6	0.0	26561.2	22274.5	22274.5	4286.7	1	0
19/05/15	Tuesday	5	1.6	0.4	181020.8298	0.9	2	0	3.9676	4.0				22274.5	22190.8	9919.0	5980.0	87.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
20/05/15	Wednesday	5	2.1	0.8	181020.8298	0.9	2	0	7.9352	7.9				22190.8	22106.2	9919.0	5980.0	92.6	0.0	22106.2	22106.2	22106.2	0.0	0	0
21/05/15	Thursday	5	2.3	0	181020.8298	0.9	2	0	0	0.0				22106.2	22011.6	9919.0	5980.0	94.6	0.0	22011.6	22011.6	22011.6	0.0	0	0
22/05/15	Friday	5	1.7	0	181020.8298	0.9	2	0	0	0.0				22011.6	21923.0	9919.0	5980.0	88.6	0.0	21923.0	21923.0	21923.0	0.0	0	0
23/05/15	Saturday	5	1.5	0	181020.8298	0.9	2	0	0	0.0				21923.0	21836.3	9919.0	5980.0	86.6	0.0	21836.3	21836.3	21836.3	0.0	0	0
24/05/15	Sunday	5	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				21836.3	21751.7	9919.0	5980.0	86.6	0.0	21751.7	21751.7	21751.7	0.0	0	0
25/05/15	Monday	5	1.6	0	181020.8298	0.9	2	0	0	0.0				21751.7	21664.0	9919.0	5980.0	87.6	0.0	21664.0	21664.0	21664.0	0.0	0	0
26/05/15	Tuesday	5	1.4	0.6	181020.8298	0.9	2	0	5.9514	6.0				21664.0	21584.3	9919.0	5980.0	85.6	0.0	21584.3	21584.3	21584.3	0.0	0	0
27/05/15	Wednesday	5	1.5	0.8	181020.8298	0.9	2	0	7.9352	7.9				21584.3	21505.6	9919.0	5980.0	86.6	0.0	21505.6	21505.6	21505.6	0.0	0	0
28/05/15	Thursday	5	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21505.6	21424.0	9919.0	5980.0	83.7	0.0	21424.0	21424.0	21424.0	0.0	0	0
29/05/15	Friday	5	1.6	0	181020.8298	0.9	2	0	0	0.0				21424.0	21336.3	9919.0	5980.0	87.6	0.0	21336.3	21336.3	21336.3	0.0	0	0
30/05/15	Saturday	5	1.7	0	181020.8298	0.9	2	0	0	0.0				21336.3	21247.7	9919.0	5980.0	88.6	0.0	21247.7	21247.7	21247.7	0.0	0	0
31/05/15	Sunday	5	1.2	0	181020.8298	0.9	2	0	0	0.0				21247.7	21164.0	9919.0	5980.0	83.7	0.0	21164.0	21164.0	21164.0	0.0	0	0
01/06/15	Monday	6	2.1	0.2	181020.8298	0.9	2	0	1.9838	2.0				21164.0	21073.4	9919.0	5980.0	92.6	0.0	21073.4	21073.4	21073.4	0.0	0	0
02/06/15	Tuesday	6	1.9	10.4	181020.8298	0.9	2	8.4	103.1576	1471.7				21073.4	22454.5	9919.0	5980.0	90.6	0.0	22454.5	22274.5	22274.5	180.0	1	0
03/06/15	Wednesday	6	1.9	7	181020.8298	0.9	2	5	69.433	884.0				22274.5	23067.9	9919.0	5980.0	90.6	0.0	23067.9	22274.5	22274.5	793.4	1	0
04/06/15	Thursday	6	1.5	1.2	181020.8298	0.9	2	0	11.9028	11.9				22274.5	22199.7	9919.0	5980.0	86.6	0.0	22199.7	22199.7	22199.7	0.0	0	0
05/06/15	Friday	6	1.2	0.4	181020.8298	0.9	2	0	3.9676	4.0				22199.7	22120.0	9919.0	5980.0	83.7	0.0	22120.0	22120.0	22120.0	0.0	0	0
06/06/15	Saturday	6	1.3	1.6	181020.8298	0.9	2	0	15.8704	15.9				22120.0	22051.3	9919.0	5980.0	84.7	0.0	22051.3	22051.3	22051.3	0.0	0	0
07/06/15	Sunday	6	1.3	0.6	181020.8298	0.9	2	0	5.9514	6.0				22051.3	21972.6	9919.0	5980.0	84.7	0.0	21972.6	21972.6	21972.6	0.0	0	0
08/06/15	Monday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				21972.6	21888.9	9919.0	5980.0	85.6	0.0	21888.9	21888.9	21888.9	0.0	0	0
09/06/15	Tuesday	6	2.3	0	181020.8298	0.9	2	0	0	0.0				21888.9	21794.3	9919.0	5980.0	94.6	0.0	21794.3	21794.3	21794.3	0.0	0	0
10/06/15	Wednesday	6	2.3	0	181020.8298	0.9	2	0	0	0.0				21794.3	21699.7	9919.0	5980.0	94.6	0.0	21699.7	21699.7	21699.7	0.0	0	0
11/06/15	Thursday	6	2.2	0	181020.8298	0.9	2	0	0	0.0				21699.7	21606.2	9919.0	5980.0	93.6	0.0	21606.2	21606.2	21606.2	0.0	0	0
12/06/15	Friday	6	1.5	0	181020.8298	0.9	2	0	0	0.0				21606.2	21519.5	9919.0	5980.0	86.6	0.0	21519.5	21519.5	21519.5	0.0	0	0
13/06/15	Saturday	6	1.5	0	181020.8298	0.9	2	0	0	0.0				21519.5	21432.9	9919.0	5980.0	86.6	0.0	21432.9	21432.9	21432.9	0.0	0	0
14/06/15	Sunday	6	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				21432.9	21346.3	9919.0	5980.0	88.6	0.0	21346.3	21346.3	21346.3	0.0	0	0
15/06/15	Monday	6	1.3	0	181020.8298	0.9	2	0	0	0.0				21346.3	21261.6	9919.0	5980.0	84.7	0.0	21261.6	21261.6	21261.6	0.0	0	0
16/06/15	Tuesday	6	2.2	0	181020.8298	0.9	2	0	0	0.0				21261.6	21168.0	9919.0	5980.0	93.6	0.0	21168.0	21168.0	21168.0	0.0	0	0
17/06/15	Wednesday	6	2.8	0	181020.8298	0.9	2	0	0	0.0				21168.0	21068.5	9919.0	5980.0	99.5	0.0	21068.5	21068.5	21068.5	0.0	0	0
18/06/15	Thursday	6	1.7	1.4	181020.8298	0.9	2	0	13.8866	13.9				21068.5	20993.7	9919.0	5980.0	88.6	0.0	20993.7	20993.7	20993.7	0.0	0	0
19/06/15	Friday	6	1.7	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0				20993.7	22031.1	9919.0	5980.0	88.6	0.0	22031.1	22031.1	22031.1	0.0	0	0
20/06/15	Saturday	6	1.5	14.4	181020.8298	0.9	2	12.4	142.8336	2163.0				22031.1	24107.5	9919.0	5980.0	86.6	0.0	24107.5	22274.5	22274.5	1833.0	1	0
21/06/15	Sunday	6	2	50.4	181020.8298	0.9	2	48.4	499.9176	8385.2				22274.5	30568.1	9919.0	5980.0	91.6	0.0	30568.1	22274.5	22274.5	8293.6	1	0
22/06/15	Monday	6	1.7	22.4	181020.8298	0.9	2	20.4	222.1856	3545.7				22274.5	25731.6	9919.0	5980.0	88.6	0.0	25731.6	22274.5	22274.5	3457.1	1	0
23/06/15	Tuesday	6	1	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22194.8	9919.0	5980.0	81.7	0.0	22194.8	22194.8	22194.8	0.0	0	0
24/06/15	Wednesday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22194.8	22111.1	9919.0	5980.0	85.6	0.0	22111.1	22111.1	22111.1	0.0	0	0
25/06/15	Thursday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22111.1	22027.5	9919.0	5980.0	85.6	0.0	22027.5	22027.5	22027.5	0.0	0	0
26/06/15	Friday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22027.5	21944.8	9919.0	5980.0	84.7	0.0	21944.8	21944.8	21944.8	0.0	0	0
27/06/15	Saturday	6	1.6	0	181020.8298	0.9	2	0	0	0.0				21944.8	21857.2	9919.0	5980.0	87.6	0.0	21857.2	21857.2	21857.2	0.0	0	0
28/06/15	Sunday	6	1.9	0	181020.8298	0.9	2	0	0	0.0				21857.2	21766.5	9919.0	5980.0	90.6	0.0	21766.5	21766.5	21766.5	0.0	0	0
29/06/15	Monday	6	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				21766.5	21678.9	9919.0	5980.0	89.6	0.0	21678.9	21678.9	21678.9	0.0	0	0
30/06/15	Tuesday	6	1.8	0	181020.8298	0.9	2	0	0	0.0				21678.9	21589.3	9919.0	5980.0	89.6	0.0	21589.3	21589.3	21589.3	0.0	0	0
01/07/15	Wednesday	7	1.2	0	181020.8298	0.9	2	0	0	0.0				21589.3	21505.6	9919.0	5980.0	83.7	0.0	21505.6	21505.6	21505.6	0.0	0	0
02/07/15	Thursday	7	1.3	0.8	181020.8298	0.9	2	0	7.9352	7.9				21505.6	21428.9	9919.0	5980.0	84.7	0.0	21428.9	21428.9	21428.9	0.0	0	0
03/07/15	Friday	7	1.2	0.8	181020.8298	0.9	2	0	7.9352	7.9				21428.9	21353.2	9919.0	5980.0	83.7	0.0	21353.2	21353.2	21353.2	0.0	0	0
04/07/15	Saturday	7	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21353.2	21271.5	9919.0	5980.0	83.7	0.0	21271.5	21271.5	21271.5	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
05/07/15	Sunday	7	1.2	3	181020.8298	0.9	2	1	29.757	192.7			
06/07/15	Monday	7	1.2	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
07/07/15	Tuesday	7	1.2	6.8	181020.8298	0.9	2	4.8	67.4492	849.5			
08/07/15	Wednesday	7	1.9	16.8	181020.8298	0.9	2	14.8	166.6392	2577.8			
09/07/15	Thursday	7	1.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
10/07/15	Friday	7	1.4	1.8	181020.8298	0.9	2	0	17.8542	17.9			
11/07/15	Saturday	7	1.2	1.4	181020.8298	0.9	2	0	13.8866	13.9			
12/07/15	Sunday	7	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
13/07/15	Monday	7	1.6	0	181020.8298	0.9	2	0	0	0.0			
14/07/15	Tuesday	7	1.9	0	181020.8298	0.9	2	0	0	0.0			
15/07/15	Wednesday	7	1.9	0	181020.8298	0.9	2	0	0	0.0			
16/07/15	Thursday	7	2.7	0	181020.8298	0.9	2	0	0	0.0			
17/07/15	Friday	7	2.1	0	181020.8298	0.9	2	0	0	0.0			
18/07/15	Saturday	7	1.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
19/07/15	Sunday	7	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
20/07/15	Monday	7	1.9	70.6	181020.8298	0.9	2	68.6	700.2814	11876.5			
21/07/15	Tuesday	7	1.5	15	181020.8298	0.9	2	13	148.785	2266.7			
22/07/15	Wednesday	7	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
23/07/15	Thursday	7	1.6	10.4	181020.8298	0.9	2	8.4	103.1576	1471.7			
24/07/15	Friday	7	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
25/07/15	Saturday	7	1.5	0.6	181020.8298	0.9	2	0	5.9514	6.0			
26/07/15	Sunday	7	1.5	0.4	181020.8298	0.9	2	0	3.9676	4.0			
27/07/15	Monday	7	1.9	0	181020.8298	0.9	2	0	0	0.0			
28/07/15	Tuesday	7	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
29/07/15	Wednesday	7	1.1	5.6	181020.8298	0.9	2	3.6	55.5464	642.1			
30/07/15	Thursday	7	1.1	1.6	181020.8298	0.9	2	0	15.8704	15.9			
31/07/15	Friday	7	2	15.8	181020.8298	0.9	2	13.8	156.7202	2405.0			
01/08/15	Saturday	8	2.3	0	181020.8298	0.9	2	0	0	0.0			
02/08/15	Sunday	8	1.7	0	181020.8298	0.9	2	0	0	0.0			
03/08/15	Monday	8	1.7	0	181020.8298	0.9	2	0	0	0.0			
04/08/15	Tuesday	8	1.9	0	181020.8298	0.9	2	0	0	0.0			
05/08/15	Wednesday	8	2.1	0	181020.8298	0.9	2	0	0	0.0			
06/08/15	Thursday	8	2.1	0	181020.8298	0.9	2	0	0	0.0			
07/08/15	Friday	8	1.3	2	181020.8298	0.9	2	0	19.838	19.8			
08/08/15	Saturday	8	1.9	12.2	181020.8298	0.9	2	10.2	121.0118	1782.8			
09/08/15	Sunday	8	1.5	13.2	181020.8298	0.9	2	11.2	130.9308	1955.6			
10/08/15	Monday	8	2.2	1	181020.8298	0.9	2	0	9.919	9.9			
11/08/15	Tuesday	8	1.9	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
12/08/15	Wednesday	8	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
13/08/15	Thursday	8	1.3	0	181020.8298	0.9	2	0	0	0.0			
14/08/15	Friday	8	2	0.4	181020.8298	0.9	2	0	3.9676	4.0			
15/08/15	Saturday	8	2.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
16/08/15	Sunday	8	1.9	0	181020.8298	0.9	2	0	0	0.0			
17/08/15	Monday	8	1.7	13.6	181020.8298	0.9	2	11.6	134.8984	2024.8			
18/08/15	Tuesday	8	2.4	22.2	181020.8298	0.9	2	20.2	220.2018	3511.2			
19/08/15	Wednesday	8	2.3	0	181020.8298	0.9	2	0	0	0.0			
20/08/15	Thursday	8	2.4	0	181020.8298	0.9	2	0	0	0.0			
21/08/15	Friday	8	1.7	2.8	181020.8298	0.9	2	0.8	27.7732	158.1			
22/08/15	Saturday	8	1.8	14.6	181020.8298	0.9	2	12.6	144.8174	2197.6			
23/08/15	Sunday	8	2.2	1	181020.8298	0.9	2	0	9.919	9.9			
24/08/15	Monday	8	2.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
25/08/15	Tuesday	8	3	0	181020.8298	0.9	2	0	0	0.0			
26/08/15	Wednesday	8	2.5	0	181020.8298	0.9	2	0	0	0.0			
27/08/15	Thursday	8	3.3	0	181020.8298	0.9	2	0	0	0.0			
28/08/15	Friday	8	2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
29/08/15	Saturday	8	2.3	1.2	181020.8298	0.9	2	0	11.9028	11.9			
30/08/15	Sunday	8	2.6	22	181020.8298	0.9	2	20	218.218	3476.6			
31/08/15	Monday	8	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
01/09/15	Tuesday	9	2.6	6.2	181020.8298	0.9	2	4.2	61.4978	745.8			
02/09/15	Wednesday	9	2.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
03/09/15	Thursday	9	3	0	181020.8298	0.9	2	0	0	0.0			
04/09/15	Friday	9	2.6	0	181020.8298	0.9	2	0	0	0.0			
05/09/15	Saturday	9	2.8	24.6	181020.8298	0.9	2	22.6	244.0074	3926.0			
06/09/15	Sunday	9	2.8	1.8	181020.8298	0.9	2	0	17.8542	17.9			
07/09/15	Monday	9	3.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
08/09/15	Tuesday	9	4	0	181020.8298	0.9	2	0	0	0.0			
09/09/15	Wednesday	9	5.2	0	181020.8298	0.9	2	0	0	0.0			
10/09/15	Thursday	9	2.6	0	181020.8298	0.9	2	0	0	0.0			
11/09/15	Friday	9	3.2	10.2	181020.8298	0.9	2	8.2	101.1738	1437.1			
12/09/15	Saturday	9	2.8	23.2	181020.8298	0.9	2	21.2	230.1208	3684.0			
13/09/15	Sunday	9	2.9	3.6	181020.8298	0.9	2	1.6	35.7084	296.4			
14/09/15	Monday	9	2.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
15/09/15	Tuesday	9	3.3	0.4	181020.8298	0.9	2	0	3.9676	4.0			
16/09/15	Wednesday	9	3.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
17/09/15	Thursday	9	3.9	0	181020.8298	0.9	2	0	0	0.0			
18/09/15	Friday	9	3.7	0	181020.8298	0.9	2	0	0	0.0			
19/09/15	Saturday	9	3.7	0	181020.8298	0.9	2	0	0	0.0			
20/09/15	Sunday	9	4	0	181020.8298	0.9	2	0	0	0.0			
21/09/15	Monday	9	4.3	0	181020.8298	0.9	2	0	0	0.0			
22/09/15	Tuesday	9	4.8	0	181020.8298	0.9	2	0	0	0.0			
23/09/15	Wednesday	9	5.2	0	181020.8298	0.9	2	0	0	0.0			
24/09/15	Thursday	9	5.4	0	181020.8298	0.9	2	0	0	0.0			
25/09/15	Friday	9	3.9	0	181020.8298	0.9	2	0	0	0.0			
26/09/15	Saturday	9	4.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
27/09/15	Sunday	9	5	0	181020.8298	0.9	2	0	0	0.0			
28/09/15	Monday	9	5.2	0	181020.8298	0.9	2	0	0	0.0			
29/09/15	Tuesday	9	3.8	0	181020.8298	0.9	2	0	0	0.0			
30/09/15	Wednesday	9	4	0	181020.8298	0.9	2	0	0	0.0			
01/10/15	Thursday	10	5.8	0	181020.8298	0.9	2	0	0	0.0			
02/10/15	Friday	10	4.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
03/10/15	Saturday	10	4.1	0	181020.8298	0.9	2	0	0	0.0			
04/10/15	Sunday	10	3.6	0	181020.8298	0.9	2	0	0	0.0			

	Adjustments						Final pond volumes			Overflow Calcs		
Date	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
05/07/15	21271.5	21380.5	9919.0	5980.0	83.7	0.0	21380.5	21380.5	21380.5	0.0	0	0
06/07/15	21380.5	21385.8	9919.0	5980.0	83.7	0.0	21385.8	21385.8	21385.8	0.0	0	0
07/07/15	21385.8	22151.6	9919.0	5980.0	83.7	0.0	22151.6	22151.6	22151.6	0.0	0	0
08/07/15	22151.6	24638.9	9919.0	5980.0	90.6	0.0	24638.9	22274.5	22274.5	2364.4	1	0
09/07/15	22274.5	22193.8	9919.0	5980.0	82.7	0.0	22193.8	22193.8	22193.8	0.0	0	0
10/07/15	22193.8	22126.0	9919.0	5980.0	85.6	0.0	22126.0	22126.0	22126.0	0.0	0	0
11/07/15	22126.0	22056.2	9919.0	5980.0	83.7	0.0	22056.2	22056.2	22056.2	0.0	0	0
12/07/15	22056.2	21973.6	9919.0	5980.0	84.7	0.0	21973.6	21973.6	21973.6	0.0	0	0
13/07/15	21973.6	21885.9	9919.0	5980.0	87.6	0.0	21885.9	21885.9	21885.9	0.0	0	0
14/07/15	21885.9	21795.3	9919.0	5980.0	90.6	0.0	21795.3	21795.3	21795.3	0.0	0	0
15/07/15	21795.3	21704.7	9919.0	5980.0	90.6	0.0	21704.7	21704.7	21704.7	0.0	0	0
16/07/15	21704.7	21606.2	9919.0	5980.0	98.5	0.0	21606.2	21606.2	21606.2	0.0	0	0
17/07/15	21606.2	21513.6	9919.0	5980.0	92.6	0.0	21513.6	21513.6	21513.6	0.0	0	0
18/07/15	21513.6	21432.9	9919.0	5980.0	82.7	0.0	21432.9	21432.9	21432.9	0.0	0	0
19/07/15	21432.9	21345.3	9919.0	5980.0	89.6	0.0	21345.3	21345.3	21345.3	0.0	0	0
20/07/15	21345.3	33131.2	9919.0	5980.0	90.6	0.0	33131.2	22274.5	22274.5	10856.7	1	0
21/07/15	22274.5	24454.6	9919.0	5980.0	86.6	0.0	24454.6	22274.5	22274.5	2180.1	1	0
22/07/15	22274.5	22187.8	9919.0	5980.0	88.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
23/07/15	22187.8	23571.9	9919.0	5980.0	87.6	0.0	23571.9	22274.5	22274.5	1297.4	1	0
24/07/15	22274.5	22190.8	9919.0	5980.0	85.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
25/07/15	22190.8	22110.1	9919.0	5980.0	86.6	0.0	22110.1	22110.1	22110.1	0.0	0	0
26/07/15	22110.1	22027.5	9919.0	5980.0	86.6	0.0	22027.5	22027.5	22027.5	0.0	0	0
27/07/15	22027.5	21936.8	9919.0	5980.0	90.6	0.0	21936.8	21936.8	21936.8	0.0	0	0
28/07/15	21936.8	21852.2	9919.0	5980.0	86.6	0.0	21852.2	21852.2	21852.2	0.0	0	0
29/07/15	21852.2	22411.6	9919.0	5980.0	82.7	0.0	22411.6	22274.5	22274.5	137.1	1	0
30/07/15	22274.5	22207.7	9919.0	5980.0	82.7	0.0	22207.7	22207.7	22207.7	0.0	0	0
31/07/15	22207.7	24521.1	9919.0	5980.0	91.6	0.0	24521.1	22274.5	22274.5	2246.6	1	0
01/08/15	22274.5	22179.9	9919.0	5980.0	94.6	0.0	22179.9	22179.9	22179.9	0.0	0	0
02/08/15	22179.9	22091.3	9919.0	5980.0	88.6	0.0	22091.3	22091.3	22091.3	0.0	0	0
03/08/15	22091.3	22002.7	9919.0	5980.0	88.6	0.0	22002.7	22002.7	22002.7	0.0	0	0
04/08/15	22002.7	21912.1	9919.0	5980.0	90.6	0.0	21912.1	21912.1	21912.1	0.0	0	0
05/08/15	21912.1	21819.5	9919.0	5980.0	92.6	0.0	21819.5	21819.5	21819.5	0.0	0	0
06/08/15	21819.5	21726.9	9919.0	5980.0	92.6	0.0	21726.9	21726.9	21726.9	0.0	0	0
07/08/15	21726.9	21662.1	9919.0	5980.0	84.7	0.0	21662.1	21662.1	21662.1	0.0	0	0
08/08/15	21662.1	23354.2	9919.0	5980.0	90.6	0.0	23354.2	22274.5	22274.5	1079.8	1	0
09/08/15	22274.5	24143.5	9919.0	5980.0	86.6	0.0	24143.5	22274.5	22274.5	1869.0	1	0
10/08/15	22274.5	22190.8	9919.0	5980.0	93.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
11/08/15	22190.8	22431.2	9919.0	5980.0	90.6	0.0	22431.2	22274.5	22274.5	156.7	1	0
12/08/15	22274.5	22190.8	9919.0	5980.0	85.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
13/08/15	22190.8	22106.2	9919.0	5980.0	84.7	0.0	22106.2	22106.2	22106.2	0.0	0	0
14/08/15	22106.2	22018.5	9919.0	5980.0	91.6	0.0	22018.5	22018.5	22018.5	0.0	0	0
15/08/15	22018.5	21922.0	9919.0	5980.0	98.5	0.0	21922.0	21922.0	21922.0	0.0	0	0
16/08/15	21922.0	21831.4	9919.0	5980.0	90.6	0.0	21831.4	21831.4	21831.4	0.0	0	0
17/08/15	21831.4	23767.5	9919.0	5980.0	88.6	0.0	23767.5	22274.5	22274.5	1493.0	1	0
18/08/15	22274.5	25690.1	9919.0	5980.0	95.6	0.0	25690.1	22274.5	22274.5	3415.6	1	0
19/08/15	22274.5	22179.9	9919.0	5980.0	94.6	0.0	22179.9	22179.9	22179.9	0.0	0	0
20/08/15	22179.9	22084.3	9919.0	5980.0	95.6	0.0	22084.3	22084.3	22084.3	0.0	0	0
21/08/15	22084.3	22153.8	9919.0	5980.0	88.6	0.0	22153.8	22153.8	22153.8	0.0	0	0
22/08/15	22153.8	24261.8	9919.0	5980.0	89.6	0.0	24261.8	22274.5	22274.5	1987.3	1	0
23/08/15	22274.5	22190.8	9919.0	5980.0	93.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
24/08/15	22190.8	22094.3	9919.0	5980.0	98.5	0.0	22094.3	22094.3	22094.3	0.0	0	0
25/08/15	22094.3	21992.7	9919.0	5980.0	101.5	0.0	21992.7	21992.7	21992.7	0.0	0	0
26/08/15	21992.7	21896.2	9919.0	5980.0	96.6	0.0	21896.2	21896.2	21896.2	0.0	0	0
27/08/15	21896.2	21791.7	9919.0	5980.0	104.5	0.0	21791.7	21791.7	21791.7	0.0	0	0
28/08/15	21791.7	21702.1	9919.0	5980.0	91.6	0.0	21702.1	21702.1	21702.1	0.0	0	0
29/08/15	21702.1	21619.4	9919.0	5980.0	94.6	0.0	21619.4	21619.4	21619.4	0.0	0	0
30/08/15	21619.4	24998.4	9919.0	5980.0	97.5	0.0	24998.4	22274.5	22274.5	2724.0	1	0
31/08/15	22274.5	22182.9	9919.0	5980.0	93.6	0.0	22182.9	22182.9	22182.9	0.0	0	0
01/09/15	22182.9	22831.1	9919.0	5980.0	97.5	0.0	22831.1	22274.5	22274.5	556.6	1	0
02/09/15	22274.5	22183.9	9919.0	5980.0	92.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
03/09/15	22183.9	22082.4	9919.0	5980.0	101.5	0.0	22082.4	22082.4	22082.4	0.0	0	0
04/09/15	22082.4	21984.8	9919.0	5980.0	97.5	0.0	21984.8	21984.8	21984.8	0.0	0	0
05/09/15	21984.8	25811.2	9919.0	5980.0	99.5	0.0	25811.2	22274.5	22274.5	3536.8	1	0
06/09/15	22274.5	22192.8	9919.0	5980.0	99.5	0.0	22192.8	22192.8	22192.8	0.0	0	0
07/09/15	22192.8	22092.3	9919.0	5980.0	102.5	0.0	22092.3	22092.3	22092.3	0.0	0	0
08/09/15	22092.3	21980.8	9919.0	5980.0	111.4	0.0	21980.8	21980.8	21980.8	0.0	0	0
09/09/15	21980.8	21857.5	9919.0	5980.0	123.3	0.0	21857.5	21857.5	21857.5	0.0	0	0
10/09/15	21857.5	21759.9	9919.0	5980.0	97.5	0.0	21759.9	21759.9	21759.9	0.0	0	0
11/09/15	21759.9	23093.6	9919.0	5980.0	103.5	0.0	23093.6	22274.5	22274.5	819.1	1	0
12/09/15	22274.5	25858.9	9919.0	5980.0	99.5	0.0	25858.9	22274.5	22274.5	3584.5	1	0
13/09/15	22274.5	22470.3	9919.0	5980.0	100.5	0.0	22470.3	22274.5	22274.5	195.9	1	0
14/09/15	22274.5	22177.9	9919.0	5980.0	98.5	0.0	22177.9	22177.9	22177.9	0.0	0	0
15/09/15	22177.9	22077.4	9919.0	5980.0	104.5	0.0	22077.4	22077.4	22077.4	0.0	0	0
16/09/15	22077.4	21974.9	9919.0	5980.0	104.5	0.0	21974.9	21974.9	21974.9	0.0	0	0
17/09/15	21974.9	21864.4	9919.0	5980.0	110.4	0.0	21864.4	21864.4	21864.4	0.0	0	0
18/09/15	21864.4	21756.0	9919.0	5980.0	108.5	0.0	21756.0	21756.0	21756.0	0.0	0	0
19/09/15	21756.0	21647.5	9919.0	5980.0	108.5	0.0	21647.5	21647.5	21647.5	0.0	0	0
20/09/15	21647.5	21536.1	9919.0	5980.0	111.4	0.0	21536.1	21536.1	21536.1	0.0	0	0
21/09/15	21536.1	21421.7	9919.0	5980.0	114.4	0.0	21421.7	21421.7	21421.7	0.0	0	0
22/09/15	21421.7	21302.3	9919.0	5980.0	119.4	0.0	21302.3	21302.3	21302.3	0.0	0	0
23/09/15	21302.3	21179.0	9919.0	5980.0	123.3	0.0	21179.0	21179.0	21179.0	0.0	0	0
24/09/15	21179.0	21053.6	9919.0	5980.0	125.3	0.0	21053.6	21053.6	21053.6	0.0	0	0
25/09/15	21053.6	20943.2	9919.0	5980.0	110.4	0.0	20943.2	20943.2	20943.2	0.0	0	0
26/09/15	20943.2	20832.8	9919.0	5980.0	112.4	0.0	20832.8	20832.8	20832.8	0.0	0	0
27/09/15	20832.8	20711.4	9919.0	5980.0	121.4	0.0	20711.4	20711.4	20711.4	0.0	0	0
28/09/15	20711.4	20588.1	9919.0	5980.0	123.3	0.0	20588.1	20588.1	20588.1	0.0	0	0
29/09/15	20588.1	20478.6	9919.0	5980.0	109.5	0.0	20478.6	20478.6	20478.6	0.0	0	0
30/09/15	20478.6	20367.2	9919.0	5980.0	111.4	0.0	20367.2	20367.2	20367.2	0.0	0	0
01/10/15	20367.2	20237.9	9919.0	5980.0	129.3	0.0	20237.9	20237.9	20237.9	0.0	0	0
02/10/15	20237.9	20125.5	9919.0	5980.0	114.4	0.0	20125.5	20125.5	20125.5	0.0	0	0
03/10/15	20125.5	20013.0	9919.0	5980.0	112.4	0.0	20013.0	20013.0	20013.0	0.0	0	0
04/10/15	20013.0	19905.6	9919.0	5980.0	107.5	0.0	19905.6	19905.6	19905.6	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m³)	Overflow flag	Pond Empty during winter flag
05/10/15	Monday	10	4.2	4.2	181020.8298	0.9	2	2.2	41.6598	400.1				19905.6	20192.2	9919.0	5980.0	113.4	0.0	20192.2	20192.2	20192.2	0.0	0	0
06/10/15	Tuesday	10	4.7	1.8	181020.8298	0.9	2	0	17.8542	17.9				20192.2	20091.7	9919.0	5980.0	118.4	0.0	20091.7	20091.7	20091.7	0.0	0	0
07/10/15	Wednesday	10	7.1	0.2	181020.8298	0.9	2	0	1.9838	2.0				20091.7	19951.5	9919.0	5980.0	142.2	0.0	19951.5	19951.5	19951.5	0.0	0	0
08/10/15	Thursday	10	6.1	0	181020.8298	0.9	2	0	0	0.0				19951.5	19819.2	9919.0	5980.0	132.3	0.0	19819.2	19819.2	19819.2	0.0	0	0
09/10/15	Friday	10	6.8	0	181020.8298	0.9	2	0	0	0.0				19819.2	19680.0	9919.0	5980.0	139.2	0.0	19680.0	19680.0	19680.0	0.0	0	0
10/10/15	Saturday	10	5.4	0	181020.8298	0.9	2	0	0	0.0				19680.0	19554.7	9919.0	5980.0	125.3	0.0	19554.7	19554.7	19554.7	0.0	0	0
11/10/15	Sunday	10	6.3	0	181020.8298	0.9	2	0	0	0.0				19554.7	19420.4	9919.0	5980.0	134.2	0.0	19420.4	19420.4	19420.4	0.0	0	0
12/10/15	Monday	10	6.4	0	181020.8298	0.9	2	0	0	0.0				19420.4	19285.2	9919.0	5980.0	135.2	0.0	19285.2	19285.2	19285.2	0.0	0	0
13/10/15	Tuesday	10	5.8	0	181020.8298	0.9	2	0	0	0.0				19285.2	19155.9	9919.0	5980.0	129.3	0.0	19155.9	19155.9	19155.9	0.0	0	0
14/10/15	Wednesday	10	3.3	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				19155.9	19313.2	9919.0	5980.0	104.5	0.0	19313.2	19313.2	19313.2	0.0	0	0
15/10/15	Thursday	10	4.6	5.4	181020.8298	0.9	2	3.4	53.5626	607.5				19313.2	19803.3	9919.0	5980.0	117.4	0.0	19803.3	19803.3	19803.3	0.0	0	0
16/10/15	Friday	10	4.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				19803.3	19687.9	9919.0	5980.0	117.4	0.0	19687.9	19687.9	19687.9	0.0	0	0
17/10/15	Saturday	10	4.6	0	181020.8298	0.9	2	0	0	0.0				19687.9	19570.5	9919.0	5980.0	117.4	0.0	19570.5	19570.5	19570.5	0.0	0	0
18/10/15	Sunday	10	3.8	0	181020.8298	0.9	2	0	0	0.0				19570.5	19461.1	9919.0	5980.0	109.5	0.0	19461.1	19461.1	19461.1	0.0	0	0
19/10/15	Monday	10	4.2	15.2	181020.8298	0.9	2	13.2	150.7688	2301.3				19461.1	21649.0	9919.0	5980.0	113.4	0.0	21649.0	21649.0	21649.0	0.0	0	0
20/10/15	Tuesday	10	5.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				21649.0	21522.6	9919.0	5980.0	128.3	0.0	21522.6	21522.6	21522.6	0.0	0	0
21/10/15	Wednesday	10	6.8	0	181020.8298	0.9	2	0	0	0.0				21522.6	21383.4	9919.0	5980.0	139.2	0.0	21383.4	21383.4	21383.4	0.0	0	0
22/10/15	Thursday	10	3.5	0	181020.8298	0.9	2	0	0	0.0				21383.4	21277.0	9919.0	5980.0	106.5	0.0	21277.0	21277.0	21277.0	0.0	0	0
23/10/15	Friday	10	4.4	0	181020.8298	0.9	2	0	0	0.0				21277.0	21161.6	9919.0	5980.0	115.4	0.0	21161.6	21161.6	21161.6	0.0	0	0
24/10/15	Saturday	10	4	0	181020.8298	0.9	2	0	0	0.0				21161.6	21050.1	9919.0	5980.0	111.4	0.0	21050.1	21050.1	21050.1	0.0	0	0
25/10/15	Sunday	10	4.4	0	181020.8298	0.9	2	0	0	0.0				21050.1	20934.7	9919.0	5980.0	115.4	0.0	20934.7	20934.7	20934.7	0.0	0	0
26/10/15	Monday	10	6.2	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				20934.7	20925.0	9919.0	5980.0	133.3	0.0	20925.0	20925.0	20925.0	0.0	0	0
27/10/15	Tuesday	10	4.8	0	181020.8298	0.9	2	0	0	0.0				20925.0	20805.6	9919.0	5980.0	119.4	0.0	20805.6	20805.6	20805.6	0.0	0	0
28/10/15	Wednesday	10	5.5	1.8	181020.8298	0.9	2	0	17.8542	17.9				20805.6	20697.2	9919.0	5980.0	126.3	0.0	20697.2	20697.2	20697.2	0.0	0	0
29/10/15	Thursday	10	4.6	0	181020.8298	0.9	2	0	0	0.0				20697.2	20579.8	9919.0	5980.0	117.4	0.0	20579.8	20579.8	20579.8	0.0	0	0
30/10/15	Friday	10	4.5	0	181020.8298	0.9	2	0	0	0.0				20579.8	20463.4	9919.0	5980.0	116.4	0.0	20463.4	20463.4	20463.4	0.0	0	0
31/10/15	Saturday	10	4.9	31	181020.8298	0.9	2	29	307.489	5032.1				20463.4	25375.2	9919.0	5980.0	120.4	0.0	25375.2	22274.5	22274.5	3100.7	1	0
01/11/15	Sunday	11	4.7	0	181020.8298	0.9	2	0	0	0.0				22274.5	22156.1	9919.0	5980.0	118.4	0.0	22156.1	22156.1	22156.1	0.0	0	0
02/11/15	Monday	11	4.4	23.6	181020.8298	0.9	2	21.6	234.0884	3753.1				22156.1	25793.8	9919.0	5980.0	115.4	0.0	25793.8	22274.5	22274.5	3519.4	1	0
03/11/15	Tuesday	11	5.4	3.8	181020.8298	0.9	2	1.8	37.6922	330.9				22274.5	22480.1	9919.0	5980.0	125.3	0.0	22480.1	22274.5	22274.5	205.6	1	0
04/11/15	Wednesday	11	5.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22152.1	9919.0	5980.0	124.3	0.0	22152.1	22152.1	22152.1	0.0	0	0
05/11/15	Thursday	11	4.7	0	181020.8298	0.9	2	0	0	0.0				22152.1	22033.8	9919.0	5980.0	118.4	0.0	22033.8	22033.8	22033.8	0.0	0	0
06/11/15	Friday	11	4.2	0	181020.8298	0.9	2	0	0	0.0				22033.8	21920.3	9919.0	5980.0	113.4	0.0	21920.3	21920.3	21920.3	0.0	0	0
07/11/15	Saturday	11	4.1	0.8	181020.8298	0.9	2	0	7.9352	7.9				21920.3	21815.8	9919.0	5980.0	112.4	0.0	21815.8	21815.8	21815.8	0.0	0	0
08/11/15	Sunday	11	5.8	0	181020.8298	0.9	2	0	0	0.0				21815.8	21686.5	9919.0	5980.0	129.3	0.0	21686.5	21686.5	21686.5	0.0	0	0
09/11/15	Monday	11	6.4	0	181020.8298	0.9	2	0	0	0.0				21686.5	21551.3	9919.0	5980.0	135.2	0.0	21551.3	21551.3	21551.3	0.0	0	0
10/11/15	Tuesday	11	6.8	0	181020.8298	0.9	2	0	0	0.0				21551.3	21412.1	9919.0	5980.0	139.2	0.0	21412.1	21412.1	21412.1	0.0	0	0
11/11/15	Wednesday	11	5.9	0	181020.8298	0.9	2	0	0	0.0				21412.1	21281.8	9919.0	5980.0	130.3	0.0	21281.8	21281.8	21281.8	0.0	0	0
12/11/15	Thursday	11	7.8	0	181020.8298	0.9	2	0	0	0.0				21281.8	21132.7	9919.0	5980.0	149.1	0.0	21132.7	21132.7	21132.7	0.0	0	0
13/11/15	Friday	11	9.4	0	181020.8298	0.9	2	0	0	0.0				21132.7	20967.7	9919.0	5980.0	165.0	0.0	20967.7	20967.7	20967.7	0.0	0	0
14/11/15	Saturday	11	10	0	181020.8298	0.9	2	0	0	0.0				20967.7	20796.7	9919.0	5980.0	171.0	0.0	20796.7	20796.7	20796.7	0.0	0	0
15/11/15	Sunday	11	7.6	1	181020.8298	0.9	2	0	9.919	9.9				20796.7	20659.5	9919.0	5980.0	147.1	0.0	20659.5	20659.5	20659.5	0.0	0	0
16/11/15	Monday	11	6.8	0	181020.8298	0.9	2	0	0	0.0				20659.5	20520.3	9919.0	5980.0	139.2	0.0	20520.3	20520.3	20520.3	0.0	0	0
17/11/15	Tuesday	11	6.6	0	181020.8298	0.9	2	0	0	0.0				20520.3	20383.1	9919.0	5980.0	137.2	0.0	20383.1	20383.1	20383.1	0.0	0	0
18/11/15	Wednesday	11	5.2	1.6	181020.8298	0.9	2	0	15.8704	15.9				20383.1	20275.6	9919.0	5980.0	123.3	0.0	20275.6	20275.6	20275.6	0.0	0	0
19/11/15	Thursday	11	5.5	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				20275.6	20203.7	9919.0	5980.0	126.3	0.0	20203.7	20203.7	20203.7	0.0	0	0
20/11/15	Friday	11	8	0	181020.8298	0.9	2	0	0	0.0				20203.7	20052.6	9919.0	5980.0	151.1	0.0	20052.6	20052.6	20052.6	0.0	0	0
21/11/15	Saturday	11	10.7	0	181020.8298	0.9	2	0	0	0.0				20052.6	19874.7	9919.0	5980.0	177.9	0.0	19874.7	19874.7	19874.7	0.0	0	0
22/11/15	Sunday	11	10.2	0	181020.8298	0.9	2	0	0	0.0				19874.7	19701.8	9919.0	5980.0	172.9	0.0	19701.8	19701.8	19701.8	0.0	0	0
23/11/15	Monday	11	5.5	0	181020.8298	0.9	2	0	0	0.0				19701.8	19575.4	9919.0	5980.0	126.3	0.0	19575.4	19575.4	19575.4	0.0	0	0
24/11/15	Tuesday	11	6.6	0	181020.8298	0.9	2	0	0	0.0				19575.4	19438.2	9919.0	5980.0	137.2	0.0	19438.2	19438.2	19438.2	0.0	0	0
25/11/15	Wednesday	11	6.8	0	181020.8298	0.9	2	0	0	0.0				19438.2	19299.0	9919.0	5980.0	139.2	0.0	19299.0	19299.0	19299.0	0.0	0	0
26/11/15	Thursday	11	8.4	0	181020.8298	0.9	2	0	0	0.0				19299.0	19143.9	9919.0	5980.0	155.1	0.0	19143.9	19143.9	19143.9	0.0	0	0
27/11/15	Friday	11	7.7	0	181020.8298	0.9	2	0	0	0.0				19143.9	18995.8	9919.0	5980.0	148.1	0.0	18995.8	18995.8	18995.8	0.0	0	0
28/11/15	Saturday	11	6.8	0	181020.8298	0.9	2	0	0	0.0				18995.8	18856.6	9919.0	5980.0	139.2	0.0	18856.6	18856.6	18856.6	0.0	0	0
29/11/15	Sunday	11	6.7	0	181020.8298	0.9	2	0	0	0.0				18856.6	18718.4	9919.0	5980.0	138.2	0.0	18718.4	18718.4	18718.4	0.0	0	0
30/11/15	Monday	11	6.5	0	181020.8298	0.9	2	0	0	0.0				18718.4	18582.1	9919.0	5980.0	136.2	0.0	18582.1	18582.1	18582.1	0.0	0	0
01/12/15	Tuesday	12	8.7	0	181020.8298	0.9	2	0	0	0.0				18582.1	18424.1	9919.0	5980.0	158.1	0.0	18424.1	18424.1	18424.1	0.0	0	0
02/12/15	Wednesday	12	10	0	181020.8298	0.9	2	0	0	0.0				18424.1	18253.1	9919.0	5980.0	171.0	0.0	18253.1	18253.1	18253.1	0.0	0	0
03/12/15	Thursday	12	6.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				18253.1	18116.9	9919.0	5980.0	138.2	0.0	18116.9	18116.9	18116.9	0.0	0	0
04/12/15	Friday	12	5.7	0	181020.8298	0.9	2	0	0	0.0				18116.9	17988.6	9919.0	5980.0	128.3	0.0	17988.6	17988.6	17988.6	0.0	0	0
05/12/15	Saturday	12	3.6	12.4	181020.8298	0.9	2	10.4	122.9956	1817.4				17988.6	19698.5	9919.0	5980.0	107.5	0.0	19698.5	19698.5	19698.5	0.0	0	0
06/12/15	Sunday	12	3.2	6.8	181020.8298	0.9	2	4.8	67.4492	849.5				19698.5	20444.4	9919.0	5980.0	103.5	0.0	20444.4	20444.4	20444.4	0.0	0	0
07/12/15	Monday	12	5.1	0.4	181020.8298	0.9	2	0	3.9676	4.0				20444.4	20326.1	9919.0	5980.0	122.3	0.0	20326.1	20326.1	20326.1	0.0	0	0
08/12/15	Tuesday	12	5.6	0	181020.8298	0.9	2	0	0	0.0				20326.1	20198.8	9919.0	5980.0	127.3	0.0	20198.8	20198.8	20198.8	0.0	0	0
09/12/15	Wednesday	12	5.8	0	181020.8298	0.9	2	0	0	0.0				20198.8	20069.5	9919.0	5980.0	129.3	0.0	20069.5	20069.5	20069.5	0.0	0	0
10/12/15	Thursday	12	7.1	0	181020.8298	0.9	2	0	0	0.0				20069.5	19927.3	9919.0	5980.0	142.2	0.0	19927.3	19927.3	19927.3	0.0	0	0
11/12/15	Friday	12	9.3	0	181020.8298	0.9	2	0	0	0.0				19927.3	19763.3	9919.0	5980.0	164.0	0.0	19763.3	19763.3	19763.3	0.0	0	0
12/12/15	Saturday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				19763.3	19628.0	9919.0	5980.0	135.2	0.0	19628.0	19628.0	19628.0	0.0	0	0
13/12/15	Sunday	12	5.6	0	181020.8298	0.9	2	0	0	0.0				19628.0	19500.7	9919.0	5980.0	127.3	0.0	19500.7	19500.7	19500.7	0.0	0	0
14/12/15	Monday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				19500.7	19365.5	9919.0	5980.0	135.2	0.0	19365.5	19365.5	19365.5	0.0	0	0
15/12/15	Tuesday	12	6.7	0	181020.8298	0.9	2	0	0	0.0				19365.5	19227.3	9919.0	5980.0	138.2	0.0	19227.3	19227.3	19227.3	0.0	0	0
16/12/15	Wednesday	12	6.9	0	181020.8298	0.9	2	0	0	0.0				19227.3	19087.1	9919.0	5980.0	140.2	0.0	19087.1	19087.1	19087.1	0.0	0	0
17/12/15	Thursday	12	7.3	0	181020.8298	0.9	2	0	0	0.0				19087.1	18942.9	9919.0	5980.0	144.2	0.0	18942.9	18942.9	18942.9	0.0	0	0
18/12/15	Friday	12	6.5	0	181020.8298	0.9	2	0	0	0.0				18942.9	18806.7	9919.0	5980.0	136.2	0.0	18806.7	18806.7	18806.7	0.0	0	0
19/12/15	Saturday	12	7.1	0	181020.8298	0.9	2	0	0	0.0				18806.7	18664.5	9919.0	5980.0	142.2	0.0	18664.5	18664.5	18664.5	0.0	0	0
20/12/15	Sunday	12	9.1	0	181020.8298	0.9	2	0	0	0.0				18664.5	18502.5	9919.0	5980.0	162.0	0.0	18502.5	18502.5	18502.5	0.0	0	0
21/12/15	Monday	12	10.5	0	181020.8298	0.9	2	0	0	0.0				18502.5	18326.5	9919.0	5980.0	175.9	0.0	18326.5	18326.5	18326.5	0.0	0	0
22/12/15	Tuesday	12	10.5	0	181020.8298	0.9	2	0	0	0.0				18326.5	18150.6	9919.0	5980.0	175.9	0.0	18150.6	18150.6	18150.6	0.0	0	0
23/12/15	Wednesday	12	10.7	0	181020.8298	0.9	2	0	0	0.0				18150.6	17972.7	9919.0	5980.0	177.9	0.0	17972.7	17972.7	17972.7	0.0	0	0
24/12/15	Thursday	12	7	0	181020.8298	0.9	2	0	0	0.0				17972.7	17831.5	9919.0	5980.0	141.2	0.0	17831.5	17831.5	17831.5	0.0	0	0
25/12/15	Friday	12	8	0	181020.8298	0.9	2	0	0	0.0				17831.5	17680.4	9919.0	5980.0	151.1	0.0	17680.4	17680.4	17680.4	0.0	0	0
26/12/15	Saturday	12	9.8	0	181020.8298	0.9	2	0	0	0.0				17680.4	17511.5	9919.0	5980.0	169.0	0.0	17511.5	17511.5	17511.5	0.0	0	0
27/12/15	Sunday	12	10.5	0	181020.8298	0.9	2	0	0	0.0				17511.5	17335.6	9919.0	5980.0	175.9	0.0	17335.6	17335.6	17335.6	0.0	0	0
28/12/15	Monday	12	10.9	0	181020.8298	0.9	2	0	0	0.0				17335.6	17155.7	9919.0	5980.0	179.9	0.0	17155.7	17155.7	17155.7	0.0	0	0
29/12/15	Tuesday	12	8.5	0	181020.8298	0.9	2	0	0	0.0				17155.7	16999.6	9919.0	5980.0	156.1	0.0	16999.6	16999.6	16999.6	0.0	0	0
30/12/15	Wednesday	12	7.6	0	181020.8298	0.9	2	0	0	0.0				16999.6	16852.5	9919.0	5980.0	147.1	0.0	16852.5	16852.5	16852.5	0.0	0	0
31/12/15	Thursday	12	7.6	0	181020.8298	0.9	2	0	0	0.0				16852.5	16705.3	7439.3	4485.0	110.4	-36.8	16742.1	16742.1	16742.1	0.0	0	0
01/01/16	Friday	1	7.6	0	181020.8298	0.9	2	0	0	0.0				16742.1	16595.0	7439.3	4485.0	110.4	-36.8	16631.8	16631.8	16631.8	0.0	0	0
02/01/16	Saturday	1	9.8	0	181020.8298	0.9	2	0	0	0.0				16631.8	16462.8	7439.3	4485.0	126.7	-42.2	16505.0	16505.0	16505.0	0.0	0	0
03/01/16	Sunday	1	10	0	181020.8298	0.9	2	0	0	0.0				16505.0	16334.1	7439.3	4485.0	128.2	-42.7	16376.8	16376.8	16376.8	0.0	0	0
04/01/16	Monday	1	5.8	0	181020.8298	0.9	2	0	0	0.0				16376.8	16247.5	7439.3	4485.0	97.0	-32.3	16279.8	16279.8	16279.8	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty during winter flag
05/01/16	Tuesday	1	6.1	0	181020.8298	0.9	2	0	0	0.0				16279.8	16147.6	7439.3	4485.0	99.2	-33.1	16180.6	16180.6	16180.6	0.0	0	0
06/01/16	Wednesday	1	7.4	0	181020.8298	0.9	2	0	0	0.0				16180.6	16035.5	7439.3	4485.0	108.9	-36.3	16071.8	16071.8	16071.8	0.0	0	0
07/01/16	Thursday	1	7.4	0	181020.8298	0.9	2	0	0	0.0				16071.8	15926.6	7439.3	4485.0	108.9	-36.3	15962.9	15962.9	15962.9	0.0	0	0
08/01/16	Friday	1	7.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				15962.9	15819.7	7439.3	4485.0	108.9	-36.3	15856.0	15856.0	15856.0	0.0	0	0
09/01/16	Saturday	1	7.9	0.8	181020.8298	0.9	2	0	7.9352	7.9				15856.0	15713.8	7439.3	4485.0	112.5	-37.5	15751.4	15751.4	15751.4	0.0	0	0
10/01/16	Sunday	1	4.6	0	181020.8298	0.9	2	0	0	0.0				15751.4	15634.0	7439.3	4485.0	88.0	-29.3	15663.3	15663.3	15663.3	0.0	0	0
11/01/16	Monday	1	5.4	0	181020.8298	0.9	2	0	0	0.0				15663.3	15538.0	7439.3	4485.0	94.0	-31.3	15569.3	15569.3	15569.3	0.0	0	0
12/01/16	Tuesday	1	5.4	1.4	181020.8298	0.9	2	0	13.8866	13.9				15569.3	15457.9	7439.3	4485.0	94.0	-31.3	15489.2	15489.2	15489.2	0.0	0	0
13/01/16	Wednesday	1	9.7	2	181020.8298	0.9	2	0	19.838	19.8				15489.2	15341.1	7439.3	4485.0	126.0	-42.0	15383.1	15383.1	15383.1	0.0	0	0
14/01/16	Thursday	1	11.3	0	181020.8298	0.9	2	0	0	0.0				15383.1	15199.2	7439.3	4485.0	137.3	-46.0	15245.2	15245.2	15245.2	0.0	0	0
15/01/16	Friday	1	10.7	0	181020.8298	0.9	2	0	0	0.0				15245.2	15067.3	7439.3	4485.0	133.4	-44.5	15111.8	15111.8	15111.8	0.0	0	0
16/01/16	Saturday	1	10	0	181020.8298	0.9	2	0	0	0.0				15111.8	14940.8	7439.3	4485.0	128.2	-42.7	14983.6	14983.6	14983.6	0.0	0	0
17/01/16	Sunday	1	6.5	0	181020.8298	0.9	2	0	0	0.0				14983.6	14847.3	7439.3	4485.0	102.2	-34.1	14881.4	14881.4	14881.4	0.0	0	0
18/01/16	Monday	1	3.8	0	181020.8298	0.9	2	0	0	0.0				14881.4	14771.9	7439.3	4485.0	82.1	-27.4	14799.3	14799.3	14799.3	0.0	0	0
19/01/16	Tuesday	1	4.9	0	181020.8298	0.9	2	0	0	0.0				14799.3	14678.9	7439.3	4485.0	90.3	-30.1	14709.0	14709.0	14709.0	0.0	0	0
20/01/16	Wednesday	1	4.7	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				14709.0	14645.1	7439.3	4485.0	88.8	-29.6	14674.7	14674.7	14674.7	0.0	0	0
21/01/16	Thursday	1	5.4	0.4	181020.8298	0.9	2	0	3.9676	4.0				14674.7	14553.3	7439.3	4485.0	94.0	-31.3	14584.6	14584.6	14584.6	0.0	0	0
22/01/16	Friday	1	7.3	0	181020.8298	0.9	2	0	0	0.0				14584.6	14440.5	7439.3	4485.0	108.1	-36.0	14476.5	14476.5	14476.5	0.0	0	0
23/01/16	Saturday	1	8.5	0	181020.8298	0.9	2	0	0	0.0				14476.5	14320.4	7439.3	4485.0	117.1	-39.0	14359.4	14359.4	14359.4	0.0	0	0
24/01/16	Sunday	1	8	1	181020.8298	0.9	2	0	9.919	9.9				14359.4	14218.3	7439.3	4485.0	113.3	-37.8	14256.0	14256.0	14256.0	0.0	0	0
25/01/16	Monday	1	7.2	0.8	181020.8298	0.9	2	0	7.9352	7.9				14256.0	14120.8	7439.3	4485.0	107.4	-35.8	14156.6	14156.6	14156.6	0.0	0	0
26/01/16	Tuesday	1	6.8	0	181020.8298	0.9	2	0	0	0.0				14156.6	14017.4	7439.3	4485.0	104.4	-34.8	14052.2	14052.2	14052.2	0.0	0	0
27/01/16	Wednesday	1	8.9	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				14052.2	13981.1	7439.3	4485.0	120.0	-40.0	14021.1	14021.1	14021.1	0.0	0	0
28/01/16	Thursday	1	10.2	0	181020.8298	0.9	2	0	0	0.0				14021.1	13848.2	7439.3	4485.0	129.7	-43.2	13891.4	13891.4	13891.4	0.0	0	0
29/01/16	Friday	1	11	0	181020.8298	0.9	2	0	0	0.0				13891.4	13710.6	7439.3	4485.0	135.7	-45.2	13755.8	13755.8	13755.8	0.0	0	0
30/01/16	Saturday	1	4.3	0	181020.8298	0.9	2	0	0	0.0				13755.8	13641.4	7439.3	4485.0	85.8	-28.6	13670.0	13670.0	13670.0	0.0	0	0
31/01/16	Sunday	1	3.8	11	181020.8298	0.9	2	9	109.109	1575.4				13670.0	15135.9	7439.3	4485.0	82.1	-27.4	15163.3	15163.3	15163.3	0.0	0	0
01/02/16	Monday	2	5.1	0.4	181020.8298	0.9	2	0	3.9676	4.0				15163.3	15044.9	7439.3	4485.0	91.8	-30.6	15075.5	15075.5	15075.5	0.0	0	0
02/02/16	Tuesday	2	6.4	0	181020.8298	0.9	2	0	0	0.0				15075.5	14940.2	7439.3	4485.0	101.4	-33.8	14974.0	14974.0	14974.0	0.0	0	0
03/02/16	Wednesday	2	8.3	0	181020.8298	0.9	2	0	0	0.0				14974.0	14819.9	7439.3	4485.0	115.6	-38.5	14858.5	14858.5	14858.5	0.0	0	0
04/02/16	Thursday	2	8.4	0	181020.8298	0.9	2	0	0	0.0				14858.5	14703.4	7439.3	4485.0	116.3	-38.8	14742.2	14742.2	14742.2	0.0	0	0
05/02/16	Friday	2	8.5	0	181020.8298	0.9	2	0	0	0.0				14742.2	14586.1	7439.3	4485.0	117.1	-39.0	14625.1	14625.1	14625.1	0.0	0	0
06/02/16	Saturday	2	8	0	181020.8298	0.9	2	0	0	0.0				14625.1	14474.0	7439.3	4485.0	113.3	-37.8	14511.8	14511.8	14511.8	0.0	0	0
07/02/16	Sunday	2	10.5	0	181020.8298	0.9	2	0	0	0.0				14511.8	14335.9	7439.3	4485.0	131.9	-44.0	14379.8	14379.8	14379.8	0.0	0	0
08/02/16	Monday	2	11.2	0	181020.8298	0.9	2	0	0	0.0				14379.8	14197.0	7439.3	4485.0	137.1	-45.7	14242.7	14242.7	14242.7	0.0	0	0
09/02/16	Tuesday	2	9.6	0	181020.8298	0.9	2	0	0	0.0				14242.7	14075.7	7439.3	4485.0	125.2	-41.7	14117.5	14117.5	14117.5	0.0	0	0
10/02/16	Wednesday	2	9.1	0	181020.8298	0.9	2	0	0	0.0				14117.5	13955.4	7439.3	4485.0	121.5	-40.5	13995.9	13995.9	13995.9	0.0	0	0
11/02/16	Thursday	2	7.3	0	181020.8298	0.9	2	0	0	0.0				13995.9	13851.8	7439.3	4485.0	108.1	-36.0	13887.8	13887.8	13887.8	0.0	0	0
12/02/16	Friday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				13887.8	13749.6	7439.3	4485.0	103.7	-34.6	13784.1	13784.1	13784.1	0.0	0	0
13/02/16	Saturday	2	8.2	0	181020.8298	0.9	2	0	0	0.0				13784.1	13631.1	7439.3	4485.0	114.8	-38.3	13669.3	13669.3	13669.3	0.0	0	0
14/02/16	Sunday	2	9.2	0	181020.8298	0.9	2	0	0	0.0				13669.3	13506.3	7439.3	4485.0	122.3	-40.8	13547.1	13547.1	13547.1	0.0	0	0
15/02/16	Monday	2	10.2	0	181020.8298	0.9	2	0	0	0.0				13547.1	13374.1	7439.3	4485.0	129.7	-43.2	13417.4	13417.4	13417.4	0.0	0	0
16/02/16	Tuesday	2	10.6	0	181020.8298	0.9	2	0	0	0.0				13417.4	13240.5	7439.3	4485.0	132.7	-44.2	13284.7	13284.7	13284.7	0.0	0	0
17/02/16	Wednesday	2	8.1	0	181020.8298	0.9	2	0	0	0.0				13284.7	13132.6	7439.3	4485.0	114.1	-38.0	13170.6	13170.6	13170.6	0.0	0	0
18/02/16	Thursday	2	7.5	0	181020.8298	0.9	2	0	0	0.0				13170.6	13024.5	7439.3	4485.0	109.6	-36.5	13061.0	13061.0	13061.0	0.0	0	0
19/02/16	Friday	2	8.7	0	181020.8298	0.9	2	0	0	0.0				13061.0	12902.9	7439.3	4485.0	118.5	-39.5	12942.5	12942.5	12942.5	0.0	0	0
20/02/16	Saturday	2	8.2	0	181020.8298	0.9	2	0	0	0.0				12942.5	12789.4	7439.3	4485.0	114.8	-38.3	12827.6	12827.6	12827.6	0.0	0	0
21/02/16	Sunday	2	4.1	0	181020.8298	0.9	2	0	0	0.0				12827.6	12715.2	7439.3	4485.0	84.3	-28.1	12743.3	12743.3	12743.3	0.0	0	0
22/02/16	Monday	2	4.8	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				12743.3	12747.5	7439.3	4485.0	89.5	-29.8	12777.3	12777.3	12777.3	0.0	0	0
23/02/16	Tuesday	2	3.8	0	181020.8298	0.9	2	0	0	0.0				12777.3	12667.9	7439.3	4485.0	82.1	-27.4	12695.2	12695.2	12695.2	0.0	0	0
24/02/16	Wednesday	2	5.3	1	181020.8298	0.9	2	0	9.919	9.9				12695.2	12580.8	7439.3	4485.0	93.2	-31.1	12611.9	12611.9	12611.9	0.0	0	0
25/02/16	Thursday	2	7.6	0	181020.8298	0.9	2	0	0	0.0				12611.9	12464.8	7439.3	4485.0	110.4	-36.8	12501.5	12501.5	12501.5	0.0	0	0
26/02/16	Friday	2	8.9	0	181020.8298	0.9	2	0	0	0.0				12501.5	12341.5	7439.3	4485.0	120.0	-40.0	12381.5	12381.5	12381.5	0.0	0	0
27/02/16	Saturday	2	8.2	0	181020.8298	0.9	2	0	0	0.0				12381.5	12228.4	7439.3	4485.0	114.8	-38.3	12266.7	12266.7	12266.7	0.0	0	0
28/02/16	Sunday	2	4.7	0	181020.8298	0.9	2	0	0	0.0				12266.7	12148.3	7439.3	4485.0	88.8	-29.6	12177.9	12177.9	12177.9	0.0	0	0
29/02/16	Monday	2	4.4	0	181020.8298	0.9	2	0	0	0.0				12177.9	12062.5	7439.3	4485.0	86.6	-28.9	12091.4	12091.4	12091.4	0.0	0	0
01/03/16	Tuesday	3	5.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				12091.4	11970.0	7439.3	4485.0	92.5	-30.8	12000.8	12000.8	12000.8	0.0	0	0
02/03/16	Wednesday	3	6.4	0	181020.8298	0.9	2	0	0	0.0				12000.8	11865.6	7439.3	4485.0	101.4	-33.8	11899.4	11899.4	11899.4	0.0	0	0
03/03/16	Thursday	3	4.5	0	181020.8298	0.9	2	0	0	0.0				11899.4	11783.0	7439.3	4485.0	87.3	-29.1	11812.1	11812.1	11812.1	0.0	0	0
04/03/16	Friday	3	5.7	0	181020.8298	0.9	2	0	0	0.0				11812.1	11683.8	7439.3	4485.0	96.2	-32.1	11715.9	11715.9	11715.9	0.0	0	0
05/03/16	Saturday	3	6.4	0	181020.8298	0.9	2	0	0	0.0				11715.9	11580.6	7439.3	4485.0	101.4	-33.8	11614.5	11614.5	11614.5	0.0	0	0
06/03/16	Sunday	3	6.9	0	181020.8298	0.9	2	0	0	0.0				11614.5	11474.3	7439.3	4485.0	105.2	-35.1	11509.3	11509.3	11509.3	0.0	0	0
07/03/16	Monday	3	7.8	0	181020.8298	0.9	2	0	0	0.0				11509.3	11360.2	7439.3	4485.0	111.8	-37.3	11397.5	11397.5	11397.5	0.0	0	0
08/03/16	Tuesday	3	7.4	0	181020.8298	0.9	2	0	0	0.0				11397.5	11252.3	7439.3	4485.0	108.9	-36.3	11288.6	11288.6	11288.6	0.0	0	0
09/03/16	Wednesday	3	7.2	0	181020.8298	0.9	2	0	0	0.0				11288.6	11145.4	7439.3	4485.0	107.4	-35.8	11181.2	11181.2	11181.2	0.0	0	0
10/03/16	Thursday	3	5.1	0	181020.8298	0.9	2	0	0	0.0				11181.2	11058.9	4959.5	2990.0	61.2	-61.2	11120.0	11120.0	11120.0	0.0	0	0
11/03/16	Friday	3	6.2	0	181020.8298	0.9	2	0	0	0.0				11120.0	10986.8	4959.5	2990.0	66.6	-66.6	11053.4	11053.4	11053.4	0.0	0	0
12/03/16	Saturday	3	6.9	0	181020.8298	0.9	2	0	0	0.0				11053.4	10913.2	4959.5	2990.0	70.1	-70.1	10983.3	10983.3	10983.3	0.0	0	0
13/03/16	Sunday	3	9.1	0	181020.8298	0.9	2	0	0	0.0				10983.3	10821.3	4959.5	2990.0	81.0	-81.0	10902.3	10902.3	10902.3	0.0	0	0
14/03/16	Monday	3	12.1	0	181020.8298	0.9	2	0	0	0.0				10902.3	10710.5	4959.5	2990.0	95.9	-95.9	10806.4	10806.4	10806.4	0.0	0	0
15/03/16	Tuesday	3	5.3	0	181020.8298	0.9	2	0	0	0.0				10806.4	10682.1	4959.5	2990.0	62.2	-62.2	10744.2	10744.2	10744.2	0.0	0	0
16/03/16	Wednesday	3	5.8	0	181020.8298	0.9	2	0	0	0.0				10744.2	10614.9	4959.5	2990.0	64.6	-64.6	10679.6	10679.6	10679.6	0.0	0	0
17/03/16	Thursday	3	7.2	0	181020.8298	0.9	2	0	0	0.0				10679.6	10536.4	4959.5	2990.0	71.6	-71.6	10608.0	10608.0	10608.0	0.0	0	0
18/03/16	Friday	3	7	0	181020.8298	0.9	2	0	0	0.0				10608.0	10466.8	4959.5	2990.0	70.6	-70.6	10537.4	10537.4	10537.4	0.0	0	0
19/03/16	Saturday	3	3.8	0	181020.8298	0.9	2	0	0	0.0				10537.4	10428.0	4959.5	2990.0	54.7	-54.7	10482.7	10482.7	10482.7	0.0	0	0
20/03/16	Sunday	3	5.2	0	181020.8298	0.9	2	0	0	0.0				10482.7	10359.3	4959.5	2990.0	61.7	-61.7	10421.0	10421.0	10421.0	0.0	0	0
21/03/16	Monday	3	5.2	0	181020.8298	0.9	2	0	0	0.0				10421.0	10297.7	4959.5	2990.0	61.7	-61.7	10359.3	10359.3	10359.3	0.0	0	0
22/03/16	Tuesday	3	4.3	0	181020.8298	0.9	2	0	0	0.0				10359.3	10244.9	4959.5	2990.0	57.2	-57.2	10302.1	10302.1	10302.1	0.0	0	0
23/03/16	Wednesday	3	4.2	0	181020.8298	0.9	2	0	0	0.0				10302.1	10188.7	4959.5	2990.0	56.7	-56.7	10245.4	10245.4	10245.4	0.0	0	0
24/03/16	Thursday	3	5.3	0	181020.8298	0.9	2	0	0	0.0				10245.4	10121.1	4959.5	2990.0	62.2	-62.2	10183.3	10183.3	10183.3	0.0	0	0
25/03/16	Friday	3	5.6	0	181020.8298	0.9	2	0	0	0.0				10183.3	10056.0	4959.5	2990.0	63.7	-63.7	10119.6	10119.6	10119.6	0.0	0	0
26/03/16	Saturday	3	1.3	12.6	181020.8298	0.9	2	10.6	124.9794	1851.9				10119.6	11886.9	7439.3	4485.0	63.5	-21.2	11908.0	11908.0	11908.0	0.0	0	0
27/03/16	Sunday	3	3.9	6.2	181020.8298	0.9	2	4.2	61.4978	745.8				11908.0	12543.3	7439.3	4485.0	82.8	-27.6	12571.0	12571.0	12571.0	0.0	0	0
28/03/16	Monday	3	4.5	0	181020.8298	0.9	2	0	0	0.0				12571.0	12454.6	7439.3	4485.0	87.3	-29.1	12483.7	12483.7	12483.7	0.0	0	0
29/03/16	Tuesday	3	4.7	0	181020.8298	0.9	2	0	0	0.0				12483.7	12365.3	7439.3	4485.0	88.8	-29.6	12394.9	12394.9	12394.9	0.0	0	0
30/03/16	Wednesday	3	4.9	0	181020.8298	0.9	2	0	0	0.0				12394.9	12274.5	7439.3	4485.0	90.3	-30.1	12304.6	12304.6	12304.6	0.0	0	0
31/03/16	Thursday	3	4.1	0	181020.8298	0.9	2	0	0	0.0				12304.6	12192.2	7439.3	4485.0	84.3	-28.1	12220.3	12220.3	12220.3	0.0	0	0
01/04/16	Friday	4	3.3	0	181020.8298	0.9	2	0	0	0.0				12220.3	12115.8	7439.3	4485.0	78.4	-26.1	12141.9	12141.9	12141.9	0.0	0	0
02/04/16	Saturday	4	4.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				12141.9	12026.5	7439.3	4485.0	88.0	-29.3	12055.9	12055.9	12055.9	0.0	0	0
03/04/16	Sunday	4	5.4	0	181020.8298	0.9	2	0	0	0.0				12055.9	11930.5	7439.3	4485.0	94.0	-31.3	11961.9	11961.9	11961.9	0.0	0	0
04/04/16	Monday	4	3.6	0	181020.8298	0.9	2	0	0	0.0				11961.9	11854.4	7439.3	4485.0	80.6	-26.9	11881.3	11881.3	11881.3	0.0	0	0
05/04/16	Tuesday	4	4.9	0	181020.8298	0.9	2	0	0	0.0				11881.3	11760.9	7439.3	4485.0	90.3	-30.1	11791.0	11791.0	11791.0	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty during winter flag
06/04/16	Wednesday	4	4.7	0	181020.8298	0.9	2	0	0	0.0				11751.0	11672.6	7439.3	4485.0	88.8	-29.6	11702.2	11702.2	11702.2	0.0	0	0
07/04/16	Thursday	4	4.9	0	181020.8298	0.9	2	0	0	0.0				11702.2	11581.8	7439.3	4485.0	90.3	-30.1	11611.9	11611.9	11611.9	0.0	0	0
08/04/16	Friday	4	4.4	0	181020.8298	0.9	2	0	0	0.0				11611.9	11496.5	7439.3	4485.0	86.6	-28.9	11525.4	11525.4	11525.4	0.0	0	0
09/04/16	Saturday	4	3	0	181020.8298	0.9	2	0	0	0.0				11525.4	11423.8	7439.3	4485.0	76.1	-25.4	11449.2	11449.2	11449.2	0.0	0	0
10/04/16	Sunday	4	5.3	11.4	181020.8298	0.9	2	9.4	113.0766	1644.5				11449.2	12969.4	7439.3	4485.0	93.2	-31.1	13000.5	13000.5	13000.5	0.0	0	0
11/04/16	Monday	4	3.1	4	181020.8298	0.9	2	2	39.676	365.5				13000.5	13263.5	7439.3	4485.0	76.9	-25.6	13289.1	13289.1	13289.1	0.0	0	0
12/04/16	Tuesday	4	2.1	5.2	181020.8298	0.9	2	3.2	51.5788	572.9				13289.1	13769.5	7439.3	4485.0	69.4	-23.1	13792.6	13792.6	13792.6	0.0	0	0
13/04/16	Wednesday	4	2.5	2	181020.8298	0.9	2	0	19.838	19.8				13792.6	13715.9	7439.3	4485.0	72.4	-24.1	13740.0	13740.0	13740.0	0.0	0	0
14/04/16	Thursday	4	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				13740.0	13645.5	7439.3	4485.0	72.4	-24.1	13669.6	13669.6	13669.6	0.0	0	0
15/04/16	Friday	4	4.1	0	181020.8298	0.9	2	0	0	0.0				13669.6	13557.2	7439.3	4485.0	84.3	-28.1	13585.3	13585.3	13585.3	0.0	0	0
16/04/16	Saturday	4	5.3	0	181020.8298	0.9	2	0	0	0.0				13585.3	13461.0	7439.3	4485.0	93.2	-31.1	13492.0	13492.0	13492.0	0.0	0	0
17/04/16	Sunday	4	1.5	1.2	181020.8298	0.9	2	0	11.9028	11.9				13492.0	13417.3	7439.3	4485.0	65.0	-21.7	13439.0	13439.0	13439.0	0.0	0	0
18/04/16	Monday	4	1.9	1.6	181020.8298	0.9	2	0	15.8704	15.9				13439.0	13364.2	7439.3	4485.0	68.0	-22.7	13386.9	13386.9	13386.9	0.0	0	0
19/04/16	Tuesday	4	3.2	21.6	181020.8298	0.9	2	19.6	214.2504	3407.5				13386.9	16690.8	7439.3	4485.0	77.6	-25.9	16716.7	16716.7	16716.7	0.0	0	0
20/04/16	Wednesday	4	3.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				16716.7	16615.2	7439.3	4485.0	77.6	-25.9	16641.1	16641.1	16641.1	0.0	0	0
21/04/16	Thursday	4	3.8	0	181020.8298	0.9	2	0	0	0.0				16641.1	16531.6	7439.3	4485.0	82.1	-27.4	16559.0	16559.0	16559.0	0.0	0	0
22/04/16	Friday	4	4.7	0	181020.8298	0.9	2	0	0	0.0				16559.0	16440.6	7439.3	4485.0	88.8	-29.6	16470.2	16470.2	16470.2	0.0	0	0
23/04/16	Saturday	4	5.4	0	181020.8298	0.9	2	0	0	0.0				16470.2	16344.9	7439.3	4485.0	94.0	-31.3	16376.2	16376.2	16376.2	0.0	0	0
24/04/16	Sunday	4	3.2	0	181020.8298	0.9	2	0	0	0.0				16376.2	16272.7	7439.3	4485.0	77.6	-25.9	16298.6	16298.6	16298.6	0.0	0	0
25/04/16	Monday	4	1.6	0.6	181020.8298	0.9	2	0	5.9514	6.0				16298.6	16216.9	7439.3	4485.0	65.7	-21.9	16238.8	16238.8	16238.8	0.0	0	0
26/04/16	Tuesday	4	3	7.4	181020.8298	0.9	2	5.4	73.4006	953.2				16238.8	17090.4	9919.0	5980.0	101.5	0.0	17090.4	17090.4	17090.4	0.0	0	0
27/04/16	Wednesday	4	1.8	1.8	181020.8298	0.9	2	0	17.8542	17.9				17090.4	17018.7	9919.0	5980.0	89.6	0.0	17018.7	17018.7	17018.7	0.0	0	0
28/04/16	Thursday	4	2.7	1.8	181020.8298	0.9	2	0	17.8542	17.9				17018.7	16938.0	9919.0	5980.0	98.5	0.0	16938.0	16938.0	16938.0	0.0	0	0
29/04/16	Friday	4	3.1	6.6	181020.8298	0.9	2	4.6	65.4654	814.9				16938.0	17650.4	9919.0	5980.0	102.5	0.0	17650.4	17650.4	17650.4	0.0	0	0
30/04/16	Saturday	4	2.5	4.6	181020.8298	0.9	2	2.6	45.6274	469.2				17650.4	18023.0	9919.0	5980.0	96.6	0.0	18023.0	18023.0	18023.0	0.0	0	0
01/05/16	Sunday	5	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				18023.0	17931.4	9919.0	5980.0	93.6	0.0	17931.4	17931.4	17931.4	0.0	0	0
02/05/16	Monday	5	2.1	0	181020.8298	0.9	2	0	0	0.0				17931.4	17838.9	9919.0	5980.0	92.6	0.0	17838.9	17838.9	17838.9	0.0	0	0
03/05/16	Tuesday	5	1.9	0.4	181020.8298	0.9	2	0	3.9676	4.0				17838.9	17752.2	9919.0	5980.0	90.6	0.0	17752.2	17752.2	17752.2	0.0	0	0
04/05/16	Wednesday	5	2.1	0	181020.8298	0.9	2	0	0	0.0				17752.2	17659.6	9919.0	5980.0	92.6	0.0	17659.6	17659.6	17659.6	0.0	0	0
05/05/16	Thursday	5	1.6	0.4	181020.8298	0.9	2	0	3.9676	4.0				17659.6	17576.0	9919.0	5980.0	87.6	0.0	17576.0	17576.0	17576.0	0.0	0	0
06/05/16	Friday	5	1.9	0	181020.8298	0.9	2	0	0	0.0				17576.0	17485.4	9919.0	5980.0	90.6	0.0	17485.4	17485.4	17485.4	0.0	0	0
07/05/16	Saturday	5	2.4	25.2	181020.8298	0.9	2	23.2	249.9588	4029.7				17485.4	21419.5	9919.0	5980.0	95.6	0.0	21419.5	21419.5	21419.5	0.0	0	0
08/05/16	Sunday	5	2.2	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				21419.5	21380.3	9919.0	5980.0	93.6	0.0	21380.3	21380.3	21380.3	0.0	0	0
09/05/16	Monday	5	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21380.3	21288.7	9919.0	5980.0	93.6	0.0	21288.7	21288.7	21288.7	0.0	0	0
10/05/16	Tuesday	5	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				21288.7	21197.1	9919.0	5980.0	93.6	0.0	21197.1	21197.1	21197.1	0.0	0	0
11/05/16	Wednesday	5	3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21197.1	21097.6	9919.0	5980.0	101.5	0.0	21097.6	21097.6	21097.6	0.0	0	0
12/05/16	Thursday	5	2.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				21097.6	21000.0	9919.0	5980.0	99.5	0.0	21000.0	21000.0	21000.0	0.0	0	0
13/05/16	Friday	5	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				21000.0	20905.4	9919.0	5980.0	96.6	0.0	20905.4	20905.4	20905.4	0.0	0	0
14/05/16	Saturday	5	2.3	11.2	181020.8298	0.9	2	9.2	111.0928	1609.9				20905.4	22420.8	9919.0	5980.0	94.6	0.0	22420.8	22274.5	22274.5	146.3	1	0
15/05/16	Sunday	5	2.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22177.9	9919.0	5980.0	98.5	0.0	22177.9	22177.9	22177.9	0.0	0	0
16/05/16	Monday	5	2	5	181020.8298	0.9	2	3	49.595	538.4				22177.9	22624.7	9919.0	5980.0	91.6	0.0	22624.7	22274.5	22274.5	350.2	1	0
17/05/16	Tuesday	5	1.9	0	181020.8298	0.9	2	0	0	0.0				22274.5	22183.9	9919.0	5980.0	90.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
18/05/16	Wednesday	5	1.8	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				22183.9	22183.2	9919.0	5980.0	89.6	0.0	22183.2	22183.2	22183.2	0.0	0	0
19/05/16	Thursday	5	1.8	0	181020.8298	0.9	2	0	0	0.0				22183.2	22093.6	9919.0	5980.0	89.6	0.0	22093.6	22093.6	22093.6	0.0	0	0
20/05/16	Friday	5	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22093.6	22006.0	9919.0	5980.0	89.6	0.0	22006.0	22006.0	22006.0	0.0	0	0
21/05/16	Saturday	5	2.9	37.2	181020.8298	0.9	2	35.2	368.9868	6103.7				22006.0	28009.2	9919.0	5980.0	100.5	0.0	28009.2	22274.5	22274.5	5734.7	1	0
22/05/16	Sunday	5	2.2	17.4	181020.8298	0.9	2	15.4	172.5906	2681.5				22274.5	24862.4	9919.0	5980.0	93.6	0.0	24862.4	22274.5	22274.5	2588.0	1	0
23/05/16	Monday	5	3	5.6	181020.8298	0.9	2	3.6	55.5464	642.1				22274.5	22815.0	9919.0	5980.0	101.5	0.0	22815.0	22274.5	22274.5	540.5	1	0
24/05/16	Tuesday	5	2.8	44.6	181020.8298	0.9	2	42.6	442.3874	7382.7				22274.5	29557.7	9919.0	5980.0	99.5	0.0	29557.7	22274.5	22274.5	7283.2	1	0
25/05/16	Wednesday	5	2.8	1	181020.8298	0.9	2	0	9.919	9.9				22274.5	22184.9	9919.0	5980.0	99.5	0.0	22184.9	22184.9	22184.9	0.0	0	0
26/05/16	Thursday	5	2.8	4.4	181020.8298	0.9	2	2.4	43.6436	434.6				22184.9	22520.0	9919.0	5980.0	99.5	0.0	22520.0	22274.5	22274.5	245.5	1	0
27/05/16	Friday	5	2.3	0.4	181020.8298	0.9	2	0	3.9676	4.0				22274.5	22183.9	9919.0	5980.0	94.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
28/05/16	Saturday	5	2.6	9.4	181020.8298	0.9	2	7.4	93.2386	1298.8				22183.9	23385.2	9919.0	5980.0	97.5	0.0	23385.2	22274.5	22274.5	1110.7	1	0
29/05/16	Sunday	5	1.6	4	181020.8298	0.9	2	2	39.676	365.5				22274.5	22552.4	9919.0	5980.0	87.6	0.0	22552.4	22274.5	22274.5	277.9	1	0
30/05/16	Monday	5	1.9	0	181020.8298	0.9	2	0	0	0.0				22274.5	22183.9	9919.0	5980.0	90.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
31/05/16	Tuesday	5	1.9	0	181020.8298	0.9	2	0	0	0.0				22183.9	22093.3	9919.0	5980.0	90.6	0.0	22093.3	22093.3	22093.3	0.0	0	0
01/06/16	Wednesday	6	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22093.3	21997.7	9919.0	5980.0	97.5	0.0	21997.7	21997.7	21997.7	0.0	0	0
02/06/16	Thursday	6	3.1	0	181020.8298	0.9	2	0	0	0.0				21997.7	21895.2	9919.0	5980.0	102.5	0.0	21895.2	21895.2	21895.2	0.0	0	0
03/06/16	Friday	6	3	0	181020.8298	0.9	2	0	0	0.0				21895.2	21793.7	9919.0	5980.0	101.5	0.0	21793.7	21793.7	21793.7	0.0	0	0
04/06/16	Saturday	6	2	11.8	181020.8298	0.9	2	9.8	117.0442	1713.6				21793.7	23415.7	9919.0	5980.0	91.6	0.0	23415.7	22274.5	22274.5	1141.2	1	0
05/06/16	Sunday	6	1.7	0.4	181020.8298	0.9	2	0	3.9676	4.0				22274.5	22189.8	9919.0	5980.0	88.6	0.0	22189.8	22189.8	22189.8	0.0	0	0
06/06/16	Monday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22189.8	22106.2	9919.0	5980.0	85.6	0.0	22106.2	22106.2	22106.2	0.0	0	0
07/06/16	Tuesday	6	1.9	21	181020.8298	0.9	2	19	208.299	3303.8				22106.2	25319.3	9919.0	5980.0	90.6	0.0	25319.3	22274.5	22274.5	3044.8	1	0
08/06/16	Wednesday	6	1.8	0	181020.8298	0.9	2	0	0	0.0				22274.5	22184.9	9919.0	5980.0	89.6	0.0	22184.9	22184.9	22184.9	0.0	0	0
09/06/16	Thursday	6	1.6	0	181020.8298	0.9	2	0	0	0.0				22184.9	22097.2	9919.0	5980.0	87.6	0.0	22097.2	22097.2	22097.2	0.0	0	0
10/06/16	Friday	6	1.4	8	181020.8298	0.9	2	6	79.352	1056.9				22097.2	23068.5	9919.0	5980.0	85.6	0.0	23068.5	22274.5	22274.5	794.0	1	0
11/06/16	Saturday	6	2	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22184.9	9919.0	5980.0	91.6	0.0	22184.9	22184.9	22184.9	0.0	0	0
12/06/16	Sunday	6	3.2	0	181020.8298	0.9	2	0	0	0.0				22184.9	22081.4	9919.0	5980.0	103.5	0.0	22081.4	22081.4	22081.4	0.0	0	0
13/06/16	Monday	6	1.7	24	181020.8298	0.9	2	22	238.056	3822.3				22081.4	25815.0	9919.0	5980.0	88.6	0.0	25815.0	22274.5	22274.5	3540.5	1	0
14/06/16	Tuesday	6	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22186.8	9919.0	5980.0	89.6	0.0	22186.8	22186.8	22186.8	0.0	0	0
15/06/16	Wednesday	6	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22186.8	22101.2	9919.0	5980.0	87.6	0.0	22101.2	22101.2	22101.2	0.0	0	0
16/06/16	Thursday	6	1.6	0	181020.8298	0.9	2	0	0	0.0				22101.2	22013.6	9919.0	5980.0	87.6	0.0	22013.6	22013.6	22013.6	0.0	0	0
17/06/16	Friday	6	1.8	0	181020.8298	0.9	2	0	0	0.0				22013.6	21924.0	9919.0	5980.0	89.6	0.0	21924.0	21924.0	21924.0	0.0	0	0
18/06/16	Saturday	6	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				21924.0	21830.4	9919.0	5980.0	95.6	0.0	21830.4	21830.4	21830.4	0.0	0	0
19/06/16	Sunday	6	1.7	0	181020.8298	0.9	2	0	0	0.0				21830.4	21741.8	9919.0	5980.0	88.6	0.0	21741.8	21741.8	21741.8	0.0	0	0
20/06/16	Monday	6	1.1	9	181020.8298	0.9	2	7	89.271	1229.7				21741.8	22888.8	9919.0	5980.0	82.7	0.0	22888.8	22274.5	22274.5	614.3	1	0
21/06/16	Tuesday	6	1.6	6.4	181020.8298	0.9	2	4.4	63.4816	780.3				22274.5	22967.2	9919.0	5980.0	87.6	0.0	22967.2	22274.5	22274.5	692.7	1	0
22/06/16	Wednesday	6	1.8	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				22274.5	22308.4	9919.0	5980.0	89.6	0.0	22308.4	22274.5	22274.5	33.9	1	0
23/06/16	Thursday	6	1.3	2	181020.8298	0.9	2	0	19.838	19.8				22274.5	22209.7	9919.0	5980.0	84.7	0.0	22209.7	22209.7	22209.7	0.0	0	0
24/06/16	Friday	6	2	0	181020.8298	0.9	2	0	0	0.0				22209.7	22118.1	9919.0	5980.0	91.6	0.0	22118.1	22118.1	22118.1	0.0	0	0
25/06/16	Saturday	6	1.7	7.4	181020.8298	0.9	2	5.4	73.4006	953.2				22118.1	22982.6	9919.0	5980.0	88.6	0.0	22982.6	22274.5	22274.5	708.1	1	0
26/06/16	Sunday	6	1.8	0.8	181020.8298	0.9	2	0	7.9352	7.9				22274.5	22192.8	9919.0	5980.0	89.6	0.0	22192.8	22192.8	22192.8	0.0	0	0
27/06/16	Monday	6	2.5	0	181020.8298	0.9	2	0	0	0.0				22192.8	22096.2	9919.0	5980.0	96.6	0.0	22096.2	22096.2	22096.2	0.0	0	0
28/06/16	Tuesday	6	1.4	2.8	181020.8298	0.9	2	0.8	27.7732	158.1				22096.2	22168.7	9919.0	5980.0	85.6	0.0	22168.7	22168.7	22168.7	0.0	0	0
29/06/16	Wednesday	6	1.7	23.2	181020.8298	0.9	2	21.2	230.1208	3684.0				22168.7	25764.1	9919.0	5980.0	88.6	0.0	25764.1	22274.5	22274.5	3489.6	1	0
30/06/16	Thursday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22189.8	9919.0	5980.0	86.6	0.0	22189.8	22189.8	22189.8	0.0	0	0
01/07/16	Friday	7	1.7	0.4	181020.8298	0.9	2	0	3.9676	4.0				22189.8	22105.2	9919.0	5980.0	88.6	0.0	22105.2	22105.2	22105.2	0.0	0	0
02/07/16	Saturday	7	2.5	0	181020.8298	0.9	2	0	0	0.0				22105.2	22008.6	9919.0	5980.0	96.6	0.0	22008.6	22008.6	22008.6	0.0	0	0
03/07/16	Sunday	7	1.8	0.4	181020.8298	0.9	2	0	3.9676	4.0				22008.6	21923.0	9919.0	5980.0	89.6	0.0	21923.0	21923.0	21923.0	0.0	0	0
04/07/16	Monday	7	1.9	0.2	181020.8298	0.9	2	0	1.9838	2.0				21923.0	21834.3	9919.0	5980.0	90.6	0.0	21834.3	21834.3	21834.3	0.0	0	0
05/07/16	Tuesday	7	2.5	0	181020.8298	0.9	2	0	0	0.0				21834.3	21737.8	9919.0	5980.0	96.6	0.0	21737.8	21737.8	21737.8	0.0	0	0
06/07/16	Wednesday	7	2.1	0	181020.8298	0.9	2	0	0	0.0				21737.8	21645.2	9919.0	5980.0	92.6	0.0	21645.2	21645.2	21645.2	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
07/07/16	Thursday	7	1.5	0	181020.8298	0.9	2	0	0	0.0			
08/07/16	Friday	7	2.3	18.8	181020.8298	0.9	2	16.8	186.4772	2923.5			
09/07/16	Saturday	7	2.3	16.2	181020.8298	0.9	2	14.2	160.6878	2474.1			
10/07/16	Sunday	7	2.3	30.8	181020.8298	0.9	2	28.8	305.5052	4997.6			
11/07/16	Monday	7	2.3	1.4	181020.8298	0.9	2	0	13.8866	13.9			
12/07/16	Tuesday	7	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
13/07/16	Wednesday	7	3.5	0	181020.8298	0.9	2	0	0	0.0			
14/07/16	Thursday	7	4.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
15/07/16	Friday	7	2.4	0	181020.8298	0.9	2	0	0	0.0			
16/07/16	Saturday	7	2.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
17/07/16	Sunday	7	1.9	35	181020.8298	0.9	2	33	347.165	5723.5			
18/07/16	Monday	7	1.8	9	181020.8298	0.9	2	7	89.271	1229.7			
19/07/16	Tuesday	7	2.4	0.4	181020.8298	0.9	2	0	3.9676	4.0			
20/07/16	Wednesday	7	2.6	0	181020.8298	0.9	2	0	0	0.0			
21/07/16	Thursday	7	2.1	23.4	181020.8298	0.9	2	21.4	232.1046	3718.6			
22/07/16	Friday	7	1.9	5.2	181020.8298	0.9	2	3.2	51.5788	572.9			
23/07/16	Saturday	7	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
24/07/16	Sunday	7	1.7	1.4	181020.8298	0.9	2	0	13.8866	13.9			
25/07/16	Monday	7	1.6	0	181020.8298	0.9	2	0	0	0.0			
26/07/16	Tuesday	7	1.9	0.2	181020.8298	0.9	2	0	1.9838	2.0			
27/07/16	Wednesday	7	1.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
28/07/16	Thursday	7	2.9	0	181020.8298	0.9	2	0	0	0.0			
29/07/16	Friday	7	3.3	0	181020.8298	0.9	2	0	0	0.0			
30/07/16	Saturday	7	2.8	1.6	181020.8298	0.9	2	0	15.8704	15.9			
31/07/16	Sunday	7	2	9	181020.8298	0.9	2	7	89.271	1229.7			
01/08/16	Monday	8	2.6	1.8	181020.8298	0.9	2	0	17.8542	17.9			
02/08/16	Tuesday	8	2.6	0	181020.8298	0.9	2	0	0	0.0			
03/08/16	Wednesday	8	1.1	0	181020.8298	0.9	2	0	0	0.0			
04/08/16	Thursday	8	1.3	6.4	181020.8298	0.9	2	4.4	63.4816	780.3			
05/08/16	Friday	8	2.3	4.6	181020.8298	0.9	2	2.6	45.6274	469.2			
06/08/16	Saturday	8	3.5	0	181020.8298	0.9	2	0	0	0.0			
07/08/16	Sunday	8	2.5	8.6	181020.8298	0.9	2	6.6	85.3034	1160.6			
08/08/16	Monday	8	2.1	20.6	181020.8298	0.9	2	18.6	204.3314	3234.6			
09/08/16	Tuesday	8	2	9	181020.8298	0.9	2	7	89.271	1229.7			
10/08/16	Wednesday	8	2.3	7.6	181020.8298	0.9	2	5.6	75.3844	987.7			
11/08/16	Thursday	8	2	1.8	181020.8298	0.9	2	0	17.8542	17.9			
12/08/16	Friday	8	2.1	10	181020.8298	0.9	2	8	99.19	1402.5			
13/08/16	Saturday	8	2.5	0	181020.8298	0.9	2	0	0	0.0			
14/08/16	Sunday	8	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
15/08/16	Monday	8	2.5	0	181020.8298	0.9	2	0	0	0.0			
16/08/16	Tuesday	8	2.3	4.4	181020.8298	0.9	2	2.4	43.6436	434.6			
17/08/16	Wednesday	8	2.2	1.6	181020.8298	0.9	2	0	15.8704	15.9			
18/08/16	Thursday	8	2	26.6	181020.8298	0.9	2	24.6	263.8454	4271.6			
19/08/16	Friday	8	2.4	0	181020.8298	0.9	2	0	0	0.0			
20/08/16	Saturday	8	2.3	9.8	181020.8298	0.9	2	7.8	97.2062	1368.0			
21/08/16	Sunday	8	2.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
22/08/16	Monday	8	2.4	14.8	181020.8298	0.9	2	12.8	146.8012	2232.2			
23/08/16	Tuesday	8	3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
24/08/16	Wednesday	8	3.5	0	181020.8298	0.9	2	0	0	0.0			
25/08/16	Thursday	8	4.1	0	181020.8298	0.9	2	0	0	0.0			
26/08/16	Friday	8	2.6	0	181020.8298	0.9	2	0	0	0.0			
27/08/16	Saturday	8	2.6	51	181020.8298	0.9	2	49	505.869	8488.9			
28/08/16	Sunday	8	2.4	10.4	181020.8298	0.9	2	8.4	103.1576	1471.7			
29/08/16	Monday	8	2.1	2.2	181020.8298	0.9	2	0.2	21.8218	54.4			
30/08/16	Tuesday	8	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
31/08/16	Wednesday	8	2.6	5	181020.8298	0.9	2	3	49.595	538.4			
01/09/16	Thursday	9	2.2	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
02/09/16	Friday	9	3	0	181020.8298	0.9	2	0	0	0.0			
03/09/16	Saturday	9	3.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
04/09/16	Sunday	9	3	0	181020.8298	0.9	2	0	0	0.0			
05/09/16	Monday	9	2.9	0	181020.8298	0.9	2	0	0	0.0			
06/09/16	Tuesday	9	3.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
07/09/16	Wednesday	9	3.1	12.8	181020.8298	0.9	2	10.8	126.9632	1886.5			
08/09/16	Thursday	9	2.2	14.4	181020.8298	0.9	2	12.4	142.8336	2163.0			
09/09/16	Friday	9	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
10/09/16	Saturday	9	3.3	2.2	181020.8298	0.9	2	0.2	21.8218	54.4			
11/09/16	Sunday	9	4.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
12/09/16	Monday	9	4.2	0	181020.8298	0.9	2	0	0	0.0			
13/09/16	Tuesday	9	3.7	0	181020.8298	0.9	2	0	0	0.0			
14/09/16	Wednesday	9	2.9	0	181020.8298	0.9	2	0	0	0.0			
15/09/16	Thursday	9	3.4	0	181020.8298	0.9	2	0	0	0.0			
16/09/16	Friday	9	3.2	5.4	181020.8298	0.9	2	3.4	53.5626	607.5			
17/09/16	Saturday	9	2.9	0	181020.8298	0.9	2	0	0	0.0			
18/09/16	Sunday	9	2.9	0	181020.8298	0.9	2	0	0	0.0			
19/09/16	Monday	9	3.1	16.6	181020.8298	0.9	2	14.6	164.6554	2543.3			
20/09/16	Tuesday	9	3.6	0	181020.8298	0.9	2	0	0	0.0			
21/09/16	Wednesday	9	2.4	0.4	181020.8298	0.9	2	0	3.9676	4.0			
22/09/16	Thursday	9	3.1	0	181020.8298	0.9	2	0	0	0.0			
23/09/16	Friday	9	2.7	10.6	181020.8298	0.9	2	8.6	105.1414	1506.2			
24/09/16	Saturday	9	3.4	0.6	181020.8298	0.9	2	0	5.9514	6.0			
25/09/16	Sunday	9	2.6	16.6	181020.8298	0.9	2	14.6	164.6554	2543.3			
26/09/16	Monday	9	3.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
27/09/16	Tuesday	9	3.3	7.8	181020.8298	0.9	2	5.8	77.3682	1022.3			
28/09/16	Wednesday	9	3.7	9.4	181020.8298	0.9	2	7.4	93.2386	1298.8			
29/09/16	Thursday	9	3	0	181020.8298	0.9	2	0	0	0.0			
30/09/16	Friday	9	4.4	0	181020.8298	0.9	2	0	0	0.0			
01/10/16	Saturday	10	3.8	9.4	181020.8298	0.9	2	7.4	93.2386	1298.8			
02/10/16	Sunday	10	2.1	5.6	181020.8298	0.9	2	3.6	55.5464	642.1			
03/10/16	Monday	10	2.9	0.2	181020.8298	0.9	2	0	1.9838	2.0			
04/10/16	Tuesday	10	4.4	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
05/10/16	Wednesday	10	3.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
06/10/16	Thursday	10	4.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			

Date	Adjustments: Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow Calcs: Overflow (m^3)	Overflow flag	Pond Empty during winter flag
07/07/16	21645.2	21558.6	9919.0	5980.0	86.6	0.0	21558.6	21558.6	21558.6	0.0	0	0
08/07/16	21558.6	24387.5	9919.0	5980.0	94.6	0.0	24387.5	22274.5	22274.5	2113.0	1	0
09/07/16	22274.5	24654.0	9919.0	5980.0	94.6	0.0	24654.0	22274.5	22274.5	2379.6	1	0
10/07/16	22274.5	27177.5	9919.0	5980.0	94.6	0.0	27177.5	22274.5	22274.5	4903.0	1	0
11/07/16	22274.5	22193.8	9919.0	5980.0	94.6	0.0	22193.8	22193.8	22193.8	0.0	0	0
12/07/16	22193.8	22101.2	9919.0	5980.0	94.6	0.0	22101.2	22101.2	22101.2	0.0	0	0
13/07/16	22101.2	21994.7	9919.0	5980.0	106.5	0.0	21994.7	21994.7	21994.7	0.0	0	0
14/07/16	21994.7	21882.3	9919.0	5980.0	114.4	0.0	21882.3	21882.3	21882.3	0.0	0	0
15/07/16	21882.3	21786.7	9919.0	5980.0	95.6	0.0	21786.7	21786.7	21786.7	0.0	0	0
16/07/16	21786.7	21690.2	9919.0	5980.0	98.5	0.0	21690.2	21690.2	21690.2	0.0	0	0
17/07/16	21690.2	27323.0	9919.0	5980.0	90.6	0.0	27323.0	22274.5	22274.5	5048.6	1	0
18/07/16	22274.5	23414.6	9919.0	5980.0	89.6	0.0	23414.6	22274.5	22274.5	1140.1	1	0
19/07/16	22274.5	22182.9	9919.0	5980.0	95.6	0.0	22182.9	22182.9	22182.9	0.0	0	0
20/07/16	22182.9	22085.3	9919.0	5980.0	97.5	0.0	22085.3	22085.3	22085.3	0.0	0	0
21/07/16	22085.3	25711.3	9919.0	5980.0	92.6	0.0	25711.3	22274.5	22274.5	3436.8	1	0
22/07/16	22274.5	22756.8	9919.0	5980.0	90.6	0.0	22756.8	22274.5	22274.5	482.3	1	0
23/07/16	22274.5	22190.8	9919.0	5980.0	85.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
24/07/16	22190.8	22116.1	9919.0	5980.0	88.6	0.0	22116.1	22116.1	22116.1	0.0	0	0
25/07/16	22116.1	22028.4	9919.0	5980.0	87.6	0.0	22028.4	22028.4	22028.4	0.0	0	0
26/07/16	22028.4	21939.8	9919.0	5980.0	90.6	0.0	21939.8	21939.8	21939.8	0.0	0	0
27/07/16	21939.8	21852.2	9919.0	5980.0	89.6	0.0	21852.2	21852.2	21852.2	0.0	0	0
28/07/16	21852.2	21751.7	9919.0	5980.0	100.5	0.0	21751.7	21751.7	21751.7	0.0	0	0
29/07/16	21751.7	21647.2	9919.0	5980.0	104.5	0.0	21647.2	21647.2	21647.2	0.0	0	0
30/07/16	21647.2	21563.5	9919.0	5980.0	99.5	0.0	21563.5	21563.5	21563.5	0.0	0	0
31/07/16	21563.5	22701.6	9919.0	5980.0	91.6	0.0	22701.6	22274.5	22274.5	427.1	1	0
01/08/16	22274.5	22194.8	9919.0	5980.0	97.5	0.0	22194.8	22194.8	22194.8	0.0	0	0
02/08/16	22194.8	22097.2	9919.0	5980.0	97.5	0.0	22097.2	22097.2	22097.2	0.0	0	0
03/08/16	22097.2	22014.6	9919.0	5980.0	82.7	0.0	22014.6	22014.6	22014.6	0.0	0	0
04/08/16	22014.6	22710.2	9919.0	5980.0	84.7	0.0	22710.2	22274.5	22274.5	435.8	1	0
05/08/16	22274.5	22649.1	9919.0	5980.0	94.6	0.0	22649.1	22274.5	22274.5	374.6	1	0
06/08/16	22274.5	22168.0	9919.0	5980.0	106.5	0.0	22168.0	22168.0	22168.0	0.0	0	0
07/08/16	22168.0	23232.0	9919.0	5980.0	96.6	0.0	23232.0	22274.5	22274.5	957.5	1	0
08/08/16	22274.5	25416.5	9919.0	5980.0	92.6	0.0	25416.5	22274.5	22274.5	3142.0	1	0
09/08/16	22274.5	23412.6	9919.0	5980.0	91.6	0.0	23412.6	22274.5	22274.5	1138.1	1	0
10/08/16	22274.5	23167.6	9919.0	5980.0	94.6	0.0	23167.6	22274.5	22274.5	893.2	1	0
11/08/16	22274.5	22200.7	9919.0	5980.0	91.6	0.0	22200.7	22200.7	22200.7	0.0	0	0
12/08/16	22200.7	23510.7	9919.0	5980.0	92.6	0.0	23510.7	22274.5	22274.5	1236.2	1	0
13/08/16	22274.5	22177.9	9919.0	5980.0	96.6	0.0	22177.9	22177.9	22177.9	0.0	0	0
14/08/16	22177.9	22085.3	9919.0	5980.0	94.6	0.0	22085.3	22085.3	22085.3	0.0	0	0
15/08/16	22085.3	21988.8	9919.0	5980.0	96.6	0.0	21988.8	21988.8	21988.8	0.0	0	0
16/08/16	21988.8	22328.8	9919.0	5980.0	94.6	0.0	22328.8	22274.5	22274.5	54.4	1	0
17/08/16	22274.5	22196.8	9919.0	5980.0	93.6	0.0	22196.8	22196.8	22196.8	0.0	0	0
18/08/16	22196.8	26376.8	9919.0	5980.0	91.6	0.0	26376.8	22274.5	22274.5	4102.3	1	0
19/08/16	22274.5	22178.9	9919.0	5980.0	95.6	0.0	22178.9	22178.9	22178.9	0.0	0	0
20/08/16	22178.9	23452.3	9919.0	5980.0	94.6	0.0	23452.3	22274.5	22274.5	1177.8	1	0
21/08/16	22274.5	22176.9	9919.0	5980.0	99.5	0.0	22176.9	22176.9	22176.9	0.0	0	0
22/08/16	22176.9	24313.5	9919.0	5980.0	95.6	0.0	24313.5	22274.5	22274.5	2039.0	1	0
23/08/16	22274.5	22174.9	9919.0	5980.0	101.5	0.0	22174.9	22174.9	22174.9	0.0	0	0
24/08/16	22174.9	22068.5	9919.0	5980.0	106.5	0.0	22068.5	22068.5	22068.5	0.0	0	0
25/08/16	22068.5	21956.0	9919.0	5980.0	112.4	0.0	21956.0	21956.0	21956.0	0.0	0	0
26/08/16	21956.0	21858.5	9919.0	5980.0	97.5	0.0	21858.5	21858.5	21858.5	0.0	0	0
27/08/16	21858.5	30249.8	9919.0	5980.0	97.5	0.0	30249.8	22274.5	22274.5	7975.4	1	0
28/08/16	22274.5	23650.6	9919.0	5980.0	95.6	0.0	23650.6	22274.5	22274.5	1376.1	1	0
29/08/16	22274.5	22236.3	9919.0	5980.0	92.6	0.0	22236.3	22236.3	22236.3	0.0	0	0
30/08/16	22236.3	22141.7	9919.0	5980.0	96.6	0.0	22141.7	22141.7	22141.7	0.0	0	0
31/08/16	22141.7	22582.5	9919.0	5980.0	97.5	0.0	22582.5	22274.5	22274.5	308.0	1	0
01/09/16	22274.5	22269.9	9919.0	5980.0	93.6	0.0	22269.9	22269.9	22269.9	0.0	0	0
02/09/16	22269.9	22168.4	9919.0	5980.0	101.5	0.0	22168.4	22168.4	22168.4	0.0	0	0
03/09/16	22168.4	22064.9	9919.0	5980.0	105.5	0.0	22064.9	22064.9	22064.9	0.0	0	0
04/09/16	22064.9	21963.3	9919.0	5980.0	101.5	0.0	21963.3	21963.3	21963.3	0.0	0	0
05/09/16	21963.3	21862.8	9919.0	5980.0	100.5	0.0	21862.8	21862.8	21862.8	0.0	0	0
06/09/16	21862.8	21755.3	9919.0	5980.0	109.5	0.0	21755.3	21755.3	21755.3	0.0	0	0
07/09/16	21755.3	23539.3	9919.0	5980.0	102.5	0.0	23539.3	22274.5	22274.5	1264.8	1	0
08/09/16	22274.5	24343.9	9919.0	5980.0	93.6	0.0	24343.9	22274.5	22274.5	2069.4	1	0
09/09/16	22274.5	22181.9	9919.0	5980.0	94.6	0.0	22181.9	22181.9	22181.9	0.0	0	0
10/09/16	22181.9	22131.8	9919.0	5980.0	104.5	0.0	22131.8	22131.8	22131.8	0.0	0	0
11/09/16	22131.8	22017.4	9919.0	5980.0	116.4	0.0	22017.4	22017.4	22017.4	0.0	0	0
12/09/16	22017.4	21904.0	9919.0	5980.0	113.4	0.0	21904.0	21904.0	21904.0	0.0	0	0
13/09/16	21904.0	21795.5	9919.0	5980.0	108.5	0.0	21795.5	21795.5	21795.5	0.0	0	0
14/09/16	21795.5	21695.0	9919.0	5980.0	100.5	0.0	21695.0	21695.0	21695.0	0.0	0	0
15/09/16	21695.0	21589.5	9919.0	5980.0	105.5	0.0	21589.5	21589.5	21589.5	0.0	0	0
16/09/16	21589.5	22093.5	9919.0	5980.0	103.5	0.0	22093.5	22093.5	22093.5	0.0	0	0
17/09/16	22093.5	21993.0	9919.0	5980.0	100.5	0.0	21993.0	21993.0	21993.0	0.0	0	0
18/09/16	21993.0	21892.4	9919.0	5980.0	100.5	0.0	21892.4	21892.4	21892.4	0.0	0	0
19/09/16	21892.4	24333.2	9919.0	5980.0	102.5	0.0	24333.2	22274.5	22274.5	2058.7	1	0
20/09/16	22274.5	22167.0	9919.0	5980.0	107.5	0.0	22167.0	22167.0	22167.0	0.0	0	0
21/09/16	22167.0	22075.4	9919.0	5980.0	95.6	0.0	22075.4	22075.4	22075.4	0.0	0	0
22/09/16	22075.4	21972.9	9919.0	5980.0	102.5	0.0	21972.9	21972.9	21972.9	0.0	0	0
23/09/16	21972.9	23380.6	9919.0	5980.0	98.5	0.0	23380.6	22274.5	22274.5	1106.1	1	0
24/09/16	22274.5	22174.9	9919.0	5980.0	105.5	0.0	22174.9	22174.9	22174.9	0.0	0	0
25/09/16	22174.9	24620.7	9919.0	5980.0	97.5	0.0	24620.7	22274.5	22274.5	2346.2	1	0
26/09/16	22274.5	22168.0	9919.0	5980.0	108.5	0.0	22168.0	22168.0	22168.0	0.0	0	0
27/09/16	22168.0	23085.8	9919.0	5980.0	104.5	0.0	23085.8	22274.5	22274.5	811.3	1	0
28/09/16	22274.5	23464.9	9919.0	5980.0	108.5	0.0	23464.9	22274.5	22274.5	1190.4	1	0
29/09/16	22274.5	22173.0	9919.0	5980.0	101.5	0.0	22173.0	22173.0	22173.0	0.0	0	0
30/09/16	22173.0	22057.6	9919.0	5980.0	115.4	0.0	22057.6	22057.6	22057.6	0.0	0	0
01/10/16	22057.6	23246.9	9919.0	5980.0	109.5	0.0	23246.9	22274.5	22274.5	972.5	1	0
02/10/16	22274.5	22823.9	9919.0	5980.0	92.6	0.0	22823.9	22274.5	22274.5	549.5	1	0
03/10/16	22274.5	22175.9	9919.0	5980.0	100.5	0.0	22175.9	22175.9	22175.9	0.0	0	0
04/10/16	22175.9	22149.5	9919.0	5980.0	115.4	0.0	22149.5	22149.5	22149.5	0.0	0	0
05/10/16	22149.5	22047.0	9919.0	5980.0	104.5	0.0	22047.0	22047.0	22047.0	0.0	0	0
06/10/16	22047.0	21935.6	9919.0	5980.0	113.4	0.0	21935.6	21935.6	21935.6	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period(m^3)	Prelimpond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
07/10/16	Friday	10	2.7	10.6	181020.8298	0.9	2	8.6	105.1414	1506.2				21935.6	23343.3	9919.0	5980.0	98.5	0.0	23343.3	22274.5	22274.5	1068.8	1	0
08/10/16	Saturday	10	4.3	10.2	181020.8298	0.9	2	8.2	101.1738	1437.1				22274.5	23597.2	9919.0	5980.0	114.4	0.0	23597.2	22274.5	22274.5	1322.7	1	0
09/10/16	Sunday	10	4.2	10.6	181020.8298	0.9	2	8.6	105.1414	1506.2				22274.5	23667.3	9919.0	5980.0	113.4	0.0	23667.3	22274.5	22274.5	1392.8	1	0
10/10/16	Monday	10	5.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22149.2	9919.0	5980.0	127.3	0.0	22149.2	22149.2	22149.2	0.0	0	0
11/10/16	Tuesday	10	7.6	0	181020.8298	0.9	2	0	0	0.0				22149.2	22002.0	9919.0	5980.0	147.1	0.0	22002.0	22002.0	22002.0	0.0	0	0
12/10/16	Wednesday	10	4.4	0	181020.8298	0.9	2	0	0	0.0				22002.0	21886.6	9919.0	5980.0	115.4	0.0	21886.6	21886.6	21886.6	0.0	0	0
13/10/16	Thursday	10	4.1	0	181020.8298	0.9	2	0	0	0.0				21886.6	21774.2	9919.0	5980.0	112.4	0.0	21774.2	21774.2	21774.2	0.0	0	0
14/10/16	Friday	10	4.4	1	181020.8298	0.9	2	0	9.919	9.9				21774.2	21668.7	9919.0	5980.0	115.4	0.0	21668.7	21668.7	21668.7	0.0	0	0
15/10/16	Saturday	10	4	20.2	181020.8298	0.9	2	18.2	200.3638	3165.5				21668.7	24722.7	9919.0	5980.0	111.4	0.0	24722.7	22274.5	22274.5	2448.3	1	0
16/10/16	Sunday	10	3.2	1	181020.8298	0.9	2	0	9.919	9.9				22274.5	22180.9	9919.0	5980.0	103.5	0.0	22180.9	22180.9	22180.9	0.0	0	0
17/10/16	Monday	10	4.9	0	181020.8298	0.9	2	0	0	0.0				22180.9	22060.5	9919.0	5980.0	120.4	0.0	22060.5	22060.5	22060.5	0.0	0	0
18/10/16	Tuesday	10	3.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22060.5	21954.1	9919.0	5980.0	108.5	0.0	21954.1	21954.1	21954.1	0.0	0	0
19/10/16	Wednesday	10	4.8	0	181020.8298	0.9	2	0	0	0.0				21954.1	21834.7	9919.0	5980.0	119.4	0.0	21834.7	21834.7	21834.7	0.0	0	0
20/10/16	Thursday	10	5.3	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				21834.7	21764.8	9919.0	5980.0	124.3	0.0	21764.8	21764.8	21764.8	0.0	0	0
21/10/16	Friday	10	7.7	0	181020.8298	0.9	2	0	0	0.0				21764.8	21616.6	9919.0	5980.0	148.1	0.0	21616.6	21616.6	21616.6	0.0	0	0
22/10/16	Saturday	10	6.9	0	181020.8298	0.9	2	0	0	0.0				21616.6	21476.4	9919.0	5980.0	140.2	0.0	21476.4	21476.4	21476.4	0.0	0	0
23/10/16	Sunday	10	3.6	0	181020.8298	0.9	2	0	0	0.0				21476.4	21369.0	9919.0	5980.0	107.5	0.0	21369.0	21369.0	21369.0	0.0	0	0
24/10/16	Monday	10	3.8	0	181020.8298	0.9	2	0	0	0.0				21369.0	21259.5	9919.0	5980.0	109.5	0.0	21259.5	21259.5	21259.5	0.0	0	0
25/10/16	Tuesday	10	4.1	0	181020.8298	0.9	2	0	0	0.0				21259.5	21147.1	9919.0	5980.0	112.4	0.0	21147.1	21147.1	21147.1	0.0	0	0
26/10/16	Wednesday	10	4.7	0	181020.8298	0.9	2	0	0	0.0				21147.1	21028.7	9919.0	5980.0	118.4	0.0	21028.7	21028.7	21028.7	0.0	0	0
27/10/16	Thursday	10	4.9	0.2	181020.8298	0.9	2	0	1.9838	2.0				21028.7	20910.3	9919.0	5980.0	120.4	0.0	20910.3	20910.3	20910.3	0.0	0	0
28/10/16	Friday	10	4.6	0	181020.8298	0.9	2	0	0	0.0				20910.3	20792.9	9919.0	5980.0	117.4	0.0	20792.9	20792.9	20792.9	0.0	0	0
29/10/16	Saturday	10	5.1	1	181020.8298	0.9	2	0	9.919	9.9				20792.9	20680.5	9919.0	5980.0	122.3	0.0	20680.5	20680.5	20680.5	0.0	0	0
30/10/16	Sunday	10	5.5	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				20680.5	20850.6	9919.0	5980.0	126.3	0.0	20850.6	20850.6	20850.6	0.0	0	0
31/10/16	Monday	10	6.6	0	181020.8298	0.9	2	0	0	0.0				20850.6	20713.3	9919.0	5980.0	137.2	0.0	20713.3	20713.3	20713.3	0.0	0	0
01/11/16	Tuesday	11	7.4	0	181020.8298	0.9	2	0	0	0.0				20713.3	20568.2	9919.0	5980.0	145.2	0.0	20568.2	20568.2	20568.2	0.0	0	0
02/11/16	Wednesday	11	5.4	0	181020.8298	0.9	2	0	0	0.0				20568.2	20442.9	9919.0	5980.0	125.3	0.0	20442.9	20442.9	20442.9	0.0	0	0
03/11/16	Thursday	11	5.5	0	181020.8298	0.9	2	0	0	0.0				20442.9	20316.5	9919.0	5980.0	126.3	0.0	20316.5	20316.5	20316.5	0.0	0	0
04/11/16	Friday	11	8.6	0	181020.8298	0.9	2	0	0	0.0				20316.5	20159.5	9919.0	5980.0	157.1	0.0	20159.5	20159.5	20159.5	0.0	0	0
05/11/16	Saturday	11	5.8	0	181020.8298	0.9	2	0	0	0.0				20159.5	20030.2	9919.0	5980.0	129.3	0.0	20030.2	20030.2	20030.2	0.0	0	0
06/11/16	Sunday	11	5.6	0	181020.8298	0.9	2	0	0	0.0				20030.2	19902.9	9919.0	5980.0	127.3	0.0	19902.9	19902.9	19902.9	0.0	0	0
07/11/16	Monday	11	5.6	0	181020.8298	0.9	2	0	0	0.0				19902.9	19775.6	9919.0	5980.0	127.3	0.0	19775.6	19775.6	19775.6	0.0	0	0
08/11/16	Tuesday	11	4.7	0	181020.8298	0.9	2	0	0	0.0				19775.6	19657.2	9919.0	5980.0	118.4	0.0	19657.2	19657.2	19657.2	0.0	0	0
09/11/16	Wednesday	11	4.5	0	181020.8298	0.9	2	0	0	0.0				19657.2	19540.8	9919.0	5980.0	116.4	0.0	19540.8	19540.8	19540.8	0.0	0	0
10/11/16	Thursday	11	5.1	0	181020.8298	0.9	2	0	0	0.0				19540.8	19418.5	9919.0	5980.0	122.3	0.0	19418.5	19418.5	19418.5	0.0	0	0
11/11/16	Friday	11	4.9	6.6	181020.8298	0.9	2	4.6	65.4654	814.9				19418.5	20113.0	9919.0	5980.0	120.4	0.0	20113.0	20113.0	20113.0	0.0	0	0
12/11/16	Saturday	11	8	0	181020.8298	0.9	2	0	0	0.0				20113.0	19961.9	9919.0	5980.0	151.1	0.0	19961.9	19961.9	19961.9	0.0	0	0
13/11/16	Sunday	11	10.7	0	181020.8298	0.9	2	0	0	0.0				19961.9	19784.0	9919.0	5980.0	177.9	0.0	19784.0	19784.0	19784.0	0.0	0	0
14/11/16	Monday	11	10.6	0	181020.8298	0.9	2	0	0	0.0				19784.0	19607.1	9919.0	5980.0	176.9	0.0	19607.1	19607.1	19607.1	0.0	0	0
15/11/16	Tuesday	11	3.4	0	181020.8298	0.9	2	0	0	0.0				19607.1	19501.6	9919.0	5980.0	105.5	0.0	19501.6	19501.6	19501.6	0.0	0	0
16/11/16	Wednesday	11	5.7	0	181020.8298	0.9	2	0	0	0.0				19501.6	19373.3	9919.0	5980.0	128.3	0.0	19373.3	19373.3	19373.3	0.0	0	0
17/11/16	Thursday	11	7.3	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0				19373.3	20355.1	9919.0	5980.0	144.2	0.0	20355.1	20355.1	20355.1	0.0	0	0
18/11/16	Friday	11	6	0	181020.8298	0.9	2	0	0	0.0				20355.1	20223.8	9919.0	5980.0	131.3	0.0	20223.8	20223.8	20223.8	0.0	0	0
19/11/16	Saturday	11	5.9	0	181020.8298	0.9	2	0	0	0.0				20223.8	20093.6	9919.0	5980.0	130.3	0.0	20093.6	20093.6	20093.6	0.0	0	0
20/11/16	Sunday	11	5.8	0	181020.8298	0.9	2	0	0	0.0				20093.6	19964.3	9919.0	5980.0	129.3	0.0	19964.3	19964.3	19964.3	0.0	0	0
21/11/16	Monday	11	8.1	0	181020.8298	0.9	2	0	0	0.0				19964.3	19812.2	9919.0	5980.0	152.1	0.0	19812.2	19812.2	19812.2	0.0	0	0
22/11/16	Tuesday	11	9	0	181020.8298	0.9	2	0	0	0.0				19812.2	19651.1	9919.0	5980.0	161.0	0.0	19651.1	19651.1	19651.1	0.0	0	0
23/11/16	Wednesday	11	10.4	0	181020.8298	0.9	2	0	0	0.0				19651.1	19475.2	9919.0	5980.0	174.9	0.0	19476.2	19476.2	19476.2	0.0	0	0
24/11/16	Thursday	11	10.6	0	181020.8298	0.9	2	0	0	0.0				19475.2	19299.3	9919.0	5980.0	176.9	0.0	19299.3	19299.3	19299.3	0.0	0	0
25/11/16	Friday	11	10.9	0	181020.8298	0.9	2	0	0	0.0				19299.3	19119.4	9919.0	5980.0	179.9	0.0	19119.4	19119.4	19119.4	0.0	0	0
26/11/16	Saturday	11	7.6	0	181020.8298	0.9	2	0	0	0.0				19119.4	18972.3	9919.0	5980.0	147.1	0.0	18972.3	18972.3	18972.3	0.0	0	0
27/11/16	Sunday	11	6.8	0	181020.8298	0.9	2	0	0	0.0				18972.3	18833.1	9919.0	5980.0	139.2	0.0	18833.1	18833.1	18833.1	0.0	0	0
28/11/16	Monday	11	7.2	0	181020.8298	0.9	2	0	0	0.0				18833.1	18689.9	9919.0	5980.0	143.2	0.0	18689.9	18689.9	18689.9	0.0	0	0
29/11/16	Tuesday	11	7.4	0	181020.8298	0.9	2	0	0	0.0				18689.9	18544.8	9919.0	5980.0	145.2	0.0	18544.8	18544.8	18544.8	0.0	0	0
30/11/16	Wednesday	11	5.3	0	181020.8298	0.9	2	0	0	0.0				18544.8	18420.4	9919.0	5980.0	124.3	0.0	18420.4	18420.4	18420.4	0.0	0	0
01/12/16	Thursday	12	6.9	0	181020.8298	0.9	2	0	0	0.0				18420.4	18280.2	9919.0	5980.0	140.2	0.0	18280.2	18280.2	18280.2	0.0	0	0
02/12/16	Friday	12	5.2	0	181020.8298	0.9	2	0	0	0.0				18280.2	18156.9	9919.0	5980.0	123.3	0.0	18156.9	18156.9	18156.9	0.0	0	0
03/12/16	Saturday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				18156.9	18021.6	9919.0	5980.0	135.2	0.0	18021.6	18021.6	18021.6	0.0	0	0
04/12/16	Sunday	12	6.6	2	181020.8298	0.9	2	0	19.838	19.8				18021.6	17904.3	9919.0	5980.0	137.2	0.0	17904.3	17904.3	17904.3	0.0	0	0
05/12/16	Monday	12	6.6	0	181020.8298	0.9	2	0	0	0.0				17904.3	17767.0	9919.0	5980.0	137.2	0.0	17767.0	17767.0	17767.0	0.0	0	0
06/12/16	Tuesday	12	6.6	0	181020.8298	0.9	2	0	0	0.0				17767.0	17629.8	9919.0	5980.0	137.2	0.0	17629.8	17629.8	17629.8	0.0	0	0
07/12/16	Wednesday	12	8.7	0.4	181020.8298	0.9	2	0	3.9676	4.0				17629.8	17475.7	9919.0	5980.0	158.1	0.0	17475.7	17475.7	17475.7	0.0	0	0
08/12/16	Thursday	12	9.9	0	181020.8298	0.9	2	0	0	0.0				17475.7	17306.8	9919.0	5980.0	170.0	0.0	17305.8	17305.8	17305.8	0.0	0	0
09/12/16	Friday	12	10.1	0	181020.8298	0.9	2	0	0	0.0				17305.8	17133.8	9919.0	5980.0	171.9	0.0	17133.8	17133.8	17133.8	0.0	0	0
10/12/16	Saturday	12	6.2	0	181020.8298	0.9	2	0	0	0.0				17133.8	17000.6	9919.0	5980.0	133.3	0.0	17000.6	17000.6	17000.6	0.0	0	0
11/12/16	Sunday	12	4.7	0	181020.8298	0.9	2	0	0	0.0				17000.6	16882.2	9919.0	5980.0	118.4	0.0	16882.2	16882.2	16882.2	0.0	0	0
12/12/16	Monday	12	6.7	6.2	181020.8298	0.9	2	4.2	61.4978	745.8				16882.2	17489.7	9919.0	5980.0	138.2	0.0	17489.7	17489.7	17489.7	0.0	0	0
13/12/16	Tuesday	12	7.5	0.4	181020.8298	0.9	2	0	3.9676	4.0				17489.7	17347.5	9919.0	5980.0	146.2	0.0	17347.5	17347.5	17347.5	0.0	0	0
14/12/16	Wednesday	12	8.5	0	181020.8298	0.9	2	0	0	0.0				17347.5	17191.5	9919.0	5980.0	156.1	0.0	17191.5	17191.5	17191.5	0.0	0	0
15/12/16	Thursday	12	9.1	0	181020.8298	0.9	2	0	0	0.0				17191.5	17029.4	9919.0	5980.0	162.0	0.0	17029.4	17029.4	17029.4	0.0	0	0
16/12/16	Friday	12	8.2	0	181020.8298	0.9	2	0	0	0.0				17029.4	16876.3	9919.0	5980.0	153.1	0.0	16876.3	16876.3	16876.3	0.0	0	0
17/12/16	Saturday	12	6.7	0	181020.8298	0.9	2	0	0	0.0				16876.3	16738.1	9919.0	5980.0	138.2	0.0	16738.1	16738.1	16738.1	0.0	0	0
18/12/16	Sunday	12	7.3	0	181020.8298	0.9	2	0	0	0.0				16738.1	16554.0	7439.3	4485.0	108.1	-36.0	16630.0	16630.0	16630.0	0.0	0	0
19/12/16	Monday	12	9.9	0	181020.8298	0.9	2	0	0	0.0				16630.0	16460.0	7439.3	4485.0	127.5	-42.5	16502.5	16502.5	16502.5	0.0	0	0
20/12/16	Tuesday	12	13	0	181020.8298	0.9	2	0	0	0.0				16502.5	16301.8	7439.3	4485.0	150.5	-50.2	16352.0	16352.0	16352.0	0.0	0	0
21/12/16	Wednesday	12	6.3	0	181020.8298	0.9	2	0	0	0.0				16352.0	16217.8	7439.3	4485.0	100.7	-33.6	16251.3	16251.3	16251.3	0.0	0	0
22/12/16	Thursday	12	9.1	1.6	181020.8298	0.9	2	0	15.8704	15.9				16251.3	16125.2	7439.3	4485.0	121.5	-40.5	16145.7	16145.7	16145.7	0.0	0	0
23/12/16	Friday	12	8.5	0	181020.8298	0.9	2	0	0	0.0				16145.7	15989.6	7439.3	4485.0	117.1	-39.0	16028.6	16028.6	16028.6	0.0	0	0
24/12/16	Saturday	12	9.2	0	181020.8298	0.9	2	0	0	0.0				16028.6	15865.6	7439.3	4485.0	122.3	-40.8	15906.4	15906.4	15906.4	0.0	0	0
25/12/16	Sunday	12	8.4	0	181020.8298	0.9	2	0	0	0.0				15906.4	15751.3	7439.3	4485.0	116.3	-38.8	15790.0	15790.0	15790.0	0.0	0	0
26/12/16	Monday	12	7.3	0	181020.8298	0.9	2	0	0	0.0				15790.0	15645.9	7439.3	4485.0	108.1	-36.0	15681.9	15681.9	15681.9	0.0	0	0
27/12/16	Tuesday	12	6.2	1.6	181020.8298	0.9	2	0	15.8704	15.9				15681.9	15554.5	7439.3	4485.0	99.9	-33.3	15597.8	15597.8	15597.8	0.0	0	0
28/12/16	Wednesday	12	6.2	0	181020.8298	0.9	2	0	0	0.0				15597.8	15454.6	7439.3	4485.0	99.9	-33.3	15497.9	15497.9	15497.9	0.0	0	0
29/12/16	Thursday	12	6	0	181020.8298	0.9	2	0	0	0.0				15497.9	15366.6	7439.3	4485.0	98.5	-32.8	15399.4	15399.4	15399.4	0.0	0	0
30/12/16	Friday	12	7.2	0	181020.8298	0.9	2	0	0	0.0				15399.4	15256.3	7439.3	4485.0	107.4	-35.8	15292.1	15292.1	15292.1	0.0	0	0
31/12/16	Saturday	12	8.9	0	181020.8298	0.9	2	0	0	0.0				15292.1	15132.0	7439.3	4485.0	120.0	-40.0	15172.0	15172.0	15172.0	0.0	0	0
01/01/17	Sunday	1	10.6	0	181020.8298	0.9	2	0	0	0.0				15172.0	14995.1	7439.3	4485.0	132.7	-44.2	15039.4	15039.4	15039.4	0.0	0	0
02/01/17	Monday	1	11.1	0	181020.8298	0.9	2	0	0	0.0				15039.4	14857.5	7439.3	4485.0	136.4	-45.5	14903.0	14903.0	14903.0	0.0	0	0
03/01/17	Tuesday	1	10.9	0	181020.8298	0.9	2	0	0	0.0				14903.0	14723.1	7439.3	4485.0	134.9	-45.0	14768.1	14768.1	14768.1	0.0	0	0
04/01/17	Wednesday	1	5.3	0	181020.8298	0.9	2	0	0	0.0				14768.1	14641.7	7439.3	4485.0	93.2	-31.1	14674.8	14674.8	14674.8	0.0	0	0
05/01/17	Thursday	1	5.7	0	181020.8298	0.9	2	0	0	0.0				14674.8	14546.5	7439.3	4485.0	96.2	-32.1	14578.6	14578.6	14578.6	0.0	0	0
06/01/17	Friday	1	6.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				14578.6	14447.3	7439.3	4485.0	99.9	-33.3	14480.6	14480.6	14480.6	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: Prelim Pond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final volume	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty during winter flag
07/01/17	Saturday	1	8.1	0	181020.8298	0.9	2	0	0	0.0				14480.6	14328.5	7439.3	4485.0	114.1	-38.0	14366.5	14366.5	14366.5	0.0	0	0
08/01/17	Sunday	1	10.3	0	181020.8298	0.9	2	0	0	0.0				14366.5	14192.6	7439.3	4485.0	130.4	-43.5	14236.1	14236.1	14236.1	0.0	0	0
09/01/17	Monday	1	9.3	0	181020.8298	0.9	2	0	0	0.0				14236.1	14072.1	7439.3	4485.0	123.0	-41.0	14113.1	14113.1	14113.1	0.0	0	0
10/01/17	Tuesday	1	9.3	0	181020.8298	0.9	2	0	0	0.0				14113.1	13949.1	7439.3	4485.0	123.0	-41.0	13990.1	13990.1	13990.1	0.0	0	0
11/01/17	Wednesday	1	6.4	0	181020.8298	0.9	2	0	0	0.0				13990.1	13854.8	7439.3	4485.0	101.4	-33.8	13888.7	13888.7	13888.7	0.0	0	0
12/01/17	Thursday	1	6.7	0.4	181020.8298	0.9	2	0	3.9676	4.0				13888.7	13754.4	7439.3	4485.0	103.7	-34.6	13789.0	13789.0	13789.0	0.0	0	0
13/01/17	Friday	1	9.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				13789.0	13623.0	7439.3	4485.0	126.0	-42.0	13665.0	13665.0	13665.0	0.0	0	0
14/01/17	Saturday	1	8.7	0	181020.8298	0.9	2	0	0	0.0				13665.0	13506.9	7439.3	4485.0	118.5	-39.5	13546.4	13546.4	13546.4	0.0	0	0
15/01/17	Sunday	1	7.7	0	181020.8298	0.9	2	0	0	0.0				13546.4	13398.3	7439.3	4485.0	111.1	-37.0	13435.3	13435.3	13435.3	0.0	0	0
16/01/17	Monday	1	8.6	0	181020.8298	0.9	2	0	0	0.0				13435.3	13278.3	7439.3	4485.0	117.8	-39.3	13317.5	13317.5	13317.5	0.0	0	0
17/01/17	Tuesday	1	9.5	0	181020.8298	0.9	2	0	0	0.0				13317.5	13151.5	7439.3	4485.0	124.5	-41.5	13193.0	13193.0	13193.0	0.0	0	0
18/01/17	Wednesday	1	7.1	0	181020.8298	0.9	2	0	0	0.0				13193.0	13050.8	7439.3	4485.0	106.6	-35.5	13086.4	13086.4	13086.4	0.0	0	0
19/01/17	Thursday	1	6.5	0	181020.8298	0.9	2	0	0	0.0				13086.4	12950.2	7439.3	4485.0	102.2	-34.1	12984.2	12984.2	12984.2	0.0	0	0
20/01/17	Friday	1	8	0	181020.8298	0.9	2	0	0	0.0				12984.2	12833.1	7439.3	4485.0	113.3	-37.8	12870.9	12870.9	12870.9	0.0	0	0
21/01/17	Saturday	1	6.8	0	181020.8298	0.9	2	0	0	0.0				12870.9	12731.7	7439.3	4485.0	104.4	-34.8	12766.5	12766.5	12766.5	0.0	0	0
22/01/17	Sunday	1	5.9	0	181020.8298	0.9	2	0	0	0.0				12766.5	12636.2	7439.3	4485.0	97.7	-32.6	12668.8	12668.8	12668.8	0.0	0	0
23/01/17	Monday	1	9.1	0	181020.8298	0.9	2	0	0	0.0				12668.8	12506.7	7439.3	4485.0	121.5	-40.5	12547.2	12547.2	12547.2	0.0	0	0
24/01/17	Tuesday	1	10.2	0	181020.8298	0.9	2	0	0	0.0				12547.2	12374.3	7439.3	4485.0	129.7	-43.2	12417.5	12417.5	12417.5	0.0	0	0
25/01/17	Wednesday	1	11.6	0	181020.8298	0.9	2	0	0	0.0				12417.5	12230.7	7439.3	4485.0	140.1	-46.7	12277.4	12277.4	12277.4	0.0	0	0
26/01/17	Thursday	1	8.4	0	181020.8298	0.9	2	0	0	0.0				12277.4	12122.4	7439.3	4485.0	116.3	-38.8	12161.1	12161.1	12161.1	0.0	0	0
27/01/17	Friday	1	9.8	0	181020.8298	0.9	2	0	0	0.0				12161.1	11992.2	7439.3	4485.0	126.7	-42.2	12034.4	12034.4	12034.4	0.0	0	0
28/01/17	Saturday	1	3.2	0	181020.8298	0.9	2	0	0	0.0				12034.4	11930.9	7439.3	4485.0	77.6	-25.9	11956.8	11956.8	11956.8	0.0	0	0
29/01/17	Sunday	1	2.5	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				11956.8	12122.0	7439.3	4485.0	72.4	-24.1	12146.2	12146.2	12146.2	0.0	0	0
30/01/17	Monday	1	2.2	0.4	181020.8298	0.9	2	0	3.9676	4.0				12146.2	12056.5	7439.3	4485.0	70.2	-23.4	12079.9	12079.9	12079.9	0.0	0	0
31/01/17	Tuesday	1	6.6	15.2	181020.8298	0.9	2	13.2	150.7688	2301.3				12079.9	14244.0	7439.3	4485.0	102.9	-34.3	14278.3	14278.3	14278.3	0.0	0	0
01/02/17	Wednesday	2	6.6	1.2	181020.8298	0.9	2	0	11.9028	11.9				14278.3	14153.0	7439.3	4485.0	102.9	-34.3	14187.3	14187.3	14187.3	0.0	0	0
02/02/17	Thursday	2	7	0	181020.8298	0.9	2	0	0	0.0				14187.3	14046.1	7439.3	4485.0	105.9	-35.3	14081.4	14081.4	14081.4	0.0	0	0
03/02/17	Friday	2	6.7	0	181020.8298	0.9	2	0	0	0.0				14081.4	13943.2	7439.3	4485.0	103.7	-34.6	13977.7	13977.7	13977.7	0.0	0	0
04/02/17	Saturday	2	8.1	0	181020.8298	0.9	2	0	0	0.0				13977.7	13825.6	7439.3	4485.0	114.1	-38.0	13863.7	13863.7	13863.7	0.0	0	0
05/02/17	Sunday	2	9.3	0	181020.8298	0.9	2	0	0	0.0				13863.7	13699.7	7439.3	4485.0	123.0	-41.0	13740.7	13740.7	13740.7	0.0	0	0
06/02/17	Monday	2	5.8	0	181020.8298	0.9	2	0	0	0.0				13740.7	13611.4	7439.3	4485.0	97.0	-32.3	13643.7	13643.7	13643.7	0.0	0	0
07/02/17	Tuesday	2	8.5	0	181020.8298	0.9	2	0	0	0.0				13643.7	13487.6	7439.3	4485.0	117.1	-39.0	13526.6	13526.6	13526.6	0.0	0	0
08/02/17	Wednesday	2	3.2	0	181020.8298	0.9	2	0	0	0.0				13526.6	13423.1	7439.3	4485.0	77.5	-25.9	13449.0	13449.0	13449.0	0.0	0	0
09/02/17	Thursday	2	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				13449.0	13362.4	7439.3	4485.0	66.5	-22.2	13384.5	13384.5	13384.5	0.0	0	0
10/02/17	Friday	2	4.9	62	181020.8298	0.9	2	60	614.978	10390.1				13384.5	23654.3	9919.0	5980.0	120.4	0.0	23654.3	22274.5	22274.5	1379.8	1	0
11/02/17	Saturday	2	6.3	13.2	181020.8298	0.9	2	11.2	130.9308	1955.6				22274.5	24095.8	9919.0	5980.0	134.2	0.0	24095.8	22274.5	22274.5	1821.4	1	0
12/02/17	Sunday	2	5.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22151.1	9919.0	5980.0	125.3	0.0	22151.1	22151.1	22151.1	0.0	0	0
13/02/17	Monday	2	5.6	0	181020.8298	0.9	2	0	0	0.0				22151.1	22023.8	9919.0	5980.0	127.3	0.0	22023.8	22023.8	22023.8	0.0	0	0
14/02/17	Tuesday	2	5.5	0	181020.8298	0.9	2	0	0	0.0				22023.8	21897.5	9919.0	5980.0	126.3	0.0	21897.5	21897.5	21897.5	0.0	0	0
15/02/17	Wednesday	2	7.6	0	181020.8298	0.9	2	0	0	0.0				21897.5	21750.4	9919.0	5980.0	147.1	0.0	21750.4	21750.4	21750.4	0.0	0	0
16/02/17	Thursday	2	9.1	0	181020.8298	0.9	2	0	0	0.0				21750.4	21588.3	9919.0	5980.0	162.0	0.0	21588.3	21588.3	21588.3	0.0	0	0
17/02/17	Friday	2	8.6	0	181020.8298	0.9	2	0	0	0.0				21588.3	21431.3	9919.0	5980.0	157.1	0.0	21431.3	21431.3	21431.3	0.0	0	0
18/02/17	Saturday	2	9.2	0	181020.8298	0.9	2	0	0	0.0				21431.3	21268.3	9919.0	5980.0	163.0	0.0	21268.3	21268.3	21268.3	0.0	0	0
19/02/17	Sunday	2	5.7	0	181020.8298	0.9	2	0	0	0.0				21268.3	21140.0	9919.0	5980.0	128.3	0.0	21140.0	21140.0	21140.0	0.0	0	0
20/02/17	Monday	2	5.7	0	181020.8298	0.9	2	0	0	0.0				21140.0	21011.7	9919.0	5980.0	128.3	0.0	21011.7	21011.7	21011.7	0.0	0	0
21/02/17	Tuesday	2	4.6	3.2	181020.8298	0.9	2	1.2	31.7408	227.2				21011.7	21121.5	9919.0	5980.0	117.4	0.0	21121.5	21121.5	21121.5	0.0	0	0
22/02/17	Wednesday	2	6.1	0	181020.8298	0.9	2	0	0	0.0				21121.5	20989.3	9919.0	5980.0	132.3	0.0	20989.3	20989.3	20989.3	0.0	0	0
23/02/17	Thursday	2	8.7	0	181020.8298	0.9	2	0	0	0.0				20989.3	20831.2	9919.0	5980.0	158.1	0.0	20831.2	20831.2	20831.2	0.0	0	0
24/02/17	Friday	2	9.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				20831.2	20669.2	9919.0	5980.0	164.0	0.0	20669.2	20669.2	20669.2	0.0	0	0
25/02/17	Saturday	2	6	0	181020.8298	0.9	2	0	0	0.0				20669.2	20537.9	9919.0	5980.0	131.3	0.0	20537.9	20537.9	20537.9	0.0	0	0
26/02/17	Sunday	2	5.6	0	181020.8298	0.9	2	0	0	0.0				20537.9	20410.6	9919.0	5980.0	127.3	0.0	20410.6	20410.6	20410.6	0.0	0	0
27/02/17	Monday	2	6.1	0	181020.8298	0.9	2	0	0	0.0				20410.6	20278.3	9919.0	5980.0	132.3	0.0	20278.3	20278.3	20278.3	0.0	0	0
28/02/17	Tuesday	2	7.4	0	181020.8298	0.9	2	0	0	0.0				20278.3	20133.2	9919.0	5980.0	145.2	0.0	20133.2	20133.2	20133.2	0.0	0	0
01/03/17	Wednesday	3	2.4	0	181020.8298	0.9	2	0	0	0.0				20133.2	20037.6	9919.0	5980.0	95.6	0.0	20037.6	20037.6	20037.6	0.0	0	0
02/03/17	Thursday	3	6.3	5.2	181020.8298	0.9	2	3.2	51.5788	572.9				20037.6	20476.3	9919.0	5980.0	134.2	0.0	20476.3	20476.3	20476.3	0.0	0	0
03/03/17	Friday	3	7.3	0	181020.8298	0.9	2	0	0	0.0				20476.3	20332.1	9919.0	5980.0	144.2	0.0	20332.1	20332.1	20332.1	0.0	0	0
04/03/17	Saturday	3	8.2	0	181020.8298	0.9	2	0	0	0.0				20332.1	20179.0	9919.0	5980.0	153.1	0.0	20179.0	20179.0	20179.0	0.0	0	0
05/03/17	Sunday	3	6.3	0	181020.8298	0.9	2	0	0	0.0				20179.0	20044.8	9919.0	5980.0	134.2	0.0	20044.8	20044.8	20044.8	0.0	0	0
06/03/17	Monday	3	5.6	0	181020.8298	0.9	2	0	0	0.0				20044.8	19917.5	9919.0	5980.0	127.3	0.0	19917.5	19917.5	19917.5	0.0	0	0
07/03/17	Tuesday	3	7.2	0	181020.8298	0.9	2	0	0	0.0				19917.5	19774.3	9919.0	5980.0	143.2	0.0	19774.3	19774.3	19774.3	0.0	0	0
08/03/17	Wednesday	3	6.9	0	181020.8298	0.9	2	0	0	0.0				19774.3	19634.1	9919.0	5980.0	140.2	0.0	19634.1	19634.1	19634.1	0.0	0	0
09/03/17	Thursday	3	7.6	0	181020.8298	0.9	2	0	0	0.0				19634.1	19486.9	9919.0	5980.0	147.1	0.0	19486.9	19486.9	19486.9	0.0	0	0
10/03/17	Friday	3	8.3	0	181020.8298	0.9	2	0	0	0.0				19486.9	19332.9	9919.0	5980.0	154.1	0.0	19332.9	19332.9	19332.9	0.0	0	0
11/03/17	Saturday	3	4	0	181020.8298	0.9	2	0	0	0.0				19332.9	19221.4	9919.0	5980.0	111.4	0.0	19221.4	19221.4	19221.4	0.0	0	0
12/03/17	Sunday	3	3.8	0	181020.8298	0.9	2	0	0	0.0				19221.4	19112.0	9919.0	5980.0	109.5	0.0	19112.0	19112.0	19112.0	0.0	0	0
13/03/17	Monday	3	5.2	12	181020.8298	0.9	2	10	119.028	1748.2				19112.0	20736.8	9919.0	5980.0	123.3	0.0	20736.8	20736.8	20736.8	0.0	0	0
14/03/17	Tuesday	3	5.4	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				20736.8	20665.9	9919.0	5980.0	125.3	0.0	20665.9	20665.9	20665.9	0.0	0	0
15/03/17	Wednesday	3	5.9	2.4	181020.8298	0.9	2	0.4	23.8056	89.0				20665.9	20624.6	9919.0	5980.0	130.3	0.0	20624.6	20624.6	20624.6	0.0	0	0
16/03/17	Thursday	3	4.2	0	181020.8298	0.9	2	0	0	0.0				20624.6	20511.2	9919.0	5980.0	113.4	0.0	20511.2	20511.2	20511.2	0.0	0	0
17/03/17	Friday	3	2.4	0	181020.8298	0.9	2	0	0	0.0				20511.2	20415.6	9919.0	5980.0	95.6	0.0	20415.6	20415.6	20415.6	0.0	0	0
18/03/17	Saturday	3	5	5.2	181020.8298	0.9	2	3.2	51.5788	572.9				20415.6	20867.2	9919.0	5980.0	121.4	0.0	20867.2	20867.2	20867.2	0.0	0	0
19/03/17	Sunday	3	5.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				20867.2	20739.9	9919.0	5980.0	129.3	0.0	20739.9	20739.9	20739.9	0.0	0	0
20/03/17	Monday	3	3.9	0	181020.8298	0.9	2	0	0	0.0				20739.9	20629.4	9919.0	5980.0	110.4	0.0	20629.4	20629.4	20629.4	0.0	0	0
21/03/17	Tuesday	3	3.7	0	181020.8298	0.9	2	0	0	0.0				20629.4	20521.0	9919.0	5980.0	108.5	0.0	20521.0	20521.0	20521.0	0.0	0	0
22/03/17	Wednesday	3	3.5	10	181020.8298	0.9	2	8	99.19	1402.5				20521.0	21817.0	9919.0	5980.0	106.5	0.0	21817.0	21817.0	21817.0	0.0	0	0
23/03/17	Thursday	3	4.1	4.6	181020.8298	0.9	2	2.6	45.6274	469.2				21817.0	22173.8	9919.0	5980.0	112.4	0.0	22173.8	22173.8	22173.8	0.0	0	0
24/03/17	Friday	3	4.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22173.8	22061.4	9919.0	5980.0	114.4	0.0	22061.4	22061.4	22061.4	0.0	0	0
25/03/17	Saturday	3	4.8	0	181020.8298	0.9	2	0	0	0.0				22061.4	21942.0	9919.0	5980.0	119.4	0.0	21942.0	21942.0	21942.0	0.0	0	0
26/03/17	Sunday	3	3.9	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				21942.0	21886.0	9919.0	5980.0	110.4	0.0	21886.0	21886.0	21886.0	0.0	0	0
27/03/17	Monday	3	3	0	181020.8298	0.9	2	0	0	0.0				21886.0	21784.5	9919.0	5980.0	101.5	0.0	21784.5	21784.5	21784.5	0.0	0	0
28/03/17	Tuesday	3	5.6	0	181020.8298	0.9	2	0	0	0.0				21784.5	21657.2	9919.0	5980.0	127.3	0.0	21657.2	21657.2	21657.2	0.0	0	0
29/03/17	Wednesday	3	6	0.2	181020.8298	0.9	2	0	1.9838	2.0				21657.2	21527.9	9919.0	5980.0	131.3	0.0	21527.9	21527.9	21527.9	0.0	0	0
30/03/17	Thursday	3	5.6	0	181020.8298	0.9	2	0	0	0.0				21527.9	21400.6	9919.0	5980.0	127.3	0.0	21400.6	21400.6	21400.6	0.0	0	0
31/03/17	Friday	3	6.7	0	181020.8298	0.9	2	0	0	0.0				21400.6	21262.4	9919.0	5980.0	138.2	0.0	21262.4	21262.4	21262.4	0.0	0	0
01/04/17	Saturday	4	6.7	0	181020.8298	0.9	2	0	0	0.0				21262.4	21124.1	9919.0	5980.0	138.2	0.0	21124.1	21124.1	21124.1	0.0	0	0
02/04/17	Sunday	4	6.1	0	181020.8298	0.9	2	0	0	0.0				21124.1	20991.9	9919.0	5980.0	132.3	0.0	20991.9	20991.9	20991.9	0.0	0	0
03/04/17	Monday	4	5.6	0	181020.8298	0.9	2	0	0	0.0				20991.9	20864.6	9919.0	5980.0	127.3	0.0	20864.6	20864.6	20864.6	0.0	0	0
04/04/17	Tuesday	4	4.4	0	181020.8298	0.9	2	0	0	0.0				20864.6	20749.2	9919.0	5980.0	115.4	0.0	20749.2	20749.2	20749.2	0.0	0	0
05/04/17	Wednesday	4	3.8	0	181020.8298	0.9	2	0	0	0.0				20749.2	20639.7	9919.0	5980.0	109.5	0.0	20639.7	20639.7	20639.7	0.0	0	0
06/04/17	Thursday	4	4.5	0	181020.8298	0.9	2	0	0	0.0				20639.7	20523.3	9919.0	5980.0	116.4	0.0	20523.3	20523.3	20523.3	0.0	0	0
07/04/17	Friday	4	4.2	0	181020.8298	0.9	2	0	0	0.0				20523.3	20409.9	9919.0	5980.0	113.4	0.0	20409.9	20409.9	20409.9	0.0	0	0
08/04/17	Saturday	4	4.8	0	181020.8298	0.9	2	0	0	0.0				20409.9	20290.5	9919.0	5980.0	119.4	0.0	20290.5	20290.5	20290.5	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
09/04/17	Sunday	4	5.3	0	181020.8298	0.9	2	0	0	0.0			
10/04/17	Monday	4	4.7	0	181020.8298	0.9	2	0	0	0.0			
11/04/17	Tuesday	4	3.4	0	181020.8298	0.9	2	0	0	0.0			
12/04/17	Wednesday	4	4.1	0	181020.8298	0.9	2	0	0	0.0			
13/04/17	Thursday	4	4.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
14/04/17	Friday	4	4.4	0	181020.8298	0.9	2	0	0	0.0			
15/04/17	Saturday	4	4.3	0	181020.8298	0.9	2	0	0	0.0			
16/04/17	Sunday	4	2.6	0	181020.8298	0.9	2	0	0	0.0			
17/04/17	Monday	4	3.2	0	181020.8298	0.9	2	0	0	0.0			
18/04/17	Tuesday	4	3.4	0	181020.8298	0.9	2	0	0	0.0			
19/04/17	Wednesday	4	3.8	0	181020.8298	0.9	2	0	0	0.0			
20/04/17	Thursday	4	3.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
21/04/17	Friday	4	4.2	0	181020.8298	0.9	2	0	0	0.0			
22/04/17	Saturday	4	4.8	0	181020.8298	0.9	2	0	0	0.0			
23/04/17	Sunday	4	4	0	181020.8298	0.9	2	0	0	0.0			
24/04/17	Monday	4	3.9	0	181020.8298	0.9	2	0	0	0.0			
25/04/17	Tuesday	4	3.7	0	181020.8298	0.9	2	0	0	0.0			
26/04/17	Wednesday	4	3.6	0	181020.8298	0.9	2	0	0	0.0			
27/04/17	Thursday	4	3.1	0	181020.8298	0.9	2	0	0	0.0			
28/04/17	Friday	4	3.8	0	181020.8298	0.9	2	0	0	0.0			
29/04/17	Saturday	4	2.8	0	181020.8298	0.9	2	0	0	0.0			
30/04/17	Sunday	4	3.4	0	181020.8298	0.9	2	0	0	0.0			
01/05/17	Monday	5	3.9	0	181020.8298	0.9	2	0	0	0.0			
02/05/17	Tuesday	5	4.9	0	181020.8298	0.9	2	0	0	0.0			
03/05/17	Wednesday	5	2.7	0	181020.8298	0.9	2	0	0	0.0			
04/05/17	Thursday	5	2.5	0	181020.8298	0.9	2	0	0	0.0			
05/05/17	Friday	5	3.1	12	181020.8298	0.9	2	10	119.028	1748.2			
06/05/17	Saturday	5	4.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
07/05/17	Sunday	5	3	0	181020.8298	0.9	2	0	0	0.0			
08/05/17	Monday	5	2.2	0	181020.8298	0.9	2	0	0	0.0			
09/05/17	Tuesday	5	2.8	4.4	181020.8298	0.9	2	2.4	43.6436	434.6			
10/05/17	Wednesday	5	2.8	0	181020.8298	0.9	2	0	0	0.0			
11/05/17	Thursday	5	2.9	0.2	181020.8298	0.9	2	0	1.9838	2.0			
12/05/17	Friday	5	2.4	0	181020.8298	0.9	2	0	0	0.0			
13/05/17	Saturday	5	4.7	0	181020.8298	0.9	2	0	0	0.0			
14/05/17	Sunday	5	3.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
15/05/17	Monday	5	2.5	10.8	181020.8298	0.9	2	8.8	107.1252	1540.8			
16/05/17	Tuesday	5	2.5	10	181020.8298	0.9	2	8	99.19	1402.5			
17/05/17	Wednesday	5	3.9	0.4	181020.8298	0.9	2	0	3.9676	4.0			
18/05/17	Thursday	5	2.6	0	181020.8298	0.9	2	0	0	0.0			
19/05/17	Friday	5	1.5	6	181020.8298	0.9	2	4	59.514	711.2			
20/05/17	Saturday	5	2.2	8	181020.8298	0.9	2	6	79.352	1056.9			
21/05/17	Sunday	5	1.9	27.2	181020.8298	0.9	2	25.2	269.7968	4375.3			
22/05/17	Monday	5	1.4	8	181020.8298	0.9	2	6	79.352	1056.9			
23/05/17	Tuesday	5	2	5.2	181020.8298	0.9	2	3.2	51.5788	572.9			
24/05/17	Wednesday	5	2	1.4	181020.8298	0.9	2	0	13.8866	13.9			
25/05/17	Thursday	5	2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
26/05/17	Friday	5	1.9	3.2	181020.8298	0.9	2	1.2	31.7408	227.2			
27/05/17	Saturday	5	1.9	0.4	181020.8298	0.9	2	0	3.9676	4.0			
28/05/17	Sunday	5	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
29/05/17	Monday	5	3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
30/05/17	Tuesday	5	2.4	0	181020.8298	0.9	2	0	0	0.0			
31/05/17	Wednesday	5	1.3	0	181020.8298	0.9	2	0	0	0.0			
01/06/17	Thursday	6	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
02/06/17	Friday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
03/06/17	Saturday	6	2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
04/06/17	Sunday	6	2.9	0.2	181020.8298	0.9	2	0	1.9838	2.0			
05/06/17	Monday	6	3.3	0.4	181020.8298	0.9	2	0	3.9676	4.0			
06/06/17	Tuesday	6	1.9	0	181020.8298	0.9	2	0	0	0.0			
07/06/17	Wednesday	6	3.3	0	181020.8298	0.9	2	0	0	0.0			
08/06/17	Thursday	6	3.8	0	181020.8298	0.9	2	0	0	0.0			
09/06/17	Friday	6	3.5	0	181020.8298	0.9	2	0	0	0.0			
10/06/17	Saturday	6	3.6	0	181020.8298	0.9	2	0	0	0.0			
11/06/17	Sunday	6	3.8	0	181020.8298	0.9	2	0	0	0.0			
12/06/17	Monday	6	2.7	0	181020.8298	0.9	2	0	0	0.0			
13/06/17	Tuesday	6	1.7	0	181020.8298	0.9	2	0	0	0.0			
14/06/17	Wednesday	6	1.7	8.8	181020.8298	0.9	2	6.8	87.2872	1195.1			
15/06/17	Thursday	6	1.7	0	181020.8298	0.9	2	0	0	0.0			
16/06/17	Friday	6	1.9	0.2	181020.8298	0.9	2	0	1.9838	2.0			
17/06/17	Saturday	6	2.2	0.4	181020.8298	0.9	2	0	3.9676	4.0			
18/06/17	Sunday	6	2.2	0	181020.8298	0.9	2	0	0	0.0			
19/06/17	Monday	6	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
20/06/17	Tuesday	6	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
21/06/17	Wednesday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
22/06/17	Thursday	6	2.4	34.6	181020.8298	0.9	2	32.6	343.1974	5654.3			
23/06/17	Friday	6	2.3	11.6	181020.8298	0.9	2	9.6	115.0604	1679.1			
24/06/17	Saturday	6	1.8	0	181020.8298	0.9	2	0	0	0.0			
25/06/17	Sunday	6	1.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
26/06/17	Monday	6	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
27/06/17	Tuesday	6	2.1	0	181020.8298	0.9	2	0	0	0.0			
28/06/17	Wednesday	6	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
29/06/17	Thursday	6	3.2	0	181020.8298	0.9	2	0	0	0.0			
30/06/17	Friday	6	1.3	0	181020.8298	0.9	2	0	0	0.0			
01/07/17	Saturday	7	1.3	15.4	181020.8298	0.9	2	13.4	152.7526	2335.9			
02/07/17	Sunday	7	1.5	20.8	181020.8298	0.9	2	18.8	206.3152	3269.2			
03/07/17	Monday	7	1	0	181020.8298	0.9	2	0	0	0.0			
04/07/17	Tuesday	7	1.7	4.4	181020.8298	0.9	2	2.4	43.6436	434.6			
05/07/17	Wednesday	7	1.4	7.2	181020.8298	0.9	2	5.2	71.4168	918.6			
06/07/17	Thursday	7	1.8	10.2	181020.8298	0.9	2	8.2	101.1738	1437.1			
07/07/17	Friday	7	1.7	21.8	181020.8298	0.9	2	19.8	216.2342	3442.0			
08/07/17	Saturday	7	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
09/07/17	Sunday	7	2.7	0	181020.8298	0.9	2	0	0	0.0			

Date	Adjustments						Final pond volumes			Overflow Calcs		
	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
09/04/17	20290.5	20166.2	9919.0	5980.0	124.3	0.0	20166.2	20166.2	20166.2	0.0	0	0
10/04/17	20166.2	20047.8	9919.0	5980.0	118.4	0.0	20047.8	20047.8	20047.8	0.0	0	0
11/04/17	20047.8	19942.3	9919.0	5980.0	105.5	0.0	19942.3	19942.3	19942.3	0.0	0	0
12/04/17	19942.3	19829.9	9919.0	5980.0	112.4	0.0	19829.9	19829.9	19829.9	0.0	0	0
13/04/17	19829.9	19716.5	9919.0	5980.0	115.4	0.0	19716.5	19716.5	19716.5	0.0	0	0
14/04/17	19716.5	19601.1	9919.0	5980.0	115.4	0.0	19601.1	19601.1	19601.1	0.0	0	0
15/04/17	19601.1	19486.7	9919.0	5980.0	114.4	0.0	19486.7	19486.7	19486.7	0.0	0	0
16/04/17	19486.7	19389.1	9919.0	5980.0	97.5	0.0	19389.1	19389.1	19389.1	0.0	0	0
17/04/17	19389.1	19285.6	9919.0	5980.0	103.5	0.0	19285.6	19285.6	19285.6	0.0	0	0
18/04/17	19285.6	19180.1	9919.0	5980.0	105.5	0.0	19180.1	19180.1	19180.1	0.0	0	0
19/04/17	19180.1	19070.7	9919.0	5980.0	109.5	0.0	19070.7	19070.7	19070.7	0.0	0	0
20/04/17	19070.7	18967.2	9919.0	5980.0	105.5	0.0	18967.2	18967.2	18967.2	0.0	0	0
21/04/17	18967.2	18853.8	9919.0	5980.0	113.4	0.0	18853.8	18853.8	18853.8	0.0	0	0
22/04/17	18853.8	18734.4	9919.0	5980.0	119.4	0.0	18734.4	18734.4	18734.4	0.0	0	0
23/04/17	18734.4	18623.0	9919.0	5980.0	111.4	0.0	18623.0	18623.0	18623.0	0.0	0	0
24/04/17	18623.0	18512.5	9919.0	5980.0	110.4	0.0	18512.5	18512.5	18512.5	0.0	0	0
25/04/17	18512.5	18404.1	9919.0	5980.0	108.5	0.0	18404.1	18404.1	18404.1	0.0	0	0
26/04/17	18404.1	18296.6	9919.0	5980.0	107.5	0.0	18296.6	18296.6	18296.6	0.0	0	0
27/04/17	18296.6	18194.1	9919.0	5980.0	102.5	0.0	18194.1	18194.1	18194.1	0.0	0	0
28/04/17	18194.1	18084.6	9919.0	5980.0	109.5	0.0	18084.6	18084.6	18084.6	0.0	0	0
29/04/17	18084.6	17985.1	9919.0	5980.0	99.5	0.0	17985.1	17985.1	17985.1	0.0	0	0
30/04/17	17985.1	17879.6	9919.0	5980.0	105.5	0.0	17879.6	17879.6	17879.6	0.0	0	0
01/05/17	17879.6	17769.2	9919.0	5980.0	110.4	0.0	17769.2	17769.2	17769.2	0.0	0	0
02/05/17	17769.2	17648.8	9919.0	5980.0	120.4	0.0	17648.8	17648.8	17648.8	0.0	0	0
03/05/17	17648.8	17550.3	9919.0	5980.0	98.5	0.0	17550.3	17550.3	17550.3	0.0	0	0
04/05/17	17550.3	17453.7	9919.0	5980.0	96.6	0.0	17453.7	17453.7	17453.7	0.0	0	0
05/05/17	17453.7	19099.4	9919.0	5980.0	102.5	0.0	19099.4	19099.4	19099.4	0.0	0	0
06/05/17	19099.4	18989.0	9919.0	5980.0	112.4	0.0	18989.0	18989.0	18989.0	0.0	0	0
07/05/17	18989.0	18887.4	9919.0	5980.0	101.5	0.0	18887.4	18887.4	18887.4	0.0	0	0
08/05/17	18887.4	18793.9	9919.0	5980.0	93.6	0.0	18793.9	18793.9	18793.9	0.0	0	0
09/05/17	18793.9	19129.0	9919.0	5980.0	99.5	0.0	19129.0	19129.0	19129.0	0.0	0	0
10/05/17	19129.0	19029.4	9919.0	5980.0	99.5	0.0	19029.4	19029.4	19029.4	0.0	0	0
11/05/17	19029.4	18930.9	9919.0	5980.0	100.5	0.0	18930.9	18930.9	18930.9	0.0	0	0
12/05/17	18930.9	18835.3	9919.0	5980.0	95.6	0.0	18835.3	18835.3	18835.3	0.0	0	0
13/05/17	18835.3	18717.0	9919.0	5980.0	118.4	0.0	18717.0	18717.0	18717.0	0.0	0	0
14/05/17	18717.0	18614.4	9919.0	5980.0	104.5	0.0	18614.4	18614.4	18614.4	0.0	0	0
15/05/17	18614.4	20058.7	9919.0	5980.0	96.6	0.0	20058.7	20058.7	20058.7	0.0	0	0
16/05/17	20058.7	21364.7	9919.0	5980.0	96.6	0.0	21364.7	21364.7	21364.7	0.0	0	0
17/05/17	21364.7	21258.2	9919.0	5980.0	110.4	0.0	21258.2	21258.2	21258.2	0.0	0	0
18/05/17	21258.2	21160.7	9919.0	5980.0	97.5	0.0	21160.7	21160.7	21160.7	0.0	0	0
19/05/17	21160.7	21785.2	9919.0	5980.0	86.6	0.0	21785.2	21785.2	21785.2	0.0	0	0
20/05/17	21785.2	22748.5	9919.0	5980.0	93.6	0.0	22748.5	22274.5	22274.5	474.0	1	0
21/05/17	22274.5	26559.2	9919.0	5980.0	90.6	0.0	26559.2	22274.5	22274.5	4284.7	1	0
22/05/17	22274.5	23245.7	9919.0	5980.0	85.6	0.0	23245.7	22274.5	22274.5	971.2	1	0
23/05/17	22274.5	22755.8	9919.0	5980.0	91.6	0.0	22755.8	22274.5	22274.5	481.3	1	0
24/05/17	22274.5	22196.8	9919.0	5980.0	91.6	0.0	22196.8	22196.8	22196.8	0.0	0	0
25/05/17	22196.8	22107.2	9919.0	5980.0	91.6	0.0	22107.2	22107.2	22107.2	0.0	0	0
26/05/17	22107.2	22243.8	9919.0	5980.0	90.6	0.0	22243.8	22243.8	22243.8	0.0	0	0
27/05/17	22243.8	22157.1	9919.0	5980.0	90.6	0.0	22157.1	22157.1	22157.1	0.0	0	0
28/05/17	22157.1	22061.6	9919.0	5980.0	97.5	0.0	22061.6	22061.6	22061.6	0.0	0	0
29/05/17	22061.6	21962.1	9919.0	5980.0	101.5	0.0	21962.1	21962.1	21962.1	0.0	0	0
30/05/17	21962.1	21866.5	9919.0	5980.0	95.6	0.0	21866.5	21866.5	21866.5	0.0	0	0
31/05/17	21866.5	21781.8	9919.0	5980.0	84.7	0.0	21781.8	21781.8	21781.8	0.0	0	0
01/06/17	21781.8	21696.2	9919.0	5980.0	87.6	0.0	21696.2	21696.2	21696.2	0.0	0	0
02/06/17	21696.2	21611.5	9919.0	5980.0	86.6	0.0	21611.5	21611.5	21611.5	0.0	0	0
03/06/17	21611.5	21521.9	9919.0	5980.0	91.6	0.0	21521.9	21521.9	21521.9	0.0	0	0
04/06/17	21521.9	21423.4	9919.0	5980.0	100.5	0.0	21423.4	21423.4	21423.4	0.0	0	0
05/06/17	21423.4	21322.8	9919.0	5980.0	104.5	0.0	21322.8	21322.8	21322.8	0.0	0	0
06/06/17	21322.8	21232.2	9919.0	5980.0	90.6	0.0	21232.2	21232.2	21232.2	0.0	0	0
07/06/17	21232.2	21127.8	9919.0	5980.0	104.5	0.0	21127.8	21127.8	21127.8	0.0	0	0
08/06/17	21127.8	21018.3	9919.0	5980.0	109.5	0.0	21018.3	21018.3	21018.3	0.0	0	0
09/06/17	21018.3	20911.8	9919.0	5980.0	106.5	0.0	20911.8	20911.8	20911.8	0.0	0	0
10/06/17	20911.8	20804.4	9919.0	5980.0	107.5	0.0	20804.4	20804.4	20804.4	0.0	0	0
11/06/17	20804.4	20694.9	9919.0	5980.0	109.5	0.0	20694.9	20694.9	20694.9	0.0	0	0
12/06/17	20694.9	20596.4	9919.0	5980.0	98.5	0.0	20596.4	20596.4	20596.4	0.0	0	0
13/06/17	20596.4	20507.7	9919.0	5980.0	88.6	0.0	20507.7	20507.7	20507.7	0.0	0	0
14/06/17	20507.7	21614.2	9919.0	5980.0	88.6	0.0	21614.2	21614.2	21614.2	0.0	0	0
15/06/17	21614.2	21525.6	9919.0	5980.0	88.6	0.0	21525.6	21525.6	21525.6	0.0	0	0
16/06/17	21525.6	21437.0	9919.0	5980.0	90.6	0.0	21437.0	21437.0	21437.0	0.0	0	0
17/06/17	21437.0	21347.4	9919.0	5980.0	93.6	0.0	21347.4	21347.4	21347.4	0.0	0	0
18/06/17	21347.4	21253.8	9919.0	5980.0	93.6	0.0	21253.8	21253.8	21253.8	0.0	0	0
19/06/17	21253.8	21162.2	9919.0	5980.0	93.6	0.0	21162.2	21162.2	21162.2	0.0	0	0
20/06/17	21162.2	21066.6	9919.0	5980.0	97.5	0.0	21066.6	21066.6	21066.6	0.0	0	0
21/06/17	21066.6	20982.0	9919.0	5980.0	86.6	0.0	20982.0	20982.0	20982.0	0.0	0	0
22/06/17	20982.0	26540.8	9919.0	5980.0	95.6	0.0	26540.8	22274.5	22274.5	4266.3	1	0
23/06/17	22274.5	23859.0	9919.0	5980.0	94.6	0.0	23859.0	22274.5	22274.5	1584.5	1	0
24/06/17	22274.5	22184.9	9919.0	5980.0	89.6	0.0	22184.9	22184.9	22184.9	0.0	0	0
25/06/17	22184.9	22099.2	9919.0	5980.0	87.6	0.0	22099.2	22099.2	22099.2	0.0	0	0
26/06/17	22099.2	22012.6	9919.0	5980.0	88.6	0.0	22012.6	22012.6	22012.6	0.0	0	0
27/06/17	22012.6	21920.0	9919.0	5980.0	92.6	0.0	21920.0	21920.0	21920.0	0.0	0	0
28/06/17	21920.0	21825.4	9919.0	5980.0	96.6	0.0	21825.4	21825.4	21825.4	0.0	0	0
29/06/17	21825.4	21721.9	9919.0	5980.0	103.5	0.0	21721.9	21721.9	21721.9	0.0	0	0
30/06/17	21721.9	21637.3	9919.0	5980.0	84.7	0.0	21637.3	21637.3	21637.3	0.0	0	0
01/07/17	21637.3	23888.5	9919.0	5980.0	84.7	0.0	23888.5	22274.5	22274.5	1614.0	1	0
02/07/17	22274.5	25457.0	9919.0	5980.0	86.6	0.0	25457.0	22274.5	22274.5	3182.5	1	0
03/07/17	22274.5	22192.8	9919.0	5980.0	81.7	0.0	22192.8	22192.8	22192.8	0.0	0	0
04/07/17	22192.8	22538.8	9919.0	5980.0	88.6	0.0	22538.8	22274.5	22274.5	264.3	1	0
05/07/17	22274.5	23107.4	9919.0	5980.0	85.6	0.0	23107.4	22274.5	22274.5	832.9	1	0
06/07/17	22274.5	23622.0	9919.0	5980.0	89.6	0.0	23622.0	22274.5	22274.5	1347.5	1	0
07/07/17	22274.5	25627.9	9919.0	5980.0	88.6	0.0	25627.9	22274.5	22274.5	3353.4	1	0
08/07/17	22274.5	22189.8	9919.0	5980.0	86.6	0.0	22189.8	22189.8	22189.8	0.0	0	0
09/07/17	22189.8	22091.3	9919.0	5980.0	98.5	0.0	22091.3	22091.3	22091.3	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
10/07/17	Monday	7	3.1	0	181020.8298	0.9	2	0	0	0.0			
11/07/17	Tuesday	7	2.8	0	181020.8298	0.9	2	0	0	0.0			
12/07/17	Wednesday	7	1.5	5.8	181020.8298	0.9	2	3.8	57.5302	676.6			
13/07/17	Thursday	7	1.6	15.6	181020.8298	0.9	2	13.6	154.7364	2370.4			
14/07/17	Friday	7	2.1	0	181020.8298	0.9	2	0	0	0.0			
15/07/17	Saturday	7	2.3	0	181020.8298	0.9	2	0	0	0.0			
16/07/17	Sunday	7	2.1	17.4	181020.8298	0.9	2	15.4	172.5906	2681.5			
17/07/17	Monday	7	4.5	0	181020.8298	0.9	2	0	0	0.0			
18/07/17	Tuesday	7	3	0	181020.8298	0.9	2	0	0	0.0			
19/07/17	Wednesday	7	2.6	17.2	181020.8298	0.9	2	15.2	170.6068	2647.0			
20/07/17	Thursday	7	3.1	21	181020.8298	0.9	2	19	208.299	3303.8			
21/07/17	Friday	7	2	10.2	181020.8298	0.9	2	8.2	101.1738	1437.1			
22/07/17	Saturday	7	1.8	16.6	181020.8298	0.9	2	14.6	164.6554	2543.3			
23/07/17	Sunday	7	1.9	4.6	181020.8298	0.9	2	2.6	45.6274	469.2			
24/07/17	Monday	7	2.3	9.8	181020.8298	0.9	2	7.8	97.2062	1368.0			
25/07/17	Tuesday	7	2.1	6	181020.8298	0.9	2	4	59.514	711.2			
26/07/17	Wednesday	7	2.7	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
27/07/17	Thursday	7	3.1	3.6	181020.8298	0.9	2	1.6	35.7084	296.4			
28/07/17	Friday	7	2.7	15	181020.8298	0.9	2	13	148.785	2266.7			
29/07/17	Saturday	7	2	13.8	181020.8298	0.9	2	11.8	136.8822	2050.3			
30/07/17	Sunday	7	1.9	5.6	181020.8298	0.9	2	3.6	55.5464	642.1			
31/07/17	Monday	7	1.9	0.4	181020.8298	0.9	2	0	3.9676	4.0			
01/08/17	Tuesday	8	1.9	29	181020.8298	0.9	2	27	287.651	4686.5			
02/08/17	Wednesday	8	2.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
03/08/17	Thursday	8	1.7	1.2	181020.8298	0.9	2	0	11.9028	11.9			
04/08/17	Friday	8	1.9	6.4	181020.8298	0.9	2	4.4	63.4816	780.3			
05/08/17	Saturday	8	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
06/08/17	Sunday	8	2	0	181020.8298	0.9	2	0	0	0.0			
07/08/17	Monday	8	1.4	0	181020.8298	0.9	2	0	0	0.0			
08/08/17	Tuesday	8	2	1.6	181020.8298	0.9	2	0	15.8704	15.9			
09/08/17	Wednesday	8	2.1	46.2	181020.8298	0.9	2	44.2	458.2578	7659.3			
10/08/17	Thursday	8	2.9	10.4	181020.8298	0.9	2	8.4	103.1576	1471.7			
11/08/17	Friday	8	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
12/08/17	Saturday	8	3.2	29.2	181020.8298	0.9	2	27.2	289.6348	4721.0			
13/08/17	Sunday	8	3.6	6	181020.8298	0.9	2	4	59.514	711.2			
14/08/17	Monday	8	3.1	12.2	181020.8298	0.9	2	10.2	121.0118	1782.8			
15/08/17	Tuesday	8	3.3	14	181020.8298	0.9	2	12	138.866	2093.9			
16/08/17	Wednesday	8	2.8	4.2	181020.8298	0.9	2	2.2	41.6598	400.1			
17/08/17	Thursday	8	3.3	2.2	181020.8298	0.9	2	0.2	21.8218	54.4			
18/08/17	Friday	8	2.4	1.4	181020.8298	0.9	2	0	13.8866	13.9			
19/08/17	Saturday	8	2.4	8.2	181020.8298	0.9	2	6.2	81.3358	1091.4			
20/08/17	Sunday	8	1.6	1.6	181020.8298	0.9	2	0	15.8704	15.9			
21/08/17	Monday	8	2.5	0	181020.8298	0.9	2	0	0	0.0			
22/08/17	Tuesday	8	2.9	0.4	181020.8298	0.9	2	0	3.9676	4.0			
23/08/17	Wednesday	8	4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
24/08/17	Thursday	8	3.2	0	181020.8298	0.9	2	0	0	0.0			
25/08/17	Friday	8	2.6	0	181020.8298	0.9	2	0	0	0.0			
26/08/17	Saturday	8	4.8	0	181020.8298	0.9	2	0	0	0.0			
27/08/17	Sunday	8	3.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
28/08/17	Monday	8	1.4	0	181020.8298	0.9	2	0	0	0.0			
29/08/17	Tuesday	8	2.5	0	181020.8298	0.9	2	0	0	0.0			
30/08/17	Wednesday	8	2.3	1	181020.8298	0.9	2	0	9.919	9.9			
31/08/17	Thursday	8	2.8	2.6	181020.8298	0.9	2	0.6	25.7894	123.5			
01/09/17	Friday	9	2.7	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
02/09/17	Saturday	9	2.5	5.4	181020.8298	0.9	2	3.4	53.5626	607.5			
03/09/17	Sunday	9	2.6	0	181020.8298	0.9	2	0	0	0.0			
04/09/17	Monday	9	3.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
05/09/17	Tuesday	9	4.9	0	181020.8298	0.9	2	0	0	0.0			
06/09/17	Wednesday	9	4.8	0	181020.8298	0.9	2	0	0	0.0			
07/09/17	Thursday	9	3.5	0	181020.8298	0.9	2	0	0	0.0			
08/09/17	Friday	9	2.9	0	181020.8298	0.9	2	0	0	0.0			
09/09/17	Saturday	9	2.6	0	181020.8298	0.9	2	0	0	0.0			
10/09/17	Sunday	9	2.7	0	181020.8298	0.9	2	0	0	0.0			
11/09/17	Monday	9	4	5	181020.8298	0.9	2	3	49.595	538.4			
12/09/17	Tuesday	9	4.1	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
13/09/17	Wednesday	9	4.2	0	181020.8298	0.9	2	0	0	0.0			
14/09/17	Thursday	9	5	0	181020.8298	0.9	2	0	0	0.0			
15/09/17	Friday	9	4	0	181020.8298	0.9	2	0	0	0.0			
16/09/17	Saturday	9	3.5	0	181020.8298	0.9	2	0	0	0.0			
17/09/17	Sunday	9	3.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
18/09/17	Monday	9	2.9	0.2	181020.8298	0.9	2	0	1.9838	2.0			
19/09/17	Tuesday	9	4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
20/09/17	Wednesday	9	3.5	6.4	181020.8298	0.9	2	4.4	63.4816	780.3			
21/09/17	Thursday	9	3.9	14.6	181020.8298	0.9	2	12.6	144.8174	2197.6			
22/09/17	Friday	9	3.5	16.4	181020.8298	0.9	2	14.4	162.6716	2508.7			
23/09/17	Saturday	9	2.5	9.2	181020.8298	0.9	2	7.2	91.2548	1264.3			
24/09/17	Sunday	9	2.4	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
25/09/17	Monday	9	3.8	23	181020.8298	0.9	2	21	228.137	3649.4			
26/09/17	Tuesday	9	2.6	0	181020.8298	0.9	2	0	0	0.0			
27/09/17	Wednesday	9	2.1	0	181020.8298	0.9	2	0	0	0.0			
28/09/17	Thursday	9	3.5	1	181020.8298	0.9	2	0	9.919	9.9			
29/09/17	Friday	9	3.9	1.4	181020.8298	0.9	2	0	13.8866	13.9			
30/09/17	Saturday	9	5.1	0	181020.8298	0.9	2	0	0	0.0			
01/10/17	Sunday	10	4.3	0	181020.8298	0.9	2	0	0	0.0			
02/10/17	Monday	10	4.7	0	181020.8298	0.9	2	0	0	0.0			
03/10/17	Tuesday	10	4.8	0.2	181020.8298	0.9	2	0	1.9838	2.0			
04/10/17	Wednesday	10	4.7	0	181020.8298	0.9	2	0	0	0.0			
05/10/17	Thursday	10	4.2	0	181020.8298	0.9	2	0	0	0.0			
06/10/17	Friday	10	3.2	0	181020.8298	0.9	2	0	0	0.0			
07/10/17	Saturday	10	3.4	2.6	181020.8298	0.9	2	0.6	25.7894	123.5			
08/10/17	Sunday	10	4.1	1	181020.8298	0.9	2	0	9.919	9.9			
09/10/17	Monday	10	3.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			

Date	Adjustments: Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow Calcs: Overflow (m^3)	Overflow flag	Pond Empty during winter flag
10/07/17	22091.3	21988.8	9919.0	5980.0	102.5	0.0	21988.8	21988.8	21988.8	0.0	0	0
11/07/17	21988.8	21889.2	9919.0	5980.0	99.5	0.0	21889.2	21889.2	21889.2	0.0	0	0
12/07/17	21889.2	22479.2	9919.0	5980.0	86.6	0.0	22479.2	22274.5	22274.5	204.7	1	0
13/07/17	22274.5	24557.3	9919.0	5980.0	87.6	0.0	24557.3	22274.5	22274.5	2282.8	1	0
14/07/17	22274.5	22181.9	9919.0	5980.0	92.6	0.0	22181.9	22181.9	22181.9	0.0	0	0
15/07/17	22181.9	22087.3	9919.0	5980.0	94.6	0.0	22087.3	22087.3	22087.3	0.0	0	0
16/07/17	22087.3	24676.3	9919.0	5980.0	92.6	0.0	24676.3	22274.5	22274.5	2401.8	1	0
17/07/17	22274.5	22158.1	9919.0	5980.0	116.4	0.0	22158.1	22158.1	22158.1	0.0	0	0
18/07/17	22158.1	22056.6	9919.0	5980.0	101.5	0.0	22056.6	22056.6	22056.6	0.0	0	0
19/07/17	22056.6	24606.0	9919.0	5980.0	97.5	0.0	24606.0	22274.5	22274.5	2331.5	1	0
20/07/17	22274.5	25475.7	9919.0	5980.0	102.5	0.0	25475.7	22274.5	22274.5	3201.2	1	0
21/07/17	22274.5	23620.0	9919.0	5980.0	91.6	0.0	23620.0	22274.5	22274.5	1345.5	1	0
22/07/17	22274.5	24728.1	9919.0	5980.0	89.6	0.0	24728.1	22274.5	22274.5	2453.7	1	0
23/07/17	22274.5	22653.1	9919.0	5980.0	90.6	0.0	22653.1	22274.5	22274.5	378.6	1	0
24/07/17	22274.5	23547.9	9919.0	5980.0	94.6	0.0	23547.9	22274.5	22274.5	1273.4	1	0
25/07/17	22274.5	22893.1	9919.0	5980.0	92.6	0.0	22893.1	22274.5	22274.5	618.6	1	0
26/07/17	22274.5	22264.9	9919.0	5980.0	98.5	0.0	22264.9	22264.9	22264.9	0.0	0	0
27/07/17	22264.9	22458.8	9919.0	5980.0	102.5	0.0	22458.8	22274.5	22274.5	184.3	1	0
28/07/17	22274.5	24442.7	9919.0	5980.0	98.5	0.0	24442.7	22274.5	22274.5	2168.2	1	0
29/07/17	22274.5	24242.2	9919.0	5980.0	91.6	0.0	24242.2	22274.5	22274.5	1967.7	1	0
30/07/17	22274.5	22825.9	9919.0	5980.0	90.6	0.0	22825.9	22274.5	22274.5	551.4	1	0
31/07/17	22274.5	22187.8	9919.0	5980.0	90.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
01/08/17	22187.8	26783.7	9919.0	5980.0	90.6	0.0	26783.7	22274.5	22274.5	4509.2	1	0
02/08/17	22274.5	22183.9	9919.0	5980.0	92.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
03/08/17	22183.9	22107.2	9919.0	5980.0	88.6	0.0	22107.2	22107.2	22107.2	0.0	0	0
04/08/17	22107.2	22796.9	9919.0	5980.0	90.6	0.0	22796.9	22274.5	22274.5	522.4	1	0
05/08/17	22274.5	22182.9	9919.0	5980.0	93.6	0.0	22182.9	22182.9	22182.9	0.0	0	0
06/08/17	22182.9	22091.3	9919.0	5980.0	91.6	0.0	22091.3	22091.3	22091.3	0.0	0	0
07/08/17	22091.3	22005.6	9919.0	5980.0	85.6	0.0	22005.6	22005.6	22005.6	0.0	0	0
08/08/17	22005.6	21929.9	9919.0	5980.0	91.6	0.0	21929.9	21929.9	21929.9	0.0	0	0
09/08/17	21929.9	29496.6	9919.0	5980.0	92.6	0.0	29496.6	22274.5	22274.5	7222.1	1	0
10/08/17	22274.5	23645.6	9919.0	5980.0	100.5	0.0	23645.6	22274.5	22274.5	1371.1	1	0
11/08/17	22274.5	22179.9	9919.0	5980.0	96.6	0.0	22179.9	22179.9	22179.9	0.0	0	0
12/08/17	22179.9	26797.4	9919.0	5980.0	103.5	0.0	26797.4	22274.5	22274.5	4523.0	1	0
13/08/17	22274.5	22878.2	9919.0	5980.0	107.5	0.0	22878.2	22274.5	22274.5	603.7	1	0
14/08/17	22274.5	23954.8	9919.0	5980.0	102.5	0.0	23954.8	22274.5	22274.5	1680.3	1	0
15/08/17	22274.5	24263.9	9919.0	5980.0	104.5	0.0	24263.9	22274.5	22274.5	1989.4	1	0
16/08/17	22274.5	22575.0	9919.0	5980.0	99.5	0.0	22575.0	22274.5	22274.5	300.5	1	0
17/08/17	22274.5	22224.4	9919.0	5980.0	104.5	0.0	22224.4	22224.4	22224.4	0.0	0	0
18/08/17	22224.4	22142.7	9919.0	5980.0	95.6	0.0	22142.7	22142.7	22142.7	0.0	0	0
19/08/17	22142.7	23138.6	9919.0	5980.0	95.6	0.0	23138.6	22274.5	22274.5	864.1	1	0
20/08/17	22274.5	22202.7	9919.0	5980.0	87.6	0.0	22202.7	22202.7	22202.7	0.0	0	0
21/08/17	22202.7	22106.2	9919.0	5980.0	96.6	0.0	22106.2	22106.2	22106.2	0.0	0	0
22/08/17	22106.2	22009.6	9919.0	5980.0	100.5	0.0	22009.6	22009.6	22009.6	0.0	0	0
23/08/17	22009.6	21900.1	9919.0	5980.0	111.4	0.0	21900.1	21900.1	21900.1	0.0	0	0
24/08/17	21900.1	21796.6	9919.0	5980.0	103.5	0.0	21796.6	21796.6	21796.6	0.0	0	0
25/08/17	21796.6	21699.1	9919.0	5980.0	97.5	0.0	21699.1	21699.1	21699.1	0.0	0	0
26/08/17	21699.1	21579.7	9919.0	5980.0	119.4	0.0	21579.7	21579.7	21579.7	0.0	0	0
27/08/17	21579.7	21473.3	9919.0	5980.0	108.5	0.0	21473.3	21473.3	21473.3	0.0	0	0
28/08/17	21473.3	21387.6	9919.0	5980.0	85.6	0.0	21387.6	21387.6	21387.6	0.0	0	0
29/08/17	21387.6	21291.0	9919.0	5980.0	96.6	0.0	21291.0	21291.0	21291.0	0.0	0	0
30/08/17	21291.0	21206.4	9919.0	5980.0	94.6	0.0	21206.4	21206.4	21206.4	0.0	0	0
31/08/17	21206.4	21230.4	9919.0	5980.0	99.5	0.0	21230.4	21230.4	21230.4	0.0	0	0
01/09/17	21230.4	21462.8	9919.0	5980.0	98.5	0.0	21462.8	21462.8	21462.8	0.0	0	0
02/09/17	21462.8	21973.7	9919.0	5980.0	96.6	0.0	21973.7	21973.7	21973.7	0.0	0	0
03/09/17	21973.7	21876.2	9919.0	5980.0	97.5	0.0	21876.2	21876.2	21876.2	0.0	0	0
04/09/17	21876.2	21770.7	9919.0	5980.0	107.5	0.0	21770.7	21770.7	21770.7	0.0	0	0
05/09/17	21770.7	21650.3	9919.0	5980.0	120.4	0.0	21650.3	21650.3	21650.3	0.0	0	0
06/09/17	21650.3	21531.0	9919.0	5980.0	119.4	0.0	21531.0	21531.0	21531.0	0.0	0	0
07/09/17	21531.0	21424.5	9919.0	5980.0	106.5	0.0	21424.5	21424.5	21424.5	0.0	0	0
08/09/17	21424.5	21324.0	9919.0	5980.0	100.5	0.0	21324.0	21324.0	21324.0	0.0	0	0
09/09/17	21324.0	21226.4	9919.0	5980.0	97.5	0.0	21226.4	21226.4	21226.4	0.0	0	0
10/09/17	21226.4	21127.9	9919.0	5980.0	98.5	0.0	21127.9	21127.9	21127.9	0.0	0	0
11/09/17	21127.9	21554.8	9919.0	5980.0	111.4	0.0	21554.8	21554.8	21554.8	0.0	0	0
12/09/17	21554.8	21773.3	9919.0	5980.0	112.4	0.0	21773.3	21773.3	21773.3	0.0	0	0
13/09/17	21773.3	21659.9	9919.0	5980.0	113.4	0.0	21659.9	21659.9	21659.9	0.0	0	0
14/09/17	21659.9	21538.5	9919.0	5980.0	121.4	0.0	21538.5	21538.5	21538.5	0.0	0	0
15/09/17	21538.5	21427.1	9919.0	5980.0	111.4	0.0	21427.1	21427.1	21427.1	0.0	0	0
16/09/17	21427.1	21320.6	9919.0	5980.0	106.5	0.0	21320.6	21320.6	21320.6	0.0	0	0
17/09/17	21320.6	21213.2	9919.0	5980.0	109.5	0.0	21213.2	21213.2	21213.2	0.0	0	0
18/09/17	21213.2	21114.6	9919.0	5980.0	100.5	0.0	21114.6	21114.6	21114.6	0.0	0	0
19/09/17	21114.6	21005.2	9919.0	5980.0	111.4	0.0	21005.2	21005.2	21005.2	0.0	0	0
20/09/17	21005.2	21679.0	9919.0	5980.0	106.5	0.0	21679.0	21679.0	21679.0	0.0	0	0
21/09/17	21679.0	23766.2	9919.0	5980.0	110.4	0.0	23766.2	22274.5	22274.5	1491.7	1	0
22/09/17	22274.5	24676.7	9919.0	5980.0	106.5	0.0	24676.7	22274.5	22274.5	2402.2	1	0
23/09/17	22274.5	23442.2	9919.0	5980.0	96.6	0.0	23442.2	22274.5	22274.5	1167.7	1	0
24/09/17	22274.5	22509.9	9919.0	5980.0	95.6	0.0	22509.9	22274.5	22274.5	235.4	1	0
25/09/17	22274.5	25814.5	9919.0	5980.0	109.5	0.0	25814.5	22274.5	22274.5	3540.0	1	0
26/09/17	22274.5	22176.9	9919.0	5980.0	97.5	0.0	22176.9	22176.9	22176.9	0.0	0	0
27/09/17	22176.9	22084.3	9919.0	5980.0	92.6	0.0	22084.3	22084.3	22084.3	0.0	0	0
28/09/17	22084.3	21987.8	9919.0	5980.0	106.5	0.0	21987.8	21987.8	21987.8	0.0	0	0
29/09/17	21987.8	21891.2	9919.0	5980.0	110.4	0.0	21891.2	21891.2	21891.2	0.0	0	0
30/09/17	21891.2	21768.9	9919.0	5980.0	122.3	0.0	21768.9	21768.9	21768.9	0.0	0	0
01/10/17	21768.9	21654.5	9919.0	5980.0	114.4	0.0	21654.5	21654.5	21654.5	0.0	0	0
02/10/17	21654.5	21536.1	9919.0	5980.0	118.4	0.0	21536.1	21536.1	21536.1	0.0	0	0
03/10/17	21536.1	21418.7	9919.0	5980.0	119.4	0.0	21418.7	21418.7	21418.7	0.0	0	0
04/10/17	21418.7	21300.3	9919.0	5980.0	118.4	0.0	21300.3	21300.3	21300.3	0.0	0	0
05/10/17	21300.3	21186.9	9919.0	5980.0	113.4	0.0	21186.9	21186.9	21186.9	0.0	0	0
06/10/17	21186.9	21083.4	9919.0	5980.0	103.5	0.0	21083.4	21083.4	21083.4	0.0	0	0
07/10/17	21083.4	21101.5	9919.0	5980.0	105.5	0.0	21101.5	21101.5	21101.5	0.0	0	0
08/10/17	21101.5	20998.9	9919.0	5980.0	112.4	0.0	20998.9	20998.9	20998.9	0.0	0	0
09/10/17	20998.9	20895.4	9919.0	5980.0	105.5	0.0	20895.4	20895.4	20895.4	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
10/10/17	Tuesday	10	3.6	0	181020.8298	0.9	2	0	0	0.0				20895.4	20788.0	9919.0	5980.0	107.5	0.0	20788.0	20788.0	20788.0	0.0	0	0
11/10/17	Wednesday	10	4.8	2	181020.8298	0.9	2	0	19.838	19.8				20788.0	20688.4	9919.0	5980.0	119.4	0.0	20688.4	20688.4	20688.4	0.0	0	0
12/10/17	Thursday	10	7.8	0	181020.8298	0.9	2	0	0	0.0				20688.4	20539.3	9919.0	5980.0	149.1	0.0	20539.3	20539.3	20539.3	0.0	0	0
13/10/17	Friday	10	5.2	0	181020.8298	0.9	2	0	0	0.0				20539.3	20416.0	9919.0	5980.0	123.3	0.0	20416.0	20416.0	20416.0	0.0	0	0
14/10/17	Saturday	10	4.8	0	181020.8298	0.9	2	0	0	0.0				20416.0	20296.6	9919.0	5980.0	119.4	0.0	20296.6	20296.6	20296.6	0.0	0	0
15/10/17	Sunday	10	4.3	0	181020.8298	0.9	2	0	0	0.0				20296.6	20182.2	9919.0	5980.0	114.4	0.0	20182.2	20182.2	20182.2	0.0	0	0
16/10/17	Monday	10	4.3	8.8	181020.8298	0.9	2	6.8	87.2872	1195.1				20182.2	21262.9	9919.0	5980.0	114.4	0.0	21262.9	21262.9	21262.9	0.0	0	0
17/10/17	Tuesday	10	4.8	13.6	181020.8298	0.9	2	11.6	134.8984	2024.8				21262.9	23168.3	9919.0	5980.0	119.4	0.0	23168.3	22274.5	22274.5	893.8	1	0
18/10/17	Wednesday	10	5.6	7.2	181020.8298	0.9	2	5.2	71.4168	918.6				22274.5	23065.8	9919.0	5980.0	127.3	0.0	23065.8	22274.5	22274.5	791.3	1	0
19/10/17	Thursday	10	7.8	0	181020.8298	0.9	2	0	0	0.0				22274.5	22125.3	9919.0	5980.0	149.1	0.0	22125.3	22125.3	22125.3	0.0	0	0
20/10/17	Friday	10	7.9	0	181020.8298	0.9	2	0	0	0.0				22125.3	21975.2	9919.0	5980.0	150.1	0.0	21975.2	21975.2	21975.2	0.0	0	0
21/10/17	Saturday	10	6.1	0	181020.8298	0.9	2	0	0	0.0				21975.2	21843.0	9919.0	5980.0	132.3	0.0	21843.0	21843.0	21843.0	0.0	0	0
22/10/17	Sunday	10	3.4	3	181020.8298	0.9	2	1	29.757	192.7				21843.0	21930.2	9919.0	5980.0	105.5	0.0	21930.2	21930.2	21930.2	0.0	0	0
23/10/17	Monday	10	5	0	181020.8298	0.9	2	0	0	0.0				21930.2	21808.8	9919.0	5980.0	121.4	0.0	21808.8	21808.8	21808.8	0.0	0	0
24/10/17	Tuesday	10	4.1	0	181020.8298	0.9	2	0	0	0.0				21808.8	21696.4	9919.0	5980.0	112.4	0.0	21696.4	21696.4	21696.4	0.0	0	0
25/10/17	Wednesday	10	4.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				21696.4	21583.9	9919.0	5980.0	114.4	0.0	21583.9	21583.9	21583.9	0.0	0	0
26/10/17	Thursday	10	3.9	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				21583.9	21597.0	9919.0	5980.0	110.4	0.0	21597.0	21597.0	21597.0	0.0	0	0
27/10/17	Friday	10	3.9	7.8	181020.8298	0.9	2	5.8	77.3682	1022.3				21597.0	22508.9	9919.0	5980.0	110.4	0.0	22508.9	22274.5	22274.5	234.4	1	0
28/10/17	Saturday	10	4.9	1.4	181020.8298	0.9	2	0	13.8866	13.9				22274.5	22168.0	9919.0	5980.0	120.4	0.0	22168.0	22168.0	22168.0	0.0	0	0
29/10/17	Sunday	10	4.8	3.2	181020.8298	0.9	2	1.2	31.7408	227.2				22168.0	22275.9	9919.0	5980.0	119.4	0.0	22275.9	22274.5	22274.5	1.4	1	0
30/10/17	Monday	10	4.9	0	181020.8298	0.9	2	0	0	0.0				22274.5	22154.1	9919.0	5980.0	120.4	0.0	22154.1	22154.1	22154.1	0.0	0	0
31/10/17	Tuesday	10	4.8	0	181020.8298	0.9	2	0	0	0.0				22154.1	22034.7	9919.0	5980.0	119.4	0.0	22034.7	22034.7	22034.7	0.0	0	0
01/11/17	Wednesday	11	6.4	0	181020.8298	0.9	2	0	0	0.0				22034.7	21899.5	9919.0	5980.0	135.2	0.0	21899.5	21899.5	21899.5	0.0	0	0
02/11/17	Thursday	11	5.6	0	181020.8298	0.9	2	0	0	0.0				21899.5	21772.2	5919.0	5980.0	127.3	0.0	21772.2	21772.2	21772.2	0.0	0	0
03/11/17	Friday	11	7.9	0	181020.8298	0.9	2	0	0	0.0				21772.2	21622.1	5919.0	5980.0	150.1	0.0	21622.1	21622.1	21622.1	0.0	0	0
04/11/17	Saturday	11	9	0	181020.8298	0.9	2	0	0	0.0				21622.1	21461.0	9919.0	5980.0	161.0	0.0	21461.0	21461.0	21461.0	0.0	0	0
05/11/17	Sunday	11	9.3	0	181020.8298	0.9	2	0	0	0.0				21461.0	21297.0	9919.0	5980.0	164.0	0.0	21297.0	21297.0	21297.0	0.0	0	0
06/11/17	Monday	11	10	0	181020.8298	0.9	2	0	0	0.0				21297.0	21126.1	9919.0	5980.0	171.0	0.0	21126.1	21126.1	21126.1	0.0	0	0
07/11/17	Tuesday	11	8.2	0	181020.8298	0.9	2	0	0	0.0				21126.1	20973.0	9919.0	5980.0	153.1	0.0	20973.0	20973.0	20973.0	0.0	0	0
08/11/17	Wednesday	11	7	0	181020.8298	0.9	2	0	0	0.0				20973.0	20831.8	9919.0	5980.0	141.2	0.0	20831.8	20831.8	20831.8	0.0	0	0
09/11/17	Thursday	11	6.7	0	181020.8298	0.9	2	0	0	0.0				20831.8	20693.6	9919.0	5980.0	138.2	0.0	20693.6	20693.6	20693.6	0.0	0	0
10/11/17	Friday	11	7.4	0	181020.8298	0.9	2	0	0	0.0				20693.6	20548.4	9919.0	5980.0	145.2	0.0	20548.4	20548.4	20548.4	0.0	0	0
11/11/17	Saturday	11	7.5	0	181020.8298	0.9	2	0	0	0.0				20548.4	20402.3	9919.0	5980.0	146.2	0.0	20402.3	20402.3	20402.3	0.0	0	0
12/11/17	Sunday	11	6.9	0	181020.8298	0.9	2	0	0	0.0				20402.3	20262.1	9919.0	5980.0	140.2	0.0	20262.1	20262.1	20262.1	0.0	0	0
13/11/17	Monday	11	9.1	1	181020.8298	0.9	2	0	9.919	9.9				20262.1	20110.0	9919.0	5980.0	162.0	0.0	20110.0	20110.0	20110.0	0.0	0	0
14/11/17	Tuesday	11	9.5	0	181020.8298	0.9	2	0	0	0.0				20110.0	19944.0	9919.0	5980.0	166.0	0.0	19944.0	19944.0	19944.0	0.0	0	0
15/11/17	Wednesday	11	9.8	0	181020.8298	0.9	2	0	0	0.0				19944.0	19775.0	9919.0	5980.0	169.0	0.0	19775.0	19775.0	19775.0	0.0	0	0
16/11/17	Thursday	11	4.3	0	181020.8298	0.9	2	0	0	0.0				19775.0	19660.6	9919.0	5980.0	114.4	0.0	19660.6	19660.6	19660.6	0.0	0	0
17/11/17	Friday	11	5.4	0	181020.8298	0.9	2	0	0	0.0				19660.6	19535.3	9919.0	5980.0	125.3	0.0	19535.3	19535.3	19535.3	0.0	0	0
18/11/17	Saturday	11	4.7	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				19535.3	19678.7	9919.0	5980.0	118.4	0.0	19678.7	19678.7	19678.7	0.0	0	0
19/11/17	Sunday	11	5.3	0	181020.8298	0.9	2	0	0	0.0				19678.7	19554.4	9919.0	5980.0	124.3	0.0	19554.4	19554.4	19554.4	0.0	0	0
20/11/17	Monday	11	7.1	0	181020.8298	0.9	2	0	0	0.0				19554.4	19412.2	9919.0	5980.0	142.2	0.0	19412.2	19412.2	19412.2	0.0	0	0
21/11/17	Tuesday	11	8.8	0	181020.8298	0.9	2	0	0	0.0				19412.2	19253.1	9919.0	5980.0	159.0	0.0	19253.1	19253.1	19253.1	0.0	0	0
22/11/17	Wednesday	11	9.2	0	181020.8298	0.9	2	0	0	0.0				19253.1	19090.1	9919.0	5980.0	163.0	0.0	19090.1	19090.1	19090.1	0.0	0	0
23/11/17	Thursday	11	8.2	0	181020.8298	0.9	2	0	0	0.0				19090.1	18937.0	9919.0	5980.0	153.1	0.0	18937.0	18937.0	18937.0	0.0	0	0
24/11/17	Friday	11	8.5	0	181020.8298	0.9	2	0	0	0.0				18937.0	18781.0	9319.0	5980.0	156.1	0.0	18781.0	18781.0	18781.0	0.0	0	0
25/11/17	Saturday	11	8.4	0	181020.8298	0.9	2	0	0	0.0				18781.0	18625.9	9319.0	5980.0	155.1	0.0	18625.9	18625.9	18625.9	0.0	0	0
26/11/17	Sunday	11	5.8	0	181020.8298	0.9	2	0	0	0.0				18625.9	18496.6	9919.0	5980.0	129.3	0.0	18496.6	18496.6	18496.6	0.0	0	0
27/11/17	Monday	11	5.5	0	181020.8298	0.9	2	0	0	0.0				18496.6	18370.3	9919.0	5980.0	126.3	0.0	18370.3	18370.3	18370.3	0.0	0	0
28/11/17	Tuesday	11	5.1	0	181020.8298	0.9	2	0	0	0.0				18370.3	18247.9	9919.0	5980.0	122.3	0.0	18247.9	18247.9	18247.9	0.0	0	0
29/11/17	Wednesday	11	6.6	0	181020.8298	0.9	2	0	0	0.0				18247.9	18110.7	9919.0	5980.0	137.2	0.0	18110.7	18110.7	18110.7	0.0	0	0
30/11/17	Thursday	11	7.9	0	181020.8298	0.9	2	0	0	0.0				18110.7	17960.6	9919.0	5980.0	150.1	0.0	17960.6	17960.6	17960.6	0.0	0	0
01/12/17	Friday	12	9.6	0	181020.8298	0.9	2	0	0	0.0				17960.6	17793.6	9919.0	5980.0	167.0	0.0	17793.6	17793.6	17793.6	0.0	0	0
02/12/17	Saturday	12	8.9	0	181020.8298	0.9	2	0	0	0.0				17793.6	17633.6	9919.0	5980.0	160.0	0.0	17633.6	17633.6	17633.6	0.0	0	0
03/12/17	Sunday	12	2.1	0	181020.8298	0.9	2	0	0	0.0				17633.6	17541.0	9919.0	5980.0	92.6	0.0	17541.0	17541.0	17541.0	0.0	0	0
04/12/17	Monday	12	6	7	181020.8298	0.9	2	5	69.433	884.0				17541.0	18293.7	9919.0	5980.0	131.3	0.0	18293.7	18293.7	18293.7	0.0	0	0
05/12/17	Tuesday	12	8.2	0	181020.8298	0.9	2	0	0	0.0				18293.7	18140.6	9919.0	5980.0	153.1	0.0	18140.6	18140.6	18140.6	0.0	0	0
06/12/17	Wednesday	12	8.2	0	181020.8298	0.9	2	0	0	0.0				18140.6	17987.5	9919.0	5980.0	153.1	0.0	17987.5	17987.5	17987.5	0.0	0	0
07/12/17	Thursday	12	10.8	0	181020.8298	0.9	2	0	0	0.0				17987.5	17808.6	9919.0	5980.0	178.9	0.0	17808.6	17808.6	17808.6	0.0	0	0
08/12/17	Friday	12	7.6	0	181020.8298	0.9	2	0	0	0.0				17808.6	17661.5	9919.0	5980.0	147.1	0.0	17661.5	17661.5	17661.5	0.0	0	0
09/12/17	Saturday	12	8.9	0	181020.8298	0.9	2	0	0	0.0				17661.5	17501.5	9919.0	5980.0	160.0	0.0	17501.5	17501.5	17501.5	0.0	0	0
10/12/17	Sunday	12	8.3	0	181020.8298	0.9	2	0	0	0.0				17501.5	17347.4	9919.0	5980.0	154.1	0.0	17347.4	17347.4	17347.4	0.0	0	0
11/12/17	Monday	12	6.7	0	181020.8298	0.9	2	0	0	0.0				17347.4	17209.2	9919.0	5980.0	138.2	0.0	17209.2	17209.2	17209.2	0.0	0	0
12/12/17	Tuesday	12	6.1	0	181020.8298	0.9	2	0	0	0.0				17209.2	17076.9	9919.0	5980.0	132.3	0.0	17076.9	17076.9	17076.9	0.0	0	0
13/12/17	Wednesday	12	7.1	0	181020.8298	0.9	2	0	0	0.0				17076.9	16934.7	9919.0	5980.0	142.2	0.0	16934.7	16934.7	16934.7	0.0	0	0
14/12/17	Thursday	12	7.4	0	181020.8298	0.9	2	0	0	0.0				16934.7	16789.5	9919.0	5980.0	145.2	0.0	16789.5	16789.5	16789.5	0.0	0	0
15/12/17	Friday	12	6.9	0	181020.8298	0.9	2	0	0	0.0				16789.5	16649.3	7439.3	4485.0	105.2	-35.1	16684.4	16684.4	16684.4	0.0	0	0
16/12/17	Saturday	12	4.4	0	181020.8298	0.9	2	0	0	0.0				16684.4	16569.8	7439.3	4485.0	86.6	-28.9	16597.8	16597.8	16597.8	0.0	0	0
17/12/17	Sunday	12	4.1	6.8	181020.8298	0.9	2	4.8	67.4492	849.5				16597.8	17334.9	9919.0	5980.0	112.4	0.0	17334.9	17334.9	17334.9	0.0	0	0
18/12/17	Monday	12	6	28.8	181020.8298	0.9	2	26.8	285.6672	4651.9				17334.9	21855.5	9919.0	5980.0	131.3	0.0	21855.5	21855.5	21855.5	0.0	0	0
19/12/17	Tuesday	12	7.6	5.6	181020.8298	0.9	2	3.6	55.5464	642.1				21855.5	22350.4	9919.0	5980.0	147.1	0.0	22350.4	22274.5	22274.5	75.9	1	0
20/12/17	Wednesday	12	9.4	0	181020.8298	0.9	2	0	0	0.0				22274.5	22109.5	9919.0	5980.0	165.0	0.0	22109.5	22109.5	22109.5	0.0	0	0
21/12/17	Thursday	12	8.1	0	181020.8298	0.9	2	0	0	0.0				22109.5	21957.4	9919.0	5980.0	152.1	0.0	21957.4	21957.4	21957.4	0.0	0	0
22/12/17	Friday	12	8.3	0	181020.8298	0.9	2	0	0	0.0				21957.4	21803.3	9519.0	5980.0	154.1	0.0	21803.3	21803.3	21803.3	0.0	0	0
23/12/17	Saturday	12	10.3	0	181020.8298	0.9	2	0	0	0.0				21803.3	21629.4	9519.0	5980.0	173.9	0.0	21629.4	21629.4	21629.4	0.0	0	0
24/12/17	Sunday	12	8.3	0	181020.8298	0.9	2	0	0	0.0				21629.4	21475.3	9519.0	5980.0	154.1	0.0	21475.3	21475.3	21475.3	0.0	0	0
25/12/17	Monday	12	6.5	0	181020.8298	0.9	2	0	0	0.0				21475.3	21339.0	9519.0	5980.0	136.2	0.0	21339.0	21339.0	21339.0	0.0	0	0
26/12/17	Tuesday	12	6.8	0	181020.8298	0.9	2	0	0	0.0				21339.0	21199.8	9919.0	5980.0	139.2	0.0	21199.8	21199.8	21199.8	0.0	0	0
27/12/17	Wednesday	12	9.3	0	181020.8298	0.9	2	0	0	0.0				21199.8	21035.8	9919.0	5980.0	164.0	0.0	21035.8	21035.8	21035.8	0.0	0	0
28/12/17	Thursday	12	7.4	0	181020.8298	0.9	2	0	0	0.0				21035.8	20890.7	9919.0	5980.0	145.2	0.0	20890.7	20890.7	20890.7	0.0	0	0
29/12/17	Friday	12	7.8	0	181020.8298	0.9	2	0	0	0.0				20890.7	20741.5	9919.0	5980.0	149.1	0.0	20741.5	20741.5	20741.5	0.0	0	0
30/12/17	Saturday	12	5.9	0	181020.8298	0.9	2	0	0	0.0				20741.5	20611.3	9919.0	5980.0	130.3	0.0	20611.3	20611.3	20611.3	0.0	0	0
31/12/17	Sunday	12	7.8	0	181020.8298	0.9	2	0	0	0.0				20611.3	20462.1	9919.0	5980.0	149.1	0.0	20462.1	20462.1	20462.1	0.0	0	0
01/01/18	Monday	1	9.2	0	181020.8298	0.9	2	0	0	0.0				20462.1	20299.1	9919.0	5980.0	163.0	0.0	20299.1	20299.1	20299.1	0.0	0	0
02/01/18	Tuesday	1	10.2	0	181020.8298	0.9	2	0	0	0.0				20299.1	20126.2	9919.0	5980.0	172.9	0.0	20126.2	20126.2	20126.2	0.0	0	0
03/01/18	Wednesday	1	10.6	0	181020.8298	0.9	2	0	0	0.0				20126.2	19949.3	9919.0	5980.0	176.9	0.0	19949.3	19949.3	19949.3	0.0	0	0
04/01/18	Thursday	1	7.9	0	181020.8298	0.9	2	0	0	0.0				19949.3	19799.2	9919.0	5980.0	150.1	0.0	19799.2	19799.2	19799.2	0.0	0	0
05/01/18	Friday	1	6.4	0	181020.8298	0.9	2	0	0	0.0				19799.2	19663.9	9919.0	5980.0	135.2	0.0	19663.9	19663.9	19663.9	0.0	0	0
06/01/18	Saturday	1	6.8	0	181020.8298	0.9	2	0	0	0.0				19663.9	19524.7	9919.0	5980.0	139.2	0.0	19524.7	19524.7	19524.7	0.0	0	0
07/01/18	Sunday	1	10.1	0	181020.8298	0.9	2	0	0	0.0				19524.7	19352.8	9919.0	5980.0	171.9	0.0	19352.8	19352.8	19352.8	0.0	0	0
08/01/18	Monday	1	10.4	0	181020.8298	0.9	2	0	0	0.0				19352.8	19177.8	9919.0	5980.0	174.9	0.0	19177.8	19177.8	19177.8	0.0	0	0
09/01/18	Tuesday	1	4	0	181020.8298	0.9	2	0	0	0.0				19177.8	19066.4	9919.0	5980.0	111.4	0.0	19066.4	19066.4	19066.4	0.0	0	0

Date	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
10/01/18	Wednesday	1	6	0	181020.8298	0.9	2	0	0	0.0			
11/01/18	Thursday	1	3.3	1.8	181020.8298	0.9	2	0	17.8542	17.9			
12/01/18	Friday	1	6.3	0	181020.8298	0.9	2	0	0	0.0			
13/01/18	Saturday	1	8.1	0	181020.8298	0.9	2	0	0	0.0			
14/01/18	Sunday	1	8.9	0	181020.8298	0.9	2	0	0	0.0			
15/01/18	Monday	1	7.7	0.8	181020.8298	0.9	2	0	7.9352	7.9			
16/01/18	Tuesday	1	8.2	117.4	181020.8298	0.9	2	115.4	1164.4906	19965.3			
17/01/18	Wednesday	1	8.4	1.2	181020.8298	0.9	2	0	11.9028	11.9			
18/01/18	Thursday	1	8.1	4.8	181020.8298	0.9	2	2.8	47.6112	503.8			
19/01/18	Friday	1	7.3	0	181020.8298	0.9	2	0	0	0.0			
20/01/18	Saturday	1	7.4	0	181020.8298	0.9	2	0	0	0.0			
21/01/18	Sunday	1	6.6	0	181020.8298	0.9	2	0	0	0.0			
22/01/18	Monday	1	8.1	0	181020.8298	0.9	2	0	0	0.0			
23/01/18	Tuesday	1	10.3	0	181020.8298	0.9	2	0	0	0.0			
24/01/18	Wednesday	1	10	0	181020.8298	0.9	2	0	0	0.0			
25/01/18	Thursday	1	9.2	0	181020.8298	0.9	2	0	0	0.0			
26/01/18	Friday	1	8.2	0	181020.8298	0.9	2	0	0	0.0			
27/01/18	Saturday	1	7.5	0	181020.8298	0.9	2	0	0	0.0			
28/01/18	Sunday	1	6.6	0	181020.8298	0.9	2	0	0	0.0			
29/01/18	Monday	1	6.3	0	181020.8298	0.9	2	0	0	0.0			
30/01/18	Tuesday	1	6.3	0	181020.8298	0.9	2	0	0	0.0			
31/01/18	Wednesday	1	6.3	0	181020.8298	0.9	2	0	0	0.0			
01/02/18	Thursday	2	5.1	0	181020.8298	0.9	2	0	0	0.0			
02/02/18	Friday	2	6.7	0	181020.8298	0.9	2	0	0	0.0			
03/02/18	Saturday	2	6	0	181020.8298	0.9	2	0	0	0.0			
04/02/18	Sunday	2	7.6	0	181020.8298	0.9	2	0	0	0.0			
05/02/18	Monday	2	7.5	0	181020.8298	0.9	2	0	0	0.0			
06/02/18	Tuesday	2	8	0	181020.8298	0.9	2	0	0	0.0			
07/02/18	Wednesday	2	6.1	0	181020.8298	0.9	2	0	0	0.0			
08/02/18	Thursday	2	7.4	0	181020.8298	0.9	2	0	0	0.0			
09/02/18	Friday	2	9.9	0	181020.8298	0.9	2	0	0	0.0			
10/02/18	Saturday	2	7.7	0	181020.8298	0.9	2	0	0	0.0			
11/02/18	Sunday	2	5.1	0	181020.8298	0.9	2	0	0	0.0			
12/02/18	Monday	2	4.8	0	181020.8298	0.9	2	0	0	0.0			
13/02/18	Tuesday	2	6.5	0	181020.8298	0.9	2	0	0	0.0			
14/02/18	Wednesday	2	6.4	0	181020.8298	0.9	2	0	0	0.0			
15/02/18	Thursday	2	6.6	0	181020.8298	0.9	2	0	0	0.0			
16/02/18	Friday	2	5.4	0	181020.8298	0.9	2	0	0	0.0			
17/02/18	Saturday	2	6.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
18/02/18	Sunday	2	8.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
19/02/18	Monday	2	6.7	0	181020.8298	0.9	2	0	0	0.0			
20/02/18	Tuesday	2	4.5	0	181020.8298	0.9	2	0	0	0.0			
21/02/18	Wednesday	2	5.8	0	181020.8298	0.9	2	0	0	0.0			
22/02/18	Thursday	2	6.8	0	181020.8298	0.9	2	0	0	0.0			
23/02/18	Friday	2	6.7	0	181020.8298	0.9	2	0	0	0.0			
24/02/18	Saturday	2	6.5	0	181020.8298	0.9	2	0	0	0.0			
25/02/18	Sunday	2	7.4	0	181020.8298	0.9	2	0	0	0.0			
26/02/18	Monday	2	8.3	0	181020.8298	0.9	2	0	0	0.0			
27/02/18	Tuesday	2	8.7	0.4	181020.8298	0.9	2	0	3.9676	4.0			
28/02/18	Wednesday	2	7.9	0	181020.8298	0.9	2	0	0	0.0			
01/03/18	Thursday	3	4.6	0	181020.8298	0.9	2	0	0	0.0			
02/03/18	Friday	3	4.9	0	181020.8298	0.9	2	0	0	0.0			
03/03/18	Saturday	3	5.5	0	181020.8298	0.9	2	0	0	0.0			
04/03/18	Sunday	3	8.6	0	181020.8298	0.9	2	0	0	0.0			
05/03/18	Monday	3	9.1	0	181020.8298	0.9	2	0	0	0.0			
06/03/18	Tuesday	3	8.4	0	181020.8298	0.9	2	0	0	0.0			
07/03/18	Wednesday	3	8	0	181020.8298	0.9	2	0	0	0.0			
08/03/18	Thursday	3	3.4	0	181020.8298	0.9	2	0	0	0.0			
09/03/18	Friday	3	3.7	0	181020.8298	0.9	2	0	0	0.0			
10/03/18	Saturday	3	4.1	0	181020.8298	0.9	2	0	0	0.0			
11/03/18	Sunday	3	4.4	0	181020.8298	0.9	2	0	0	0.0			
12/03/18	Monday	3	5.5	0	181020.8298	0.9	2	0	0	0.0			
13/03/18	Tuesday	3	6.1	0	181020.8298	0.9	2	0	0	0.0			
14/03/18	Wednesday	3	8.2	1	181020.8298	0.9	2	0	9.919	9.9			
15/03/18	Thursday	3	8.1	4.6	181020.8298	0.9	2	2.6	45.6274	469.2			
16/03/18	Friday	3	3.5	0	181020.8298	0.9	2	0	0	0.0			
17/03/18	Saturday	3	4.8	0	181020.8298	0.9	2	0	0	0.0			
18/03/18	Sunday	3	5.1	0	181020.8298	0.9	2	0	0	0.0			
19/03/18	Monday	3	4.3	0	181020.8298	0.9	2	0	0	0.0			
20/03/18	Tuesday	3	3.3	0	181020.8298	0.9	2	0	0	0.0			
21/03/18	Wednesday	3	4	0	181020.8298	0.9	2	0	0	0.0			
22/03/18	Thursday	3	3.9	0	181020.8298	0.9	2	0	0	0.0			
23/03/18	Friday	3	4.7	0	181020.8298	0.9	2	0	0	0.0			
24/03/18	Saturday	3	6.4	0	181020.8298	0.9	2	0	0	0.0			
25/03/18	Sunday	3	4.9	0	181020.8298	0.9	2	0	0	0.0			
26/03/18	Monday	3	5.8	1	181020.8298	0.9	2	0	9.919	9.9			
27/03/18	Tuesday	3	6.3	4.8	181020.8298	0.9	2	2.8	47.6112	503.8			
28/03/18	Wednesday	3	5.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
29/03/18	Thursday	3	3.8	0	181020.8298	0.9	2	0	0	0.0			
30/03/18	Friday	3	4.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
31/03/18	Saturday	3	4.1	0	181020.8298	0.9	2	0	0	0.0			
01/04/18	Sunday	4	3.2	0	181020.8298	0.9	2	0	0	0.0			
02/04/18	Monday	4	3	0	181020.8298	0.9	2	0	0	0.0			
03/04/18	Tuesday	4	3.6	0	181020.8298	0.9	2	0	0	0.0			
04/04/18	Wednesday	4	3	0	181020.8298	0.9	2	0	0	0.0			
05/04/18	Thursday	4	2.8	0	181020.8298	0.9	2	0	0	0.0			
06/04/18	Friday	4	2.4	0	181020.8298	0.9	2	0	0	0.0			
07/04/18	Saturday	4	2.8	0	181020.8298	0.9	2	0	0	0.0			
08/04/18	Sunday	4	3.1	0	181020.8298	0.9	2	0	0	0.0			
09/04/18	Monday	4	4.2	0	181020.8298	0.9	2	0	0	0.0			
10/04/18	Tuesday	4	6.5	2	181020.8298	0.9	2	0	19.838	19.8			
11/04/18	Wednesday	4	3	0.2	181020.8298	0.9	2	0	1.9838	2.0			

Date	Adjustments						Final pond volumes			Overflow Calcs		
Date	Volume at start of period (m^3)	Prelim pond volume - corrections for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
10/01/18	19066.4	18935.1	9919.0	5980.0	131.3	0.0	18935.1	18935.1	18935.1	0.0	0	0
11/01/18	18935.1	18848.5	9919.0	5980.0	104.5	0.0	18848.5	18848.5	18848.5	0.0	0	0
12/01/18	18848.5	18714.2	9919.0	5980.0	134.2	0.0	18714.2	18714.2	18714.2	0.0	0	0
13/01/18	18714.2	18562.1	9919.0	5980.0	152.1	0.0	18562.1	18562.1	18562.1	0.0	0	0
14/01/18	18562.1	18402.1	9919.0	5980.0	160.0	0.0	18402.1	18402.1	18402.1	0.0	0	0
15/01/18	18402.1	18261.9	9919.0	5980.0	148.1	0.0	18261.9	18261.9	18261.9	0.0	0	0
16/01/18	18261.9	38074.1	9919.0	5980.0	153.1	0.0	38074.1	22274.5	22274.5	15799.6	1	0
17/01/18	22274.5	22131.3	9919.0	5980.0	155.1	0.0	22131.3	22131.3	22131.3	0.0	0	0
18/01/18	22131.3	22483.0	9919.0	5980.0	152.1	0.0	22483.0	22274.5	22274.5	208.5	1	0
19/01/18	22274.5	22130.3	9919.0	5980.0	144.2	0.0	22130.3	22130.3	22130.3	0.0	0	0
20/01/18	22130.3	21985.1	9919.0	5980.0	145.2	0.0	21985.1	21985.1	21985.1	0.0	0	0
21/01/18	21985.1	21847.9	9919.0	5980.0	137.2	0.0	21847.9	21847.9	21847.9	0.0	0	0
22/01/18	21847.9	21695.8	9919.0	5980.0	152.1	0.0	21695.8	21695.8	21695.8	0.0	0	0
23/01/18	21695.8	21521.9	9919.0	5980.0	173.9	0.0	21521.9	21521.9	21521.9	0.0	0	0
24/01/18	21521.9	21350.9	9919.0	5980.0	171.0	0.0	21350.9	21350.9	21350.9	0.0	0	0
25/01/18	21350.9	21187.9	9919.0	5980.0	163.0	0.0	21187.9	21187.9	21187.9	0.0	0	0
26/01/18	21187.9	21034.8	9919.0	5980.0	153.1	0.0	21034.8	21034.8	21034.8	0.0	0	0
27/01/18	21034.8	20888.7	9919.0	5980.0	146.2	0.0	20888.7	20888.7	20888.7	0.0	0	0
28/01/18	20888.7	20751.5	9919.0	5980.0	137.2	0.0	20751.5	20751.5	20751.5	0.0	0	0
29/01/18	20751.5	20617.2	9919.0	5980.0	134.2	0.0	20617.2	20617.2	20617.2	0.0	0	0
30/01/18	20617.2	20483.0	9919.0	5980.0	134.2	0.0	20483.0	20483.0	20483.0	0.0	0	0
31/01/18	20483.0	20348.7	9919.0	5980.0	134.2	0.0	20348.7	20348.7	20348.7	0.0	0	0
01/02/18	20348.7	20226.4	9919.0	5980.0	122.3	0.0	20226.4	20226.4	20226.4	0.0	0	0
02/02/18	20226.4	20088.1	9919.0	5980.0	138.2	0.0	20088.1	20088.1	20088.1	0.0	0	0
03/02/18	20088.1	19956.9	9919.0	5980.0	131.3	0.0	19956.9	19956.9	19956.9	0.0	0	0
04/02/18	19956.9	19809.7	9919.0	5980.0	147.1	0.0	19809.7	19809.7	19809.7	0.0	0	0
05/02/18	19809.7	19663.6	9919.0	5980.0	146.2	0.0	19663.6	19663.6	19663.6	0.0	0	0
06/02/18	19663.6	19512.5	9919.0	5980.0	151.1	0.0	19512.5	19512.5	19512.5	0.0	0	0
07/02/18	19512.5	19380.2	9919.0	5980.0	132.3	0.0	19380.2	19380.2	19380.2	0.0	0	0
08/02/18	19380.2	19235.0	9919.0	5980.0	145.2	0.0	19235.0	19235.0	19235.0	0.0	0	0
09/02/18	19235.0	19065.1	9919.0	5980.0	170.0	0.0	19065.1	19065.1	19065.1	0.0	0	0
10/02/18	19065.1	18916.9	9919.0	5980.0	148.1	0.0	18916.9	18916.9	18916.9	0.0	0	0
11/02/18	18916.9	18794.6	9919.0	5980.0	122.3	0.0	18794.6	18794.6	18794.6	0.0	0	0
12/02/18	18794.6	18675.2	9919.0	5980.0	119.4	0.0	18675.2	18675.2	18675.2	0.0	0	0
13/02/18	18675.2	18539.0	9919.0	5980.0	136.2	0.0	18539.0	18539.0	18539.0	0.0	0	0
14/02/18	18539.0	18403.7	9919.0	5980.0	135.2	0.0	18403.7	18403.7	18403.7	0.0	0	0
15/02/18	18403.7	18266.5	9919.0	5980.0	137.2	0.0	18266.5	18266.5	18266.5	0.0	0	0
16/02/18	18266.5	18141.2	9919.0	5980.0	125.3	0.0	18141.2	18141.2	18141.2	0.0	0	0
17/02/18	18141.2	18007.9	9919.0	5980.0	135.2	0.0	18007.9	18007.9	18007.9	0.0	0	0
18/02/18	18007.9	17851.9	9919.0	5980.0	158.1	0.0	17851.9	17851.9	17851.9	0.0	0	0
19/02/18	17851.9	17713.6	9919.0	5980.0	138.2	0.0	17713.6	17713.6	17713.6	0.0	0	0
20/02/18	17713.6	17597.3	9919.0	5980.0	116.4	0.0	17597.3	17597.3	17597.3	0.0	0	0
21/02/18	17597.3	17468.0	9919.0	5980.0	129.3	0.0	17468.0	17468.0	17468.0	0.0	0	0
22/02/18	17468.0	17328.8	9919.0	5980.0	139.2	0.0	17328.8	17328.8	17328.8	0.0	0	0
23/02/18	17328.8	17190.5	9919.0	5980.0	138.2	0.0	17190.5	17190.5	17190.5	0.0	0	0
24/02/18	17190.5	17054.3	9919.0	5980.0	136.2	0.0	17054.3	17054.3	17054.3	0.0	0	0
25/02/18	17054.3	16909.1	9919.0	5980.0	145.2	0.0	16909.1	16909.1	16909.1	0.0	0	0
26/02/18	16909.1	16755.1	9919.0	5980.0	154.1	0.0	16755.1	16755.1	16755.1	0.0	0	0
27/02/18	16755.1	16601.0	7439.3	4485.0	118.5	-39.5	16640.5	16640.5	16640.5	0.0	0	0
28/02/18	16640.5	16490.4	7439.3	4485.0	112.6	-37.5	16527.9	16527.9	16527.9	0.0	0	0
01/03/18	16527.9	16410.5	7439.3	4485.0	88.0	-29.3	16439.9	16439.9	16439.9	0.0	0	0
02/03/18	16439.9	16319.5	7439.3	4485.0	90.3	-30.1	16349.6	16349.6	16349.6	0.0	0	0
03/03/18	16349.6	16223.3	7439.3	4485.0	94.7	-31.6	16254.8	16254.8	16254.8	0.0	0	0
04/03/18	16254.8	16097.8	7439.3	4485.0	117.8	-39.3	16137.0	16137.0	16137.0	0.0	0	0
05/03/18	16137.0	15975.0	7439.3	4485.0	121.5	-40.5	16015.5	16015.5	16015.5	0.0	0	0
06/03/18	16015.5	15860.4	7439.3	4485.0	116.3	-38.8	15899.2	15899.2	15899.2	0.0	0	0
07/03/18	15899.2	15748.1	7439.3	4485.0	113.3	-37.8	15785.9	15785.9	15785.9	0.0	0	0
08/03/18	15785.9	15680.4	7439.3	4485.0	79.1	-26.4	15706.8	15706.8	15706.8	0.0	0	0
09/03/18	15706.8	15598.3	7439.3	4485.0	81.3	-27.1	15625.4	15625.4	15625.4	0.0	0	0
10/03/18	15625.4	15513.0	7439.3	4485.0	84.3	-28.1	15541.1	15541.1	15541.1	0.0	0	0
11/03/18	15541.1	15425.7	7439.3	4485.0	86.6	-28.9	15454.6	15454.6	15454.6	0.0	0	0
12/03/18	15454.6	15328.2	7439.3	4485.0	94.7	-31.6	15359.8	15359.8	15359.8	0.0	0	0
13/03/18	15359.8	15227.5	7439.3	4485.0	99.2	-33.1	15260.6	15260.6	15260.6	0.0	0	0
14/03/18	15260.6	15117.4	7439.3	4485.0	114.8	-38.3	15155.7	15155.7	15155.7	0.0	0	0
15/03/18	15155.7	15472.8	7439.3	4485.0	114.1	-38.0	15510.9	15510.9	15510.9	0.0	0	0
16/03/18	15510.9	15404.4	7439.3	4485.0	79.9	-26.6	15431.0	15431.0	15431.0	0.0	0	0
17/03/18	15431.0	15311.6	7439.3	4485.0	89.5	-29.8	15341.5	15341.5	15341.5	0.0	0	0
18/03/18	15341.5	15219.1	7439.3	4485.0	91.8	-30.6	15249.7	15249.7	15249.7	0.0	0	0
19/03/18	15249.7	15135.3	7439.3	4485.0	85.8	-28.6	15163.9	15163.9	15163.9	0.0	0	0
20/03/18	15163.9	15059.4	7439.3	4485.0	78.4	-26.1	15085.5	15085.5	15085.5	0.0	0	0
21/03/18	15085.5	14974.1	7439.3	4485.0	83.6	-27.9	15002.0	15002.0	15002.0	0.0	0	0
22/03/18	15002.0	14891.5	7439.3	4485.0	82.8	-27.6	14919.1	14919.1	14919.1	0.0	0	0
23/03/18	14919.1	14800.7	7439.3	4485.0	88.8	-29.6	14830.3	14830.3	14830.3	0.0	0	0
24/03/18	14830.3	14695.1	7439.3	4485.0	101.4	-33.8	14728.9	14728.9	14728.9	0.0	0	0
25/03/18	14728.9	14608.5	7439.3	4485.0	90.3	-30.1	14638.6	14638.6	14638.6	0.0	0	0
26/03/18	14638.6	14519.3	7439.3	4485.0	97.0	-32.3	14551.6	14551.6	14551.6	0.0	0	0
27/03/18	14551.6	14921.1	7439.3	4485.0	100.7	-33.6	14954.7	14954.7	14954.7	0.0	0	0
28/03/18	14954.7	14834.3	7439.3	4485.0	91.8	-30.6	14864.9	14864.9	14864.9	0.0	0	0
29/03/18	14864.9	14755.4	7439.3	4485.0	82.1	-27.4	14782.8	14782.8	14782.8	0.0	0	0
30/03/18	14782.8	14671.4	7439.3	4485.0	85.1	-28.4	14699.7	14699.7	14699.7	0.0	0	0
31/03/18	14699.7	14587.3	7439.3	4485.0	84.3	-28.1	14615.4	14615.4	14615.4	0.0	0	0
01/04/18	14615.4	14511.9	7439.3	4485.0	77.6	-25.9	14537.8	14537.8	14537.8	0.0	0	0
02/04/18	14537.8	14436.3	7439.3	4485.0	76.1	-25.4	14461.6	14461.6	14461.6	0.0	0	0
03/04/18	14461.6	14354.2	7439.3	4485.0	80.6	-26.9	14381.0	14381.0	14381.0	0.0	0	0
04/04/18	14381.0	14279.5	7439.3	4485.0	76.1	-25.4	14304.9	14304.9	14304.9	0.0	0	0
05/04/18	14304.9	14205.4	7439.3	4485.0	74.6	-24.9	14230.3	14230.3	14230.3	0.0	0	0
06/04/18	14230.3	14134.7	7439.3	4485.0	71.7	-23.9	14158.6	14158.6	14158.6	0.0	0	0
07/04/18	14158.6	14059.1	7439.3	4485.0	74.6	-24.9	14083.9	14083.9	14083.9	0.0	0	0
08/04/18	14083.9	13981.4	7439.3	4485.0	76.9	-25.6	14007.1	14007.1	14007.1	0.0	0	0
09/04/18	14007.1	13893.6	7439.3	4485.0	85.1	-28.4	13922.0	13922.0	13922.0	0.0	0	0
10/04/18	13922.0	13805.6	7439.3	4485.0	102.2	-34.1	13839.6	13839.6	13839.6	0.0	0	0
11/04/18	13839.6	13740.1	7439.3	4485.0	76.1	-25.4	13765.5	13765.5	13765.5	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
12/04/18	Thursday	4	2.5	0	181020.8298	0.9	2	0	0	0.0				13765.5	13668.9	7439.3	4485.0	72.4	-24.1	13693.1	13693.1	13693.1	0.0	0	0
13/04/18	Friday	4	2.3	4.4	181020.8298	0.9	2	2.4	43.6436	434.6				13693.1	14033.2	7439.3	4485.0	70.9	-23.6	14056.8	14056.8	14056.8	0.0	0	0
14/04/18	Saturday	4	3	0.2	181020.8298	0.9	2	0	1.9838	2.0				14056.8	13957.3	7439.3	4485.0	76.1	-25.4	13982.6	13982.6	13982.6	0.0	0	0
15/04/18	Sunday	4	4	0.4	181020.8298	0.9	2	0	3.9676	4.0				13982.6	13875.2	7439.3	4485.0	83.6	-27.9	13903.0	13903.0	13903.0	0.0	0	0
16/04/18	Monday	4	2.4	0	181020.8298	0.9	2	0	0	0.0				13903.0	13807.5	7439.3	4485.0	71.7	-23.9	13831.4	13831.4	13831.4	0.0	0	0
17/04/18	Tuesday	4	3.1	0	181020.8298	0.9	2	0	0	0.0				13831.4	13728.8	7439.3	4485.0	76.9	-25.6	13754.5	13754.5	13754.5	0.0	0	0
18/04/18	Wednesday	4	2.7	3.6	181020.8298	0.9	2	1.6	35.7084	296.4				13754.5	13952.3	7439.3	4485.0	73.9	-24.6	13976.9	13976.9	13976.9	0.0	0	0
19/04/18	Thursday	4	3.2	0.4	181020.8298	0.9	2	0	3.9676	4.0				13976.9	13877.4	7439.3	4485.0	77.6	-25.9	13903.3	13903.3	13903.3	0.0	0	0
20/04/18	Friday	4	3	0	181020.8298	0.9	2	0	0	0.0				13903.3	13801.8	7439.3	4485.0	76.1	-25.4	13827.2	13827.2	13827.2	0.0	0	0
21/04/18	Saturday	4	3.7	0	181020.8298	0.9	2	0	0	0.0				13827.2	13718.7	7439.3	4485.0	81.3	-27.1	13745.8	13745.8	13745.8	0.0	0	0
22/04/18	Sunday	4	4	0	181020.8298	0.9	2	0	0	0.0				13745.8	13634.4	7439.3	4485.0	83.6	-27.9	13662.2	13662.2	13662.2	0.0	0	0
23/04/18	Monday	4	6	0	181020.8298	0.9	2	0	0	0.0				13662.2	13531.0	7439.3	4485.0	98.5	-32.8	13563.8	13563.8	13563.8	0.0	0	0
24/04/18	Tuesday	4	4.4	0.4	181020.8298	0.9	2	0	3.9676	4.0				13563.8	13452.3	7439.3	4485.0	86.6	-28.9	13481.2	13481.2	13481.2	0.0	0	0
25/04/18	Wednesday	4	3.1	0.2	181020.8298	0.9	2	0	1.9838	2.0				13481.2	13380.7	7439.3	4485.0	76.9	-25.6	13406.3	13406.3	13406.3	0.0	0	0
26/04/18	Thursday	4	2.9	0	181020.8298	0.9	2	0	0	0.0				13406.3	13305.8	7439.3	4485.0	75.4	-25.1	13330.9	13330.9	13330.9	0.0	0	0
27/04/18	Friday	4	2.6	0	181020.8298	0.9	2	0	0	0.0				13330.9	13233.3	7439.3	4485.0	73.2	-24.4	13257.7	13257.7	13257.7	0.0	0	0
28/04/18	Saturday	4	2.4	0	181020.8298	0.9	2	0	0	0.0				13257.7	13162.2	7439.3	4485.0	71.7	-23.9	13186.1	13186.1	13186.1	0.0	0	0
29/04/18	Sunday	4	5.4	0	181020.8298	0.9	2	0	0	0.0				13186.1	13060.7	7439.3	4485.0	94.0	-31.3	13092.1	13092.1	13092.1	0.0	0	0
30/04/18	Monday	4	3.4	0	181020.8298	0.9	2	0	0	0.0				13092.1	12986.6	7439.3	4485.0	79.1	-26.4	13013.0	13013.0	13013.0	0.0	0	0
01/05/18	Tuesday	5	2.2	0	181020.8298	0.9	2	0	0	0.0				13013.0	12919.4	7439.3	4485.0	70.2	-23.4	12942.8	12942.8	12942.8	0.0	0	0
02/05/18	Wednesday	5	2.7	0	181020.8298	0.9	2	0	0	0.0				12942.8	12844.2	7439.3	4485.0	73.9	-24.6	12868.9	12868.9	12868.9	0.0	0	0
03/05/18	Thursday	5	3.8	0.4	181020.8298	0.9	2	0	3.9676	4.0				12868.9	12763.4	7439.3	4485.0	82.1	-27.4	12790.7	12790.7	12790.7	0.0	0	0
04/05/18	Friday	5	4	0	181020.8298	0.9	2	0	0	0.0				12790.7	12679.3	7439.3	4485.0	83.6	-27.9	12707.2	12707.2	12707.2	0.0	0	0
05/05/18	Saturday	5	4	0.2	181020.8298	0.9	2	0	1.9838	2.0				12707.2	12597.7	7439.3	4485.0	83.6	-27.9	12625.6	12625.6	12625.6	0.0	0	0
06/05/18	Sunday	5	4.2	1.6	181020.8298	0.9	2	0	15.8704	15.9				12625.6	12528.0	7439.3	4485.0	85.1	-28.4	12556.4	12556.4	12556.4	0.0	0	0
07/05/18	Monday	5	2.5	2.2	181020.8298	0.9	2	0.2	21.8218	54.4				12556.4	12514.2	7439.3	4485.0	72.4	-24.1	12538.4	12538.4	12538.4	0.0	0	0
08/05/18	Tuesday	5	3.8	0.2	181020.8298	0.9	2	0	1.9838	2.0				12538.4	12430.9	7439.3	4485.0	82.1	-27.4	12458.3	12458.3	12458.3	0.0	0	0
09/05/18	Wednesday	5	4.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				12458.3	12343.8	7439.3	4485.0	87.3	-29.1	12372.9	12372.9	12372.9	0.0	0	0
10/05/18	Thursday	5	3.3	0	181020.8298	0.9	2	0	0	0.0				12372.9	12268.5	7439.3	4485.0	78.4	-26.1	12294.6	12294.6	12294.6	0.0	0	0
11/05/18	Friday	5	3.2	0	181020.8298	0.9	2	0	0	0.0				12294.6	12191.1	7439.3	4485.0	77.6	-25.9	12217.0	12217.0	12217.0	0.0	0	0
12/05/18	Saturday	5	3.5	0	181020.8298	0.9	2	0	0	0.0				12217.0	12110.5	7439.3	4485.0	79.9	-26.6	12137.1	12137.1	12137.1	0.0	0	0
13/05/18	Sunday	5	2.9	0	181020.8298	0.9	2	0	0	0.0				12137.1	12036.6	7439.3	4485.0	75.4	-25.1	12061.7	12061.7	12061.7	0.0	0	0
14/05/18	Monday	5	2.8	0	181020.8298	0.9	2	0	0	0.0				12061.7	11962.2	7439.3	4485.0	74.6	-24.9	11987.1	11987.1	11987.1	0.0	0	0
15/05/18	Tuesday	5	3.4	0	181020.8298	0.9	2	0	0	0.0				11987.1	11881.6	7439.3	4485.0	79.1	-26.4	11907.9	11907.9	11907.9	0.0	0	0
16/05/18	Wednesday	5	4.1	0	181020.8298	0.9	2	0	0	0.0				11907.9	11795.5	7439.3	4485.0	84.3	-28.1	11823.6	11823.6	11823.6	0.0	0	0
17/05/18	Thursday	5	3.6	0	181020.8298	0.9	2	0	0	0.0				11823.6	11716.1	7439.3	4485.0	80.6	-26.9	11743.0	11743.0	11743.0	0.0	0	0
18/05/18	Friday	5	5.2	0	181020.8298	0.9	2	0	0	0.0				11743.0	11619.7	7439.3	4485.0	92.5	-30.8	11650.5	11650.5	11650.5	0.0	0	0
19/05/18	Saturday	5	2.4	0	181020.8298	0.9	2	0	0	0.0				11650.5	11554.9	7439.3	4485.0	71.7	-23.9	11578.8	11578.8	11578.8	0.0	0	0
20/05/18	Sunday	5	1.6	0	181020.8298	0.9	2	0	0	0.0				11578.8	11491.2	7439.3	4485.0	65.7	-21.9	11513.1	11513.1	11513.1	0.0	0	0
21/05/18	Monday	5	2.4	0	181020.8298	0.9	2	0	0	0.0				11513.1	11417.5	7439.3	4485.0	71.7	-23.9	11441.4	11441.4	11441.4	0.0	0	0
22/05/18	Tuesday	5	1.3	0	181020.8298	0.9	2	0	0	0.0				11441.4	11356.8	7439.3	4485.0	63.5	-21.2	11377.9	11377.9	11377.9	0.0	0	0
23/05/18	Wednesday	5	1.3	0	181020.8298	0.9	2	0	0	0.0				11377.9	11293.3	7439.3	4485.0	63.5	-21.2	11314.5	11314.5	11314.5	0.0	0	0
24/05/18	Thursday	5	1.3	0	181020.8298	0.9	2	0	0	0.0				11314.5	11229.8	7439.3	4485.0	63.5	-21.2	11251.0	11251.0	11251.0	0.0	0	0
25/05/18	Friday	5	1.6	39.8	181020.8298	0.9	2	37.8	394.7762	6553.1				11251.0	17716.4	9919.0	5980.0	87.6	0.0	17716.4	17716.4	17716.4	0.0	0	0
26/05/18	Saturday	5	1.8	27	181020.8298	0.9	2	25	267.813	4340.8				17716.4	21967.6	9919.0	5980.0	89.6	0.0	21967.6	21967.6	21967.6	0.0	0	0
27/05/18	Sunday	5	2	16	181020.8298	0.9	2	14	158.704	2439.6				21967.6	24315.6	9919.0	5980.0	91.6	0.0	24315.6	22274.5	22274.5	2041.1	1	0
28/05/18	Monday	5	2.2	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0				22274.5	23306.9	9919.0	5980.0	93.6	0.0	23306.9	22274.5	22274.5	1032.4	1	0
29/05/18	Tuesday	5	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22187.8	9919.0	5980.0	88.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
30/05/18	Wednesday	5	1.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				22187.8	22101.2	9919.0	5980.0	88.6	0.0	22101.2	22101.2	22101.2	0.0	0	0
31/05/18	Thursday	5	1.7	0	181020.8298	0.9	2	0	0	0.0				22101.2	22012.6	9919.0	5980.0	88.6	0.0	22012.6	22012.6	22012.6	0.0	0	0
01/06/18	Friday	6	1.3	19.2	181020.8298	0.9	2	17.2	190.4448	2992.6				22012.6	24920.6	9919.0	5980.0	84.7	0.0	24920.6	22274.5	22274.5	2646.1	1	0
02/06/18	Saturday	6	1.4	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22190.8	9919.0	5980.0	85.6	0.0	22190.8	22190.8	22190.8	0.0	0	0
03/06/18	Sunday	6	1.5	0	181020.8298	0.9	2	0	0	0.0				22190.8	22104.2	9919.0	5980.0	86.6	0.0	22104.2	22104.2	22104.2	0.0	0	0
04/06/18	Monday	6	1.2	0	181020.8298	0.9	2	0	0	0.0				22104.2	22020.5	9919.0	5980.0	83.7	0.0	22020.5	22020.5	22020.5	0.0	0	0
05/06/18	Tuesday	6	2	4.6	181020.8298	0.9	2	2.6	45.6274	469.2				22020.5	22398.1	9919.0	5980.0	91.6	0.0	22398.1	22274.5	22274.5	123.7	1	0
06/06/18	Wednesday	6	1.3	12.8	181020.8298	0.9	2	10.8	126.9632	1886.5				22274.5	24076.3	9919.0	5980.0	84.7	0.0	24076.3	22274.5	22274.5	1801.8	1	0
07/06/18	Thursday	6	0.9	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0				22274.5	23319.8	9919.0	5980.0	80.7	0.0	23319.8	22274.5	22274.5	1045.3	1	0
08/06/18	Friday	6	1.3	3.4	181020.8298	0.9	2	1.4	33.7246	261.8				22274.5	22451.6	9919.0	5980.0	84.7	0.0	22451.6	22274.5	22274.5	177.2	1	0
09/06/18	Saturday	6	2.1	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22183.9	9919.0	5980.0	92.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
10/06/18	Sunday	6	2.2	38	181020.8298	0.9	2	36	376.922	6242.0				22183.9	28332.3	9919.0	5980.0	93.6	0.0	28332.3	22274.5	22274.5	6057.8	1	0
11/06/18	Monday	6	1	11	181020.8298	0.9	2	9	109.109	1575.4				22274.5	23768.2	9919.0	5980.0	81.7	0.0	23768.2	22274.5	22274.5	1493.7	1	0
12/06/18	Tuesday	6	1.2	1.6	181020.8298	0.9	2	0	15.8704	15.9				22274.5	22206.7	9919.0	5980.0	83.7	0.0	22206.7	22206.7	22206.7	0.0	0	0
13/06/18	Wednesday	6	0.9	2	181020.8298	0.9	2	0	19.838	19.8				22206.7	22145.8	9919.0	5980.0	80.7	0.0	22145.8	22145.8	22145.8	0.0	0	0
14/06/18	Thursday	6	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				22145.8	22064.2	9919.0	5980.0	83.7	0.0	22064.2	22064.2	22064.2	0.0	0	0
15/06/18	Friday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22064.2	21981.5	9919.0	5980.0	84.7	0.0	21981.5	21981.5	21981.5	0.0	0	0
16/06/18	Saturday	6	1.7	0	181020.8298	0.9	2	0	0	0.0				21981.5	21892.9	9919.0	5980.0	88.6	0.0	21892.9	21892.9	21892.9	0.0	0	0
17/06/18	Sunday	6	2.6	0	181020.8298	0.9	2	0	0	0.0				21892.9	21795.3	9919.0	5980.0	97.5	0.0	21795.3	21795.3	21795.3	0.0	0	0
18/06/18	Monday	6	1.9	19.6	181020.8298	0.9	2	17.6	194.4124	3061.8				21795.3	24766.5	9919.0	5980.0	90.6	0.0	24766.5	22274.5	22274.5	2492.0	1	0
19/06/18	Tuesday	6	1.2	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				22274.5	22314.4	9919.0	5980.0	83.7	0.0	22314.4	22274.5	22274.5	39.9	1	0
20/06/18	Wednesday	6	1.1	9.6	181020.8298	0.9	2	7.6	95.2224	1333.4				22274.5	23525.2	9919.0	5980.0	82.7	0.0	23525.2	22274.5	22274.5	1250.7	1	0
21/06/18	Thursday	6	1.2	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22192.8	9919.0	5980.0	83.7	0.0	22192.8	22192.8	22192.8	0.0	0	0
22/06/18	Friday	6	1	1.8	181020.8298	0.9	2	0	17.8542	17.9				22192.8	22129.0	9919.0	5980.0	81.7	0.0	22129.0	22129.0	22129.0	0.0	0	0
23/06/18	Saturday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22129.0	22046.3	9919.0	5980.0	84.7	0.0	22046.3	22046.3	22046.3	0.0	0	0
24/06/18	Sunday	6	1.3	0.2	181020.8298	0.9	2	0	1.9838	2.0				22046.3	21963.6	9919.0	5980.0	84.7	0.0	21963.6	21963.6	21963.6	0.0	0	0
25/06/18	Monday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				21963.6	21879.0	9919.0	5980.0	86.6	0.0	21879.0	21879.0	21879.0	0.0	0	0
26/06/18	Tuesday	6	1.6	0	181020.8298	0.9	2	0	0	0.0				21879.0	21791.3	9919.0	5980.0	87.6	0.0	21791.3	21791.3	21791.3	0.0	0	0
27/06/18	Wednesday	6	0.8	29.8	181020.8298	0.9	2	27.8	295.5862	4824.7				21791.3	26536.4	9919.0	5980.0	79.7	0.0	26536.4	22274.5	22274.5	4261.9	1	0
28/06/18	Thursday	6	1.2	16.8	181020.8298	0.9	2	14.8	166.6392	2577.8				22274.5	24768.7	9919.0	5980.0	83.7	0.0	24768.7	22274.5	22274.5	2494.2	1	0
29/06/18	Friday	6	1.1	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22193.8	9919.0	5980.0	82.7	0.0	22193.8	22193.8	22193.8	0.0	0	0
30/06/18	Saturday	6	1.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				22193.8	22109.1	9919.0	5980.0	86.6	0.0	22109.1	22109.1	22109.1	0.0	0	0
01/07/18	Sunday	7	2.2	0	181020.8298	0.9	2	0	0	0.0				22109.1	22015.6	9919.0	5980.0	93.6	0.0	22015.6	22015.6	22015.6	0.0	0	0
02/07/18	Monday	7	2.1	5.2	181020.8298	0.9	2	3.2	51.5788	572.9				22015.6	22495.9	9919.0	5980.0	92.6	0.0	22495.9	22274.5	22274.5	221.4	1	0
03/07/18	Tuesday	7	2.3	44	181020.8298	0.9	2	42	436.436	7279.0				22274.5	29458.9	9919.0	5980.0	94.6	0.0	29458.9	22274.5	22274.5	7184.4	1	0
04/07/18	Wednesday	7	2.3	9.2	181020.8298	0.9	2	7.2	91.2548	1264.3				22274.5	23444.2	9919.0	5980.0	94.6	0.0	23444.2	22274.5	22274.5	1169.7	1	0
05/07/18	Thursday	7	1.4	22	181020.8298	0.9	2	20	218.218	3476.6				22274.5	25665.4	9919.0	5980.0	85.6	0.0	25665.4	22274.5	22274.5	3390.9	1	0
06/07/18	Friday	7	1.1	0.4	181020.8298	0.9	2	0	3.9676	4.0				22274.5	22195.8	9919.0	5980.0	82.7	0.0	22195.8	22195.8	22195.8	0.0	0	0
07/07/18	Saturday	7	1.2	0.4	181020.8298	0.9	2	0	3.9676	4.0				22195.8	22116.1	9919.0	5980.0	83.7	0.0	22116.1	22116.1	22116.1	0.0	0	0
08/07/18	Sunday	7	1.5	0	181020.8298	0.9	2	0	0	0.0				22116.1	22029.4	9919.0	5980.0	86.6	0.0	22029.4	22029.4	22029.4	0.0	0	0
09/07/18	Monday	7	1.4	0	181020.8298	0.9	2	0	0	0.0				22029.4	21943.8	9919.0	5980.0	85.6	0.0	21943.8	21943.8	21943.8	0.0	0	0
10/07/18	Tuesday	7	1.4	0.4	181020.8298	0.9	2	0	3.9676	4.0				21943.8	21862.1	9919.0	5980.0	85.6	0.0	21862.1	21862.1	21862.1	0.0	0	0
11/07/18	Wednesday	7	1.4	0	181020.8298	0.9	2	0	0	0.0				21862.1	21776.5	9919.0	5980.0	85.6	0.0	21776.5	21776.5	21776.5	0.0	0	0
12/07/18	Thursday	7	1.6	0.4	181020.8298	0.9	2	0	3.9676	4.0				21776.5	21692.8	9919.0	5980.0	87.6	0.0	21692.8	21692.8	21692.8	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
13/07/18	Friday	7	1.8	11.8	181020.8298	0.9	2	9.8	117.0442	1713.6			
14/07/18	Saturday	7	1.4	0.8	181020.8298	0.9	2	0	7.9352	7.9			
15/07/18	Sunday	7	1.3	21.8	181020.8298	0.9	2	19.8	216.2342	3442.0			
16/07/18	Monday	7	1.9	9.8	181020.8298	0.9	2	7.8	97.2062	1368.0			
17/07/18	Tuesday	7	1.7	3.2	181020.8298	0.9	2	1.2	31.7408	227.2			
18/07/18	Wednesday	7	1.8	0.8	181020.8298	0.9	2	0	7.9352	7.9			
19/07/18	Thursday	7	1.3	2.8	181020.8298	0.9	2	0.8	27.7732	158.1			
20/07/18	Friday	7	2.1	0	181020.8298	0.9	2	0	0	0.0			
21/07/18	Saturday	7	1.5	6.6	181020.8298	0.9	2	4.6	65.4654	814.9			
22/07/18	Sunday	7	2.5	28.8	181020.8298	0.9	2	26.8	285.6672	4651.9			
23/07/18	Monday	7	2.2	10.6	181020.8298	0.9	2	8.6	105.1414	1506.2			
24/07/18	Tuesday	7	1.5	1.8	181020.8298	0.9	2	0	17.8542	17.9			
25/07/18	Wednesday	7	2.4	1.6	181020.8298	0.9	2	0	15.8704	15.9			
26/07/18	Thursday	7	1.7	31.8	181020.8298	0.9	2	29.8	315.4242	5170.4			
27/07/18	Friday	7	1.4	1.4	181020.8298	0.9	2	0	13.8866	13.9			
28/07/18	Saturday	7	1.3	3	181020.8298	0.9	2	1	29.757	192.7			
29/07/18	Sunday	7	2.2	0	181020.8298	0.9	2	0	0	0.0			
30/07/18	Monday	7	1.7	8.6	181020.8298	0.9	2	6.6	85.3034	1160.6			
31/07/18	Tuesday	7	1.9	0.4	181020.8298	0.9	2	0	3.9676	4.0			
01/08/18	Wednesday	8	2.1	23.2	181020.8298	0.9	2	21.2	230.1208	3684.0			
02/08/18	Thursday	8	1.9	15	181020.8298	0.9	2	13	148.785	2266.7			
03/08/18	Friday	8	2	7.8	181020.8298	0.9	2	5.8	77.3682	1022.3			
04/08/18	Saturday	8	2.3	36.6	181020.8298	0.9	2	34.6	363.0354	6000.0			
05/08/18	Sunday	8	1.7	6.2	181020.8298	0.9	2	4.2	61.4978	745.8			
06/08/18	Monday	8	1.3	0	181020.8298	0.9	2	0	0	0.0			
07/08/18	Tuesday	8	2	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
08/08/18	Wednesday	8	1.8	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
09/08/18	Thursday	8	2.3	34.2	181020.8298	0.9	2	32.2	339.2298	5585.2			
10/08/18	Friday	8	1.6	13.2	181020.8298	0.9	2	11.2	130.9308	1955.6			
11/08/18	Saturday	8	1.6	0	181020.8298	0.9	2	0	0	0.0			
12/08/18	Sunday	8	2.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
13/08/18	Monday	8	3.2	0	181020.8298	0.9	2	0	0	0.0			
14/08/18	Tuesday	8	2.2	25.8	181020.8298	0.9	2	23.8	255.9102	4133.4			
15/08/18	Wednesday	8	1.9	0.8	181020.8298	0.9	2	0	7.9352	7.9			
16/08/18	Thursday	8	1.9	1.4	181020.8298	0.9	2	0	13.8866	13.9			
17/08/18	Friday	8	2.2	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
18/08/18	Saturday	8	2.2	0	181020.8298	0.9	2	0	0	0.0			
19/08/18	Sunday	8	3	0	181020.8298	0.9	2	0	0	0.0			
20/08/18	Monday	8	3	0	181020.8298	0.9	2	0	0	0.0			
21/08/18	Tuesday	8	1.8	5.6	181020.8298	0.9	2	3.6	55.5464	642.1			
22/08/18	Wednesday	8	2.3	3.8	181020.8298	0.9	2	1.8	37.6922	330.9			
23/08/18	Thursday	8	2.1	0.2	181020.8298	0.9	2	0	1.9838	2.0			
24/08/18	Friday	8	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
25/08/18	Saturday	8	2.5	0.2	181020.8298	0.9	2	0	1.9838	2.0			
26/08/18	Sunday	8	2.6	0.2	181020.8298	0.9	2	0	1.9838	2.0			
27/08/18	Monday	8	2.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
28/08/18	Tuesday	8	1.9	19	181020.8298	0.9	2	17	188.461	2958.1			
29/08/18	Wednesday	8	1.8	21.2	181020.8298	0.9	2	19.2	210.2828	3338.3			
30/08/18	Thursday	8	2.4	7.8	181020.8298	0.9	2	5.8	77.3682	1022.3			
31/08/18	Friday	8	2.1	0	181020.8298	0.9	2	0	0	0.0			
01/09/18	Saturday	9	2.7	0	181020.8298	0.9	2	0	0	0.0			
02/09/18	Sunday	9	2.5	0	181020.8298	0.9	2	0	0	0.0			
03/09/18	Monday	9	2.5	0	181020.8298	0.9	2	0	0	0.0			
04/09/18	Tuesday	9	2.6	4.4	181020.8298	0.9	2	2.4	43.6436	434.6			
05/09/18	Wednesday	9	2.7	2.6	181020.8298	0.9	2	0.6	25.7894	123.5			
06/09/18	Thursday	9	2.1	0.6	181020.8298	0.9	2	0	5.9514	6.0			
07/09/18	Friday	9	2.4	2.4	181020.8298	0.9	2	0.4	23.8056	89.0			
08/09/18	Saturday	9	2.4	1.4	181020.8298	0.9	2	0	13.8866	13.9			
09/09/18	Sunday	9	3.2	0.4	181020.8298	0.9	2	0	3.9676	4.0			
10/09/18	Monday	9	3	2.2	181020.8298	0.9	2	0.2	21.8218	54.4			
11/09/18	Tuesday	9	2.7	3.2	181020.8298	0.9	2	1.2	31.7408	227.2			
12/09/18	Wednesday	9	2.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
13/09/18	Thursday	9	2.7	0.8	181020.8298	0.9	2	0	7.9352	7.9			
14/09/18	Friday	9	3.3	3.2	181020.8298	0.9	2	1.2	31.7408	227.2			
15/09/18	Saturday	9	3.4	0	181020.8298	0.9	2	0	0	0.0			
16/09/18	Sunday	9	3.2	0.2	181020.8298	0.9	2	0	1.9838	2.0			
17/09/18	Monday	9	3	1	181020.8298	0.9	2	0	9.919	9.9			
18/09/18	Tuesday	9	3.1	0	181020.8298	0.9	2	0	0	0.0			
19/09/18	Wednesday	9	3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
20/09/18	Thursday	9	3.7	0.2	181020.8298	0.9	2	0	1.9838	2.0			
21/09/18	Friday	9	3.7	0	181020.8298	0.9	2	0	0	0.0			
22/09/18	Saturday	9	4.3	0.2	181020.8298	0.9	2	0	1.9838	2.0			
23/09/18	Sunday	9	3.9	0	181020.8298	0.9	2	0	0	0.0			
24/09/18	Monday	9	3.1	0	181020.8298	0.9	2	0	0	0.0			
25/09/18	Tuesday	9	3	0	181020.8298	0.9	2	0	0	0.0			
26/09/18	Wednesday	9	3.4	0.2	181020.8298	0.9	2	0	1.9838	2.0			
27/09/18	Thursday	9	4.1	0	181020.8298	0.9	2	0	0	0.0			
28/09/18	Friday	9	5	0	181020.8298	0.9	2	0	0	0.0			
29/09/18	Saturday	9	3.1	2.6	181020.8298	0.9	2	0.6	25.7894	123.5			
30/09/18	Sunday	9	4	7.4	181020.8298	0.9	2	5.4	73.4006	953.2			
01/10/18	Monday	10	2.7	0	181020.8298	0.9	2	0	0	0.0			
02/10/18	Tuesday	10	4.5	0	181020.8298	0.9	2	0	0	0.0			
03/10/18	Wednesday	10	3.7	0	181020.8298	0.9	2	0	0	0.0			
04/10/18	Thursday	10	3.8	7.6	181020.8298	0.9	2	5.6	75.3844	987.7			
05/10/18	Friday	10	3.5	0.4	181020.8298	0.9	2	0	3.9676	4.0			
06/10/18	Saturday	10	2.8	0	181020.8298	0.9	2	0	0	0.0			
07/10/18	Sunday	10	3.8	0	181020.8298	0.9	2	0	0	0.0			
08/10/18	Monday	10	4.1	0	181020.8298	0.9	2	0	0	0.0			
09/10/18	Tuesday	10	5.7	0	181020.8298	0.9	2	0	0	0.0			
10/10/18	Wednesday	10	4.3	18.4	181020.8298	0.9	2	16.4	182.5096	2854.4			
11/10/18	Thursday	10	4.3	0.4	181020.8298	0.9	2	0	3.9676	4.0			
12/10/18	Friday	10	2.2	1	181020.8298	0.9	2	0	9.919	9.9			

	Adjustments						Final pond volumes			Overflow Calcs		
Date	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
13/07/18	21692.8	23316.8	9919.0	5980.0	89.6	0.0	23316.8	22274.5	22274.5	1042.4	1	0
14/07/18	22274.5	22196.8	9919.0	5980.0	85.6	0.0	22196.8	22196.8	22196.8	0.0	0	0
15/07/18	22196.8	25554.1	9919.0	5980.0	84.7	0.0	25554.1	22274.5	22274.5	3279.7	1	0
16/07/18	22274.5	23551.8	9919.0	5980.0	90.6	0.0	23551.8	22274.5	22274.5	1277.4	1	0
17/07/18	22274.5	22413.1	9919.0	5980.0	88.6	0.0	22413.1	22274.5	22274.5	138.6	1	0
18/07/18	22274.5	22192.8	9919.0	5980.0	89.6	0.0	22192.8	22192.8	22192.8	0.0	0	0
19/07/18	22192.8	22266.3	9919.0	5980.0	84.7	0.0	22266.3	22266.3	22266.3	0.0	0	0
20/07/18	22266.3	22173.7	9919.0	5980.0	92.6	0.0	22173.7	22173.7	22173.7	0.0	0	0
21/07/18	22173.7	22901.9	9919.0	5980.0	86.6	0.0	22901.9	22274.5	22274.5	627.4	1	0
22/07/18	22274.5	26829.8	9919.0	5980.0	96.6	0.0	26829.8	22274.5	22274.5	4555.3	1	0
23/07/18	22274.5	23687.1	9919.0	5980.0	93.6	0.0	23687.1	22274.5	22274.5	1412.7	1	0
24/07/18	22274.5	22205.7	9919.0	5980.0	86.6	0.0	22205.7	22205.7	22205.7	0.0	0	0
25/07/18	22205.7	22126.0	9919.0	5980.0	95.6	0.0	22126.0	22126.0	22126.0	0.0	0	0
26/07/18	22126.0	27207.8	9919.0	5980.0	88.6	0.0	27207.8	22274.5	22274.5	4933.3	1	0
27/07/18	22274.5	22202.7	9919.0	5980.0	85.6	0.0	22202.7	22202.7	22202.7	0.0	0	0
28/07/18	22202.7	22310.7	9919.0	5980.0	84.7	0.0	22310.7	22274.5	22274.5	36.3	1	0
29/07/18	22274.5	22180.9	9919.0	5980.0	93.6	0.0	22180.9	22180.9	22180.9	0.0	0	0
30/07/18	22180.9	23252.8	9919.0	5980.0	88.6	0.0	23252.8	22274.5	22274.5	978.4	1	0
31/07/18	22274.5	22187.8	9919.0	5980.0	90.6	0.0	22187.8	22187.8	22187.8	0.0	0	0
01/08/18	22187.8	25779.2	9919.0	5980.0	92.6	0.0	25779.2	22274.5	22274.5	3504.8	1	0
02/08/18	22274.5	24450.6	9919.0	5980.0	90.6	0.0	24450.6	22274.5	22274.5	2176.1	1	0
03/08/18	22274.5	23205.2	9919.0	5980.0	91.6	0.0	23205.2	22274.5	22274.5	930.7	1	0
04/08/18	22274.5	28179.9	9919.0	5980.0	94.6	0.0	28179.9	22274.5	22274.5	5905.5	1	0
05/08/18	22274.5	22931.6	9919.0	5980.0	88.6	0.0	22931.6	22274.5	22274.5	657.1	1	0
06/08/18	22274.5	22189.8	9919.0	5980.0	84.7	0.0	22189.8	22189.8	22189.8	0.0	0	0
07/08/18	22189.8	22187.2	9919.0	5980.0	91.6	0.0	22187.2	22187.2	22187.2	0.0	0	0
08/08/18	22187.2	22186.6	9919.0	5980.0	89.6	0.0	22186.6	22186.6	22186.6	0.0	0	0
09/08/18	22186.6	27677.2	9919.0	5980.0	94.6	0.0	27677.2	22274.5	22274.5	5402.7	1	0
10/08/18	22274.5	24142.5	9919.0	5980.0	87.6	0.0	24142.5	22274.5	22274.5	1868.0	1	0
11/08/18	22274.5	22186.8	9919.0	5980.0	87.6	0.0	22186.8	22186.8	22186.8	0.0	0	0
12/08/18	22186.8	22093.3	9919.0	5980.0	95.6	0.0	22093.3	22093.3	22093.3	0.0	0	0
13/08/18	22093.3	21989.8	9919.0	5980.0	103.5	0.0	21989.8	21989.8	21989.8	0.0	0	0
14/08/18	21989.8	26029.6	9919.0	5980.0	93.6	0.0	26029.6	22274.5	22274.5	3755.1	1	0
15/08/18	22274.5	22191.8	9919.0	5980.0	90.6	0.0	22191.8	22191.8	22191.8	0.0	0	0
16/08/18	22191.8	22115.1	9919.0	5980.0	90.6	0.0	22115.1	22115.1	22115.1	0.0	0	0
17/08/18	22115.1	22352.5	9919.0	5980.0	93.6	0.0	22352.5	22274.5	22274.5	78.0	1	0
18/08/18	22274.5	22180.9	9919.0	5980.0	93.6	0.0	22180.9	22180.9	22180.9	0.0	0	0
19/08/18	22180.9	22079.4	9919.0	5980.0	101.5	0.0	22079.4	22079.4	22079.4	0.0	0	0
20/08/18	22079.4	21977.9	9919.0	5980.0	101.5	0.0	21977.9	21977.9	21977.9	0.0	0	0
21/08/18	21977.9	22530.3	9919.0	5980.0	89.6	0.0	22530.3	22274.5	22274.5	255.8	1	0
22/08/18	22274.5	22510.8	9919.0	5980.0	94.6	0.0	22510.8	22274.5	22274.5	236.4	1	0
23/08/18	22274.5	22183.9	9919.0	5980.0	92.6	0.0	22183.9	22183.9	22183.9	0.0	0	0
24/08/18	22183.9	22091.3	9919.0	5980.0	94.6	0.0	22091.3	22091.3	22091.3	0.0	0	0
25/08/18	22091.3	21996.7	9919.0	5980.0	96.6	0.0	21996.7	21996.7	21996.7	0.0	0	0
26/08/18	21996.7	21901.1	9919.0	5980.0	97.5	0.0	21901.1	21901.1	21901.1	0.0	0	0
27/08/18	21901.1	21808.6	9919.0	5980.0	94.6	0.0	21808.6	21808.6	21808.6	0.0	0	0
28/08/18	21808.6	24676.0	9919.0	5980.0	90.6	0.0	24676.0	22274.5	22274.5	2401.5	1	0
29/08/18	22274.5	25523.2	9919.0	5980.0	89.6	0.0	25523.2	22274.5	22274.5	3248.7	1	0
30/08/18	22274.5	23201.2	9919.0	5980.0	95.6	0.0	23201.2	22274.5	22274.5	926.7	1	0
31/08/18	22274.5	22181.9	9919.0	5980.0	92.6	0.0	22181.9	22181.9	22181.9	0.0	0	0
01/09/18	22181.9	22083.3	9919.0	5980.0	98.5	0.0	22083.3	22083.3	22083.3	0.0	0	0
02/09/18	22083.3	21986.8	9919.0	5980.0	96.6	0.0	21986.8	21986.8	21986.8	0.0	0	0
03/09/18	21986.8	21890.2	9919.0	5980.0	96.6	0.0	21890.2	21890.2	21890.2	0.0	0	0
04/09/18	21890.2	22227.3	9919.0	5980.0	97.5	0.0	22227.3	22227.3	22227.3	0.0	0	0
05/09/18	22227.3	22252.3	9919.0	5980.0	98.5	0.0	22252.3	22252.3	22252.3	0.0	0	0
06/09/18	22252.3	22165.7	9919.0	5980.0	92.6	0.0	22165.7	22165.7	22165.7	0.0	0	0
07/09/18	22165.7	22159.1	9919.0	5980.0	95.6	0.0	22159.1	22159.1	22159.1	0.0	0	0
08/09/18	22159.1	22077.4	9919.0	5980.0	95.6	0.0	22077.4	22077.4	22077.4	0.0	0	0
09/09/18	22077.4	21977.9	9919.0	5980.0	103.5	0.0	21977.9	21977.9	21977.9	0.0	0	0
10/09/18	21977.9	21930.8	9919.0	5980.0	101.5	0.0	21930.8	21930.8	21930.8	0.0	0	0
11/09/18	21930.8	22059.5	9919.0	5980.0	98.5	0.0	22059.5	22059.5	22059.5	0.0	0	0
12/09/18	22059.5	21967.9	9919.0	5980.0	93.6	0.0	21967.9	21967.9	21967.9	0.0	0	0
13/09/18	21967.9	21877.3	9919.0	5980.0	98.5	0.0	21877.3	21877.3	21877.3	0.0	0	0
14/09/18	21877.3	22000.0	9919.0	5980.0	104.5	0.0	22000.0	22000.0	22000.0	0.0	0	0
15/09/18	22000.0	21894.5	9919.0	5980.0	105.5	0.0	21894.5	21894.5	21894.5	0.0	0	0
16/09/18	21894.5	21793.0	9919.0	5980.0	103.5	0.0	21793.0	21793.0	21793.0	0.0	0	0
17/09/18	21793.0	21701.4	9919.0	5980.0	101.5	0.0	21701.4	21701.4	21701.4	0.0	0	0
18/09/18	21701.4	21598.9	9919.0	5980.0	102.5	0.0	21598.9	21598.9	21598.9	0.0	0	0
19/09/18	21598.9	21499.4	9919.0	5980.0	101.5	0.0	21499.4	21499.4	21499.4	0.0	0	0
20/09/18	21499.4	21392.9	9919.0	5980.0	108.5	0.0	21392.9	21392.9	21392.9	0.0	0	0
21/09/18	21392.9	21284.4	9919.0	5980.0	108.5	0.0	21284.4	21284.4	21284.4	0.0	0	0
22/09/18	21284.4	21172.0	9919.0	5980.0	114.4	0.0	21172.0	21172.0	21172.0	0.0	0	0
23/09/18	21172.0	21061.6	9919.0	5980.0	110.4	0.0	21061.6	21061.6	21061.6	0.0	0	0
24/09/18	21061.6	20959.1	9919.0	5980.0	102.5	0.0	20959.1	20959.1	20959.1	0.0	0	0
25/09/18	20959.1	20857.5	9919.0	5980.0	101.5	0.0	20857.5	20857.5	20857.5	0.0	0	0
26/09/18	20857.5	20754.0	9919.0	5980.0	105.5	0.0	20754.0	20754.0	20754.0	0.0	0	0
27/09/18	20754.0	20641.6	9919.0	5980.0	112.4	0.0	20641.6	20641.6	20641.6	0.0	0	0
28/09/18	20641.6	20520.3	9919.0	5980.0	121.4	0.0	20520.3	20520.3	20520.3	0.0	0	0
29/09/18	20520.3	20541.3	9919.0	5980.0	102.5	0.0	20541.3	20541.3	20541.3	0.0	0	0
30/09/18	20541.3	21383.0	9919.0	5980.0	111.4	0.0	21383.0	21383.0	21383.0	0.0	0	0
01/10/18	21383.0	21284.5	9919.0	5980.0	98.5	0.0	21284.5	21284.5	21284.5	0.0	0	0
02/10/18	21284.5	21168.1	9919.0	5980.0	116.4	0.0	21168.1	21168.1	21168.1	0.0	0	0
03/10/18	21168.1	21059.6	9919.0	5980.0	108.5	0.0	21059.6	21059.6	21059.6	0.0	0	0
04/10/18	21059.6	21937.9	9919.0	5980.0	109.5	0.0	21937.9	21937.9	21937.9	0.0	0	0
05/10/18	21937.9	21835.4	9919.0	5980.0	106.5	0.0	21835.4	21835.4	21835.4	0.0	0	0
06/10/18	21835.4	21735.9	9919.0	5980.0	99.5	0.0	21735.9	21735.9	21735.9	0.0	0	0
07/10/18	21735.9	21626.4	9919.0	5980.0	109.5	0.0	21626.4	21626.4	21626.4	0.0	0	0
08/10/18	21626.4	21514.0	9919.0	5980.0	112.4	0.0	21514.0	21514.0	21514.0	0.0	0	0
09/10/18	21514.0	21385.7	9919.0	5980.0	128.3	0.0	21385.7	21385.7	21385.7	0.0	0	0
10/10/18	21385.7	24125.6	9919.0	5980.0	114.4	0.0	24125.6	22274.5	22274.5	1851.2	1	0
11/10/18	22274.5	22164.0	9919.0	5980.0	114.4	0.0	22164.0	22164.0	22164.0	0.0	0	0
12/10/18	22164.0	22080.4	9919.0	5980.0	93.6	0.0	22080.4	22080.4	22080.4	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes			Overflow Calcs		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Final Volume	Overflow (m^3)	Overflow flag	Pond Empty during winter flag
13/10/18	Saturday	10	3.4	1.4	181020.8298	0.9	2	0	13.8866	13.9				22080.4	21988.8	9919.0	5980.0	105.5	0.0	21988.8	21988.8	21988.8	0.0	0	0
14/10/18	Sunday	10	3	8.4	181020.8298	0.9	2	6.4	83.3196	1126.0				21988.8	23013.3	9919.0	5980.0	101.5	0.0	23013.3	22274.5	22274.5	738.8	1	0
15/10/18	Monday	10	4.2	12	181020.8298	0.9	2	10	119.028	1748.2				22274.5	23909.3	9919.0	5980.0	113.4	0.0	23909.3	22274.5	22274.5	1634.8	1	0
16/10/18	Tuesday	10	4.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				22274.5	22160.1	9919.0	5980.0	116.4	0.0	22160.1	22160.1	22160.1	0.0	0	0
17/10/18	Wednesday	10	5.7	0	181020.8298	0.9	2	0	0	0.0				22160.1	22031.8	9919.0	5980.0	128.3	0.0	22031.8	22031.8	22031.8	0.0	0	0
18/10/18	Thursday	10	3.5	8	181020.8298	0.9	2	6	79.352	1056.9				22031.8	22982.2	9919.0	5980.0	106.5	0.0	22982.2	22274.5	22274.5	707.7	1	0
19/10/18	Friday	10	3.2	7.6	181020.8298	0.9	2	5.6	75.3844	987.7				22274.5	23158.7	9919.0	5980.0	103.5	0.0	23158.7	22274.5	22274.5	884.2	1	0
20/10/18	Saturday	10	3	0	181020.8298	0.9	2	0	0	0.0				22274.5	22173.0	9919.0	5980.0	101.5	0.0	22173.0	22173.0	22173.0	0.0	0	0
21/10/18	Sunday	10	4	1.8	181020.8298	0.9	2	0	17.8542	17.9				22173.0	22079.4	9919.0	5980.0	111.4	0.0	22079.4	22079.4	22079.4	0.0	0	0
22/10/18	Monday	10	4.1	2.6	181020.8298	0.9	2	0.6	25.7894	123.5				22079.4	22090.5	9919.0	5980.0	112.4	0.0	22090.5	22090.5	22090.5	0.0	0	0
23/10/18	Tuesday	10	4.1	0	181020.8298	0.9	2	0	0	0.0				22090.5	21978.1	9919.0	5980.0	112.4	0.0	21978.1	21978.1	21978.1	0.0	0	0
24/10/18	Wednesday	10	3.4	0	181020.8298	0.9	2	0	0	0.0				21978.1	21872.6	9919.0	5980.0	105.5	0.0	21872.6	21872.6	21872.6	0.0	0	0
25/10/18	Thursday	10	5.4	0.6	181020.8298	0.9	2	0	5.9514	6.0				21872.6	21753.2	9919.0	5980.0	125.3	0.0	21753.2	21753.2	21753.2	0.0	0	0
26/10/18	Friday	10	5.9	0	181020.8298	0.9	2	0	0	0.0				21753.2	21622.9	9919.0	5980.0	130.3	0.0	21622.9	21622.9	21622.9	0.0	0	0
27/10/18	Saturday	10	5.5	0	181020.8298	0.9	2	0	0	0.0				21622.9	21496.6	9919.0	5980.0	126.3	0.0	21496.6	21496.6	21496.6	0.0	0	0
28/10/18	Sunday	10	6	0	181020.8298	0.9	2	0	0	0.0				21496.6	21365.3	9919.0	5980.0	131.3	0.0	21365.3	21365.3	21365.3	0.0	0	0
29/10/18	Monday	10	5.1	0	181020.8298	0.9	2	0	0	0.0				21365.3	21243.0	9919.0	5980.0	122.3	0.0	21243.0	21243.0	21243.0	0.0	0	0
30/10/18	Tuesday	10	5.3	0	181020.8298	0.9	2	0	0	0.0				21243.0	21118.7	9919.0	5980.0	124.3	0.0	21118.7	21118.7	21118.7	0.0	0	0
31/10/18	Wednesday	10	5.1	0	181020.8298	0.9	2	0	0	0.0				21118.7	20996.3	9919.0	5980.0	122.3	0.0	20996.3	20996.3	20996.3	0.0	0	0
01/11/18	Thursday	11	5.1	0	181020.8298	0.9	2	0	0	0.0				20996.3	20874.0	9919.0	5980.0	122.3	0.0	20874.0	20874.0	20874.0	0.0	0	0
02/11/18	Friday	11	4	0	181020.8298	0.9	2	0	0	0.0				20874.0	20762.5	9919.0	5980.0	111.4	0.0	20762.5	20762.5	20762.5	0.0	0	0
03/11/18	Saturday	11	5.6	0	181020.8298	0.9	2	0	0	0.0				20762.5	20635.2	9919.0	5980.0	127.3	0.0	20635.2	20635.2	20635.2	0.0	0	0
04/11/18	Sunday	11	4.9	0	181020.8298	0.9	2	0	0	0.0				20635.2	20514.9	9919.0	5980.0	120.4	0.0	20514.9	20514.9	20514.9	0.0	0	0
05/11/18	Monday	11	4.6	2.8	181020.8298	0.9	2	0.8	27.7732	158.1				20514.9	20555.6	9919.0	5980.0	117.4	0.0	20555.6	20555.6	20555.6	0.0	0	0
06/11/18	Tuesday	11	4.5	0.2	181020.8298	0.9	2	0	1.9838	2.0				20555.6	20441.2	9919.0	5980.0	116.4	0.0	20441.2	20441.2	20441.2	0.0	0	0
07/11/18	Wednesday	11	5.5	0	181020.8298	0.9	2	0	0	0.0				20441.2	20314.9	9919.0	5980.0	126.3	0.0	20314.9	20314.9	20314.9	0.0	0	0
08/11/18	Thursday	11	5.9	0	181020.8298	0.9	2	0	0	0.0				20314.9	20184.6	9919.0	5980.0	130.3	0.0	20184.6	20184.6	20184.6	0.0	0	0
09/11/18	Friday	11	7.4	0	181020.8298	0.9	2	0	0	0.0				20184.6	20039.4	9919.0	5980.0	145.2	0.0	20039.4	20039.4	20039.4	0.0	0	0
10/11/18	Saturday	11	4.6	0	181020.8298	0.9	2	0	0	0.0				20039.4	19922.0	9919.0	5980.0	117.4	0.0	19922.0	19922.0	19922.0	0.0	0	0
11/11/18	Sunday	11	4.9	0	181020.8298	0.9	2	0	0	0.0				19922.0	19801.7	9919.0	5980.0	120.4	0.0	19801.7	19801.7	19801.7	0.0	0	0
12/11/18	Monday	11	5.2	0	181020.8298	0.9	2	0	0	0.0				19801.7	19678.3	9919.0	5980.0	123.3	0.0	19678.3	19678.3	19678.3	0.0	0	0
13/11/18	Tuesday	11	5	0	181020.8298	0.9	2	0	0	0.0				19678.3	19557.0	9919.0	5980.0	121.4	0.0	19557.0	19557.0	19557.0	0.0	0	0
14/11/18	Wednesday	11	6.5	0	181020.8298	0.9	2	0	0	0.0				19557.0	19420.7	9919.0	5980.0	136.2	0.0	19420.7	19420.7	19420.7	0.0	0	0
15/11/18	Thursday	11	6.6	0	181020.8298	0.9	2	0	0	0.0				19420.7	19283.5	9919.0	5980.0	137.2	0.0	19283.5	19283.5	19283.5	0.0	0	0
16/11/18	Friday	11	7.8	0	181020.8298	0.9	2	0	0	0.0				19283.5	19134.4	9919.0	5980.0	149.1	0.0	19134.4	19134.4	19134.4	0.0	0	0
17/11/18	Saturday	11	3.7	0	181020.8298	0.9	2	0	0	0.0				19134.4	19025.9	9919.0	5980.0	108.5	0.0	19025.9	19025.9	19025.9	0.0	0	0
18/11/18	Sunday	11	5.2	0	181020.8298	0.9	2	0	0	0.0				19025.9	18902.6	9919.0	5980.0	123.3	0.0	18902.6	18902.6	18902.6	0.0	0	0
19/11/18	Monday	11	5.3	0	181020.8298	0.9	2	0	0	0.0				18902.6	18778.3	9919.0	5980.0	124.3	0.0	18778.3	18778.3	18778.3	0.0	0	0
20/11/18	Tuesday	11	5.7	0	181020.8298	0.9	2	0	0	0.0				18778.3	18650.0	9919.0	5980.0	128.3	0.0	18650.0	18650.0	18650.0	0.0	0	0
21/11/18	Wednesday	11	6.2	0	181020.8298	0.9	2	0	0	0.0				18650.0	18516.7	9919.0	5980.0	133.3	0.0	18516.7	18516.7	18516.7	0.0	0	0
22/11/18	Thursday	11	7	0	181020.8298	0.9	2	0	0	0.0				18516.7	18375.5	9919.0	5980.0	141.2	0.0	18375.5	18375.5	18375.5	0.0	0	0
23/11/18	Friday	11	5.5	3	181020.8298	0.9	2	1	29.757	192.7				18375.5	18441.9	9919.0	5980.0	126.3	0.0	18441.9	18441.9	18441.9	0.0	0	0
24/11/18	Saturday	11	5.7	0	181020.8298	0.9	2	0	0	0.0				18441.9	18313.6	9919.0	5980.0	128.3	0.0	18313.6	18313.6	18313.6	0.0	0	0
25/11/18	Sunday	11	4.5	0	181020.8298	0.9	2	0	0	0.0				18313.6	18197.2	9919.0	5980.0	116.4	0.0	18197.2	18197.2	18197.2	0.0	0	0
26/11/18	Monday	11	6	1	181020.8298	0.9	2	0	9.919	9.9				18197.2	18075.8	9919.0	5980.0	131.3	0.0	18075.8	18075.8	18075.8	0.0	0	0
27/11/18	Tuesday	11	7	0	181020.8298	0.9	2	0	0	0.0				18075.8	17934.6	9919.0	5980.0	141.2	0.0	17934.6	17934.6	17934.6	0.0	0	0
28/11/18	Wednesday	11	6.2	0	181020.8298	0.9	2	0	0	0.0				17934.6	17801.4	9919.0	5980.0	133.3	0.0	17801.4	17801.4	17801.4	0.0	0	0
29/11/18	Thursday	11	6.4	0	181020.8298	0.9	2	0	0	0.0				17801.4	17666.1	9919.0	5980.0	135.2	0.0	17666.1	17666.1	17666.1	0.0	0	0
30/11/18	Friday	11	5.9	0	181020.8298	0.9	2	0	0	0.0				17666.1	17535.8	9919.0	5980.0	130.3	0.0	17535.8	17535.8	17535.8	0.0	0	0
01/12/18	Saturday	12	4.4	0	181020.8298	0.9	2	0	0	0.0				17535.8	17420.4	9919.0	5980.0	115.4	0.0	17420.4	17420.4	17420.4	0.0	0	0
02/12/18	Sunday	12	7	0	181020.8298	0.9	2	0	0	0.0				17420.4	17279.2	9919.0	5980.0	141.2	0.0	17279.2	17279.2	17279.2	0.0	0	0
03/12/18	Monday	12	8.3	0	181020.8298	0.9	2	0	0	0.0				17279.2	17125.2	9919.0	5980.0	154.1	0.0	17125.2	17125.2	17125.2	0.0	0	0
04/12/18	Tuesday	12	3.9	0	181020.8298	0.9	2	0	0	0.0				17125.2	17014.7	9919.0	5980.0	110.4	0.0	17014.7	17014.7	17014.7	0.0	0	0
05/12/18	Wednesday	12	5.4	0	181020.8298	0.9	2	0	0	0.0				17014.7	16889.4	9919.0	5980.0	125.3	0.0	16889.4	16889.4	16889.4	0.0	0	0
06/12/18	Thursday	12	5.2	1	181020.8298	0.9	2	0	9.919	9.9				16889.4	16776.0	9919.0	5980.0	123.3	0.0	16776.0	16776.0	16776.0	0.0	0	0
07/12/18	Friday	12	5.8	0	181020.8298	0.9	2	0	0	0.0				16776.0	16646.7	7439.3	4485.0	97.0	-32.3	16679.0	16679.0	16679.0	0.0	0	0
08/12/18	Saturday	12	6.6	0.2	181020.8298	0.9	2	0	1.9838	2.0				16679.0	16543.8	7439.3	4485.0	102.9	-34.3	16578.1	16578.1	16578.1	0.0	0	0
09/12/18	Sunday	12	7	0	181020.8298	0.9	2	0	0	0.0				16578.1	16436.9	7439.3	4485.0	105.9	-35.3	16472.2	16472.2	16472.2	0.0	0	0
10/12/18	Monday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				16472.2	16336.9	7439.3	4485.0	101.4	-33.8	16370.7	16370.7	16370.7	0.0	0	0
11/12/18	Tuesday	12	5	0	181020.8298	0.9	2	0	0	0.0				16370.7	16249.4	7439.3	4485.0	91.0	-30.3	16279.7	16279.7	16279.7	0.0	0	0
12/12/18	Wednesday	12	5.1	0	181020.8298	0.9	2	0	0	0.0				16279.7	16157.4	7439.3	4485.0	91.8	-30.6	16188.0	16188.0	16188.0	0.0	0	0
13/12/18	Thursday	12	7.9	0	181020.8298	0.9	2	0	0	0.0				16188.0	16037.8	7439.3	4485.0	112.6	-37.5	16075.4	16075.4	16075.4	0.0	0	0
14/12/18	Friday	12	8.8	0	181020.8298	0.9	2	0	0	0.0				16075.4	15916.3	7439.3	4485.0	119.3	-39.8	15956.1	15956.1	15956.1	0.0	0	0
15/12/18	Saturday	12	4.7	0.2	181020.8298	0.9	2	0	1.9838	2.0				15956.1	15839.7	7439.3	4485.0	88.8	-29.6	15869.3	15869.3	15869.3	0.0	0	0
16/12/18	Sunday	12	6.9	0.2	181020.8298	0.9	2	0	1.9838	2.0				15869.3	15731.1	7439.3	4485.0	105.2	-35.1	15766.1	15766.1	15766.1	0.0	0	0
17/12/18	Monday	12	6.8	0	181020.8298	0.9	2	0	0	0.0				15766.1	15626.9	7439.3	4485.0	104.4	-34.8	15661.7	15661.7	15661.7	0.0	0	0
18/12/18	Tuesday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				15661.7	15526.5	7439.3	4485.0	101.4	-33.8	15560.3	15560.3	15560.3	0.0	0	0
19/12/18	Wednesday	12	6.7	0	181020.8298	0.9	2	0	0	0.0				15560.3	15422.1	7439.3	4485.0	103.7	-34.6	15456.6	15456.6	15456.6	0.0	0	0
20/12/18	Thursday	12	8.1	0	181020.8298	0.9	2	0	0	0.0				15456.6	15304.5	7439.3	4485.0	114.1	-38.0	15342.5	15342.5	15342.5	0.0	0	0
21/12/18	Friday	12	8.6	0	181020.8298	0.9	2	0	0	0.0				15342.5	15185.5	7439.3	4485.0	117.8	-39.3	15224.7	15224.7	15224.7	0.0	0	0
22/12/18	Saturday	12	9.1	0	181020.8298	0.9	2	0	0	0.0				15224.7	15062.7	7439.3	4485.0	121.5	-40.5	15103.2	15103.2	15103.2	0.0	0	0
23/12/18	Sunday	12	6.5	0	181020.8298	0.9	2	0	0	0.0				15103.2	14967.0	7439.3	4485.0	102.2	-34.1	15001.1	15001.1	15001.1	0.0	0	0
24/12/18	Monday	12	7.5	0	181020.8298	0.9	2	0	0	0.0				15001.1	14854.9	7439.3	4485.0	109.6	-36.5	14891.4	14891.4	14891.4	0.0	0	0
25/12/18	Tuesday	12	7.1	0	181020.8298	0.9	2	0	0	0.0				14891.4	14749.3	7439.3	4485.0	106.6	-35.5	14784.8	14784.8	14784.8	0.0	0	0
26/12/18	Wednesday	12	5.5	0	181020.8298	0.9	2	0	0	0.0				14784.8	14658.5	7439.3	4485.0	94.7	-31.6	14690.1	14690.1	14690.1	0.0	0	0
27/12/18	Thursday	12	6	0	181020.8298	0.9	2	0	0	0.0				14690.1	14558.8	7439.3	4485.0	98.5	-32.8	14591.6	14591.6	14591.6	0.0	0	0
28/12/18	Friday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				14591.6	14456.4	7439.3	4485.0	101.4	-33.8	14490.2	14490.2	14490.2	0.0	0	0
29/12/18	Saturday	12	6.4	0	181020.8298	0.9	2	0	0	0.0				14490.2	14354.3	7439.3	4485.0	101.4	-33.8	14388.7	14388.7	14388.7	0.0	0	0
30/12/18	Sunday	12	6.6	0	181020.8298	0.9	2	0	0	0.0				14388.7	14251.5	7439.3	4485.0	102.9	-34.3	14285.8	14285.8	14285.8	0.0	0	0
31/12/18	Monday	12	7.2	0	181020.8298	0.9	2	0	0	0.0				14285.8	14142.5	7439.3	4485.0	107.4	-35.8	14178.4	14178.4	14178.4	0.0	0	0

Date	Timing Tools: Weekday	Month number	BOM Data: Loss - evaporation (mm)	Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Demand (loss): Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Abstraction: Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty flag
Formula/Parameter			Raw data	Raw data	Raw data	Raw data	Raw data	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
01/01/13	Tuesday	1	6.8	0	181020.8	0.9	2	0	0.0	0.0				16782.1	16535.2	9200.7	7231.2	149.3	-47.6	16642.8	16642.8	100	45	145	[illegible]	[illegible]	0.0	0	0
02/01/13	Wednesday	1	6.4	0.8	181020.8	0.9	2	0	14.7	0.0				16497.8	16320.7	9200.7	7231.2	145.7	-31.4	16352.1	16352.1	100	45	145	[illegible]	[illegible]	0.0	0	0
03/01/13	Thursday	1	5.8	0	181020.8	0.9	2	0	0.0	0.0				16207.1	16041.1	9200.7	7231.2	140.1	-25.9	16067.0	16067.0	100	45	145	[illegible]	[illegible]	0.0	0	0
04/01/13	Friday	1	6.7	0	181020.8	0.9	2	0	0.0	0.0				15921.0	15739.4	9200.7	7231.2	148.4	-34.2	15773.6	15773.6	100	45	145	[illegible]	[illegible]	0.0	0	0
05/01/13	Saturday	1	4.4	0	181020.8	0.9	2	0	0.0	0.0				15628.6	15414.7	9200.7	7231.2	164.1	-49.8	15464.5	15464.5	100	45	145	[illegible]	[illegible]	0.0	0	0
06/01/13	Sunday	1	5.8	1	181020.8	0.9	2	0	18.4	0.0				15319.5	15153.5	9200.7	7231.2	140.1	-25.9	15179.4	15179.4	100	45	145	[illegible]	[illegible]	0.0	0	0
07/01/13	Monday	1	5.3	19.8	181020.8	0.9	2	17.8	364.3	2900.0				15034.4	17777.5	13801.0	10846.7	203.3	46.5	17731.0	17731.0	100	45	145	[illegible]	[illegible]	0.0	0	0
08/01/13	Tuesday	1	8.5	0.4	181020.8	0.9	2	0	7.4	0.0				17586.0	17370.3	13801.0	10846.7	247.5	31.8	17338.5	17338.5	100	45	145	[illegible]	[illegible]	0.0	0	0
09/01/13	Wednesday	1	5.3	0	181020.8	0.9	2	0	0.0	0.0				17193.5	17018.3	13801.0	10846.7	217.1	41.9	16976.4	16976.4	100	45	145	[illegible]	[illegible]	0.0	0	0
10/01/13	Thursday	1	6.3	0	181020.8	0.9	2	0	0.0	0.0				16831.4	16656.2	9200.7	7231.2	144.7	-30.5	16686.7	16686.7	100	45	145	[illegible]	[illegible]	0.0	0	0
11/01/13	Friday	1	7	0	181020.8	0.9	2	0	0.0	0.0				16541.7	16353.6	9200.7	7231.2	151.2	-36.9	16390.5	16390.5	100	45	145	[illegible]	[illegible]	0.0	0	0
12/01/13	Saturday	1	5.2	0	181020.8	0.9	2	0	0.0	0.0				16245.5	16035.3	9200.7	7231.2	167.2	-48.0	16083.3	16083.3	100	45	145	[illegible]	[illegible]	0.0	0	0
13/01/13	Sunday	1	4.5	0	181020.8	0.9	2	0	0.0	0.0				15938.3	15796.2	9200.7	7231.2	128.2	-13.9	15810.1	15810.1	100	45	145	[illegible]	[illegible]	0.0	0	0
14/01/13	Monday	1	7.5	1.6	181020.8	0.9	2	0	29.4	0.0				15665.1	15467.8	9200.7	7231.2	155.8	-41.5	15509.3	15509.3	100	45	145	[illegible]	[illegible]	0.0	0	0
15/01/13	Tuesday	1	5.9	0	181020.8	0.9	2	0	0.0	0.0				15364.3	15178.1	9200.7	7231.2	150.3	-36.0	15214.1	15214.1	100	45	145	[illegible]	[illegible]	0.0	0	0
16/01/13	Wednesday	1	4.4	0	181020.8	0.9	2	0	0.0	0.0				15069.1	14928.8	9200.7	7231.2	127.3	-13.0	14941.8	14941.8	100	45	145	[illegible]	[illegible]	0.0	0	0
17/01/13	Thursday	1	5.9	4.4	181020.8	0.9	2	2.4	81.0	391.0				14796.8	15001.6	9200.7	7231.2	150.3	-36.0	15037.6	15037.6	100	45	145	[illegible]	[illegible]	0.0	0	0
18/01/13	Friday	1	7.3	0	181020.8	0.9	2	0	0.0	0.0				14892.6	14699.0	9200.7	7231.2	153.9	-39.7	14738.6	14738.6	100	45	145	[illegible]	[illegible]	0.0	0	0
19/01/13	Saturday	1	8.3	0	181020.8	0.9	2	0	0.0	0.0				14593.6	14381.6	9200.7	7231.2	163.1	-48.9	14430.5	14430.5	100	45	145	[illegible]	[illegible]	0.0	0	0
20/01/13	Sunday	1	7.6	0	181020.8	0.9	2	0	0.0	0.0				14285.5	14086.4	9200.7	7231.2	156.7	-42.4	14128.8	14128.8	100	45	145	[illegible]	[illegible]	0.0	0	0
21/01/13	Monday	1	7.4	0	181020.8	0.9	2	0	0.0	0.0				13983.8	13788.3	9200.7	7231.2	154.9	-40.6	13828.9	13828.9	100	45	145	[illegible]	[illegible]	0.0	0	0
22/01/13	Tuesday	1	8.4	0	181020.8	0.9	2	0	0.0	0.0				13683.9	13470.1	9200.7	7231.2	164.1	-49.8	13519.9	13519.9	100	45	145	[illegible]	[illegible]	0.0	0	0
23/01/13	Wednesday	1	6.8	0	181020.8	0.9	2	0	0.0	0.0				13374.9	13190.5	9200.7	7231.2	149.3	-35.1	13225.5	13225.5	100	45	145	[illegible]	[illegible]	0.0	0	0
24/01/13	Thursday	1	7.2	0	181020.8	0.9	2	0	0.0	0.0				13080.5	12888.6	9200.7	7231.2	153.0	-38.8	12927.5	12927.5	100	45	145	[illegible]	[illegible]	0.0	0	0
25/01/13	Friday	1	7.6	0	181020.8	0.9	2	0	0.0	0.0				12782.5	12583.4	9200.7	7231.2	156.7	-42.4	12625.8	12625.8	100	45	145	[illegible]	[illegible]	0.0	0	0
26/01/13	Saturday	1	7.9	0	181020.8	0.9	2	0	0.0	0.0				12480.8	12276.2	9200.7	7231.2	159.5	-45.2	12321.4	12321.4	100	45	145	[illegible]	[illegible]	0.0	0	0
27/01/13	Sunday	1	8.1	0	181020.8	0.9	2	0	0.0	0.0				12176.4	11968.0	9200.7	7231.2	161.3	-47.0	12015.1	12015.1	100	45	145	[illegible]	[illegible]	0.0	0	0
28/01/13	Monday	1	7.7	0	181020.8	0.9	2	0	0.0	0.0				11870.1	11669.1	9200.7	7231.2	157.6	-43.4	11712.4	11712.4	100	45	145	[illegible]	[illegible]	0.0	0	0
29/01/13	Tuesday	1	8	0	181020.8	0.9	2	0	0.0	0.0				11567.4	11361.0	9200.7	7231.2	160.4	-46.1	11407.1	11407.1	100	45	145	[illegible]	[illegible]	0.0	0	0
30/01/13	Wednesday	1	7.4	0	181020.8	0.9	2	0	0.0	0.0				11267.1	11066.6	9200.7	7231.2	154.9	-40.6	11107.2	11107.2	100	45	145	[illegible]	[illegible]	0.0	0	0
31/01/13	Thursday	1	8.6	0	181020.8	0.9	2	0	0.0	0.0				10962.2	10744.7	9200.7	7231.2	165.9	-51.6	10796.3	10796.3	100	45	145	[illegible]	[illegible]	0.0	0	0
01/02/13	Friday	2	8.6	0	181020.8	0.9	2	0	0.0	0.0				10651.3	10433.8	9200.7	7231.2	165.9	-51.6	10485.4	10485.4	100	45	145	[illegible]	[illegible]	0.0	0	0
02/02/13	Saturday	2	8.1	0	181020.8	0.9	2	0	0.0	0.0				10340.4	10132.1	9200.7	7231.2	161.3	-47.0	10179.1	10179.1	100	45	145	[illegible]	[illegible]	0.0	0	0
03/02/13	Sunday	2	7.6	0	181020.8	0.9	2	0	0.0	0.0				10034.1	9835.0	9200.7	7231.2	156.7	-42.4	9877.4	9877.4	100	45	145	[illegible]	[illegible]	0.0	0	0
04/02/13	Monday	2	6	0	181020.8	0.9	2	0	0.0	0.0				9732.4	9562.7	9200.7	7231.2	142.0	-27.7	9590.4	9590.4	100	45	145	[illegible]	[illegible]	0.0	0	0
05/02/13	Tuesday	2	5.7	0	181020.8	0.9	2	0	0.0	0.0				9445.4	9281.3	9200.7	7231.2	139.2	-24.9	9306.2	9306.2	100	45	145	[illegible]	[illegible]	0.0	0	0
06/02/13	Wednesday	2	7	0	181020.8	0.9	2	0	0.0	0.0				9161.2	8973.1	9200.7	7231.2	151.2	-36.9	9010.0	9010.0	100	45	145	[illegible]	[illegible]	0.0	0	0
07/02/13	Thursday	2	6.6	0	181020.8	0.9	2	0	0.0	0.0				8865.0	8684.3	9200.7	7231.2	147.5	-33.2	8717.5	8717.5	100	45	145	[illegible]	[illegible]	0.0	0	0
08/02/13	Friday	2	7.4	0	181020.8	0.9	2	0	0.0	0.0				8572.5	8377.1	4600.3	3615.6	77.4	-118.0	8495.1	8495.1	100	45	145	[illegible]	[illegible]	0.0	0	0
09/02/13	Saturday	2	8.5	0	181020.8	0.9	2	0	0.0	0.0				8350.1	8134.4	4600.3	3615.6	82.5	-133.2	8267.6	8267.6	100	45	145	[illegible]	[illegible]	0.0	0	0
10/02/13	Sunday	2	8.9	0	181020.8	0.9	2	0	0.0	0.0				8122.6	7899.6	4600.3	3615.6	84.3	-138.7	8038.3	8038.3	100	45	145	[illegible]	[illegible]	0.0	0	0
11/02/13	Monday	2	7	0	181020.8	0.9	2	0	0.0	0.0				7893.3	7705.2	4600.3	3615.6	75.6	-112.5	7817.7	7817.7	100	45	145	[illegible]	[illegible]	0.0	0	0
12/02/13	Tuesday	2	7.4	0	181020.8	0.9	2	0	0.0	0.0				7672.7	7477.2	4600.3	3615.6	77.4	-118.0	7595.3	7595.3	100	45	145	[illegible]	[illegible]	0.0	0	0
13/02/13	Wednesday	2	6.8	0	181020.8	0.9	2	0	0.0	0.0				7450.3	7265.9	4600.3	3615.6	74.7	-109.7	7375.6	7375.6	100	45	145	[illegible]	[illegible]	0.0	0	0
14/02/13	Thursday	2	5	0	181020.8	0.9	2	0	0.0	0.0				7230.6	7079.3	4600.3	3615.6	66.4	-84.9	7164.2	7164.2	100	45	145	[illegible]	[illegible]	0.0	0	0
15/02/13	Friday	2	7	0	181020.8	0.9	2	0	0.0	0.0				7019.2	6831.1	4600.3	3615.6	75.6	-112.5	6943.6	6943.6	100	45	145	[illegible]	[illegible]	0.0	0	0
16/02/13	Saturday	2	6.1	0	181020.8	0.9	2	0	0.0	0.0				6798.6	6627.1	4600.3	3615.6	71.4	-100.1	6727.2	6727.2	100	45	145	[illegible]	[illegible]	0.0	0	0
17/02/13	Sunday	2	5.5	0	181020.8	0.9	2	0	0.0	0.0				6582.2	6421.7	4600.3	3615.6	68.7	-91.8	6511.3	6511.3	100	45	145	[illegible]	[illegible]	0.0	0	0
18/02/13	Monday	2	7.1	0	181020.8	0.9	2	0	0.0	0.0				6368.5	6178.6	4600.3	3615.6	76.0	-113.9	6292.4	6292.4	100	45	145	[illegible]	[illegible]	0.0	0	0
19/02/13	Tuesday	2	7.4	0	181020.8	0.9	2	0	0.0	0.0				6147.4	5952.0	4600.3	3615.6	77.4	-118.0	6070.0	6070.0	100	45	145	[illegible]	[illegible]	0.0	0	0
20/02/13	Wednesday	2	7.8	0	181020.8	0.9	2	0	0.0	0.0				5925.0	5722.2	4600.3	3615.6	79.3	-123.5	5845.7	5845.7	100	45	145	[illegible]	[illegible]	0.0	0	0
21/02/13	Thursday	2	6.4	2.4	181020.8	0.9	2	0.4	44.2	65.2				5700.7	5588.9	4600.3	3615.6	72.8	-104.2	5693.1	5693.1	100	45	145	[illegible]	[illegible]	0.0	0	0
22/02/13	Friday	2	4.5	0	181020.8	0.9	2	0	0.0	0.0				5548.1	5406.0	4600.3	3615.6	64.1	-78.0	5484.0	5484.0	100	45	145	[illegible]	[illegible]	0.0	0	0
23/02/13	Saturday	2	5.3	1	181020.8	0.9	2	0	18.4	0.0				5339.0	5182.2	4600.3	3615.6	67.8	-89.0	5271.2	5271.2	100	45	145	[illegible]	[illegible]	0.0	0	0
24/02/13	Sunday	2	5.9	0	181020.8	0.9	2	0	0.0	0.0				5126.2	4958.4	4600.3	3615.6	70.5	-97.3	5055.7	5055.7	100	45	145	[illegible]	[illegible]	0.0	0	0
25/02/13	Monday	2	7.4	0	181020.8	0.9	2	0	0.0	0.0				4910.7	4715.2	4600.3	3615.6	77.4	-118.0	4833.3	4833.3	100	45	145	[illegible]	[illegible]	0.0	0	0
26/02/13	Tuesday	2	7.1	0	181020.8	0.9	2	0	0.0	0.0				4688.3	4498.3	4600.3	3615.6	76.0	-113.9	4612.2	4612.2	100	45	145	[illegible]	[illegible]	0.0	0	0
27/02/13	Wednesday	2	7.7	0	181020.8	0.9	2	0	0.0	0.0				4467.2	4266.2	4600.3	3615.6	78.8	-122.2	4388.4	4388.4	100	45	145	[illegible]	[illegible]	0.0	0	0
28/02/13	Thursday	2	7.1	0	181020.8	0.9	2	0	0.0	0.0				4243.4	4053.5	4600.3	3615.6	76.0	-113.9	4167.4	4167.4	100	45	145	[illegible]	[illegible]	0.0	0	0
01/03/13	Friday	3	7.3	0	181020.8	0.9	2	0	0.0	0.0				4022.4	3828.7	4600.3	3615.6	77.0	-116.6	3945.4	3945.4	100	45	145	[illegible]	[illegible]	0.0	0	0
02/03/13	Saturday	3	5.5	0	181020.8	0.9	2	0	0.0	0.0				3800.4	3639.9	4600.3	3615.6	68.7	-91.8	3731.7	3731.7	100	45	145	[illegible]	[illegible]	0.0	0	0
03/03/13	Sunday	3	5.2	0	181020.8	0.9	2	0	0.0	0.0				3586.7	3431.7	4600.3	3615.6	67.3	-87.7	3519.4	3519.4	100	45	145	[illegible]	[illegible]	0.0	0	0
04/03/13	Monday	3	3.9	0	181020.8	0.9	2	0	0.0	0.0				3374.4	3243.3	4600.3	3615.6	61.3	-69.7	3313.1	3313.1	100	45	145	[illegible]	[illegible]	0.0	0	0
05/03/13	Tuesday	3	4.1	0.4	181020.8	0.9	2	0	7.4	0.0				3168.1	3033.3	4600.3	3615.6	62.2	-72.5	3105.8	3105.8	100	45	145	[illegible]	[illegible]	0.0	0	0
06/03/13	Wednesday	3	5.6	0	181020.8	0.9	2	0	0.0	0.0				2960.8	2798.5	4600.3	3615.6	69.1	-93.2	2891.7	2891.7	100	45	145	[illegible]	[illegible]	0.0	0	0
07/03/13	Thursday	3	6.1	0	181020.8	0.9	2	0	0.0	0.0				2746.7	2575.1	4600.3	3615.6	71.4	-100.1	2675.2	2675.2	100	45	145	[illegible]	[illegible]	0.0	0	0
08/03/13	Friday	3	6.6	0	181020.8	0.9	2	0	0.0	0.0				2530.2	2349.5	4600.3	3615.6	73.7	-107.0	2456.5	2456.5	100	45	145	[illegible]	[illegible]	0.0	0	0
09/03/13	Saturday	3	5.7	0	181020.8	0.9	2	0	0.0	0.0				2311.5	2147.3	4600.3	3615.6	69.6	-94.6	2241.9	2241.9	100	45	145	[illegible]	[illegible]	0.0	0	0
10/03/13	Sunday	3	2.8	0	181020.8	0.9	2	0	0.0	0.0				2096.9	1986.1	4600.3	3615.6	56.3	-54.5	2040.6	2040.6	100	45	145	[illegible]	[illegible]	0.0	0	0
11/03/13	Monday	3	4.3	27.6	181020.8	0.9	2	25.6	507.9	4170.7				1895.6	5927.9	4600.3	3615.6	63.2	-75.2	6003.1	6003.1	100	45	145	[illegible]	[illegible]	0.0	0	0
12/03/13	Tuesday	3	5.5	1	181020.8	0.9	2	0	18.4	0.0				5858.1	5697.7	4600.3	3615.6	68.7	-91.8	5789.4	5789.4	100	45	145	[illegible]	[illegible]	0.0	0	0
13/03/13	Wednesday	3	5.7	0	181020.8	0.9	2	0	0.0	0.0				5644.4	5480.3	4600.3	3615.6	69.6	-94.6	5574.8	5574.8	100	45	145	[illegible]	[illegible]	0.0	0	0
14/03/13	Thursday	3	2.4	0	181020.8	0.9	2	0	0.0	0.0				5429.8	5326.4	4600.3	3615.6	54.4	-49.0	5375.4	5375.4	100	45	145	[illegible]	[illegible]	0.0	0	0
15/03/13	Friday	3	3.9	28.8	181020.8	0.9	2	26.8	530.0	4366.2				5230.4	9465.6	9200.7	7231.2	122.7	-8.4	9474.0	9474.0	100	45	145	[illegible]	[illegible]	0.0	0	0
16/03/13	Saturday	3	5.2	0	181020.8	0.9	2	0	0.0	0.0				9379.0	9174.0	9200.7	7231.2	134.6	-20.3	9194.4	9194.4	100	45	145	[illegible]	[illegible]	0.0	0	0
17/03/13	Sunday	3	5	0	181020.8	0.9	2	0	0.0	0.0				9049.4	8898.1	9200.7	7231.2	132.8	-18.5	8918.6	8918.6	100	45	145	[illegible]	[illegible]	0.0	0	0
18/03/13	Monday	3	4.4	0	181020.8	0.9	2	0	0.0	0.0				8771.6	8631.3	9200.7	7231.2	127.3	-13.0	8644.3	8644.3	100	45	145	[illegible]	[illegible]	0.0	0	0
19/03/13	Tuesday	3	4	0	181020.8	0.9	2	0	0.0	0.0				8499.3	8366.4	4600.3	3615.6	61.8	-71.1	8437.5	8437.5	100	45	145	[illegible]	[illegible]	0.0	0	0
20/03/13	Wednesday	3	3.5	0	181020.8	0.9	2	0	0.0	0.0				8292.5	8168.9	4600.3	3615.6	59.5	-64.2	8233.1	8233.1	100	45	145	[illegible]	[illegible]	0.0	0	0
21/03/13	Thursday	3	4.3	0	181020.8	0.9	2	0	0.0	0.0				8088.1	7949.6	4600.3	3615.6	63.2	-75.2	8024.9	8024.9	100	45	145	[illegible]	[illegible]	0.0	0	0
22/03/13	Friday	3	4.7	0	181020.8	0.9	2	0	0.0	0.0				7879.9	7734.1	4600.3	3615.6	65.0	-80.8	7814.9	7814.9	100	45	145	[illegible]	[illegible]	0.0	0	0
23/03/13	Saturday	3	4.3	0	181020.8	0.9	2	0	0.0	0.0				7669.9	7531.5	4600.3	3615.6	63.2	-75.2	7606.7	7606.7	100	45	145	[illegible]	[illegible]	0.0	0	0
24/03/13	Sunday	3	4.7	0	181020.8	0.9	2	0	0.0	0.0				7461.7	7315.9	4600.3	3615.6	65.0	-80.8	7396.7	7396.7	100	45	145	[illegible]	[illegible]	0.0	0	0
25/03/13	Monday	3	2.6	0	181020.8	0.9	2	0	0.0	0.0				7251.7	7144.6	4600.3	3615.6	55.3	-51.8	7196.4	7196.4	100	45	145	[illegible]	[illegible]	0.0	0	0
26/03/13	Tuesday	3	3.9	23.2	181020.8	0.9	2	21.2	426.9	2453.9				7051.4	10374.2	9200.7	7231.2	122.7	-8.4	10382.6	10382.6	100	45	145	[illegible]	[illegible]	0.0	0	0
27/03/13	Wednesday	3	3.5	0.2	181020.8	0.9	2	0	3.7	0.0				10237.6	10113.9	9200.7	7231.2	119.0	-4.7	10118.6	10118.6	100	45	145	[illegible]	[illegible]	0.0	0	0
28/03/13	Thursday	3	3.5	0	181020.8	0.9	2	0	0.0	0.0				9973.6	9849.9	9200.7	7231.2	119.0	-4.7	9854.6	9854.6	100	45	145	[illegible]	[illegible]	0.0	0	0
29/03/13	Friday	3	3.5	0	181020.8	0.9	2	0	0.0	0.0				9709.6	9585.9	9200.7	7231.2	119.0	-4.7	9590.6	9590.6	100	45	145	[illegible]	[illegible]	0.0	0	0
30/03/13	Saturday	3	3.5	0	181020.8	0.9	2	0	0.0	0.0				9445.6	9322.0	9200.7	7231.2	119.0	-4.7	9326.7	9326.7	100	45	145	[illegible]	[illegible]	0.0	0	0
31/03/13	Sunday	3	3.5	0	181020.8	0.9	2	0	0.0	0.0				9181.7	9058.0	9200.7	7231.2	119.0	-4.7	9062.7	9062.7	100	45	145	[illegible]	[illegible]	0.0	0	0
01/04/13	Monday	4	5	0	181020.8	0.9	2	0	0.0	0.0				8917.7	8766.4	9200.7	7231.2	132.8	-18.5	8784.9	8784.9	100	45	145	[illegible]	[illegible]	0.0	0	0
02/04/13	Tuesday	4	4.8	0	181020.8	0.9	2	0	0.0	0.0				8639.9	8492.3	9200.7	7231.2	130.9	-16.7	8509.0	8509.0	100	45	145	[illegible]	[illegible]	0.0	0	0
03/04/13	Wednesday	4	5.5	0	181020.8	0.9	2	0	0.0	0.0				8364.0	8203.5	4600.3	3615.6	68.7	-91.8	8295.3	8295.3	100	45	145	[illegible]	[illegible]	0.0	0	0
04/04/13	Thursday	4	4.8	0	181020.8	0.9	2	0	0.0	0.0				8150.3	8002.7	4600.3	3615.6	65.5	-82.1	8084.8	8084.8	100	45	145	[illegible]	[illegible]	0.0	0	0
05/04/13	Friday	4	4.1	0	181020.8	0.9	2	0	0.0	0.0				7939.8	7805.1	4600.3	3615.6	62.2	-72.5	7877.8	7877.8	100	45	145	[illegible]	[illegible]	0.0	0	0

	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses									Final pond volumes		Demand (dust)			Abstraction		Overflow Calcs		
Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m³)	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m³/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
06/04/13	Saturday	4	4.6	0	[illegible]	0.9	2	0	0.0	0.0				7732.6	7588.5	4600.3	3615.6	64.3	-79.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/04/13	Sunday	4	4.9	0	[illegible]	0.9	2	0	0.0	0.0				7523.0	7373.5	4600.3	3615.6	65.9	-83.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/04/13	Monday	4	4.8	0	[illegible]	0.9	2	0	0.0	0.0				7312.1	7164.3	4600.3	3615.6	65.3	-82.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/04/13	Tuesday	4	3.9	0	[illegible]	0.9	2	0	0.0	0.0				7101.6	6970.5	4600.3	3615.6	61.3	-69.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/04/13	Wednesday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0				6895.3	6773.5	4600.3	3615.6	59.0	-62.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/04/13	Thursday	4	4.6	0	[illegible]	0.9	2	0	0.0	0.0				6691.3	6547.3	4600.3	3615.6	64.5	-79.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/04/13	Friday	4	1.6	0.6	[illegible]	0.9	2	0	11.0	0.0				6481.7	6391.3	4600.3	3615.6	50.7	-38.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/04/13	Saturday	4	2.4	2	[illegible]	0.9	2	0	36.8	0.0				6286.0	6182.5	4600.3	3615.6	54.4	-49.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/04/13	Sunday	4	1.9	3	[illegible]	0.9	2	1	55.2	162.9				6086.5	6136.3	4600.3	3615.6	56.7	-55.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/04/13	Monday	4	2.7	0.6	[illegible]	0.9	2	0	11.0	0.0				6047.7	5938.3	4600.3	3615.6	55.4	-53.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/04/13	Tuesday	4	2.1	0.2	[illegible]	0.9	2	0	3.7	0.0				5846.9	5749.3	4600.3	3615.6	53.6	-44.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/04/13	Wednesday	4	2.2	0	[illegible]	0.9	2	0	0.0	0.0				5648.9	5549.1	4600.3	3615.6	53.5	-46.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/04/13	Thursday	4	2.2	0	[illegible]	0.9	2	0	0.0	0.0				5450.4	5350.5	4600.3	3615.6	53.5	-46.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/04/13	Friday	4	2.5	1.4	[illegible]	0.9	2	0	25.8	0.0				5251.9	5146.5	4600.3	3615.6	54.9	-50.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/04/13	Saturday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0				5052.0	4941.1	4600.3	3615.6	56.3	-54.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/04/13	Sunday	4	2.4	0	[illegible]	0.9	2	0	0.0	0.0				4850.7	4747.3	4600.3	3615.6	54.4	-49.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/04/13	Monday	4	2.4	6.4	[illegible]	0.9	2	4.4	117.8	716.8				4651.3	5764.7	4600.3	3615.6	54.4	-49.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/04/13	Tuesday	4	2.6	0.2	[illegible]	0.9	2	0	3.7	0.0				5168.7	5061.6	4600.3	3615.6	55.3	-51.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/04/13	Wednesday	4	3	0.2	[illegible]	0.9	2	0	3.7	0.0				4968.4	4853.9	4600.3	3615.6	57.2	-57.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/04/13	Thursday	4	2.1	0	[illegible]	0.9	2	0	0.0	0.0				4766.2	4668.3	4600.3	3615.6	53.9	-44.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/04/13	Friday	4	2.7	0	[illegible]	0.9	2	0	0.0	0.0				4568.1	4459.3	4600.3	3615.6	55.8	-53.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/04/13	Saturday	4	2.5	0	[illegible]	0.9	2	0	0.0	0.0				4367.3	4262.0	4600.3	3615.6	54.9	-50.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/04/13	Sunday	4	2.8	2.4	[illegible]	0.9	2	0.4	44.2	65.2				4167.4	4121.3	4600.3	3615.6	56.3	-54.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/04/13	Monday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0				4031.3	3920.5	4600.3	3615.6	56.3	-54.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/04/13	Tuesday	4	2.9	0	[illegible]	0.9	2	0	0.0	0.0				3830.1	3717.4	4600.3	3615.6	56.7	-55.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/05/13	Wednesday	5	2.7	0	[illegible]	0.9	2	0	0.0	0.0				3628.3	3519.4	4600.3	3615.6	55.4	-53.2	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
02/05/13	Thursday	5	2.3	19.2	[illegible]	0.9	2	17.2	353.3	2802.2				3527.5	6228.1	4600.3	3615.6	54.0	-47.6	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
03/05/13	Friday	5	2.2	6	[illegible]	0.9	2	4	110.4	651.7				6230.8	6782.7	4600.3	3615.6	53.5	-46.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
04/05/13	Saturday	5	2.5	0.2	[illegible]	0.9	2	0	3.7	0.0				6783.9	6678.6	4600.3	3615.6	54.9	-50.4	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
05/05/13	Sunday	5	2.4	0	[illegible]	0.9	2	0	0.0	0.0				6684.0	6580.6	4600.3	3615.6	54.4	-49.0	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
06/05/13	Monday	5	1.7	0	[illegible]	0.9	2	0	0.0	0.0				6584.6	6494.0	4600.3	3615.6	51.2	-39.4	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
07/05/13	Tuesday	5	1.9	0	[illegible]	0.9	2	0	0.0	0.0				6488.4	6394.2	4600.3	3615.6	51.2	-41.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
08/05/13	Wednesday	5	2.5	42	[illegible]	0.9	2	40	772.9	6516.7				6391.3	12802.7	9200.7	7231.2	109.9	4.5	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
09/05/13	Thursday	5	2.9	26.8	[illegible]	0.9	2	24.8	493.2	4047.4				12751.2	16681.0	9200.7	7231.2	113.5	0.8	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
10/05/13	Friday	5	2.5	11.6	[illegible]	0.9	2	9.6	213.5	1564.0				16635.2	18091.9	13801.0	10846.7	164.7	59.4	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
11/05/13	Saturday	5	2.2	4.6	[illegible]	0.9	2	2.6	84.6	423.6				17989.5	18313.4	13801.0	10846.7	160.3	60.8	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
12/05/13	Sunday	5	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0				18307.6	18118.9	13801.0	10846.7	152.2	63.5	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
13/05/13	Monday	5	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				18010.4	17918.0	13801.0	10846.7	155.3	62.6	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
14/05/13	Tuesday	5	2.2	0	[illegible]	0.9	2	0	0.0	0.0				17810.4	17710.6	13801.0	10846.7	160.3	60.8	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
15/05/13	Wednesday	5	2	0	[illegible]	0.9	2	0	0.0	0.0				17604.8	17508.7	13801.0	10846.7	157.8	61.7	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
16/05/13	Thursday	5	2.3	0	[illegible]	0.9	2	0	0.0	0.0				17402.1	17300.5	13801.0	10846.7	161.3	60.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
17/05/13	Friday	5	1.7	8.4	[illegible]	0.9	2	6.4	154.6	1042.7				17195.2	18147.3	13801.0	10846.7	151.5	63.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
18/05/13	Saturday	5	1.5	0	[illegible]	0.9	2	0	0.0	0.0				18039.2	17952.3	13801.0	10846.7	150.3	64.0	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
19/05/13	Sunday	5	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				17843.4	17751.0	13801.0	10846.7	155.3	62.6	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
20/05/13	Monday	5	2	5.6	[illegible]	0.9	2	3.6	103.0	586.5				17643.4	18133.8	13801.0	10846.7	157.5	61.7	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
21/05/13	Tuesday	5	1.9	0.4	[illegible]	0.9	2	0	7.4	0.0				18027.1	17932.9	13801.0	10846.7	156.4	62.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
22/05/13	Wednesday	5	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0				17825.7	17737.0	13801.0	10846.7	152.2	63.5	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
23/05/13	Thursday	5	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				17628.5	17536.3	13801.0	10846.7	155.3	62.6	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
24/05/13	Friday	5	1.9	0	[illegible]	0.9	2	0	0.0	0.0				17428.5	17334.2	13801.0	10846.7	156.4	62.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
25/05/13	Saturday	5	2.1	0	[illegible]	0.9	2	0	0.0	0.0				17227.1	17139.2	13801.0	10846.7	159.1	61.2	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
26/05/13	Sunday	5	1.8	0	[illegible]	0.9	2	0	0.0	0.0				17021.9	16930.5	13801.0	10846.7	155.3	62.6	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
27/05/13	Monday	5	2	1.8	[illegible]	0.9	2	0	33.1	0.0				16821.9	16726.9	9200.3	7231.2	105.1	9.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
28/05/13	Tuesday	5	1.6	2.2	[illegible]	0.9	2	0.2	40.5	32.6				16672.8	16616.6	9200.3	7231.2	101.3	12.8	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
29/05/13	Wednesday	5	1.9	7.2	[illegible]	0.9	2	5.2	132.5	847.2				16558.9	17311.8	13801.0	10846.7	156.4	62.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
30/05/13	Thursday	5	1.6	17	[illegible]	0.9	2	15	312.8	2443.6				17204.7	19559.7	13801.0	10846.7	152.2	63.5	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
31/05/13	Friday	5	1.7	4.4	[illegible]	0.9	2	2.4	81.0	391.0				19451.2	19751.6	13801.0	10846.7	153.3	63.1	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
01/06/13	Saturday	6	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				19643.6	19551.2	13801.0	10846.7	155.3	62.6	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
02/06/13	Sunday	6	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0				19488.6	19399.9	13801.0	10846.7	152.1	63.5	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
03/06/13	Monday	6	2	0	[illegible]	0.9	2	0	0.0	0.0				19336.3	19240.2	13801.0	10846.7	157.3	61.7	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
04/06/13	Tuesday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0				19178.6	19095.4	13801.0	10846.7	148.1	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
05/06/13	Wednesday	6	1.6	1.2	[illegible]	0.9	2	0	22.1	0.0				19030.5	18941.7	13801.0	10846.7	152.1	63.5	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
06/06/13	Thursday	6	1.6	0	[illegible]	0.9	2	0	0.0	0.0				18878.2	18789.5	13801.0	10846.7	152.1	63.5	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
07/06/13	Friday	6	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0				18726.0	18639.1	13801.0	10846.7	150.7	64.0	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
08/06/13	Saturday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0				18575.1	18491.3	13801.0	10846.7	148.1	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
09/06/13	Sunday	6	1.4	2.6	[illegible]	0.9	2	0.6	47.8	97.8				18427.0	18439.7	13801.0	10846.7	149.5	64.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
10/06/13	Monday	6	1.4	19	[illegible]	0.9	2	17	349.6	[illegible]				18375.3	21059.9	13801.0	10846.7	149.5	64.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
11/06/13	Tuesday	6	1.9	0	[illegible]	0.9	2	0	0.0	0.0				20995.4	20901.2	13801.0	10846.7	156.1	62.1	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
12/06/13	Wednesday	6	2.1	0	[illegible]	0.9	2	0	0.0	0.0				20839.0	20741.3	13801.0	10846.7	159.1	61.2	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
13/06/13	Thursday	6	1.9	0	[illegible]	0.9	2	0	0.0	0.0				20679.9	20585.7	13801.0	10846.7	156.4	62.1	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
14/06/13	Friday	6	2	0	[illegible]	0.9	2	0	0.0	0.0				20523.5	20427.4	13801.0	10846.7	157.4	61.7	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
15/06/13	Saturday	6	1.1	0	[illegible]	0.9	2	0	0.0	0.0				20365.8	20286.3	13801.0	10846.7	145.3	65.8	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
16/06/13	Sunday	6	1.1	0	[illegible]	0.9	2	0	0.0	0.0				20220.4	20140.9	13801.0	10846.7	145.3	65.8	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
17/06/13	Monday	6	1.3	3.2	[illegible]	0.9	2	1.2	58.9	195.5				20075.1	20187.4	13801.0	10846.7	[illegible]	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
18/06/13	Tuesday	6	1.1	0	[illegible]	0.9	2	0	0.0	0.0				20122.5	20042.3	13801.0	10846.7	145.3	65.8	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
19/06/13	Wednesday	6	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				19977.3	19892.1	13801.0	10846.7	149.5	64.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
20/06/13	Thursday	6	1.2	0.2	[illegible]	0.9	2	0	3.7	0.0				19827.6	19746.3	13801.0	10846.7	146.7	65.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
21/06/13	Friday	6	1.6	0	[illegible]	0.9	2	0	0.0	0.0				19680.9	19592.3	13801.0	10846.7	152.3	63.5	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
22/06/13	Saturday	6	2.3	0	[illegible]	0.9	2	0	0.0	0.0				19528.7	19427.1	13801.0	10846.7	161.9	60.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
23/06/13	Sunday	6	2.3	0	[illegible]	0.9	2	0	0.0	0.0				19366.8	19265.3	13801.0	10846.7	161.9	60.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
24/06/13	Monday	6	1.8	11.4	[illegible]	0.9	2	9.4	209.8	1531.4				19204.9	20643.3	13801.0	10846.7	155.0	62.6	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
25/06/13	Tuesday	6	1.4	4	[illegible]	0.9	2	2	73.6	325.8				20581.3	20822.1	13801.0	10846.7	149.5	64.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
26/06/13	Wednesday	6	1	1.6	[illegible]	0.9	2	0	29.4	0.0				20757.7	20680.3	13801.0	10846.7	144.8	66.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
27/06/13	Thursday	6	1.2	0	[illegible]	0.9	2	0	0.0	0.0				20613.7	20532.3	13801.0	10846.7	146.7	65.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
28/06/13	Friday	6	1.2	0.2	[illegible]	0.9	2	0	3.7	0.0				20467.0	20385.5	13801.0	10846.7	146.7	65.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
29/06/13	Saturday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0				20320.3	20237.1	13801.0	10846.7	[illegible]	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
30/06/13	Sunday	6	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0				20172.2	20085.3	13801.0	10846.7	150.9	64.0	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
01/07/13	Monday	7	1.9	0.2	[illegible]	0.9	2	0	3.7	0.0				20021.3	19927.1	13801.0	10846.7	156.4	62.1	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
02/07/13	Tuesday	7	1.5	0	[illegible]	0.9	2	0	0.0	0.0				19864.9	19778.3	13801.0	10846.7	150.9	64.0	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
03/07/13	Wednesday	7	1.3	3.2	[illegible]	0.9	2	1.2	58.9	195.5				19714.1	19826.1	13801.0	10846.7	[illegible]	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
04/07/13	Thursday	7	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0				19761.5	19678.2	13801.0	10846.7	[illegible]	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
05/07/13	Friday	7	1.2	0.2	[illegible]	0.9	2	0	3.7	0.0				19613.3	19532.3	13801.0	10846.7	146.7	65.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
06/07/13	Saturday	7	1.7	0	[illegible]	0.9	2	0	0.0	0.0				19466.6	19376.1	13801.0	10846.7	153.6	63.1	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
07/07/13	Sunday	7	1.5	0	[illegible]	0.9	2	0	0.0	0.0				19313.0	19226.1	13801.0	10846.7	150.9	64.0	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
08/07/13	Monday	7	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				19162.1	19077.1	13801.0	10846.7	149.5	64.4	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
09/07/13	Tuesday	7	1.5	0	[illegible]	0.9	2	0	0.0	0.0				19012.7	18925.3	13801.0	10846.7	150.9	64.0	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
10/07/13	Wednesday	7	1.3	32.6	[illegible]	0.9	2	30.6	599.9	4945.3				18861.8	23763.9	13801.0	10846.7	[illegible]	64.9	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
11/07/13	Thursday	7	0.7	0.2	[illegible]	0.9	2	0	3.7	0.0				23699.0	23626.8	13801.0	10846.7	139.8	67.7	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
12/07/13	Friday	7	1.5	4	[illegible]	0.9	2	2	73.6	325.8				23559.3	23798.1	13801.0	10846.7	150.9	64.0	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
13/07/13	Saturday	7	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				23734.2	23641.3	13801.0	10846.7	155.8	62.6	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
14/07/13	Sunday	7	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				23579.3	23486.8	13801.0	10846.7	155.0	62.6	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
15/07/13	Monday	7	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0				23424.3	23335.4	13801.0	10846.7	152.2	63.5	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
16/07/13	Tuesday	7	2.1	12.8	[illegible]	0.9	2	10.8	235.5	1759.5				23271.9	24933.5	13801.0	10846.7	159.2	61.2	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
17/07/13	Wednesday	7	2	28.8	[illegible]	0.9	2	26.8	530.0	4366.2				24872.3	29142.4	18401.3	14462.3	210.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
18/07/13	Thursday	7	1.3	0	[illegible]	0.9	2	0	0.0	0.0				29028.2	28945.0	18401.3	14462.3	197.3	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Lost-evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Prelim pond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardip brook (m3/day)	Required dust suppression in south of cardip brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m³)	PrelimInfiltration (m³/day)	Prelim Pond Loss (m³/day)
09/11/13	Saturday	11	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/11/13	Sunday	11	9.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/11/13	Monday	11	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/11/13	Tuesday	11	6.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
13/11/13	Wednesday	11	7.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
14/11/13	Thursday	11	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/11/13	Friday	11	9.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/11/13	Saturday	11	8.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/11/13	Sunday	11	5.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/11/13	Monday	11	5.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/11/13	Tuesday	11	7.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/11/13	Wednesday	11	7.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
21/11/13	Thursday	11	8.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/11/13	Friday	11	6.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/11/13	Saturday	11	6.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/11/13	Sunday	11	5.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
25/11/13	Monday	11	6	0.6	[illegible]	0.9	[illegible]	0	11.0	0.0			
26/11/13	Tuesday	11	7.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
27/11/13	Wednesday	11	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
28/11/13	Thursday	11	7.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
29/11/13	Friday	11	4.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
30/11/13	Saturday	11	5.5	17.2	[illegible]	0.9	[illegible]	15.2	316.5	[illegible]			
01/12/13	Sunday	12	5.9	0.4	[illegible]	0.9	[illegible]	0	7.4	0.0			
02/12/13	Monday	12	6.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
03/12/13	Tuesday	12	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
04/12/13	Wednesday	12	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
05/12/13	Thursday	12	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
06/12/13	Friday	12	7.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
07/12/13	Saturday	12	5.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
08/12/13	Sunday	12	7.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
09/12/13	Monday	12	7.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/12/13	Tuesday	12	8.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/12/13	Wednesday	12	9.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/12/13	Thursday	12	9.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
13/12/13	Friday	12	10.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
14/12/13	Saturday	12	9.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/12/13	Sunday	12	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/12/13	Monday	12	7.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/12/13	Tuesday	12	5.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/12/13	Wednesday	12	6.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/12/13	Thursday	12	7.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/12/13	Friday	12	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
21/12/13	Saturday	12	8.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/12/13	Sunday	12	7.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/12/13	Monday	12	8.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/12/13	Tuesday	12	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
25/12/13	Wednesday	12	8.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
26/12/13	Thursday	12	7.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
27/12/13	Friday	12	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
28/12/13	Saturday	12	9.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
29/12/13	Sunday	12	8.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
30/12/13	Monday	12	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
31/12/13	Tuesday	12	6.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
01/01/14	Wednesday	1	7.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
02/01/14	Thursday	1	5.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
03/01/14	Friday	1	7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
04/01/14	Saturday	1	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
05/01/14	Sunday	1	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
06/01/14	Monday	1	8.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
07/01/14	Tuesday	1	5.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
08/01/14	Wednesday	1	6.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
09/01/14	Thursday	1	7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/01/14	Friday	1	7.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/01/14	Saturday	1	9.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/01/14	Sunday	1	10.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
13/01/14	Monday	1	6.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
14/01/14	Tuesday	1	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/01/14	Wednesday	1	5.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/01/14	Thursday	1	6.7	0.2	[illegible]	0.9	[illegible]	0	3.7	0.0			
17/01/14	Friday	1	7.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/01/14	Saturday	1	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/01/14	Sunday	1	9.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/01/14	Monday	1	9.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
21/01/14	Tuesday	1	8.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/01/14	Wednesday	1	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/01/14	Thursday	1	8.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/01/14	Friday	1	7.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
25/01/14	Saturday	1	7.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
26/01/14	Sunday	1	7.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
27/01/14	Monday	1	5.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
28/01/14	Tuesday	1	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
29/01/14	Wednesday	1	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
30/01/14	Thursday	1	6.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
31/01/14	Friday	1	5.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
01/02/14	Saturday	2	6.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
02/02/14	Sunday	2	8.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
03/02/14	Monday	2	8.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
04/02/14	Tuesday	2	8.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
05/02/14	Wednesday	2	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
06/02/14	Thursday	2	6.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
07/02/14	Friday	2	6.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
08/02/14	Saturday	2	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
09/02/14	Sunday	2	8.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/02/14	Monday	2	6.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/02/14	Tuesday	2	7.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/02/14	Wednesday	2	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
13/02/14	Thursday	2	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
14/02/14	Friday	2	6.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/02/14	Saturday	2	6.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/02/14	Sunday	2	5.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/02/14	Monday	2	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/02/14	Tuesday	2	7.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/02/14	Wednesday	2	8.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/02/14	Thursday	2	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
21/02/14	Friday	2	7.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/02/14	Saturday	2	7.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/02/14	Sunday	2	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/02/14	Monday	2	6.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
25/02/14	Tuesday	2	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
26/02/14	Wednesday	2	6.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
27/02/14	Thursday	2	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
28/02/14	Friday	2	6.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
01/03/14	Saturday	3	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			

Date	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
09/11/13	23161.2	22945.6	13801.0	12846.7	247.5	31.8	22913.8	22913.8	100	45	145	[illegible]	[illegible]	0.0	0	0
10/11/13	22768.8	22531.0	13801.0	12846.7	264.0	26.3	22504.7	22504.7	100	45	145	[illegible]	[illegible]	0.0	0	0
11/11/13	22159.7	22177.2	13801.0	12846.7	222.6	40.1	22137.1	22137.1	100	45	145	[illegible]	[illegible]	0.0	0	0
12/11/13	21992.1	21805.9	13801.0	12846.7	225.4	39.1	21766.7	21766.7	100	45	145	[illegible]	[illegible]	0.0	0	0
13/11/13	21621.7	21422.6	13801.0	12846.7	235.0	35.9	21386.7	21386.7	100	45	145	[illegible]	[illegible]	0.0	0	0
14/11/13	21241.7	21026.0	13801.0	12846.7	247.5	31.8	20994.2	20994.2	100	45	145	[illegible]	[illegible]	0.0	0	0
15/11/13	20849.2	20622.5	13801.0	12846.7	255.7	29.0	20593.5	20593.5	100	45	145	[illegible]	[illegible]	0.0	0	0
16/11/13	20448.5	20227.3	13801.0	12846.7	251.6	30.4	20196.9	20196.9	100	45	145	[illegible]	[illegible]	0.0	0	0
17/11/13	20051.9	19885.8	13801.0	12846.7	210.2	44.2	19841.6	19841.6	100	45	145	[illegible]	[illegible]	0.0	0	0
18/11/13	19696.6	19536.2	13801.0	12846.7	206.1	45.6	19490.6	19490.6	100	45	145	[illegible]	[illegible]	0.0	0	0
19/11/13	19345.6	19148.3	13801.0	12846.7	233.7	36.4	19111.9	19111.9	100	45	145	[illegible]	[illegible]	0.0	0	0
20/11/13	18966.9	18765.9	13801.0	12846.7	236.4	35.5	18730.5	18730.5	100	45	145	[illegible]	[illegible]	0.0	0	0
21/11/13	18585.5	18373.5	13801.0	12846.7	244.7	32.7	18340.8	18340.8	100	45	145	[illegible]	[illegible]	0.0	0	0
22/11/13	18195.8	18011.4	13801.0	12846.7	224.3	39.6	17971.8	17971.8	100	45	145	[illegible]	[illegible]	0.0	0	0
23/11/13	17826.8	17651.4	13801.0	12846.7	215.7	42.4	17611.0	17611.0	100	45	145	[illegible]	[illegible]	0.0	0	0
24/11/13	17466.0	17307.4	13801.0	12846.7	204.7	46.0	17261.4	17261.4	100	45	145	[illegible]	[illegible]	0.0	0	0
25/11/13	17116.4	16946.7	13801.0	12846.7	213.0	43.3	16903.4	16903.4	100	45	145	[illegible]	[illegible]	0.0	0	0
26/11/13	16758.4	16561.1	9200.7	7331.2	155.8	-41.5	16602.6	16602.6	100	45	145	[illegible]	[illegible]	0.0	0	0
27/11/13	16457.6	16265.8	9200.7	7331.2	153.0	-38.8	16304.6	16304.6	100	45	145	[illegible]	[illegible]	0.0	0	0
28/11/13	16159.6	15958.6	9200.7	7331.2	157.6	-43.4	16002.0	16002.0	100	45	145	[illegible]	[illegible]	0.0	0	0
29/11/13	15857.0	15707.5	9200.7	7331.2	131.9	-17.6	15725.1	15725.1	100	45	145	[illegible]	[illegible]	0.0	0	0
30/11/13	15580.1	17896.0	13801.0	12846.7	206.1	45.6	17850.4	17850.4	100	45	145	[illegible]	[illegible]	0.0	0	0
01/12/13	17705.4	17537.6	13801.0	12846.7	211.6	43.7	17493.8	17493.8	100	45	145	[illegible]	[illegible]	0.0	0	0
02/12/13	17348.8	17169.9	13801.0	12846.7	219.9	41.0	17129.0	17129.0	100	45	145	[illegible]	[illegible]	0.0	0	0
03/12/13	16984.0	16792.2	13801.0	12846.7	229.5	37.8	16754.4	16754.4	100	45	145	[illegible]	[illegible]	0.0	0	0
04/12/13	16609.4	16402.9	9200.7	7331.2	160.4	-46.1	16449.1	16448.1	100	45	145	[illegible]	[illegible]	0.0	0	0
05/12/13	16304.1	16088.4	9200.7	7331.2	165.0	-50.7	16139.1	16139.1	100	45	145	[illegible]	[illegible]	0.0	0	0
06/12/13	15994.1	15798.6	9200.7	7331.2	154.9	-40.6	15839.2	15839.2	100	45	145	[illegible]	[illegible]	0.0	0	0
07/12/13	15694.2	15531.9	9200.7	7331.2	138.3	-24.0	15555.9	15555.9	100	45	145	[illegible]	[illegible]	0.0	0	0
08/12/13	15410.9	15221.0	9200.7	7331.2	152.1	-37.8	15258.8	15258.8	100	45	145	[illegible]	[illegible]	0.0	0	0
09/12/13	15113.8	14911.0	9200.7	7331.2	158.5	-44.3	14955.3	14955.3	100	45	145	[illegible]	[illegible]	0.0	0	0
10/12/13	14810.3	14592.8	9200.7	7331.2	165.9	-51.6	14644.4	14644.4	100	45	145	[illegible]	[illegible]	0.0	0	0
11/12/13	14499.4	14272.7	9200.7	7331.2	170.5	-56.2	14328.9	14328.9	100	45	145	[illegible]	[illegible]	0.0	0	0
12/12/13	14183.9	13948.0	9200.7	7331.2	175.1	-60.8	14008.8	14008.8	100	45	145	[illegible]	[illegible]	0.0	0	0
13/12/13	13863.8	13616.8	9200.7	7331.2	180.5	-66.4	13683.2	13683.2	100	45	145	[illegible]	[illegible]	0.0	0	0
14/12/13	13538.2	13298.6	9200.7	7331.2	176.9	-62.7	13361.2	13361.2	100	45	145	[illegible]	[illegible]	0.0	0	0
15/12/13	13216.2	13000.5	9200.7	7331.2	165.0	-50.7	13051.2	13051.2	100	45	145	[illegible]	[illegible]	0.0	0	0
16/12/13	12906.2	12703.4	9200.7	7331.2	158.5	-44.3	12747.7	12747.7	100	45	145	[illegible]	[illegible]	0.0	0	0
17/12/13	12602.7	12438.5	9200.7	7331.2	139.2	-24.9	12463.5	12463.5	100	45	145	[illegible]	[illegible]	0.0	0	0
18/12/13	12318.5	12134.1	9200.7	7331.2	149.3	-35.1	12169.2	12169.2	100	45	145	[illegible]	[illegible]	0.0	0	0
19/12/13	12024.2	11823.2	9200.7	7331.2	157.5	-43.4	11866.5	11866.5	100	45	145	[illegible]	[illegible]	0.0	0	0
20/12/13	11721.5	11505.8	9200.7	7331.2	165.0	-50.7	11556.6	11556.6	100	45	145	[illegible]	[illegible]	0.0	0	0
21/12/13	11411.6	11197.7	9200.7	7331.2	164.1	-49.8	11247.5	11247.5	100	45	145	[illegible]	[illegible]	0.0	0	0
22/12/13	11102.5	10899.7	9200.7	7331.2	158.5	-44.3	10944.0	10944.0	100	45	145	[illegible]	[illegible]	0.0	0	0
23/12/13	10799.0	10575.9	9200.7	7331.2	168.7	-54.4	10630.3	10630.3	100	45	145	[illegible]	[illegible]	0.0	0	0
24/12/13	10485.3	10293.5	9200.7	7331.2	153.0	-38.8	10332.3	10332.3	100	45	145	[illegible]	[illegible]	0.0	0	0
25/12/13	10187.3	9977.1	9200.7	7331.2	162.2	-48.0	10025.1	10025.1	100	45	145	[illegible]	[illegible]	0.0	0	0
26/12/13	9880.1	9686.4	9200.7	7331.2	153.3	-39.7	9726.1	9726.1	100	45	145	[illegible]	[illegible]	0.0	0	0
27/12/13	9581.1	9389.3	9200.7	7331.2	153.0	-38.8	9428.1	9428.1	100	45	145	[illegible]	[illegible]	0.0	0	0
28/12/13	9283.1	9056.4	9200.7	7331.2	170.5	-56.2	9112.6	9112.6	100	45	145	[illegible]	[illegible]	0.0	0	0
29/12/13	8967.6	8746.4	9200.7	7331.2	167.7	-53.5	8799.9	8799.9	100	45	145	[illegible]	[illegible]	0.0	0	0
30/12/13	8654.9	8448.4	9200.7	7331.2	160.4	-46.1	8494.5	8494.5	100	45	145	[illegible]	[illegible]	0.0	0	0
31/12/13	8349.5	8170.6	4600.3	3415.6	73.2	-105.6	8276.2	8276.2	100	45	145	[illegible]	[illegible]	0.0	0	0
01/01/14	8131.2	7935.7	4600.3	3415.6	77.4	-118.0	8053.8	8053.8	100	45	145	[illegible]	[illegible]	0.0	0	0
02/01/14	7908.8	7744.6	4600.3	3415.6	69.6	-94.6	7839.2	7839.2	100	45	145	[illegible]	[illegible]	0.0	0	0
03/01/14	7694.2	7506.1	4600.3	3415.6	75.4	-112.5	7618.6	7618.6	100	45	145	[illegible]	[illegible]	0.0	0	0
04/01/14	7473.6	7281.8	4600.3	3415.6	76.5	-115.3	7397.1	7397.1	100	45	145	[illegible]	[illegible]	0.0	0	0
05/01/14	7252.1	7045.6	4600.3	3415.6	80.2	-126.3	7171.9	7171.9	100	45	145	[illegible]	[illegible]	0.0	0	0
06/01/14	7026.9	6805.7	4600.3	3415.6	83.9	-137.3	6943.0	6943.0	100	45	145	[illegible]	[illegible]	0.0	0	0
07/01/14	6798.0	6630.1	4600.3	3415.6	70.5	-97.3	6727.5	6727.5	100	45	145	[illegible]	[illegible]	0.0	0	0
08/01/14	6582.5	6403.6	4600.3	3415.6	73.2	-105.6	6509.2	6509.2	100	45	145	[illegible]	[illegible]	0.0	0	0
09/01/14	6364.2	6176.1	4600.3	3415.6	75.4	-112.5	6288.6	6288.6	100	45	145	[illegible]	[illegible]	0.0	0	0
10/01/14	6143.6	5944.5	4600.3	3415.6	78.2	-120.8	6065.2	6065.2	100	45	145	[illegible]	[illegible]	0.0	0	0
11/01/14	5920.2	5678.8	4600.3	3415.6	88.9	-152.5	5831.3	5831.3	100	45	145	[illegible]	[illegible]	0.0	0	0
12/01/14	5686.3	5435.7	4600.3	3415.6	91.2	-159.4	5595.1	5595.1	100	45	145	[illegible]	[illegible]	0.0	0	0
13/01/14	5450.1	5274.9	4600.3	3415.6	72.4	-102.8	5377.7	5377.7	100	45	145	[illegible]	[illegible]	0.0	0	0
14/01/14	5232.7	5050.1	4600.3	3415.6	74.2	-108.4	5158.5	5158.5	100	45	145	[illegible]	[illegible]	0.0	0	0
15/01/14	5013.5	4847.5	4600.3	3415.6	70.2	-95.9	4943.4	4943.4	100	45	145	[illegible]	[illegible]	0.0	0	0
16/01/14	4798.4	4615.9	4600.3	3415.6	74.2	-108.4	4724.2	4724.2	100	45	145	[illegible]	[illegible]	0.0	0	0
17/01/14	4579.2	4378.2	4600.3	3415.6	78.6	-122.2	4500.4	4500.4	100	45	145	[illegible]	[illegible]	0.0	0	0
18/01/14	4355.4	4139.7	4600.3	3415.6	82.5	-133.2	4272.9	4272.9	100	45	145	[illegible]	[illegible]	0.0	0	0
19/01/14	4127.9	3888.3	4600.3	3415.6	88.5	-151.1	4039.5	4039.5	100	45	145	[illegible]	[illegible]	0.0	0	0
20/01/14	3894.5	3667.7	4600.3	3415.6	85.2	-141.5	3809.2	3809.2	100	45	145	[illegible]	[illegible]	0.0	0	0
21/01/14	3664.2	3441.2	4600.3	3415.6	84.2	-138.7	3579.9	3579.9	100	45	145	[illegible]	[illegible]	0.0	0	0
22/01/14	3434.9	3219.2	4600.3	3415.6	82.5	-133.2	3352.4	3352.4	100	45	145	[illegible]	[illegible]	0.0	0	0
23/01/14	3207.4	2986.2	4600.3	3415.6	83.9	-137.3	3123.5	3123.5	100	45	145	[illegible]	[illegible]	0.0	0	0
24/01/14	2978.5	2777.5	4600.3	3415.6	78.6	-122.2	2899.7	2899.7	100	45	145	[illegible]	[illegible]	0.0	0	0
25/01/14	2754.7	2557.4	4600.3	3415.6	77.9	-119.4	2676.8	2676.8	100	45	145	[illegible]	[illegible]	0.0	0	0
26/01/14	2531.8	2341.9	4600.3	3415.6	76.8	-113.9	2455.8	2455.8	100	45	145	[illegible]	[illegible]	0.0	0	0
27/01/14	2310.8	2150.3	4600.3	3415.6	68.7	-91.8	2242.1	2242.1	100	45	145	[illegible]	[illegible]	0.0	0	0
28/01/14	2097.1	1890.6	4600.3	3415.6	80.2	-126.3	2016.9	2016.9	100	45	145	[illegible]	[illegible]	0.0	0	0
29/01/14	1871.9	1665.4	4600.3	3415.6	80.2	-126.3	1791.7	1791.7	100	45	145	[illegible]	[illegible]	0.0	0	0
30/01/14	1646.7	1463.3	4600.3	3415.6	74.7	-109.7	1572.0	1572.0	100	45	145	[illegible]	[illegible]	0.0	0	0
31/01/14	1427.0	1264.7	4600.3	3415.6	69.2	-93.2	1357.9	1357.9	100	45	145	[illegible]	[illegible]	0.0	0	0
01/02/14	1212.9	1028.5	4600.3	3415.6	74.7	-109.7	1138.2	1138.2	100	45	145	[illegible]	[illegible]	0.0	0	0
02/02/14	993.2	783.0	4600.3	3415.6	81.1	-129.1	912.1	912.1	100	45	145	[illegible]	[illegible]	0.0	0	0
03/02/14	767.1	555.1	4600.3	3415.6	81.6	-130.4	685.5	685.5	100	45	145	[illegible]	[illegible]	0.0	0	0
04/02/14	540.5	323.0	4600.3	3415.6	82.9	-134.6	457.6	457.6	100	45	145	[illegible]	[illegible]	0.0	0	0
05/02/14	457.6	275.0	4600.3	3415.6	74.2	-108.4	383.4	383.4	100	45	145	[illegible]	[illegible]	0.0	0	0
06/02/14	383.4	197.1	4600.3	3415.6	75.1	-111.1	308.2	308.2	100	45	145	[illegible]	[illegible]	0.0	0	0
07/02/14	308.2	122.0	4600.3	3415.6	75.1	-111.1	233.1	233.1	100	45	145	[illegible]	[illegible]	0.0	0	0
08/02/14	233.1	41.3	4600.3	3415.6	76.5	-115.3	156.6	156.6	100	45	145	[illegible]	[illegible]	0.0	0	0
09/02/14	156.6	0.0	4600.3	3415.6	80.6	-127.7	76.0	76.0	100	45	145	[illegible]	[illegible]	0.0	0	0
10/02/14	76.0	0.0	4600.3	3415.6	73.7	-107.0	2.2	2.2	100	45	145	[illegible]	[illegible]	0.0	0	0
11/02/14	2.2	0.0	4600.3	3415.6	78.2	-122.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
12/02/14	0.0	0.0	4600.3	3415.6	76.5	-115.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
13/02/14	0.0	0.0	4600.3	3415.6	76.5	-115.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
14/02/14	0.0	0.0	4600.3	3415.6	73.7	-107.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
15/02/14	0.0	0.0	4600.3	3415.6	73.2	-105.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
16/02/14	0.0	0.0	4600.3	3415.6	67.2	-87.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
17/02/14	0.0	0.0	4600.3	3415.6	74.2	-108.4	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
18/02/14	0.0	0.0	4600.3	3415.6	79.7	-124.9	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
19/02/14	0.0	0.0	4600.3	3415.6	80.6	-127.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
20/02/14	0.0	0.0	4600.3	3415.6	80.2	-126.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
21/02/14	0.0	0.0	4600.3	3415.6	79.7	-124.9	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
22/02/14	0.0	0.0	4600.3	3415.6	78.3	-120.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
23/02/14	0.0	0.0	4600.3	3415.6	74.2	-108.4	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
24/02/14	0.0	0.0	4600.3	3415.6	73.3	-105.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
25/02/14	0.0	0.0	4600.3	3415.6	74.2	-108.4	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
26/02/14	0.0	0.0	4600.3	3415.6	75.1	-111.1	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
27/02/14	0.0	0.0	4600.3	3415.6	76.5	-115.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
28/02/14	0.0	0.0	4600.3	3415.6	74.7	-109.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
01/03/14	0.0	0.0	4600.3	3415.6	76.5	-115.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1

Date	Timing Tests: Weekday	Month number	BOM Data: Lake evaporation (mm)	Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: Prelim Pond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)
02/03/14	Sunday	3	6.1	0	[illegible]	0.9	2	0	0.0	0.0			
03/03/14	Monday	3	5.5	0	[illegible]	0.9	2	0	0.0	0.0			
04/03/14	Tuesday	3	6.9	0	[illegible]	0.9	2	0	0.0	0.0			
05/03/14	Wednesday	3	6.5	0	[illegible]	0.9	2	0	0.0	0.0			
06/03/14	Thursday	3	6.3	0	[illegible]	0.9	2	0	0.0	0.0			
07/03/14	Friday	3	7.4	0	[illegible]	0.9	2	0	0.0	0.0			
08/03/14	Saturday	3	4.4	0	[illegible]	0.9	2	0	0.0	0.0			
09/03/14	Sunday	3	5.1	0	[illegible]	0.9	2	0	0.0	0.0			
10/03/14	Monday	3	5.5	0	[illegible]	0.9	2	0	0.0	0.0			
11/03/14	Tuesday	3	6.6	0	[illegible]	0.9	2	0	0.0	0.0			
12/03/14	Wednesday	3	6.7	0	[illegible]	0.9	2	0	0.0	0.0			
13/03/14	Thursday	3	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
14/03/14	Friday	3	5.1	0	[illegible]	0.9	2	0	0.0	0.0			
15/03/14	Saturday	3	4.5	0	[illegible]	0.9	2	0	0.0	0.0			
16/03/14	Sunday	3	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
17/03/14	Monday	3	4.6	0	[illegible]	0.9	2	0	0.0	0.0			
18/03/14	Tuesday	3	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
19/03/14	Wednesday	3	5.2	0	[illegible]	0.9	2	0	0.0	0.0			
20/03/14	Thursday	3	6.2	0	[illegible]	0.9	2	0	0.0	0.0			
21/03/14	Friday	3	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
22/03/14	Saturday	3	5.7	0	[illegible]	0.9	2	0	0.0	0.0			
23/03/14	Sunday	3	6.5	5.2	[illegible]	0.9	2	3.2	95.7	521.3			
24/03/14	Monday	3	5.8	0	[illegible]	0.9	2	0	0.0	0.0			
25/03/14	Tuesday	3	2.8	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/03/14	Wednesday	3	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
27/03/14	Thursday	3	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
28/03/14	Friday	3	5.2	0	[illegible]	0.9	2	0	0.0	0.0			
29/03/14	Saturday	3	2.3	0	[illegible]	0.9	2	0	0.0	0.0			
30/03/14	Sunday	3	3.2	15	[illegible]	0.9	2	13	276.0	2117.9			
31/03/14	Monday	3	2.7	2	[illegible]	0.9	2	0	36.8	0.0			
01/04/14	Tuesday	4	3.6	1.6	[illegible]	0.9	2	0	29.4	0.0			
02/04/14	Wednesday	4	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
03/04/14	Thursday	4	4.6	0	[illegible]	0.9	2	0	0.0	0.0			
04/04/14	Friday	4	3.6	0	[illegible]	0.9	2	0	0.0	0.0			
05/04/14	Saturday	4	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
06/04/14	Sunday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
07/04/14	Monday	4	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
08/04/14	Tuesday	4	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
09/04/14	Wednesday	4	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
10/04/14	Thursday	4	4.5	0	[illegible]	0.9	2	0	0.0	0.0			
11/04/14	Friday	4	4.6	0	[illegible]	0.9	2	0	0.0	0.0			
12/04/14	Saturday	4	4.3	0	[illegible]	0.9	2	0	0.0	0.0			
13/04/14	Sunday	4	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
14/04/14	Monday	4	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
15/04/14	Tuesday	4	2.9	0	[illegible]	0.9	2	0	0.0	0.0			
16/04/14	Wednesday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
17/04/14	Thursday	4	3	0	[illegible]	0.9	2	0	0.0	0.0			
18/04/14	Friday	4	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
19/04/14	Saturday	4	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
20/04/14	Sunday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
21/04/14	Monday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
22/04/14	Tuesday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
23/04/14	Wednesday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
24/04/14	Thursday	4	2.3	0	[illegible]	0.9	2	0	0.0	0.0			
25/04/14	Friday	4	2.3	0.6	[illegible]	0.9	2	0	11.0	0.0			
26/04/14	Saturday	4	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
27/04/14	Sunday	4	2.4	12.8	[illegible]	0.9	2	10.8	235.5	1759.5			
28/04/14	Monday	4	2.7	17.8	[illegible]	0.9	2	15.8	327.5	2574.1			
29/04/14	Tuesday	4	1.9	0.6	[illegible]	0.9	2	0	11.0	0.0			
30/04/14	Wednesday	4	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
01/05/14	Thursday	5	2.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
02/05/14	Friday	5	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
03/05/14	Saturday	5	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
04/05/14	Sunday	5	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
05/05/14	Monday	5	1.6	1.4	[illegible]	0.9	2	0	25.8	0.0			
06/05/14	Tuesday	5	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
07/05/14	Wednesday	5	1.3	2	[illegible]	0.9	2	0	36.8	0.0			
08/05/14	Thursday	5	2.5	53.4	[illegible]	0.9	2	51.4	982.6	8374.0			
09/05/14	Friday	5	2.2	11.2	[illegible]	0.9	2	9.2	206.1	1498.9			
10/05/14	Saturday	5	1.8	10	[illegible]	0.9	2	8	184.0	1303.3			
11/05/14	Sunday	5	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
12/05/14	Monday	5	2	0	[illegible]	0.9	2	0	0.0	0.0			
13/05/14	Tuesday	5	1.7	2.8	[illegible]	0.9	2	0.8	51.5	130.3			
14/05/14	Wednesday	5	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0			
15/05/14	Thursday	5	1.5	0.6	[illegible]	0.9	2	0	11.0	0.0			
16/05/14	Friday	5	1.6	0	[illegible]	0.9	2	0	0.0	0.0			
17/05/14	Saturday	5	1.8	3.6	[illegible]	0.9	2	1.6	66.2	260.7			
18/05/14	Sunday	5	1.3	1.8	[illegible]	0.9	2	0	33.1	0.0			
19/05/14	Monday	5	1.4	2	[illegible]	0.9	2	0	36.8	0.0			
20/05/14	Tuesday	5	1.5	6.2	[illegible]	0.9	2	4.2	114.1	684.3			
21/05/14	Wednesday	5	1.4	6.4	[illegible]	0.9	2	4.4	117.8	716.8			
22/05/14	Thursday	5	1.8	2.8	[illegible]	0.9	2	0.8	51.5	130.3			
23/05/14	Friday	5	2.1	54	[illegible]	0.9	2	52	993.7	8471.8			
24/05/14	Saturday	5	2.3	17.6	[illegible]	0.9	2	15.6	323.9	2541.5			
25/05/14	Sunday	5	2.1	7.4	[illegible]	0.9	2	5.4	136.2	879.8			
26/05/14	Monday	5	1.5	3.6	[illegible]	0.9	2	1.6	66.2	260.7			
27/05/14	Tuesday	5	1.1	0.6	[illegible]	0.9	2	0	11.0	0.0			
28/05/14	Wednesday	5	1.4	8.4	[illegible]	0.9	2	6.4	154.6	1042.7			
29/05/14	Thursday	5	1.5	0.4	[illegible]	0.9	2	0	7.4	0.0			
30/05/14	Friday	5	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
31/05/14	Saturday	5	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
01/06/14	Sunday	6	1.5	1.8	[illegible]	0.9	2	0	33.1	0.0			
02/06/14	Monday	6	1.4	3.6	[illegible]	0.9	2	1.6	66.2	260.7			
03/06/14	Tuesday	6	1.3	0.4	[illegible]	0.9	2	0	7.4	0.0			
04/06/14	Wednesday	6	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
05/06/14	Thursday	6	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0			
06/06/14	Friday	6	2	0	[illegible]	0.9	2	0	0.0	0.0			
07/06/14	Saturday	6	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
08/06/14	Sunday	6	1.7	0	[illegible]	0.9	2	0	0.0	0.0			
09/06/14	Monday	6	1.8	1.4	[illegible]	0.9	2	0	25.8	0.0			
10/06/14	Tuesday	6	1.5	19.6	[illegible]	0.9	2	17.6	360.7	2867.4			
11/06/14	Wednesday	6	1.3	0.8	[illegible]	0.9	2	0	14.7	0.0			
12/06/14	Thursday	6	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
13/06/14	Friday	6	1.1	0.4	[illegible]	0.9	2	0	7.4	0.0			
14/06/14	Saturday	6	1	0.2	[illegible]	0.9	2	0	3.7	0.0			
15/06/14	Sunday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
16/06/14	Monday	6	1	0	[illegible]	0.9	2	0	0.0	0.0			
17/06/14	Tuesday	6	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
18/06/14	Wednesday	6	1.9	62.4	[illegible]	0.9	2	60.4	1148.2	9840.3			
19/06/14	Thursday	6	1	15.4	[illegible]	0.9	2	13.4	283.4	2183.1			
20/06/14	Friday	6	1.2	5.4	[illegible]	0.9	2	3.4	99.4	553.9			
21/06/14	Saturday	6	2	3.8	[illegible]	0.9	2	1.8	69.9	293.3			
22/06/14	Sunday	6	1.4	38	[illegible]	0.9	2	36	699.2	5865.1			

Date	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for non negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Demand (km): Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Abstraction: Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty flag
02/03/14	0.0	0.0	4600.3	3615.6	71.4	[illegible]	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
03/03/14	0.0	0.0	4600.3	3615.6	68.7	-91.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
04/03/14	0.0	0.0	4600.3	3615.6	75.1	-111.1	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
05/03/14	0.0	0.0	4600.3	3615.6	73.3	-105.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
06/03/14	0.0	0.0	4600.3	3615.6	72.4	-102.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
07/03/14	0.0	0.0	4600.3	3615.6	77.4	-118.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
08/03/14	0.0	0.0	4600.3	3615.6	63.6	-76.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
09/03/14	0.0	0.0	4600.3	3615.6	66.8	-86.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
10/03/14	0.0	0.0	4600.3	3615.6	68.7	-91.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
11/03/14	0.0	0.0	4600.3	3615.6	73.7	-107.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
12/03/14	0.0	0.0	4600.3	3615.6	74.2	-108.4	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
13/03/14	0.0	0.0	4600.3	3615.6	55.8	-53.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
14/03/14	0.0	0.0	4600.3	3615.6	66.8	-86.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
15/03/14	0.0	0.0	4600.3	3615.6	64.1	-78.0	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
16/03/14	0.0	0.0	4600.3	3615.6	65.9	-83.5	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
17/03/14	0.0	0.0	4600.3	3615.6	64.5	-79.4	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
18/03/14	0.0	0.0	4600.3	3615.6	65.9	-83.5	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
19/03/14	0.0	0.0	4600.3	3615.6	67.3	-87.7	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
20/03/14	0.0	0.0	4600.3	3615.6	71.9	-101.5	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
21/03/14	0.0	0.0	4600.3	3615.6	65.5	-82.1	0.0	0.3	100	45	145	[illegible]	[illegible]	0.0	0	1
22/03/14	0.0	0.0	4600.3	3615.6	69.6	-94.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
23/03/14	0.0	342.5	4600.3	3615.6	73.2	-105.6	448.1	448.1	100	45	145	[illegible]	[illegible]	0.0	0	0
24/03/14	448.1	282.0	4600.3	3615.6	70.1	-95.9	378.0	378.0	100	45	145	[illegible]	[illegible]	0.0	0	0
25/03/14	378.0	267.2	4600.3	3615.6	56.3	-54.5	321.7	321.7	100	45	145	[illegible]	[illegible]	0.0	0	0
26/03/14	321.7	199.9	4600.3	3615.6	59.0	-61.8	262.7	262.7	100	45	145	[illegible]	[illegible]	0.0	0	0
27/03/14	262.7	126.1	4600.3	3615.6	62.7	-73.9	200.0	200.0	100	45	145	[illegible]	[illegible]	0.0	0	0
28/03/14	200.0	45.0	4600.3	3615.6	67.3	-87.7	132.7	132.7	100	45	145	[illegible]	[illegible]	0.0	0	0
29/03/14	132.7	31.1	4600.3	3615.6	54.0	-47.6	78.7	78.7	100	45	145	[illegible]	[illegible]	0.0	0	0
30/03/14	78.7	2078.5	4600.3	3615.6	58.1	-60.1	2138.5	2138.5	100	45	145	[illegible]	[illegible]	0.0	0	0
31/03/14	1993.5	1884.6	4600.3	3615.6	55.8	-53.2	1937.7	1937.7	100	45	145	[illegible]	[illegible]	0.0	0	0
01/04/14	1792.7	1667.2	4600.3	3615.6	59.9	-65.6	1732.8	1732.8	100	45	145	[illegible]	[illegible]	0.0	0	0
02/04/14	1587.8	1453.1	4600.3	3615.6	62.2	-72.5	1525.5	1525.5	100	45	145	[illegible]	[illegible]	0.0	0	0
03/04/14	1380.5	1236.6	4600.3	3615.6	64.5	-79.4	1316.0	1316.0	100	45	145	[illegible]	[illegible]	0.0	0	0
04/04/14	1171.0	1045.5	4600.3	3615.6	59.9	-65.6	1111.0	1111.0	100	45	145	[illegible]	[illegible]	0.0	0	0
05/04/14	966.0	838.7	4600.3	3615.6	60.4	-67.0	905.6	905.6	100	45	145	[illegible]	[illegible]	0.0	0	0
06/04/14	760.6	638.8	4600.3	3615.6	59.0	-62.8	701.6	701.6	100	45	145	[illegible]	[illegible]	0.0	0	0
07/04/14	556.6	427.4	4600.3	3615.6	60.9	-68.3	495.7	495.7	100	45	145	[illegible]	[illegible]	0.0	0	0
08/04/14	495.7	359.2	4600.3	3615.6	62.7	-73.9	433.0	433.0	100	45	145	[illegible]	[illegible]	0.0	0	0
09/04/14	433.0	305.7	4600.3	3615.6	60.4	-67.0	372.6	372.6	100	45	145	[illegible]	[illegible]	0.0	0	0
10/04/14	372.6	230.5	4600.3	3615.6	64.1	-78.0	308.5	308.5	100	45	145	[illegible]	[illegible]	0.0	0	0
11/04/14	308.5	164.6	4600.3	3615.6	64.5	-79.4	244.0	244.0	100	45	145	[illegible]	[illegible]	0.0	0	0
12/04/14	244.0	105.6	4600.3	3615.6	63.2	-75.2	180.8	180.8	100	45	145	[illegible]	[illegible]	0.0	0	0
13/04/14	180.8	57.1	4600.3	3615.6	59.5	-64.2	121.3	121.3	100	45	145	[illegible]	[illegible]	0.0	0	0
14/04/14	121.3	1.3	4600.3	3615.6	58.6	-61.4	62.8	62.8	100	45	145	[illegible]	[illegible]	0.0	0	0
15/04/14	62.8	0.0	4600.3	3615.6	56.7	-55.9	6.0	6.0	100	45	145	[illegible]	[illegible]	0.0	0	0
16/04/14	6.0	0.0	4600.3	3615.6	56.3	-54.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
17/04/14	0.0	0.0	4600.3	3615.6	57.2	-57.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
18/04/14	0.0	0.0	4600.3	3615.6	60.4	-67.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
19/04/14	0.0	0.0	4600.3	3615.6	58.6	-61.4	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
20/04/14	0.0	0.0	4600.3	3615.6	56.3	-54.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
21/04/14	0.0	0.0	4600.3	3615.6	59.0	-62.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
22/04/14	0.0	0.0	4600.3	3615.6	57.6	-58.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
23/04/14	0.0	0.0	4600.3	3615.6	57.6	-58.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
24/04/14	0.0	0.0	4600.3	3615.6	54.0	-47.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
25/04/14	0.0	0.0	4600.3	3615.6	54.0	-47.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
26/04/14	0.0	0.0	4600.3	3615.6	50.3	-36.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
27/04/14	0.0	1656.1	4600.3	3615.6	54.4	-49.0	1705.1	1705.1	100	45	145	[illegible]	[illegible]	0.0	0	0
28/04/14	1560.1	4025.2	4600.3	3615.6	55.8	-53.2	4078.4	4078.4	100	45	145	[illegible]	[illegible]	0.0	0	0
29/04/14	3933.4	3839.2	4600.3	3615.6	52.1	-42.1	3881.3	3881.3	100	45	145	[illegible]	[illegible]	0.0	0	0
30/04/14	3736.3	3632.8	4600.3	3615.6	54.4	-49.0	3681.8	3681.8	100	45	145	[illegible]	[illegible]	0.0	0	0
01/05/14	3536.8	3433.4	4600.3	3615.6	54.4	-49.0	3482.4	3482.4	0	45	45	[illegible]	[illegible]	0.0	0	0
02/05/14	3437.4	3332.1	4600.3	3615.6	54.9	-50.4	3382.5	3382.5	0	45	45	[illegible]	[illegible]	0.0	0	0
03/05/14	3337.5	3239.6	4600.3	3615.6	53.0	-44.9	3284.5	3284.5	0	45	45	[illegible]	[illegible]	0.0	0	0
04/05/14	3239.5	3152.6	4600.3	3615.6	50.3	-36.6	3189.2	3189.2	0	45	45	[illegible]	[illegible]	0.0	0	0
05/05/14	3144.2	3055.5	4600.3	3615.6	50.7	-38.0	3093.5	3093.5	0	45	45	[illegible]	[illegible]	0.0	0	0
06/05/14	3048.5	2959.7	4600.3	3615.6	50.7	-38.0	2997.7	2997.7	0	45	45	[illegible]	[illegible]	0.0	0	0
07/05/14	2952.7	2869.5	4600.3	3615.6	49.4	-33.8	2903.3	2903.3	0	45	45	[illegible]	[illegible]	0.0	0	0
08/05/14	2858.3	11127.1	9200.7	7231.2	109.8	4.5	11122.6	11122.6	0	45	45	[illegible]	[illegible]	0.0	0	0
09/05/14	11077.6	12476.7	9200.7	7231.2	107.0	7.3	12469.4	12469.4	0	45	45	[illegible]	[illegible]	0.0	0	0
10/05/14	12424.4	13635.4	9200.7	7231.2	103.3	10.9	13624.4	13624.4	0	45	45	[illegible]	[illegible]	0.0	0	0
11/05/14	13579.4	13479.7	9200.7	7231.2	107.0	7.3	13472.4	13472.4	0	45	45	[illegible]	[illegible]	0.0	0	0
12/05/14	13427.4	13331.3	9200.7	7231.2	105.2	9.1	13322.2	13322.2	0	45	45	[illegible]	[illegible]	0.0	0	0
13/05/14	13277.2	13317.0	9200.7	7231.2	102.4	11.9	13305.2	13305.2	0	45	45	[illegible]	[illegible]	0.0	0	0
14/05/14	13260.2	13169.6	9200.7	7231.2	102.4	11.9	13157.8	13157.8	0	45	45	[illegible]	[illegible]	0.0	0	0
15/05/14	13112.8	13025.9	9200.7	7231.2	100.6	13.7	13012.2	13012.2	0	45	45	[illegible]	[illegible]	0.0	0	0
16/05/14	12967.2	12878.5	9200.7	7231.2	101.5	12.8	12865.7	12865.7	0	45	45	[illegible]	[illegible]	0.0	0	0
17/05/14	12820.7	12988.9	9200.7	7231.2	103.3	10.9	12978.0	12978.0	0	45	45	[illegible]	[illegible]	0.0	0	0
18/05/14	12933.0	12849.8	9200.7	7231.2	98.7	15.5	12834.3	12834.3	0	45	45	[illegible]	[illegible]	0.0	0	0
19/05/14	12789.3	12704.2	9200.7	7231.2	99.7	14.6	12689.6	12689.6	0	45	45	[illegible]	[illegible]	0.0	0	0
20/05/14	12644.6	13242.0	9200.7	7231.2	100.6	13.7	13228.3	13228.3	0	45	45	[illegible]	[illegible]	0.0	0	0
21/05/14	13183.3	13815.1	9200.7	7231.2	99.7	14.6	13800.5	13800.5	0	45	45	[illegible]	[illegible]	0.0	0	0
22/05/14	13755.5	13793.4	9200.7	7231.2	103.3	10.9	13782.5	13782.5	0	45	45	[illegible]	[illegible]	0.0	0	0
23/05/14	13737.5	22111.4	13801.0	10846.7	159.1	61.2	22050.1	22050.1	0	45	45	[illegible]	[illegible]	0.0	0	0
24/05/14	22005.1	24445.1	13801.0	10846.7	161.9	60.3	24384.8	24384.8	0	45	45	[illegible]	[illegible]	0.0	0	0
25/05/14	24339.8	25121.6	13801.0	10846.7	159.1	61.2	25060.4	25060.4	0	45	45	[illegible]	[illegible]	0.0	0	0
26/05/14	25015.4	25189.2	18401.3	14462.3	201.1	114.3	25074.9	25074.9	0	45	45	[illegible]	[illegible]	0.0	0	0
27/05/14	25029.9	24950.4	13801.0	10846.7	145.3	65.8	24884.6	24884.6	0	45	45	[illegible]	[illegible]	0.0	0	0
28/05/14	24839.6	25797.2	18401.3	14462.3	199.3	114.3	25682.9	25682.9	0	45	45	[illegible]	[illegible]	0.0	0	0
29/05/14	25637.9	25551.0	18401.3	14462.3	201.1	114.3	25436.8	25436.8	0	45	45	[illegible]	[illegible]	0.0	0	0
30/05/14	25391.8	25306.7	18401.3	14462.3	199.3	114.3	25192.5	25192.5	0	45	45	[illegible]	[illegible]	0.0	0	0
31/05/14	25147.5	25064.3	13801.0	10846.7	148.1	64.9	24999.4	24999.4	0	45	45	[illegible]	[illegible]	0.0	0	0
01/06/14	24954.4	24867.5	13801.0	10846.7	150.9	64.0	24803.5	24803.5	0	0	0	[illegible]	[illegible]	0.0	0	0
02/06/14	24803.5	24979.1	13801.0	10846.7	149.5	64.4	24914.7	24914.7	0	0	0	[illegible]	[illegible]	0.0	0	0
03/06/14	24914.7	24831.5	13801.0	10846.7	148.1	64.9	24766.6	24766.6	0	0	0	[illegible]	[illegible]	0.0	0	0
04/06/14	24766.6	24679.7	13801.0	10846.7	150.9	64.0	24615.7	24615.7	0	0	0	[illegible]	[illegible]	0.0	0	0
05/06/14	24615.7	24523.3	13801.0	10846.7	155.0	62.6	24460.7	24460.7	0	0	0	[illegible]	[illegible]	0.0	0	0
06/06/14	24460.7	24364.6	13801.0	10846.7	157.8	61.7	24303.0	24303.0	0	0	0	[illegible]	[illegible]	0.0	0	0
07/06/14	24303.0	24199.5	13801.0	10846.7	163.3	59.8	24139.7	24139.7	0	0	0	[illegible]	[illegible]	0.0	0	0
08/06/14	24139.7	24049.1	13801.0	10846.7	153.6	63.1	23986.1	23986.1	0	0	0	[illegible]	[illegible]	0.0	0	0
09/06/14	23986.1	23893.7	13801.0	10846.7	155.0	62.6	23831.1	23831.1	0	0	0	[illegible]	[illegible]	0.0	0	0
10/06/14	23831.1	26611.5	18401.3	14462.3	201.1	114.3	26497.3	26497.3	0	0	0	[illegible]	[illegible]	0.0	0	0
11/06/14	26497.3	26414.1	18401.3	14462.3	197.5	114.3	26299.8	26299.8	0	0	0	[illegible]	[illegible]	0.0	0	0
12/06/14	26299.8	26214.8	18401.3	14462.3	199.3	114.3	26100.5	26100.5	0	0	0	[illegible]	[illegible]	0.0	0	0
13/06/14	26100.5	26021.0	18401.3	14462.3	193.8	114.3	25906.7	25906.7	0	0	0	[illegible]	[illegible]	0.0	0	0
14/06/14	25906.7	25829.0	18401.3	14462.3	191.9	114.3	25714.8	25714.8	0	0	0	[illegible]	[illegible]	0.0	0	0
15/06/14	25714.8	25631.6	18401.3	14462.3	197.5	114.3	25517.3	25517.3	0	0	0	[illegible]	[illegible]	0.0	0	0
16/06/14	25517.3	25421.2	18401.3	14462.3	210.4	114.3	25306.9	25306.9	0	0	0	[illegible]	[illegible]	0.0	0	0
17/06/14	25306.9	25207.2	18401.3	14462.3	214.0	114.3	25092.9	25092.9	0	0	0	[illegible]	[illegible]	0.0	0	0
18/06/14	25092.9	34839.0	18401.3	14462.3	208.5	114.3	34724.7	33584.2	0	0	0	[illegible]	[illegible]	1140.5	1	0
19/06/14	33584.2	35689.6	18401.3	14462.3	191.9	114.3	35575.4	33584.2	0	0	0	[illegible]	[illegible]	1991.2	1	0
20/06/14	33584.2	34056.8	18401.3	14462.3	195.6	114.3	33942.5	33584.2	0	0	0	[illegible]	[illegible]	358.3	1	0
21/06/14	33584.2	33781.4	18401.3	14462.3	210.4	114.3	33667.1	33584.2	0	0	0	[illegible]	[illegible]	82.9	1	0
22/06/14	33584.2	39364.2	18401.3	14462.3	199.3	114.3	39250.0	33584.2	0	0	0	[illegible]	[illegible]	5665.8	1	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m³)	Prelim Pond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)
14/10/14	Tuesday	10	6	0	[illegible]	0.9	2	0	0.0	0.0
15/10/14	Wednesday	10	6.5	0	[illegible]	0.9	2	0	0.0	0.0
16/10/14	Thursday	10	5.4	0	[illegible]	0.9	2	0	0.0	0.0
17/10/14	Friday	10	4.2	0	[illegible]	0.9	2	0	0.0	0.0
18/10/14	Saturday	10	4	1.6	[illegible]	0.9	2	0	29.4	0.0
19/10/14	Sunday	10	2.5	6.8	[illegible]	0.9	2	4.8	125.1	782.0
20/10/14	Monday	10	3.9	3.4	[illegible]	0.9	2	1.4	62.6	228.1
21/10/14	Tuesday	10	4.6	0.2	[illegible]	0.9	2	0	3.7	0.0
22/10/14	Wednesday	10	6.8	0	[illegible]	0.9	2	0	0.0	0.0
23/10/14	Thursday	10	4.2	1	[illegible]	0.9	2	0	18.4	0.0
24/10/14	Friday	10	4.8	0	[illegible]	0.9	2	0	0.0	0.0
25/10/14	Saturday	10	3.5	0.4	[illegible]	0.9	2	0	7.4	0.0
26/10/14	Sunday	10	4.6	1.6	[illegible]	0.9	2	0	29.4	0.0
27/10/14	Monday	10	5.1	0.4	[illegible]	0.9	2	0	7.4	0.0
28/10/14	Tuesday	10	5.2	0	[illegible]	0.9	2	0	0.0	0.0
29/10/14	Wednesday	10	5	0	[illegible]	0.9	2	0	0.0	0.0
30/10/14	Thursday	10	3.7	0	[illegible]	0.9	2	0	0.0	0.0
31/10/14	Friday	10	5.3	1.4	[illegible]	0.9	2	0	25.8	0.0
01/11/14	Saturday	11	6.4	0	[illegible]	0.9	2	0	0.0	0.0
02/11/14	Sunday	11	3.9	0	[illegible]	0.9	2	0	0.0	0.0
03/11/14	Monday	11	4.9	1.8	[illegible]	0.9	2	0	33.1	0.0
04/11/14	Tuesday	11	5.9	0.2	[illegible]	0.9	2	0	3.7	0.0
05/11/14	Wednesday	11	5.8	0.2	[illegible]	0.9	2	0	3.7	0.0
06/11/14	Thursday	11	3.7	0	[illegible]	0.9	2	0	0.0	0.0
07/11/14	Friday	11	5.3	4.8	[illegible]	0.9	2	2.8	88.3	456.2
08/11/14	Saturday	11	6.2	0.2	[illegible]	0.9	2	0	3.7	0.0
09/11/14	Sunday	11	7.6	0	[illegible]	0.9	2	0	0.0	0.0
10/11/14	Monday	11	3.3	2	[illegible]	0.9	2	0	36.8	0.0
11/11/14	Tuesday	11	5	0.4	[illegible]	0.9	2	0	7.4	0.0
12/11/14	Wednesday	11	5	0	[illegible]	0.9	2	0	0.0	0.0
13/11/14	Thursday	11	5.5	0	[illegible]	0.9	2	0	0.0	0.0
14/11/14	Friday	11	5.5	0	[illegible]	0.9	2	0	0.0	0.0
15/11/14	Saturday	11	6.2	0	[illegible]	0.9	2	0	0.0	0.0
16/11/14	Sunday	11	6.1	0	[illegible]	0.9	2	0	0.0	0.0
17/11/14	Monday	11	5.6	0	[illegible]	0.9	2	0	0.0	0.0
18/11/14	Tuesday	11	4.6	0	[illegible]	0.9	2	0	0.0	0.0
19/11/14	Wednesday	11	5	0	[illegible]	0.9	2	0	0.0	0.0
20/11/14	Thursday	11	4.2	0	[illegible]	0.9	2	0	0.0	0.0
21/11/14	Friday	11	3.8	4	[illegible]	0.9	2	1	73.6	325.8
22/11/14	Saturday	11	4.8	1.2	[illegible]	0.9	2	0	22.1	0.0
23/11/14	Sunday	11	5.8	0	[illegible]	0.9	2	0	0.0	0.0
24/11/14	Monday	11	6.6	0	[illegible]	0.9	2	0	0.0	0.0
25/11/14	Tuesday	11	7.9	0	[illegible]	0.9	2	0	0.0	0.0
26/11/14	Wednesday	11	4.7	0	[illegible]	0.9	2	0	0.0	0.0
27/11/14	Thursday	11	3.2	16.4	[illegible]	0.9	2	14.4	301.8	2346.0
28/11/14	Friday	11	3.9	2.6	[illegible]	0.9	2	0.6	47.8	97.8
29/11/14	Saturday	11	5.6	0	[illegible]	0.9	2	0	0.0	0.0
30/11/14	Sunday	11	5.8	0	[illegible]	0.9	2	0	0.0	0.0
01/12/14	Monday	12	5.4	0	[illegible]	0.9	2	0	0.0	0.0
02/12/14	Tuesday	12	6.6	0.4	[illegible]	0.9	2	0	7.4	0.0
03/12/14	Wednesday	12	6.2	0	[illegible]	0.9	2	0	0.0	0.0
04/12/14	Thursday	12	6.3	0	[illegible]	0.9	2	0	0.0	0.0
05/12/14	Friday	12	3.5	0	[illegible]	0.9	2	0	0.0	0.0
06/12/14	Saturday	12	6.4	0	[illegible]	0.9	2	0	0.0	0.0
07/12/14	Sunday	12	6.5	0	[illegible]	0.9	2	0	0.0	0.0
08/12/14	Monday	12	5.9	0	[illegible]	0.9	2	0	0.0	0.0
09/12/14	Tuesday	12	5.7	0	[illegible]	0.9	2	0	0.0	0.0
10/12/14	Wednesday	12	7.2	0	[illegible]	0.9	2	0	0.0	0.0
11/12/14	Thursday	12	8.4	0	[illegible]	0.9	2	0	0.0	0.0
12/12/14	Friday	12	6.1	0	[illegible]	0.9	2	0	0.0	0.0
13/12/14	Saturday	12	6.6	0	[illegible]	0.9	2	0	0.0	0.0
14/12/14	Sunday	12	6.4	0	[illegible]	0.9	2	0	0.0	0.0
15/12/14	Monday	12	5.4	0	[illegible]	0.9	2	0	0.0	0.0
16/12/14	Tuesday	12	6	0	[illegible]	0.9	2	0	0.0	0.0
17/12/14	Wednesday	12	6.4	0	[illegible]	0.9	2	0	0.0	0.0
18/12/14	Thursday	12	7.8	0	[illegible]	0.9	2	0	0.0	0.0
19/12/14	Friday	12	9.1	0	[illegible]	0.9	2	0	0.0	0.0
20/12/14	Saturday	12	7.2	0	[illegible]	0.9	2	0	0.0	0.0
21/12/14	Sunday	12	7.5	0	[illegible]	0.9	2	0	0.0	0.0
22/12/14	Monday	12	7.2	0	[illegible]	0.9	2	0	0.0	0.0
23/12/14	Tuesday	12	8.3	0	[illegible]	0.9	2	0	0.0	0.0
24/12/14	Wednesday	12	8.4	0	[illegible]	0.9	2	0	0.0	0.0
25/12/14	Thursday	12	8.4	0	[illegible]	0.9	2	0	0.0	0.0
26/12/14	Friday	12	8.1	0	[illegible]	0.9	2	0	0.0	0.0
27/12/14	Saturday	12	8.7	0	[illegible]	0.9	2	0	0.0	0.0
28/12/14	Sunday	12	7.3	0	[illegible]	0.9	2	0	0.0	0.0
29/12/14	Monday	12	8.2	0	[illegible]	0.9	2	0	0.0	0.0
30/12/14	Tuesday	12	9.3	0	[illegible]	0.9	2	0	0.0	0.0
31/12/14	Wednesday	12	6.8	0	[illegible]	0.9	2	0	0.0	0.0
01/01/15	Thursday	1	7.1	0	[illegible]	0.9	2	0	0.0	0.0
02/01/15	Friday	1	5.6	0	[illegible]	0.9	2	0	0.0	0.0
03/01/15	Saturday	1	7.6	0	[illegible]	0.9	2	0	0.0	0.0
04/01/15	Sunday	1	8.2	0	[illegible]	0.9	2	0	0.0	0.0
05/01/15	Monday	1	9.5	0	[illegible]	0.9	2	0	0.0	0.0
06/01/15	Tuesday	1	7.2	0	[illegible]	0.9	2	0	0.0	0.0
07/01/15	Wednesday	1	8.8	0	[illegible]	0.9	2	0	0.0	0.0
08/01/15	Thursday	1	9.1	0	[illegible]	0.9	2	0	0.0	0.0
09/01/15	Friday	1	8.2	0	[illegible]	0.9	2	0	0.0	0.0
10/01/15	Saturday	1	8.2	0	[illegible]	0.9	2	0	0.0	0.0
11/01/15	Sunday	1	8.2	0	[illegible]	0.9	2	0	0.0	0.0
12/01/15	Monday	1	8.1	0	[illegible]	0.9	2	0	0.0	0.0
13/01/15	Tuesday	1	7.4	0	[illegible]	0.9	2	0	0.0	0.0
14/01/15	Wednesday	1	6.2	0	[illegible]	0.9	2	0	0.0	0.0
15/01/15	Thursday	1	7.1	0	[illegible]	0.9	2	0	0.0	0.0
16/01/15	Friday	1	7.3	0	[illegible]	0.9	2	0	0.0	0.0
17/01/15	Saturday	1	8.4	0	[illegible]	0.9	2	0	0.0	0.0
18/01/15	Sunday	1	6	0	[illegible]	0.9	2	0	0.0	0.0
19/01/15	Monday	1	6.1	0	[illegible]	0.9	2	0	0.0	0.0
20/01/15	Tuesday	1	7	0	[illegible]	0.9	2	0	0.0	0.0
21/01/15	Wednesday	1	7.8	0	[illegible]	0.9	2	0	0.0	0.0
22/01/15	Thursday	1	5.1	0	[illegible]	0.9	2	0	0.0	0.0
23/01/15	Friday	1	6.8	0	[illegible]	0.9	2	0	0.0	0.0
24/01/15	Saturday	1	7.3	0	[illegible]	0.9	2	0	0.0	0.0
25/01/15	Sunday	1	8.1	0	[illegible]	0.9	2	0	0.0	0.0
26/01/15	Monday	1	8.5	0	[illegible]	0.9	2	0	0.0	0.0
27/01/15	Tuesday	1	8.8	0	[illegible]	0.9	2	0	0.0	0.0
28/01/15	Wednesday	1	7.5	0	[illegible]	0.9	2	0	0.0	0.0
29/01/15	Thursday	1	6	7.2	[illegible]	0.9	2	5.2	132.5	847.2
30/01/15	Friday	1	4.9	6.2	[illegible]	0.9	2	4.2	114.1	684.3
31/01/15	Saturday	1	6.2	0	[illegible]	0.9	2	0	0.0	0.0
01/02/15	Sunday	2	6.1	0	[illegible]	0.9	2	0	0.0	0.0
02/02/15	Monday	2	4	0	[illegible]	0.9	2	0	0.0	0.0
03/02/15	Tuesday	2	6.7	12.8	[illegible]	0.9	2	10.8	235.5	1759.5

Date	PrelimPond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)
14/10/14				31416.5	31246.8	18401.3	14462.3	284.0	114.3
15/10/14				30987.5	30808.7	18401.3	14462.3	293.2	114.3
16/10/14				30549.4	30390.7	18401.3	14462.3	272.9	114.3
17/10/14				30131.5	29994.9	18401.3	14462.3	250.8	114.3
18/10/14				29735.6	29602.8	18401.3	14462.3	247.2	114.3
19/10/14				29343.5	30010.2	18401.3	14462.3	219.6	114.3
20/10/14				29761.0	29858.0	18401.3	14462.3	245.3	114.3
21/10/14				29598.7	29454.8	18401.3	14462.3	258.2	114.3
22/10/14				29195.5	29011.1	18401.3	14462.3	198.7	114.3
23/10/14				28751.9	28615.3	18401.3	14462.3	250.8	114.3
24/10/14				28356.0	28208.4	18401.3	14462.3	261.9	114.3
25/10/14				27949.1	27825.5	18401.3	14462.3	238.0	114.3
26/10/14				27566.2	27422.3	18401.3	14462.3	258.2	114.3
27/10/14				27163.0	27009.9	18401.3	14462.3	267.4	114.3
28/10/14				26750.6	26595.6	18401.3	14462.3	269.2	114.3
29/10/14				26336.4	26185.1	18401.3	14462.3	265.6	114.3
30/10/14				25925.8	25798.5	18401.3	14462.3	241.6	114.3
31/10/14				25539.2	25382.4	18401.3	14462.3	271.1	114.3
01/11/14				25123.1	24946.1	13801.0	10846.7	218.5	41.4
02/11/14				24759.6	24628.6	13801.0	10846.7	184.0	52.9
03/11/14				24430.6	24281.2	13801.0	10846.7	197.8	48.3
04/11/14				24087.9	23970.0	13801.0	10846.7	211.6	43.7
05/11/14				23731.3	23565.3	13801.0	10846.7	210.2	44.2
06/11/14				23376.1	23248.7	13801.0	10846.7	181.2	53.9
07/11/14				23049.8	23349.2	13801.0	10846.7	203.3	46.5
08/11/14				23157.7	22984.3	13801.0	10846.7	215.7	42.4
09/11/14				22797.0	22597.8	13801.0	10846.7	235.0	35.9
10/11/14				22416.9	22296.9	13801.0	10846.7	175.7	55.7
11/11/14				22096.2	21944.9	13801.0	10846.7	199.2	47.9
12/11/14				21751.1	21600.8	13801.0	10846.7	199.2	47.9
13/11/14				21407.9	21247.4	13801.0	10846.7	206.1	45.6
14/11/14				21056.8	20896.3	13801.0	10846.7	206.1	45.6
15/11/14				20705.8	20532.4	13801.0	10846.7	215.7	42.4
16/11/14				20345.0	20173.5	13801.0	10846.7	214.3	42.8
17/11/14				19985.7	19823.4	13801.0	10846.7	207.4	45.1
18/11/14				19633.2	19489.3	13801.0	10846.7	193.6	49.7
19/11/14				19294.6	19143.3	13801.0	10846.7	199.2	47.9
20/11/14				18950.4	18813.9	13801.0	10846.7	188.1	51.6
21/11/14				18617.3	18813.9	13801.0	10846.7	182.6	53.4
22/11/14				18615.5	18467.9	13801.0	10846.7	196.4	48.8
23/11/14				18274.1	18108.1	13801.0	10846.7	210.2	44.2
24/11/14				17918.9	17738.2	13801.0	10846.7	221.2	40.5
25/11/14				17552.7	17348.0	13801.0	10846.7	239.2	34.5
26/11/14				17168.5	17022.7	13801.0	10846.7	195.0	49.3
27/11/14				16828.5	19056.3	13801.0	10846.7	174.3	56.2
28/11/14				18855.2	18821.9	13801.0	10846.7	184.0	52.9
29/11/14				18623.9	18461.6	13801.0	10846.7	207.4	45.1
30/11/14				18271.5	18105.5	13801.0	10846.7	210.2	44.2
01/12/14				17916.3	17757.6	13801.0	10846.7	204.7	46.0
02/12/14				17566.6	17385.9	13801.0	10846.7	221.2	40.5
03/12/14				17200.4	17027.0	13801.0	10846.7	215.7	42.4
04/12/14				16839.6	16664.4	9200.7	7231.2	144.7	-30.5
05/12/14				16549.9	16426.2	9200.7	7231.2	119.0	-4.7
06/12/14				16285.9	16108.9	9200.7	7231.2	145.7	-31.4
07/12/14				15995.3	15816.4	9200.7	7231.2	146.6	-32.3
08/12/14				15703.7	15535.8	9200.7	7231.2	141.1	-26.8
09/12/14				15417.6	15253.5	9200.7	7231.2	139.2	-24.9
10/12/14				15133.4	14941.6	9200.7	7231.2	153.0	-38.8
11/12/14				14835.4	14621.5	9200.7	7231.2	164.1	-49.8
12/12/14				14526.3	14354.8	9200.7	7231.2	142.9	-28.6
13/12/14				14238.4	14057.7	9200.7	7231.2	147.5	-33.2
14/12/14				13945.9	13768.9	9200.7	7231.2	145.7	-31.4
15/12/14				13655.3	13496.6	9200.7	7231.2	136.5	-22.2
16/12/14				13373.8	13204.1	9200.7	7231.2	142.0	-27.7
17/12/14				13086.8	12909.8	9200.7	7231.2	145.7	-31.4
18/12/14				12796.2	12593.4	9200.7	7231.2	158.5	-44.3
19/12/14				12492.6	12265.9	9200.7	7231.2	170.5	-56.2
20/12/14				12177.1	11985.4	9200.7	7231.2	153.0	-38.8
21/12/14				11879.1	11681.8	9200.7	7231.2	155.8	-41.5
22/12/14				11578.3	11386.6	9200.7	7231.2	153.0	-38.8
23/12/14				11280.1	11068.3	9200.7	7231.2	161.1	-48.9
24/12/14				10972.2	10758.3	9200.7	7231.2	164.1	-49.8
25/12/14				10663.1	10449.3	9200.7	7231.2	164.1	-49.8
26/12/14				10354.1	10145.7	9200.7	7231.2	161.3	-47.0
27/12/14				10047.8	9828.4	9200.7	7231.2	166.8	-52.6
28/12/14				9735.9	9542.3	9200.7	7231.2	153.9	-39.7
29/12/14				9437.0	9216.8	9200.7	7231.2	162.2	-48.0
30/12/14				9129.8	8899.4	9200.7	7231.2	172.3	-58.1
31/12/14				8812.5	8628.0	9200.7	7231.2	149.3	-35.1
01/01/15				8518.1	8328.2	4600.3	3615.6	76.0	113.9
02/01/15				8197.1	8134.7	4600.3	3615.6	69.1	-93.2
03/01/15				8082.9	7883.8	4600.3	3615.6	78.3	-120.8
04/01/15				7859.6	7649.4	4600.3	3615.6	81.1	-129.1
05/01/15				7633.5	7399.4	4600.3	3615.6	87.1	-147.0
06/01/15				7401.4	7209.6	4600.3	3615.6	76.5	-115.3
07/01/15				7179.9	6958.6	4600.3	3615.6	83.9	-137.3
08/01/15				6951.0	6724.3	4600.3	3615.6	85.2	-141.5
09/01/15				6720.7	6510.6	4600.3	3615.6	81.1	-129.1
10/01/15				6494.6	6284.5	4600.3	3615.6	81.1	-129.1
11/01/15				6268.5	6058.3	4600.3	3615.6	81.1	-129.1
12/01/15				6042.4	5834.1	4600.3	3615.6	80.6	-127.7
13/01/15				5816.8	5621.3	4600.3	3615.6	77.4	-118.0
14/01/15				5594.3	5421.0	4600.3	3615.6	71.9	-101.5
15/01/15				5377.4	5187.5	4600.3	3615.6	76.0	-113.9
16/01/15				5156.4	4962.8	4600.3	3615.6	77.0	-116.6
17/01/15				4934.4	4720.6	4600.3	3615.6	82.0	-131.8
18/01/15				4707.4	4537.7	4600.3	3615.6	71.0	-98.7
19/01/15				4491.4	4319.9	4600.3	3615.6	71.4	-100.1
20/01/15				4274.9	4086.8	4600.3	3615.6	75.6	-112.5
21/01/15				4054.3	3851.5	4600.3	3615.6	79.3	-123.5
22/01/15				3830.1	3676.9	4600.3	3615.6	66.8	-86.3
23/01/15				3618.2	3433.8	4600.3	3615.6	74.7	-109.7
24/01/15				3398.6	3206.8	4600.3	3615.6	76.5	-115.3
25/01/15				3177.0	2968.7	4600.3	3615.6	80.6	-127.7
26/01/15				2951.4	2735.7	4600.3	3615.6	82.5	-133.2
27/01/15				2723.9	2501.7	4600.3	3615.6	83.9	-137.3
28/01/15				2495.0	2297.8	4600.3	3615.6	77.9	-119.4
29/01/15				2272.2	2949.6	4600.3	3615.6	71.0	-98.7
30/01/15				2903.3	3438.2	4600.3	3615.6	65.9	-83.5
31/01/15				3376.7	3203.3	4600.3	3615.6	71.9	-101.5
01/02/15				3159.8	2988.2	4600.3	3615.6	71.4	-100.1
02/02/15				2943.3	2810.4	4600.3	3615.6	63.8	-71.1
03/02/15				2736.5	4313.5	4600.3	3615.6	74.2	-108.4

Date	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
14/10/14	31132.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/10/14	30694.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/10/14	30276.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/10/14	29880.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/10/14	29488.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/10/14	29906.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/10/14	29743.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/10/14	29140.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/10/14	28836.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/10/14	28501.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/10/14	28094.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/10/14	27711.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/10/14	27308.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/10/14	26895.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/10/14	26481.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/10/14	26073.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/10/14	25684.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/10/14	25268.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/11/14	24904.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/11/14	24575.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/11/14	24232.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/11/14	23878.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/11/14	23521.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/11/14	23154.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/11/14	23302.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/11/14	22942.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/11/14	22561.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/11/14	22241.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/11/14	21897.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/11/14	21552.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/11/14	21201.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/11/14	20850.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/11/14	20490.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/11/14	20130.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/11/14	19778.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/11/14	19419.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/11/14	19095.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/11/14	18782.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/11/14	18760.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/11/14	18419.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/11/14	18063.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/11/14	17687.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/11/14	17313.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/11/14	16973.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/11/14	19000.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/11/14	18768.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/11/14	18416.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/11/14	18061.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/12/14	17711.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/12/14	17345.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/12/14	16984.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/12/14	16694.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/12/14	16433.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/12/14	16140.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/12/14	15848.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/12/14	15562.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/12/14	15278.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/12/14	14980.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/12/14	14671.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/12/14	14383.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/12/14	14090.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/12/14	13800.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/12/14	13518.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/12/14	13231.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/12/14	12941.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/12/14	12637.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/12/14	12321.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/12/14	12024.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/12/14	11723.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/12/14	11425.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/12/14	11117.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/12/14	10808.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/12/14	10499.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/12/14	10190.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/12/14	9880.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/12/14	9582.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/12/14	9274.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/12/14	8957.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/12/14	8663.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/01/15	8442.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/01/15	8227.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/01/15	8004.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/01/15	7776.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/01/15	7546.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/01/15	7324.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/01/15	7096.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/01/15	6865.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/01/15	6639.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/01/15	6413.5	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/01/15	6187.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/01/15	5961.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/01/15	5739.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/01/15	5522.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/01/15	5301.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/01/15	5079.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/01/15	4852.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/01/15	4636.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/01/15	4419.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/01/15	4199.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/01/15	3975.1	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/01/15	3783.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/01/15	3543.6	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/01/15	3322.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/01/15	3096.4	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/01/15	2868.9	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/01/15	2640.0	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/01/15	2417.2	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/01/15	3048.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/01/15	3521.7	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/01/15	3304.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/02/15	3088.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/02/15	2881.3	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/02/15	4421.8	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (cell)	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
04/02/15	Wednesday	2	6.3	2.4	[illegible]	0.9	2	0.4	44.2	65.2			
05/02/15	Thursday	2	6.1	0	[illegible]	0.9	2	0	0.0	0.0			
06/02/15	Friday	2	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
07/02/15	Saturday	2	7.2	0	[illegible]	0.9	2	0	0.0	0.0			
08/02/15	Sunday	2	8	0	[illegible]	0.9	2	0	0.0	0.0			
09/02/15	Monday	2	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
10/02/15	Tuesday	2	6.6	0	[illegible]	0.9	2	0	0.0	0.0			
11/02/15	Wednesday	2	7.8	0	[illegible]	0.9	2	0	0.0	0.0			
12/02/15	Thursday	2	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
13/02/15	Friday	2	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
14/02/15	Saturday	2	5.8	0	[illegible]	0.9	2	0	0.0	0.0			
15/02/15	Sunday	2	6.7	0	[illegible]	0.9	2	0	0.0	0.0			
16/02/15	Monday	2	6.7	0	[illegible]	0.9	2	0	0.0	0.0			
17/02/15	Tuesday	2	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
18/02/15	Wednesday	2	5.5	0	[illegible]	0.9	2	0	0.0	0.0			
19/02/15	Thursday	2	6.1	0	[illegible]	0.9	2	0	0.0	0.0			
20/02/15	Friday	2	5.8	0	[illegible]	0.9	2	0	0.0	0.0			
21/02/15	Saturday	2	5.7	0	[illegible]	0.9	2	0	0.0	0.0			
22/02/15	Sunday	2	6.3	0	[illegible]	0.9	2	0	0.0	0.0			
23/02/15	Monday	2	7.5	0	[illegible]	0.9	2	0	0.0	0.0			
24/02/15	Tuesday	2	7.1	0	[illegible]	0.9	2	0	0.0	0.0			
25/02/15	Wednesday	2	5.4	0	[illegible]	0.9	2	0	0.0	0.0			
26/02/15	Thursday	2	5.3	0	[illegible]	0.9	2	0	0.0	0.0			
27/02/15	Friday	2	5.3	0.4	[illegible]	0.9	2	0	7.4	0.0			
28/02/15	Saturday	2	6.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
01/03/15	Sunday	3	5.9	0	[illegible]	0.9	2	0	0.0	0.0			
02/03/15	Monday	3	5.7	0	[illegible]	0.9	2	0	0.0	0.0			
03/03/15	Tuesday	3	5.8	0	[illegible]	0.9	2	0	0.0	0.0			
04/03/15	Wednesday	3	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
05/03/15	Thursday	3	6.7	0	[illegible]	0.9	2	0	0.0	0.0			
06/03/15	Friday	3	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
07/03/15	Saturday	3	6.1	0	[illegible]	0.9	2	0	0.0	0.0			
08/03/15	Sunday	3	6.2	0	[illegible]	0.9	2	0	0.0	0.0			
09/03/15	Monday	3	5.7	0	[illegible]	0.9	2	0	0.0	0.0			
10/03/15	Tuesday	3	5.5	0	[illegible]	0.9	2	0	0.0	0.0			
11/03/15	Wednesday	3	5.9	0	[illegible]	0.9	2	0	0.0	0.0			
12/03/15	Thursday	3	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
13/03/15	Friday	3	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
14/03/15	Saturday	3	3.7	5	[illegible]	0.9	2	3	92.0	488.8			
15/03/15	Sunday	3	4.2	12.8	[illegible]	0.9	2	10.8	235.5	1759.5			
16/03/15	Monday	3	3.9	4.6	[illegible]	0.9	2	2.6	84.6	423.6			
17/03/15	Tuesday	3	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
18/03/15	Wednesday	3	3.5	11.2	[illegible]	0.9	2	9.2	206.1	1496.9			
19/03/15	Thursday	3	3	0.8	[illegible]	0.9	2	0	14.7	0.0			
20/03/15	Friday	3	5.2	0	[illegible]	0.9	2	0	0.0	0.0			
21/03/15	Saturday	3	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
22/03/15	Sunday	3	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
23/03/15	Monday	3	5	0	[illegible]	0.9	2	0	0.0	0.0			
24/03/15	Tuesday	3	5.1	0	[illegible]	0.9	2	0	0.0	0.0			
25/03/15	Wednesday	3	5.6	0	[illegible]	0.9	2	0	0.0	0.0			
26/03/15	Thursday	3	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
27/03/15	Friday	3	4	4.2	[illegible]	0.9	2	2.2	77.3	358.4			
28/03/15	Saturday	3	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
29/03/15	Sunday	3	4.4	0	[illegible]	0.9	2	0	0.0	0.0			
30/03/15	Monday	3	3	0	[illegible]	0.9	2	0	0.0	0.0			
31/03/15	Tuesday	3	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
01/04/15	Wednesday	4	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
02/04/15	Thursday	4	4.5	0	[illegible]	0.9	2	0	0.0	0.0			
03/04/15	Friday	4	4	0	[illegible]	0.9	2	0	0.0	0.0			
04/04/15	Saturday	4	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
05/04/15	Sunday	4	5	0	[illegible]	0.9	2	0	0.0	0.0			
06/04/15	Monday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
07/04/15	Tuesday	4	2.1	3.4	[illegible]	0.9	2	1.4	62.6	228.1			
08/04/15	Wednesday	4	2	3.4	[illegible]	0.9	2	1.4	62.6	228.1			
09/04/15	Thursday	4	1.3	1.2	[illegible]	0.9	2	0	22.1	0.0			
10/04/15	Friday	4	2.7	24.6	[illegible]	0.9	2	22.6	452.7	3682.0			
11/04/15	Saturday	4	2.9	1.2	[illegible]	0.9	2	0	22.1	0.0			
12/04/15	Sunday	4	2.8	4.4	[illegible]	0.9	2	2.4	81.0	391.0			
13/04/15	Monday	4	2.7	1.4	[illegible]	0.9	2	0	25.8	0.0			
14/04/15	Tuesday	4	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
15/04/15	Wednesday	4	3.6	1.8	[illegible]	0.9	2	0	33.1	0.0			
16/04/15	Thursday	4	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
17/04/15	Friday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
18/04/15	Saturday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
19/04/15	Sunday	4	3.9	0	[illegible]	0.9	2	0	0.0	0.0			
20/04/15	Monday	4	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
21/04/15	Tuesday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
22/04/15	Wednesday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
23/04/15	Thursday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
24/04/15	Friday	4	2.3	0	[illegible]	0.9	2	0	0.0	0.0			
25/04/15	Saturday	4	2.3	0	[illegible]	0.9	2	0	0.0	0.0			
26/04/15	Sunday	4	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
27/04/15	Monday	4	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
28/04/15	Tuesday	4	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
29/04/15	Wednesday	4	1.9	0	[illegible]	0.9	2	0	0.0	0.0			
30/04/15	Thursday	4	2.4	0.4	[illegible]	0.9	2	0	7.4	0.0			
01/05/15	Friday	5	3.1	1	[illegible]	0.9	2	0	18.4	0.0			
02/05/15	Saturday	5	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
03/05/15	Sunday	5	2.9	0	[illegible]	0.9	2	0	0.0	0.0			
04/05/15	Monday	5	2.2	11.6	[illegible]	0.9	2	9.6	213.5	1564.3			
05/05/15	Tuesday	5	2	0	[illegible]	0.9	2	0	0.0	0.0			
06/05/15	Wednesday	5	2	0.2	[illegible]	0.9	2	0	3.7	0.0			
07/05/15	Thursday	5	2.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
08/05/15	Friday	5	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
09/05/15	Saturday	5	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
10/05/15	Sunday	5	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
11/05/15	Monday	5	2.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
12/05/15	Tuesday	5	2.9	0	[illegible]	0.9	2	0	0.0	0.0			
13/05/15	Wednesday	5	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
14/05/15	Thursday	5	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
15/05/15	Friday	5	4.4	0	[illegible]	0.9	2	0	0.0	0.0			
16/05/15	Saturday	5	2.9	5	[illegible]	0.9	2	3	92.0	488.8			
17/05/15	Sunday	5	1.5	24	[illegible]	0.9	2	22	441.6	3584.2			
18/05/15	Monday	5	1.7	27.2	[illegible]	0.9	2	25.2	500.5	4105.6			
19/05/15	Tuesday	5	1.6	0.4	[illegible]	0.9	2	0	7.4	0.0			
20/05/15	Wednesday	5	2.1	0.8	[illegible]	0.9	2	0	14.7	0.0			
21/05/15	Thursday	5	2.3	0	[illegible]	0.9	2	0	0.0	0.0			
22/05/15	Friday	5	1.7	0	[illegible]	0.9	2	0	0.0	0.0			
23/05/15	Saturday	5	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
24/05/15	Sunday	5	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
25/05/15	Monday	5	1.6	0	[illegible]	0.9	2	0	0.0	0.0			
26/05/15	Tuesday	5	1.4	0.6	[illegible]	0.9	2	0	11.0	0.0			
27/05/15	Wednesday	5	1.5	0.8	[illegible]	0.9	2	0	14.7	0.0			

Date	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration prelim loss calc	Adjusted total loss (m³/day)	Loss correction applied (m3/day)	Corrected volume plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
04/02/15	4276.8	4166.8	4600.3	[illegible]	72.4	-102.8	4269.6	4269.6	100	45	145	[illegible]	[illegible]	0.0	0	0
05/02/15	4124.6	3953.1	4600.3	[illegible]	71.4	-100.1	4053.2	4053.2	100	45	145	[illegible]	[illegible]	0.0	0	0
06/02/15	3908.2	3731.1	4600.3	[illegible]	72.8	-104.2	3835.4	3835.4	100	45	145	[illegible]	[illegible]	0.0	0	0
07/02/15	3690.4	3498.6	4600.3	[illegible]	76.5	-115.3	3613.8	3613.8	100	45	145	[illegible]	[illegible]	0.0	0	0
08/02/15	3468.8	3262.4	4600.3	[illegible]	80.2	-126.3	3388.7	3388.7	100	45	145	[illegible]	[illegible]	0.0	0	0
09/02/15	3243.7	3066.6	4600.3	[illegible]	72.8	-104.2	3170.8	3170.8	100	45	145	[illegible]	[illegible]	0.0	0	0
10/02/15	3025.8	2845.1	4600.3	[illegible]	73.7	-107.0	2952.1	2952.1	100	45	145	[illegible]	[illegible]	0.0	0	0
11/02/15	2807.1	2604.3	4600.3	[illegible]	79.3	-123.5	2727.8	2727.8	100	45	145	[illegible]	[illegible]	0.0	0	0
12/02/15	2582.8	2453.6	4600.3	[illegible]	60.9	-68.3	2521.9	2521.9	100	45	145	[illegible]	[illegible]	0.0	0	0
13/02/15	2376.9	2249.6	4600.3	[illegible]	60.4	-67.0	2316.5	2316.5	100	45	145	[illegible]	[illegible]	0.0	0	0
14/02/15	2171.5	2005.5	4600.3	[illegible]	70.1	-95.9	2101.5	2101.5	100	45	145	[illegible]	[illegible]	0.0	0	0
15/02/15	1966.5	1773.9	4600.3	[illegible]	74.2	-108.4	1882.3	1882.3	100	45	145	[illegible]	[illegible]	0.0	0	0
16/02/15	1737.3	1554.7	4600.3	[illegible]	74.2	-108.4	1663.0	1663.0	100	45	145	[illegible]	[illegible]	0.0	0	0
17/02/15	1518.0	1390.7	4600.3	[illegible]	60.4	-67.0	1457.6	1457.6	100	45	145	[illegible]	[illegible]	0.0	0	0
18/02/15	1312.6	1152.2	4600.3	[illegible]	68.7	-91.8	1244.0	1244.0	100	45	145	[illegible]	[illegible]	0.0	0	0
19/02/15	1099.0	927.4	4600.3	[illegible]	71.4	-100.1	1027.5	1027.5	100	45	145	[illegible]	[illegible]	0.0	0	0
20/02/15	882.5	716.5	4600.3	[illegible]	70.1	-95.9	812.4	812.4	100	45	145	[illegible]	[illegible]	0.0	0	0
21/02/15	667.4	503.3	4600.3	[illegible]	69.6	-94.6	597.8	597.8	100	45	145	[illegible]	[illegible]	0.0	0	0
22/02/15	452.8	277.6	4600.3	[illegible]	72.4	-102.8	380.5	380.5	100	45	145	[illegible]	[illegible]	0.0	0	0
23/02/15	380.5	183.2	4600.3	[illegible]	77.9	-119.4	302.6	302.6	100	45	145	[illegible]	[illegible]	0.0	0	0
24/02/15	302.6	112.6	4600.3	[illegible]	76.0	-113.9	226.5	226.5	100	45	145	[illegible]	[illegible]	0.0	0	0
25/02/15	226.5	67.9	4600.3	[illegible]	68.2	-90.4	158.3	158.3	100	45	145	[illegible]	[illegible]	0.0	0	0
26/02/15	158.3	1.5	4600.3	[illegible]	67.8	-89.0	90.5	90.5	100	45	145	[illegible]	[illegible]	0.0	0	0
27/02/15	90.5	0.0	4600.3	[illegible]	67.8	-89.0	22.8	22.8	100	45	145	[illegible]	[illegible]	0.0	0	0
28/02/15	22.8	0.0	4600.3	[illegible]	72.4	-102.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
01/03/15	0.0	0.0	4600.3	[illegible]	70.5	-97.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
02/03/15	0.0	0.0	4600.3	[illegible]	69.6	-94.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
03/03/15	0.0	0.0	4600.3	[illegible]	70.1	-95.9	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
04/03/15	0.0	0.0	4600.3	[illegible]	72.8	-104.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
05/03/15	0.0	0.0	4600.3	[illegible]	74.2	-108.4	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
06/03/15	0.0	0.0	4600.3	[illegible]	72.8	-104.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
07/03/15	0.0	0.0	4600.3	[illegible]	71.4	-100.1	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
08/03/15	0.0	0.0	4600.3	[illegible]	71.9	-101.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
09/03/15	0.0	0.0	4600.3	[illegible]	69.6	-94.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
10/03/15	0.0	0.0	4600.3	[illegible]	68.7	-91.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
11/03/15	0.0	0.0	4600.3	[illegible]	70.5	-97.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
12/03/15	0.0	0.0	4600.3	[illegible]	72.8	-104.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
13/03/15	0.0	0.0	4600.3	[illegible]	59.0	-62.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
14/03/15	0.0	361.4	4600.3	[illegible]	60.4	-67.0	428.3	428.3	100	45	145	[illegible]	[illegible]	0.0	0	0
15/03/15	428.3	2051.3	4600.3	[illegible]	62.7	-73.9	2125.2	2125.2	100	45	145	[illegible]	[illegible]	0.0	0	0
16/03/15	1980.2	2272.7	4600.3	[illegible]	61.3	-69.7	2342.4	2342.4	100	45	145	[illegible]	[illegible]	0.0	0	0
17/03/15	2197.4	2070.1	4600.3	[illegible]	60.4	-67.0	2137.0	2137.0	100	45	145	[illegible]	[illegible]	0.0	0	0
18/03/15	1992.0	3367.2	4600.3	[illegible]	59.5	-64.2	3431.4	3431.4	100	45	145	[illegible]	[illegible]	0.0	0	0
19/03/15	3286.4	3171.9	4600.3	[illegible]	57.2	-57.3	3229.2	3229.2	100	45	145	[illegible]	[illegible]	0.0	0	0
20/03/15	3084.2	2929.2	4600.3	[illegible]	67.3	-87.7	3016.9	3016.9	100	45	145	[illegible]	[illegible]	0.0	0	0
21/03/15	2871.9	2748.2	4600.3	[illegible]	59.5	-64.2	2812.4	2812.4	100	45	145	[illegible]	[illegible]	0.0	0	0
22/03/15	2667.4	2519.8	4600.3	[illegible]	65.5	-82.1	2601.9	2601.9	100	45	145	[illegible]	[illegible]	0.0	0	0
23/03/15	2456.9	2305.6	4600.3	[illegible]	66.4	-84.9	2390.5	2390.5	100	45	145	[illegible]	[illegible]	0.0	0	0
24/03/15	2245.5	2092.4	4600.3	[illegible]	66.8	-86.3	2178.7	2178.7	100	45	145	[illegible]	[illegible]	0.0	0	0
25/03/15	2033.7	1871.4	4600.3	[illegible]	69.1	-93.2	1964.5	1964.5	100	45	145	[illegible]	[illegible]	0.0	0	0
26/03/15	1819.5	1670.1	4600.3	[illegible]	65.9	-83.5	1753.6	1753.6	100	45	145	[illegible]	[illegible]	0.0	0	0
27/03/15	1608.6	1834.1	4600.3	[illegible]	61.8	-71.1	1905.2	1905.2	100	45	145	[illegible]	[illegible]	0.0	0	0
28/03/15	1760.2	1632.9	4600.3	[illegible]	60.4	-67.0	1699.8	1699.8	100	45	145	[illegible]	[illegible]	0.0	0	0
29/03/15	1554.8	1414.6	4600.3	[illegible]	63.6	-76.6	1491.2	1491.2	100	45	145	[illegible]	[illegible]	0.0	0	0
30/03/15	1346.2	1231.7	4600.3	[illegible]	57.2	-57.3	1289.0	1289.0	100	45	145	[illegible]	[illegible]	0.0	0	0
31/03/15	1144.0	1016.7	4600.3	[illegible]	60.4	-67.0	1083.6	1083.6	100	45	145	[illegible]	[illegible]	0.0	0	0
01/04/15	938.6	802.0	4600.3	[illegible]	61.7	-73.9	875.9	875.9	100	45	145	[illegible]	[illegible]	0.0	0	0
02/04/15	730.9	588.8	4600.3	[illegible]	64.1	-78.0	666.8	666.8	100	45	145	[illegible]	[illegible]	0.0	0	0
03/04/15	521.8	388.9	4600.3	[illegible]	61.8	-71.1	460.0	460.0	100	45	145	[illegible]	[illegible]	0.0	0	0
04/04/15	460.0	341.9	4600.3	[illegible]	58.1	-60.1	401.9	401.9	100	45	145	[illegible]	[illegible]	0.0	0	0
05/04/15	401.9	250.6	4600.3	[illegible]	66.4	-84.9	335.5	335.5	100	45	145	[illegible]	[illegible]	0.0	0	0
06/04/15	335.5	219.2	4600.3	[illegible]	57.6	-58.7	277.9	277.9	100	45	145	[illegible]	[illegible]	0.0	0	0
07/04/15	277.9	408.0	4600.3	[illegible]	53.0	-44.9	452.9	452.9	100	45	145	[illegible]	[illegible]	0.0	0	0
08/04/15	452.9	584.9	4600.3	[illegible]	52.6	-43.5	628.4	628.4	100	45	145	[illegible]	[illegible]	0.0	0	0
09/04/15	483.4	400.2	4600.3	[illegible]	49.4	-33.8	434.1	434.1	100	45	145	[illegible]	[illegible]	0.0	0	0
10/04/15	434.1	4007.1	4600.3	[illegible]	55.8	-53.1	4060.2	4060.2	100	45	145	[illegible]	[illegible]	0.0	0	0
11/04/15	3915.2	3802.6	4600.3	[illegible]	56.7	-55.9	3858.5	3858.5	100	45	145	[illegible]	[illegible]	0.0	0	0
12/04/15	3713.5	3993.7	4600.3	[illegible]	56.3	-54.5	4048.2	4048.2	100	45	145	[illegible]	[illegible]	0.0	0	0
13/04/15	3903.2	3794.3	4600.3	[illegible]	55.8	-53.1	3847.4	3847.4	100	45	145	[illegible]	[illegible]	0.0	0	0
14/04/15	3702.4	3595.3	4600.3	[illegible]	55.3	-51.8	3647.1	3647.1	100	45	145	[illegible]	[illegible]	0.0	0	0
15/04/15	3502.1	3376.5	4600.3	[illegible]	59.9	-65.6	3442.1	3442.1	100	45	145	[illegible]	[illegible]	0.0	0	0
16/04/15	3297.1	3173.4	4600.3	[illegible]	59.5	-64.2	3237.6	3237.6	100	45	145	[illegible]	[illegible]	0.0	0	0
17/04/15	3092.6	2976.3	4600.3	[illegible]	57.6	-58.7	3035.0	3035.0	100	45	145	[illegible]	[illegible]	0.0	0	0
18/04/15	2890.0	2768.1	4600.3	[illegible]	59.0	-62.8	2831.0	2831.0	100	45	145	[illegible]	[illegible]	0.0	0	0
19/04/15	2686.0	2554.9	4600.3	[illegible]	61.3	-69.7	2624.6	2624.6	100	45	145	[illegible]	[illegible]	0.0	0	0
20/04/15	2479.6	2361.5	4600.3	[illegible]	58.1	-60.1	2421.5	2421.5	100	45	145	[illegible]	[illegible]	0.0	0	0
21/04/15	2276.5	2154.7	4600.3	[illegible]	59.0	-62.8	2217.5	2217.5	100	45	145	[illegible]	[illegible]	0.0	0	0
22/04/15	2072.5	1956.2	4600.3	[illegible]	57.6	-58.7	2014.8	2014.8	100	45	145	[illegible]	[illegible]	0.0	0	0
23/04/15	1869.8	1753.5	4600.3	[illegible]	57.6	-58.7	1812.2	1812.2	100	45	145	[illegible]	[illegible]	0.0	0	0
24/04/15	1667.2	1565.6	4600.3	[illegible]	54.0	-47.6	1613.2	1613.2	100	45	145	[illegible]	[illegible]	0.0	0	0
25/04/15	1468.2	1366.6	4600.3	[illegible]	54.0	-47.6	1414.3	1414.3	100	45	145	[illegible]	[illegible]	0.0	0	0
26/04/15	1269.3	1182.4	4600.3	[illegible]	50.3	-36.6	1219.0	1219.0	100	45	145	[illegible]	[illegible]	0.0	0	0
27/04/15	1074.0	970.5	4600.3	[illegible]	54.4	-49.0	1019.5	1019.5	100	45	145	[illegible]	[illegible]	0.0	0	0
28/04/15	874.5	765.6	4600.3	[illegible]	55.8	-53.2	818.7	818.7	100	45	145	[illegible]	[illegible]	0.0	0	0
29/04/15	673.7	579.5	4600.3	[illegible]	52.1	-42.1	621.6	621.6	100	45	145	[illegible]	[illegible]	0.0	0	0
30/04/15	476.6	373.2	4600.3	[illegible]	54.4	-49.0	422.2	422.2	100	45	145	[illegible]	[illegible]	0.0	0	0
01/05/15	422.2	305.9	4600.3	[illegible]	57.6	-58.7	364.5	364.5	0	45	45	[illegible]	[illegible]	0.0	0	0
02/05/15	364.5	253.7	4600.3	[illegible]	56.3	-54.5	308.3	308.3	0	45	45	[illegible]	[illegible]	0.0	0	0
03/05/15	308.3	195.6	4600.3	[illegible]	56.7	-55.9	251.5	251.5	0	45	45	[illegible]	[illegible]	0.0	0	0
04/05/15	251.5	1715.8	4600.3	[illegible]	53.5	-46.3	1762.0	1762.0	0	45	45	[illegible]	[illegible]	0.0	0	0
05/05/15	1717.0	1621.0	4600.3	[illegible]	52.6	-43.5	1664.5	1664.5	0	45	45	[illegible]	[illegible]	0.0	0	0
06/05/15	1619.5	1523.4	4600.3	[illegible]	52.6	-43.5	1566.9	1566.9	0	45	45	[illegible]	[illegible]	0.0	0	0
07/05/15	1521.9	1418.4	4600.3	[illegible]	54.4	-49.0	1467.4	1467.4	0	45	45	[illegible]	[illegible]	0.0	0	0
08/05/15	1422.4	1321.7	4600.3	[illegible]	53.5	-46.3	1368.9	1368.9	0	45	45	[illegible]	[illegible]	0.0	0	0
09/05/15	1323.9	1226.0	4600.3	[illegible]	53.0	-44.9	1270.9	1270.9	0	45	45	[illegible]	[illegible]	0.0	0	0
10/05/15	1225.9	1126.1	4600.3	[illegible]	53.5	-46.3	1172.4	1172.4	0	45	45	[illegible]	[illegible]	0.0	0	0
11/05/15	1127.4	1023.9	4600.3	[illegible]	54.4	-49.0	1073.0	1073.0	0	45	45	[illegible]	[illegible]	0.0	0	0
12/05/15	1028.0	915.3	4600.3	[illegible]	56.7	-55.9	971.2	971.2	0	45	45	[illegible]	[illegible]	0.0	0	0
13/05/15	926.2	806.2	4600.3	[illegible]	58.6	-61.4	867.7	867.7	0	45	45	[illegible]	[illegible]	0.0	0	0
14/05/15	822.7	700.8	4600.3	[illegible]	59.0	-62.8	763.6	763.6	0	45	45	[illegible]	[illegible]	0.0	0	0
15/05/15	718.6	578.4	4600.3	[illegible]	63.6	-76.6	655.0	655.0	0	45	45	[illegible]	[illegible]	0.0	0	0
16/05/15	610.0	986.1	4600.3	[illegible]	56.7	-55.9	1042.0	1042.0	0	45	45	[illegible]	[illegible]	0.0	0	0
17/05/15	997.0	4494.4	4600.3	[illegible]	50.3	-36.6	4531.0	4531.0	0	45	45	[illegible]	[illegible]	0.0	0	0
18/05/15	4486.0	8500.9	9200.7	[illegible]	102.4	11.9	8489.1	8489.1	0	45	45	[illegible]	[illegible]	0.0	0	0
19/05/15	8444.1	8355.4	4600.3	[illegible]	50.7	-38.0	8393.3	8393.3	0	45	45	[illegible]	[illegible]	0.0	0	0
20/05/15	8348.3	8250.4	4600.3	[illegible]	53.0	-44.9	8295.3	8295.3	0	45	45	[illegible]	[illegible]	0.0	0	0
21/05/15	8250.3	8148.7	4600.3	[illegible]	54.0	-47.6	8196.3	8196.3	0	45	45	[illegible]	[illegible]	0.0	0	0
22/05/15	8151.3	8060.8	4600.3	[illegible]	51.2	-39.4	8100.1	8100.1	0	45	45	[illegible]	[illegible]	0.0	0	0
23/05/15	8055.1	7968.2	4600.3	[illegible]	50.3	-36.6	8004.8	8004.8	0	45	45	[illegible]	[illegible]	0.0	0	0
24/05/15	7959.8	7873.0	4600.3	[illegible]	50.3	-36.6	7909.5	7909.5	0	45	45	[illegible]	[illegible]	0.0	0	0
25/05/15	7864.5	7775.8	4600.3	[illegible]	50.7	-38.0	7813.8	7813.8	0	45	45	[illegible]	[illegible]	0.0	0	0
26/05/15	7768.8	7683.8	4600.3	[illegible]	49.8	-35.2	7719.0	7719.0	0	45	45	[illegible]	[illegible]	0.0	0	0
27/05/15	7674.0	7587.1	4600.3	[illegible]	50.3	-36.6	7623.7	7623.7	0	45	45	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after Initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m³)	Prelim Infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust supression in north of cardup brook (m3/day)	Required dust supression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
	Timing Tests		BOM Data		Stormwater Catchment Absorption and Wetting						Pond Losses			Adjustments						Final pond volumes		Demand (load)			Abstraction		Overflow Calcs		
28/05/15	Thursday	5	1.2	0.2	[illegible]	0.9	2	0	3.7	0.0				7578.7	7497.3	4600.3	3615.6	48.9	-32.5	7529.8	7529.8	0	45	45	[illegible]	[illegible]	0.0	0	0
29/05/15	Friday	5	1.6	0	[illegible]	0.9	2	0	0.0	0.0				7484.8	7396.1	4600.3	3615.6	50.7	-38.0	7434.0	7434.0	0	45	45	[illegible]	[illegible]	0.0	0	0
30/05/15	Saturday	5	1.7	0	[illegible]	0.9	2	0	0.0	0.0				7389.0	7298.5	4600.3	3615.6	51.2	-39.4	7337.8	7337.8	0	45	45	[illegible]	[illegible]	0.0	0	0
31/05/15	Sunday	5	1.2	0	[illegible]	0.9	2	0	0.0	0.0				7292.8	7211.5	4600.3	3615.6	48.9	-32.5	7243.9	7243.9	0	45	45	[illegible]	[illegible]	0.0	0	0
01/06/15	Monday	6	2.1	0.2	[illegible]	0.9	2	0	3.7	0.0				7198.9	7101.0	4600.3	3615.6	53.0	-44.9	7145.9	7145.9	0	0	0	[illegible]	[illegible]	0.0	0	0
02/06/15	Tuesday	6	1.9	10.4	[illegible]	0.9	2	8.4	191.4	1368.5				7145.9	8430.1	9200.7	7231.2	104.3	10.0	8410.1	8410.1	0	0	0	[illegible]	[illegible]	0.0	0	0
03/06/15	Wednesday	6	1.9	7	[illegible]	0.9	2	5	128.8	814.6				8410.1	9130.5	9200.7	7231.2	104.3	10.0	9120.5	9120.5	0	0	0	[illegible]	[illegible]	0.0	0	0
04/06/15	Thursday	6	1.5	1.2	[illegible]	0.9	2	0	22.1	0.0				9120.5	9033.6	9200.7	7231.2	100.6	13.7	9019.9	9019.9	0	0	0	[illegible]	[illegible]	0.0	0	0
05/06/15	Friday	6	1.2	0.4	[illegible]	0.9	2	0	7.4	0.0				9019.9	8938.5	9200.7	7231.2	97.8	16.5	8922.1	8922.1	0	0	0	[illegible]	[illegible]	0.0	0	0
06/06/15	Saturday	6	1.3	1.6	[illegible]	0.9	2	0	29.4	0.0				8922.1	8838.9	9200.7	7231.2	98.7	15.5	8823.3	8823.3	0	0	0	[illegible]	[illegible]	0.0	0	0
07/06/15	Sunday	6	1.3	0.6	[illegible]	0.9	2	0	11.0	0.0				8823.3	8740.1	9200.7	7231.2	98.7	15.5	8724.6	8724.6	0	0	0	[illegible]	[illegible]	0.0	0	0
08/06/15	Monday	6	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				8724.6	8639.6	9200.7	7231.2	99.7	14.6	8625.0	8625.0	0	0	0	[illegible]	[illegible]	0.0	0	0
09/06/15	Tuesday	6	2.3	0	[illegible]	0.9	2	0	0.0	0.0				8625.0	8523.4	9200.7	7231.2	107.9	6.3	8517.0	8517.0	0	0	0	[illegible]	[illegible]	0.0	0	0
10/06/15	Wednesday	6	2.3	0	[illegible]	0.9	2	0	0.0	0.0				8517.0	8415.4	9200.7	7231.2	107.9	6.3	8409.1	8409.1	0	0	0	[illegible]	[illegible]	0.0	0	0
11/06/15	Thursday	6	2.2	0	[illegible]	0.9	2	0	0.0	0.0				8409.1	8309.3	4600.3	3615.6	53.5	-45.3	8355.6	8355.6	0	0	0	[illegible]	[illegible]	0.0	0	0
12/06/15	Friday	6	1.5	0	[illegible]	0.9	2	0	0.0	0.0				8355.6	8268.7	4600.3	3615.6	50.3	-36.6	8305.3	8305.3	0	0	0	[illegible]	[illegible]	0.0	0	0
13/06/15	Saturday	6	1.5	0	[illegible]	0.9	2	0	0.0	0.0				8305.3	8218.4	4600.3	3615.6	50.3	-36.6	8255.0	8255.0	0	0	0	[illegible]	[illegible]	0.0	0	0
14/06/15	Sunday	6	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0				8255.0	8164.4	4600.3	3615.6	51.2	-39.4	8203.8	8203.8	0	0	0	[illegible]	[illegible]	0.0	0	0
15/06/15	Monday	6	1.3	0	[illegible]	0.9	2	0	0.0	0.0				8203.8	8120.6	4600.3	3615.6	49.4	-33.8	8154.4	8154.4	0	0	0	[illegible]	[illegible]	0.0	0	0
16/06/15	Tuesday	6	2.2	0	[illegible]	0.9	2	0	0.0	0.0				8154.4	8054.7	4600.3	3615.6	53.5	-46.3	8100.9	8100.9	0	0	0	[illegible]	[illegible]	0.0	0	0
17/06/15	Wednesday	6	2.8	0	[illegible]	0.9	2	0	0.0	0.0				8100.9	7990.1	4600.3	3615.6	56.3	-54.5	8044.7	8044.7	0	0	0	[illegible]	[illegible]	0.0	0	0
18/06/15	Thursday	6	1.7	1.4	[illegible]	0.9	2	0	25.8	0.0				8044.7	7954.1	4600.3	3615.6	51.3	-39.4	7993.4	7993.4	0	0	0	[illegible]	[illegible]	0.0	0	0
19/06/15	Friday	6	1.7	8.4	[illegible]	0.9	2	6.4	154.6	1542.7				7993.4	8945.6	9200.7	7231.2	102.4	11.9	8933.7	8933.7	0	0	0	[illegible]	[illegible]	0.0	0	0
20/06/15	Saturday	6	1.5	14.4	[illegible]	0.9	2	12.4	265.0	2020.2				8933.7	10867.0	9200.7	7231.2	100.6	13.7	10853.3	10853.3	0	0	0	[illegible]	[illegible]	0.0	0	0
21/06/15	Sunday	6	2.0	50.4	[illegible]	0.9	2	48.4	977.4	7665.3				10853.3	18642.5	13801.0	10846.7	157.8	61.7	18580.8	18580.8	0	0	0	[illegible]	[illegible]	0.0	0	0
22/06/15	Monday	6	1.7	22.4	[illegible]	0.9	2	20.4	412.2	3323.5				18580.8	21813.8	13801.0	10846.7	151.6	63.1	21750.8	21750.8	0	0	0	[illegible]	[illegible]	0.0	0	0
23/06/15	Tuesday	6	1.0	0.2	[illegible]	0.9	2	0	3.7	0.0				21750.8	21673.1	13801.0	10846.7	144.0	66.3	21606.8	21606.8	0	0	0	[illegible]	[illegible]	0.0	0	0
24/06/15	Wednesday	6	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				21606.8	21521.7	13801.0	10846.7	149.5	64.4	21457.3	21457.3	0	0	0	[illegible]	[illegible]	0.0	0	0
25/06/15	Thursday	6	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				21457.3	21372.3	13801.0	10846.7	149.5	64.4	21307.8	21307.8	0	0	0	[illegible]	[illegible]	0.0	0	0
26/06/15	Friday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0				21307.8	21224.6	13801.0	10846.7	148.1	64.9	21159.7	21159.7	0	0	0	[illegible]	[illegible]	0.0	0	0
27/06/15	Saturday	6	1.6	0	[illegible]	0.9	2	0	0.0	0.0				21159.7	21071.0	13801.0	10846.7	152.2	63.5	21007.5	21007.5	0	0	0	[illegible]	[illegible]	0.0	0	0
28/06/15	Sunday	6	1.9	0	[illegible]	0.9	2	0	0.0	0.0				21007.5	20913.2	13801.0	10846.7	156.4	62.1	20851.1	20851.1	0	0	0	[illegible]	[illegible]	0.0	0	0
29/06/15	Monday	6	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				20851.1	20758.7	13801.0	10846.7	155.0	62.6	20696.1	20696.1	0	0	0	[illegible]	[illegible]	0.0	0	0
30/06/15	Tuesday	6	1.8	0	[illegible]	0.9	2	0	0.0	0.0				20696.1	20603.7	13801.0	10846.7	155.0	62.6	20541.1	20541.1	0	0	0	[illegible]	[illegible]	0.0	0	0
01/07/15	Wednesday	7	1.2	0	[illegible]	0.9	2	0	0.0	0.0				20541.1	20459.7	13801.0	10846.7	146.7	65.4	20394.4	20394.4	0	0	0	[illegible]	[illegible]	0.0	0	0
02/07/15	Thursday	7	1.3	0.8	[illegible]	0.9	2	0	14.7	0.0				20394.4	20311.2	13801.0	10846.7	148.1	64.9	20246.3	20246.3	0	0	0	[illegible]	[illegible]	0.0	0	0
03/07/15	Friday	7	1.2	0.8	[illegible]	0.9	2	0	14.7	0.0				20246.3	20164.9	13801.0	10846.7	146.7	65.4	20099.5	20099.5	0	0	0	[illegible]	[illegible]	0.0	0	0
04/07/15	Saturday	7	1.2	0.2	[illegible]	0.9	2	0	3.7	0.0				20099.5	20018.2	13801.0	10846.7	146.7	65.4	19952.8	19952.8	0	0	0	[illegible]	[illegible]	0.0	0	0
05/07/15	Sunday	7	1.2	3	[illegible]	0.9	2	1	55.2	162.9				19952.8	20034.4	13801.0	10846.7	146.7	65.4	19969.0	19969.0	0	0	0	[illegible]	[illegible]	0.0	0	0
06/07/15	Monday	7	1.2	2.4	[illegible]	0.9	2	0.4	44.2	65.2				19969.0	19952.8	13801.0	10846.7	146.7	65.4	19887.5	19887.5	0	0	0	[illegible]	[illegible]	0.0	0	0
07/07/15	Tuesday	7	1.2	6.8	[illegible]	0.9	2	4.8	125.1	782.0				19887.5	20588.1	13801.0	10846.7	146.7	65.4	20522.8	20522.8	0	0	0	[illegible]	[illegible]	0.0	0	0
08/07/15	Wednesday	7	1.9	16.8	[illegible]	0.9	2	14.8	309.1	2411.2				20522.8	22839.7	13801.0	10846.7	156.4	62.1	22777.6	22777.6	0	0	0	[illegible]	[illegible]	0.0	0	0
09/07/15	Thursday	7	1.1	0.2	[illegible]	0.9	2	0	3.7	0.0				22777.6	22698.1	13801.0	10846.7	145.3	65.8	22632.2	22632.2	0	0	0	[illegible]	[illegible]	0.0	0	0
10/07/15	Friday	7	1.4	1.8	[illegible]	0.9	2	0	33.1	0.0				22632.2	22547.2	13801.0	10846.7	149.5	64.4	22482.7	22482.7	0	0	0	[illegible]	[illegible]	0.0	0	0
11/07/15	Saturday	7	1.2	1.4	[illegible]	0.9	2	0	25.8	0.0				22482.7	22401.4	13801.0	10846.7	146.7	65.4	22336.0	22336.0	0	0	0	[illegible]	[illegible]	0.0	0	0
12/07/15	Sunday	7	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0				22336.0	22252.8	13801.0	10846.7	148.1	64.9	22187.9	22187.9	0	0	0	[illegible]	[illegible]	0.0	0	0
13/07/15	Monday	7	1.6	0	[illegible]	0.9	2	0	0.0	0.0				22187.9	22099.2	13801.0	10846.7	152.2	63.5	22035.7	22035.7	0	0	0	[illegible]	[illegible]	0.0	0	0
14/07/15	Tuesday	7	1.9	0	[illegible]	0.9	2	0	0.0	0.0				22035.7	21941.4	13801.0	10846.7	156.4	62.1	21879.3	21879.3	0	0	0	[illegible]	[illegible]	0.0	0	0
15/07/15	Wednesday	7	1.9	0	[illegible]	0.9	2	0	0.0	0.0				21879.3	21785.1	13801.0	10846.7	156.4	62.1	21722.9	21722.9	0	0	0	[illegible]	[illegible]	0.0	0	0
16/07/15	Thursday	7	2.7	0	[illegible]	0.9	2	0	0.0	0.0				21722.9	21614.0	13801.0	10846.7	167.4	58.5	21555.5	21555.5	0	0	0	[illegible]	[illegible]	0.0	0	0
17/07/15	Friday	7	2.1	0	[illegible]	0.9	2	0	0.0	0.0				21555.5	21457.6	13801.0	10846.7	159.1	61.2	21396.4	21396.4	0	0	0	[illegible]	[illegible]	0.0	0	0
18/07/15	Saturday	7	1.1	0.2	[illegible]	0.9	2	0	3.7	0.0				21396.4	21316.8	13801.0	10846.7	145.3	65.8	21251.0	21251.0	0	0	0	[illegible]	[illegible]	0.0	0	0
19/07/15	Sunday	7	1.8	0.2	[illegible]	0.9	2	0	3.7	0.0				21251.0	21158.6	13801.0	10846.7	155.0	62.6	21096.0	21096.0	0	0	0	[illegible]	[illegible]	0.0	0	0
20/07/15	Monday	7	1.9	70.6	[illegible]	0.9	2	68.6	1399.1	11176.2				21096.0	32178.0	18401.3	14462.3	208.5	114.3	32063.7	32063.7	0	0	0	[illegible]	[illegible]	0.0	0	0
21/07/15	Tuesday	7	1.5	15	[illegible]	0.9	2	13	276.0	2117.9				32063.7	34094.8	18401.3	14462.3	201.1	114.3	33980.5	33584.2	0	0	0	[illegible]	[illegible]	396.3	1	0
22/07/15	Wednesday	7	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0				33584.2	33493.6	18401.3	14462.3	204.8	114.3	33379.4	33379.4	0	0	0	[illegible]	[illegible]	0.0	0	0
23/07/15	Thursday	7	1.6	10.4	[illegible]	0.9	2	8.4	191.4	1368.5				33379.4	34659.2	18401.3	14462.3	203.0	114.3	34544.9	33584.2	0	0	0	[illegible]	[illegible]	960.7	1	0
24/07/15	Friday	7	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				33584.2	33499.2	18401.3	14462.3	199.3	114.3	33384.9	33384.9	0	0	0	[illegible]	[illegible]	0.0	0	0
25/07/15	Saturday	7	1.5	0.6	[illegible]	0.9	2	0	11.0	0.0				33384.9	33298.0	18401.3	14462.3	201.1	114.3	33183.8	33183.8	0	0	0	[illegible]	[illegible]	0.0	0	0
26/07/15	Sunday	7	1.5	0.4	[illegible]	0.9	2	0	7.4	0.0				33183.8	33096.9	18401.3	14462.3	201.1	114.3	32982.6	32982.6	0	0	0	[illegible]	[illegible]	0.0	0	0
27/07/15	Monday	7	1.9	0	[illegible]	0.9	2	0	0.0	0.0				32982.6	32888.4	18401.3	14462.3	208.5	114.3	32774.1	32774.1	0	0	0	[illegible]	[illegible]	0.0	0	0
28/07/15	Tuesday	7	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0				32774.1	32687.2	18401.3	14462.3	201.1	114.3	32572.9	32572.9	0	0	0	[illegible]	[illegible]	0.0	0	0
29/07/15	Wednesday	7	1.1	5.6	[illegible]	0.9	2	3.6	103.0	586.5				32572.9	33079.9	18401.3	14462.3	193.8	114.3	32965.7	32965.7	0	0	0	[illegible]	[illegible]	0.0	0	0
30/07/15	Thursday	7	1.1	1.6	[illegible]	0.9	2	0	29.4	0.0				32965.7	32886.1	18401.3	14462.3	193.8	114.3	32771.9	32771.9	0	0	0	[illegible]	[illegible]	0.0	0	0
31/07/15	Friday	7	2	15.8	[illegible]	0.9	2	13.8	290.7	2248.3				32771.9	34924.1	18401.3	14462.3	210.4	114.3	34819.8	33584.2	0	0	0	[illegible]	[illegible]	1235.6	1	0
01/08/15	Saturday	8	2.3	0	[illegible]	0.9	2	0	0.0	0.0				33584.2	33482.6	18401.3	14462.3	215.9	114.3	33368.3	33368.3	0	0	0	[illegible]	[illegible]	0.0	0	0
02/08/15	Sunday	8	1.7	0	[illegible]	0.9	2	0	0.0	0.0				33368.3	33277.8	18401.3	14462.3	204.8	114.3	33163.5	33163.5	0	0	0	[illegible]	[illegible]	0.0	0	0
03/08/15	Monday	8	1.7	0	[illegible]	0.9	2	0	0.0	0.0				33163.5	33072.9	18401.3	14462.3	204.8	114.3	32958.7	32958.7	0	0	0	[illegible]	[illegible]	0.0	0	0
04/08/15	Tuesday	8	1.9	0	[illegible]	0.9	2	0	0.0	0.0				32958.7	32864.4	18401.3	14462.3	208.5	114.3	32750.2	32750.2	0	0	0	[illegible]	[illegible]	0.0	0	0
05/08/15	Wednesday	8	2.1	0	[illegible]	0.9	2	0	0.0	0.0				32750.2	32652.2	18401.3	14462.3	212.2	114.3	32538.0	32538.0	0	0	0	[illegible]	[illegible]	0.0	0	0
06/08/15	Thursday	8	2.1	0	[illegible]	0.9	2	0	0.0	0.0				32538.0	32440.1	18401.3	14462.3	212.2	114.3	32325.8	32325.8	0	0	0	[illegible]	[illegible]	0.0	0	0
07/08/15	Friday	8	1.3	2	[illegible]	0.9	2	0	36.8	0.0				32325.8	32242.6	18401.3	14462.3	197.5	114.3	32128.3	32128.3	0	0	0	[illegible]	[illegible]	0.0	0	0
08/08/15	Saturday	8	1.9	12.2	[illegible]	0.9	2	10.2	224.5	1661.5				32128.3	33695.8	18401.3	14462.3	208.5	114.3	33581.6	33581.6	0	0	0	[illegible]	[illegible]	0.0	0	0
09/08/15	Sunday	8	1.5	13.2	[illegible]	0.9	2	11.2	242.9	1824.7				33581.6	35319.4	18401.3	14462.3	201.1	114.3	35205.1	33584.2	0	0	0	[illegible]	[illegible]	1620.9	1	0
10/08/15	Monday	8	2.2	1	[illegible]	0.9	2	0	18.4	0.0				33584.2	33484.4	18401.3	14462.3	214.0	114.3	33370.2	33370.2	0	0	0	[illegible]	[illegible]	0.0	0	0
11/08/15	Tuesday	8	1.9	3.8	[illegible]	0.9	2	1.8	69.9	293.3				33370.2	33569.2	18401.3	14462.3	208.5	114.3	33454.9	33454.9	0	0	0	[illegible]	[illegible]	0.0	0	0
12/08/15	Wednesday	8	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0				33454.9	33369.9	18401.3	14462.3	199.3	114.3	33255.6	33255.6	0	0	0	[illegible]	[illegible]	0.0	0	0
13/08/15	Thursday	8	1.3	0	[illegible]	0.9	2	0	0.0	0.0				33255.6	33172.4	18401.3	14462.3	197.5	114.3	33058.1	33058.1	0	0	0	[illegible]	[illegible]	0.0	0	0
14/08/15	Friday	8	2	0.4	[illegible]	0.9	2	0	7.4	0.0				33058.1	32962.1	18401.3	14462.3	210.4	114.3	32847.8	32847.8	0	0	0	[illegible]	[illegible]	0.0	0	0
15/08/15	Saturday	8	2.7	0.2	[illegible]	0.9	2	0	3.7	0.0				32847.8	32738.8	18401.3	14462.3	223.2	114.3	32624.6	32624.6	0	0	0	[illegible]	[illegible]	0.0	0	0
16/08/15	Sunday	8	1.9	0	[illegible]	0.9	2	0	0.0	0.0				32624.6	32530.3	18401.3	14462.3	208.5	114.3	32416.1	32416.1	0	0	0	[illegible]	[illegible]	0.0	0	0
17/08/15	Monday	8	1.7	13.6	[illegible]	0.9	2	11.6	250.3	1889.9				32416.1	34215.3	18401.3	14462.3	204.8	114.3	34101.1	33584.2	0	0	0	[illegible]	[illegible]	516.9	1	0
18/08/15	Tuesday	8	2.4	22.2	[illegible]	0.9	2	20.2	408.5	3291.0				33584.2	36771.7	18401.3	14462.3	217.7	114.3	36657.5	33584.2	0	0	0	[illegible]	[illegible]	3073.2	1	0
19/08/15	Wednesday	8	2.3	0	[illegible]	0.9	2	0	0.0	0.0				33584.2	33482.6	18401.3	14462.3	215.9	114.3	33368.3	33368.3	0	0	0	[illegible]	[illegible]	0.0	0	0
20/08/15	Thursday	8	2.4	0	[illegible]	0.9	2	0	0.0	0.0				33368.3	33264.9	18401.3	14462.3	217.7	114.3	33150.6	33150.6	0	0	0	[illegible]	[illegible]	0.0	0	0
21/08/15	Friday	8	1.7	2.8	[illegible]	0.9	2	0.8	51.5	130.3				33150.6	33190.4	18401.3	14462.3	204.8	114.3	33076.1	33076.1	0	0	0	[illegible]	[illegible]	0.0	0	0
22/08/15	Saturday	8	1.8	14.6	[illegible]	0.9	2	12.6	268.7	2052.8				33076.1	35036.5	18401.3	14462.3	206.7	114.3	34922.2	33584.2	0	0	0	[illegible]	[illegible]	1336.0	1	0
23/08/15	Sunday	8	2.2	1	[illegible]	0.9	2	0	18.4	0.0				33584.2	33484.4	18401.3	14462.3	214.0	114.3	33370.2	33370.2	0	0	0	[illegible]	[illegible]	0.0	0	0
24/08/15	Monday	8	2.7	0.2	[illegible]	0.9	2	0	3.7	0.0				33370.2	33261.2	18401.3	14462.3	223.2	114.3	33146.9	33146.9	0	0	0	[illegible]	[illegible]	0.0	0	0
25/08/15	Tuesday	8	3	0	[illegible]	0.9	2	0	0.0	0.0				33146.9	33032.5	18401.3	14462.3	228.8	114.3	32918.2	32918.2	0	0	0	[illegible]	[illegible]	0.0	0	0
26/08/15	Wednesday	8	2.5	0	[illegible]	0.9	2	0	0.0	0.0				32918.2	32812.9	18401.3	14462.3	219.6	114.3	32698.6	32698.6	0	0	0	[illegible]	[illegible]	0.0	0	0
27/08/15	Thursday	8	3.3	0	[illegible]	0.9	2	0	0.0	0.0				32698.6	32578.6	18401.3	14462.3	234.3	114.3	32464.4	32464.4	0	0	0	[illegible]	[illegible]	0.0	0	0
28/08/15	Friday	8	2	0.2	[illegible]	0.9	2	0	3.7	0.0				32464.4	32368.3	18401.3	14462.3	210.4	114.3	32254.0	32254.0	0	0	0	[illegible]	[illegible]	0.0	0	0
29/08/15	Saturday	8	2.3	1.2	[illegible]	0.9	2	0	22.1	0.0				32254.0	32152.4	18401.3	14462.3	215.9	114.3	32038.2	32038.2	0	0	0	[illegible]	[illegible]	0.0	0	0
30/08/15	Sunday	8	2.6	22	[illegible]	0.9	2	20	404.8	3255.4				32038.2	35189.4	18401.3	14462.3	221.4	114.3	35075.1	33584.2	0	0	0	[illegible]	[illegible]	1490.9	1	0
31/08/15	Monday	8	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0				33584.2	33484.4	18401.3	14462.3	214.0	114.3	33370.2	33370.2	0	0	0	[illegible]	[illegible]	0.0	0	0
01/09/15	Tuesday	9	2.6	6.2	[illegible]	0.9	2	4.2	114.1	684.3				33370.2	33947.3	18401.3	14462.3	221.4	114.3	33833.0	33584.2	0	45	45	[illegible]	[illegible]	248.8	1	0
02/09/15	Wednesday	9	2.1	0.2	[illegible]	0.9	2	0	3.7	0.0				33539.2	33441.3	18401.3	14462.3	213.2	114.3	33327.0	33327.0	0	45	45	[illegible]	[illegible]	0.0	0	0
03/09/15	Thursday	9	3	0	[illegible]	0.9	2	0	0.0	0.0				33282.0	33167.5	18401.3	14462.3	228.8	114.3	33053.3	33053.3	0	45	45	[illegible]	[illegible]	0.0	0	0
04/09/15	Friday	9	2.6	0	[illegible]	0.9	2	0	0.0	0.0				33008.3	32901.1	18401.3	14462.3	221.4	114.3	32786.9	32786.9	0	45	45	[illegible]	[illegible]	0.0	0	0
05/09/15	Saturday	9	2.8	24.6	[illegible]	0.9	2	22.6	452.7	3682.0				32741.9	36313.0	18401.3	14462.3	225.1	114.3	36198.8	33584.2	0	45	45	[illegible]	[illegible]	3614.6	1	0
06/09/15	Sunday	9	2.8	1.8	[illegible]	0.9	2	0	33.1	0.0				33539.2	33428.4	18401.3	14462.3	225.1	114.3	33314.1	33314.1	0	45	45	[illegible]	[illegible]	0.0	0	0
07/09/15	Monday	9	3.1	0.2	[illegible]	0.9	2	0	3.7	0.0				33269.1	33152.8	18401.3	14462.3	230.6	114.3	33038.5	33038.5	0	45	45	[illegible]	[illegible]	0.0	0	0
08/09/15	Tuesday	9	4	0	[illegible]	0.9	2	0	0.0	0.0				32993.5	32860.7	18401.3	14462.3	247.3	114.3	32746.4	32746.4	0	45	45	[illegible]	[illegible]	0.0	0	0
09/09/15	Wednesday	9	5.2	0	[illegible]	0.9	2	0	0.0	0.0				32701.4	32546.4	18401.3	14462.3	269.2	114.3	32432.2	32432.2	0	45	45	[illegible]	[illegible]	0.0	0	0
10/09/15	Thursday	9	3.6	0	[illegible]	0.9	2	0	0.0	0.0				32387.2	32280.0	18401.3	14462.3	221.4	114.3	32165.8	32165.8	0	45	45	[illegible]	[illegible]	0.0	0	0
11/09/15	Friday	9	3.7	10.2	[illegible]	0.9	2	8.2	187.7	1335.9				32120.8	33338.5	18401.3	14462.3	232.4	114.3	33224.3	33224.3	0	45	45	[illegible]	[illegible]	0.0	0	0
12/09/15	Saturday	9	2.8	23.2	[illegible]	0.9	2	21.2	426.9	3453.9				33179.3	36522.3	18401.3	14462.3	225.1	114.3	36408.1	33584.2	0	45	45	[illegible]	[illegible]	2823.9	1	0
13/09/15	Sunday	9	2.9	3.6	[illegible]	0.9	2	1.6	66.2	260.7				33539.2	33687.2	18401.3	14462.3	226.9	114.3	33573.0	33573.0	0	45	45	[illegible]	[illegible]	0.0	0	0
14/09/15	Monday	9	2.7	0.2	[illegible]	0.9	2	0	3.7	0.0				33528.0	33419.0	18401.3	14462.3	223.2	114.3	33304.7	33304.7	0	45	45	[illegible]	[illegible]	0.0	0	0
15/09/15	Tuesday	9	3.3	0.4	[illegible]	0.9	2	0	7.4	0.0				33259.7	33139.7	18401.3	14462.3	234.3	114.3	33025.3	33025.3	0	45	45	[illegible]	[illegible]	0.0	0	0
16/09/15	Wednesday	9	3.3	0.2	[illegible]	0.9	2	0	3.7	0.0				32980.5	32860.5	18401.3	14462.3	234.3	114.3	32746.2	32746.2	0	45	45	[illegible]	[illegible]	0.0	0	0
17/09/15	Thursday	9	3.9	0	[illegible]	0.9	2	0	0.0	0.0				32701.2	32570.1	18401.3	14462.3	245.3	114.3	32455.8	32455.8	0	45	45	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (cell)
18/09/15	Friday	9	3.7	0	[illegible]	0.9	2	0	0.0	0.0
19/09/15	Saturday	9	3.7	0	[illegible]	0.9	2	0	0.0	0.0
20/09/15	Sunday	9	4	0	[illegible]	0.9	2	0	0.0	0.0
21/09/15	Monday	9	4.3	0	[illegible]	0.9	2	0	0.0	0.0
22/09/15	Tuesday	9	4.8	0	[illegible]	0.9	2	0	0.0	0.0
23/09/15	Wednesday	9	5.2	0	[illegible]	0.9	2	0	0.0	0.0
24/09/15	Thursday	9	5.4	0	[illegible]	0.9	2	0	0.0	0.0
25/09/15	Friday	9	3.9	0	[illegible]	0.9	2	0	0.0	0.0
26/09/15	Saturday	9	4.1	0.2	[illegible]	0.9	2	0	3.7	0.0
27/09/15	Sunday	9	5	0	[illegible]	0.9	2	0	0.0	0.0
28/09/15	Monday	9	5.2	0	[illegible]	0.9	2	0	0.0	0.0
29/09/15	Tuesday	9	3.8	0	[illegible]	0.9	2	0	0.0	0.0
30/09/15	Wednesday	9	4	0	[illegible]	0.9	2	0	0.0	0.0
01/10/15	Thursday	10	5.8	0	[illegible]	0.9	2	0	0.0	0.0
02/10/15	Friday	10	4.3	0.2	[illegible]	0.9	2	0	3.7	0.0
03/10/15	Saturday	10	4.1	0	[illegible]	0.9	2	0	0.0	0.0
04/10/15	Sunday	10	3.6	0	[illegible]	0.9	2	0	0.0	0.0
05/10/15	Monday	10	4.2	4.2	[illegible]	0.9	2	2.2	77.3	358.4
06/10/15	Tuesday	10	4.7	1.8	[illegible]	0.9	2	0	33.1	0.0
07/10/15	Wednesday	10	7.1	0.2	[illegible]	0.9	2	0	3.7	0.0
08/10/15	Thursday	10	6.1	0	[illegible]	0.9	2	0	0.0	0.0
09/10/15	Friday	10	6.8	0	[illegible]	0.9	2	0	0.0	0.0
10/10/15	Saturday	10	5.4	0	[illegible]	0.9	2	0	0.0	0.0
11/10/15	Sunday	10	6.3	0	[illegible]	0.9	2	0	0.0	0.0
12/10/15	Monday	10	6.4	0	[illegible]	0.9	2	0	0.0	0.0
13/10/15	Tuesday	10	5.8	0	[illegible]	0.9	2	0	0.0	0.0
14/10/15	Wednesday	10	3.3	3.4	[illegible]	0.9	2	1.4	62.6	228.1
15/10/15	Thursday	10	4.6	5.4	[illegible]	0.9	2	3.4	99.4	553.9
16/10/15	Friday	10	4.6	0.2	[illegible]	0.9	2	0	3.7	0.0
17/10/15	Saturday	10	4.6	0	[illegible]	0.9	2	0	0.0	0.0
18/10/15	Sunday	10	3.8	0	[illegible]	0.9	2	0	0.0	0.0
19/10/15	Monday	10	4.7	15.2	[illegible]	0.9	2	13.2	279.7	2150.5
20/10/15	Tuesday	10	5.7	0.2	[illegible]	0.9	2	0	3.7	0.0
21/10/15	Wednesday	10	6.8	0	[illegible]	0.9	2	0	0.0	0.0
22/10/15	Thursday	10	3.5	0	[illegible]	0.9	2	0	0.0	0.0
23/10/15	Friday	10	4.4	0	[illegible]	0.9	2	0	0.0	0.0
24/10/15	Saturday	10	4	0	[illegible]	0.9	2	0	0.0	0.0
25/10/15	Sunday	10	4.4	0	[illegible]	0.9	2	0	0.0	0.0
26/10/15	Monday	10	6.2	2.6	[illegible]	0.9	2	0.6	47.8	97.8
27/10/15	Tuesday	10	4.8	0	[illegible]	0.9	2	0	0.0	0.0
28/10/15	Wednesday	10	5.5	1.8	[illegible]	0.9	2	0	33.1	0.0
29/10/15	Thursday	10	4.6	0	[illegible]	0.9	2	0	0.0	0.0
30/10/15	Friday	10	4.5	0	[illegible]	0.9	2	0	0.0	0.0
31/10/15	Saturday	10	4.9	31	[illegible]	0.9	2	29	570.4	4724.6
01/11/15	Sunday	11	4.7	0	[illegible]	0.9	2	0	0.0	0.0
02/11/15	Monday	11	4.4	23.6	[illegible]	0.9	2	21.6	434.3	3519.0
03/11/15	Tuesday	11	5.4	3.8	[illegible]	0.9	2	1.8	69.9	293.3
04/11/15	Wednesday	11	5.3	0.2	[illegible]	0.9	2	0	3.7	0.0
05/11/15	Thursday	11	4.7	0	[illegible]	0.9	2	0	0.0	0.0
06/11/15	Friday	11	4.2	0	[illegible]	0.9	2	0	0.0	0.0
07/11/15	Saturday	11	4.1	0.8	[illegible]	0.9	2	0	14.7	0.0
08/11/15	Sunday	11	5.8	0	[illegible]	0.9	2	0	0.0	0.0
09/11/15	Monday	11	6.4	0	[illegible]	0.9	2	0	0.0	0.0
10/11/15	Tuesday	11	6.8	0	[illegible]	0.9	2	0	0.0	0.0
11/11/15	Wednesday	11	5.9	0	[illegible]	0.9	2	0	0.0	0.0
12/11/15	Thursday	11	7.8	0	[illegible]	0.9	2	0	0.0	0.0
13/11/15	Friday	11	9.4	0	[illegible]	0.9	2	0	0.0	0.0
14/11/15	Saturday	11	10	0	[illegible]	0.9	2	0	0.0	0.0
15/11/15	Sunday	11	7.6	1	[illegible]	0.9	2	0	18.4	0.0
16/11/15	Monday	11	6.8	0	[illegible]	0.9	2	0	0.0	0.0
17/11/15	Tuesday	11	6.6	0	[illegible]	0.9	2	0	0.0	0.0
18/11/15	Wednesday	11	5.2	1.6	[illegible]	0.9	2	0	29.4	0.0
19/11/15	Thursday	11	5.5	2.2	[illegible]	0.9	2	0.2	40.5	32.6
20/11/15	Friday	11	8	0	[illegible]	0.9	2	0	0.0	0.0
21/11/15	Saturday	11	10.7	0	[illegible]	0.9	2	0	0.0	0.0
22/11/15	Sunday	11	10.2	0	[illegible]	0.9	2	0	0.0	0.0
23/11/15	Monday	11	5.5	0	[illegible]	0.9	2	0	0.0	0.0
24/11/15	Tuesday	11	6.6	0	[illegible]	0.9	2	0	0.0	0.0
25/11/15	Wednesday	11	6.8	0	[illegible]	0.9	2	0	0.0	0.0
26/11/15	Thursday	11	8.4	0	[illegible]	0.9	2	0	0.0	0.0
27/11/15	Friday	11	7.7	0	[illegible]	0.9	2	0	0.0	0.0
28/11/15	Saturday	11	6.8	0	[illegible]	0.9	2	0	0.0	0.0
29/11/15	Sunday	11	6.7	0	[illegible]	0.9	2	0	0.0	0.0
30/11/15	Monday	11	6.5	0	[illegible]	0.9	2	0	0.0	0.0
01/12/15	Tuesday	12	8.7	0	[illegible]	0.9	2	0	0.0	0.0
02/12/15	Wednesday	12	10	0	[illegible]	0.9	2	0	0.0	0.0
03/12/15	Thursday	12	6.7	0.2	[illegible]	0.9	2	0	3.7	0.0
04/12/15	Friday	12	5.7	0	[illegible]	0.9	2	0	0.0	0.0
05/12/15	Saturday	12	3.6	12.4	[illegible]	0.9	2	10.4	228.2	1694.4
06/12/15	Sunday	12	3.2	6.8	[illegible]	0.9	2	4.8	125.1	782.0
07/12/15	Monday	12	5.1	0.4	[illegible]	0.9	2	0	7.4	0.0
08/12/15	Tuesday	12	5.6	0	[illegible]	0.9	2	0	0.0	0.0
09/12/15	Wednesday	12	5.8	0	[illegible]	0.9	2	0	0.0	0.0
10/12/15	Thursday	12	7.1	0	[illegible]	0.9	2	0	0.0	0.0
11/12/15	Friday	12	9.3	0	[illegible]	0.9	2	0	0.0	0.0
12/12/15	Saturday	12	6.4	0	[illegible]	0.9	2	0	0.0	0.0
13/12/15	Sunday	12	5.6	0	[illegible]	0.9	2	0	0.0	0.0
14/12/15	Monday	12	6.4	0	[illegible]	0.9	2	0	0.0	0.0
15/12/15	Tuesday	12	6.7	0	[illegible]	0.9	2	0	0.0	0.0
16/12/15	Wednesday	12	6.9	0	[illegible]	0.9	2	0	0.0	0.0
17/12/15	Thursday	12	7.3	0	[illegible]	0.9	2	0	0.0	0.0
18/12/15	Friday	12	6.5	0	[illegible]	0.9	2	0	0.0	0.0
19/12/15	Saturday	12	7.1	0	[illegible]	0.9	2	0	0.0	0.0
20/12/15	Sunday	12	9.1	0	[illegible]	0.9	2	0	0.0	0.0
21/12/15	Monday	12	10.5	0	[illegible]	0.9	2	0	0.0	0.0
22/12/15	Tuesday	12	10.5	0	[illegible]	0.9	2	0	0.0	0.0
23/12/15	Wednesday	12	10.7	0	[illegible]	0.9	2	0	0.0	0.0
24/12/15	Thursday	12	7	0	[illegible]	0.9	2	0	0.0	0.0
25/12/15	Friday	12	8	0	[illegible]	0.9	2	0	0.0	0.0
26/12/15	Saturday	12	9.8	0	[illegible]	0.9	2	0	0.0	0.0
27/12/15	Sunday	12	10.5	0	[illegible]	0.9	2	0	0.0	0.0
28/12/15	Monday	12	10.9	0	[illegible]	0.9	2	0	0.0	0.0
29/12/15	Tuesday	12	8.5	0	[illegible]	0.9	2	0	0.0	0.0
30/12/15	Wednesday	12	7.6	0	[illegible]	0.9	2	0	0.0	0.0
31/12/15	Thursday	12	7.6	0	[illegible]	0.9	2	0	0.0	0.0
01/01/16	Friday	1	7.6	0	[illegible]	0.9	2	0	0.0	0.0
02/01/16	Saturday	1	9.8	0	[illegible]	0.9	2	0	0.0	0.0
03/01/16	Sunday	1	10	0	[illegible]	0.9	2	0	0.0	0.0
04/01/16	Monday	1	5.8	0	[illegible]	0.9	2	0	0.0	0.0
05/01/16	Tuesday	1	6.1	0	[illegible]	0.9	2	0	0.0	0.0
06/01/16	Wednesday	1	7.4	0	[illegible]	0.9	2	0	0.0	0.0
07/01/16	Thursday	1	7.4	0	[illegible]	0.9	2	0	0.0	0.0
08/01/16	Friday	1	7.4	0.2	[illegible]	0.9	2	0	3.7	0.0

Date	PrelimPond loss evaporation (m³)	Prel minfiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - corrected for no negatives	Pond surface area for loss calc	Pond infiltration loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
18/09/15				[illegible]	[illegible]	18401.3	[illegible]	241.6	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
19/09/15				32124.2	31996.9	18401.3	[illegible]	241.6	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
20/09/15				31837.6	31704.7	18401.3	[illegible]	247.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
21/09/15				31545.5	31407.1	18401.3	[illegible]	252.7	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
22/09/15				31247.8	31100.1	18401.3	[illegible]	261.9	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
23/09/15				30940.9	30786.0	18401.3	[illegible]	269.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
24/09/15				30626.7	30468.0	18401.3	[illegible]	272.9	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
25/09/15				30308.8	30177.7	18401.3	[illegible]	245.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
26/09/15				30018.5	29883.7	18401.3	[illegible]	249.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
27/09/15				29724.5	29573.2	18401.3	[illegible]	265.6	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
28/09/15				29413.9	29258.9	18401.3	[illegible]	269.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
29/09/15				29099.7	28970.5	18401.3	[illegible]	243.5	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
30/09/15				28811.2	28678.3	18401.3	[illegible]	247.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
01/10/15				28519.0	28353.0	18401.3	[illegible]	280.2	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/10/15				28093.8	27955.4	18401.3	[illegible]	252.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/10/15				27696.1	27561.4	18401.3	[illegible]	249.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/10/15				27302.1	27176.6	18401.3	[illegible]	239.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/10/15				26917.3	27139.2	18401.3	[illegible]	250.2	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/10/15				26879.9	26734.1	18401.3	[illegible]	260.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/10/15				26474.9	26284.9	18401.3	[illegible]	304.2	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/10/15				26025.7	25854.1	18401.3	[illegible]	285.2	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/10/15				25594.9	25410.5	18401.3	[illegible]	298.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/10/15				25151.1	24992.6	13801.2	[illegible]	204.7	46.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/10/15				24801.5	24626.3	13801.2	[illegible]	217.1	41.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/10/15				24439.4	24262.4	13801.2	[illegible]	218.1	41.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/10/15				24075.9	23909.9	13801.2	[illegible]	210.2	44.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/10/15				23720.7	23828.8	13801.2	[illegible]	175.7	55.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/10/15				23628.1	24038.1	13801.2	[illegible]	193.6	49.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/10/15				23843.4	23699.4	13801.2	[illegible]	193.6	49.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/10/15				23504.7	23360.8	13801.2	[illegible]	193.8	49.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/10/15				23166.1	23036.9	13801.2	[illegible]	182.6	53.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/10/15				22838.5	24852.4	13801.2	[illegible]	188.1	51.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/10/15				24655.9	24491.7	13801.2	[illegible]	208.8	44.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/10/15				24302.1	24117.6	13801.2	[illegible]	224.0	39.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/10/15				23913.0	23609.4	13801.2	[illegible]	178.5	54.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/10/15				23609.6	23469.3	13801.2	[illegible]	190.5	50.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/10/15				23273.7	23140.8	13801.2	[illegible]	185.4	52.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/10/15				22943.3	22803.1	13801.2	[illegible]	190.5	50.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/10/15				22607.5	22531.8	13801.2	[illegible]	215.7	42.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/10/15				22344.5	22196.9	13801.2	[illegible]	196.4	48.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/10/15				22001.1	21842.6	13801.4	[illegible]	206.1	45.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/10/15				21652.0	21508.1	13801.4	[illegible]	193.6	49.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/10/15				21313.4	21171.3	13801.4	[illegible]	193.3	50.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/10/15				20976.1	25551.3	18401.3	[illegible]	263.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/11/15				25292.0	25146.3	13801.4	[illegible]	195.0	49.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/11/15				24952.0	28330.8	18401.3	[illegible]	254.5	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/11/15				28071.5	28206.1	18401.3	[illegible]	272.9	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/11/15				27946.9	27790.1	18401.3	[illegible]	271.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/11/15				27510.8	27385.0	18401.3	[illegible]	260.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/11/15				27125.8	26989.2	18401.3	[illegible]	250.8	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/11/15				26729.9	26595.2	18401.3	[illegible]	249.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/11/15				26335.9	26169.5	18401.3	[illegible]	280.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/11/15				25910.7	25733.6	18401.3	[illegible]	291.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/11/15				25474.3	25289.5	18401.3	[illegible]	298.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/11/15				25030.7	24862.8	13801.4	[illegible]	211.6	43.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/11/15				24674.1	24471.3	13801.4	[illegible]	237.8	35.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/11/15				24291.1	24059.0	13801.4	[illegible]	259.9	27.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/11/15				23886.4	23643.1	13801.4	[illegible]	268.2	24.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/11/15				23473.2	23274.1	13801.4	[illegible]	235.0	35.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/11/15				23093.2	22908.8	13801.4	[illegible]	224.0	39.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/11/15				22714.2	22543.4	13801.4	[illegible]	221.2	40.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/11/15				22357.9	22202.5	13801.4	[illegible]	201.9	47.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/11/15				22011.0	21883.1	13801.4	[illegible]	206.1	45.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/11/15				21692.5	21486.0	13801.0	[illegible]	240.6	34.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/11/15				21306.9	21050.8	13801.0	[illegible]	277.8	21.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/11/15				20884.1	20637.1	13801.0	[illegible]	270.9	24.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/11/15				20468.1	20307.7	13801.0	[illegible]	206.1	45.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/11/15				20117.1	19936.4	13801.0	[illegible]	231.2	40.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/11/15				19750.9	19566.4	13801.0	[illegible]	224.0	39.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/11/15				19381.9	19168.0	13801.0	[illegible]	246.1	32.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/11/15				18990.8	18789.8	13801.0	[illegible]	236.4	35.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/11/15				18609.3	18424.9	13801.0	[illegible]	224.0	39.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/11/15				18240.1	18057.8	13801.0	[illegible]	221.6	40.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/11/15				17872.7	17693.8	13801.0	[illegible]	219.9	41.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/12/15				17507.8	17288.5	13801.0	[illegible]	250.2	30.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/12/15				17112.6	16869.3	13801.0	[illegible]	268.2	24.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/12/15				16699.4	16516.9	9200.7	[illegible]	148.4	-34.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/12/15				16406.0	16241.8	9200.7	[illegible]	139.2	-24.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/12/15				16121.8	17690.6	13801.0	[illegible]	179.8	54.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/12/15				17491.3	18155.2	13801.0	[illegible]	174.3	56.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/12/15				17954.0	17800.9	13801.0	[illegible]	200.5	47.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/12/15				17608.4	17446.1	13801.0	[illegible]	207.4	45.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/12/15				17256.0	17090.0	13801.0	[illegible]	210.2	44.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/12/15				16900.8	16710.9	9200.7	[illegible]	152.1	-37.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/12/15				16603.7	16373.3	9200.7	[illegible]	172.3	-58.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/12/15				16286.4	16109.3	9200.7	[illegible]	145.7	-31.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/12/15				15995.7	15833.4	9200.7	[illegible]	138.3	-24.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/12/15				15714.4	15535.4	9200.7	[illegible]	145.7	-31.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/12/15				15421.7	15239.2	9200.7	[illegible]	148.4	-34.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/12/15				15128.3	14942.1	9200.7	[illegible]	150.3	-36.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/12/15				14833.1	14639.5	9200.7	[illegible]	153.9	-39.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/12/15				14534.1	14355.2	9200.7	[illegible]	146.6	-32.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/12/15				14242.6	14052.6	9200.7	[illegible]	152.1	-37.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/12/15				13945.5	13718.7	9200.7	[illegible]	170.5	-56.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/12/15				13630.0	13377.5	9200.7	[illegible]	183.4	-69.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/12/15				13301.6	13049.1	9200.7	[illegible]	183.4	-69.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/12/15				12973.2	12717.0	9200.7	[illegible]	185.2	-71.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/12/15				12643.0	12454.9	9200.7	[illegible]	151.2	-36.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/12/15				12346.8	12140.3	9200.7	[illegible]	160.4	-46.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/12/15				12041.4	11801.8	9200.7	[illegible]	176.9	-62.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/12/15				11719.5	11467.0	9200.7	[illegible]	183.4	-69.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/12/15				11391.1	11131.2	9200.7	[illegible]	187.1	-72.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/12/15				11059.0	10843.3	9200.7	[illegible]	165.0	-50.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/12/15				10749.1	10549.9	9200.7	[illegible]	156.7	-42.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/12/15				10447.4	10248.2	9200.7	[illegible]	156.7	-42.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/01/16				10145.7	9946.5	9200.7	[illegible]	156.7	-42.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/01/16				9844.0	9604.3	9200.7	[illegible]	176.9	-62.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/01/16				9532.0	9278.7	9200.7	[illegible]	178.8	-64.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/01/16				9198.2	9012.2	9200.7	[illegible]	140.1	-25.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/01/16				8913.1	8741.6	9200.7	[illegible]	142.9	-28.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/01/16				8625.2	8429.8	9200.7	[illegible]	154.9	-40.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/01/16				8325.3	8129.9	4600.3	[illegible]	77.4	-118.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/01/16				8102.9	7907.5	4600.3	[illegible]	77.4	-118.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
09/01/16	Saturday	1	7.9	0.8	[illegible]	0.9	[illegible]	0	14.7	0.0			
10/01/16	Sunday	1	4.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/01/16	Monday	1	5.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/01/16	Tuesday	1	5.4	1.4	[illegible]	0.9	[illegible]	0	25.8	0.0			
13/01/16	Wednesday	1	9.7	2	[illegible]	0.9	[illegible]	0	36.8	0.0			
14/01/16	Thursday	1	11.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/01/16	Friday	1	10.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/01/16	Saturday	1	10	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/01/16	Sunday	1	6.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/01/16	Monday	1	3.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/01/16	Tuesday	1	4.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/01/16	Wednesday	1	4.7	2.2	[illegible]	0.9	[illegible]	0.2	40.5	32.6			
21/01/16	Thursday	1	5.4	0.4	[illegible]	0.9	[illegible]	0	7.4	0.0			
22/01/16	Friday	1	7.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/01/16	Saturday	1	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/01/16	Sunday	1	8	1	[illegible]	0.9	[illegible]	0	18.4	0.0			
25/01/16	Monday	1	7.2	0.8	[illegible]	0.9	[illegible]	0	14.7	0.0			
26/01/16	Tuesday	1	6.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
27/01/16	Wednesday	1	8.9	2.4	[illegible]	0.9	[illegible]	0.4	44.2	65.2			
28/01/16	Thursday	1	10.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
29/01/16	Friday	1	11	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
30/01/16	Saturday	1	4.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
31/01/16	Sunday	1	3.8	11	[illegible]	0.9	[illegible]	9	202.4	1466.3			
01/02/16	Monday	2	5.1	0.4	[illegible]	0.9	[illegible]	0	7.4	0.0			
02/02/16	Tuesday	2	6.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
03/02/16	Wednesday	2	8.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
04/02/16	Thursday	2	8.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
05/02/16	Friday	2	8.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
06/02/16	Saturday	2	8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
07/02/16	Sunday	2	10.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
08/02/16	Monday	2	11.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
09/02/16	Tuesday	2	9.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/02/16	Wednesday	2	9.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/02/16	Thursday	2	7.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/02/16	Friday	2	6.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
13/02/16	Saturday	2	8.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
14/02/16	Sunday	2	9.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/02/16	Monday	2	10.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/02/16	Tuesday	2	10.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/02/16	Wednesday	2	8.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/02/16	Thursday	2	7.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/02/16	Friday	2	8.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/02/16	Saturday	2	8.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
21/02/16	Sunday	2	4.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/02/16	Monday	2	4.8	2.6	[illegible]	0.9	[illegible]	0.6	47.8	97.8			
23/02/16	Tuesday	2	3.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/02/16	Wednesday	2	5.3	1	[illegible]	0.9	[illegible]	0	18.4	0.0			
25/02/16	Thursday	2	7.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
26/02/16	Friday	2	8.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
27/02/16	Saturday	2	8.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
28/02/16	Sunday	2	4.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
29/02/16	Monday	2	4.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
01/03/16	Tuesday	3	5.2	0.2	[illegible]	0.9	[illegible]	0	3.7	0.0			
02/03/16	Wednesday	3	6.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
03/03/16	Thursday	3	4.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
04/03/16	Friday	3	5.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
05/03/16	Saturday	3	6.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
06/03/16	Sunday	3	6.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
07/03/16	Monday	3	7.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
08/03/16	Tuesday	3	7.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
09/03/16	Wednesday	3	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/03/16	Thursday	3	5.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
11/03/16	Friday	3	6.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
12/03/16	Saturday	3	6.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
13/03/16	Sunday	3	9.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
14/03/16	Monday	3	12.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
15/03/16	Tuesday	3	5.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/03/16	Wednesday	3	5.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/03/16	Thursday	3	7.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
18/03/16	Friday	3	7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
19/03/16	Saturday	3	3.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
20/03/16	Sunday	3	5.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
21/03/16	Monday	3	5.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/03/16	Tuesday	3	4.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/03/16	Wednesday	3	4.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/03/16	Thursday	3	5.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
25/03/16	Friday	3	5.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
26/03/16	Saturday	3	1.3	12.6	[illegible]	0.9	[illegible]	10.6	231.9	1726.9			
27/03/16	Sunday	3	3.9	6.2	[illegible]	0.9	[illegible]	4.2	114.1	684.3			
28/03/16	Monday	3	4.5	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
29/03/16	Tuesday	3	4.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
30/03/16	Wednesday	3	4.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
31/03/16	Thursday	3	4.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
01/04/16	Friday	4	3.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
02/04/16	Saturday	4	4.6	0.2	[illegible]	0.9	[illegible]	0	3.7	0.0			
03/04/16	Sunday	4	5.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
04/04/16	Monday	4	3.6	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
05/04/16	Tuesday	4	4.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
06/04/16	Wednesday	4	4.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
07/04/16	Thursday	4	4.9	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
08/04/16	Friday	4	4.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
09/04/16	Saturday	4	3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
10/04/16	Sunday	4	5.3	11.4	[illegible]	0.9	[illegible]	9.4	209.8	1531.4			
11/04/16	Monday	4	3.3	4	[illegible]	0.9	[illegible]	2	73.6	325.8			
12/04/16	Tuesday	4	2.3	5.2	[illegible]	0.9	[illegible]	3.2	95.7	521.3			
13/04/16	Wednesday	4	2.5	2	[illegible]	0.9	[illegible]	0	36.8	0.0			
14/04/16	Thursday	4	2.5	0.2	[illegible]	0.9	[illegible]	0	3.7	0.0			
15/04/16	Friday	4	4.1	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
16/04/16	Saturday	4	5.3	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
17/04/16	Sunday	4	1.5	1.2	[illegible]	0.9	[illegible]	0	22.1	0.0			
18/04/16	Monday	4	1.9	1.6	[illegible]	0.9	[illegible]	0	29.4	0.0			
19/04/16	Tuesday	4	3.2	21.6	[illegible]	0.9	[illegible]	19.6	397.5	3193.2			
20/04/16	Wednesday	4	3.2	0.2	[illegible]	0.9	[illegible]	0	3.7	0.0			
21/04/16	Thursday	4	3.8	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
22/04/16	Friday	4	4.7	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
23/04/16	Saturday	4	5.4	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
24/04/16	Sunday	4	3.2	0	[illegible]	0.9	[illegible]	0	0.0	0.0			
25/04/16	Monday	4	1.6	0.6	[illegible]	0.9	[illegible]	0	11.0	0.0			
26/04/16	Tuesday	4	3	7.4	[illegible]	0.9	[illegible]	5.4	136.2	879.8			
27/04/16	Wednesday	4	1.8	1.8	[illegible]	0.9	[illegible]	0	33.1	0.0			
28/04/16	Thursday	4	2.7	1.8	[illegible]	0.9	[illegible]	0	33.1	0.0			
29/04/16	Friday	4	3.1	6.6	[illegible]	0.9	[illegible]	4.6	121.4	749.4			
30/04/16	Saturday	4	2.5	4.6	[illegible]	0.9	[illegible]	2.6	84.6	423.6			

Date	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
09/01/16	7880.5	7675.8	4600.3	3615.6	79.7	-124.9	7800.8	7800.8	100	45	145	[illegible]	[illegible]	0.0	0	0
10/01/16	7655.8	7511.8	4600.3	3615.6	64.5	-79.4	7591.2	7591.2	100	45	145	[illegible]	[illegible]	0.0	0	0
11/01/16	7446.2	7287.6	4600.3	3615.6	68.2	-90.4	7378.0	7378.0	100	45	145	[illegible]	[illegible]	0.0	0	0
12/01/16	7233.0	7074.3	4600.3	3615.6	68.2	-90.4	7164.7	7164.7	100	45	145	[illegible]	[illegible]	0.0	0	0
13/01/16	7019.7	6782.0	4600.3	3615.6	88.0	-149.8	6931.7	6931.7	100	45	145	[illegible]	[illegible]	0.0	0	0
14/01/16	6786.7	6519.5	4600.3	3615.6	95.4	-171.8	6691.4	6691.4	100	45	145	[illegible]	[illegible]	0.0	0	0
15/01/16	6546.4	6290.2	4600.3	3615.6	92.6	-163.6	6453.8	6453.8	100	45	145	[illegible]	[illegible]	0.0	0	0
16/01/16	6308.8	6065.5	4600.3	3615.6	89.4	-153.9	6219.4	6219.4	100	45	145	[illegible]	[illegible]	0.0	0	0
17/01/16	6074.4	5895.5	4600.3	3615.6	73.3	-105.6	6001.1	6001.1	100	45	145	[illegible]	[illegible]	0.0	0	0
18/01/16	5856.1	5726.9	4600.3	3615.6	60.9	-68.3	5795.2	5795.2	100	45	145	[illegible]	[illegible]	0.0	0	0
19/01/16	5650.2	5500.8	4600.3	3615.6	65.9	-83.5	5584.3	5584.3	100	45	145	[illegible]	[illegible]	0.0	0	0
20/01/16	5439.3	5326.1	4600.3	3615.6	65.0	-80.8	5406.9	5406.9	100	45	145	[illegible]	[illegible]	0.0	0	0
21/01/16	5261.9	5103.2	4600.3	3615.6	68.2	-90.4	5193.6	5193.6	100	45	145	[illegible]	[illegible]	0.0	0	0
22/01/16	5048.6	4855.0	4600.3	3615.6	77.0	-116.6	4971.7	4971.7	100	45	145	[illegible]	[illegible]	0.0	0	0
23/01/16	4826.7	4611.0	4600.3	3615.6	82.5	-133.2	4744.2	4744.2	100	45	145	[illegible]	[illegible]	0.0	0	0
24/01/16	4599.2	4392.7	4600.3	3615.6	80.2	-126.3	4519.0	4519.0	100	45	145	[illegible]	[illegible]	0.0	0	0
25/01/16	4374.0	4182.2	4600.3	3615.6	76.5	-115.3	4297.5	4297.5	100	45	145	[illegible]	[illegible]	0.0	0	0
26/01/16	4152.5	3968.1	4600.3	3615.6	74.7	-109.7	4077.8	4077.8	100	45	145	[illegible]	[illegible]	0.0	0	0
27/01/16	3932.8	3774.9	4600.3	3615.6	84.3	-138.7	3913.6	3913.6	100	45	145	[illegible]	[illegible]	0.0	0	0
28/01/16	3768.6	3521.7	4600.3	3615.6	90.3	-156.7	3678.3	3678.3	100	45	145	[illegible]	[illegible]	0.0	0	0
29/01/16	3533.3	3271.6	4600.3	3615.6	94.0	-167.7	3439.3	3439.3	100	45	145	[illegible]	[illegible]	0.0	0	0
30/01/16	3294.3	3155.9	4600.3	3615.6	63.2	-75.2	3231.2	3231.2	100	45	145	[illegible]	[illegible]	0.0	0	0
31/01/16	3086.2	4423.2	4600.3	3615.6	60.9	-68.3	4491.6	4491.6	100	45	145	[illegible]	[illegible]	0.0	0	0
01/02/16	4346.6	4193.4	4600.3	3615.6	66.8	-86.3	4279.7	4279.7	100	45	145	[illegible]	[illegible]	0.0	0	0
02/02/16	4134.7	3957.7	4600.3	3615.6	72.8	-104.2	4061.9	4061.9	100	45	145	[illegible]	[illegible]	0.0	0	0
03/02/16	3916.9	3704.9	4600.3	3615.6	81.6	-130.4	3835.3	3835.3	100	45	145	[illegible]	[illegible]	0.0	0	0
04/02/16	3690.3	3476.5	4600.3	3615.6	82.0	-131.8	3608.3	3608.3	100	45	145	[illegible]	[illegible]	0.0	0	0
05/02/16	3463.3	3247.6	4600.3	3615.6	82.5	-133.2	3380.8	3380.8	100	45	145	[illegible]	[illegible]	0.0	0	0
06/02/16	3235.8	3029.3	4600.3	3615.6	80.2	-126.3	3155.6	3155.6	100	45	145	[illegible]	[illegible]	0.0	0	0
07/02/16	3010.6	2758.1	4600.3	3615.6	91.7	-160.8	2918.9	2918.9	100	45	145	[illegible]	[illegible]	0.0	0	0
08/02/16	2773.9	2508.5	4600.3	3615.6	94.9	-170.5	2679.0	2679.0	100	45	145	[illegible]	[illegible]	0.0	0	0
09/02/16	2534.0	2298.1	4600.3	3615.6	87.6	-148.4	2446.5	2446.5	100	45	145	[illegible]	[illegible]	0.0	0	0
10/02/16	2301.5	2074.7	4600.3	3615.6	85.2	-141.5	2216.2	2216.2	100	45	145	[illegible]	[illegible]	0.0	0	0
11/02/16	2071.2	1877.6	4600.3	3615.6	77.0	-116.6	1994.2	1994.2	100	45	145	[illegible]	[illegible]	0.0	0	0
12/02/16	1849.2	1666.7	4600.3	3615.6	74.2	-108.4	1775.0	1775.0	100	45	145	[illegible]	[illegible]	0.0	0	0
13/02/16	1630.0	1419.9	4600.3	3615.6	81.3	-129.1	1548.9	1548.9	100	45	145	[illegible]	[illegible]	0.0	0	0
14/02/16	1403.9	1175.4	4600.3	3615.6	85.7	-142.9	1318.2	1318.2	100	45	145	[illegible]	[illegible]	0.0	0	0
15/02/16	1173.2	926.2	4600.3	3615.6	90.3	-156.7	1082.9	1082.9	100	45	145	[illegible]	[illegible]	0.0	0	0
16/02/16	937.9	683.6	4600.3	3615.6	91.2	-162.2	845.8	845.8	100	45	145	[illegible]	[illegible]	0.0	0	0
17/02/16	700.8	492.4	4600.3	3615.6	80.6	-127.7	620.1	620.1	100	45	145	[illegible]	[illegible]	0.0	0	0
18/02/16	475.1	277.8	4600.3	3615.6	77.9	-119.4	397.2	397.2	100	45	145	[illegible]	[illegible]	0.0	0	0
19/02/16	397.2	177.8	4600.3	3615.6	83.4	-136.0	313.8	313.8	100	45	145	[illegible]	[illegible]	0.0	0	0
20/02/16	313.8	103.6	4600.3	3615.6	81.1	-129.1	232.7	232.7	100	45	145	[illegible]	[illegible]	0.0	0	0
21/02/16	232.7	98.0	4600.3	3615.6	62.2	-72.5	170.4	170.4	100	45	145	[illegible]	[illegible]	0.0	0	0
22/02/16	170.4	120.6	4600.3	3615.6	65.5	-82.1	202.7	202.7	100	45	145	[illegible]	[illegible]	0.0	0	0
23/02/16	202.7	73.5	4600.3	3615.6	60.9	-68.3	141.9	141.9	100	45	145	[illegible]	[illegible]	0.0	0	0
24/02/16	141.9	0.0	4600.3	3615.6	67.8	-89.0	74.1	74.1	100	45	145	[illegible]	[illegible]	0.0	0	0
25/02/16	74.1	0.0	4600.3	3615.6	78.3	-120.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
26/02/16	0.0	0.0	4600.3	3615.6	84.3	-138.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
27/02/16	0.0	0.0	4600.3	3615.6	81.3	-129.1	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
28/02/16	0.0	0.0	4600.3	3615.6	65.0	-80.8	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
29/02/16	0.0	0.0	4600.3	3615.6	63.6	-76.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
01/03/16	0.0	0.0	4600.3	3615.6	67.3	-87.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
02/03/16	0.0	0.0	4600.3	3615.6	72.8	-104.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
03/03/16	0.0	0.0	4600.3	3615.6	64.1	-78.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
04/03/16	0.0	0.0	4600.3	3615.6	69.6	-94.6	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
05/03/16	0.0	0.0	4600.3	3615.6	72.8	-104.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
06/03/16	0.0	0.0	4600.3	3615.6	75.1	-111.1	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
07/03/16	0.0	0.0	4600.3	3615.6	79.3	-123.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
08/03/16	0.0	0.0	4600.3	3615.6	77.4	-118.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
09/03/16	0.0	0.0	4600.3	3615.6	76.5	-115.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
10/03/16	0.0	0.0	4600.3	3615.6	66.8	-86.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
11/03/16	0.0	0.0	4600.3	3615.6	71.9	-101.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
12/03/16	0.0	0.0	4600.3	3615.6	75.1	-111.1	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
13/03/16	0.0	0.0	4600.3	3615.6	85.2	-141.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
14/03/16	0.0	0.0	4600.3	3615.6	99.1	-182.9	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
15/03/16	0.0	0.0	4600.3	3615.6	67.8	-89.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
16/03/16	0.0	0.0	4600.3	3615.6	70.1	-95.9	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
17/03/16	0.0	0.0	4600.3	3615.6	76.5	-115.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
18/03/16	0.0	0.0	4600.3	3615.6	75.6	-112.5	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
19/03/16	0.0	0.0	4600.3	3615.6	60.9	-68.3	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
20/03/16	0.0	0.0	4600.3	3615.6	67.3	-87.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
21/03/16	0.0	0.0	4600.3	3615.6	67.3	-87.7	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
22/03/16	0.0	0.0	4600.3	3615.6	63.2	-75.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
23/03/16	0.0	0.0	4600.3	3615.6	62.7	-73.9	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
24/03/16	0.0	0.0	4600.3	3615.6	67.8	-89.0	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
25/03/16	0.0	0.0	4600.3	3615.6	69.1	-93.2	0.0	0.0	100	45	145	[illegible]	[illegible]	0.0	0	1
26/03/16	0.0	1643.7	4600.3	3615.6	49.4	-33.8	1677.6	1677.6	100	45	145	[illegible]	[illegible]	0.0	0	0
27/03/16	1532.6	2085.8	4600.3	3615.6	61.3	-69.7	2155.5	2155.5	100	45	145	[illegible]	[illegible]	0.0	0	0
28/03/16	2010.5	1868.4	4600.3	3615.6	64.1	-78.0	1946.4	1946.4	100	45	145	[illegible]	[illegible]	0.0	0	0
29/03/16	1801.4	1655.6	4600.3	3615.6	65.0	-80.8	1736.4	1736.4	100	45	145	[illegible]	[illegible]	0.0	0	0
30/03/16	1591.4	1442.0	4600.3	3615.6	65.9	-83.5	1525.5	1525.5	100	45	145	[illegible]	[illegible]	0.0	0	0
31/03/16	1380.5	1245.8	4600.3	3615.6	62.2	-72.5	1318.2	1318.2	100	45	145	[illegible]	[illegible]	0.0	0	0
01/04/16	1173.2	1053.2	4600.3	3615.6	58.6	-61.4	1114.7	1114.7	100	45	145	[illegible]	[illegible]	0.0	0	0
02/04/16	969.7	825.7	4600.3	3615.6	64.5	-79.4	905.1	905.1	100	45	145	[illegible]	[illegible]	0.0	0	0
03/04/16	760.1	601.5	4600.3	3615.6	68.2	-90.4	691.9	691.9	100	45	145	[illegible]	[illegible]	0.0	0	0
04/04/16	546.9	421.4	4600.3	3615.6	59.9	-65.6	486.9	486.9	100	45	145	[illegible]	[illegible]	0.0	0	0
05/04/16	486.9	337.5	4600.3	3615.6	65.9	-83.5	421.0	421.0	100	45	145	[illegible]	[illegible]	0.0	0	0
06/04/16	421.0	275.2	4600.3	3615.6	65.0	-80.8	356.0	356.0	100	45	145	[illegible]	[illegible]	0.0	0	0
07/04/16	356.0	206.6	4600.3	3615.6	65.9	-83.5	290.1	290.1	100	45	145	[illegible]	[illegible]	0.0	0	0
08/04/16	290.1	149.8	4600.3	3615.6	63.6	-76.6	226.4	226.4	100	45	145	[illegible]	[illegible]	0.0	0	0
09/04/16	226.4	112.0	4600.3	3615.6	57.2	-57.3	169.3	169.3	100	45	145	[illegible]	[illegible]	0.0	0	0
10/04/16	169.3	1543.9	4600.3	3615.6	67.8	-89.0	1632.9	1632.9	100	45	145	[illegible]	[illegible]	0.0	0	0
11/04/16	1487.9	1697.4	4600.3	3615.6	57.6	-58.7	1756.1	1756.1	100	45	145	[illegible]	[illegible]	0.0	0	0
12/04/16	1611.1	2034.5	4600.3	3615.6	53.0	-44.9	2079.4	2079.4	100	45	145	[illegible]	[illegible]	0.0	0	0
13/04/16	1934.4	1829.1	4600.3	3615.6	54.9	-50.4	1879.5	1879.5	100	45	145	[illegible]	[illegible]	0.0	0	0
14/04/16	1734.5	1629.2	4600.3	3615.6	54.9	-50.4	1679.6	1679.6	100	45	145	[illegible]	[illegible]	0.0	0	0
15/04/16	1534.6	1399.9	4600.3	3615.6	62.2	-72.5	1472.4	1472.4	100	45	145	[illegible]	[illegible]	0.0	0	0
16/04/16	1327.4	1170.6	4600.3	3615.6	67.8	-89.0	1259.6	1259.6	100	45	145	[illegible]	[illegible]	0.0	0	0
17/04/16	1114.6	1027.7	4600.3	3615.6	50.3	-36.6	1064.3	1064.3	100	45	145	[illegible]	[illegible]	0.0	0	0
18/04/16	919.3	825.1	4600.3	3615.6	52.1	-42.1	867.2	867.2	100	45	145	[illegible]	[illegible]	0.0	0	0
19/04/16	722.2	3797.2	4600.3	3615.6	58.1	-60.1	3857.3	3857.3	100	45	145	[illegible]	[illegible]	0.0	0	0
20/04/16	3712.3	3594.1	4600.3	3615.6	58.1	-60.1	3654.2	3654.2	100	45	145	[illegible]	[illegible]	0.0	0	0
21/04/16	3509.2	3380.0	4600.3	3615.6	60.9	-68.3	3448.3	3448.3	100	45	145	[illegible]	[illegible]	0.0	0	0
22/04/16	3303.3	3157.6	4600.3	3615.6	65.0	-80.8	3238.3	3238.3	100	45	145	[illegible]	[illegible]	0.0	0	0
23/04/16	3093.3	2934.7	4600.3	3615.6	68.2	-90.4	3025.1	3025.1	100	45	145	[illegible]	[illegible]	0.0	0	0
24/04/16	2880.1	2761.9	4600.3	3615.6	58.1	-60.1	2822.0	2822.0	100	45	145	[illegible]	[illegible]	0.0	0	0
25/04/16	2677.0	2588.3	4600.3	3615.6	50.7	-38.0	2626.2	2626.2	100	45	145	[illegible]	[illegible]	0.0	0	0
26/04/16	2481.2	3246.5	4600.3	3615.6	57.2	-57.3	3303.8	3303.8	100	45	145	[illegible]	[illegible]	0.0	0	0
27/04/16	3158.8	3066.4	4600.3	3615.6	51.7	-40.7	3107.1	3107.1	100	45	145	[illegible]	[illegible]	0.0	0	0
28/04/16	2962.1	2853.2	4600.3	3615.6	55.8	-53.2	2906.3	2906.3	100	45	145	[illegible]	[illegible]	0.0	0	0
29/04/16	2761.3	3394.4	4600.3	3615.6	57.6	-58.7	3453.1	3453.1	100	45	145	[illegible]	[illegible]	0.0	0	0
30/04/16	3308.1	3626.4	4600.3	3615.6	54.9	-50.4	3676.8	3676.8	100	45	145	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Prev. infiltration area surface calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
01/05/16	Sunday	5	2.2	0.2	181020.8	0.9	2	0	3.7	0.0				3531.8	3432.0	4600.3	[illegible]	[illegible]	-46.3	3478.3	3478.3	0	45	45	[illegible]	[illegible]	0.0	0	0
02/05/16	Monday	5	2.1	0	181020.8	0.9	2	0	0.0	0.0				3433.3	3335.4	4600.3	[illegible]	53.0	-44.9	3380.2	3380.2	0	45	45	[illegible]	[illegible]	0.0	0	0
03/05/16	Tuesday	5	1.9	0.4	181020.8	0.9	2	0	7.4	0.0				3335.2	3241.0	4600.3	[illegible]	52.1	-42.1	3283.1	3283.1	0	45	45	[illegible]	[illegible]	0.0	0	0
04/05/16	Wednesday	5	2.1	0	181020.8	0.9	2	0	0.0	0.0				3238.1	3140.2	4600.3	[illegible]	53.0	-44.9	3185.1	3185.1	0	45	45	[illegible]	[illegible]	0.0	0	0
05/05/16	Thursday	5	1.6	0.4	181020.8	0.9	2	0	7.4	0.0				3140.1	3051.4	4600.3	[illegible]	50.7	-38.0	3089.3	3089.3	0	45	45	[illegible]	[illegible]	0.0	0	0
06/05/16	Friday	5	1.9	0	181020.8	0.9	2	0	0.0	0.0				3044.3	2950.1	4600.3	[illegible]	52.1	-42.1	2992.2	2992.2	0	45	45	[illegible]	[illegible]	0.0	0	0
07/05/16	Saturday	5	2.4	25.2	181020.8	0.9	2	23.2	463.7	3779.7				2947.3	6623.5	4600.3	[illegible]	54.4	-49.0	6672.5	6672.5	0	45	45	[illegible]	[illegible]	0.0	0	0
08/05/16	Sunday	5	2.2	2.2	181020.8	0.9	2	0.2	40.5	32.6				6627.5	6560.3	4600.3	[illegible]	53.5	-46.3	6606.6	6606.6	0	45	45	[illegible]	[illegible]	0.0	0	0
09/05/16	Monday	5	2.2	0.2	181020.8	0.9	2	0	3.7	0.0				6561.6	6461.8	4600.3	[illegible]	53.5	-46.3	6508.1	6508.1	0	45	45	[illegible]	[illegible]	0.0	0	0
10/05/16	Tuesday	5	2.2	0.2	181020.8	0.9	2	0	3.7	0.0				6463.1	6363.3	4600.3	[illegible]	53.5	-46.3	6409.5	6409.5	0	45	45	[illegible]	[illegible]	0.0	0	0
11/05/16	Wednesday	5	3	0.2	181020.8	0.9	2	0	3.7	0.0				6364.5	6250.1	4600.3	[illegible]	57.3	-57.3	6307.4	6307.4	0	45	45	[illegible]	[illegible]	0.0	0	0
12/05/16	Thursday	5	2.8	0.2	181020.8	0.9	2	0	3.7	0.0				6262.4	6151.6	4600.3	[illegible]	56.3	-54.5	6206.1	6206.1	0	45	45	[illegible]	[illegible]	0.0	0	0
13/05/16	Friday	5	2.5	0.2	181020.8	0.9	2	0	3.7	0.0				6161.1	6055.8	4600.3	[illegible]	54.9	-50.4	6106.2	6106.2	0	45	45	[illegible]	[illegible]	0.0	0	0
14/05/16	Saturday	5	2.3	11.2	181020.8	0.9	2	9.2	206.1	1498.9				6061.2	7458.5	4600.3	[illegible]	54.0	-47.6	7506.1	7506.1	0	45	45	[illegible]	[illegible]	0.0	0	0
15/05/16	Sunday	5	2.7	0.2	181020.8	0.9	2	0	3.7	0.0				7461.1	7352.1	4600.3	[illegible]	55.8	-53.2	7405.3	7405.3	0	45	45	[illegible]	[illegible]	0.0	0	0
16/05/16	Monday	5	2	5	181020.8	0.9	2	3	92.0	488.8				7360.3	7753.0	4600.3	[illegible]	52.6	-43.5	7796.4	7796.4	0	45	45	[illegible]	[illegible]	0.0	0	0
17/05/16	Tuesday	5	1.9	0	181020.8	0.9	2	0	0.0	0.0				7751.4	7657.2	4600.3	[illegible]	52.1	-42.1	7699.3	7699.3	0	45	45	[illegible]	[illegible]	0.0	0	0
18/05/16	Wednesday	5	1.8	2.4	181020.8	0.9	2	0.4	44.2	65.2				7654.3	7627.1	4600.3	[illegible]	51.7	-40.7	7667.8	7667.8	0	45	45	[illegible]	[illegible]	0.0	0	0
19/05/16	Thursday	5	1.8	0	181020.8	0.9	2	0	0.0	0.0				7622.8	7510.4	4600.3	[illegible]	51.7	-40.7	7571.2	7571.2	0	45	45	[illegible]	[illegible]	0.0	0	0
20/05/16	Friday	5	1.8	0.2	181020.8	0.9	2	0	3.7	0.0				7526.2	7433.8	4600.3	[illegible]	51.7	-40.7	7474.5	7474.5	0	45	45	[illegible]	[illegible]	0.0	0	0
21/05/16	Saturday	5	2.9	37.2	181020.8	0.9	2	35.2	684.5	5734.7				7429.5	13051.6	9200.7	[illegible]	113.5	0.8	13050.8	13050.8	0	45	45	[illegible]	[illegible]	0.0	0	0
22/05/16	Sunday	5	2.2	17.4	181020.8	0.9	2	15.4	320.2	2508.9				13005.8	15415.0	9200.7	[illegible]	107.0	7.3	15407.7	15407.7	0	45	45	[illegible]	[illegible]	0.0	0	0
23/05/16	Monday	5	3	5.6	181020.8	0.9	2	3.6	103.0	586.5				15362.7	15834.7	9200.7	[illegible]	114.4	-0.1	15834.8	15834.8	0	45	45	[illegible]	[illegible]	0.0	0	0
24/05/16	Tuesday	5	2.8	44.6	181020.8	0.9	2	42.6	820.7	6940.3				15789.8	22619.4	13801.0	13446.7	168.8	58.0	22561.4	22561.4	0	45	45	[illegible]	[illegible]	0.0	0	0
25/05/16	Wednesday	5	2.8	1	181020.8	0.9	2	0	18.4	0.0				22516.4	22405.6	13801.0	13446.7	168.8	58.0	22347.6	22347.6	0	45	45	[illegible]	[illegible]	0.0	0	0
26/05/16	Thursday	5	2.8	4.4	181020.8	0.9	2	2.4	81.0	391.0				22302.6	22582.8	13801.0	13446.7	168.8	58.0	22524.8	22524.8	0	45	45	[illegible]	[illegible]	0.0	0	0
27/05/16	Friday	5	2.3	0.4	181020.8	0.9	2	0	7.4	0.0				22479.8	22378.2	13801.0	13446.7	161.9	60.3	22317.9	22317.9	0	45	45	[illegible]	[illegible]	0.0	0	0
28/05/16	Saturday	5	2.6	9.4	181020.8	0.9	2	7.4	173.0	1205.6				22272.9	23371.3	13801.0	13446.7	166.0	58.9	23312.4	23312.4	0	45	45	[illegible]	[illegible]	0.0	0	0
29/05/16	Sunday	5	1.6	4	181020.8	0.9	2	2	73.6	325.8				23267.4	23504.5	13801.0	13446.7	152.2	63.5	23441.0	23441.0	0	45	45	[illegible]	[illegible]	0.0	0	0
30/05/16	Monday	5	1.9	0	181020.8	0.9	2	0	0.0	0.0				23396.0	23301.8	13801.0	13446.7	156.4	62.1	23239.6	23239.6	0	45	45	[illegible]	[illegible]	0.0	0	0
31/05/16	Tuesday	5	1.9	0	181020.8	0.9	2	0	0.0	0.0				23194.6	23100.4	13801.0	13446.7	156.4	62.1	23038.3	23038.3	0	45	45	[illegible]	[illegible]	0.0	0	0
01/06/16	Wednesday	6	2.6	0.2	181020.8	0.9	2	0	3.7	0.0				22993.3	22886.1	13801.0	13446.7	166.0	58.9	22827.2	22827.2	0	0	0	[illegible]	[illegible]	0.0	0	0
02/06/16	Thursday	6	3.1	0	181020.8	0.9	2	0	0.0	0.0				22827.2	22710.9	13801.0	13446.7	172.9	56.6	22654.3	22654.3	0	0	0	[illegible]	[illegible]	0.0	0	0
03/06/16	Friday	6	3	0	181020.8	0.9	2	0	0.0	0.0				22654.3	22539.8	13801.0	13446.7	171.6	57.1	22482.7	22482.7	0	0	0	[illegible]	[illegible]	0.0	0	0
04/06/16	Saturday	6	2	11.8	181020.8	0.9	2	9.8	217.1	1596.6				22482.7	23983.2	13801.0	13446.7	157.8	61.7	23921.5	23921.5	0	0	0	[illegible]	[illegible]	0.0	0	0
05/06/16	Sunday	6	1.7	0.4	181020.8	0.9	2	0	7.4	0.0				23921.5	23831.0	13801.0	13446.7	153.6	63.1	23767.9	23767.9	0	0	0	[illegible]	[illegible]	0.0	0	0
06/06/16	Monday	6	1.4	0.2	181020.8	0.9	2	0	3.7	0.0				23767.9	23682.9	13801.0	13446.7	149.5	64.4	23618.4	23618.4	0	0	0	[illegible]	[illegible]	0.0	0	0
07/06/16	Tuesday	6	1.9	21	181020.8	0.9	2	19	386.4	3095.5				23618.4	26619.7	18401.3	14462.3	208.5	114.3	26505.4	26505.4	0	0	0	[illegible]	[illegible]	0.0	0	0
08/06/16	Wednesday	6	1.8	0	181020.8	0.9	2	0	0.0	0.0				26505.4	26413.0	18401.3	14462.3	206.7	114.3	26298.7	26298.7	0	0	0	[illegible]	[illegible]	0.0	0	0
09/06/16	Thursday	6	1.6	0	181020.8	0.9	2	0	0.0	0.0				26298.7	26210.0	18401.3	14462.3	203.0	114.3	26095.7	26095.7	0	0	0	[illegible]	[illegible]	0.0	0	0
10/06/16	Friday	6	1.4	8	181020.8	0.9	2	6	147.2	977.5				26095.7	26988.2	18401.3	14462.3	199.3	114.3	26873.9	26873.9	0	0	0	[illegible]	[illegible]	0.0	0	0
11/06/16	Saturday	6	2	0.2	181020.8	0.9	2	0	3.7	0.0				26873.9	26777.8	18401.3	14462.3	210.4	114.3	26663.6	26663.6	0	0	0	[illegible]	[illegible]	0.0	0	0
12/06/16	Sunday	6	3.2	0	181020.8	0.9	2	0	0.0	0.0				26663.6	26545.4	18401.3	14462.3	232.4	114.3	26431.1	26431.1	0	0	0	[illegible]	[illegible]	0.0	0	0
13/06/16	Monday	6	1.7	24	181020.8	0.9	2	22	441.6	3584.2				26431.1	29924.8	18401.3	14462.3	204.8	114.3	29810.5	29810.5	0	0	0	[illegible]	[illegible]	0.0	0	0
14/06/16	Tuesday	6	1.8	0.2	181020.8	0.9	2	0	3.7	0.0				29810.5	29718.1	18401.3	14462.3	206.7	114.3	29603.9	29603.9	0	0	0	[illegible]	[illegible]	0.0	0	0
15/06/16	Wednesday	6	1.6	0.2	181020.8	0.9	2	0	3.7	0.0				29603.9	29515.1	18401.3	14462.3	203.0	114.3	29400.9	29400.9	0	0	0	[illegible]	[illegible]	0.0	0	0
16/06/16	Thursday	6	1.6	0	181020.8	0.9	2	0	0.0	0.0				29400.9	29312.1	18401.3	14462.3	203.0	114.3	29197.9	29197.9	0	0	0	[illegible]	[illegible]	0.0	0	0
17/06/16	Friday	6	1.8	0	181020.8	0.9	2	0	0.0	0.0				29197.9	29105.5	18401.3	14462.3	206.7	114.3	28991.2	28991.2	0	0	0	[illegible]	[illegible]	0.0	0	0
18/06/16	Saturday	6	2.4	0.2	181020.8	0.9	2	0	3.7	0.0				28991.2	28887.8	18401.3	14462.3	217.7	114.3	28773.5	28773.5	0	0	0	[illegible]	[illegible]	0.0	0	0
19/06/16	Sunday	6	1.7	0	181020.8	0.9	2	0	0.0	0.0				28773.5	28682.9	18401.3	14462.3	204.8	114.3	28568.7	28568.7	0	0	0	[illegible]	[illegible]	0.0	0	0
20/06/16	Monday	6	1.1	9	181020.8	0.9	2	7	165.6	1140.4				28568.7	29629.6	18401.3	14462.3	193.8	114.3	29515.3	29515.3	0	0	0	[illegible]	[illegible]	0.0	0	0
21/06/16	Tuesday	6	1.6	6.4	181020.8	0.9	2	4.4	117.8	716.8				29515.3	30143.4	18401.3	14462.3	203.0	114.3	30029.2	30029.2	0	0	0	[illegible]	[illegible]	0.0	0	0
22/06/16	Wednesday	6	1.8	2.6	181020.8	0.9	2	0.6	47.8	97.8				30029.2	30034.5	18401.3	14462.3	206.7	114.3	29920.2	29920.2	0	0	0	[illegible]	[illegible]	0.0	0	0
23/06/16	Thursday	6	1.3	2	181020.8	0.9	2	0	36.8	0.0				29920.2	29837.0	18401.3	14462.3	197.5	114.3	29722.8	29722.8	0	0	0	[illegible]	[illegible]	0.0	0	0
24/06/16	Friday	6	2	0	181020.8	0.9	2	0	0.0	0.0				29722.8	29626.7	18401.3	14462.3	210.4	114.3	29512.4	29512.4	0	0	0	[illegible]	[illegible]	0.0	0	0
25/06/16	Saturday	6	1.7	7.4	181020.8	0.9	2	5.4	136.2	879.8				29512.4	30301.6	18401.3	14462.3	204.8	114.3	30187.4	30187.4	0	0	0	[illegible]	[illegible]	0.0	0	0
26/06/16	Sunday	6	1.8	0.8	181020.8	0.9	2	0	14.7	0.0				30187.4	30095.0	18401.3	14462.3	206.7	114.3	29980.7	29980.7	0	0	0	[illegible]	[illegible]	0.0	0	0
27/06/16	Monday	6	2.5	0	181020.8	0.9	2	0	0.0	0.0				29980.7	29875.4	18401.3	14462.3	219.6	114.3	29761.1	29761.1	0	0	0	[illegible]	[illegible]	0.0	0	0
28/06/16	Tuesday	6	1.4	2.8	181020.8	0.9	2	0.8	51.5	130.3				29761.1	29806.4	18401.3	14462.3	199.3	114.3	29692.2	29692.2	0	0	0	[illegible]	[illegible]	0.0	0	0
29/06/16	Wednesday	6	1.7	23.2	181020.8	0.9	2	21.2	426.9	3453.9				29692.2	33055.5	18401.3	14462.3	204.8	114.3	32941.2	32941.2	0	0	0	[illegible]	[illegible]	0.0	0	0
30/06/16	Thursday	6	1.5	0.2	181020.8	0.9	2	0	3.7	0.0				32941.2	32854.3	18401.3	14462.3	201.1	114.3	32740.1	32740.1	0	0	0	[illegible]	[illegible]	0.0	0	0
01/07/16	Friday	7	1.7	0.4	181020.8	0.9	2	0	7.4	0.0				32740.1	32649.5	18401.3	14462.3	204.8	114.3	32535.2	32535.2	0	0	0	[illegible]	[illegible]	0.0	0	0
02/07/16	Saturday	7	2.5	0	181020.8	0.9	2	0	0.0	0.0				32535.2	32429.9	18401.3	14462.3	219.6	114.3	32315.7	32315.7	0	0	0	[illegible]	[illegible]	0.0	0	0
03/07/16	Sunday	7	1.8	0.4	181020.8	0.9	2	0	7.4	0.0				32315.7	32223.3	18401.3	14462.3	206.7	114.3	32109.0	32109.0	0	0	0	[illegible]	[illegible]	0.0	0	0
04/07/16	Monday	7	1.9	0.2	181020.8	0.9	2	0	3.7	0.0				32109.0	32014.8	18401.3	14462.3	208.5	114.3	31900.5	31900.5	0	0	0	[illegible]	[illegible]	0.0	0	0
05/07/16	Tuesday	7	2.5	0	181020.8	0.9	2	0	0.0	0.0				31900.5	31795.2	18401.3	14462.3	219.6	114.3	31680.9	31680.9	0	0	0	[illegible]	[illegible]	0.0	0	0
06/07/16	Wednesday	7	2.1	0	181020.8	0.9	2	0	0.0	0.0				31680.9	31583.0	18401.3	14462.3	212.2	114.3	31468.8	31468.8	0	0	0	[illegible]	[illegible]	0.0	0	0
07/07/16	Thursday	7	1.5	0	181020.8	0.9	2	0	0.0	0.0				31468.8	31381.9	18401.3	14462.3	201.1	114.3	31267.6	31267.6	0	0	0	[illegible]	[illegible]	0.0	0	0
08/07/16	Friday	7	2.3	18.8	181020.8	0.9	2	16.8	345.9	2737.0				31267.6	33903.0	18401.3	14462.3	215.9	114.3	33788.8	33584.2	0	0	0	[illegible]	33584.2	204.6	1	0
09/07/16	Saturday	7	2.3	16.2	181020.8	0.9	2	14.2	298.1	2313.4				33584.2	35796.1	18401.3	14462.3	215.9	114.3	35681.8	33584.2	0	0	0	[illegible]	33584.2	2097.6	1	0
10/07/16	Sunday	7	2.3	30.8	181020.8	0.9	2	28.8	566.8	4692.1				33584.2	38174.7	18401.3	14462.3	215.9	114.3	38060.4	33584.2	0	0	0	[illegible]	33584.2	4476.2	1	0
11/07/16	Monday	7	2.3	1.4	181020.8	0.9	2	0	25.8	0.0				33584.2	33481.6	18401.3	14462.3	215.9	114.3	33368.3	33368.3	0	0	0	[illegible]	[illegible]	0.0	0	0
12/07/16	Tuesday	7	2.3	0.2	181020.8	0.9	2	0	3.7	0.0				33368.3	33266.7	18401.3	14462.3	215.9	114.3	33152.5	33152.5	0	0	0	[illegible]	[illegible]	0.0	0	0
13/07/16	Wednesday	7	3.5	0	181020.8	0.9	2	0	0.0	0.0				33152.5	33028.8	18401.3	14462.3	238.0	114.3	32914.5	32914.5	0	0	0	[illegible]	[illegible]	0.0	0	0
14/07/16	Thursday	7	4.3	0.2	181020.8	0.9	2	0	3.7	0.0				32914.5	32776.1	18401.3	14462.3	252.7	114.3	32661.8	32661.8	0	0	0	[illegible]	[illegible]	0.0	0	0
15/07/16	Friday	7	2.4	0	181020.8	0.9	2	0	0.0	0.0				32661.8	32558.4	18401.3	14462.3	217.7	114.3	32444.1	32444.1	0	0	0	[illegible]	[illegible]	0.0	0	0
16/07/16	Saturday	7	2.7	0.2	181020.8	0.9	2	0	3.7	0.0				32444.1	32335.2	18401.3	14462.3	223.2	114.3	32220.9	32220.9	0	0	0	[illegible]	[illegible]	0.0	0	0
17/07/16	Sunday	7	1.9	35	181020.8	0.9	2	33	644.0	5376.3				32220.9	37503.0	18401.3	14462.3	208.5	114.3	37388.7	33584.2	0	0	0	[illegible]	33584.2	3804.5	1	0
18/07/16	Monday	7	1.8	9	181020.8	0.9	2	7	165.6	1140.4				33584.2	34632.2	18401.3	14462.3	206.7	114.3	34518.0	33584.2	0	0	0	[illegible]	33584.2	933.8	1	0
19/07/16	Tuesday	7	2.4	0.4	181020.8	0.9	2	0	7.4	0.0				33584.2	33480.8	18401.3	14462.3	217.7	114.3	33366.5	33366.5	0	0	0	[illegible]	[illegible]	0.0	0	0
20/07/16	Wednesday	7	2.6	0	181020.8	0.9	2	0	0.0	0.0				33366.5	33259.4	18401.3	14462.3	221.4	114.3	33145.1	33145.1	0	0	0	[illegible]	[illegible]	0.0	0	0
21/07/16	Thursday	7	2.1	23.4	181020.8	0.9	2	21.4	430.6	3486.5				33145.1	36533.6	18401.3	14462.3	212.2	114.3	36419.4	33584.2	0	0	0	[illegible]	33584.2	2835.2	1	0
22/07/16	Friday	7	1.9	5.2	181020.8	0.9	2	3.2	95.7	521.3				33584.2	34011.3	18401.3	14462.3	208.5	114.3	33897.0	33584.2	0	0	0	[illegible]	33584.2	312.8	1	0
23/07/16	Saturday	7	1.4	0.2	181020.8	0.9	2	0	3.7	0.0				33584.2	33499.2	18401.3	14462.3	199.3	114.3	33384.9	33384.9	0	0	0	[illegible]	[illegible]	0.0	0	0
24/07/16	Sunday	7	1.7	1.4	181020.8	0.9	2	0	25.8	0.0				33384.9	33394.3	18401.3	14462.3	204.8	114.3	33180.1	33180.1	0	0	0	[illegible]	[illegible]	0.0	0	0
25/07/16	Monday	7	1.6	0	181020.8	0.9	2	0	0.0	0.0				33180.1	33091.3	18401.3	14462.3	203.0	114.3	32977.1	32977.1	0	0	0	[illegible]	[illegible]	0.0	0	0
26/07/16	Tuesday	7	1.9	0.2	181020.8	0.9	2	0	3.7	0.0				32977.1	32882.8	18401.3	14462.3	208.5	114.3	32768.6	32768.6	0	0	0	[illegible]	[illegible]	0.0	0	0
27/07/16	Wednesday	7	1.8	0.2	181020.8	0.9	2	0	3.7	0.0				32768.6	32676.2	18401.3	14462.3	206.7	114.3	32561.9	32561.9	0	0	0	[illegible]	[illegible]	0.0	0	0
28/07/16	Thursday	7	2.9	0	181020.8	0.9	2	0	0.0	0.0				32561.9	32449.3	18401.3	14462.3	226.9	114.3	32335.0	32335.0	0	0	0	[illegible]	[illegible]	0.0	0	0
29/07/16	Friday	7	3.3	0	181020.8	0.9	2	0	0.0	0.0				32335.0	32215.0	18401.3	14462.3	234.3	114.3	32100.7	32100.7	0	0	0	[illegible]	[illegible]	0.0	0	0
30/07/16	Saturday	7	2.8	1.6	181020.8	0.9	2	0	29.4	0.0				32100.7	31989.9	18401.3	14462.3	225.1	114.3	31875.6	31875.6	0	0	0	[illegible]	[illegible]	0.0	0	0
31/07/16	Sunday	7	2	9	181020.8	0.9	2	7	165.6	1140.4				31875.6	32920.0	18401.3	14462.3	210.4	114.3	32805.7	32805.7	0	0	0	[illegible]	[illegible]	0.0	0	0
01/08/16	Monday	8	2.6	1.8	181020.8	0.9	2	0	33.1	0.0				32805.7	32698.6	18401.3	14462.3	221.4	114.3	32584.3	32584.3	0	0	0	[illegible]	[illegible]	0.0	0	0
02/08/16	Tuesday	8	2.6	0	181020.8	0.9	2	0	0.0	0.0				32584.3	32477.2	18401.3	14462.3	221.4	114.3	32362.9	32362.9	0	0	0	[illegible]	[illegible]	0.0	0	0
03/08/16	Wednesday	8	1.1	0	181020.8	0.9	2	0	0.0	0.0				32362.9	32283.4	18401.3	14462.3	193.8	114.3	32169.2	32169.2	0	0	0	[illegible]	[illegible]	0.0	0	0
04/08/16	Thursday	8	1.3	6.4	181020.8	0.9	2	4.4	117.8	716.8				32169.2	32802.8	18401.3	14462.3	197.5	114.3	32688.5	32688.5	0	0	0	[illegible]	[illegible]	0.0	0	0
05/08/16	Friday	8	2.3	4.6	181020.8	0.9	2	2.6	84.6	423.6				32688.5	33010.5	18401.3	14462.3	215.9	114.3	32896.2	32896.2	0	0	0	[illegible]	[illegible]	0.0	0	0
06/08/16	Saturday	8	3.5	0	181020.8	0.9	2	0	0.0	0.0				32896.2	32772.6	18401.3	14462.3	238.0	114.3	32658.3	32658.3	0	0	0	[illegible]	[illegible]	0.0	0	0
07/08/16	Sunday	8	2.5	8.6	181020.8	0.9	2	6.6	158.3	1075.3				32658.3	33628.3	18401.3	14462.3	219.6	114.3	33514.0	33514.0	0	0	0	[illegible]	[illegible]	0.0	0	0
08/08/16	Monday	8	2.1	20.6	181020.8	0.9	2	18.6	379.1	3030.3				33514.0	36446.4	18401.3	14462.3	212.2	114.3	36332.1	33584.2	0	0	0	[illegible]	33584.2	2747.9	1	0
09/08/16	Tuesday	8	2	9	181020.8	0.9	2	7	165.6	1140.4				33584.2	34628.6	18401.3	14462.3	210.4	114.3	34514.3	33584.2	0	0	0	[illegible]	33584.2	930.1	1	0
10/08/16	Wednesday	8	2.3	7.6	181020.8	0.9	2	5.6	139.8	912.3				33584.2	34395.0	18401.3	14462.3	215.9	114.3	34280.7	33584.2	0	0	0	[illegible]	33584.2	696.5	1	0
11/08/16	Thursday	8	2	1.8	181020.8	0.9	2	0	33.1	0.0				33584.2	33488.1	18401.3	14462.3	210.4	114.3	33373.9	33373.9	0	0	0	[illegible]	[illegible]	0.0	0	0
12/08/16	Friday	8	2.1	10	181020.8	0.9	2	8	184.0	1303.1				33373.9	34579.3	18401.3	14462.3	212.2	114.3	34465.0	33584.2	0	0	0	[illegible]	33584.2	880.8	1	0
13/08/16	Saturday	8	2.5	0	181020.8	0.9	2	0	0.0	0.0				33584.2	33478.9	18401.3	14462.3	219.6	114.3	33364.7	33364.7	0	0	0	[illegible]	[illegible]	0.0	0	0
14/08/16	Sunday	8	2.3	0.2	181020.8	0.9	2	0	3.7	0.0				33364.7	33263.1	18401.3	14462.3	215.9	114.3	33148.8	33148.8	0	0	0	[illegible]	[illegible]	0.0	0	0
15/08/16	Monday	8	2.5	0	181020.8	0.9	2	0	0.0	0.0				33148.8	33043.5	18401.3	14462.3	219.6	114.3	32929.2	32929.2	0	0	0	[illegible]	[illegible]	0.0	0	0
16/08/16	Tuesday	8	2.3	4.4	181020.8	0.9	2	2.4	81.0	391.0				32929.2	33218.6	18401.3	14462.3	215.9	114.3	33104.4	33104.4	0	0	0	[illegible]	[illegible]	0.0	0	0
17/08/16	Wednesday	8	2.2	1.6	181020.8	0.9	2	0	29.4	0.0				33104.4	33004.6	18401.3	14462.3	214.0	114.3	32890.3	32890.3	0	0	0	[illegible]	[illegible]	0.0	0	0
18/08/16	Thursday	8	2	26.6	181020.8	0.9	2	24.6	489.5	4007.8				32890.3	36801.1	18401.3	14462.3	210.4	114.3	36687.8	33584.2	0	0	0	[illegible]	33584.2	3103.6	1	0
19/08/16	Friday	8	2.4	0	181020.8	0.9	2	0	0.0	0.0				33584.2	33480.8	18401.3	14462.3	217.7	114.3	33366.5	33366.5	0	0	0	[illegible]	[illegible]	0.0	0	0
20/08/16	Saturday	8	2.3	9.8	181020.8	0.9	2	7.8	180.3	1270.8				33366.5	34535.7	18401.3	14462.3	215.9	114.3	34421.4	33584.2	0	0	0	[illegible]	33584.2	837.2	1	0
21/08/16	Sunday	8	2.8	0.2	181020.8	0.9	2	0	3.7	0.0				33584.2	33473.4	18401.3	14462.3	225.1	114.3	33359.1	33359.1	0	0	0	[illegible]	[illegible]	0.0	0	0

Date	Timing Table: Weekday	Month number	BOM Data: Loss evaporation (mm)	Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)
22/08/16	Monday	8	2.4	14.8	[illegible]	0.9	2	12.8	272.3	2085.4
23/08/16	Tuesday	8	3	0.2	[illegible]	0.9	2	0	3.7	0.0
24/08/16	Wednesday	8	3.5	0	[illegible]	0.9	2	0	0.0	0.0
25/08/16	Thursday	8	4.1	0	[illegible]	0.9	2	0	0.0	0.0
26/08/16	Friday	8	2.6	0	[illegible]	0.9	2	0	0.0	0.0
27/08/16	Saturday	8	2.6	51	[illegible]	0.9	2	49	938.5	7943.0
28/08/16	Sunday	8	2.4	10.4	[illegible]	0.9	2	8.4	191.4	1368.5
29/08/16	Monday	8	2.1	2.2	[illegible]	0.9	2	0.2	40.5	32.6
30/08/16	Tuesday	8	2.5	0.2	[illegible]	0.9	2	0	3.7	0.0
31/08/16	Wednesday	8	2.6	5	[illegible]	0.9	2	3	92.0	488.8
01/09/16	Thursday	9	2.2	2.4	[illegible]	0.9	2	0.4	44.2	65.2
02/09/16	Friday	9	3	0	[illegible]	0.9	2	0	0.0	0.0
03/09/16	Saturday	9	3.4	0.2	[illegible]	0.9	2	0	3.7	0.0
04/09/16	Sunday	9	3	0	[illegible]	0.9	2	0	0.0	0.0
05/09/16	Monday	9	2.9	0	[illegible]	0.9	2	0	0.0	0.0
06/09/16	Tuesday	9	3.8	0.2	[illegible]	0.9	2	0	3.7	0.0
07/09/16	Wednesday	9	3.1	12.8	[illegible]	0.9	2	10.8	235.5	1759.5
08/09/16	Thursday	9	2.2	14.4	[illegible]	0.9	2	12.4	265.0	2020.2
09/09/16	Friday	9	2.3	0.2	[illegible]	0.9	2	0	3.7	0.0
10/09/16	Saturday	9	3.3	2.2	[illegible]	0.9	2	0.2	40.5	32.6
11/09/16	Sunday	9	4.5	0.2	[illegible]	0.9	2	0	3.7	0.0
12/09/16	Monday	9	4.2	0	[illegible]	0.9	2	0	0.0	0.0
13/09/16	Tuesday	9	3.7	0	[illegible]	0.9	2	0	0.0	0.0
14/09/16	Wednesday	9	2.9	0	[illegible]	0.9	2	0	0.0	0.0
15/09/16	Thursday	9	3.4	0	[illegible]	0.9	2	0	0.0	0.0
16/09/16	Friday	9	3.2	5.4	[illegible]	0.9	2	3.4	99.4	553.9
17/09/16	Saturday	9	2.9	0	[illegible]	0.9	2	0	0.0	0.0
18/09/16	Sunday	9	2.9	0	[illegible]	0.9	2	0	0.0	0.0
19/09/16	Monday	9	3.1	16.6	[illegible]	0.9	2	14.6	305.5	2378.6
20/09/16	Tuesday	9	3.6	0	[illegible]	0.9	2	0	0.0	0.0
21/09/16	Wednesday	9	2.4	0.4	[illegible]	0.9	2	0	7.4	0.0
22/09/16	Thursday	9	3.1	0	[illegible]	0.9	2	0	0.0	0.0
23/09/16	Friday	9	2.7	10.6	[illegible]	0.9	2	8.6	195.1	1401.1
24/09/16	Saturday	9	3.4	0.6	[illegible]	0.9	2	0	11.0	0.0
25/09/16	Sunday	9	2.6	16.6	[illegible]	0.9	2	14.6	305.5	2378.6
26/09/16	Monday	9	3.7	0.2	[illegible]	0.9	2	0	3.7	0.0
27/09/16	Tuesday	9	3.3	7.8	[illegible]	0.9	2	5.8	143.5	944.9
28/09/16	Wednesday	9	3.7	9.4	[illegible]	0.9	2	7.4	173.0	1205.6
29/09/16	Thursday	9	3	0	[illegible]	0.9	2	0	0.0	0.0
30/09/16	Friday	9	4.4	0	[illegible]	0.9	2	0	0.0	0.0
01/10/16	Saturday	10	3.8	9.4	[illegible]	0.9	2	7.4	173.0	1205.6
02/10/16	Sunday	10	2.1	5.6	[illegible]	0.9	2	3.6	103.0	586.5
03/10/16	Monday	10	2.9	0.2	[illegible]	0.9	2	0	3.7	0.0
04/10/16	Tuesday	10	4.4	2.4	[illegible]	0.9	2	0.4	44.2	65.2
05/10/16	Wednesday	10	3.3	0.2	[illegible]	0.9	2	0	3.7	0.0
06/10/16	Thursday	10	4.2	0.2	[illegible]	0.9	2	0	3.7	0.0
07/10/16	Friday	10	2.7	10.6	[illegible]	0.9	2	8.6	195.1	1401.1
08/10/16	Saturday	10	4.3	10.2	[illegible]	0.9	2	8.2	187.7	1339.9
09/10/16	Sunday	10	4.2	10.6	[illegible]	0.9	2	8.6	195.1	1401.1
10/10/16	Monday	10	5.6	0.2	[illegible]	0.9	2	0	3.7	0.0
11/10/16	Tuesday	10	7.6	0	[illegible]	0.9	2	0	0.0	0.0
12/10/16	Wednesday	10	4.4	0	[illegible]	0.9	2	0	0.0	0.0
13/10/16	Thursday	10	4.1	0	[illegible]	0.9	2	0	0.0	0.0
14/10/16	Friday	10	4.4	1	[illegible]	0.9	2	0	18.4	0.0
15/10/16	Saturday	10	4	20.2	[illegible]	0.9	2	18.2	371.7	2985.1
16/10/16	Sunday	10	3.2	1	[illegible]	0.9	2	0	18.4	0.0
17/10/16	Monday	10	4.9	0	[illegible]	0.9	2	0	0.0	0.0
18/10/16	Tuesday	10	3.7	0.2	[illegible]	0.9	2	0	3.7	0.0
19/10/16	Wednesday	10	4.8	0	[illegible]	0.9	2	0	0.0	0.0
20/10/16	Thursday	10	5.3	2.2	[illegible]	0.9	2	0.2	40.5	32.6
21/10/16	Friday	10	7.7	0	[illegible]	0.9	2	0	0.0	0.0
22/10/16	Saturday	10	6.9	0	[illegible]	0.9	2	0	0.0	0.0
23/10/16	Sunday	10	3.6	0	[illegible]	0.9	2	0	0.0	0.0
24/10/16	Monday	10	3.8	0	[illegible]	0.9	2	0	0.0	0.0
25/10/16	Tuesday	10	4.1	0	[illegible]	0.9	2	0	0.0	0.0
26/10/16	Wednesday	10	4.7	0	[illegible]	0.9	2	0	0.0	0.0
27/10/16	Thursday	10	4.9	0.2	[illegible]	0.9	2	0	3.7	0.0
28/10/16	Friday	10	4.6	0	[illegible]	0.9	2	0	0.0	0.0
29/10/16	Saturday	10	5.1	1	[illegible]	0.9	2	0	18.4	0.0
30/10/16	Sunday	10	5.5	3.6	[illegible]	0.9	2	1.6	66.2	260.7
31/10/16	Monday	10	6.6	0	[illegible]	0.9	2	0	0.0	0.0
01/11/16	Tuesday	11	7.4	0	[illegible]	0.9	2	0	0.0	0.0
02/11/16	Wednesday	11	5.4	0	[illegible]	0.9	2	0	0.0	0.0
03/11/16	Thursday	11	5.5	0	[illegible]	0.9	2	0	0.0	0.0
04/11/16	Friday	11	8.6	0	[illegible]	0.9	2	0	0.0	0.0
05/11/16	Saturday	11	5.8	0	[illegible]	0.9	2	0	0.0	0.0
06/11/16	Sunday	11	5.6	0	[illegible]	0.9	2	0	0.0	0.0
07/11/16	Monday	11	5.6	0	[illegible]	0.9	2	0	0.0	0.0
08/11/16	Tuesday	11	4.7	0	[illegible]	0.9	2	0	0.0	0.0
09/11/16	Wednesday	11	4.5	0	[illegible]	0.9	2	0	0.0	0.0
10/11/16	Thursday	11	5.1	0	[illegible]	0.9	2	0	0.0	0.0
11/11/16	Friday	11	4.9	6.6	[illegible]	0.9	2	4.6	121.4	749.4
12/11/16	Saturday	11	8	0	[illegible]	0.9	2	0	0.0	0.0
13/11/16	Sunday	11	10.7	0	[illegible]	0.9	2	0	0.0	0.0
14/11/16	Monday	11	10.6	0	[illegible]	0.9	2	0	0.0	0.0
15/11/16	Tuesday	11	3.4	0	[illegible]	0.9	2	0	0.0	0.0
16/11/16	Wednesday	11	5.7	0	[illegible]	0.9	2	0	0.0	0.0
17/11/16	Thursday	11	7.3	8.4	[illegible]	0.9	2	6.4	154.6	1042.7
18/11/16	Friday	11	6	0	[illegible]	0.9	2	0	0.0	0.0
19/11/16	Saturday	11	5.9	0	[illegible]	0.9	2	0	0.0	0.0
20/11/16	Sunday	11	5.8	0	[illegible]	0.9	2	0	0.0	0.0
21/11/16	Monday	11	8.1	0	[illegible]	0.9	2	0	0.0	0.0
22/11/16	Tuesday	11	9	0	[illegible]	0.9	2	0	0.0	0.0
23/11/16	Wednesday	11	10.4	0	[illegible]	0.9	2	0	0.0	0.0
24/11/16	Thursday	11	10.6	0	[illegible]	0.9	2	0	0.0	0.0
25/11/16	Friday	11	10.9	0	[illegible]	0.9	2	0	0.0	0.0
26/11/16	Saturday	11	7.6	0	[illegible]	0.9	2	0	0.0	0.0
27/11/16	Sunday	11	6.8	0	[illegible]	0.9	2	0	0.0	0.0
28/11/16	Monday	11	7.2	0	[illegible]	0.9	2	0	0.0	0.0
29/11/16	Tuesday	11	7.4	0	[illegible]	0.9	2	0	0.0	0.0
30/11/16	Wednesday	11	5.3	0	[illegible]	0.9	2	0	0.0	0.0
01/12/16	Thursday	12	6.9	0	[illegible]	0.9	2	0	0.0	0.0
02/12/16	Friday	12	5.2	0	[illegible]	0.9	2	0	0.0	0.0
03/12/16	Saturday	12	6.4	0	[illegible]	0.9	2	0	0.0	0.0
04/12/16	Sunday	12	6.6	2	[illegible]	0.9	2	0	36.8	0.0
05/12/16	Monday	12	6.6	0	[illegible]	0.9	2	0	0.0	0.0
06/12/16	Tuesday	12	6.6	0	[illegible]	0.9	2	0	0.0	0.0
07/12/16	Wednesday	12	8.7	0.4	[illegible]	0.9	2	0	7.4	0.0
08/12/16	Thursday	12	9.9	0	[illegible]	0.9	2	0	0.0	0.0
09/12/16	Friday	12	10.1	0	[illegible]	0.9	2	0	0.0	0.0
10/12/16	Saturday	12	6.2	0	[illegible]	0.9	2	0	0.0	0.0
11/12/16	Sunday	12	4.7	0	[illegible]	0.9	2	0	0.0	0.0
12/12/16	Monday	12	6.7	6.2	[illegible]	0.9	2	4.2	114.1	684.3

Date	Pond Losses: PrelimPond loss evaporation (m^3)	Prelim Infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Adjustments: Volume at start of period (m^3)	Prelim pond volume (correction for no negatives)	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)
22/08/16				33159.1	35341.1	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]
23/08/16				33584.2	33469.7	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]
24/08/16				33355.5	33231.8	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]
25/08/16				33117.5	32982.8	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]
26/08/16				32868.5	32761.4	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]
27/08/16				32647.1	40523.0	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]
28/08/16				33584.2	34849.3	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]
29/08/16				33584.2	33518.9	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]
30/08/16				33404.6	33299.3	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]
31/08/16				33185.1	33566.7	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]
01/09/16				33452.4	33417.8	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]
02/09/16				33258.6	33144.1	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]
03/09/16				32984.8	32863.0	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]
04/09/16				32703.7	32589.2	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]
05/09/16				32429.9	32317.3	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]
06/09/16				32158.0	32078.8	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]
07/09/16				31869.6	33512.8	18401.3	14462.3	230.6	114.3	[illegible]	[illegible]
08/09/16				33353.5	35273.9	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]
09/09/16				33539.2	33437.6	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]
10/09/16				33278.1	33190.9	18401.3	14462.3	234.3	114.3	[illegible]	[illegible]
11/09/16				33031.7	32889.6	18401.3	14462.3	256.4	114.3	[illegible]	[illegible]
12/09/16				32730.3	32593.7	18401.3	14462.3	250.8	114.3	[illegible]	[illegible]
13/09/16				32434.5	32307.1	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]
14/09/16				32147.8	32035.2	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]
15/09/16				31875.9	31754.1	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]
16/09/16				31594.8	32030.6	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]
17/09/16				31871.3	31758.7	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]
18/09/16				31599.4	31486.7	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]
19/09/16				31327.5	33589.8	18401.3	14462.3	230.6	114.3	[illegible]	[illegible]
20/09/16				33410.5	33305.0	18401.3	14462.3	239.8	114.3	[illegible]	[illegible]
21/09/16				33145.7	33042.3	18401.3	14462.3	217.7	114.3	31928.0	[illegible]
22/09/16				32883.0	32766.7	18401.3	14462.3	230.6	114.3	[illegible]	[illegible]
23/09/16				32607.4	33899.5	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]
24/09/16				33539.2	33417.4	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]
25/09/16				33256.1	35529.6	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]
26/09/16				33539.2	33411.8	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]
27/09/16				33252.6	34077.5	18401.3	14462.3	234.3	114.3	[illegible]	[illegible]
28/09/16				33539.2	34617.4	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]
29/09/16				33539.2	33424.7	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]
30/09/16				33265.5	33125.2	18401.3	14462.3	254.5	114.3	[illegible]	[illegible]
01/10/16				32965.9	34042.3	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]
02/10/16				33439.2	33927.8	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]
03/10/16				33439.2	33326.6	18401.3	14462.3	226.9	114.3	33217.3	[illegible]
04/10/16				33067.3	33997.2	18401.3	14462.3	254.5	114.3	[illegible]	[illegible]
05/10/16				32733.0	32612.9	18401.3	14462.3	234.3	114.3	[illegible]	[illegible]
06/10/16				32353.7	32217.1	18401.3	14462.3	250.8	114.3	[illegible]	[illegible]
07/10/16				31957.8	33250.0	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]
08/10/16				32990.7	34188.2	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]
09/10/16				33439.2	34703.7	18401.3	14462.3	250.8	114.3	[illegible]	[illegible]
10/10/16				33439.2	33276.9	18401.3	14462.3	276.6	114.3	[illegible]	[illegible]
11/10/16				33017.6	32818.5	18401.3	14462.3	313.4	114.3	[illegible]	32704.2
12/10/16				32559.2	32419.0	18401.3	14462.3	254.5	114.3	[illegible]	[illegible]
13/10/16				32159.7	32025.0	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]
14/10/16				31765.7	31625.5	18401.3	14462.3	254.5	114.3	[illegible]	[illegible]
15/10/16				31366.2	34198.4	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]
16/10/16				33439.2	33321.0	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]
17/10/16				33061.8	32912.3	18401.3	14462.3	263.7	114.3	[illegible]	[illegible]
18/10/16				32653.1	32525.7	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]
19/10/16				32266.4	32118.8	18401.3	14462.3	261.9	114.3	[illegible]	[illegible]
20/10/16				31859.6	31735.3	18401.3	14462.3	271.1	114.3	[illegible]	[illegible]
21/10/16				31476.1	31275.1	18401.3	14462.3	315.2	114.3	[illegible]	[illegible]
22/10/16				31015.8	30879.6	18401.3	14462.3	300.5	114.3	[illegible]	[illegible]
23/10/16				30570.3	30444.8	18401.3	14462.3	239.8	114.3	[illegible]	[illegible]
24/10/16				30185.5	30056.3	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]
25/10/16				29797.0	29662.3	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]
26/10/16				29401.1	29257.3	18401.3	14462.3	260.0	114.3	[illegible]	[illegible]
27/10/16				28998.0	28848.6	18401.3	14462.3	263.7	114.3	[illegible]	[illegible]
28/10/16				28589.3	28445.4	18401.3	14462.3	258.2	114.3	[illegible]	[illegible]
29/10/16				28186.1	28033.0	18401.3	14462.3	267.4	114.3	[illegible]	[illegible]
30/10/16				27773.7	27873.9	18401.3	14462.3	274.8	114.3	[illegible]	[illegible]
31/10/16				27614.6	27431.9	18401.3	14462.3	295.0	114.3	[illegible]	[illegible]
01/11/16				27174.6	26979.2	18401.3	14462.3	309.7	114.3	[illegible]	[illegible]
02/11/16				26719.9	26561.3	18401.3	14462.3	272.9	114.3	[illegible]	[illegible]
03/11/16				26302.0	26141.5	18401.3	14462.3	274.8	114.3	[illegible]	[illegible]
04/11/16				25882.3	25664.7	18401.3	14462.3	331.8	114.3	[illegible]	[illegible]
05/11/16				25405.5	25239.4	18401.3	14462.3	280.3	114.3	[illegible]	[illegible]
06/11/16				24980.2	24817.9	13801.0	10846.7	207.4	45.1	[illegible]	[illegible]
07/11/16				24627.7	24465.4	13801.0	10846.7	207.4	45.1	[illegible]	[illegible]
08/11/16				24275.3	24129.5	13801.0	10846.7	195.0	49.3	[illegible]	[illegible]
09/11/16				23935.3	23793.2	13801.0	10846.7	192.3	50.2	[illegible]	[illegible]
10/11/16				23598.0	23444.9	13801.0	10846.7	200.5	47.4	[illegible]	[illegible]
11/11/16				23252.5	23852.4	13801.0	10846.7	197.8	48.3	[illegible]	[illegible]
12/11/16				23659.1	23452.6	13801.0	10846.7	240.6	34.1	[illegible]	[illegible]
13/11/16				23273.5	23017.3	13801.0	10846.7	277.8	21.7	[illegible]	[illegible]
14/11/16				22850.7	22596.4	13801.0	10846.7	276.5	22.1	[illegible]	[illegible]
15/11/16				22429.2	22307.4	13801.0	10846.7	177.1	55.2	[illegible]	[illegible]
16/11/16				22107.2	21943.0	13801.0	10846.7	208.8	44.7	[illegible]	[illegible]
17/11/16				21753.3	22601.4	13801.0	10846.7	230.9	37.3	[illegible]	[illegible]
18/11/16				22420.1	22250.4	13801.0	10846.7	213.0	43.3	[illegible]	[illegible]
19/11/16				22062.1	21894.3	13801.0	10846.7	211.6	43.7	[illegible]	[illegible]
20/11/16				21705.5	21539.5	13801.0	10846.7	210.2	44.2	[illegible]	[illegible]
21/11/16				21350.3	21142.0	13801.0	10846.7	241.9	33.6	[illegible]	[illegible]
22/11/16				20963.4	20738.5	13801.0	10846.7	254.4	29.5	[illegible]	[illegible]
23/11/16				20564.0	20313.4	13801.0	10846.7	273.7	23.0	[illegible]	[illegible]
24/11/16				20145.3	19891.0	13801.0	10846.7	276.5	22.1	[illegible]	[illegible]
25/11/16				19723.9	19464.0	13801.0	10846.7	280.6	20.7	[illegible]	[illegible]
26/11/16				19298.3	19099.2	13801.0	10846.7	235.0	35.9	[illegible]	[illegible]
27/11/16				18918.2	18733.8	13801.0	10846.7	224.0	39.6	[illegible]	[illegible]
28/11/16				18549.2	18357.5	13801.0	10846.7	229.5	37.8	[illegible]	[illegible]
29/11/16				18174.7	17979.3	13801.0	10846.7	232.3	36.8	[illegible]	[illegible]
30/11/16				17797.4	17640.6	13801.0	10846.7	203.3	46.5	[illegible]	[illegible]
01/12/16				17449.1	17262.9	13801.0	10846.7	215.4	39.1	[illegible]	[illegible]
02/12/16				17078.7	16923.8	13801.0	10846.7	201.9	47.0	[illegible]	[illegible]
03/12/16				16731.8	16554.8	9700.7	7231.2	145.7	-31.4	[illegible]	[illegible]
04/12/16				16441.1	16260.4	9700.7	7231.2	147.5	-33.2	[illegible]	[illegible]
05/12/16				16148.6	15967.9	9700.7	7231.2	147.5	-33.2	[illegible]	[illegible]
06/12/16				15856.1	15675.4	9700.7	7231.2	147.5	-33.2	[illegible]	[illegible]
07/12/16				15561.6	15344.3	9700.7	7231.2	166.8	-52.6	[illegible]	[illegible]
08/12/16				15251.8	15010.4	9700.7	7231.2	177.9	-63.6	[illegible]	[illegible]
09/12/16				14929.0	14683.8	9700.7	7231.2	179.7	-65.4	[illegible]	[illegible]
10/12/16				14604.3	14430.9	9700.7	7231.2	143.8	-29.6	[illegible]	[illegible]
11/12/16				14315.5	14169.7	9700.7	7231.2	130.0	-15.7	[illegible]	[illegible]
12/12/16				14040.4	14542.1	9700.7	7231.2	148.4	-34.2	[illegible]	[illegible]

Date	Demand (Dust): Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Abstraction: Allowed abstraction (m^3)	Pond Vol after abstraction (m^3)	Overflow Calcs: Overflow (m^3)	Overflow Flag	Pond Empty Flag
22/08/16	0	0	0	0.0	33584.2	[illegible]	1	0
23/08/16	0	0	0	0.0	[illegible]	0.0	0	0
24/08/16	0	0	0	0.0	[illegible]	0.0	0	0
25/08/16	0	0	0	0.0	[illegible]	0.0	0	0
26/08/16	0	0	0	0.0	[illegible]	0.0	0	0
27/08/16	0	0	0	0.0	33584.2	6824.5	1	0
28/08/16	0	0	0	0.0	33584.2	1150.8	1	0
29/08/16	0	0	0	0.0	[illegible]	0.0	0	0
30/08/16	0	0	0	0.0	[illegible]	0.0	0	0
31/08/16	0	0	0	0.0	[illegible]	0.0	0	0
01/09/16	0	45	45	45.0	[illegible]	0.0	0	0
02/09/16	0	45	45	45.0	[illegible]	0.0	0	0
03/09/16	0	45	45	45.0	[illegible]	0.0	0	0
04/09/16	0	45	45	45.0	[illegible]	0.0	0	0
05/09/16	0	45	45	45.0	[illegible]	0.0	0	0
06/09/16	0	45	45	45.0	[illegible]	0.0	0	0
07/09/16	0	45	45	45.0	[illegible]	0.0	0	0
08/09/16	0	45	45	45.0	[illegible]	1975.4	1	0
09/09/16	0	45	45	45.0	[illegible]	0.0	0	0
10/09/16	0	45	45	45.0	[illegible]	0.0	0	0
11/09/16	0	45	45	45.0	[illegible]	0.0	0	0
12/09/16	0	45	45	45.0	[illegible]	0.0	0	0
13/09/16	0	45	45	45.0	[illegible]	0.0	0	0
14/09/16	0	45	45	45.0	[illegible]	0.0	0	0
15/09/16	0	45	45	45.0	[illegible]	0.0	0	0
16/09/16	0	45	45	45.0	[illegible]	0.0	0	0
17/09/16	0	45	45	45.0	[illegible]	0.0	0	0
18/09/16	0	45	45	45.0	[illegible]	0.0	0	0
19/09/16	0	45	45	45.0	[illegible]	0.0	0	0
20/09/16	0	45	45	45.0	[illegible]	0.0	0	0
21/09/16	0	45	45	45.0	[illegible]	0.0	0	0
22/09/16	0	45	45	45.0	[illegible]	0.0	0	0
23/09/16	0	45	45	45.0	[illegible]	201.1	1	0
24/09/16	0	45	45	45.0	[illegible]	0.0	0	0
25/09/16	0	45	45	45.0	[illegible]	1831.1	1	0
26/09/16	0	45	45	45.0	[illegible]	0.0	0	0
27/09/16	0	45	45	45.0	[illegible]	379.0	1	0
28/09/16	0	45	45	45.0	[illegible]	919.0	1	0
29/09/16	0	45	45	45.0	[illegible]	0.0	0	0
30/09/16	0	45	45	45.0	[illegible]	0.0	0	0
01/10/16	100	45	145	145.0	[illegible]	343.9	1	0
02/10/16	100	45	145	145.0	[illegible]	229.3	1	0
03/10/16	100	45	145	145.0	[illegible]	0.0	0	0
04/10/16	100	45	145	145.0	[illegible]	0.0	0	0
05/10/16	100	45	145	145.0	[illegible]	0.0	0	0
06/10/16	100	45	145	145.0	[illegible]	0.0	0	0
07/10/16	100	45	145	145.0	[illegible]	0.0	0	0
08/10/16	100	45	145	145.0	[illegible]	489.8	1	0
09/10/16	100	45	145	145.0	[illegible]	1005.3	1	0
10/10/16	100	45	145	145.0	[illegible]	0.0	0	0
11/10/16	100	45	145	145.0	[illegible]	0.0	0	0
12/10/16	100	45	145	145.0	[illegible]	0.0	0	0
13/10/16	100	45	145	145.0	[illegible]	0.0	0	0
14/10/16	100	45	145	145.0	[illegible]	0.0	0	0
15/10/16	100	45	145	145.0	[illegible]	500.0	1	0
16/10/16	100	45	145	145.0	[illegible]	0.0	0	0
17/10/16	100	45	145	145.0	[illegible]	0.0	0	0
18/10/16	100	45	145	145.0	[illegible]	0.0	0	0
19/10/16	100	45	145	145.0	[illegible]	0.0	0	0
20/10/16	100	45	145	145.0	[illegible]	0.0	0	0
21/10/16	100	45	145	145.0	[illegible]	0.0	0	0
22/10/16	100	45	145	145.0	[illegible]	0.0	0	0
23/10/16	100	45	145	145.0	[illegible]	0.0	0	0
24/10/16	100	45	145	145.0	[illegible]	0.0	0	0
25/10/16	100	45	145	145.0	[illegible]	0.0	0	0
26/10/16	100	45	145	145.0	[illegible]	0.0	0	0
27/10/16	100	45	145	145.0	[illegible]	0.0	0	0
28/10/16	100	45	145	145.0	[illegible]	0.0	0	0
29/10/16	100	45	145	145.0	[illegible]	0.0	0	0
30/10/16	100	45	145	145.0	[illegible]	0.0	0	0
31/10/16	100	45	145	145.0	[illegible]	0.0	0	0
01/11/16	100	45	145	145.0	[illegible]	0.0	0	0
02/11/16	100	45	145	145.0	[illegible]	0.0	0	0
03/11/16	100	45	145	145.0	[illegible]	0.0	0	0
04/11/16	100	45	145	145.0	[illegible]	0.0	0	0
05/11/16	100	45	145	145.0	[illegible]	0.0	0	0
06/11/16	100	45	145	145.0	[illegible]	0.0	0	0
07/11/16	100	45	145	145.0	[illegible]	0.0	0	0
08/11/16	100	45	145	145.0	[illegible]	0.0	0	0
09/11/16	100	45	145	145.0	[illegible]	0.0	0	0
10/11/16	100	45	145	145.0	[illegible]	0.0	0	0
11/11/16	100	45	145	145.0	[illegible]	0.0	0	0
12/11/16	100	45	145	145.0	[illegible]	0.0	0	0
13/11/16	100	45	145	145.0	[illegible]	0.0	0	0
14/11/16	100	45	145	145.0	[illegible]	0.0	0	0
15/11/16	100	45	145	145.0	[illegible]	0.0	0	0
16/11/16	100	45	145	145.0	[illegible]	0.0	0	0
17/11/16	100	45	145	145.0	[illegible]	0.0	0	0
18/11/16	100	45	145	145.0	[illegible]	0.0	0	0
19/11/16	100	45	145	145.0	[illegible]	0.0	0	0
20/11/16	100	45	145	145.0	[illegible]	0.0	0	0
21/11/16	100	45	145	145.0	[illegible]	0.0	0	0
22/11/16	100	45	145	145.0	[illegible]	0.0	0	0
23/11/16	100	45	145	145.0	[illegible]	0.0	0	0
24/11/16	100	45	145	145.0	[illegible]	0.0	0	0
25/11/16	100	45	145	145.0	[illegible]	0.0	0	0
26/11/16	100	45	145	145.0	[illegible]	0.0	0	0
27/11/16	100	45	145	145.0	[illegible]	0.0	0	0
28/11/16	100	45	145	145.0	[illegible]	0.0	0	0
29/11/16	100	45	145	145.0	[illegible]	0.0	0	0
30/11/16	100	45	145	145.0	[illegible]	0.0	0	0
01/12/16	100	45	145	145.0	[illegible]	0.0	0	0
02/12/16	100	45	145	145.0	[illegible]	0.0	0	0
03/12/16	100	45	145	145.0	[illegible]	0.0	0	0
04/12/16	100	45	145	145.0	[illegible]	0.0	0	0
05/12/16	100	45	145	145.0	[illegible]	0.0	0	0
06/12/16	100	45	145	145.0	[illegible]	0.0	0	0
07/12/16	100	45	145	145.0	[illegible]	0.0	0	0
08/12/16	100	45	145	145.0	[illegible]	0.0	0	0
09/12/16	100	45	145	145.0	[illegible]	0.0	0	0
10/12/16	100	45	145	145.0	[illegible]	0.0	0	0
11/12/16	100	45	145	145.0	[illegible]	0.0	0	0
12/12/16	100	45	145	145.0	[illegible]	0.0	0	0

Date	Timing Tests		SILO Data		Stormwater Catchment Absorption and Wetting						Pond Losses									Final pond volumes		Demand (Dust)			Abstraction				
	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)	Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Perimeter area for seepage	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m^3)	Pond Vol after abstraction (m^3)	Overflow (m^3)	Overflow flag	Pond Empty flag
13/12/16	Tuesday	12	7.5	0.4	[illegible]	0.9	2	0	7.4	0.0				14431.3	14234.0	9200	2331.2	155.8	-41.5	14275.3	14275.3	100	45	145	145.0	[illegible]	0.0	0	0
14/12/16	Wednesday	12	8.5	0	[illegible]	0.9	2	0	0.0	0.0				14130.5	13914.8	9200	2331.2	165.0	-50.7	13965.5	13965.5	100	45	145	145.0	[illegible]	0.0	0	0
15/12/16	Thursday	12	9.1	0	[illegible]	0.9	2	0	0.0	0.0				13820.5	13593.8	9200	2331.2	170.5	-56.2	13650.0	13650.0	100	45	145	145.0	[illegible]	0.0	0	0
16/12/16	Friday	12	8.2	0	[illegible]	0.9	2	0	0.0	0.0				13505.0	13294.8	9200	2331.2	162.2	-48.0	13342.8	13342.8	100	45	145	145.0	[illegible]	0.0	0	0
17/12/16	Saturday	12	6.7	0	[illegible]	0.9	2	0	0.0	0.0				13197.8	13015.2	9200	2331.2	148.4	-34.2	13049.4	13049.4	100	45	145	145.0	[illegible]	0.0	0	0
18/12/16	Sunday	12	7.3	0	[illegible]	0.9	2	0	0.0	0.0				12904.4	12710.8	9200	2331.2	153.9	-39.7	12750.4	12750.4	100	45	145	145.0	[illegible]	0.0	0	0
19/12/16	Monday	12	9.9	0	[illegible]	0.9	2	0	0.0	0.0				12605.4	12364.0	9200	2331.2	177.9	-63.6	12427.6	12427.6	100	45	145	145.0	[illegible]	0.0	0	0
20/12/16	Tuesday	12	13	0	[illegible]	0.9	2	0	0.0	0.0				12282.6	11984.1	9200	2331.2	206.4	-92.1	12076.2	12076.2	100	45	145	145.0	[illegible]	0.0	0	0
21/12/16	Wednesday	12	6.3	0	[illegible]	0.9	2	0	0.0	0.0				11931.2	11756.0	9200	2331.2	144.7	-30.5	11786.5	11786.5	100	45	145	145.0	[illegible]	0.0	0	0
22/12/16	Thursday	12	9.1	1.6	[illegible]	0.9	2	0	29.4	0.0				11641.5	11414.7	9200	2331.2	170.5	-56.2	11471.0	11471.0	100	45	145	145.0	[illegible]	0.0	0	0
23/12/16	Friday	12	8.5	0	[illegible]	0.9	2	0	0.0	0.0				11326.0	11110.3	9200	2331.2	165.0	-50.7	11161.0	11161.0	100	45	145	145.0	[illegible]	0.0	0	0
24/12/16	Saturday	12	9.2	0	[illegible]	0.9	2	0	0.0	0.0				11016.0	10787.4	9200	2331.2	171.4	-57.2	10844.6	10844.6	100	45	145	145.0	[illegible]	0.0	0	0
25/12/16	Sunday	12	8.4	0	[illegible]	0.9	2	0	0.0	0.0				10699.6	10485.7	9200	2331.2	164.3	-49.8	10535.5	10535.5	100	45	145	145.0	[illegible]	0.0	0	0
26/12/16	Monday	12	7.3	0	[illegible]	0.9	2	0	0.0	0.0				10390.5	10196.9	9200	2331.2	153.9	-39.7	10236.6	10236.6	100	45	145	145.0	[illegible]	0.0	0	0
27/12/16	Tuesday	12	6.2	1.6	[illegible]	0.9	2	0	29.4	0.0				10091.6	9918.2	9200	2331.2	143.8	-29.6	9947.7	9947.7	100	45	145	145.0	[illegible]	0.0	0	0
28/12/16	Wednesday	12	6.2	0	[illegible]	0.9	2	0	0.0	0.0				9802.7	9629.1	9200	2331.2	143.8	-29.6	9658.9	9658.9	100	45	145	145.0	[illegible]	0.0	0	0
29/12/16	Thursday	12	6	0	[illegible]	0.9	2	0	0.0	0.0				9513.9	9344.2	9200	2331.2	142.0	-27.7	9372.0	9372.0	100	45	145	145.0	[illegible]	0.0	0	0
30/12/16	Friday	12	7.2	0	[illegible]	0.9	2	0	0.0	0.0				9227.0	9035.2	9200	2331.2	153.0	-38.8	9073.9	9073.9	100	45	145	145.0	[illegible]	0.0	0	0
31/12/16	Saturday	12	8.9	0	[illegible]	0.9	2	0	0.0	0.0				8928.9	8705.3	9200	2331.2	168.7	-54.4	8760.3	8760.3	100	45	145	145.0	[illegible]	0.0	0	0
01/01/17	Sunday	1	10.6	0	[illegible]	0.9	2	0	0.0	0.0				8615.3	8360.3	4600	3415.6	92.3	-162.2	8523.1	8523.1	100	45	145	145.0	[illegible]	0.0	0	0
02/01/17	Monday	1	11.1	0	[illegible]	0.9	2	0	0.0	0.0				8378.1	8114.5	4600	3415.6	94.5	-169.1	8283.7	8283.7	100	45	145	145.0	[illegible]	0.0	0	0
03/01/17	Tuesday	1	10.9	0	[illegible]	0.9	2	0	0.0	0.0				8138.7	7878.3	4600	3415.6	93.5	-166.3	8045.1	8045.1	100	45	145	145.0	[illegible]	0.0	0	0
04/01/17	Wednesday	1	5.3	0	[illegible]	0.9	2	0	0.0	0.0				7900.1	7743.3	4600	3415.6	67.4	-89.0	7832.4	7832.4	100	45	145	145.0	[illegible]	0.0	0	0
05/01/17	Thursday	1	5.7	0	[illegible]	0.9	2	0	0.0	0.0				7687.4	7523.2	4600	3415.6	69.6	-94.6	7617.8	7617.8	100	45	145	145.0	[illegible]	0.0	0	0
06/01/17	Friday	1	6.2	0.2	[illegible]	0.9	2	0	3.7	0.0				7472.8	7299.4	4600	3415.6	71.9	-101.5	7400.9	7400.9	100	45	145	145.0	[illegible]	0.0	0	0
07/01/17	Saturday	1	8.1	0	[illegible]	0.9	2	0	0.0	0.0				7255.9	7047.5	4600	3415.6	80.6	-127.7	7175.1	7175.1	100	45	145	145.0	[illegible]	0.0	0	0
08/01/17	Sunday	1	10.3	0	[illegible]	0.9	2	0	0.0	0.0				7030.2	6781.3	4600	3415.6	90.3	-158.0	6938.4	6938.4	100	45	145	145.0	[illegible]	0.0	0	0
09/01/17	Monday	1	9.3	0	[illegible]	0.9	2	0	0.0	0.0				6794.4	6564.0	4600	3415.6	86.2	-144.2	6708.3	6708.3	100	45	145	145.0	[illegible]	0.0	0	0
10/01/17	Tuesday	1	9.3	0	[illegible]	0.9	2	0	0.0	0.0				6563.3	6332.9	4600	3415.6	86.2	-144.2	6477.1	6477.1	100	45	145	145.0	[illegible]	0.0	0	0
11/01/17	Wednesday	1	6.4	0	[illegible]	0.9	2	0	0.0	0.0				6332.1	6155.0	4600	3415.6	72.8	-104.2	6259.3	6259.3	100	45	145	145.0	[illegible]	0.0	0	0
12/01/17	Thursday	1	6.7	0.4	[illegible]	0.9	2	0	7.4	0.0				6114.3	5931.7	4600	3415.6	74.2	-108.4	6040.1	6040.1	100	45	145	145.0	[illegible]	0.0	0	0
13/01/17	Friday	1	9.7	0.2	[illegible]	0.9	2	0	3.7	0.0				5895.1	5657.3	4600	3415.6	88.8	-149.8	5807.0	5807.0	100	45	145	145.0	[illegible]	0.0	0	0
14/01/17	Saturday	1	8.7	0	[illegible]	0.9	2	0	0.0	0.0				5662.0	5442.7	4600	3415.6	83.4	-136.0	5578.6	5578.6	100	45	145	145.0	[illegible]	0.0	0	0
15/01/17	Sunday	1	7.7	0	[illegible]	0.9	2	0	0.0	0.0				5433.6	5232.7	4600	3415.6	78.8	-122.2	5354.8	5354.8	100	45	145	145.0	[illegible]	0.0	0	0
16/01/17	Monday	1	8.6	0	[illegible]	0.9	2	0	0.0	0.0				5209.8	4992.3	4600	3415.6	82.9	-134.6	5126.9	5126.9	100	45	145	145.0	[illegible]	0.0	0	0
17/01/17	Tuesday	1	9.5	0	[illegible]	0.9	2	0	0.0	0.0				4981.9	4747.8	4600	3415.6	87.1	-147.0	4894.8	4894.8	100	45	145	145.0	[illegible]	0.0	0	0
18/01/17	Wednesday	1	7.1	0	[illegible]	0.9	2	0	0.0	0.0				4749.8	4559.9	4600	3415.6	76.8	-113.9	4673.7	4673.7	100	45	145	145.0	[illegible]	0.0	0	0
19/01/17	Thursday	1	6.5	0	[illegible]	0.9	2	0	0.0	0.0				4528.7	4349.9	4600	3415.6	73.5	-105.6	4455.5	4455.5	100	45	145	145.0	[illegible]	0.0	0	0
20/01/17	Friday	1	8	0	[illegible]	0.9	2	0	0.0	0.0				4310.5	4104.0	4600	3415.6	80.2	-126.3	4230.3	4230.3	100	45	145	145.0	[illegible]	0.0	0	0
21/01/17	Saturday	1	6.8	0	[illegible]	0.9	2	0	0.0	0.0				4085.3	3900.9	4600	3415.6	74.7	-109.7	4010.6	4010.6	100	45	145	145.0	[illegible]	0.0	0	0
22/01/17	Sunday	1	5.9	0	[illegible]	0.9	2	0	0.0	0.0				3865.6	3697.7	4600	3415.6	70.5	-97.3	3795.1	3795.1	100	45	145	145.0	[illegible]	0.0	0	0
23/01/17	Monday	1	9.1	0	[illegible]	0.9	2	0	0.0	0.0				3650.1	3423.3	4600	3415.6	85.2	-141.5	3564.8	3564.8	100	45	145	145.0	[illegible]	0.0	0	0
24/01/17	Tuesday	1	10.2	0	[illegible]	0.9	2	0	0.0	0.0				3419.8	3172.8	4600	3415.6	90.2	-156.7	3329.5	3329.5	100	45	145	145.0	[illegible]	0.0	0	0
25/01/17	Wednesday	1	11.6	0	[illegible]	0.9	2	0	0.0	0.0				3184.5	2911.8	4600	3415.6	96.8	-176.0	3087.8	3087.8	100	45	145	145.0	[illegible]	0.0	0	0
26/01/17	Thursday	1	8.4	0	[illegible]	0.9	2	0	0.0	0.0				2942.8	2728.9	4600	3415.6	82.0	-131.8	2860.7	2860.7	100	45	145	145.0	[illegible]	0.0	0	0
27/01/17	Friday	1	9.8	0	[illegible]	0.9	2	0	0.0	0.0				2715.7	2476.1	4600	3415.6	88.5	-151.1	2627.3	2627.3	100	45	145	145.0	[illegible]	0.0	0	0
28/01/17	Saturday	1	3.2	0	[illegible]	0.9	2	0	0.0	0.0				2482.3	2364.1	4600	3415.6	58.2	-60.1	2424.1	2424.1	100	45	145	145.0	[illegible]	0.0	0	0
29/01/17	Sunday	1	2.5	3.4	[illegible]	0.9	2	1.4	62.6	228.1				2279.1	2401.9	4600	3415.6	54.9	-50.4	2452.3	2452.3	100	45	145	145.0	[illegible]	0.0	0	0
30/01/17	Monday	1	2.2	0.4	[illegible]	0.9	2	0	7.4	0.0				2307.3	2207.6	4600	3415.6	53.1	-46.3	2253.8	2253.8	100	45	145	145.0	[illegible]	0.0	0	0
31/01/17	Tuesday	1	6.6	15.2	[illegible]	0.9	2	13.2	279.7	2150.5				2108.8	4078.6	4600	3415.6	73.7	-107.0	4185.6	4185.6	100	45	145	145.0	[illegible]	0.0	0	0
01/02/17	Wednesday	2	6.6	1.2	[illegible]	0.9	2	0	22.1	0.0				4040.6	3859.9	4600	3415.6	73.7	-107.0	3966.9	3966.9	100	45	145	145.0	[illegible]	0.0	0	0
02/02/17	Thursday	2	7	0	[illegible]	0.9	2	0	0.0	0.0				3821.9	3633.8	4600	3415.6	75.6	-112.5	3746.3	3746.3	100	45	145	145.0	[illegible]	0.0	0	0
03/02/17	Friday	2	6.7	0	[illegible]	0.9	2	0	0.0	0.0				3601.3	3418.7	4600	3415.6	74.2	-108.4	3527.1	3527.1	100	45	145	145.0	[illegible]	0.0	0	0
04/02/17	Saturday	2	8.1	0	[illegible]	0.9	2	0	0.0	0.0				3382.1	3173.7	4600	3415.6	80.6	-127.7	3301.4	3301.4	100	45	145	145.0	[illegible]	0.0	0	0
05/02/17	Sunday	2	9.3	0	[illegible]	0.9	2	0	0.0	0.0				3156.4	2926.0	4600	3415.6	86.2	-144.2	3070.2	3070.2	100	45	145	145.0	[illegible]	0.0	0	0
06/02/17	Monday	2	5.8	0	[illegible]	0.9	2	0	0.0	0.0				2925.2	2759.2	4600	3415.6	70.2	-95.9	2855.2	2855.2	100	45	145	145.0	[illegible]	0.0	0	0
07/02/17	Tuesday	2	8.5	0	[illegible]	0.9	2	0	0.0	0.0				2710.2	2494.5	4600	3415.6	82.5	-133.2	2627.7	2627.7	100	45	145	145.0	[illegible]	0.0	0	0
08/02/17	Wednesday	2	3.2	0	[illegible]	0.9	2	0	0.0	0.0				2482.7	2364.5	4600	3415.6	58.2	-60.1	2424.6	2424.6	100	45	145	145.0	[illegible]	0.0	0	0
09/02/17	Thursday	2	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0				2279.6	2189.0	4600	3415.6	51.2	-39.4	2228.4	2228.4	100	45	145	145.0	[illegible]	0.0	0	0
10/02/17	Friday	2	4.9	62	[illegible]	0.9	2	60	1140.9	9775.1				2083.4	11709.3	9200	2331.2	131.3	-17.6	11726.8	11726.8	100	45	145	145.0	[illegible]	0.0	0	0
11/02/17	Saturday	2	6.3	13.2	[illegible]	0.9	2	11.2	242.9	1834.7				11581.6	13231.3	9200	2331.2	144.7	-30.5	13261.8	13261.8	100	45	145	145.0	[illegible]	0.0	0	0
12/02/17	Sunday	2	5.4	0.2	[illegible]	0.9	2	0	3.7	0.0				13116.6	12957.9	9200	2331.2	136.5	-22.2	12980.1	12980.1	100	45	145	145.0	[illegible]	0.0	0	0
13/02/17	Monday	2	5.6	0	[illegible]	0.9	2	0	0.0	0.0				12835.1	12672.8	9200	2331.2	138.3	-24.0	12696.8	12696.8	100	45	145	145.0	[illegible]	0.0	0	0
14/02/17	Tuesday	2	5.5	0	[illegible]	0.9	2	0	0.0	0.0				12551.8	12391.4	9200	2331.2	137.4	-23.1	12414.5	12414.5	100	45	145	145.0	[illegible]	0.0	0	0
15/02/17	Wednesday	2	7.6	0	[illegible]	0.9	2	0	0.0	0.0				12269.5	12070.3	9200	2331.2	156.7	-42.4	12112.8	12112.8	100	45	145	145.0	[illegible]	0.0	0	0
16/02/17	Thursday	2	9.1	0	[illegible]	0.9	2	0	0.0	0.0				11967.8	11741.0	9200	2331.2	170.5	-56.2	11797.3	11797.3	100	45	145	145.0	[illegible]	0.0	0	0
17/02/17	Friday	2	8.6	0	[illegible]	0.9	2	0	0.0	0.0				11652.3	11434.7	9200	2331.2	165.3	-51.6	11486.4	11486.4	100	45	145	145.0	[illegible]	0.0	0	0
18/02/17	Saturday	2	9.2	0	[illegible]	0.9	2	0	0.0	0.0				11341.4	11112.8	9200	2331.2	171.1	-57.2	11169.9	11169.9	100	45	145	145.0	[illegible]	0.0	0	0
19/02/17	Sunday	2	5.7	0	[illegible]	0.9	2	0	0.0	0.0				11024.9	10860.8	9200	2331.2	139.2	-24.9	10885.7	10885.7	100	45	145	145.0	[illegible]	0.0	0	0
20/02/17	Monday	2	5.7	0	[illegible]	0.9	2	0	0.0	0.0				10740.7	10576.6	9200	2331.2	139.2	-24.9	10601.5	10601.5	100	45	145	145.0	[illegible]	0.0	0	0
21/02/17	Tuesday	2	4.6	3.2	[illegible]	0.9	2	1.2	58.8	295.3				10456.5	10508.1	9200	2331.2	129.1	-14.8	10522.9	10522.9	100	45	145	145.0	[illegible]	0.0	0	0
22/02/17	Wednesday	2	6.1	0	[illegible]	0.9	2	0	0.0	0.0				10377.9	10206.4	9200	2331.2	142.9	-28.6	10235.0	10235.0	100	45	145	145.0	[illegible]	0.0	0	0
23/02/17	Thursday	2	8.7	0	[illegible]	0.9	2	0	0.0	0.0				10090.0	9870.6	9200	2331.2	166.3	-51.6	9923.2	9923.2	100	45	145	145.0	[illegible]	0.0	0	0
24/02/17	Friday	2	9.3	0.2	[illegible]	0.9	2	0	3.7	0.0				9778.2	9547.8	9200	2331.2	172.4	-58.1	9605.9	9605.9	100	45	145	145.0	[illegible]	0.0	0	0
25/02/17	Saturday	2	6	0	[illegible]	0.9	2	0	0.0	0.0				9460.9	9291.2	9200	2331.2	142.0	-27.7	9318.9	9318.9	100	45	145	145.0	[illegible]	0.0	0	0
26/02/17	Sunday	2	5.6	0	[illegible]	0.9	2	0	0.0	0.0				9173.9	9011.6	9200	2331.2	138.3	-24.0	9035.6	9035.6	100	45	145	145.0	[illegible]	0.0	0	0
27/02/17	Monday	2	6.1	0	[illegible]	0.9	2	0	0.0	0.0				8890.6	8719.1	9200	2331.2	142.9	-28.6	8747.7	8747.7	100	45	145	145.0	[illegible]	0.0	0	0
28/02/17	Tuesday	2	7.4	0	[illegible]	0.9	2	0	0.0	0.0				8602.7	8407.2	9200	2331.2	154.9	-40.6	8447.8	8447.8	100	45	145	145.0	[illegible]	0.0	0	0
01/03/17	Wednesday	3	2.4	0	[illegible]	0.9	2	0	0.0	0.0				8302.8	8199.4	4600	3815.6	54.4	-49.0	8248.4	8248.4	100	45	145	145.0	[illegible]	0.0	0	0
02/03/17	Thursday	3	6.3	5.2	[illegible]	0.9	2	3.2	95.7	521.3				8103.4	8449.5	9200	2331.2	144.7	-30.5	8480.0	8480.0	100	45	145	145.0	[illegible]	0.0	0	0
03/03/17	Friday	3	7.3	0	[illegible]	0.9	2	0	0.0	0.0				8335.0	8141.4	4600	3815.6	77.0	-116.6	8258.0	8258.0	100	45	145	145.0	[illegible]	0.0	0	0
04/03/17	Saturday	3	8.2	0	[illegible]	0.9	2	0	0.0	0.0				8113.0	7902.9	4600	3815.6	81.1	-129.1	8031.9	8031.9	100	45	145	145.0	[illegible]	0.0	0	0
05/03/17	Sunday	3	6.3	0	[illegible]	0.9	2	0	0.0	0.0				7886.9	7711.7	4600	3815.6	72.4	-102.8	7814.6	7814.6	100	45	145	145.0	[illegible]	0.0	0	0
06/03/17	Monday	3	5.6	0	[illegible]	0.9	2	0	0.0	0.0				7669.6	7507.2	4600	3815.6	69.1	-93.7	7600.4	7600.4	100	45	145	145.0	[illegible]	0.0	0	0
07/03/17	Tuesday	3	7.2	0	[illegible]	0.9	2	0	0.0	0.0				7455.4	7263.6	4600	3815.6	76.5	-115.3	7378.9	7378.9	100	45	145	145.0	[illegible]	0.0	0	0
08/03/17	Wednesday	3	6.9	0	[illegible]	0.9	2	0	0.0	0.0				7233.9	7047.6	4600	3815.6	75.1	-111.1	7158.8	7158.8	100	45	145	145.0	[illegible]	0.0	0	0
09/03/17	Thursday	3	7.6	0	[illegible]	0.9	2	0	0.0	0.0				7013.8	6814.6	4600	3815.6	78.3	-120.8	6935.4	6935.4	100	45	145	145.0	[illegible]	0.0	0	0
10/03/17	Friday	3	8.3	0	[illegible]	0.9	2	0	0.0	0.0				6790.4	6578.4	4600	3815.6	81.8	-130.4	6708.8	6708.8	100	45	145	145.0	[illegible]	0.0	0	0
11/03/17	Saturday	3	4	0	[illegible]	0.9	2	0	0.0	0.0				6563.8	6431.0	4600	3815.6	61.8	-71.1	6502.1	6502.1	100	45	145	145.0	[illegible]	0.0	0	0
12/03/17	Sunday	3	3.8	0	[illegible]	0.9	2	0	0.0	0.0				6357.1	6227.9	4600	3815.6	60.5	-68.3	6296.2	6296.2	100	45	145	145.0	[illegible]	0.0	0	0
13/03/17	Monday	3	5.1	12	[illegible]	0.9	2	10	220.8	1579.2				6151.2	7625.4	4600	3815.6	67.5	-87.7	7713.1	7713.1	100	45	145	145.0	[illegible]	0.0	0	0
14/03/17	Tuesday	3	5.4	2.2	[illegible]	0.9	2	0.2	40.5	32.6				7568.1	7442.0	4600	3815.6	68.2	-90.4	7532.4	7532.4	100	45	145	145.0	[illegible]	0.0	0	0
15/03/17	Wednesday	3	5.9	2.4	[illegible]	0.9	2	0.4	44.2	65.2				7387.4	7284.7	4600	3815.6	70.5	-97.3	7382.1	7382.1	100	45	145	145.0	[illegible]	0.0	0	0
16/03/17	Thursday	3	4.2	0	[illegible]	0.9	2	0	0.0	0.0				7237.1	7100.5	4600	3815.6	62.7	-73.9	7174.4	7174.4	100	45	145	145.0	[illegible]	0.0	0	0
17/03/17	Friday	3	2.4	0	[illegible]	0.9	2	0	0.0	0.0				7029.4	6925.9	4600	3815.6	54.4	-49.0	6974.9	6974.9	100	45	145	145.0	[illegible]	0.0	0	0
18/03/17	Saturday	3	5	5.2	[illegible]	0.9	2	3.2	95.7	521.3				6829.9	7200.0	4600	3815.6	66.4	-84.9	7284.9	7284.9	100	45	145	145.0	[illegible]	0.0	0	0
19/03/17	Sunday	3	3.8	0.2	[illegible]	0.9	2	0	3.7	0.0				7139.9	6973.9	4600	3815.6	70.1	-95.9	7069.8	7069.8	100	45	145	145.0	[illegible]	0.0	0	0
20/03/17	Monday	3	3.9	0	[illegible]	0.9	2	0	0.0	0.0				6924.8	6793.8	4600	3215.6	61.2	-69.7	6863.5	6863.5	100	45	145	145.0	[illegible]	0.0	0	0
21/03/17	Tuesday	3	3.7	0	[illegible]	0.9	2	0	0.0	0.0				6718.5	6591.1	4600	3215.6	60.4	-67.0	6658.1	6658.1	100	45	145	145.0	[illegible]	0.0	0	0
22/03/17	Wednesday	3	3.5	10	[illegible]	0.9	2	8	184.0	1303.3				6513.1	7692.7	4600	3215.6	59.5	-64.2	7756.9	7756.9	100	45	145	145.0	[illegible]	0.0	0	0
23/03/17	Thursday	3	4.1	4.6	[illegible]	0.9	2	2.6	84.6	423.6				7611.9	7900.8	4600	3215.6	62.2	-72.5	7973.3	7973.3	100	45	145	145.0	[illegible]	0.0	0	0
24/03/17	Friday	3	4.3	0.2	[illegible]	0.9	2	0	3.7	0.0				7828.3	7689.9	4600	3215.6	63.2	-75.2	7765.1	7765.1	100	45	145	145.0	[illegible]	0.0	0	0
25/03/17	Saturday	3	4.8	0	[illegible]	0.9	2	0	0.0	0.0				7620.1	7472.5	4600	3215.6	65.5	-82.1	7554.6	7554.6	100	45	145	145.0	[illegible]	0.0	0	0
26/03/17	Sunday	3	3.9	2.2	[illegible]	0.9	2	0.2	40.5	32.6				7409.6	7311.2	4600	3215.6	61.3	-69.7	7380.9	7380.9	100	45	145	145.0	[illegible]	0.0	0	0
27/03/17	Monday	3	3	0	[illegible]	0.9	2	0	0.0	0.0				7235.9	7121.4	4600	3215.6	57.2	-57.3	7178.7	7178.7	100	45	145	145.0	[illegible]	0.0	0	0
28/03/17	Tuesday	3	5.6	0	[illegible]	0.9	2	0	0.0	0.0				7033.7	6871.4	4600	3215.6	69.1	-93.2	6964.6	6964.6	100	45	145	145.0	[illegible]	0.0	0	0
29/03/17	Wednesday	3	6	0.2	[illegible]	0.9	2	0	3.7	0.0				6819.6	6649.5	4600	3215.6	71.0	-98.7	6748.6	6748.6	100	45	145	145.0	[illegible]	0.0	0	0
30/03/17	Thursday	3	5.6	0	[illegible]	0.9	2	0	0.0	0.0				6603.6	6441.2	4600	3215.6	69.1	-93.2	6534.4	6534.4	100	45	145	145.0	[illegible]	0.0	0	0
31/03/17	Friday	3	6.7	0	[illegible]	0.9	2	0	0.0	0.0				6389.4	6206.5	4600	3215.6	74.2	-108.4	6315.2	6315.2	100	45	145	145.0	[illegible]	0.0	0	0
01/04/17	Saturday	4	6.7	0	[illegible]	0.9	2	0	0.0	0.0				6170.2	5987.6	4600	3215.6	74.2	-108.4	6096.0	6096.0	100	45	145	145.0	[illegible]	0.0	0	0
02/04/17	Sunday	4	6.1	0	[illegible]	0.9	2	0	0.0	0.0				5951.0	5779.5	4600	3215.6	71.4	-100.1	5879.6	5879.6	100	45	145	145.0	[illegible]	0.0	0	0
03/04/17	Monday	4	5.6	0	[illegible]	0.9	2	0	0.0	0.0				5734.6	5572.2	4600	3215.6	69.1	-93.2	5665.4	5665.4	100	45	145	145.0	[illegible]	0.0	0	0
04/04/17	Tuesday	4	4.4	0	[illegible]	0.9	2	0	0.0	0.0				5520.4	5380.2	4600	3215.6	63.6	-76.6	5456.8	5456.8	100	45	145	145.0	[illegible]	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: Prelim Pond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
05/04/17	Wednesday	4	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
06/04/17	Thursday	4	4.5	0	[illegible]	0.9	2	0	0.0	0.0			
07/04/17	Friday	4	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
08/04/17	Saturday	4	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
09/04/17	Sunday	4	5.3	0	[illegible]	0.9	2	0	0.0	0.0			
10/04/17	Monday	4	4.7	0	[illegible]	0.9	2	0	0.0	0.0			
11/04/17	Tuesday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
12/04/17	Wednesday	4	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
13/04/17	Thursday	4	4.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
14/04/17	Friday	4	4.4	0	[illegible]	0.9	2	0	0.0	0.0			
15/04/17	Saturday	4	4.3	0	[illegible]	0.9	2	0	0.0	0.0			
16/04/17	Sunday	4	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
17/04/17	Monday	4	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
18/04/17	Tuesday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
19/04/17	Wednesday	4	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
20/04/17	Thursday	4	3.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
21/04/17	Friday	4	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
22/04/17	Saturday	4	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
23/04/17	Sunday	4	4	0	[illegible]	0.9	2	0	0.0	0.0			
24/04/17	Monday	4	3.9	0	[illegible]	0.9	2	0	0.0	0.0			
25/04/17	Tuesday	4	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
26/04/17	Wednesday	4	3.6	0	[illegible]	0.9	2	0	0.0	0.0			
27/04/17	Thursday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
28/04/17	Friday	4	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
29/04/17	Saturday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
30/04/17	Sunday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
01/05/17	Monday	5	3.9	0	[illegible]	0.9	2	0	0.0	0.0			
02/05/17	Tuesday	5	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
03/05/17	Wednesday	5	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
04/05/17	Thursday	5	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
05/05/17	Friday	5	3.1	12	[illegible]	0.9	2	10	220.8	1629.2			
06/05/17	Saturday	5	4.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
07/05/17	Sunday	5	3	0	[illegible]	0.9	2	0	0.0	0.0			
08/05/17	Monday	5	2.2	0	[illegible]	0.9	2	0	0.0	0.0			
09/05/17	Tuesday	5	2.8	4.4	[illegible]	0.9	2	2.4	81.0	391.0			
10/05/17	Wednesday	5	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
11/05/17	Thursday	5	2.9	0.2	[illegible]	0.9	2	0	3.7	0.0			
12/05/17	Friday	5	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
13/05/17	Saturday	5	4.7	0	[illegible]	0.9	2	0	0.0	0.0			
14/05/17	Sunday	5	3.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
15/05/17	Monday	5	2.5	10.8	[illegible]	0.9	2	8.8	198.7	1433.7			
16/05/17	Tuesday	5	2.5	10	[illegible]	0.9	2	8	184.0	1303.3			
17/05/17	Wednesday	5	3.9	0.4	[illegible]	0.9	2	0	7.4	0.0			
18/05/17	Thursday	5	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
19/05/17	Friday	5	1.5	6	[illegible]	0.9	2	4	110.4	651.7			
20/05/17	Saturday	5	2.2	8	[illegible]	0.9	2	6	147.2	977.5			
21/05/17	Sunday	5	1.9	27.2	[illegible]	0.9	2	25.2	500.5	4105.6			
22/05/17	Monday	5	1.4	8	[illegible]	0.9	2	6	147.2	977.5			
23/05/17	Tuesday	5	2	5.2	[illegible]	0.9	2	3.2	95.7	521.3			
24/05/17	Wednesday	5	2	1.4	[illegible]	0.9	2	0	25.8	0.0			
25/05/17	Thursday	5	2	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/05/17	Friday	5	1.9	3.2	[illegible]	0.9	2	1.2	58.9	195.5			
27/05/17	Saturday	5	1.9	0.4	[illegible]	0.9	2	0	7.4	0.0			
28/05/17	Sunday	5	2.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
29/05/17	Monday	5	3	0.2	[illegible]	0.9	2	0	3.7	0.0			
30/05/17	Tuesday	5	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
31/05/17	Wednesday	5	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
01/06/17	Thursday	6	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
02/06/17	Friday	6	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
03/06/17	Saturday	6	2	0.2	[illegible]	0.9	2	0	3.7	0.0			
04/06/17	Sunday	6	2.9	0.2	[illegible]	0.9	2	0	3.7	0.0			
05/06/17	Monday	6	3.3	0.4	[illegible]	0.9	2	0	7.4	0.0			
06/06/17	Tuesday	6	1.9	0	[illegible]	0.9	2	0	0.0	0.0			
07/06/17	Wednesday	6	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
08/06/17	Thursday	6	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
09/06/17	Friday	6	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
10/06/17	Saturday	6	3.6	0	[illegible]	0.9	2	0	0.0	0.0			
11/06/17	Sunday	6	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
12/06/17	Monday	6	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
13/06/17	Tuesday	6	1.7	0	[illegible]	0.9	2	0	0.0	0.0			
14/06/17	Wednesday	6	1.7	8.8	[illegible]	0.9	2	6.8	161.9	1107.8			
15/06/17	Thursday	6	1.7	0	[illegible]	0.9	2	0	0.0	0.0			
16/06/17	Friday	6	1.9	0.2	[illegible]	0.9	2	0	3.7	0.0			
17/06/17	Saturday	6	2.2	0.4	[illegible]	0.9	2	0	7.4	0.0			
18/06/17	Sunday	6	2.2	0	[illegible]	0.9	2	0	0.0	0.0			
19/06/17	Monday	6	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
20/06/17	Tuesday	6	2.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
21/06/17	Wednesday	6	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
22/06/17	Thursday	6	2.4	34.6	[illegible]	0.9	2	32.6	636.7	5311.2			
23/06/17	Friday	6	2.3	11.6	[illegible]	0.9	2	9.6	213.5	1584.0			
24/06/17	Saturday	6	1.8	0	[illegible]	0.9	2	0	0.0	0.0			
25/06/17	Sunday	6	1.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/06/17	Monday	6	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0			
27/06/17	Tuesday	6	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
28/06/17	Wednesday	6	2.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
29/06/17	Thursday	6	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
30/06/17	Friday	6	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
01/07/17	Saturday	7	1.3	15.4	[illegible]	0.9	2	13.4	283.4	2180.1			
02/07/17	Sunday	7	1.5	20.8	[illegible]	0.9	2	18.8	382.7	3062.9			
03/07/17	Monday	7	1	0	[illegible]	0.9	2	0	0.0	0.0			
04/07/17	Tuesday	7	1.7	4.4	[illegible]	0.9	2	2.4	81.0	391.0			
05/07/17	Wednesday	7	1.4	7.2	[illegible]	0.9	2	5.2	132.5	847.2			
06/07/17	Thursday	7	1.8	10.2	[illegible]	0.9	2	8.2	187.7	1335.9			
07/07/17	Friday	7	1.7	21.8	[illegible]	0.9	2	19.8	401.1	3225.8			
08/07/17	Saturday	7	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
09/07/17	Sunday	7	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
10/07/17	Monday	7	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
11/07/17	Tuesday	7	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
12/07/17	Wednesday	7	1.5	5.8	[illegible]	0.9	2	3.8	106.7	619.1			
13/07/17	Thursday	7	1.6	15.6	[illegible]	0.9	2	13.6	287.1	2215.7			
14/07/17	Friday	7	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
15/07/17	Saturday	7	2.3	0	[illegible]	0.9	2	0	0.0	0.0			
16/07/17	Sunday	7	2.1	17.4	[illegible]	0.9	2	15.4	320.2	2538.9			
17/07/17	Monday	7	4.5	0	[illegible]	0.9	2	0	0.0	0.0			
18/07/17	Tuesday	7	3	0	[illegible]	0.9	2	0	0.0	0.0			
19/07/17	Wednesday	7	2.6	17.2	[illegible]	0.9	2	15.2	316.5	2476.4			
20/07/17	Thursday	7	3.1	21	[illegible]	0.9	2	19	386.4	3095.5			
21/07/17	Friday	7	2	10.2	[illegible]	0.9	2	8.2	187.7	1335.9			
22/07/17	Saturday	7	1.8	16.6	[illegible]	0.9	2	14.6	305.5	2378.6			
23/07/17	Sunday	7	1.9	4.6	[illegible]	0.9	2	2.6	84.6	423.6			
24/07/17	Monday	7	2.3	9.8	[illegible]	0.9	2	7.8	180.3	1270.8			
25/07/17	Tuesday	7	2.1	6	[illegible]	0.9	2	4	110.4	651.7			
26/07/17	Wednesday	7	2.7	2.4	[illegible]	0.9	2	0.4	44.2	65.2			

Date	Adjustments: Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Demand (Dust): Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Abstraction: Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow Calcs: Overflow (m³)	Overflow flag	Pond Empty flag
05/04/17	5311.8	5182.6	4600.3	3615.6	60.9	-68.3	5250.9	5250.9	100	45	145	[illegible]	[illegible]	0.0	0	0
06/04/17	5105.9	4963.8	4600.3	3615.6	64.1	-78.0	5041.8	5041.8	100	45	145	[illegible]	[illegible]	0.0	0	0
07/04/17	4896.8	4760.3	4600.3	3615.6	62.7	-73.9	4834.1	4834.1	100	45	145	[illegible]	[illegible]	0.0	0	0
08/04/17	4689.1	4541.5	4600.3	3615.6	65.5	-82.1	4623.6	4623.6	100	45	145	[illegible]	[illegible]	0.0	0	0
09/04/17	4478.6	4321.8	4600.3	3615.6	67.8	-89.0	4410.9	4410.9	100	45	145	[illegible]	[illegible]	0.0	0	0
10/04/17	4265.9	4120.1	4600.3	3615.6	65.0	-80.8	4200.9	4200.9	100	45	145	[illegible]	[illegible]	0.0	0	0
11/04/17	4055.9	3914.0	4600.3	3615.6	59.0	-62.8	3996.8	3996.8	100	45	145	[illegible]	[illegible]	0.0	0	0
12/04/17	3851.8	3717.1	4600.3	3615.6	62.2	-72.5	3789.6	3789.6	100	45	145	[illegible]	[illegible]	0.0	0	0
13/04/17	3644.6	3504.3	4600.3	3615.6	63.6	-76.6	3581.0	3581.0	100	45	145	[illegible]	[illegible]	0.0	0	0
14/04/17	3436.0	3295.7	4600.3	3615.6	63.6	-76.6	3372.3	3372.3	100	45	145	[illegible]	[illegible]	0.0	0	0
15/04/17	3227.3	3088.9	4600.3	3615.6	63.2	-75.2	3164.2	3164.2	100	45	145	[illegible]	[illegible]	0.0	0	0
16/04/17	3019.2	2912.0	4600.3	3615.6	55.3	-51.8	2963.8	2963.8	100	45	145	[illegible]	[illegible]	0.0	0	0
17/04/17	2818.8	2700.7	4600.3	3615.6	58.1	-60.1	2760.7	2760.7	100	45	145	[illegible]	[illegible]	0.0	0	0
18/04/17	2615.7	2493.9	4600.3	3615.6	59.0	-62.8	2556.7	2556.7	100	45	145	[illegible]	[illegible]	0.0	0	0
19/04/17	2411.7	2282.5	4600.3	3615.6	60.9	-68.3	2350.8	2350.8	100	45	145	[illegible]	[illegible]	0.0	0	0
20/04/17	2205.8	2084.0	4600.3	3615.6	59.0	-62.8	2146.8	2146.8	100	45	145	[illegible]	[illegible]	0.0	0	0
21/04/17	2001.8	1865.2	4600.3	3615.6	61.7	-73.9	1939.1	1939.1	100	45	145	[illegible]	[illegible]	0.0	0	0
22/04/17	1794.1	1646.5	4600.3	3615.6	65.5	-82.1	1728.6	1728.6	100	45	145	[illegible]	[illegible]	0.0	0	0
23/04/17	1583.6	1450.7	4600.3	3615.6	61.8	-71.1	1521.8	1521.8	100	45	145	[illegible]	[illegible]	0.0	0	0
24/04/17	1376.8	1245.8	4600.3	3615.6	61.3	-69.7	1315.5	1315.5	100	45	145	[illegible]	[illegible]	0.0	0	0
25/04/17	1170.5	1043.1	4600.3	3615.6	60.4	-67.0	1110.1	1110.1	100	45	145	[illegible]	[illegible]	0.0	0	0
26/04/17	965.1	839.6	4600.3	3615.6	59.9	-65.6	905.1	905.1	100	45	145	[illegible]	[illegible]	0.0	0	0
27/04/17	760.1	643.8	4600.3	3615.6	57.6	-58.7	702.5	702.5	100	45	145	[illegible]	[illegible]	0.0	0	0
28/04/17	557.5	428.3	4600.3	3615.6	60.9	-68.3	496.6	496.6	100	45	145	[illegible]	[illegible]	0.0	0	0
29/04/17	496.6	385.8	4600.3	3615.6	56.3	-54.5	440.4	440.4	100	45	145	[illegible]	[illegible]	0.0	0	0
30/04/17	440.4	318.5	4600.3	3615.6	59.0	-62.8	381.3	381.3	100	45	145	[illegible]	[illegible]	0.0	0	0
01/05/17	381.3	250.3	4600.3	3615.6	61.3	-69.7	320.0	320.0	0	45	45	[illegible]	[illegible]	0.0	0	0
02/05/17	320.0	170.5	4600.3	3615.6	65.9	-83.5	254.1	254.1	0	45	45	[illegible]	[illegible]	0.0	0	0
03/05/17	254.1	145.1	4600.3	3615.6	55.8	-53.2	198.3	198.3	0	45	45	[illegible]	[illegible]	0.0	0	0
04/05/17	198.3	93.0	4600.3	3615.6	54.9	-50.4	143.4	143.4	0	45	45	[illegible]	[illegible]	0.0	0	0
05/05/17	143.4	1656.2	4600.3	3615.6	57.6	-58.7	1714.9	1714.9	0	45	45	[illegible]	[illegible]	0.0	0	0
06/05/17	1669.9	1535.2	4600.3	3615.6	62.2	-72.5	1607.7	1607.7	0	45	45	[illegible]	[illegible]	0.0	0	0
07/05/17	1562.7	1448.2	4600.3	3615.6	57.2	-57.3	1505.5	1505.5	0	45	45	[illegible]	[illegible]	0.0	0	0
08/05/17	1460.5	1360.7	4600.3	3615.6	53.5	-46.3	1407.0	1407.0	0	45	45	[illegible]	[illegible]	0.0	0	0
09/05/17	1362.0	1642.2	4600.3	3615.6	56.3	-54.5	1696.7	1696.7	0	45	45	[illegible]	[illegible]	0.0	0	0
10/05/17	1651.7	1540.9	4600.3	3615.6	56.3	-54.5	1595.4	1595.4	0	45	45	[illegible]	[illegible]	0.0	0	0
11/05/17	1550.4	1437.8	4600.3	3615.6	56.7	-55.9	1493.7	1493.7	0	45	45	[illegible]	[illegible]	0.0	0	0
12/05/17	1448.7	1345.3	4600.3	3615.6	54.4	-49.0	1394.3	1394.3	0	45	45	[illegible]	[illegible]	0.0	0	0
13/05/17	1349.3	1203.5	4600.3	3615.6	65.0	-80.8	1284.3	1284.3	0	45	45	[illegible]	[illegible]	0.0	0	0
14/05/17	1239.3	1119.3	4600.3	3615.6	58.6	-61.4	1180.7	1180.7	0	45	45	[illegible]	[illegible]	0.0	0	0
15/05/17	1135.7	2464.1	4600.3	3615.6	54.9	-50.4	2514.5	2514.5	0	45	45	[illegible]	[illegible]	0.0	0	0
16/05/17	2469.5	3667.6	4600.3	3615.6	54.9	-50.4	3718.0	3718.0	0	45	45	[illegible]	[illegible]	0.0	0	0
17/05/17	3673.0	3541.9	4600.3	3615.6	61.3	-69.7	3611.6	3611.6	0	45	45	[illegible]	[illegible]	0.0	0	0
18/05/17	3566.6	3459.5	4600.3	3615.6	55.3	-51.8	3511.3	3511.3	0	45	45	[illegible]	[illegible]	0.0	0	0
19/05/17	3466.3	4031.1	4600.3	3615.6	50.3	-36.6	4067.7	4067.7	0	45	45	[illegible]	[illegible]	0.0	0	0
20/05/17	4022.7	4900.4	4600.3	3615.6	53.5	-46.3	4946.7	4946.7	0	45	45	[illegible]	[illegible]	0.0	0	0
21/05/17	4901.7	8913.0	9200.7	7231.2	104.3	10.0	8903.0	8903.0	0	45	45	[illegible]	[illegible]	0.0	0	0
22/05/17	8858.0	9750.4	9200.7	7231.2	99.7	14.6	9735.8	9735.8	0	45	45	[illegible]	[illegible]	0.0	0	0
23/05/17	9690.8	10116.1	9200.7	7231.2	105.2	9.1	10107.0	10107.0	0	45	45	[illegible]	[illegible]	0.0	0	0
24/05/17	10062.0	9965.9	9200.7	7231.2	105.2	9.1	9956.8	9956.8	0	45	45	[illegible]	[illegible]	0.0	0	0
25/05/17	9911.8	9815.7	9200.7	7231.2	105.2	9.1	9806.7	9806.7	0	45	45	[illegible]	[illegible]	0.0	0	0
26/05/17	9761.7	9862.9	9200.7	7231.2	104.3	10.0	9852.9	9852.9	0	45	45	[illegible]	[illegible]	0.0	0	0
27/05/17	9807.9	9713.7	9200.7	7231.2	104.3	10.0	9703.6	9703.6	0	45	45	[illegible]	[illegible]	0.0	0	0
28/05/17	9658.6	9551.5	9200.7	7231.2	110.7	3.6	9547.9	9547.9	0	45	45	[illegible]	[illegible]	0.0	0	0
29/05/17	9502.9	9388.5	9200.7	7231.2	114.4	-0.1	9388.6	9388.6	0	45	45	[illegible]	[illegible]	0.0	0	0
30/05/17	9343.6	9240.1	9200.7	7231.2	108.9	5.4	9234.7	9234.7	0	45	45	[illegible]	[illegible]	0.0	0	0
31/05/17	9189.7	9106.5	9200.7	7231.2	98.7	15.5	9091.0	9091.0	0	45	45	[illegible]	[illegible]	0.0	0	0
01/06/17	9046.0	8957.3	9200.7	7231.2	101.5	12.8	8944.5	8944.5	0	0	0	[illegible]	[illegible]	0.0	0	0
02/06/17	8944.5	8857.6	9200.7	7231.2	100.6	13.7	8843.9	8843.9	0	0	0	[illegible]	[illegible]	0.0	0	0
03/06/17	8843.9	8747.8	9200.7	7231.2	105.2	9.1	8738.7	8738.7	0	0	0	[illegible]	[illegible]	0.0	0	0
04/06/17	8738.7	8626.1	9200.7	7231.2	113.5	0.8	8625.3	8625.3	0	0	0	[illegible]	[illegible]	0.0	0	0
05/06/17	8625.3	8505.3	9200.7	7231.2	117.1	-2.9	8508.1	8508.1	0	0	0	[illegible]	[illegible]	0.0	0	0
06/06/17	8508.1	8413.9	9200.7	7231.2	104.3	10.0	8403.9	8403.9	0	0	0	[illegible]	[illegible]	0.0	0	0
07/06/17	8403.9	8283.9	4600.3	3615.6	58.6	-61.4	8345.3	8345.3	0	0	0	[illegible]	[illegible]	0.0	0	0
08/06/17	8345.3	8216.1	4600.3	3615.6	60.9	-68.3	8284.5	8284.5	0	0	0	[illegible]	[illegible]	0.0	0	0
09/06/17	8284.5	8160.8	4600.3	3615.6	59.5	-64.2	8225.0	8225.0	0	0	0	[illegible]	[illegible]	0.0	0	0
10/06/17	8225.0	8099.4	4600.3	3615.6	59.9	-65.6	8165.0	8165.0	0	0	0	[illegible]	[illegible]	0.0	0	0
11/06/17	8165.0	8035.8	4600.3	3615.6	60.9	-68.3	8104.2	8104.2	0	0	0	[illegible]	[illegible]	0.0	0	0
12/06/17	8104.2	7995.2	4600.3	3615.6	55.8	-53.1	8048.3	8048.3	0	0	0	[illegible]	[illegible]	0.0	0	0
13/06/17	8048.3	7957.8	4600.3	3615.6	51.2	-39.4	7997.1	7997.1	0	0	0	[illegible]	[illegible]	0.0	0	0
14/06/17	7997.1	9014.4	9200.7	7231.2	102.4	11.9	9002.6	9002.6	0	0	0	[illegible]	[illegible]	0.0	0	0
15/06/17	9002.6	8912.0	9200.7	7231.2	102.4	11.9	8900.2	8900.2	0	0	0	[illegible]	[illegible]	0.0	0	0
16/06/17	8900.2	8805.9	9200.7	7231.2	104.3	10.0	8795.9	8795.9	0	0	0	[illegible]	[illegible]	0.0	0	0
17/06/17	8795.9	8696.1	9200.7	7231.2	107.0	7.3	8688.9	8688.9	0	0	0	[illegible]	[illegible]	0.0	0	0
18/06/17	8688.9	8589.1	9200.7	7231.2	107.0	7.3	8581.9	8581.9	0	0	0	[illegible]	[illegible]	0.0	0	0
19/06/17	8581.9	8482.1	9200.7	7231.2	107.0	7.3	8474.9	8474.9	0	0	0	[illegible]	[illegible]	0.0	0	0
20/06/17	8474.9	8367.7	4600.3	3615.6	55.3	-51.8	8419.5	8419.5	0	0	0	[illegible]	[illegible]	0.0	0	0
21/06/17	8419.5	8332.6	4600.3	3615.6	50.3	-36.6	8369.2	8369.2	0	0	0	[illegible]	[illegible]	0.0	0	0
22/06/17	8369.2	13576.9	9200.7	7231.2	108.9	5.4	13571.5	13571.5	0	0	0	[illegible]	[illegible]	0.0	0	0
23/06/17	13571.5	15033.9	9200.7	7231.2	107.9	6.3	15027.6	15027.6	0	0	0	[illegible]	[illegible]	0.0	0	0
24/06/17	15027.6	14935.2	9200.7	7231.2	103.3	10.9	14924.3	14924.3	0	0	0	[illegible]	[illegible]	0.0	0	0
25/06/17	14924.3	14835.5	9200.7	7231.2	101.5	12.8	14822.8	14822.8	0	0	0	[illegible]	[illegible]	0.0	0	0
26/06/17	14822.8	14732.2	9200.7	7231.2	102.4	11.9	14720.4	14720.4	0	0	0	[illegible]	[illegible]	0.0	0	0
27/06/17	14720.4	14622.4	9200.7	7231.2	106.1	8.2	14614.3	14614.3	0	0	0	[illegible]	[illegible]	0.0	0	0
28/06/17	14614.3	14509.0	9200.7	7231.2	109.8	4.5	14504.5	14504.5	0	0	0	[illegible]	[illegible]	0.0	0	0
29/06/17	14504.5	14386.3	9200.7	7231.2	116.2	-1.9	14388.3	14388.3	0	0	0	[illegible]	[illegible]	0.0	0	0
30/06/17	14388.3	14305.1	9200.7	7231.2	98.7	15.5	14289.5	14289.5	0	0	0	[illegible]	[illegible]	0.0	0	0
01/07/17	14289.5	16389.4	9200.7	7231.2	98.7	15.5	16373.9	16373.9	0	0	0	[illegible]	[illegible]	0.0	0	0
02/07/17	16373.9	19349.9	13801.0	10846.7	150.9	64.0	19285.9	19285.9	0	0	0	[illegible]	[illegible]	0.0	0	0
03/07/17	19285.9	19208.2	13801.0	10846.7	144.0	66.3	19142.0	19142.0	0	0	0	[illegible]	[illegible]	0.0	0	0
04/07/17	19142.0	19442.4	13801.0	10846.7	153.6	63.1	19379.3	19379.3	0	0	0	[illegible]	[illegible]	0.0	0	0
05/07/17	19379.3	20141.5	13801.0	10846.7	149.5	64.4	20077.0	20077.0	0	0	0	[illegible]	[illegible]	0.0	0	0
06/07/17	20077.0	21320.6	13801.0	10846.7	155.0	62.6	21258.0	21258.0	0	0	0	[illegible]	[illegible]	0.0	0	0
07/07/17	21258.0	24391.2	13801.0	10846.7	153.6	63.1	24330.1	24330.1	0	0	0	[illegible]	[illegible]	0.0	0	0
08/07/17	24330.1	24243.3	13801.0	10846.7	150.9	64.0	24179.3	24179.3	0	0	0	[illegible]	[illegible]	0.0	0	0
09/07/17	24179.3	24070.3	13801.0	10846.7	167.4	58.5	24011.8	24011.8	0	0	0	[illegible]	[illegible]	0.0	0	0
10/07/17	24011.8	23895.5	13801.0	10846.7	172.9	56.6	23838.9	23838.9	0	0	0	[illegible]	[illegible]	0.0	0	0
11/07/17	23838.9	23728.1	13801.0	10846.7	168.8	58.0	23670.1	23670.1	0	0	0	[illegible]	[illegible]	0.0	0	0
12/07/17	23670.1	24202.3	13801.0	10846.7	150.9	64.0	24138.3	24138.3	0	0	0	[illegible]	[illegible]	0.0	0	0
13/07/17	24138.3	26265.3	18401.3	14462.3	203.0	114.3	26151.0	26151.0	0	0	0	[illegible]	[illegible]	0.0	0	0
14/07/17	26151.0	26053.1	18401.3	14462.3	212.2	114.3	25938.8	25938.8	0	0	0	[illegible]	[illegible]	0.0	0	0
15/07/17	25938.8	25837.2	18401.3	14462.3	215.9	114.3	25723.0	25723.0	0	0	0	[illegible]	[illegible]	0.0	0	0
16/07/17	25723.0	28134.0	18401.3	14462.3	212.2	114.3	28019.7	28019.7	0	0	0	[illegible]	[illegible]	0.0	0	0
17/07/17	28019.7	27877.6	18401.3	14462.3	256.4	114.3	27763.4	27763.4	0	0	0	[illegible]	[illegible]	0.0	0	0
18/07/17	27763.4	27648.9	18401.3	14462.3	228.8	114.3	27534.6	27534.6	0	0	0	[illegible]	[illegible]	0.0	0	0
19/07/17	27534.6	29903.9	18401.3	14462.3	221.4	114.3	29789.6	29789.6	0	0	0	[illegible]	[illegible]	0.0	0	0
20/07/17	29789.6	32768.7	18401.3	14462.3	230.6	114.3	32654.5	32654.5	0	0	0	[illegible]	[illegible]	0.0	0	0
21/07/17	32654.5	33894.3	18401.3	14462.3	210.4	114.3	33780.1	33584.2	0	0	0	[illegible]	33584.2	195.8	1	0
22/07/17	33584.2	35870.4	18401.3	14462.3	206.7	114.3	35756.2	33584.2	0	0	0	[illegible]	33584.2	2171.9	1	0
23/07/17	33584.2	33913.6	18401.3	14462.3	208.5	114.3	33799.3	33584.2	0	0	0	[illegible]	33584.2	215.1	1	0
24/07/17	33584.2	34753.4	18401.3	14462.3	215.9	114.3	34639.1	33584.2	0	0	0	[illegible]	33584.2	1054.9	1	0
25/07/17	33584.2	34138.0	18401.3	14462.3	212.2	114.3	34023.7	33584.2	0	0	0	[illegible]	33584.2	439.5	1	0
26/07/17	33584.2	33540.4	18401.3	14462.3	223.2	114.3	33426.1	33426.1	0	0	0	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall Into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
27/07/17	Thursday	7	3.1	3.6	[illegible]	0.9	2	1.6	66.2	260.7			
28/07/17	Friday	7	2.7	15	[illegible]	0.9	2	13	276.0	2117.9			
29/07/17	Saturday	7	2	13.8	[illegible]	0.9	2	11.8	253.9	1922.4			
30/07/17	Sunday	7	1.9	5.6	[illegible]	0.9	2	3.6	103.0	586.5			
31/07/17	Monday	7	1.9	0.4	[illegible]	0.9	2	0	7.4	0.0			
01/08/17	Tuesday	8	1.9	29	[illegible]	0.9	2	27	533.6	4398.8			
02/08/17	Wednesday	8	2.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
03/08/17	Thursday	8	1.7	1.2	[illegible]	0.9	2	0	22.1	0.0			
04/08/17	Friday	8	1.9	6.4	[illegible]	0.9	2	4.4	117.8	716.8			
05/08/17	Saturday	8	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
06/08/17	Sunday	8	2	0	[illegible]	0.9	2	0	0.0	0.0			
07/08/17	Monday	8	1.4	0	[illegible]	0.9	2	0	0.0	0.0			
08/08/17	Tuesday	8	2	1.6	[illegible]	0.9	2	0	29.4	0.0			
09/08/17	Wednesday	8	2.1	46.2	[illegible]	0.9	2	44.2	850.1	7201.0			
10/08/17	Thursday	8	2.9	10.4	[illegible]	0.9	2	8.4	191.4	1348.5			
11/08/17	Friday	8	2.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
12/08/17	Saturday	8	3.2	29.2	[illegible]	0.9	2	27.2	537.3	4431.4			
13/08/17	Sunday	8	3.6	6	[illegible]	0.9	2	4	110.4	651.7			
14/08/17	Monday	8	3.1	12.2	[illegible]	0.9	2	10.2	224.5	1661.8			
15/08/17	Tuesday	8	3.3	14	[illegible]	0.9	2	12	257.6	1955.0			
16/08/17	Wednesday	8	2.8	4.2	[illegible]	0.9	2	2.2	77.3	358.4			
17/08/17	Thursday	8	3.3	2.2	[illegible]	0.9	2	0.2	40.5	32.6			
18/08/17	Friday	8	2.4	1.4	[illegible]	0.9	2	0	25.8	0.0			
19/08/17	Saturday	8	2.4	8.2	[illegible]	0.9	2	6.2	150.9	1010.1			
20/08/17	Sunday	8	1.6	1.6	[illegible]	0.9	2	0	29.4	0.0			
21/08/17	Monday	8	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
22/08/17	Tuesday	8	2.9	0.4	[illegible]	0.9	2	0	7.4	0.0			
23/08/17	Wednesday	8	4	0.2	[illegible]	0.9	2	0	3.7	0.0			
24/08/17	Thursday	8	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
25/08/17	Friday	8	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
26/08/17	Saturday	8	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
27/08/17	Sunday	8	3.7	0.2	[illegible]	0.9	2	0	3.7	0.0			
28/08/17	Monday	8	1.4	0	[illegible]	0.9	2	0	0.0	0.0			
29/08/17	Tuesday	8	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
30/08/17	Wednesday	8	2.3	1	[illegible]	0.9	2	0	18.4	0.0			
31/08/17	Thursday	8	2.8	2.6	[illegible]	0.9	2	0.6	47.8	97.8			
01/09/17	Friday	9	2.7	3.8	[illegible]	0.9	2	1.8	69.9	293.3			
02/09/17	Saturday	9	2.5	5.4	[illegible]	0.9	2	3.4	99.4	553.9			
03/09/17	Sunday	9	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
04/09/17	Monday	9	3.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
05/09/17	Tuesday	9	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
06/09/17	Wednesday	9	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
07/09/17	Thursday	9	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
08/09/17	Friday	9	2.9	0	[illegible]	0.9	2	0	0.0	0.0			
09/09/17	Saturday	9	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
10/09/17	Sunday	9	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
11/09/17	Monday	9	4	5	[illegible]	0.9	2	3	92.0	468.8			
12/09/17	Tuesday	9	4.1	3.8	[illegible]	0.9	2	1.8	69.9	293.3			
13/09/17	Wednesday	9	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
14/09/17	Thursday	9	5	0	[illegible]	0.9	2	0	0.0	0.0			
15/09/17	Friday	9	4	0	[illegible]	0.9	2	0	0.0	0.0			
16/09/17	Saturday	9	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
17/09/17	Sunday	9	3.8	0.2	[illegible]	0.9	2	0	3.7	0.0			
18/09/17	Monday	9	2.9	0.2	[illegible]	0.9	2	0	3.7	0.0			
19/09/17	Tuesday	9	4	0.2	[illegible]	0.9	2	0	3.7	0.0			
20/09/17	Wednesday	9	3.5	6.4	[illegible]	0.9	2	4.4	117.8	716.8			
21/09/17	Thursday	9	3.9	14.6	[illegible]	0.9	2	12.6	268.7	2057.8			
22/09/17	Friday	9	3.5	16.4	[illegible]	0.9	2	14.4	301.8	2346.0			
23/09/17	Saturday	9	2.5	9.2	[illegible]	0.9	2	7.2	169.3	1173.9			
24/09/17	Sunday	9	2.4	3.8	[illegible]	0.9	2	1.8	69.9	293.3			
25/09/17	Monday	9	3.6	23	[illegible]	0.9	2	21	423.2	3421.3			
26/09/17	Tuesday	9	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
27/09/17	Wednesday	9	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
28/09/17	Thursday	9	3.5	1	[illegible]	0.9	2	0	18.4	0.0			
29/09/17	Friday	9	3.9	1.4	[illegible]	0.9	2	0	25.8	0.0			
30/09/17	Saturday	9	5.1	0	[illegible]	0.9	2	0	0.0	0.0			
01/10/17	Sunday	10	4.3	0	[illegible]	0.9	2	0	0.0	0.0			
02/10/17	Monday	10	4.7	0	[illegible]	0.9	2	0	0.0	0.0			
03/10/17	Tuesday	10	4.8	0.2	[illegible]	0.9	2	0	3.7	0.0			
04/10/17	Wednesday	10	4.7	0	[illegible]	0.9	2	0	0.0	0.0			
05/10/17	Thursday	10	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
06/10/17	Friday	10	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
07/10/17	Saturday	10	3.4	2.6	[illegible]	0.9	2	0.6	47.8	97.8			
08/10/17	Sunday	10	4.1	1	[illegible]	0.9	2	0	18.4	0.0			
09/10/17	Monday	10	3.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
10/10/17	Tuesday	10	3.6	0	[illegible]	0.9	2	0	0.0	0.0			
11/10/17	Wednesday	10	4.8	2	[illegible]	0.9	2	0	36.8	0.0			
12/10/17	Thursday	10	7.8	0	[illegible]	0.9	2	0	0.0	0.0			
13/10/17	Friday	10	5.2	0	[illegible]	0.9	2	0	0.0	0.0			
14/10/17	Saturday	10	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
15/10/17	Sunday	10	4.3	0	[illegible]	0.9	2	0	0.0	0.0			
16/10/17	Monday	10	4.3	8.8	[illegible]	0.9	2	6.8	161.9	1107.8			
17/10/17	Tuesday	10	4.8	13.6	[illegible]	0.9	2	11.6	250.3	1889.9			
18/10/17	Wednesday	10	5.6	7.2	[illegible]	0.9	2	5.2	132.5	847.2			
19/10/17	Thursday	10	7.8	0	[illegible]	0.9	2	0	0.0	0.0			
20/10/17	Friday	10	7.9	0	[illegible]	0.9	2	0	0.0	0.0			
21/10/17	Saturday	10	6.1	0	[illegible]	0.9	2	0	0.0	0.0			
22/10/17	Sunday	10	3.4	3	[illegible]	0.9	2	1	55.2	162.9			
23/10/17	Monday	10	5	0	[illegible]	0.9	2	0	0.0	0.0			
24/10/17	Tuesday	10	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
25/10/17	Wednesday	10	4.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/10/17	Thursday	10	3.9	2.6	[illegible]	0.9	2	0.6	47.8	97.8			
27/10/17	Friday	10	3.9	7.8	[illegible]	0.9	2	5.8	143.5	944.9			
28/10/17	Saturday	10	4.9	1.4	[illegible]	0.9	2	0	25.8	0.0			
29/10/17	Sunday	10	4.8	3.2	[illegible]	0.9	2	1.2	58.9	195.5			
30/10/17	Monday	10	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
31/10/17	Tuesday	10	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
01/11/17	Wednesday	11	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
02/11/17	Thursday	11	5.6	0	[illegible]	0.9	2	0	0.0	0.0			
03/11/17	Friday	11	7.9	0	[illegible]	0.9	2	0	0.0	0.0			
04/11/17	Saturday	11	9	0	[illegible]	0.9	2	0	0.0	0.0			
05/11/17	Sunday	11	9.3	0	[illegible]	0.9	2	0	0.0	0.0			
06/11/17	Monday	11	10	0	[illegible]	0.9	2	0	0.0	0.0			
07/11/17	Tuesday	11	8.2	0	[illegible]	0.9	2	0	0.0	0.0			
08/11/17	Wednesday	11	7	0	[illegible]	0.9	2	0	0.0	0.0			
09/11/17	Thursday	11	6.7	0	[illegible]	0.9	2	0	0.0	0.0			
10/11/17	Friday	11	7.4	0	[illegible]	0.9	2	0	0.0	0.0			
11/11/17	Saturday	11	7.5	0	[illegible]	0.9	2	0	0.0	0.0			
12/11/17	Sunday	11	6.9	0	[illegible]	0.9	2	0	0.0	0.0			
13/11/17	Monday	11	9.1	1	[illegible]	0.9	2	0	18.4	0.0			
14/11/17	Tuesday	11	9.5	0	[illegible]	0.9	2	0	0.0	0.0			
15/11/17	Wednesday	11	9.8	0	[illegible]	0.9	2	0	0.0	0.0			
16/11/17	Thursday	11	4.3	0	[illegible]	0.9	2	0	0.0	0.0			

Date	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required dust suppression in north of cardup brook (m3/day)	Required dust suppression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
27/07/17	33428.1	33570.3	18401.3	14452.3	230.8	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
28/07/17	33456.2	35465.2	18401.3	14452.3	223.2	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	1766.7	1	0
29/07/17	33584.2	35410.6	18401.3	14452.3	210.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	1712.1	1	0
30/07/17	33584.2	34076.5	18401.3	14452.3	208.5	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	378.0	1	0
31/07/17	33584.2	33490.0	18401.3	14452.3	208.5	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
01/08/17	33375.7	37680.1	18401.3	14452.3	208.5	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	3981.8	1	0
02/08/17	33584.2	33486.1	18401.3	14452.3	212.2	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
03/08/17	33372.0	33281.5	18401.3	14452.3	204.8	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
04/08/17	33167.2	33785.8	18401.3	14452.3	208.5	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	91.3	1	0
05/08/17	33584.2	33484.4	18401.3	14452.3	214.0	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
06/08/17	33370.2	33274.1	18401.3	14452.3	210.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
07/08/17	33159.8	33074.8	18401.3	14452.3	199.3	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
08/08/17	32960.5	32864.4	18401.3	14452.3	210.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
09/08/17	32750.2	39853.1	18401.3	14452.3	212.2	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	6154.8	1	0
10/08/17	33584.2	34840.1	18401.3	14452.3	226.9	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	1141.6	1	0
11/08/17	33584.2	33478.9	18401.3	14452.3	219.6	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
12/08/17	33364.7	37677.9	18401.3	14452.3	232.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	3979.4	1	0
13/08/17	33584.2	34110.4	18401.3	14452.3	239.8	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	411.9	1	0
14/08/17	33584.2	35129.7	18401.3	14452.3	230.6	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	1431.2	1	0
15/08/17	33584.2	35419.2	18401.3	14452.3	234.3	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	1720.8	1	0
16/08/17	33584.2	33831.8	18401.3	14452.3	225.1	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	133.4	1	0
17/08/17	33584.2	33496.8	18401.3	14452.3	234.3	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
18/08/17	33382.5	33279.1	18401.3	14452.3	217.7	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
19/08/17	33164.8	34071.5	18401.3	14452.3	217.7	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	373.0	1	0
20/08/17	33584.2	33495.5	18401.3	14462.3	203.0	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
21/08/17	33381.2	33275.9	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
22/08/17	33161.7	33049.0	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
23/08/17	32934.8	32801.9	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
24/08/17	32687.6	32569.4	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
25/08/17	32455.2	32348.1	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
26/08/17	32233.8	32086.2	18401.3	14462.3	261.9	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
27/08/17	31971.9	31844.5	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
28/08/17	31730.3	31645.2	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
29/08/17	31531.0	31425.7	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
30/08/17	31311.4	31209.8	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
31/08/17	31095.5	31082.5	18401.3	14462.3	225.1	114.3	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	0.0	0	0
01/09/17	30968.2	31152.5	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
02/09/17	30993.2	31441.9	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
03/09/17	31282.6	31175.5	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
04/09/17	31016.2	30890.7	18401.3	14462.3	239.8	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
05/09/17	30731.4	30587.0	18401.3	14462.3	263.7	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
06/09/17	30412.7	30275.1	18401.3	14462.3	261.9	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
07/09/17	30115.9	29991.2	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
08/09/17	29832.9	29720.1	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
09/09/17	29561.0	29453.9	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
10/09/17	29294.6	29185.6	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
11/09/17	29026.4	29382.2	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
12/09/17	29223.0	29381.5	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
13/09/17	29222.2	29085.7	18401.3	14462.3	250.8	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
14/09/17	28926.4	28775.1	18401.3	14462.3	265.6	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
15/09/17	28615.8	28483.0	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
16/09/17	28323.7	28200.0	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
17/09/17	28040.7	27911.5	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
18/09/17	27752.3	27639.6	18401.3	14462.3	226.9	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
19/09/17	27480.4	27347.5	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
20/09/17	27188.2	27781.4	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
21/09/17	27622.1	29543.8	18401.3	14462.3	245.3	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
22/09/17	29384.6	31606.9	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
23/09/17	31447.6	32515.4	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
24/09/17	32356.1	32545.9	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
25/09/17	32386.6	35678.7	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	1980.2	1	0
26/09/17	33539.2	33432.1	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
27/09/17	33272.8	33174.9	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
28/09/17	33015.6	32891.9	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
29/09/17	32732.7	32601.6	18401.3	14462.3	245.3	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
30/09/17	32442.4	32289.2	18401.3	14462.3	267.4	114.3	[illegible]	[illegible]	0	45	45	[illegible]	[illegible]	0.0	0	0
01/10/17	32130.0	31991.6	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/10/17	31732.3	31586.5	18401.3	14462.3	260.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/10/17	31327.3	31179.7	18401.3	14462.3	261.9	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/10/17	30920.4	30774.6	18401.3	14462.3	260.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/10/17	30515.4	30378.8	18401.3	14462.3	250.8	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/10/17	30119.5	30001.4	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/10/17	29742.1	29718.0	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/10/17	29458.7	29324.0	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/10/17	29064.7	28942.9	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/10/17	28683.6	28558.1	18401.3	14462.3	239.8	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/10/17	28298.8	28151.2	18401.3	14462.3	261.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/10/17	27892.0	27689.1	18401.3	14462.3	317.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/10/17	27429.9	27274.9	18401.3	14462.3	269.2	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/10/17	27015.6	26868.0	18401.3	14462.3	261.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/10/17	26608.8	26470.4	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/10/17	26211.1	27180.5	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/10/17	26921.3	28663.5	18401.3	14462.3	261.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/10/17	28404.3	29089.1	18401.3	14462.3	276.5	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/10/17	28829.8	28627.0	18401.3	14462.3	317.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/10/17	28367.8	28163.1	18401.3	14462.3	318.9	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/10/17	27903.8	27732.3	18401.3	14462.3	285.5	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/10/17	27473.0	27514.1	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/10/17	27254.9	27103.6	18401.3	14462.3	265.5	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/10/17	26844.3	26709.6	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/10/17	26450.3	26311.9	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/10/17	26052.6	26019.3	18401.3	14462.3	245.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/10/17	25760.1	26574.0	18401.3	14462.3	245.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/10/17	26314.7	26165.2	18401.3	14462.3	263.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/10/17	25906.0	25951.9	18401.3	14462.3	261.3	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/10/17	25694.6	25545.2	18401.3	14462.3	263.7	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/10/17	25285.9	25138.3	13801.8	10846.7	196.4	48.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/11/17	24944.5	24767.4	13801.8	10846.7	218.3	41.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/11/17	24581.0	24418.7	13801.8	10846.7	207.4	45.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/11/17	24228.6	24023.9	13801.8	10846.7	239.2	34.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/11/17	23844.4	23619.5	13801.8	10846.7	254.4	29.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/11/17	23445.0	23214.6	13801.8	10846.7	258.5	28.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/11/17	23041.5	22798.2	13801.8	10846.7	268.2	24.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/11/17	22628.3	22418.1	13801.8	10846.7	243.3	33.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/11/17	22240.0	22051.9	13801.8	10846.7	226.3	38.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/11/17	21868.2	21685.6	13801.8	10846.7	222.5	40.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/11/17	21500.6	21305.1	13801.8	10846.7	232.1	36.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/11/17	21123.3	20926.0	13801.8	10846.7	233.7	36.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/11/17	20744.6	20558.4	13801.8	10846.7	225.4	39.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/11/17	20374.2	20147.5	13801.8	10846.7	255.7	29.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/11/17	19973.5	19739.4	13801.8	10846.7	261.1	27.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/11/17	19567.2	19337.6	13801.8	10846.7	265.1	25.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/11/17	19156.8	19018.4	13801.8	10846.7	189.5	51.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)	Volume at start of period (m³)	Prelim pond volume - corrections for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Required duct expression in north of cardup brook (m3/day)	Required duct expression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
17/11/17	Friday	11	5.4	0	[illegible]	0.9	2	0	0.0	0.0				18822.3	18663.7	13801.0	10846.7	204.7	46.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/11/17	Saturday	11	4.7	3.4	[illegible]	0.9	2	1.4	62.6	228.1				18472.6	18554.9	13801.0	10846.7	195.0	49.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/11/17	Sunday	11	5.3	0	[illegible]	0.9	2	0	0.0	0.0				18360.7	18203.9	13801.0	10846.7	203.3	46.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/11/17	Monday	11	7.1	0	[illegible]	0.9	2	0	0.0	0.0				18012.4	17822.5	13801.0	10846.7	228.1	38.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/11/17	Tuesday	11	8.8	0	[illegible]	0.9	2	0	0.0	0.0				17639.1	17418.0	13801.0	10846.7	251.6	30.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/11/17	Wednesday	11	9.2	0	[illegible]	0.9	2	0	0.0	0.0				17242.6	17014.1	13801.0	10846.7	257.1	28.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/11/17	Thursday	11	8.2	0	[illegible]	0.9	2	0	0.0	0.0				16840.5	16630.3	9200.7	7231.2	162.2	-48.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/11/17	Friday	11	8.5	0	[illegible]	0.9	2	0	0.0	0.0				16533.3	16317.6	9200.7	7231.2	165.0	-50.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/11/17	Saturday	11	8.4	0	[illegible]	0.9	2	0	0.0	0.0				16223.3	16009.4	9200.7	7231.2	164.1	-49.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/11/17	Sunday	11	5.8	0	[illegible]	0.9	2	0	0.0	0.0				15914.2	15748.2	9200.7	7231.2	140.1	-25.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/11/17	Monday	11	5.5	0	[illegible]	0.9	2	0	0.0	0.0				15629.1	15468.6	9200.7	7231.2	137.4	-23.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/11/17	Tuesday	11	5.1	0	[illegible]	0.9	2	0	0.0	0.0				15346.7	15193.6	9200.7	7231.2	133.7	-19.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/11/17	Wednesday	11	6.6	0	[illegible]	0.9	2	0	0.0	0.0				15068.0	14887.3	9200.7	7231.2	147.5	-31.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/11/17	Thursday	11	7.9	0	[illegible]	0.9	2	0	0.0	0.0				14775.5	14570.9	9200.7	7231.2	159.5	-45.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/12/17	Friday	12	9.6	0	[illegible]	0.9	2	0	0.0	0.0				14471.1	14235.1	9200.7	7231.2	175.1	-60.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/12/17	Saturday	12	8.9	0	[illegible]	0.9	2	0	0.0	0.0				14151.0	13927.9	9200.7	7231.2	168.7	-54.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/12/17	Sunday	12	2.1	0	[illegible]	0.9	2	0	0.0	0.0				13837.3	13739.4	9200.7	7231.2	106.1	8.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/12/17	Monday	12	6	7	[illegible]	0.9	2	5	128.8	814.6				13586.2	14231.1	9200.7	7231.2	142.0	-27.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/12/17	Tuesday	12	8.2	0	[illegible]	0.9	2	0	0.0	0.0				14113.8	13903.7	9200.7	7231.2	162.2	-48.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/12/17	Wednesday	12	8.2	0	[illegible]	0.9	2	0	0.0	0.0				13806.6	13596.4	9200.7	7231.2	162.2	-48.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/12/17	Thursday	12	10.8	0	[illegible]	0.9	2	0	0.0	0.0				13499.4	13241.4	9200.7	7231.2	186.1	-71.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/12/17	Friday	12	7.6	0	[illegible]	0.9	2	0	0.0	0.0				13168.3	12969.1	9200.7	7231.2	156.7	-42.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/12/17	Saturday	12	8.9	0	[illegible]	0.9	2	0	0.0	0.0				12866.6	12643.5	9200.7	7231.2	168.7	-54.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/12/17	Sunday	12	8.3	0	[illegible]	0.9	2	0	0.0	0.0				12552.9	12340.9	9200.7	7231.2	163.1	-48.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/12/17	Monday	12	6.7	0	[illegible]	0.9	2	0	0.0	0.0				12244.8	12062.2	9200.7	7231.2	148.4	-34.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/12/17	Tuesday	12	6.1	0	[illegible]	0.9	2	0	0.0	0.0				11951.3	11779.8	9200.7	7231.2	142.9	-28.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/12/17	Wednesday	12	7.1	0	[illegible]	0.9	2	0	0.0	0.0				11663.4	11473.5	9200.7	7231.2	152.1	-37.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/12/17	Thursday	12	7.4	0	[illegible]	0.9	2	0	0.0	0.0				11366.3	11170.9	9200.7	7231.2	154.9	-40.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/12/17	Friday	12	6.9	0	[illegible]	0.9	2	0	0.0	0.0				11066.5	10880.2	9200.7	7231.2	150.3	-36.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/12/17	Saturday	12	4.4	0	[illegible]	0.9	2	0	0.0	0.0				10771.2	10631.0	9200.7	7231.2	127.3	-13.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/12/17	Sunday	12	4.1	6.8	[illegible]	0.9	2	4.8	125.1	782.0				10499.0	11146.2	9200.7	7231.2	124.5	-10.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/12/17	Monday	12	6	28.8	[illegible]	0.9	2	26.8	530.0	[illegible]				11011.5	15208.0	9200.7	7231.2	142.0	-27.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/12/17	Tuesday	12	7.6	5.6	[illegible]	0.9	2	3.6	103.0	586.5				15090.7	15478.1	9200.7	7231.2	156.7	-42.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/12/17	Wednesday	12	9.4	0	[illegible]	0.9	2	0	0.0	0.0				15375.5	15143.3	9200.7	7231.2	173.3	-59.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/12/17	Thursday	12	8.1	0	[illegible]	0.9	2	0	0.0	0.0				15057.3	14848.9	9200.7	7231.2	161.3	-47.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/12/17	Friday	12	8.3	0	[illegible]	0.9	2	0	0.0	0.0				14751.0	14539.0	9200.7	7231.2	163.1	-48.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/12/17	Saturday	12	10.3	0	[illegible]	0.9	2	0	0.0	0.0				14442.8	14194.0	9200.7	7231.2	181.5	-67.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/12/17	Sunday	12	8.3	0	[illegible]	0.9	2	0	0.0	0.0				14116.3	13904.3	9200.7	7231.2	163.1	-48.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/12/17	Monday	12	6.5	0	[illegible]	0.9	2	0	0.0	0.0				13808.1	13629.3	9200.7	7231.2	146.6	-32.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/12/17	Tuesday	12	6.8	0	[illegible]	0.9	2	0	0.0	0.0				13516.6	13332.2	9200.7	7231.2	149.3	-35.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/12/17	Wednesday	12	9.3	0	[illegible]	0.9	2	0	0.0	0.0				13221.1	12991.8	9200.7	7231.2	171.3	-58.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/12/17	Thursday	12	7.4	0	[illegible]	0.9	2	0	0.0	0.0				12904.9	12709.4	9200.7	7231.2	154.9	-40.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/12/17	Friday	12	7.8	0	[illegible]	0.9	2	0	0.0	0.0				12605.0	12402.2	9200.7	7231.2	158.5	-44.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/12/17	Saturday	12	5.9	0	[illegible]	0.9	2	0	0.0	0.0				12301.5	12133.7	9200.7	7231.2	141.1	-26.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/12/17	Sunday	12	7.8	0	[illegible]	0.9	2	0	0.0	0.0				12015.4	11812.6	9200.7	7231.2	158.5	-44.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/01/18	Monday	1	9.2	0	[illegible]	0.9	2	0	0.0	0.0				11711.9	11483.3	9200.7	7231.2	171.4	-57.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/01/18	Tuesday	1	10.2	0	[illegible]	0.9	2	0	0.0	0.0				11395.5	11148.5	9200.7	7231.2	180.6	-66.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/01/18	Wednesday	1	10.6	0	[illegible]	0.9	2	0	0.0	0.0				11069.9	10815.5	9200.7	7231.2	184.3	-70.0	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/01/18	Thursday	1	7.9	0	[illegible]	0.9	2	0	0.0	0.0				10740.6	10535.9	9200.7	7231.2	159.5	-45.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/01/18	Friday	1	6.4	0	[illegible]	0.9	2	0	0.0	0.0				10436.1	10259.1	9200.7	7231.2	145.7	-31.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/01/18	Saturday	1	6.8	0	[illegible]	0.9	2	0	0.0	0.0				10145.4	9961.0	9200.7	7231.2	149.3	-35.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/01/18	Sunday	1	10.1	0	[illegible]	0.9	2	0	0.0	0.0				9851.1	9606.0	9200.7	7231.2	179.7	-65.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/01/18	Monday	1	10.4	0	[illegible]	0.9	2	0	0.0	0.0				9526.4	9275.8	9200.7	7231.2	182.5	-68.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/01/18	Tuesday	1	4	0	[illegible]	0.9	2	0	0.0	0.0				9198.9	9066.1	9200.7	7231.2	123.6	-9.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/01/18	Wednesday	1	6	0	[illegible]	0.9	2	0	0.0	0.0				8930.4	8760.7	9200.7	7231.2	142.0	-27.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/01/18	Thursday	1	3.3	1.8	[illegible]	0.9	2	0	33.1	0.0				8643.4	8523.4	9200.7	7231.2	117.1	-2.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/01/18	Friday	1	6.3	0	[illegible]	0.9	2	0	0.0	0.0				8383.3	8206.0	4600.3	3615.6	72.4	-102.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/01/18	Saturday	1	8.1	0	[illegible]	0.9	2	0	0.0	0.0				8163.9	7955.6	4600.3	3615.6	80.6	-127.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/01/18	Sunday	1	8.9	0	[illegible]	0.9	2	0	0.0	0.0				7938.2	7715.2	4600.3	3615.6	84.3	-138.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/01/18	Monday	1	7.7	0.8	[illegible]	0.9	2	0	14.7	0.0				7708.9	7507.9	4600.3	3615.6	78.8	-122.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/01/18	Tuesday	1	8.2	117.4	[illegible]	0.9	2	115.4	2160.3	[illegible]				7485.1	26075.8	18401.3	14462.3	324.4	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/01/18	Wednesday	1	8.4	1.2	[illegible]	0.9	2	0	22.1	0.0				25816.5	25602.6	18401.3	14462.3	328.1	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/01/18	Thursday	1	8.1	4.8	[illegible]	0.9	2	2.8	88.3	456.2				25343.4	25591.2	18401.3	14462.3	322.6	114.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/01/18	Friday	1	7.3	0	[illegible]	0.9	2	0	0.0	0.0				25331.9	25138.3	13801.0	10846.7	230.9	37.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/01/18	Saturday	1	7.4	0	[illegible]	0.9	2	0	0.0	0.0				24956.0	24760.6	13801.0	10846.7	232.3	36.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/01/18	Sunday	1	6.6	0	[illegible]	0.9	2	0	0.0	0.0				24578.7	24398.0	13801.0	10846.7	221.2	40.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/01/18	Monday	1	8.1	0	[illegible]	0.9	2	0	0.0	0.0				24212.5	24004.2	13801.0	10846.7	241.9	33.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/01/18	Tuesday	1	10.3	0	[illegible]	0.9	2	0	0.0	0.0				23825.5	23576.7	13801.0	10846.7	272.3	23.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/01/18	Wednesday	1	10	0	[illegible]	0.9	2	0	0.0	0.0				23408.2	23164.9	13801.0	10846.7	268.2	24.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/01/18	Thursday	1	9.2	0	[illegible]	0.9	2	0	0.0	0.0				22995.1	22756.5	13801.0	10846.7	257.1	28.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/01/18	Friday	1	8.2	0	[illegible]	0.9	2	0	0.0	0.0				22592.9	22387.8	13801.0	10846.7	243.3	33.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/01/18	Saturday	1	7.5	0	[illegible]	0.9	2	0	0.0	0.0				22204.6	22007.3	13801.0	10846.7	233.7	36.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/01/18	Sunday	1	6.6	0	[illegible]	0.9	2	0	0.0	0.0				21825.9	21645.2	13801.0	10846.7	221.2	40.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
29/01/18	Monday	1	6.3	0	[illegible]	0.9	2	0	0.0	0.0				21459.7	21284.5	13801.0	10846.7	217.1	41.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
30/01/18	Tuesday	1	6.3	0	[illegible]	0.9	2	0	0.0	0.0				21097.6	20922.4	13801.0	10846.7	217.1	41.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
31/01/18	Wednesday	1	6.3	0	[illegible]	0.9	2	0	0.0	0.0				20735.5	20560.3	13801.0	10846.7	217.1	41.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/02/18	Thursday	2	5.1	0	[illegible]	0.9	2	0	0.0	0.0				20373.4	20220.2	13801.0	10846.7	200.5	47.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/02/18	Friday	2	6.7	0	[illegible]	0.9	2	0	0.0	0.0				20027.8	19845.3	13801.0	10846.7	222.6	40.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/02/18	Saturday	2	6	0	[illegible]	0.9	2	0	0.0	0.0				19660.2	19490.5	13801.0	10846.7	213.0	43.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/02/18	Sunday	2	7.6	0	[illegible]	0.9	2	0	0.0	0.0				19302.2	19103.1	13801.0	10846.7	235.0	35.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/02/18	Monday	2	7.5	0	[illegible]	0.9	2	0	0.0	0.0				18922.1	18724.9	13801.0	10846.7	233.7	36.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/02/18	Tuesday	2	8	0	[illegible]	0.9	2	0	0.0	0.0				18543.5	18337.0	13801.0	10846.7	240.6	34.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/02/18	Wednesday	2	6.1	0	[illegible]	0.9	2	0	0.0	0.0				18157.9	17986.4	13801.0	10846.7	214.3	42.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/02/18	Thursday	2	7.4	0	[illegible]	0.9	2	0	0.0	0.0				17798.6	17603.2	13801.0	10846.7	232.3	36.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/02/18	Friday	2	9.9	0	[illegible]	0.9	2	0	0.0	0.0				17421.3	17179.9	13801.0	10846.7	266.8	25.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
10/02/18	Saturday	2	7.7	0	[illegible]	0.9	2	0	0.0	0.0				17009.5	16808.6	13801.0	10846.7	236.4	35.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
11/02/18	Sunday	2	5.1	0	[illegible]	0.9	2	0	0.0	0.0				16628.1	16475.0	9200.7	7231.2	133.7	-19.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
12/02/18	Monday	2	4.8	0	[illegible]	0.9	2	0	0.0	0.0				16349.4	16201.8	9200.7	7231.2	110.9	-16.7	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
13/02/18	Tuesday	2	6.5	0	[illegible]	0.9	2	0	0.0	0.0				16073.5	15894.6	9200.7	7231.2	146.6	-32.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
14/02/18	Wednesday	2	6.4	0	[illegible]	0.9	2	0	0.0	0.0				15781.9	15604.8	9200.7	7231.2	145.7	-31.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
15/02/18	Thursday	2	6.6	0	[illegible]	0.9	2	0	0.0	0.0				15491.2	15310.5	9200.7	7231.2	147.5	-33.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
16/02/18	Friday	2	5.4	0	[illegible]	0.9	2	0	0.0	0.0				15198.7	15040.1	9200.7	7231.2	136.5	22.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
17/02/18	Saturday	2	6.4	0.2	[illegible]	0.9	2	0	3.7	0.0				14917.3	14740.2	9200.7	7231.2	145.7	-31.4	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
18/02/18	Sunday	2	8.7	0.2	[illegible]	0.9	2	0	3.7	0.0				14626.6	14407.2	9200.7	7231.2	166.8	-52.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
19/02/18	Monday	2	6.7	0	[illegible]	0.9	2	0	0.0	0.0				14314.8	14132.2	9200.7	7231.2	148.4	-34.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
20/02/18	Tuesday	2	4.5	0	[illegible]	0.9	2	0	0.0	0.0				14021.4	13879.3	9200.7	7231.2	128.2	-13.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
21/02/18	Wednesday	2	5.8	0	[illegible]	0.9	2	0	0.0	0.0				13748.2	13582.2	9200.7	7231.2	140.1	-25.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
22/02/18	Thursday	2	6.8	0	[illegible]	0.9	2	0	0.0	0.0				13463.1	13278.7	9200.7	7231.2	149.3	-35.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
23/02/18	Friday	2	6.7	0	[illegible]	0.9	2	0	0.0	0.0				13168.7	12986.2	9200.7	7231.2	148.4	-34.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
24/02/18	Saturday	2	6.5	0	[illegible]	0.9	2	0	0.0	0.0				12875.3	12696.4	9200.7	7231.2	146.6	-32.3	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
25/02/18	Sunday	2	7.4	0	[illegible]	0.9	2	0	0.0	0.0				12583.7	12388.3	9200.7	7231.2	154.9	-40.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
26/02/18	Monday	2	8.3	0	[illegible]	0.9	2	0	0.0	0.0				12283.9	12071.9	9200.7	7231.2	163.1	-48.9	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
27/02/18	Tuesday	2	8.7	0.4	[illegible]	0.9	2	0	7.4	0.0				11975.7	11756.4	9200.7	7231.2	166.8	-52.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
28/02/18	Wednesday	2	7.9	0	[illegible]	0.9	2	0	0.0	0.0				11663.9	11459.3	9200.7	7231.2	159.5	-45.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
01/03/18	Thursday	3	4.6	0	[illegible]	0.9	2	0	0.0	0.0				11359.5	11215.5	9200.7	7231.2	129.1	-14.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
02/03/18	Friday	3	4.9	0	[illegible]	0.9	2	0	0.0	0.0				11085.4	10935.9	9200.7	7231.2	131.9	-17.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
03/03/18	Saturday	3	5.5	0	[illegible]	0.9	2	0	0.0	0.0				10808.5	10648.0	9200.7	7231.2	137.4	-23.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
04/03/18	Sunday	3	8.6	0	[illegible]	0.9	2	0	0.0	0.0				10526.1	10308.6	9200.7	7231.2	165.9	-51.6	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
05/03/18	Monday	3	9.1	0	[illegible]	0.9	2	0	0.0	0.0				10215.2	9988.5	9200.7	7231.2	170.5	-56.2	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
06/03/18	Tuesday	3	8.4	0	[illegible]	0.9	2	0	0.0	0.0				9899.7	9685.9	9200.7	7231.2	164.1	-49.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
07/03/18	Wednesday	3	8	0	[illegible]	0.9	2	0	0.0	0.0				9590.7	9384.2	9200.7	7231.2	160.4	-46.1	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
08/03/18	Thursday	3	3.4	0	[illegible]	0.9	2	0	0.0	0.0				9285.3	9163.4	9200.7	7231.2	118.1	-3.8	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0
09/03/18	Friday	3	3.7	0	[illegible]	0.9	2	0	0.0	0.0				9021.2	8894.9	9200.7	7231.2	120.8	-6.5	[illegible]	[illegible]	100	45	145	[illegible]	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	[illegible]	Applied rainfall after initial loss (mm)	[illegible]	[illegible]	PrelimPond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
10/03/18	Saturday	3	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
11/03/18	Sunday	3	4.4	0	[illegible]	0.9	2	0	0.0	0.0			
12/03/18	Monday	3	5.5	0	[illegible]	0.9	2	0	0.0	0.0			
13/03/18	Tuesday	3	6.1	0	[illegible]	0.9	2	0	0.0	0.0			
14/03/18	Wednesday	3	8.2	1	[illegible]	0.9	2	0	18.4	0.0			
15/03/18	Thursday	3	8.1	4.6	[illegible]	0.9	2	2.6	84.6	423.6			
16/03/18	Friday	3	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
17/03/18	Saturday	3	4.8	0	[illegible]	0.9	2	0	0.0	0.0			
18/03/18	Sunday	3	5.1	0	[illegible]	0.9	2	0	0.0	0.0			
19/03/18	Monday	3	4.3	0	[illegible]	0.9	2	0	0.0	0.0			
20/03/18	Tuesday	3	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
21/03/18	Wednesday	3	4	0	[illegible]	0.9	2	0	0.0	0.0			
22/03/18	Thursday	3	3.9	0	[illegible]	0.9	2	0	0.0	0.0			
23/03/18	Friday	3	4.7	0	[illegible]	0.9	2	0	0.0	0.0			
24/03/18	Saturday	3	6.4	0	[illegible]	0.9	2	0	0.0	0.0			
25/03/18	Sunday	3	4.9	0	[illegible]	0.9	2	0	0.0	0.0			
26/03/18	Monday	3	5.8	1	[illegible]	0.9	2	0	18.4	0.0			
27/03/18	Tuesday	3	6.3	4.8	[illegible]	0.9	2	2.8	88.3	456.2			
28/03/18	Wednesday	3	5.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
29/03/18	Thursday	3	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
30/03/18	Friday	3	4.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
31/03/18	Saturday	3	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
01/04/18	Sunday	4	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
02/04/18	Monday	4	3	0	[illegible]	0.9	2	0	0.0	0.0			
03/04/18	Tuesday	4	3.6	0	[illegible]	0.9	2	0	0.0	0.0			
04/04/18	Wednesday	4	3	0	[illegible]	0.9	2	0	0.0	0.0			
05/04/18	Thursday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
06/04/18	Friday	4	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
07/04/18	Saturday	4	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
08/04/18	Sunday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
09/04/18	Monday	4	4.2	0	[illegible]	0.9	2	0	0.0	0.0			
10/04/18	Tuesday	4	6.5	2	[illegible]	0.9	2	0	36.8	0.0			
11/04/18	Wednesday	4	3	0.2	[illegible]	0.9	2	0	3.7	0.0			
12/04/18	Thursday	4	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
13/04/18	Friday	4	2.3	4.4	[illegible]	0.9	2	2.4	81.0	391.0			
14/04/18	Saturday	4	3	0.2	[illegible]	0.9	2	0	3.7	0.0			
15/04/18	Sunday	4	4	0.4	[illegible]	0.9	2	0	7.4	0.0			
16/04/18	Monday	4	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
17/04/18	Tuesday	4	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
18/04/18	Wednesday	4	2.7	3.6	[illegible]	0.9	2	1.6	66.2	260.7			
19/04/18	Thursday	4	3.2	0.4	[illegible]	0.9	2	0	7.4	0.0			
20/04/18	Friday	4	3	0	[illegible]	0.9	2	0	0.0	0.0			
21/04/18	Saturday	4	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
22/04/18	Sunday	4	4	0	[illegible]	0.9	2	0	0.0	0.0			
23/04/18	Monday	4	6	0	[illegible]	0.9	2	0	0.0	0.0			
24/04/18	Tuesday	4	4.4	0.4	[illegible]	0.9	2	0	7.4	0.0			
25/04/18	Wednesday	4	3.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/04/18	Thursday	4	2.9	0	[illegible]	0.9	2	0	0.0	0.0			
27/04/18	Friday	4	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
28/04/18	Saturday	4	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
29/04/18	Sunday	4	5.4	0	[illegible]	0.9	2	0	0.0	0.0			
30/04/18	Monday	4	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
01/05/18	Tuesday	5	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
02/05/18	Wednesday	5	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
03/05/18	Thursday	5	3.8	0.4	[illegible]	0.9	2	0	7.4	0.0			
04/05/18	Friday	5	4	0	[illegible]	0.9	2	0	0.0	0.0			
05/05/18	Saturday	5	4	0.2	[illegible]	0.9	2	0	3.7	0.0			
06/05/18	Sunday	5	4.2	1.6	[illegible]	0.9	2	0	29.4	0.0			
07/05/18	Monday	5	2.5	2.2	[illegible]	0.9	2	0.2	40.5	32.6			
08/05/18	Tuesday	5	3.8	0.2	[illegible]	0.9	2	0	3.7	0.0			
09/05/18	Wednesday	5	4.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
10/05/18	Thursday	5	3.3	0	[illegible]	0.9	2	0	0.0	0.0			
11/05/18	Friday	5	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
12/05/18	Saturday	5	3.5	0	[illegible]	0.9	2	0	0.0	0.0			
13/05/18	Sunday	5	2.9	0	[illegible]	0.9	2	0	0.0	0.0			
14/05/18	Monday	5	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
15/05/18	Tuesday	5	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
16/05/18	Wednesday	5	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
17/05/18	Thursday	5	3.6	0	[illegible]	0.9	2	0	0.0	0.0			
18/05/18	Friday	5	5.2	0	[illegible]	0.9	2	0	0.0	0.0			
19/05/18	Saturday	5	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
20/05/18	Sunday	5	1.6	0	[illegible]	0.9	2	0	0.0	0.0			
21/05/18	Monday	5	2.4	0	[illegible]	0.9	2	0	0.0	0.0			
22/05/18	Tuesday	5	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
23/05/18	Wednesday	5	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
24/05/18	Thursday	5	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
25/05/18	Friday	5	1.6	39.8	[illegible]	0.9	2	37.8	732.4	6158.5			
26/05/18	Saturday	5	1.8	27	[illegible]	0.9	2	25	496.8	4073.0			
27/05/18	Sunday	5	2	16	[illegible]	0.9	2	14	294.4	2280.9			
28/05/18	Monday	5	2.2	8.4	[illegible]	0.9	2	6.4	154.6	1042.7			
29/05/18	Tuesday	5	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0			
30/05/18	Wednesday	5	1.7	0.2	[illegible]	0.9	2	0	3.7	0.0			
31/05/18	Thursday	5	1.7	0	[illegible]	0.9	2	0	0.0	0.0			
01/06/18	Friday	6	1.3	19.2	[illegible]	0.9	2	17.2	353.3	2502.2			
02/06/18	Saturday	6	1.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
03/06/18	Sunday	6	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
04/06/18	Monday	6	1.2	0	[illegible]	0.9	2	0	0.0	0.0			
05/06/18	Tuesday	6	2	4.6	[illegible]	0.9	2	2.6	84.6	423.6			
06/06/18	Wednesday	6	1.3	12.8	[illegible]	0.9	2	10.8	235.5	1759.5			
07/06/18	Thursday	6	0.9	8.4	[illegible]	0.9	2	6.4	154.6	1042.7			
08/06/18	Friday	6	1.3	3.4	[illegible]	0.9	2	1.4	62.6	228.1			
09/06/18	Saturday	6	2.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
10/06/18	Sunday	6	2.2	38	[illegible]	0.9	2	36	699.2	5665.1			
11/06/18	Monday	6	1	11	[illegible]	0.9	2	9	202.4	1466.3			
12/06/18	Tuesday	6	1.2	1.6	[illegible]	0.9	2	0	29.4	0.0			
13/06/18	Wednesday	6	0.9	2	[illegible]	0.9	2	0	36.8	0.0			
14/06/18	Thursday	6	1.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
15/06/18	Friday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
16/06/18	Saturday	6	1.7	0	[illegible]	0.9	2	0	0.0	0.0			
17/06/18	Sunday	6	2.6	0	[illegible]	0.9	2	0	0.0	0.0			
18/06/18	Monday	6	1.9	19.6	[illegible]	0.9	2	17.6	360.7	2867.4			
19/06/18	Tuesday	6	1.2	2.6	[illegible]	0.9	2	0.6	47.8	97.8			
20/06/18	Wednesday	6	1.1	9.6	[illegible]	0.9	2	7.6	176.7	1238.2			
21/06/18	Thursday	6	1.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
22/06/18	Friday	6	1	1.8	[illegible]	0.9	2	0	33.1	0.0			
23/06/18	Saturday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
24/06/18	Sunday	6	1.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
25/06/18	Monday	6	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/06/18	Tuesday	6	1.6	0	[illegible]	0.9	2	0	0.0	0.0			
27/06/18	Wednesday	6	0.8	29.8	[illegible]	0.9	2	27.8	548.4	4529.1			
28/06/18	Thursday	6	1.2	16.8	[illegible]	0.9	2	14.8	309.1	2411.2			
29/06/18	Friday	6	1.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
30/06/18	Saturday	6	1.5	0.2	[illegible]	0.9	2	0	3.7	0.0			

Date	Volume at start of period (m³)	Prelim pond volume - [illegible] for no negatives	Pond surface area for [illegible]	[illegible]	[illegible]	Loss correction applied (m3/day)	Corrected volume plus overflow [illegible]	[illegible] volume after evap and infiltration (m3/day)	Required dust [illegible] cardup brook (m3/day)	Required dust [illegible] cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow flag	Pond Empty flag
10/03/18	8756.4	8621.7	[illegible]	[illegible]	[illegible]	-10.2	8631.9	8631.9	100	45	145	[illegible]	[illegible]	0.0	0	0
11/03/18	8486.9	8146.7	4600.3	3415.6	63.6	-76.6	8423.3	8423.3	100	45	145	[illegible]	[illegible]	0.0	0	0
12/03/18	8278.3	8117.8	4600.3	3415.6	68.7	-91.8	8209.6	8209.6	100	45	145	[illegible]	[illegible]	0.0	0	0
13/03/18	8064.6	7893.1	4600.3	3415.6	71.4	-100.1	7993.1	7993.1	100	45	145	[illegible]	[illegible]	0.0	0	0
14/03/18	7848.1	7638.0	4600.3	3415.6	81.1	-129.1	7767.0	7767.0	100	45	145	[illegible]	[illegible]	0.0	0	0
15/03/18	7622.0	7837.3	4600.3	3415.6	80.6	-127.7	7965.0	7965.0	100	45	145	[illegible]	[illegible]	0.0	0	0
16/03/18	7810.0	7696.3	4600.3	3415.6	59.5	-64.2	7760.5	7760.5	100	45	145	[illegible]	[illegible]	0.0	0	0
17/03/18	7615.5	7467.9	4600.3	3415.6	65.5	-82.1	7550.0	7550.0	100	45	145	[illegible]	[illegible]	0.0	0	0
18/03/18	7405.0	7251.9	4600.3	3415.6	66.1	-86.3	7338.2	7338.2	100	45	145	[illegible]	[illegible]	0.0	0	0
19/03/18	7193.2	7054.8	4600.3	3415.6	63.2	-75.2	7130.0	7130.0	100	45	145	[illegible]	[illegible]	0.0	0	0
20/03/18	6985.0	6865.0	4600.3	3415.6	58.6	-61.4	6926.4	6926.4	100	45	145	[illegible]	[illegible]	0.0	0	0
21/03/18	6781.4	6648.6	4600.3	3415.6	61.1	-71.1	6719.6	6719.6	100	45	145	[illegible]	[illegible]	0.0	0	0
22/03/18	6574.6	6443.6	4600.3	3415.6	61.2	-69.7	6513.3	6513.3	100	45	145	[illegible]	[illegible]	0.0	0	0
23/03/18	6368.3	6222.6	4600.3	3415.6	65.0	-80.8	6303.3	6303.3	100	45	145	[illegible]	[illegible]	0.0	0	0
24/03/18	6158.3	5981.3	4600.3	3415.6	72.1	-104.2	6085.5	6085.5	100	45	145	[illegible]	[illegible]	0.0	0	0
25/03/18	5940.5	5791.0	4600.3	3415.6	65.9	-83.5	5874.6	5874.6	100	45	145	[illegible]	[illegible]	0.0	0	0
26/03/18	5729.6	5563.5	4600.3	3415.6	70.2	-95.9	5659.5	5659.5	100	45	145	[illegible]	[illegible]	0.0	0	0
27/03/18	5514.5	5795.4	4600.3	3415.6	72.4	-102.8	5898.3	5898.3	100	45	145	[illegible]	[illegible]	0.0	0	0
28/03/18	5753.3	5600.2	4600.3	3415.6	66.1	-86.3	5686.4	5686.4	100	45	145	[illegible]	[illegible]	0.0	0	0
29/03/18	5541.4	5412.2	4600.3	3415.6	60.5	-68.3	5480.6	5480.6	100	45	145	[illegible]	[illegible]	0.0	0	0
30/03/18	5335.6	5199.0	4600.3	3415.6	62.2	-73.9	5272.9	5272.9	100	45	145	[illegible]	[illegible]	0.0	0	0
31/03/18	5127.9	4993.1	4600.3	3415.6	61.5	-71.5	5065.6	5065.6	100	45	145	[illegible]	[illegible]	0.0	0	0
01/04/18	4920.6	4802.5	4600.3	3415.6	58.1	-60.1	4862.5	4862.5	100	45	145	[illegible]	[illegible]	0.0	0	0
02/04/18	4717.5	4603.0	4600.3	3415.6	57.2	-57.3	4660.3	4660.3	100	45	145	[illegible]	[illegible]	0.0	0	0
03/04/18	4515.3	4389.8	4600.3	3415.6	59.5	-65.6	4455.4	4455.4	100	45	145	[illegible]	[illegible]	0.0	0	0
04/04/18	4310.4	4195.9	4600.3	3415.6	57.2	-57.3	4253.2	4253.2	100	45	145	[illegible]	[illegible]	0.0	0	0
05/04/18	4108.2	3997.4	4600.3	3415.6	56.2	-54.5	4051.9	4051.9	100	45	145	[illegible]	[illegible]	0.0	0	0
06/04/18	3906.9	3803.5	4600.3	3415.6	54.4	-49.0	3852.5	3852.5	100	45	145	[illegible]	[illegible]	0.0	0	0
07/04/18	3707.5	3596.7	4600.3	3415.6	56.2	-54.5	3651.2	3651.2	100	45	145	[illegible]	[illegible]	0.0	0	0
08/04/18	3506.2	3389.9	4600.3	3415.6	57.6	-58.7	3448.6	3448.6	100	45	145	[illegible]	[illegible]	0.0	0	0
09/04/18	3303.6	3167.0	4600.3	3415.6	62.7	-73.9	3240.9	3240.9	100	45	145	[illegible]	[illegible]	0.0	0	0
10/04/18	3095.9	2917.0	4600.3	3415.6	73.2	-105.6	3022.6	3022.6	100	45	145	[illegible]	[illegible]	0.0	0	0
11/04/18	2877.6	2763.1	4600.3	3415.6	57.2	-57.3	2820.4	2820.4	100	45	145	[illegible]	[illegible]	0.0	0	0
12/04/18	2675.4	2570.1	4600.3	3415.6	54.5	-50.4	2620.5	2620.5	100	45	145	[illegible]	[illegible]	0.0	0	0
13/04/18	2475.5	2764.9	4600.3	3415.6	54.0	-47.6	2812.5	2812.5	100	45	145	[illegible]	[illegible]	0.0	0	0
14/04/18	2667.5	2553.1	4600.3	3415.6	57.2	-57.3	2610.3	2610.3	100	45	145	[illegible]	[illegible]	0.0	0	0
15/04/18	2465.3	2332.5	4600.3	3415.6	61.8	-71.1	2403.6	2403.6	100	45	145	[illegible]	[illegible]	0.0	0	0
16/04/18	2258.6	2155.1	4600.3	3415.6	54.4	-49.0	2204.1	2204.1	100	45	145	[illegible]	[illegible]	0.0	0	0
17/04/18	2059.1	1942.8	4600.3	3415.6	57.8	-58.7	2001.5	2001.5	100	45	145	[illegible]	[illegible]	0.0	0	0
18/04/18	1856.5	2008.2	4600.3	3415.6	55.8	-53.2	2061.3	2061.3	100	45	145	[illegible]	[illegible]	0.0	0	0
19/04/18	1916.3	1798.3	4600.3	3415.6	58.1	-60.1	1858.3	1858.3	100	45	145	[illegible]	[illegible]	0.0	0	0
20/04/18	1713.2	1598.8	4600.3	3415.6	57.2	-57.3	1656.1	1656.1	100	45	145	[illegible]	[illegible]	0.0	0	0
21/04/18	1511.1	1383.7	4600.3	3415.6	60.4	-67.0	1450.6	1450.6	100	45	145	[illegible]	[illegible]	0.0	0	0
22/04/18	1305.6	1172.8	4600.3	3415.6	61.8	-71.1	1243.9	1243.9	100	45	145	[illegible]	[illegible]	0.0	0	0
23/04/18	1098.9	979.2	4600.3	3415.6	71.0	-98.7	1027.9	1027.9	100	45	145	[illegible]	[illegible]	0.0	0	0
24/04/18	880.9	742.6	4600.3	3415.6	63.6	-76.6	819.2	819.2	100	45	145	[illegible]	[illegible]	0.0	0	0
25/04/18	674.3	557.9	4600.3	3415.6	57.6	-58.7	616.6	616.6	100	45	145	[illegible]	[illegible]	0.0	0	0
26/04/18	471.6	358.9	4600.3	3415.6	56.7	-55.9	414.9	414.9	100	45	145	[illegible]	[illegible]	0.0	0	0
27/04/18	414.9	307.7	4600.3	3415.6	55.3	-51.8	359.5	359.5	100	45	145	[illegible]	[illegible]	0.0	0	0
28/04/18	359.5	256.1	4600.3	3415.6	54.4	-49.0	305.1	305.1	100	45	145	[illegible]	[illegible]	0.0	0	0
29/04/18	305.1	146.4	4600.3	3415.6	68.2	-90.4	236.9	236.9	100	45	145	[illegible]	[illegible]	0.0	0	0
30/04/18	236.9	115.0	4600.3	3415.6	59.0	-62.8	177.8	177.8	100	45	145	[illegible]	[illegible]	0.0	0	0
01/05/18	177.8	78.1	4600.3	3415.6	53.5	-46.3	124.3	124.3	0	45	45	[illegible]	[illegible]	0.0	0	0
02/05/18	124.3	15.4	4600.3	3415.6	55.8	-53.2	68.5	68.5	0	45	45	[illegible]	[illegible]	0.0	0	0
03/05/18	68.5	0.0	4600.3	3415.6	60.9	-68.3	7.6	7.6	0	45	45	[illegible]	[illegible]	0.0	0	0
04/05/18	7.6	0.0	4600.3	3415.6	61.8	-71.1	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
05/05/18	0.0	0.0	4600.3	3415.6	61.8	-71.1	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
06/05/18	0.0	0.0	4600.3	3415.6	61.7	-73.9	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
07/05/18	0.0	0.0	4600.3	3415.6	54.9	-50.4	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
08/05/18	0.0	0.0	4600.3	3415.6	60.9	-68.3	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
09/05/18	0.0	0.0	4600.3	3415.6	64.1	-78.0	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
10/05/18	0.0	0.0	4600.3	3415.6	58.6	-61.4	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
11/05/18	0.0	0.0	4600.3	3415.6	58.1	-60.1	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
12/05/18	0.0	0.0	4600.3	3415.6	59.5	-64.2	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
13/05/18	0.0	0.0	4600.3	3415.6	56.7	-55.9	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
14/05/18	0.0	0.0	4600.3	3415.6	56.3	-54.5	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
15/05/18	0.0	0.0	4600.3	3415.6	59.0	-62.8	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
16/05/18	0.0	0.0	4600.3	3415.6	62.2	-72.5	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
17/05/18	0.0	0.0	4600.3	3415.6	59.9	-65.6	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
18/05/18	0.0	0.0	4600.3	3415.6	67.3	-87.7	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
19/05/18	0.0	0.0	4600.3	3415.6	54.4	-49.0	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
20/05/18	0.0	0.0	4600.3	3415.6	50.7	-38.0	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
21/05/18	0.0	0.0	4600.3	3415.6	54.4	-49.0	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
22/05/18	0.0	0.0	4600.3	3415.6	49.4	-33.8	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
23/05/18	0.0	0.0	4600.3	3415.6	49.4	-33.8	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
24/05/18	0.0	0.0	4600.3	3415.6	49.4	-33.8	0.0	0.0	0	45	45	[illegible]	[illegible]	0.0	0	1
25/05/18	0.0	6069.6	4600.3	3415.6	50.7	-38.0	6107.6	6107.6	0	45	45	[illegible]	[illegible]	0.0	0	1
26/05/18	6062.6	10043.1	9200.7	7331.2	103.3	10.9	10032.2	10032.2	0	45	45	[illegible]	[illegible]	0.0	0	0
27/05/18	9987.2	11172.0	9200.7	7331.2	105.2	9.1	11162.9	11162.9	0	45	45	[illegible]	[illegible]	0.0	0	0
28/05/18	11117.9	13060.8	9200.7	7331.2	107.0	7.3	13053.6	13053.6	0	45	45	[illegible]	[illegible]	0.0	0	0
29/05/18	13008.6	12918.0	9200.7	7331.2	102.4	11.9	12906.2	12906.2	0	45	45	[illegible]	[illegible]	0.0	0	0
30/05/18	12861.2	12770.6	9200.7	7331.2	101.4	11.9	12758.7	12758.7	0	45	45	[illegible]	[illegible]	0.0	0	0
31/05/18	12713.7	12623.2	9200.7	7331.2	102.4	11.9	12611.3	12611.3	0	45	45	[illegible]	[illegible]	0.0	0	0
01/06/18	12566.3	15785.3	9200.7	7331.2	98.7	15.5	15269.8	15269.8	0	0	0	[illegible]	[illegible]	0.0	0	0
02/06/18	15269.8	15184.7	9200.7	7331.2	99.7	14.6	15170.1	15170.1	0	0	0	[illegible]	[illegible]	0.0	0	0
03/06/18	15170.1	15083.3	9200.7	7331.2	100.6	13.7	15069.6	15069.6	0	0	0	[illegible]	[illegible]	0.0	0	0
04/06/18	15069.6	14988.2	9200.7	7331.2	97.8	16.5	14971.7	14971.7	0	0	0	[illegible]	[illegible]	0.0	0	0
05/06/18	14971.7	15299.1	9200.7	7331.2	105.2	9.1	15290.2	15290.2	0	0	0	[illegible]	[illegible]	0.0	0	0
06/06/18	15290.2	16966.5	13801.1	10546.7	148.1	64.9	16901.6	16901.6	0	0	0	[illegible]	[illegible]	0.0	0	0
07/06/18	16901.6	17868.4	13801.1	10546.7	142.6	66.7	17801.7	17801.7	0	0	0	[illegible]	[illegible]	0.0	0	0
08/06/18	17801.7	17946.6	13801.1	10546.7	148.1	64.9	17881.7	17881.7	0	0	0	[illegible]	[illegible]	0.0	0	0
09/06/18	17881.7	17783.7	13801.1	10546.7	159.1	61.2	17722.5	17722.5	0	0	0	[illegible]	[illegible]	0.0	0	0
10/06/18	17722.5	23487.8	13801.1	10546.7	160.5	60.8	23427.1	23427.1	0	0	0	[illegible]	[illegible]	0.0	0	0
11/06/18	23427.1	24815.7	13801.1	10546.7	144.0	66.3	24749.4	24749.4	0	0	0	[illegible]	[illegible]	0.0	0	0
12/06/18	24749.4	24668.0	13801.1	10546.7	146.3	65.4	24602.7	24602.7	0	0	0	[illegible]	[illegible]	0.0	0	0
13/06/18	24602.7	24576.8	13801.1	10546.7	142.6	66.7	24460.1	24460.1	0	0	0	[illegible]	[illegible]	0.0	0	0
14/06/18	24460.1	24378.7	13801.1	10546.7	146.3	65.4	24313.4	24313.4	0	0	0	[illegible]	[illegible]	0.0	0	0
15/06/18	24313.4	24230.2	13801.1	10546.7	148.1	64.9	24165.3	24165.3	0	0	0	[illegible]	[illegible]	0.0	0	0
16/06/18	24165.3	24074.7	13801.1	10546.7	153.6	63.1	24011.6	24011.6	0	0	0	[illegible]	[illegible]	0.0	0	0
17/06/18	24011.6	23904.5	13801.1	10546.7	166.0	58.9	23845.6	23845.6	0	0	0	[illegible]	[illegible]	0.0	0	0
18/06/18	23845.6	26618.7	18401.3	14462.3	208.5	114.3	26504.4	26504.4	0	0	0	[illegible]	[illegible]	0.0	0	0
19/06/18	26504.4	26520.6	18401.3	14462.3	195.6	114.3	26406.6	26406.6	0	0	0	[illegible]	[illegible]	0.0	0	0
20/06/18	26406.6	27565.7	18401.3	14462.3	191.8	114.3	27451.0	27451.0	0	0	0	[illegible]	[illegible]	0.0	0	0
21/06/18	27451.0	27369.6	18401.3	14462.3	195.6	114.3	27255.3	27255.3	0	0	0	[illegible]	[illegible]	0.0	0	0
22/06/18	27255.3	27177.7	18401.3	14462.3	191.5	114.3	27063.4	27063.4	0	0	0	[illegible]	[illegible]	0.0	0	0
23/06/18	27063.4	26980.2	18401.3	14462.3	197.5	114.3	26865.9	26865.9	0	0	0	[illegible]	[illegible]	0.0	0	0
24/06/18	26865.9	26782.7	18401.3	14462.3	197.5	114.3	26668.4	26668.4	0	0	0	[illegible]	[illegible]	0.0	0	0
25/06/18	26668.4	26581.6	18401.3	14462.3	201.1	114.3	26467.3	26467.3	0	0	0	[illegible]	[illegible]	0.0	0	0
26/06/18	26467.3	26378.6	18401.3	14462.3	203.0	114.3	26264.3	26264.3	0	0	0	[illegible]	[illegible]	0.0	0	0
27/06/18	26264.3	30719.4	18401.3	14462.3	188.3	114.3	30605.2	30605.2	0	0	0	[illegible]	[illegible]	0.0	0	0
28/06/18	30605.2	32935.0	18401.3	14462.3	195.6	114.3	32820.7	32820.7	0	0	0	[illegible]	[illegible]	0.0	0	0
29/06/18	32820.7	32741.3	18401.3	14462.3	193.8	114.3	32627.0	32627.0	0	0	0	[illegible]	[illegible]	0.0	0	0
30/06/18	32627.0	32540.3	18401.3	14462.3	201.1	114.3	32425.8	32425.8	0	0	0	[illegible]	[illegible]	0.0	0	0

Date	Timing Tests: Weekday	Timing Tests: Month number	BOM Data: Loss - evaporation (mm)	BOM Data: Rainfall (mm)	Stormwater Catchment Absorption and Wetting: Catchment Area (m^2)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Pond Losses: PrelimPond loss evaporation (m^3)	Prelim infiltration (m^3/day)	Prelim Pond Loss (m^3/day)
01/07/18	Sunday	7	2.2	0	[illegible]	0.9	2	0	0.0	0.0			
02/07/18	Monday	7	2.1	5.2	[illegible]	0.9	2	3.2	95.7	521.3			
03/07/18	Tuesday	7	2.3	44	[illegible]	0.9	2	42	809.7	6642.6			
04/07/18	Wednesday	7	2.3	9.2	[illegible]	0.9	2	7.2	169.3	1173.0			
05/07/18	Thursday	7	1.4	22	[illegible]	0.9	2	20	404.8	3258.4			
06/07/18	Friday	7	1.1	0.4	[illegible]	0.9	2	0	7.4	0.0			
07/07/18	Saturday	7	1.2	0.4	[illegible]	0.9	2	0	7.4	0.0			
08/07/18	Sunday	7	1.5	0	[illegible]	0.9	2	0	0.0	0.0			
09/07/18	Monday	7	1.4	0	[illegible]	0.9	2	0	0.0	0.0			
10/07/18	Tuesday	7	1.4	0.4	[illegible]	0.9	2	0	7.4	0.0			
11/07/18	Wednesday	7	1.4	0	[illegible]	0.9	2	0	0.0	0.0			
12/07/18	Thursday	7	1.6	0.4	[illegible]	0.9	2	0	7.4	0.0			
13/07/18	Friday	7	1.8	11.8	[illegible]	0.9	2	9.8	217.1	1596.6			
14/07/18	Saturday	7	1.4	0.8	[illegible]	0.9	2	0	14.7	0.0			
15/07/18	Sunday	7	1.3	21.8	[illegible]	0.9	2	19.8	401.1	3225.8			
16/07/18	Monday	7	1.5	9.8	[illegible]	0.9	2	7.8	180.3	1270.8			
17/07/18	Tuesday	7	1.7	3.2	[illegible]	0.9	2	1.2	58.9	195.5			
18/07/18	Wednesday	7	1.8	0.8	[illegible]	0.9	2	0	14.7	0.0			
19/07/18	Thursday	7	1.3	2.8	[illegible]	0.9	2	0.8	51.5	130.3			
20/07/18	Friday	7	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
21/07/18	Saturday	7	1.3	6.6	[illegible]	0.9	2	4.6	121.4	749.4			
22/07/18	Sunday	7	2.5	28.8	[illegible]	0.9	2	26.8	530.0	4366.2			
23/07/18	Monday	7	2.2	10.6	[illegible]	0.9	2	8.6	195.1	1401.1			
24/07/18	Tuesday	7	1.5	1.8	[illegible]	0.9	2	0	33.1	0.0			
25/07/18	Wednesday	7	1.4	1.6	[illegible]	0.9	2	0	29.4	0.0			
26/07/18	Thursday	7	1.7	31.8	[illegible]	0.9	2	29.8	585.2	4855.0			
27/07/18	Friday	7	1.4	1.4	[illegible]	0.9	2	0	25.8	0.0			
28/07/18	Saturday	7	1.3	3	[illegible]	0.9	2	1	55.2	162.9			
29/07/18	Sunday	7	2.2	0	[illegible]	0.9	2	0	0.0	0.0			
30/07/18	Monday	7	1.7	8.6	[illegible]	0.9	2	6.6	158.3	1075.3			
31/07/18	Tuesday	7	1.9	0.4	[illegible]	0.9	2	0	7.4	0.0			
01/08/18	Wednesday	8	2.1	23.2	[illegible]	0.9	2	21.2	426.9	3453.9			
02/08/18	Thursday	8	1.9	15	[illegible]	0.9	2	13	276.0	2117.9			
03/08/18	Friday	8	2	7.8	[illegible]	0.9	2	5.8	143.5	944.9			
04/08/18	Saturday	8	2.3	36.6	[illegible]	0.9	2	34.6	673.5	5637.0			
05/08/18	Sunday	8	1.7	6.2	[illegible]	0.9	2	4.2	114.1	684.3			
06/08/18	Monday	8	1.3	0	[illegible]	0.9	2	0	0.0	0.0			
07/08/18	Tuesday	8	2	2.4	[illegible]	0.9	2	0.4	44.2	65.2			
08/08/18	Wednesday	8	1.8	2.4	[illegible]	0.9	2	0.4	44.2	65.2			
09/08/18	Thursday	8	2.3	34.2	[illegible]	0.9	2	32.2	629.3	5246.0			
10/08/18	Friday	8	1.6	13.2	[illegible]	0.9	2	11.2	242.9	1824.7			
11/08/18	Saturday	8	1.6	0	[illegible]	0.9	2	0	0.0	0.0			
12/08/18	Sunday	8	2.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
13/08/18	Monday	8	3.2	0	[illegible]	0.9	2	0	0.0	0.0			
14/08/18	Tuesday	8	2.2	25.8	[illegible]	0.9	2	23.8	474.8	3877.5			
15/08/18	Wednesday	8	1.3	0.8	[illegible]	0.9	2	0	14.7	0.0			
16/08/18	Thursday	8	1.3	1.4	[illegible]	0.9	2	0	25.8	0.0			
17/08/18	Friday	8	2.2	3.8	[illegible]	0.9	2	1.8	69.9	293.3			
18/08/18	Saturday	8	2.2	0	[illegible]	0.9	2	0	0.0	0.0			
19/08/18	Sunday	8	3	0	[illegible]	0.9	2	0	0.0	0.0			
20/08/18	Monday	8	3	0	[illegible]	0.9	2	0	0.0	0.0			
21/08/18	Tuesday	8	1.8	5.6	[illegible]	0.9	2	3.6	103.0	586.5			
22/08/18	Wednesday	8	2.3	3.8	[illegible]	0.9	2	1.8	69.9	293.3			
23/08/18	Thursday	8	2.1	0.2	[illegible]	0.9	2	0	3.7	0.0			
24/08/18	Friday	8	2.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
25/08/18	Saturday	8	2.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
26/08/18	Sunday	8	2.6	0.2	[illegible]	0.9	2	0	3.7	0.0			
27/08/18	Monday	8	2.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
28/08/18	Tuesday	8	1.9	19	[illegible]	0.9	2	17	349.6	2769.6			
29/08/18	Wednesday	8	1.8	21.2	[illegible]	0.9	2	19.2	390.1	3126.0			
30/08/18	Thursday	8	2.4	7.8	[illegible]	0.9	2	5.8	143.5	944.9			
31/08/18	Friday	8	2.1	0	[illegible]	0.9	2	0	0.0	0.0			
01/09/18	Saturday	9	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
02/09/18	Sunday	9	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
03/09/18	Monday	9	2.5	0	[illegible]	0.9	2	0	0.0	0.0			
04/09/18	Tuesday	9	2.6	4.4	[illegible]	0.9	2	2.4	81.0	391.0			
05/09/18	Wednesday	9	2.7	2.6	[illegible]	0.9	2	0.6	47.8	97.8			
06/09/18	Thursday	9	2.1	0.6	[illegible]	0.9	2	0	11.0	0.0			
07/09/18	Friday	9	2.4	2.4	[illegible]	0.9	2	0.4	44.2	65.2			
08/09/18	Saturday	9	2.4	1.4	[illegible]	0.9	2	0	25.8	0.0			
09/09/18	Sunday	9	3.2	0.4	[illegible]	0.9	2	0	7.4	0.0			
10/09/18	Monday	9	3	2.2	[illegible]	0.9	2	0.2	40.5	32.6			
11/09/18	Tuesday	9	2.7	3.2	[illegible]	0.9	2	1.2	58.9	195.5			
12/09/18	Wednesday	9	2.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
13/09/18	Thursday	9	2.7	0.8	[illegible]	0.9	2	0	14.7	0.0			
14/09/18	Friday	9	3.3	3.2	[illegible]	0.9	2	1.2	58.9	195.5			
15/09/18	Saturday	9	3.4	0	[illegible]	0.9	2	0	0.0	0.0			
16/09/18	Sunday	9	3.2	0.2	[illegible]	0.9	2	0	3.7	0.0			
17/09/18	Monday	9	3	1	[illegible]	0.9	2	0	18.4	0.0			
18/09/18	Tuesday	9	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
19/09/18	Wednesday	9	3	0.2	[illegible]	0.9	2	0	3.7	0.0			
20/09/18	Thursday	9	3.7	0.2	[illegible]	0.9	2	0	3.7	0.0			
21/09/18	Friday	9	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
22/09/18	Saturday	9	4.3	0.2	[illegible]	0.9	2	0	3.7	0.0			
23/09/18	Sunday	9	3.9	0	[illegible]	0.9	2	0	0.0	0.0			
24/09/18	Monday	9	3.1	0	[illegible]	0.9	2	0	0.0	0.0			
25/09/18	Tuesday	9	3	0	[illegible]	0.9	2	0	0.0	0.0			
26/09/18	Wednesday	9	3.4	0.2	[illegible]	0.9	2	0	3.7	0.0			
27/09/18	Thursday	9	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
28/09/18	Friday	9	5	0	[illegible]	0.9	2	0	0.0	0.0			
29/09/18	Saturday	9	3.1	2.6	[illegible]	0.9	2	0.6	47.8	97.8			
30/09/18	Sunday	9	4	7.4	[illegible]	0.9	2	5.4	136.2	879.8			
01/10/18	Monday	10	2.7	0	[illegible]	0.9	2	0	0.0	0.0			
02/10/18	Tuesday	10	4.5	0	[illegible]	0.9	2	0	0.0	0.0			
03/10/18	Wednesday	10	3.7	0	[illegible]	0.9	2	0	0.0	0.0			
04/10/18	Thursday	10	3.8	7.6	[illegible]	0.9	2	5.6	139.8	912.3			
05/10/18	Friday	10	3.5	0.4	[illegible]	0.9	2	0	7.4	0.0			
06/10/18	Saturday	10	2.8	0	[illegible]	0.9	2	0	0.0	0.0			
07/10/18	Sunday	10	3.8	0	[illegible]	0.9	2	0	0.0	0.0			
08/10/18	Monday	10	4.1	0	[illegible]	0.9	2	0	0.0	0.0			
09/10/18	Tuesday	10	5.7	0	[illegible]	0.9	2	0	0.0	0.0			
10/10/18	Wednesday	10	4.3	18.4	[illegible]	0.9	2	16.4	338.6	2671.9			
11/10/18	Thursday	10	4.3	0.4	[illegible]	0.9	2	0	7.4	0.0			
12/10/18	Friday	10	2.2	1	[illegible]	0.9	2	0	18.4	0.0			
13/10/18	Saturday	10	3.4	1.4	[illegible]	0.9	2	0	25.8	0.0			
14/10/18	Sunday	10	3	8.4	[illegible]	0.9	2	6.4	154.6	1042.7			
15/10/18	Monday	10	4.2	12	[illegible]	0.9	2	10	220.8	1629.2			
16/10/18	Tuesday	10	4.5	0.2	[illegible]	0.9	2	0	3.7	0.0			
17/10/18	Wednesday	10	5.7	0	[illegible]	0.9	2	0	0.0	0.0			
18/10/18	Thursday	10	3.5	8	[illegible]	0.9	2	6	147.2	977.5			
19/10/18	Friday	10	3.2	7.6	[illegible]	0.9	2	5.6	139.8	912.3			
20/10/18	Saturday	10	3	0	[illegible]	0.9	2	0	0.0	0.0			
21/10/18	Sunday	10	4	1.8	[illegible]	0.9	2	0	33.1	0.0			

Date	Adjustments: Volume at start of period (m^3)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pond infiltration area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Final pond volumes: Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)	Demand (Dust): Required dust suppression in north of cardup brook (m3/day)	Required dust supression in south of cardup brook (m3/day)	Total demand (m3/day)	Abstraction: Allowed abstraction (m^3)	Pond Vol after abstraction (m^3)	Overflow Calcs: Overflow (m^3)	Overflow flag	Pond Empty flag
01/07/18	32425.8	37326.0	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
02/07/18	32711.8	32635.2	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
03/07/18	32520.9	39261.9	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	5541.4	1	0
04/07/18	33584.2	34655.6	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	957.1	1	0
05/07/18	33584.2	36757.5	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	3059.1	1	0
06/07/18	33584.2	33504.7	18401.3	14462.3	193.8	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
07/07/18	33390.4	33309.1	18401.3	14462.3	195.6	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
08/07/18	33194.8	33107.9	18401.3	14462.3	201.1	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
09/07/18	32993.6	32908.6	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
10/07/18	32794.3	32709.1	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
11/07/18	32595.0	32510.0	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
12/07/18	32395.7	32307.0	18401.3	14462.3	203.0	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
13/07/18	32192.7	33696.9	18401.3	14462.3	206.7	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
14/07/18	33582.7	33497.6	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
15/07/18	33383.3	36525.9	18401.3	14462.3	197.5	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	2827.5	1	0
16/07/18	33584.2	34760.7	18401.3	14462.3	208.5	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	1062.3	1	0
17/07/18	33584.2	33689.2	18401.3	14462.3	204.8	114.3	33574.9	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
18/07/18	33574.9	33482.5	18401.3	14462.3	206.7	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
19/07/18	33368.2	33415.3	18401.3	14462.3	197.5	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
20/07/18	33301.1	33203.2	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
21/07/18	33088.9	33751.4	18401.3	14462.3	201.1	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	53.0	1	0
22/07/18	33584.2	37845.1	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	4146.7	1	0
23/07/18	33584.2	34885.5	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	1187.1	1	0
24/07/18	33584.2	33497.3	18401.3	14462.3	201.1	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
25/07/18	33383.1	33279.6	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
26/07/18	33165.4	37929.8	18401.3	14462.3	204.8	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	4231.3	1	0
27/07/18	33584.2	33499.2	18401.3	14462.3	199.3	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
28/07/18	33384.9	33464.6	18401.3	14462.3	197.5	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
29/07/18	33350.4	33250.6	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
30/07/18	33136.3	34121.0	18401.3	14462.3	204.8	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	422.5	1	0
31/07/18	33584.2	33490.0	18401.3	14462.3	208.5	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
01/08/18	33375.7	35731.7	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	3033.2	1	0
02/08/18	33584.2	35607.9	18401.3	14462.3	208.5	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	1909.4	1	0
03/08/18	33584.2	34433.1	18401.3	14462.3	210.4	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	734.6	1	0
04/08/18	33584.2	39119.6	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	5421.1	1	0
05/08/18	33584.2	34177.9	18401.3	14462.3	204.8	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	479.4	1	0
06/08/18	33584.2	33501.0	18401.3	14462.3	197.5	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
07/08/18	33386.7	33355.8	18401.3	14462.3	210.4	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
08/08/18	33241.6	33214.3	18401.3	14462.3	206.7	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
09/08/18	33100.1	38744.4	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	4646.0	1	0
10/08/18	33584.2	35320.2	18401.3	14462.3	203.0	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	1621.7	1	0
11/08/18	33584.2	33495.5	18401.3	14462.3	203.0	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
12/08/18	33381.2	33277.8	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
13/08/18	33163.5	33045.3	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
14/08/18	32931.1	36708.8	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	3010.5	1	0
15/08/18	33584.2	33490.0	18401.3	14462.3	208.5	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
16/08/18	33375.7	33281.5	18401.3	14462.3	208.5	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
17/08/18	33167.2	33160.7	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
18/08/18	33246.4	33146.7	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
19/08/18	33032.4	32917.9	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
20/08/18	32803.6	32689.1	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
21/08/18	32574.9	33069.0	18401.3	14462.3	206.7	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
22/08/18	32954.7	33146.4	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
23/08/18	33032.1	32934.2	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
24/08/18	32819.9	32718.3	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
25/08/18	32604.0	32498.8	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
26/08/18	32384.5	32277.4	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
27/08/18	32163.1	32061.5	18401.3	14462.3	215.9	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
28/08/18	31947.2	34622.6	18401.3	14462.3	208.5	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	924.1	1	0
29/08/18	33584.2	36619.8	18401.3	14462.3	206.7	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	2821.4	1	0
30/08/18	33584.2	34425.7	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]	0	0	0	0.0	33584.2	727.2	1	0
31/08/18	33584.2	33486.3	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	0	0	0.0	[illegible]	0.0	0	0
01/09/18	33372.0	33263.1	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
02/09/18	33103.8	32998.5	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
03/09/18	32839.2	32734.0	18401.3	14462.3	219.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
04/09/18	32574.7	32858.6	18401.3	14462.3	221.4	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
05/09/18	32699.3	32688.1	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
06/09/18	32528.8	32430.9	18401.3	14462.3	212.2	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
07/09/18	32271.6	32231.4	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
08/09/18	32074.1	31970.6	18401.3	14462.3	217.7	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
09/09/18	31811.4	31693.2	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
10/09/18	31533.9	31452.0	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
11/09/18	31292.8	31379.3	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
12/09/18	31220.0	31120.3	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
13/09/18	30961.0	30852.1	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
14/09/18	30692.8	30768.3	18401.3	14462.3	234.3	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
15/09/18	30609.0	30487.2	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
16/09/18	30327.9	30209.7	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
17/09/18	30050.5	29936.0	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
18/09/18	29776.7	29660.4	18401.3	14462.3	230.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
19/09/18	29501.1	29386.6	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
20/09/18	29227.4	29100.0	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
21/09/18	28940.7	28813.4	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
22/09/18	28654.1	28515.7	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
23/09/18	28356.4	28225.4	18401.3	14462.3	245.3	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
24/09/18	28066.1	27949.8	18401.3	14462.3	230.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
25/09/18	27790.5	27676.1	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
26/09/18	27516.8	27394.9	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
27/09/18	27235.7	27100.9	18401.3	14462.3	249.0	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
28/09/18	26941.7	26790.4	18401.3	14462.3	265.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
29/09/18	26631.1	26612.6	18401.3	14462.3	230.6	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
30/09/18	26453.3	27200.2	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]	0	45	45	45.0	[illegible]	0.0	0	0
01/10/18	27040.9	26931.9	18401.3	14462.3	223.2	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
02/10/18	26672.7	26530.6	18401.3	14462.3	256.4	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
03/10/18	26271.3	26143.9	18401.3	14462.3	241.6	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
04/10/18	25884.7	26667.8	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
05/10/18	26408.6	26284.9	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
06/10/18	26025.6	25914.8	18401.3	14462.3	225.1	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
07/10/18	25655.5	25526.3	18401.3	14462.3	243.5	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
08/10/18	25267.1	25132.3	13801.0	10846.7	186.7	52.0	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
09/10/18	24935.3	24771.1	13801.0	10846.7	208.8	44.7	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
10/10/18	24581.5	27114.9	18401.3	14462.3	252.7	114.3	[illegible]	27000.7	100	45	145	145.0	[illegible]	0.0	0	0
11/10/18	26855.7	26717.3	18401.3	14462.3	252.7	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
12/10/18	26458.0	26358.2	18401.3	14462.3	214.0	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
13/10/18	26099.0	25977.1	18401.3	14462.3	236.1	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
14/10/18	25717.9	26646.1	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
15/10/18	26386.8	27879.4	18401.3	14462.3	250.8	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
16/10/18	27620.1	27478.1	18401.3	14462.3	256.4	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
17/10/18	27218.8	27054.6	18401.3	14462.3	278.4	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
18/10/18	26795.4	27649.2	18401.3	14462.3	238.0	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
19/10/18	27389.9	28184.1	18401.3	14462.3	232.4	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
20/10/18	27924.8	27810.3	18401.3	14462.3	228.8	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0
21/10/18	27551.1	27418.2	18401.3	14462.3	247.2	114.3	[illegible]	[illegible]	100	45	145	145.0	[illegible]	0.0	0	0

Date	Weekday	Month number	Loss - evaporation (mm)	Rainfall (mm)	Catchment Area (m²)	Runoff Coefficient	Initial Loss (IL, mm)	Applied rainfall after initial loss (mm)	Direct Rainfall into Basin	Total Runoff Volume (m3)	Prelim Pond loss evaporation (m³)	Prelim infiltration (m³/day)	Prelim Pond Loss (m³/day)
22/10/18	Monday	10	4.1	2.6	181020.8	0.9	2	0.6	47.8	97.8			
23/10/18	Tuesday	10	4.1	0	181020.8	0.9	2	0	0.0	0.0			
24/10/18	Wednesday	10	3.4	0	181020.8	0.9	2	0	0.0	0.0			
25/10/18	Thursday	10	5.4	0.6	181020.8	0.9	2	0	11.0	0.0			
26/10/18	Friday	10	5.9	0	181020.8	0.9	2	0	0.0	0.0			
27/10/18	Saturday	10	5.5	0	181020.8	0.9	2	0	0.0	0.0			
28/10/18	Sunday	10	6	0	181020.8	0.9	2	0	0.0	0.0			
29/10/18	Monday	10	5.1	0	181020.8	0.9	2	0	0.0	0.0			
30/10/18	Tuesday	10	5.3	0	181020.8	0.9	2	0	0.0	0.0			
31/10/18	Wednesday	10	5.1	0	181020.8	0.9	2	0	0.0	0.0			
01/11/18	Thursday	11	5.1	0	181020.8	0.9	2	0	0.0	0.0			
02/11/18	Friday	11	4	0	181020.8	0.9	2	0	0.0	0.0			
03/11/18	Saturday	11	5.6	0	181020.8	0.9	2	0	0.0	0.0			
04/11/18	Sunday	11	4.9	0	181020.8	0.9	2	0	0.0	0.0			
05/11/18	Monday	11	4.6	2.8	181020.8	0.9	2	0.8	51.5	130.3			
06/11/18	Tuesday	11	4.5	0.2	181020.8	0.9	2	0	3.7	0.0			
07/11/18	Wednesday	11	5.5	0	181020.8	0.9	2	0	0.0	0.0			
08/11/18	Thursday	11	5.9	0	181020.8	0.9	2	0	0.0	0.0			
09/11/18	Friday	11	7.4	0	181020.8	0.9	2	0	0.0	0.0			
10/11/18	Saturday	11	4.6	0	181020.8	0.9	2	0	0.0	0.0			
11/11/18	Sunday	11	4.9	0	181020.8	0.9	2	0	0.0	0.0			
12/11/18	Monday	11	5.2	0	181020.8	0.9	2	0	0.0	0.0			
13/11/18	Tuesday	11	5	0	181020.8	0.9	2	0	0.0	0.0			
14/11/18	Wednesday	11	6.5	0	181020.8	0.9	2	0	0.0	0.0			
15/11/18	Thursday	11	6.8	0	181020.8	0.9	2	0	0.0	0.0			
16/11/18	Friday	11	7.8	0	181020.8	0.9	2	0	0.0	0.0			
17/11/18	Saturday	11	3.7	0	181020.8	0.9	2	0	0.0	0.0			
18/11/18	Sunday	11	5.2	0	181020.8	0.9	2	0	0.0	0.0			
19/11/18	Monday	11	5.3	0	181020.8	0.9	2	0	0.0	0.0			
20/11/18	Tuesday	11	5.7	0	181020.8	0.9	2	0	0.0	0.0			
21/11/18	Wednesday	11	6.2	0	181020.8	0.9	2	0	0.0	0.0			
22/11/18	Thursday	11	7	0	181020.8	0.9	2	0	0.0	0.0			
23/11/18	Friday	11	5.5	3	181020.8	0.9	2	1	55.2	162.9			
24/11/18	Saturday	11	5.7	0	181020.8	0.9	2	0	0.0	0.0			
25/11/18	Sunday	11	4.5	0	181020.8	0.9	2	0	0.0	0.0			
26/11/18	Monday	11	6	1	181020.8	0.9	2	0	18.4	0.0			
27/11/18	Tuesday	11	7	0	181020.8	0.9	2	0	0.0	0.0			
28/11/18	Wednesday	11	6.2	0	181020.8	0.9	2	0	0.0	0.0			
29/11/18	Thursday	11	6.4	0	181020.8	0.9	2	0	0.0	0.0			
30/11/18	Friday	11	5.9	0	181020.8	0.9	2	0	0.0	0.0			
01/12/18	Saturday	12	4.4	0	181020.8	0.9	2	0	0.0	0.0			
02/12/18	Sunday	12	7	0	181020.8	0.9	2	0	0.0	0.0			
03/12/18	Monday	12	8.3	0	181020.8	0.9	2	0	0.0	0.0			
04/12/18	Tuesday	12	3.9	0	181020.8	0.9	2	0	0.0	0.0			
05/12/18	Wednesday	12	5.4	0	181020.8	0.9	2	0	0.0	0.0			
06/12/18	Thursday	12	5.2	1	181020.8	0.9	2	0	18.4	0.0			
07/12/18	Friday	12	5.8	0	181020.8	0.9	2	0	0.0	0.0			
08/12/18	Saturday	12	6.6	0.2	181020.8	0.9	2	0	3.7	0.0			
09/12/18	Sunday	12	7	0	181020.8	0.9	2	0	0.0	0.0			
10/12/18	Monday	12	6.4	0	181020.8	0.9	2	0	0.0	0.0			
11/12/18	Tuesday	12	5	0	181020.8	0.9	2	0	0.0	0.0			
12/12/18	Wednesday	12	5.1	0	181020.8	0.9	2	0	0.0	0.0			
13/12/18	Thursday	12	7.9	0	181020.8	0.9	2	0	0.0	0.0			
14/12/18	Friday	12	8.8	0	181020.8	0.9	2	0	0.0	0.0			
15/12/18	Saturday	12	4.7	0.2	181020.8	0.9	2	0	3.7	0.0			
16/12/18	Sunday	12	6.9	0.2	181020.8	0.9	2	0	3.7	0.0			
17/12/18	Monday	12	8.8	0	181020.8	0.9	2	0	0.0	0.0			
18/12/18	Tuesday	12	6.4	0	181020.8	0.9	2	0	0.0	0.0			
19/12/18	Wednesday	12	6.7	0	181020.8	0.9	2	0	0.0	0.0			
20/12/18	Thursday	12	8.3	0	181020.8	0.9	2	0	0.0	0.0			
21/12/18	Friday	12	8.6	0	181020.8	0.9	2	0	0.0	0.0			
22/12/18	Saturday	12	9.1	0	181020.8	0.9	2	0	0.0	0.0			
23/12/18	Sunday	12	6.5	0	181020.8	0.9	2	0	0.0	0.0			
24/12/18	Monday	12	7.5	0	181020.8	0.9	2	0	0.0	0.0			
25/12/18	Tuesday	12	7.1	0	181020.8	0.9	2	0	0.0	0.0			
26/12/18	Wednesday	12	5.5	0	181020.8	0.9	2	0	0.0	0.0			
27/12/18	Thursday	12	6	0	181020.8	0.9	2	0	0.0	0.0			
28/12/18	Friday	12	6.4	0	181020.8	0.9	2	0	0.0	0.0			
29/12/18	Saturday	12	6.4	0	181020.8	0.9	2	0	0.0	0.0			
30/12/18	Sunday	12	6.6	0	181020.8	0.9	2	0	0.0	0.0			
31/12/18	Monday	12	7.2	0	181020.8	0.9	2	0	0.0	0.0			

Date	Volume at start of period (m³)	Prelim pond volume - correction for no negatives	Pond surface area for loss calc	Pondlet liner area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Corrected volume, plus overflow (m3/day)	Corrected final volume after evap and infiltration (m3/day)
22/10/18	27158.9	27122.0	18401.3	[illegible]	249.0	114.3	[illegible]	27007.7
23/10/18	26862.7	26728.0	18401.3	[illegible]	249.0	114.3	[illegible]	[illegible]
24/10/18	26468.7	26346.8	18401.3	[illegible]	236.1	114.3	26232.6	26232.6
25/10/18	26087.6	25928.9	18401.3	[illegible]	272.9	114.3	[illegible]	25814.7
26/10/18	25659.7	25501.8	18401.3	[illegible]	282.1	114.3	[illegible]	25387.5
27/10/18	25242.5	25082.1	13801.0	[illegible]	206.1	45.6	25036.5	[illegible]
28/10/18	24891.5	24721.8	13801.0	[illegible]	213.0	43.3	[illegible]	[illegible]
29/10/18	24533.5	24380.4	13801.0	[illegible]	200.5	47.4	[illegible]	24333.0
30/10/18	24188.0	24031.2	13801.0	[illegible]	203.3	48.5	[illegible]	[illegible]
31/10/18	23839.7	23686.5	13801.0	[illegible]	200.5	47.4	23639.1	[illegible]
01/11/18	23494.1	23341.0	13801.0	[illegible]	200.5	47.4	[illegible]	[illegible]
02/11/18	23148.6	23015.7	13801.0	[illegible]	185.4	52.5	[illegible]	[illegible]
03/11/18	22818.2	22655.9	13801.0	[illegible]	207.4	45.1	[illegible]	[illegible]
04/11/18	22465.8	22316.3	13801.0	[illegible]	197.8	48.3	22268.0	[illegible]
05/11/18	22123.0	22109.4	13801.0	[illegible]	193.6	49.7	22059.7	[illegible]
06/11/18	21914.7	21772.6	13801.0	[illegible]	197.3	50.2	21722.4	21722.4
07/11/18	21577.4	21416.9	13801.0	[illegible]	206.1	45.6	[illegible]	21371.3
08/11/18	21226.3	21058.5	13801.0	[illegible]	211.6	43.7	21014.7	21014.7
09/11/18	20869.7	20674.3	13801.0	[illegible]	232.3	36.8	20637.5	[illegible]
10/11/18	20492.5	20348.5	13801.0	[illegible]	193.6	49.7	20298.8	[illegible]
11/11/18	20153.8	20004.4	13801.0	[illegible]	197.8	48.3	19956.0	19956.0
12/11/18	19811.0	19656.1	13801.0	[illegible]	201.9	47.0	19609.1	19609.1
13/11/18	19464.1	19312.8	13801.0	[illegible]	199.2	47.9	[illegible]	[illegible]
14/11/18	19119.9	18941.1	13801.0	[illegible]	219.9	41.0	18900.1	18900.1
15/11/18	18755.1	18574.3	13801.0	[illegible]	221.2	40.5	18533.8	[illegible]
16/11/18	[illegible]	18186.0	13801.0	[illegible]	237.8	35.0	18151.0	18151.0
17/11/18	18006.0	17878.7	13801.0	[illegible]	181.2	53.9	[illegible]	[illegible]
18/11/18	17679.8	17524.8	13801.0	[illegible]	201.9	47.0	17477.9	17477.9
19/11/18	17332.9	17176.1	13801.0	[illegible]	203.3	48.5	[illegible]	17129.8
20/11/18	16984.6	16820.4	13801.0	[illegible]	208.8	44.7	[illegible]	[illegible]
21/11/18	16630.7	16457.4	9200.7	[illegible]	143.8	-29.6	[illegible]	[illegible]
22/11/18	16341.9	16153.8	9200.7	[illegible]	151.2	-38.9	16190.7	[illegible]
23/11/18	16045.7	16048.2	9200.7	[illegible]	137.4	-23.1	16071.3	16071.3
24/11/18	15926.3	15762.1	9200.7	[illegible]	139.2	-24.9	[illegible]	15787.1
25/11/18	15642.1	15500.0	9200.7	[illegible]	128.2	-13.9	15513.9	[illegible]
26/11/18	15368.9	15199.2	9200.7	[illegible]	142.0	-27.7	[illegible]	[illegible]
27/11/18	15081.9	14893.8	9200.7	[illegible]	151.2	-38.9	[illegible]	[illegible]
28/11/18	14785.7	14612.4	9200.7	[illegible]	143.8	-29.6	14641.9	[illegible]
29/11/18	14496.9	14319.9	9200.7	[illegible]	145.7	-31.4	[illegible]	14351.3
30/11/18	14206.3	14038.4	9200.7	[illegible]	141.1	-26.8	14065.2	[illegible]
01/12/18	13920.2	13780.0	9200.7	[illegible]	127.3	-13.0	[illegible]	[illegible]
02/12/18	13647.9	13459.9	9200.7	[illegible]	151.2	-36.9	[illegible]	13496.8
03/12/18	13351.8	13139.8	9200.7	[illegible]	183.1	-48.9	13188.6	[illegible]
04/12/18	13043.6	12912.8	9200.7	[illegible]	122.7	-8.4	12921.0	12921.0
05/12/18	12776.0	12617.3	9200.7	[illegible]	136.5	-22.2	[illegible]	12639.5
06/12/18	12494.5	12339.5	9200.7	[illegible]	134.6	-20.3	12359.9	[illegible]
07/12/18	12214.9	12048.9	9200.7	[illegible]	140.1	-25.9	12074.8	[illegible]
08/12/18	11919.8	11749.0	9200.7	[illegible]	147.5	-33.2	[illegible]	11782.3
09/12/18	11637.3	11449.2	9200.7	[illegible]	151.2	-36.9	11486.1	[illegible]
10/12/18	11341.1	11164.0	9200.7	[illegible]	145.7	-31.4	[illegible]	[illegible]
11/12/18	11050.4	10899.1	9200.7	[illegible]	132.8	-18.5	[illegible]	[illegible]
12/12/18	10772.6	10619.5	9200.7	[illegible]	133.7	-19.4	[illegible]	[illegible]
13/12/18	10493.9	10289.3	9200.7	[illegible]	159.5	-45.2	10334.5	[illegible]
14/12/18	10189.5	9968.3	9200.7	[illegible]	167.7	-53.5	[illegible]	[illegible]
15/12/18	9876.7	9731.0	9200.7	[illegible]	130.0	-15.7	9746.7	[illegible]
16/12/18	9601.7	9415.5	9200.7	[illegible]	150.3	-36.0	[illegible]	9451.5
17/12/18	9306.5	9122.1	9200.7	[illegible]	149.3	-35.1	[illegible]	[illegible]
18/12/18	9012.1	8835.1	9200.7	[illegible]	145.7	-31.4	[illegible]	[illegible]
19/12/18	8721.5	8538.9	9200.7	[illegible]	148.4	-34.2	8573.1	[illegible]
20/12/18	8428.1	8219.7	4600.3	[illegible]	80.6	-127.7	8347.4	[illegible]
21/12/18	8202.4	7984.9	4600.3	[illegible]	82.9	-134.6	8119.5	[illegible]
22/12/18	7974.5	7747.7	4600.3	[illegible]	85.2	-141.5	7889.2	[illegible]
23/12/18	7744.2	7565.3	4600.3	[illegible]	73.3	-105.6	[illegible]	[illegible]
24/12/18	7525.9	7318.6	4600.3	[illegible]	77.9	-119.4	7440.0	[illegible]
25/12/18	7303.0	7113.1	4600.3	[illegible]	76.0	-113.9	7227.0	[illegible]
26/12/18	7082.0	6921.5	4600.3	[illegible]	68.7	-91.8	[illegible]	[illegible]
27/12/18	6858.3	6698.6	4600.3	[illegible]	71.0	-98.7	[illegible]	[illegible]
28/12/18	6652.3	6475.3	4600.3	[illegible]	72.8	-104.2	6579.5	[illegible]
29/12/18	6434.5	6257.4	4600.3	[illegible]	72.8	-104.2	6361.6	[illegible]
30/12/18	6216.6	6035.9	4600.3	[illegible]	73.7	-107.0	6142.9	[illegible]
31/12/18	5997.9	5806.1	4600.3	[illegible]	76.5	-115.3	[illegible]	[illegible]

Date	Required dust supression in north of cardup brook (m3/day)	Required dust supression in south of cardup brook (m3/day)	Total demand (m3/day)	Allowed abstraction (m³)	Pond Vol after abstraction (m³)	Overflow (m³)	Overflow Flag	Pond Empty Flag
22/10/18	100	45	145	145.0	26862.7	0.0	0	0
23/10/18	100	45	145	145.0	26468.7	0.0	0	0
24/10/18	100	45	145	145.0	26087.6	0.0	0	0
25/10/18	100	45	145	145.0	25659.7	0.0	0	0
26/10/18	100	45	145	145.0	25242.5	0.0	0	0
27/10/18	100	45	145	145.0	24891.5	0.0	0	0
28/10/18	100	45	145	145.0	24533.5	0.0	0	0
29/10/18	100	45	145	145.0	24188.0	0.0	0	0
30/10/18	100	45	145	145.0	23839.7	0.0	0	0
31/10/18	100	45	145	145.0	23494.1	0.0	0	0
01/11/18	100	45	145	145.0	23148.6	0.0	0	0
02/11/18	100	45	145	145.0	22818.2	0.0	0	0
03/11/18	100	45	145	145.0	22465.8	0.0	0	0
04/11/18	100	45	145	145.0	22123.0	0.0	0	0
05/11/18	100	45	145	145.0	21914.7	0.0	0	0
06/11/18	100	45	145	145.0	21577.4	0.0	0	0
07/11/18	100	45	145	145.0	21226.3	0.0	0	0
08/11/18	100	45	145	145.0	20869.7	0.0	0	0
09/11/18	100	45	145	145.0	20492.5	0.0	0	0
10/11/18	100	45	145	145.0	20153.8	0.0	0	0
11/11/18	100	45	145	145.0	19811.0	0.0	0	0
12/11/18	100	45	145	145.0	19464.1	0.0	0	0
13/11/18	100	45	145	145.0	19119.9	0.0	0	0
14/11/18	100	45	145	145.0	18755.1	0.0	0	0
15/11/18	100	45	145	145.0	18388.8	0.0	0	0
16/11/18	100	45	145	145.0	18006.0	0.0	0	0
17/11/18	100	45	145	145.0	17679.8	0.0	0	0
18/11/18	100	45	145	145.0	17332.9	0.0	0	0
19/11/18	100	45	145	145.0	16984.6	0.0	0	0
20/11/18	100	45	145	145.0	16630.7	0.0	0	0
21/11/18	100	45	145	145.0	16341.9	0.0	0	0
22/11/18	100	45	145	145.0	16045.7	0.0	0	0
23/11/18	100	45	145	145.0	15926.3	0.0	0	0
24/11/18	100	45	145	145.0	15642.1	0.0	0	0
25/11/18	100	45	145	145.0	15368.9	0.0	0	0
26/11/18	100	45	145	145.0	15081.9	0.0	0	0
27/11/18	100	45	145	145.0	14785.7	0.0	0	0
28/11/18	100	45	145	145.0	14496.9	0.0	0	0
29/11/18	100	45	145	145.0	14206.3	0.0	0	0
30/11/18	100	45	145	145.0	13920.2	0.0	0	0
01/12/18	100	45	145	145.0	13647.9	0.0	0	0
02/12/18	100	45	145	145.0	13351.8	0.0	0	0
03/12/18	100	45	145	145.0	13043.6	0.0	0	0
04/12/18	100	45	145	145.0	12776.0	0.0	0	0
05/12/18	100	45	145	145.0	12494.5	0.0	0	0
06/12/18	100	45	145	145.0	12214.9	0.0	0	0
07/12/18	100	45	145	145.0	11919.8	0.0	0	0
08/12/18	100	45	145	145.0	11637.3	0.0	0	0
09/12/18	100	45	145	145.0	11341.1	0.0	0	0
10/12/18	100	45	145	145.0	11050.4	0.0	0	0
11/12/18	100	45	145	145.0	10772.6	0.0	0	0
12/12/18	100	45	145	145.0	10493.9	0.0	0	0
13/12/18	100	45	145	145.0	10189.5	0.0	0	0
14/12/18	100	45	145	145.0	9876.7	0.0	0	0
15/12/18	100	45	145	145.0	9601.7	0.0	0	0
16/12/18	100	45	145	145.0	9306.5	0.0	0	0
17/12/18	100	45	145	145.0	9012.1	0.0	0	0
18/12/18	100	45	145	145.0	8721.5	0.0	0	0
19/12/18	100	45	145	145.0	8428.1	0.0	0	0
20/12/18	100	45	145	145.0	8202.4	0.0	0	0
21/12/18	100	45	145	145.0	7974.5	0.0	0	0
22/12/18	100	45	145	145.0	7744.2	0.0	0	0
23/12/18	100	45	145	145.0	7525.9	0.0	0	0
24/12/18	100	45	145	145.0	7303.0	0.0	0	0
25/12/18	100	45	145	145.0	7082.0	0.0	0	0
26/12/18	100	45	145	145.0	6858.3	0.0	0	0
27/12/18	100	45	145	145.0	6652.3	0.0	0	0
28/12/18	100	45	145	145.0	6434.5	0.0	0	0
29/12/18	100	45	145	145.0	6216.6	0.0	0	0
30/12/18	100	45	145	145.0	5997.9	0.0	0	0
31/12/18	100	45	145	145.0	[illegible]	0.0	0	0

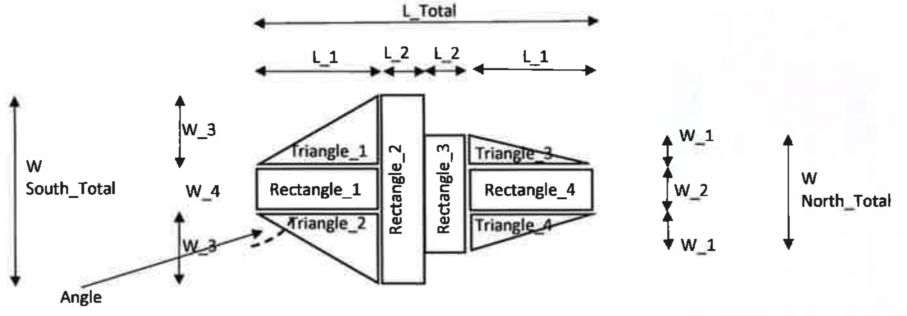
Basin size estimate

Knowns:

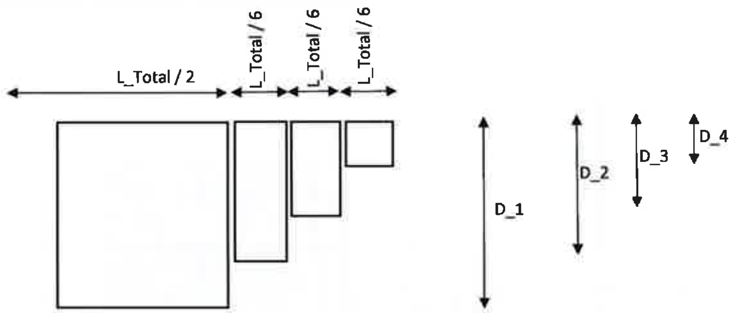
Greatest depth	4	m
Surface Area	10324	m2
PI (for spherical calcs)	3.141592654	
Side Slopes (assumption, 1 in X)	2	
Top length assumption	305	m
Top width assumption	35	m
Bottom length assumption	289	m
bottom width assumption	19	m

As a rectangular (trapezoidal)basin with sloped sides	As a Triangular Basin (ends not sloped)
V = 1/6×h×(Abase+(a+c)×(b+d)+Atop) = 1/6×h×(a×b+(a+c)×(b+d)+c×d)	x section area= top length x height divide 2
(from online calculator)	volume = basin length x area
V= 22,520.83 m3	A= 70 m2
	V= 21,350.00 m3

Plan View Of Basin (Excluding Side Slopes)



Depth Profile Of Basin Along Length (Excluding Side Slopes)



KEY:	
	INPUT
	CALC
	OUTPUT

Input Data

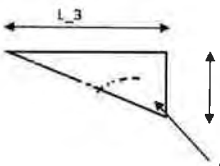
L_1	145.0	m
L_2	5.0	m
L_Total	300.0	m
W_1	6.0	m
W_2	2.0	m
W_3	20.0	m
W_4	11.0	m
W_Total_North	14.0	m
W_Total_South	51.0	m
D_1	4.0	m
D_2	3.0	m
D_3	2.0	m
D_4	1.0	m
Angle	2.4	deg

Calculate Volumes (Excluding Side Slopes)

	Area (m2)	Total Base Area (m2)	Volume (m3)	Total Volume (m3)
Triangle_1	1,450	5,980	5,800	21,897
Triangle_2	1,450		5,800	
Triangle_3	435		2,127	
Triangle_4	435			
Rectangle_1	1,595		6,380	
Rectangle_2	255		1,020	
Rectangle_3	70		210	
Rectangle_4	290		560	
		5,980		

Volume of Triangle		435	Use this if triangle crosses only two different water depths
		[illegible]	Reordered for left to right
		326	Area of Depth 1
		109	Area of Depth 2
		979	Volume of Depth 1
		210	Volume of Depth 2
Volume of Triangle		435	Use this if triangle crosses all different water depths
		[illegible]	Reordered for left to right
		242	Area of Depth 1
		145	Area of Depth 2
		48	Area of Depth 3
		725	Volume of Depth 1
		290	Volume of Depth 2
		48	Volume of Depth 3
		2126.667	

Depth Profile Of Side Slopes)



Input Data

L_3	2.5	m
Slope Ratio	5.0	-
D_5	0.5	m
Area	0.6	m2

Calculate Volumes Of Side Slopes

	Edge Length (m)	Total Edge (m)	Total Volume (m3)
Triangle_1	145	604	378
Triangle_2	145		
Triangle_3	145		
Triangle_4	145		
Rectangle_1	2		
Rectangle_2	10		
Rectangle_3	10		
Rectangle_4	2		

Calculate Total Volumes (Including Side Slopes)

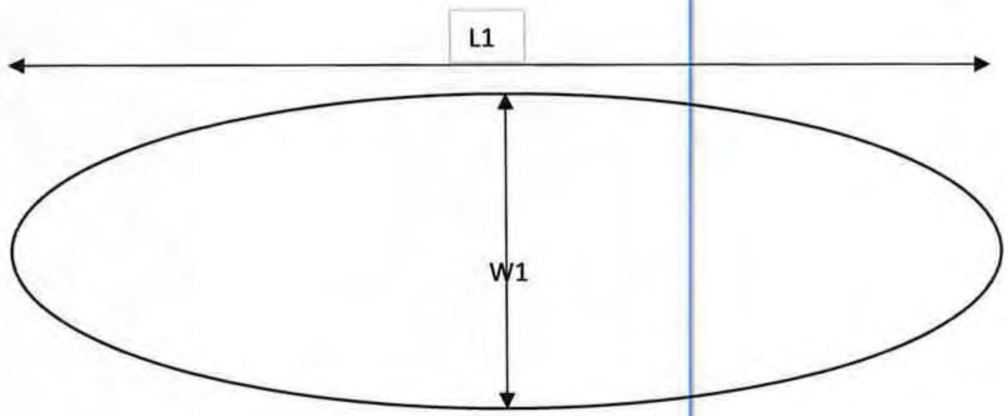
Total Volume
(m3)
22,274

Total TWL Area
(m2)
8,384

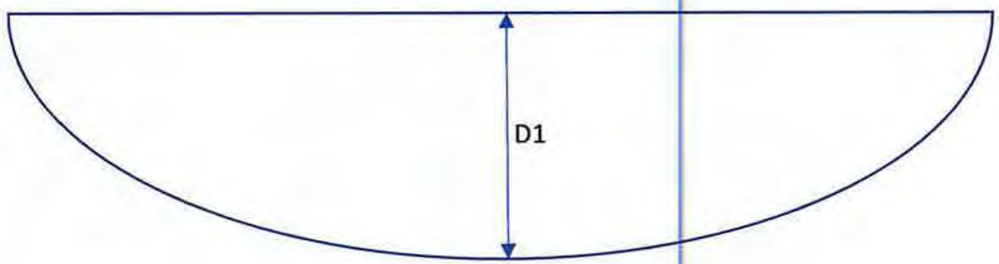
		Extra Basin
L_1	Length (m)	180
W_1	Width (m)	60
pi		3.1415927
D_1	Max Depth (m)	1

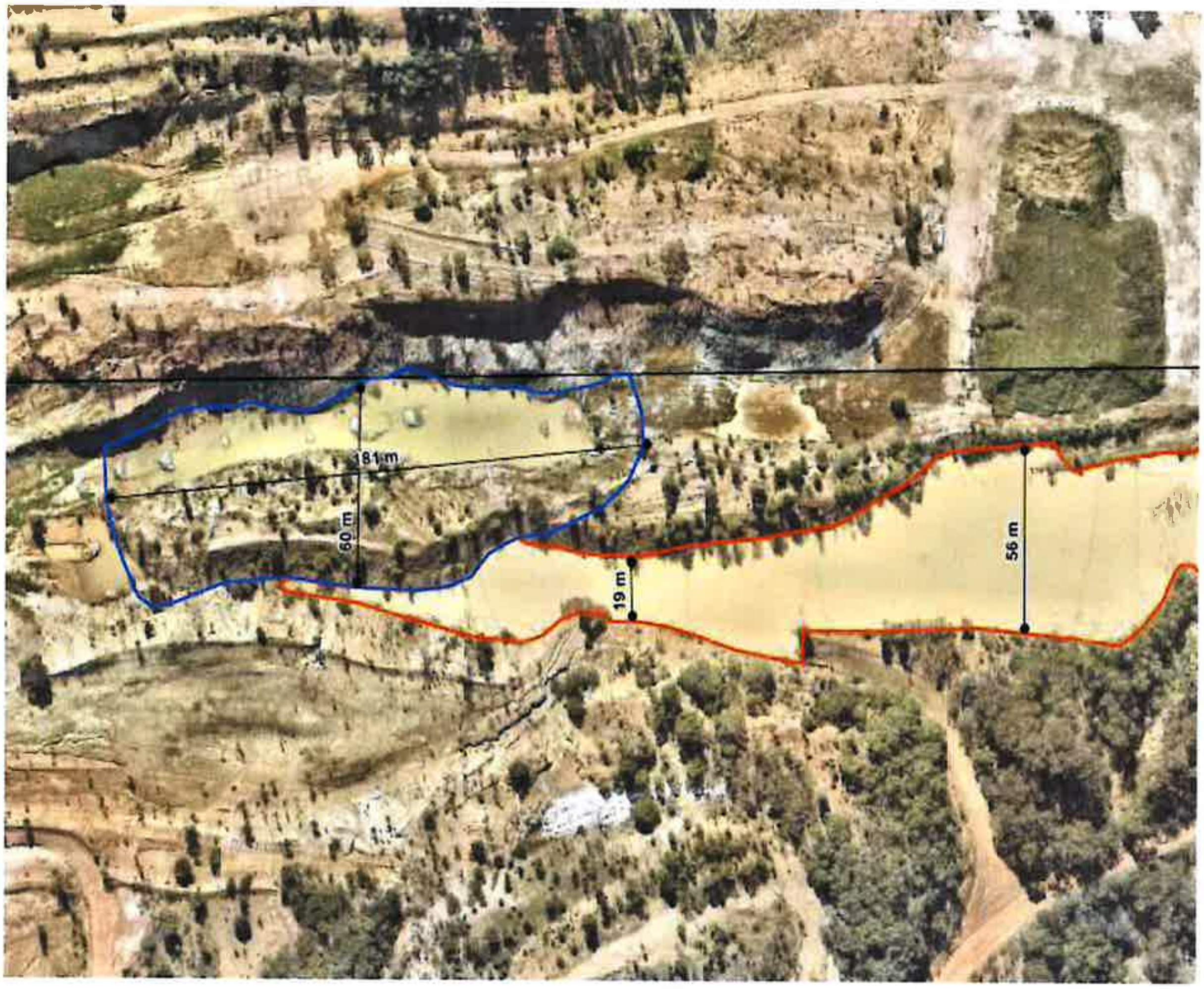
Area (sqm)	8482
Volume (m3)	11310

Top view



Cross section





3D View

Appendix 8 Flocculation Treatment Trial at Shale Road Pit

1.1 Proposed Coagulants/Flocculants

The following were investigated as part of the treatment assessment.

1.1.1 Aluminium Sulphate $Al_2(SO_4)_3$

Aluminium sulphate, commonly known as alum, is a metal salt which is widely used as a flocculent in the treatment of water. Alum contains highly charged counter-ions which neutralise the charge of the fine particles and allows flocculation to take place. The pH of alum is 2.7 (Parson *et al,* 2006).

1.1.2 Hydrated Lime Putty $Ca(OH)_2$

Lime is an alkaline mineral which is used primarily to increase the pH of the water following the addition of alum. Calcium Hydroxide (Hydrated Lime Putty) provides hydroxide ions which then bind with the Aluminium from Alum to form Aluminium Hydroxide plus Calcium Sulphate. The higher pH from Hydrated Lime addition (excess Hydroxide ions) causes the formation of insoluble metal hydroxides which then allows metal hydroxides to precipitate and coagulate. These hydroxides link together to form the chains or meshes which physically trap the fine particles into the larger flocs which further enhances the flocculation process.

1.2 Method

Water samples were taken from the settlement ponds on site and treated and analysed with various concentrations and doses of flocculants.

The investigation was undertaken by trial and error, to determine the optimum dosing rates to reduce the turbidity of the water to below the ANZECC guidelines (20 NTU). Following this, other key water quality parameters were analysed to determine whether any subsequent treatment was needed to ensure discharge water was of sound quality and within ANZECC guidelines. The investigation process and analysis is discussed further below.

1.3 Laboratory Investigation Results

The primary objective of the investigation was to determine whether turbidity levels could be reduced below the ANZECC guidelines using the flocculation treatment. The turbidity results are discussed below.

As a result of the proposed flocculent to be used (Aluminium Sulphate), pH and aluminium were also closely monitoring and addressed as part of this investigation. Aluminium Sulphate is acidic and its major component is aluminium therefore the investigation wanted to ensure that the proposed treatment did not add any potential risk to downstream water quality from those parameters as a by-product. These are therefore also discussed below.

1.3.1 Benchtest Trial 1 – August 2011

Trial 1 commenced in August 2011. An initial dose of Aluminium Sulphate (0.025%) was used and samples were taken from both ponds.

The post treatment results are presented in Table 1.

Table 1 Trial 1 Results

		Units	Guideline Triggers	Northern Pond (AUB04)	Southern Pond (AUB05)
pH		pH Unit	6.5-8.5[1]	7.34	7.92
Turbidity		NTU	10-20[1]	6.8	11.6
Alkalinity as CaCO3	Hydroxide	mg/L	n/a	<1	<1
	Carbonate	mg/L	n/a	<1	<1
	Bicarbonate	mg/L	n/a	4	7
	Total	mg/L	n/a	4	7
Acidity as CaCO3		mg/L	n/a	2	<1
Dissolved Metals	Aluminium	mg/L	n/a	0.81	1.58
	Arsenic	mg/L	n/a	<0.001	<0.001
	Iron	mg/L	n/a	<0.05	<0.05
Total Metals	Aluminium	mg/L	0.055mg/L[2] 1 mg/L[3]	1.20	2.09
	Arsenic	mg/L	0.013mg/l[2]	<0.001	<0.001
	Iron	mg/L	n/a	<0.05	0.18
[1] – ANZECC (2000) Guidelines: Upland and lowland rivers					
[2] - ANZECC (2000) Guidelines: Freshwater 95%					
[3] – DEC (2011)					

Source: WTSA, 2012

1.3.1.1 Discussion

Both of the post treatment results were significantly below the ANZECC guidelines for turbidity. The treatment was therefore considered effective for turbidity treatment.

The pH of the post treatment samples varied between 7.3 and 7.9. This pH was achieved by adding lime putty as a pH correction. Given the average pH of the receiving watercourse from the 2011 analysis was 7.1 (Coterra, 2011c), and the ANZECC guidelines for lowland rivers are 6.5-8.5, the pH of the post treatment samples were considered acceptable.

It is considered by the (then) Department of Environment and Conservation (DEC) that Aluminium levels in excess of 1 mg/l may have acidification effects on the receiving water body (DEC, 2011). The post treatment aluminium levels were above this level and above the ANZECC guidelines (Freshwater, 95% protection level). The aluminium levels were therefore further investigated in Trial 2.

1.3.2 Benchtest Trial 2 – September 2011

For the second trial, water samples were taken from the one pond and two different Aluminium Sulphate concentrations were tested. Test Sample 1 diluted the Alum at a ratio of 1:20 (from 0.025% Aluminium Sulphate used in Trial 1) and Test Sample 2 diluted the Alum at a ratio of 1:10 in an attempt to reduce the aluminium levels. The results of the laboratory analysis are presented in Table 2.

Table 2 Trial 2 Results

		Units	Guideline Triggers	Test Sample 1	Test Sample 2
pH		pH units	6.5-8.5[1]	5.25	4.66
Electrical Conductivity		µS/cm	120-300[1]	83	93
Turbidity		NTU	10-20[1]	3.6	1.2
Sulphate as SO4		mg/L	n/a	8	11
Chloride		mg/L	n/a	17	17
Dissolved Metals	Aluminium	mg/L	n/a	0.07	0.44
	Arsenic	mg/L	n/a	<0.001	<0.001
	Iron	mg/L	n/a	0.08	<0.05
Total Metals	Aluminium	mg/L	0.055mg/L[2] 1 mg/L[3]	0.19	0.51
	Arsenic	mg/L	0.013mg/l[2]	<0.001	<0.001
	Iron	mg/L	n/a	0.10	0.07

[1] – ANZECC (2000) Guidelines: Upland and lowland rivers

[2] - ANZECC (2000) Guidelines: Freshwater 95%

[3] – DEC (2011)

Source: WTSA, 2012

1.3.2.1 Discussion

The concentrations used in Trial 2 indicate that the turbidity has still remained significantly below the recommended guidelines and the aluminium levels are noticeably reduced. Further investigations regarding the aluminium levels were carried out and these are discussed in Section 1.5.3 below.

The pH levels in Trial 2 were below the ANZECC guidelines. Due to the dilution of Alum Sulphate in Trial 2, the samples were left to stand for longer to allow sufficient flocculation to occur, this however also allowed the pH to drop further below the desired levels. Trial 2 did not include any pH correction as it was focusing solely on the aluminium level treatment. pH correction could be easily conducted to adjust the pH to acceptable levels.

Trial 2 therefore determined that in order to sufficiently treat turbidity, while keeping aluminium levels low and keeping pH within an acceptable range, that treatment needs to occur in a two stage process; Stage 1 – Aluminium Sulphate dosing to allow flocculation and Stage 2 – Lime dosing to correct the pH.

1.3.3 Benchtest Trial 2 Comparison to Stream Water Quality

As detailed above, further consideration was given to the aluminium concentrations witnessed in Trial 2 and in comparison to the stream water quality and any potential impacts they could have on the receiving watercourse, given that is the major component of the flocculent proposed.

Stream samples (Figure 7) were therefore taken in October 2011 and compared to the Trial 2 results. Results are summarised in Table 3 below.

Table 3 Settlement ponds and Stream Water Quality

	Guideline Triggers	Stream Samples		Pond Samples	
		AUB01	AUB02	Test Sample 1	Test Sample 2
Turbidity	10-20 NTU[1]	-	-	3.6	1.2
Aluminium	1 mg/L[2]	1.2	2.7	0.19	0.51
[1] –ANZECC (2000) guidelines					
[2] – DEC (2011)					

1.3.3.1 Discussion

As a result of the geology of the area, it was anticipated that aluminium levels would occur naturally in the surface water runoff and watercourses. Therefore following the results of Trial 2, it was determined that the stream aluminium levels should be compared to ascertain the difference.

The post treatment aluminium levels in both samples were below the aluminium levels witnessed naturally in the stream. It is therefore considered that the aluminium levels achieved in Trial 2 would be sufficient for discharge as it is not considered that there would be any adverse impact downstream and that aluminium levels would actually be improved within the watercourse as a result of the discharge.

After the Benchtest trials, a Flocculation Management Plan was prepared for the Shire (Coterra, 2012). This detailed the trial results, and the full design, operation and maintenance requirements. Liaison was undertaken with the Shire and the in situ pond trial was commenced in 2014 following approval to proceed from the Shire.

1.4 In Situ Ponds Trial

Following preparation of the Flocculation Management Plan, further liaison was undertaken with the Shire and the in situ pond trial was commenced following the approval to proceed from the Shire.

Prior to discharge, water quality analysis was undertaken. The results and summary (provided below) were provided to the Shire with the notification of the intent to discharge and discharge was undertaken in August 2014. The onsite dosing equipment is shown in Plate 1 below.

Plate 1: Water Treatment Dosing System at Shale Road

The flocculation trial was effective at treating the water quality, significantly reducing the TSS and turbidity. A summary of the key parameters are provided below;

- The TSS in the ponds were very low at 7mg/l and <5mg/l (northern pond and southern pond respectively). The ponds were well below the immediate upstream value (SHA02) (26mg/l).
- The turbidity readings in the ponds were good (32 and 46 NTU). These were slightly above the ANZECC guidelines (20 NTU) however they were below the immediate upstream value witnessed in the stream (52 NTU at SW02). Given the concentrations in the pond water were an improvement of the receiving stream, the concentrations were considered appropriate for discharge.
- The pH levels in the ponds were at 7.2 and 7.5. These were within the ANZECC guidelines and similar to the immediate upstream value (7.1 at SHA02).
- The total aluminium in the ponds were at 0.84mg/l and 0.93mg/l. These are below the DEC 1mg/l guide referenced in the Flocculation MP (Coterra, 2013) and they are below the immediate upstream value (1.1mg/l at SHA02).

The aesthetic quality of the water within the ponds was greatly improved as a result of the flocculation treatment. Plates 2 and 3 show the aesthetic quality of the water prior to, and after treatment of the water in both the ponds.

Plate 2: Northern Pond, Prior to, and After Treatment

Plate 3: Southern Pond, Prior to, and After Treatment

Appendix 9 Manufacturing Basin Water Balance

Water Balance - Existing Scenario

Project Number: AUBCAR13

Project Name: Cardup Main Pit

Max pond capacity	3624	m³
Pond area	2916	m²
Catchment area	89523.2	m²
Infiltration rate	4	mm/hr
Loss (wetting)	2	mm
Catchment	1	

Retain vol in base of pond	0	m³
1 year ARI storm event		m³ over 72 hours
5 year ARI storm event		m³ over 72 hours

COTERRA ENVIRONMENT

Pond surface area (m²)	Pond Volume (m³)	Storage volume
2,916	3,624	100%
2,187	2,718	75%
1,458	1,359	50%
729	[illegible]	25%

Date	Roof Catchment: Rainfall (mm)	Roofwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	Rainfall (mm)	Stormwater Catchment: Stormwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	
01/06/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
02/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/06/13	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0
06/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/06/13	0.3	1	15924	0.95	2	0	0.0	0.3	1	73599.2	0.8	2	0	0.0	0.0
08/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/06/13	4	1	15924	0.95	2	2	30.3	4	1	73599.2	0.8	2	2	117.8	148.0
10/06/13	7.8	1	15924	0.95	2	5.8	87.7	7.8	1	73599.2	0.8	2	5.8	341.5	429.2
11/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/06/13	1.6	1	15924	0.95	2	0	0.0	1.6	1	73599.2	0.8	2	0	0.0	0.0
18/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/06/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
20/06/13	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
21/06/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
22/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/06/13	19.4	1	15924	0.95	2	17.4	263.2	19.4	1	73599.2	0.8	2	17.4	1024.5	1287.7
25/06/13	11.2	1	15924	0.95	2	9.2	139.2	11.2	1	73599.2	0.8	2	9.2	541.7	680.9
26/06/13	4.6	1	15924	0.95	2	2.6	39.3	4.6	1	73599.2	0.8	2	2.6	153.1	192.4
27/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/06/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
02/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/07/13	3.4	1	15924	0.95	2	1.4	21.2	3.4	1	73599.2	0.8	2	1.4	82.4	101.6
04/07/13	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
05/07/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
06/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
08/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/07/13	18.2	1	15924	0.95	2	16.2	245.1	18.2	1	73599.2	0.8	2	16.2	953.8	1198.9
11/07/13	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
12/07/13	5.6	1	15924	0.95	2	3.6	54.5	5.6	1	73599.2	0.8	2	3.6	212.0	266.4
13/07/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
14/07/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
15/07/13	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
16/07/13	18.2	1	15924	0.95	2	16.2	245.1	18.2	1	73599.2	0.8	2	16.2	953.8	1198.9
17/07/13	22.4	1	15924	0.95	2	20.4	308.6	22.4	1	73599.2	0.8	2	20.4	1201.1	1509.7
18/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/07/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/07/13	41.4	1	15924	0.95	2	39.4	596.0	41.4	1	73599.2	0.8	2	39.4	2319.8	2915.9
25/07/13	3	1	15924	0.95	2	1	15.1	3	1	73599.2	0.8	2	1	58.9	74.0
26/07/13	23.8	1	15924	0.95	2	21.8	329.8	23.8	1	73599.2	0.8	2	21.8	1281.6	1611.4
27/07/13	32.8	1	15924	0.95	2	30.8	465.9	32.8	1	73599.2	0.8	2	30.8	1813.5	2279.4
28/07/13	5.2	1	15924	0.95	2	3.2	48.4	5.2	1	73599.2	0.8	2	3.2	188.4	236.8
29/07/13	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
30/07/13	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
31/07/13	8.8	1	15924	0.95	2	6.8	102.9	8.8	1	73599.2	0.8	2	6.8	400.4	503.2
01/08/13	3	1	15924	0.95	2	1	15.1	3	1	73599.2	0.8	2	1	58.9	74.0
02/08/13	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
03/08/13	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/08/13	[illegible]	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
05/08/13	[illegible]	1	15924	0.95	2	10.6	160.4	12.6	1	73599.2	0.8	2	10.6	624.1	784.5
06/08/13	[illegible]	1	15924	0.95	2	38.6	583.9	40.6	1	73599.2	0.8	2	38.6	2272.7	2856.7
07/08/13	[illegible]	1	15924	0.95	2	16.4	248.1	18.4	1	73599.2	0.8	2	16.4	965.6	1213.7
08/08/13	[illegible]	1	15924	0.95	2	61	922.8	63	1	73599.2	0.8	2	61	3591.6	4514.4
09/08/13	[illegible]	1	15924	0.95	2	2.4	36.3	4.4	1	73599.2	0.8	2	2.4	141.3	177.6
10/08/13	[illegible]	1	15924	0.95	2	10.4	157.3	12.4	1	73599.2	0.8	2	10.4	612.3	769.7
11/08/13	[illegible]	1	15924	0.95	2	11.6	175.5	13.6	1	73599.2	0.8	2	11.6	683.0	858.5
12/08/13	[illegible]	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
13/08/13	[illegible]	1	15924	0.95	2	3.2	48.4	5.2	1	73599.2	0.8	2	3.2	188.4	236.8
14/08/13	[illegible]	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0
15/08/13	[illegible]	1	15924	0.95	2	5.8	87.7	7.8	1	73599.2	0.8	2	5.8	341.5	429.2
16/08/13	[illegible]	1	15924	0.95	2	14.4	217.8	16.4	1	73599.2	0.8	2	14.4	847.9	1065.7
17/08/13	[illegible]	1	15924	0.95	2	1.8	27.2	3.8	1	73599.2	0.8	2	1.8	106.0	133.2
18/08/13	[illegible]	1	15924	0.95	2	0	0.0	2	1	73599.2	0.8	2	0	0.0	0.0
19/08/13	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/08/13	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/08/13	[illegible]	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
22/08/13	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/08/13	[illegible]	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
24/08/13	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
25/08/13	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/08/13	[illegible]	1	15924	0.95	2	3.8	57.5	5.8	1	73599.2	0.8	2	3.8	223.7	281.2
27/08/13	[illegible]	1	15924	0.95	2	4	60.5	6	1	73599.2	0.8	2	4	235.5	296.0
28/08/13	[illegible]	1	15924	0.95	2	19.8	299.5	21.8	1	73599.2	0.8	2	19.8	1165.8	1465.3
29/08/13	[illegible]	1	15924	0.95	2	4	60.5	6	1	73599.2	0.8	2	4	235.5	296.0
30/08/13	[illegible]	1	15924	0.95	2	28.4	429.6	30.4	1	73599.2	0.8	2	28.4	1672.2	2101.8
31/08/13	[illegible]	1	15924	0.95	2	11	166.4	13	1	73599.2	0.8	2	11	647.7	814.1
01/09/13	[illegible]	1	15924	0.95	2	2	30.3	4	1	73599.2	0.8	2	2	117.8	148.0
02/09/13	[illegible]	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
03/09/13	[illegible]	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
04/09/13	[illegible]	1	15924	0.95	2	29.2	441.7	31.2	1	73599.2	0.8	2	29.2	1719.3	2161.0
05/09/13	[illegible]	1	15924	0.95	2	0	0.0	[illegible]	1	73599.2	0.8	2	0	0.0	0.0
06/09/13	[illegible]	1	15924	0.95	2	0	0.0	[illegible]	1	73599.2	0.8	2	0	0.0	0.0
07/09/13	[illegible]	1	15924	0.95	2	0	0.0	[illegible]	1	73599.2	0.8	2	0	0.0	0.0
08/09/13	[illegible]	1	15924	0.95	2	0	0.0	[illegible]	1	73599.2	0.8	2	0	0.0	0.0
09/09/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/09/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/09/13	22.8	1	15924	0.95	2	20.8	314.7	22.8	1	73599.2	0.8	2	20.8	1224.7	1539.3
12/09/13	33.6	1	15924	0.95	2	31.6	478.0	33.6	1	73599.2	0.8	2	31.6	1860.6	2338.6
13/09/13	1.2	1	15924	0.95	2	0	0.0	1.2	1	73599.2	0.8	2	0	0.0	0.0
14/09/13	27.8	1	15924	0.95	2	25.8	390.3	27.8	1	73599.2	0.8	2	25.8	1519.1	1909.4
15/09/13	8.4	1	15924	0.95	2	6.4	96.8	8.4	1	73599.2	0.8	2	6.4	376.8	473.6
16/09/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
17/09/13	33.8	1	15924	0.95	2	31.8	481.1	33.8	1	73599.2	0.8	2	31.8	1872.4	2353.4
18/09/13	7	1	15924	0.95	2	5	75.6	7	1	73599.2	0.8	2	5	294.4	370.0
19/09/13	13.8	1	15924	0.95	2	11.8	178.5	13.8	1	73599.2	0.8	2	11.8	694.8	873.3
20/09/13	8.4	1	15924	0.95	2	6.4	96.8	8.4	1	73599.2	0.8	2	6.4	376.8	473.6
21/09/13	15.8	1	15924	0.95	2	13.8	208.8	15.8	1	73599.2	0.8	2	13.8	812.5	1021.3
22/09/13	11.6	1	15924	0.95	2	9.6	145.2	11.6	1	73599.2	0.8	2	9.6	565.2	710.5
23/09/13	38.2	1	15924	0.95	2	36.2	547.6	38.2	1	73599.2	0.8	2	36.2	2131.4	2679.1

Date	Losses: Loss - evaporation (mm)	Pond loss evaporation (m³)	Infiltration (m³/day)	Total Pond Loss (m³/day)	Volume at start of period (m³)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (corrected for max level) (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m³)	Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow m³	Overflow flag	Pond Empty flag
01/06/13	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
02/06/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
03/06/13	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
04/06/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
05/06/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
06/06/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
07/06/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
08/06/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
09/06/13	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	77.0	77.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
10/06/13	1.4	4.08	279.94	284.02	0	145.2	729.0	71.0	-213.0	358.2	358.2	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
11/06/13	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
12/06/13	2.1	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
13/06/13	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
14/06/13	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
15/06/13	1.1	3.21	279.94	283.14	0	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
16/06/13	1.1	3.21	279.94	283.14	0	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
17/06/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
18/06/13	1.1	3.21	279.94	283.14	0	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
19/06/13	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
20/06/13	1.2	3.50	279.94	283.44	0	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
21/06/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
22/06/13	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
23/06/13	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
24/06/13	1.8	5.25	279.94	285.18	0	1002.5	1458.0	142.6	-142.6	1145.1	1145.1	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
25/06/13	1.4	4.08	279.94	284.02	0	396.8	1458.0	142.0	-142.0	538.9	538.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
26/06/13	1	2.92	279.94	282.85	0	0.0	729.0	70.7	-212.1	121.7	121.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
27/06/13	1.2	3.50	279.94	283.44	0	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
28/06/13	1.2	3.50	279.94	283.44	0	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
29/06/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
30/06/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
01/07/13	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
02/07/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
03/07/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	32.7	32.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
04/07/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
05/07/13	1.2	3.50	279.94	283.44	0	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
06/07/13	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
07/07/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
08/07/13	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
09/07/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
10/07/13	1.3	3.79	279.94	283.73	0	915.2	1458.0	141.9	-141.9	1057.1	1057.1	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
11/07/13	0.7	2.04	279.94	281.98	0	0.0	729.0	70.5	-211.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
12/07/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	195.3	195.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
13/07/13	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
14/07/13	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
15/07/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
16/07/13	2.1	6.12	279.94	286.06	0	912.9	1458.0	143.0	-143.0	1055.9	1055.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
17/07/13	2	5.83	279.94	285.77	0	1224.0	1458.0	142.9	-142.9	1366.9	1366.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
18/07/13	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
19/07/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
20/07/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
21/07/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
22/07/13	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
23/07/13	3.2	9.33	279.94	289.27	0	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
24/07/13	2.1	6.12	279.94	286.06	0	2629.8	2187.0	214.5	-71.5	2701.3	2701.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
25/07/13	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	2.4	2.4	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
26/07/13	2.2	6.42	279.94	286.35	0	1327.0	1458.0	143.2	-143.2	1470.2	1470.2	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
27/07/13	1.9	5.54	279.94	285.48	0	1993.9	2187.0	214.1	-71.4	2065.3	2065.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
28/07/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	165.7	165.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
29/07/13	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
30/07/13	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
31/07/13	1.7	4.96	279.94	284.89	0	218.4	729.0	71.2	-213.7	432.0	432.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
01/08/13	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	2.7	2.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
02/08/13	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
03/08/13	2.1	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
04/08/13	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
05/08/13	2.5	7.29	279.94	287.23	0	497.2	1458.0	143.6	-143.6	640.9	640.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
06/08/13	1.7	4.96	279.94	284.89	0	2571.8	2187.0	213.7	-71.2	2643.0	2643.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
07/08/13	1.9	5.54	279.94	285.48	0	928.2	1458.0	142.7	-142.7	1071.0	1071.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
08/08/13	1.6	4.67	279.94	284.60	0	4229.8	2916.0	284.6	0.0	4229.8	3624.0	318.7	[illegible]	[illegible]	[illegible]	605.8	1	0
09/08/13	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	106.5	106.5	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
10/08/13	2	5.83	279.94	285.77	0	483.9	1458.0	142.9	-142.9	626.8	626.8	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
11/08/13	2.8	8.16	279.94	288.10	0	570.4	1458.0	144.1	-144.1	714.4	714.4	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
12/08/13	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
13/08/13	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	165.2	165.2	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
14/08/13	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
15/08/13	2.6	7.58	279.94	287.52	0	141.7	729.0	71.9	-215.6	357.4	357.4	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
16/08/13	2.2	6.42	279.94	286.35	0	779.4	1458.0	143.2	-143.2	922.5	922.5	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
17/08/13	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	61.6	61.6	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
18/08/13	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
19/08/13	2.8	8.16	279.94	288.10	0	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
20/08/13	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
21/08/13	2.8	8.16	279.94	288.10	0	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
22/08/13	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
23/08/13	3	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
24/08/13	3.2	9.33	279.94	289.27	0	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
25/08/13	2.1	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
26/08/13	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	209.5	209.5	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
27/08/13	1.6	4.67	279.94	284.60	0	11.4	729.0	71.2	-213.5	224.9	224.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
28/08/13	2.6	7.58	279.94	287.52	0	1177.8	1458.0	143.8	-143.8	1321.6	1321.6	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
29/08/13	2.5	7.29	279.94	287.23	0	8.8	729.0	71.8	-215.4	224.2	224.2	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
30/08/13	2.7	7.87	279.94	287.81	0	1814.0	2187.0	215.9	-72.0	1885.9	1885.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
31/08/13	3.2	9.33	279.94	289.27	0	524.8	1458.0	144.6	-144.6	669.4	669.4	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
01/09/13	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	76.2	76.2	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
02/09/13	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
03/09/13	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
04/09/13	3.7	10.79	279.94	290.73	0	1870.3	2187.0	218.0	-72.7	1943.0	1943.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
05/09/13	3.3	9.62	279.94	289.56	0	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
06/09/13	3.6	10.50	279.94	290.43	0	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
07/09/13	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
08/09/13	3.3	9.62	279.94	289.56	0	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
09/09/13	3.4	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
10/09/13	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
11/09/13	2.4	7.00	279.94	286.93	0	1252.4	1458.0	143.5	-143.5	1395.9	1395.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
12/09/13	3.1	9.04	279.94	288.98	0	2049.7	2187.0	216.7	-72.2	2121.9	2121.9	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
13/09/13	2.7	7.87	279.94	287.81	0	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
14/09/13	1.9	5.54	279.94	285.48	0	1623.9	2187.0	214.1	-71.4	1695.3	1695.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
15/09/13	3.6	10.50	279.94	290.43	0	183.2	729.0	72.6	-217.8	401.0	401.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
16/09/13	3.7	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1
17/09/13	3.6	10.50	279.94	290.43	0	2063.0	2187.0	217.8	-72.6	2135.6	2135.6	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
18/09/13	3.5	10.21	279.94	290.14	0	79.9	729.0	72.5	-217.6	297.5	297.5	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
19/09/13	3.3	9.62	279.94	289.56	0	583.7	1458.0	144.8	-144.8	728.5	728.5	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
20/09/13	3.2	9.33	279.94	289.27	0	184.4	729.0	72.3	-217.0	401.3	401.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
21/09/13	3.6	10.50	279.94	290.43	0	730.9	1458.0	145.2	-145.2	876.1	876.1	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
22/09/13	3.6	10.50	279.94	290.43	0	420.0	1458.0	145.2	-145.2	565.3	565.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0
23/09/13	3.4	9.91	279.94	289.85	0	2389.2	2187.0	217.4	-72.5	2461.7	2461.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0

Date	Roof Catchment: Rainfall (mm)	Roofwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	Rainfall (mm)	Stormwater Catchment: Stormwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	
24/09/13	8.8	1	15924	0.95	2	6.8	102.9	8.8	1	73599.2	0.8	2	6.8	400.4	503.3
25/09/13	2	1	15924	0.95	2	0	0.0	2	1	73599.2	0.8	2	0	0.0	0.0
26/09/13	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
27/09/13	9.8	1	15924	0.95	2	7.8	118.0	9.8	1	73599.2	0.8	2	7.8	459.3	577.3
28/09/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/09/13	1.8	1	15924	0.95	2	0	0.0	1.8	1	73599.2	0.8	2	0	0.0	0.0
30/09/13	23.4	1	15924	0.95	2	21.4	323.7	23.4	1	73599.2	0.8	2	21.4	1260.0	1583.7
01/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.2
02/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
03/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
04/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
05/10/13	3.6	1	15924	0.95	2	1.6	24.2	3.6	1	73599.2	0.8	2	1.6	94.2	118.4
06/10/13	2.8	1	15924	0.95	2	0.8	12.1	2.8	1	73599.2	0.8	2	0.8	47.1	59.2
07/10/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
08/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
09/10/13	11.8	1	15924	0.95	2	9.8	148.3	11.8	1	73599.2	0.8	2	9.8	577.0	725.3
10/10/13	1.8	1	15924	0.95	2	0	0.0	1.8	1	73599.2	0.8	2	0	0.0	0.3
11/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
12/10/13	4	1	15924	0.95	2	2	30.3	4	1	73599.2	0.8	2	2	117.8	148.0
13/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
14/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
15/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
16/10/13	7.8	1	15924	0.95	2	5.8	87.7	7.8	1	73599.2	0.8	2	5.8	341.5	429.2
17/10/13	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.3
18/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.3
19/10/13	1.8	1	15924	0.95	2	0	0.0	1.8	1	73599.2	0.8	2	0	0.0	0.3
20/10/13	9.6	1	15924	0.95	2	7.6	115.0	9.6	1	73599.2	0.8	2	7.6	447.5	562.5
21/10/13	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
22/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/10/13	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
25/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
27/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
31/10/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
02/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/11/13	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
06/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/11/13	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
08/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/11/13	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
23/11/13	2	1	15924	0.95	2	0	0.0	2	1	73599.2	0.8	2	0	0.0	0.0
24/11/13	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
25/11/13	1.6	1	15924	0.95	2	0	0.0	1.6	1	73599.2	0.8	2	0	0.0	0.0
26/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
27/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/11/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/11/13	17	1	15924	0.95	2	15	226.9	17	1	73599.2	0.8	2	15	883.2	1110.1
01/12/13	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
02/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/12/13	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	0.8	2	0.2	11.8	14.8
08/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
25/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
27/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
31/12/13	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
02/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
08/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/01/14	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0
17/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0

Date	Losses: Loss - evaporation (mm)	Pond loss evaporation (m³)	Infiltration (m³/day)	Total Pond loss (m³/day)	Volume at start of period (m³)	Vol at end - correction for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end corrected for max level (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m³)	Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow (m³)	Overflow flag	Pond Empty flag	Pond surface area (m²)	Pond Volume (m³)	Storage volume
24/09/13	3.7	10.79	279.94	290.73	0	212.6	729.0	72.7	-218.0	430.6	430.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
25/09/13	4.7	13.71	279.94	291.64	0	0.0	729.0	73.4	-220.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/09/13	3.5	10.21	279.94	290.14	0	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/09/13	3.9	11.37	279.94	291.31	0	286.0	729.0	72.8	-218.5	504.4	504.4	318.7	[illegible]	[illegible]	1624	0.0	0	0			
28/09/13	3.8	11.08	279.94	291.02	0	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/09/13	2.9	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/09/13	3.6	10.50	279.94	290.43	0	1293.3	1458.0	145.2	-145.2	1438.5	1438.5	318.7	[illegible]	[illegible]	1624	0.0	0	0			
01/10/13	3.6	10.50	279.94	290.43	0	0.0	723.0	72.6	-217.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/10/13	5	14.58	279.94	294.52	0	0.0	723.0	73.6	-220.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/10/13	5.7	16.62	279.94	296.56	0	0.0	723.0	74.1	-222.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/10/13	3.5	10.21	279.94	290.14	0	0.0	723.0	72.5	-217.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
05/10/13	3.8	11.08	279.94	291.02	0	0.0	723.0	72.8	-218.3	45.7	45.7	318.7	[illegible]	[illegible]	1624	0.0	0	0			
06/10/13	4.8	14.00	279.94	293.93	0	0.0	723.0	73.5	-220.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/10/13	4.6	13.41	279.94	293.35	0	0.0	723.0	73.3	-220.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/10/13	3.6	10.50	279.94	290.43	0	0.0	723.0	72.6	-217.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/10/13	3.9	11.37	279.94	291.31	0	434.0	1458.0	145.7	-145.7	579.6	579.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
10/10/13	4.5	13.12	279.94	293.06	0	0.0	727.0	73.3	-219.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/10/13	3.8	11.08	279.94	291.02	0	0.0	727.0	72.8	-218.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/10/13	4.2	12.25	279.94	292.18	0	0.0	727.0	73.0	-219.1	75.0	75.0	318.7	[illegible]	[illegible]	1624	0.0	0	0			
13/10/13	5.5	16.04	279.94	295.97	0	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/10/13	5.9	17.20	279.94	297.14	0	0.0	729.0	74.3	-222.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/10/13	4.1	11.96	279.94	291.89	0	0.0	729.0	73.0	-218.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
16/10/13	4.7	13.71	279.94	291.64	0	135.6	729.0	73.4	-220.2	355.8	355.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
17/10/13	4.7	13.71	279.94	291.64	0	0.0	729.0	73.4	-220.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/10/13	5	14.58	279.94	294.52	0	0.0	729.0	73.6	-220.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
19/10/13	2.8	8.16	279.94	288.10	0	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/10/13	4.5	13.12	279.94	293.06	0	269.4	729.0	73.3	-219.8	489.2	489.2	318.7	[illegible]	[illegible]	1624	0.0	0	0			
21/10/13	5.6	16.33	279.94	296.27	0	0.0	729.0	74.1	-222.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/10/13	6.3	18.37	279.94	298.31	0	0.0	729.0	74.6	-223.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/10/13	7.2	21.00	279.94	300.93	0	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/10/13	7.3	21.29	279.94	301.22	0	0.0	729.0	75.3	-225.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
25/10/13	4.4	12.83	279.94	292.77	0	0.0	729.0	73.2	-219.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/10/13	4.7	13.71	279.94	293.64	0	0.0	729.0	73.4	-220.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/10/13	6.2	18.08	279.94	298.02	0	0.0	729.0	74.5	-223.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
28/10/13	7.1	20.70	279.94	300.64	0	0.0	729.0	75.2	-225.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/10/13	7	20.41	279.94	300.35	0	0.0	729.0	75.1	-225.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/10/13	8.8	25.66	279.94	305.60	0	0.0	729.0	76.4	-229.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
31/10/13	5.3	15.45	279.94	295.39	0	0.0	729.0	73.8	-221.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
01/11/13	6.1	17.79	279.94	297.72	0	0.0	729.0	74.4	-223.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/11/13	7.4	21.58	279.94	301.51	0	0.0	729.0	75.4	-226.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/11/13	7.6	22.16	279.94	302.10	0	0.0	729.0	75.5	-226.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/11/13	5.9	17.20	279.94	297.14	0	0.0	729.0	74.3	-222.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
05/11/13	5.5	16.04	279.94	295.97	0	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/11/13	5.1	14.87	279.94	294.81	0	0.0	729.0	73.7	-221.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/11/13	6.6	19.25	279.94	299.18	0	0.0	729.0	74.8	-224.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/11/13	7.8	22.74	279.94	302.68	0	0.0	729.0	75.7	-227.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/11/13	8.5	24.79	279.94	304.72	0	0.0	729.0	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/11/13	9.7	28.29	279.94	308.22	0	0.0	729.0	77.1	-231.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/11/13	6.7	19.54	279.94	299.47	0	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/11/13	6.9	20.12	279.94	300.06	0	0.0	729.0	75.0	-225.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
13/11/13	7.6	22.16	279.94	302.10	0	0.0	725.0	75.5	-226.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/11/13	8.5	24.79	279.94	304.72	0	0.0	725.0	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/11/13	9.1	26.54	279.94	306.47	0	0.0	725.0	76.6	-229.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
16/11/13	8.8	25.66	279.94	305.60	0	0.0	725.0	76.4	-229.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
17/11/13	5.8	16.91	279.94	296.85	0	0.0	725.0	74.2	-222.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/11/13	5.5	16.04	279.94	295.97	0	0.0	725.0	74.0	-222.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
19/11/13	7.5	21.87	279.94	301.81	0	0.0	725.0	75.5	-226.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/11/13	7.7	22.45	279.94	302.39	0	0.0	725.0	75.6	-226.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/11/13	8.3	24.20	279.94	304.14	0	0.0	725.0	76.0	-228.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/11/13	6.8	19.83	279.94	299.76	0	0.0	725.0	74.9	-224.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/11/13	6.2	18.08	279.94	298.02	0	0.0	725.0	74.5	-223.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/11/13	5.4	15.75	279.94	295.68	0	0.0	725.0	73.9	-221.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
25/11/13	6	17.50	279.94	297.43	0	0.0	725.0	74.4	-223.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/11/13	7.5	21.87	279.94	301.81	0	0.0	725.0	75.5	-226.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/11/13	7.2	21.00	279.94	300.93	0	0.0	725.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
28/11/13	7.7	22.45	279.94	302.39	0	0.0	725.0	75.6	-226.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/11/13	4.9	14.29	279.94	294.22	0	0.0	725.0	73.6	-220.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/11/13	5.5	16.04	279.94	295.97	0	814.1	1458.0	148.0	-148.0	962.1	962.1	318.7	[illegible]	[illegible]	1624	0.0	0	0			
01/12/13	5.9	17.20	279.94	297.14	0	0.0	729.0	74.3	-222.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/12/13	6.5	18.95	279.94	298.89	0	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/12/13	7.2	21.00	279.94	300.93	0	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/12/13	8	23.33	279.94	303.26	0	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
05/12/13	8.5	24.79	279.94	304.72	0	0.0	729.0	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/12/13	7.4	21.58	279.94	301.51	0	0.0	729.0	75.4	-226.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/12/13	5.6	16.33	279.94	296.27	0	0.0	729.0	74.1	-222.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/12/13	7.1	20.70	279.94	300.64	0	0.0	729.0	75.2	-225.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/12/13	7.8	22.74	279.94	302.68	0	0.0	729.0	75.7	-227.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/12/13	8.6	25.08	279.94	305.01	0	0.0	729.0	76.3	-228.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/12/13	9.1	26.54	279.94	306.47	0	0.0	729.0	76.6	-229.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/12/13	9.6	27.99	279.94	307.93	0	0.0	729.0	77.0	-230.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
13/12/13	10.2	29.74	279.94	309.68	0	0.0	729.0	77.4	-232.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/12/13	9.8	28.58	279.94	308.51	0	0.0	729.0	77.1	-231.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/12/13	8.5	24.79	279.94	304.72	0	0.0	729.0	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
16/12/13	7.8	22.74	279.94	302.68	0	0.0	729.0	75.7	-227.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
17/12/13	5.7	16.62	279.94	296.56	0	0.0	729.0	74.1	-222.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/12/13	6.8	19.83	279.94	299.76	0	0.0	729.0	74.9	-224.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
19/12/13	7.7	22.45	279.94	302.39	0	0.0	729.0	75.6	-226.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/12/13	8.5	24.79	279.94	304.72	0	0.0	729.0	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/12/13	8.4	24.49	279.94	304.43	0	0.0	729.0	76.1	-228.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/12/13	7.8	22.74	279.94	302.68	0	0.0	729.0	75.7	-227.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/12/13	8.9	25.95	279.94	305.89	0	0.0	729.0	76.5	-229.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/12/13	7.2	21.00	279.94	300.93	0	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
25/12/13	8.2	23.91	279.94	303.85	0	0.0	729.0	76.0	-227.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/12/13	7.3	21.29	279.94	301.22	0	0.0	729.0	75.3	-225.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/12/13	7.2	21.00	279.94	300.93	0	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
28/12/13	9.1	26.54	279.94	306.47	0	0.0	729.0	76.6	-229.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/12/13	8.8	25.66	279.94	305.60	0	0.0	729.0	76.4	-229.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/12/13	8	23.33	279.94	303.26	0	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
31/12/13	6.5	18.95	279.94	298.89	0	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
01/01/14	7.4	21.58	279.94	301.51	0	0.0	729.0	75.4	-226.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/01/14	5.7	16.62	279.94	296.56	0	0.0	729.0	74.1	-222.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/01/14	7	20.41	279.94	300.35	0	0.0	729.0	75.1	-225.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/01/14	7.2	21.00	279.94	300.93	0	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
05/01/14	8	23.33	279.94	303.26	0	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/01/14	8.8	25.66	279.94	305.60	0	0.0	729.0	76.4	-229.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/01/14	5.9	17.20	279.94	297.14	0	0.0	729.0	74.3	-222.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/01/14	6.5	18.95	279.94	298.89	0	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/01/14	7	20.41	279.94	300.35	0	0.0	729.0	75.1	-225.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/01/14	7.6	22.16	279.94	302.10	0	0.0	729.0	75.5	-226.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/01/14	9.9	28.87	279.94	308.80	0	0.0	729.0	77.2	-231.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/01/14	10.4	30.33	279.94	310.26	0	0.0	729.0	77.6	-232.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
13/01/14	6.3	18.37	279.94	298.31	0	0.0	729.0	74.6	-223.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/01/14	6.7	19.54	279.94	299.47	0	0.0	729.3	74.9	-224.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/01/14	5.8	16.91	279.94	296.85	0	0.0	729.3	74.2	-222.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
16/01/14	6.7	19.54	279.94	299.47	0	0.0	729.3	74.9	-224.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
17/01/14	7.7	22.45	279.94	302.39	0	0.0	729.3	75.6	-226.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/01/14	8.5	24.79	279.94	304.72	0	0.0	729.3	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
19/01/14	9.8	28.58	279.94	308.51	0	0.0	729.3	77.1	-231.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/01/14	9.1	26.54	279.94	306.47	0	0.0	729.3	76.6	-229.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/01/14	8.9	25.95	279.94	305.89	0	0.0	729.3	76.5	-229.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/01/14	8.5	24.79	279.94	304.72	0	0.0	729.3	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/01/14	8.8	25.66	279.94	305.60	0	0.0	729.3	76.4	-229.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			

Cardup Main Pit

Water Balance Model

	Roof Catchment				Absorption and wetting				Stormwater Catchment			Absorption and wetting			
Date	Rainfall (mm)	Roofwater Catchment	Catchment Area (m²)	Runoff Coefficient	Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	Rainfall (mm)	Stormwater Catchment	Catchment Area (m²)	Runoff Coefficient	associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	
24/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
25/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
26/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
27/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
28/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
29/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
30/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
31/01/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
01/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
02/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
03/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
04/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
05/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.3	0.0
06/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
07/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
08/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
09/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
10/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
11/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
12/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
13/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
14/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
15/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
16/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
17/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
18/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
19/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
20/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
21/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
22/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
23/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	[illegible]
24/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
25/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
26/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
27/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
28/02/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
01/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
02/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
03/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
04/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
05/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
06/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
07/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
08/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
09/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
10/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
11/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
12/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
13/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
14/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
15/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
16/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
17/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
18/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
19/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
20/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
21/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
22/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
23/03/14	6.2	1	15924	0.95	2	4.2	63.5	6.2	1	73599.2	[illegible]	2	4.2	247.3	310.8
24/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
25/03/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	[illegible]	2	0	0.0	0.0
26/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
27/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
28/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
29/03/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
30/03/14	12	1	15924	0.95	2	10	151.3	12	1	73599.2	[illegible]	2	10	588.8	740.1
31/03/14	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	[illegible]	2	0.2	11.8	14.8
01/04/14	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	[illegible]	2	0	0.0	0.0
02/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
03/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
04/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
05/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
06/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
07/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
08/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
09/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
10/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
11/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
12/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
13/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
14/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
15/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
16/04/14	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	[illegible]	2	0	0.0	0.0
17/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
18/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
19/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
20/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
21/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
22/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
23/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
24/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
25/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
26/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
27/04/14	14.6	1	15924	0.95	2	12.6	190.6	14.6	1	73599.2	[illegible]	2	12.6	741.9	932.5
28/04/14	16.2	1	15924	0.95	2	14.2	214.8	16.2	1	73599.2	[illegible]	2	14.2	836.1	1050.9
29/04/14	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	[illegible]	2	0	0.0	0.0
30/04/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
01/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
02/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
03/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
04/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
05/05/14	5	1	15924	0.95	2	3	45.4	5	1	73599.2	[illegible]	2	3	176.6	222.0
06/05/14	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	[illegible]	2	0	0.0	0.0
07/05/14	1.6	1	15924	0.95	2	0	0.0	1.6	1	73599.2	[illegible]	2	0	0.0	0.0
08/05/14	63.2	1	15924	0.95	2	61.2	925.8	63.2	1	73599.2	[illegible]	2	61.2	3603.4	4529.2
09/05/14	10.6	1	15924	0.95	2	8.6	130.1	10.6	1	73599.2	[illegible]	2	8.6	506.4	636.5
10/05/14	9.2	1	15924	0.95	2	7.2	108.9	9.2	1	73599.2	[illegible]	2	7.2	423.9	532.9
11/05/14	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	[illegible]	2	0	0.0	0.0
12/05/14	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	[illegible]	2	0	0.0	0.0
13/05/14	3.3	1	15924	0.95	2	1.3	19.7	3.3	1	73599.2	[illegible]	2	1.3	76.5	96.2
14/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
15/05/14	2.6	1	15924	0.95	2	0.6	9.1	2.6	1	73599.2	[illegible]	2	0.6	35.3	44.4
16/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
17/05/14	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	[illegible]	2	0	0.0	0.0
18/05/14	3.6	1	15924	0.95	2	1.6	24.2	3.6	1	73599.2	[illegible]	2	1.6	94.2	118.4
19/05/14	1	1	15924	0.95	2	0	0.0	1	1	73599.2	[illegible]	2	0	0.0	0.0
20/05/14	2.6	1	15924	0.95	2	0.6	9.1	2.6	1	73599.2	[illegible]	2	0.6	35.3	44.4
21/05/14	17	1	15924	0.95	2	15	226.9	17	1	73599.2	[illegible]	2	15	883.2	1110.1
22/05/14	1.8	1	15924	0.95	2	0	0.0	1.8	1	73599.2	[illegible]	2	0	0.0	0.0
23/05/14	46.6	1	15924	0.95	2	44.6	674.7	46.6	1	73599.2	[illegible]	2	44.6	2626.0	3300.7
24/05/14	17.6	1	15924	0.95	2	15.6	236.0	17.6	1	73599.2	[illegible]	2	15.6	918.5	1154.5
25/05/14	13.6	1	15924	0.95	2	11.6	175.5	13.6	1	73599.2	[illegible]	2	11.6	683.0	858.5

	Losses											Demand	Abstraction								
Date	Loss - evaporation (mm)	Pond loss evaporation (m³)	Infiltration (m³/day)	Total Pond Loss (m³/day)	Volume at start of period (m³)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected lower) (m3/day)	Volume at end (corrected for max level) (m3/day)	Required process water (m3/day)	Vol abstracted (m³)	Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow (m³)	Overflow flag	Pond Empty flag	Pond surface area (m²)	Pond Volume (m³)	Storage volume
24/01/14	7.7	22.45	279.94	302.39	[illegible]	0.0	729.0	75.6	-226.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
25/01/14	7.5	21.87	279.94	301.81	[illegible]	0.0	729.0	75.5	-226.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
26/01/14	7.1	20.70	279.94	300.64	[illegible]	0.0	729.0	75.2	-225.5	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
27/01/14	5.5	16.04	279.94	295.97	[illegible]	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
28/01/14	8	23.33	279.94	303.26	[illegible]	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
29/01/14	8	23.33	279.94	303.26	[illegible]	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
30/01/14	6.8	19.83	279.94	299.76	[illegible]	0.0	729.0	74.9	-224.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
31/01/14	5.6	16.33	279.94	296.27	[illegible]	0.0	729.0	74.1	-222.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
01/02/14	6.8	19.83	279.94	299.76	[illegible]	0.0	729.0	74.9	-224.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
02/02/14	8.2	23.91	279.94	303.85	[illegible]	0.0	729.0	76.0	-227.9	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
03/02/14	8.3	24.20	279.94	304.14	[illegible]	0.0	729.0	76.0	-228.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
04/02/14	8.6	25.08	279.94	305.01	[illegible]	0.0	729.0	76.3	-228.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
05/02/14	6.7	19.54	279.94	299.47	[illegible]	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
06/02/14	6.9	20.12	279.94	300.06	[illegible]	0.0	729.0	75.0	-225.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
07/02/14	6.9	20.12	279.94	300.06	[illegible]	0.0	729.0	75.0	-225.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
08/02/14	7.2	21.00	279.94	300.93	[illegible]	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
09/02/14	8.1	23.62	279.94	303.56	[illegible]	0.0	729.0	75.9	-227.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
10/02/14	6.6	19.25	279.94	299.18	[illegible]	0.0	729.0	74.8	-224.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
11/02/14	7.7	22.45	279.94	302.39	[illegible]	0.0	729.0	75.6	-226.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
12/02/14	7.2	21.00	279.94	300.93	[illegible]	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
13/02/14	7.2	21.00	279.94	300.93	[illegible]	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
14/02/14	6.6	19.25	279.94	299.18	[illegible]	0.0	729.0	74.8	-224.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
15/02/14	6.5	18.95	279.94	298.89	[illegible]	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
16/02/14	5.2	15.16	279.94	295.10	[illegible]	0.0	729.0	73.8	-221.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
17/02/14	6.7	19.54	279.94	299.47	[illegible]	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
18/02/14	7.9	23.04	279.94	302.97	[illegible]	0.0	729.0	75.7	-227.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
19/02/14	8.1	23.62	279.94	303.56	[illegible]	0.0	729.0	75.9	-227.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
20/02/14	8	23.33	279.94	303.26	[illegible]	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
21/02/14	7.9	23.04	279.94	302.97	[illegible]	0.0	729.0	75.7	-227.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
22/02/14	7.6	22.16	279.94	302.10	[illegible]	0.0	729.0	75.5	-226.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
23/02/14	6.7	19.54	279.94	299.47	[illegible]	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
24/02/14	6.5	18.95	279.94	298.89	[illegible]	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
25/02/14	6.7	19.54	279.94	299.47	[illegible]	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
26/02/14	6.9	20.12	279.94	300.06	[illegible]	0.0	729.0	75.0	-225.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
27/02/14	7.2	21.00	279.94	300.93	[illegible]	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
28/02/14	6.8	19.83	279.94	299.76	[illegible]	0.0	729.0	74.9	-224.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
01/03/14	7.2	21.00	279.94	300.93	[illegible]	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
02/03/14	6.1	17.79	279.94	297.72	[illegible]	0.0	729.0	74.4	-223.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
03/03/14	5.5	16.04	279.94	295.97	[illegible]	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
04/03/14	6.9	20.12	279.94	300.06	[illegible]	0.0	729.0	75.0	-225.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
05/03/14	6.5	18.95	279.94	298.89	[illegible]	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
06/03/14	6.3	18.37	279.94	298.31	[illegible]	0.0	729.0	74.6	-223.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
07/03/14	7.4	21.58	279.94	301.51	[illegible]	0.0	729.0	75.4	-226.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
08/03/14	4.4	12.83	279.94	292.77	[illegible]	0.0	729.0	73.2	-219.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
09/03/14	5.1	14.87	279.94	294.81	[illegible]	0.0	729.0	73.7	-221.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
10/03/14	5.5	16.04	279.94	295.97	[illegible]	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
11/03/14	6.6	19.25	279.94	299.18	[illegible]	0.0	729.0	74.8	-224.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
12/03/14	6.7	19.54	279.94	299.47	[illegible]	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
13/03/14	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
14/03/14	5.1	14.87	279.94	294.81	[illegible]	0.0	729.0	73.7	-221.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
15/03/14	4.5	13.12	279.94	293.06	[illegible]	0.0	729.0	73.3	-219.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
16/03/14	4.9	14.29	279.94	294.22	[illegible]	0.0	729.0	73.6	-220.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
17/03/14	4.6	13.41	279.94	293.35	[illegible]	0.0	729.0	73.3	-220.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
18/03/14	4.9	14.29	279.94	294.22	[illegible]	0.0	729.0	73.6	-220.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
19/03/14	5.2	15.16	279.94	295.10	[illegible]	0.0	729.0	73.8	-221.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
20/03/14	6.2	18.08	279.94	298.01	[illegible]	0.0	729.0	74.5	-223.5	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
21/03/14	4.8	14.00	279.94	293.93	[illegible]	0.0	729.0	73.5	-220.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
22/03/14	5.7	16.62	279.94	296.56	[illegible]	0.0	729.0	74.1	-222.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
23/03/14	6.5	18.95	279.94	298.89	[illegible]	11.9	729.0	74.7	-224.2	236.1	236.1	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
24/03/14	5.8	16.91	279.94	296.85	[illegible]	0.0	729.0	74.2	-222.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
25/03/14	2.8	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
26/03/14	3.4	9.91	279.94	289.85	[illegible]	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
27/03/14	4.2	12.25	279.94	292.18	[illegible]	0.0	729.0	73.0	-219.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
28/03/14	5.2	15.16	279.94	295.10	[illegible]	0.0	729.0	73.8	-221.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
29/03/14	2.3	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
30/03/14	3.2	9.33	279.94	289.27	[illegible]	450.8	1458.0	144.6	-144.6	595.4	595.4	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
31/03/14	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
01/04/14	3.6	10.50	279.94	290.43	[illegible]	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
02/04/14	4.1	11.96	279.94	291.89	[illegible]	0.0	729.0	73.0	-218.9	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
03/04/14	4.6	13.41	279.94	293.35	[illegible]	0.0	729.0	73.3	-220.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
04/04/14	3.6	10.50	279.94	290.43	[illegible]	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
05/04/14	3.7	10.79	279.94	290.73	[illegible]	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
06/04/14	3.4	9.91	279.94	289.85	[illegible]	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
07/04/14	3.8	11.08	279.94	291.02	[illegible]	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
08/04/14	4.2	12.25	279.94	292.18	[illegible]	0.0	729.0	73.0	-219.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
09/04/14	3.7	10.79	279.94	290.73	[illegible]	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
10/04/14	4.5	13.12	279.94	293.06	[illegible]	0.0	729.0	73.3	-219.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
11/04/14	4.6	13.41	279.94	293.35	[illegible]	0.0	729.0	73.3	-220.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
12/04/14	4.3	12.54	279.94	292.47	[illegible]	0.0	729.0	73.1	-219.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
13/04/14	3.5	10.21	279.94	290.14	[illegible]	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
14/04/14	3.3	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
15/04/14	2.9	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
16/04/14	2.8	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
17/04/14	3	8.75	279.94	288.68	[illegible]	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
18/04/14	3.7	10.79	279.94	290.73	[illegible]	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
19/04/14	3.3	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
20/04/14	2.8	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
21/04/14	3.4	9.91	279.94	289.85	[illegible]	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
22/04/14	3.1	9.04	279.94	288.98	[illegible]	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
23/04/14	3.1	9.04	279.94	288.98	[illegible]	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
24/04/14	2.3	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
25/04/14	2.3	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
26/04/14	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
27/04/14	2.4	7.00	279.94	286.93	[illegible]	645.6	1458.0	143.5	-143.5	789.0	789.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
28/04/14	2.7	7.87	279.94	287.81	[illegible]	763.1	1458.0	143.9	-143.9	907.0	907.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
29/04/14	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
30/04/14	2.4	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
01/05/14	2.4	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
02/05/14	2.5	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
03/05/14	2.1	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
04/05/14	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
05/05/14	1.6	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	150.9	150.9	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
06/05/14	1.6	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
07/05/14	1.3	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
08/05/14	2.5	7.29	279.94	287.23	[illegible]	4242.0	2916.0	287.2	0.0	4242.0	3624.0	318.7	[illegible]	[illegible]	3624	618.0	[illegible]	0			
09/05/14	2.2	6.42	279.94	286.35	[illegible]	350.1	1458.0	143.2	-143.2	493.3	493.3	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
10/05/14	1.8	5.25	279.94	285.18	[illegible]	247.7	729.0	71.3	-213.9	461.6	461.6	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
11/05/14	2.2	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
12/05/14	2	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
13/05/14	1.7	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	25.0	25.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
14/05/14	1.7	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
15/05/14	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
16/05/14	1.6	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
17/05/14	1.8	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
18/05/14	1.3	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	47.5	47.5	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
19/05/14	1.4	4.08	279.94	284.02	[illegible]	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
20/05/14	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
21/05/14	1.4	4.08	279.94	284.02	[illegible]	826.1	1458.0	142.0	-142.0	968.1	968.1	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
22/05/14	1.8	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	1			
23/05/14	2.1	6.12	279.94	286.06	[illegible]	3014.7	2916.0	286.1	0.0	3014.7	3014.7	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
24/05/14	2.3	6.71	279.94	286.64	[illegible]	857.9	1458.0	143.3	-143.3	1071.2	1071.2	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			
25/05/14	2.1	6.12	279.94	286.06	[illegible]	572.4	1458.0	143.0	-143.0	715.5	715.5	318.7	[illegible]	[illegible]	3624	0.0	[illegible]	0			

Date	Rainfall (mm)	Roofwater Catchment	Catchment Area (m^2)	Runoff Coefficient	Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m^3)	Rainfall (mm)	Stormwater Catchment	Catchment Area (m^2)	Runoff Coefficient	Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m^3)	[illegible]	Loss - evaporation (mm)
	Roof Catchment				Absorption and wetting				Stormwater Catchment			Absorption and wetting				Losses
26/05/14	15	1	15924	0.95	2	13	196.7	15	1	73599.2	0.8	2	13	765.4	962.2	1.5
27/05/14	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0	1.1
28/05/14	19.3	1	15924	0.95	2	17.3	261.7	19.3	1	73599.2	0.8	2	17.3	1018.6	1280.3	1.4
29/05/14	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0	1.5
30/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.4
31/05/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.3
01/06/14	5	1	15924	0.95	2	3	45.4	5	1	73599.2	0.8	2	3	176.6	222.0	1.5
02/06/14	3.6	1	15924	0.95	2	1.6	24.2	3.6	1	73599.2	0.8	2	1.6	94.2	118.4	1.4
03/06/14	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0	1.3
04/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.5
05/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.8
06/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2
07/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.4
08/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.7
09/06/14	1.6	1	15924	0.95	2	0	0.0	1.6	1	73599.2	0.8	2	0	0.0	0.0	1.8
10/06/14	15.6	1	15924	0.95	2	13.6	205.7	15.6	1	73599.2	0.8	2	13.6	800.8	1006.5	1.5
11/06/14	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0	1.3
12/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.4
13/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.1
14/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1
15/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.3
16/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	2
17/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.2
18/06/14	52.8	1	15924	0.95	2	50.8	768.5	52.8	1	73599.2	0.8	2	50.8	2991.1	3759.6	1.9
19/06/14	13	1	15924	0.95	2	11	166.4	13	1	73599.2	0.8	2	11	647.7	814.1	1
20/06/14	5.6	1	15924	0.95	2	3.6	54.5	5.6	1	73599.2	0.8	2	3.6	212.0	266.4	1.2
21/06/14	9	1	15924	0.95	2	7	105.9	9	1	73599.2	0.8	2	7	412.2	518.1	2
22/06/14	23.6	1	15924	0.95	2	21.6	326.8	23.6	1	73599.2	0.8	2	21.6	1271.8	1598.6	1.4
23/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1
24/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.1
25/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.1
26/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	2.1
27/06/14	4.2	1	15924	0.95	2	2.2	33.3	4.2	1	73599.2	0.8	2	2.2	129.5	162.8	1.4
28/06/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.2
29/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.6
30/06/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.4
01/07/14	3.2	1	15924	0.95	2	1.2	18.2	3.2	1	73599.2	0.8	2	1.2	70.7	88.8	2.2
02/07/14	16.2	1	15924	0.95	2	14.2	214.8	16.2	1	73599.2	0.8	2	14.2	836.1	1050.9	2.2
03/07/14	13.5	1	15924	0.95	2	11.5	174.0	13.5	1	73599.2	0.8	2	11.5	677.1	851.1	1.2
04/07/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.6
05/07/14	7	1	15924	0.95	2	5	75.6	7	1	73599.2	0.8	2	5	294.4	370.0	1.9
06/07/14	8.2	1	15924	0.95	2	6.2	93.8	8.2	1	73599.2	0.8	2	6.2	365.1	458.8	1.7
07/07/14	22.4	1	15924	0.95	2	20.4	308.6	22.4	1	73599.2	0.8	2	20.4	1201.1	1509.7	2.2
08/07/14	23	1	15924	0.95	2	21	317.7	23	1	73599.2	0.8	2	21	1236.5	1554.2	1.7
09/07/14	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0	1.1
10/07/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.2
11/07/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.1
12/07/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.6
13/07/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.7
14/07/14	20.6	1	15924	0.95	2	18.6	281.4	20.6	1	73599.2	0.8	2	18.6	1095.2	1376.6	2.3
15/07/14	4.8	1	15924	0.95	2	2.8	42.4	4.8	1	73599.2	0.8	2	2.8	164.9	207.2	1.8
16/07/14	1.2	1	15924	0.95	2	0	0.0	1.2	1	73599.2	0.8	2	0	0.0	0.0	1.4
17/07/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.3
18/07/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.6
19/07/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2
20/07/14	11.8	1	15924	0.95	2	9.8	148.3	11.8	1	73599.2	0.8	2	9.8	577.0	725.3	1.4
21/07/14	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0	1.1
22/07/14	27.2	1	15924	0.95	2	25.2	381.2	27.2	1	73599.2	0.8	2	25.2	1483.8	1865.0	1.4
23/07/14	2.6	1	15924	0.95	2	0.6	9.1	2.6	1	73599.2	0.8	2	0.6	35.3	44.4	1.2
24/07/14	10.6	1	15924	0.95	2	8.6	130.1	10.6	1	73599.2	0.8	2	8.6	506.4	636.5	1.4
25/07/14	1.8	1	15924	0.95	2	0	0.0	1.8	1	73599.2	0.8	2	0	0.0	0.0	1.7
26/07/14	22	1	15924	0.95	2	20	302.6	22	1	73599.2	0.8	2	20	1177.6	1480.2	1.4
27/07/14	25.4	1	15924	0.95	2	23.4	354.0	25.4	1	73599.2	0.8	2	23.4	1377.8	1731.8	2
28/07/14	5	1	15924	0.95	2	3	45.4	5	1	73599.2	0.8	2	3	176.6	222.0	2.1
29/07/14	5	1	15924	0.95	2	3	45.4	5	1	73599.2	0.8	2	3	176.6	222.0	1.8
30/07/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	1.6
31/07/14	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	0.8	2	0.2	11.8	14.8	1.7
01/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.9
02/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.6
03/08/14	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0	1.8
04/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.2
05/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.6
06/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.9
07/08/14	1.6	1	15924	0.95	2	0	0.0	1.6	1	73599.2	0.8	2	0	0.0	0.0	1.2
08/08/14	9	1	15924	0.95	2	7	105.9	9	1	73599.2	0.8	2	7	412.2	518.1	2
09/08/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	2.2
10/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.9
11/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.1
12/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3
13/08/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	3.6
14/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.2
15/08/14	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0	2.3
16/08/14	0.1	1	15924	0.95	2	0	0.0	0.1	1	73599.2	0.8	2	0	0.0	0.0	2.2
17/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.5
18/08/14	13.4	1	15924	0.95	2	11.4	172.5	13.4	1	73599.2	0.8	2	11.4	671.2	843.7	2.2
19/08/14	15.8	1	15924	0.95	2	13.8	208.8	15.8	1	73599.2	0.8	2	13.8	812.5	1021.3	1.9
20/08/14	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0	1.8
21/08/14	9.2	1	15924	0.95	2	7.2	108.9	9.2	1	73599.2	0.8	2	7.2	423.9	532.9	2.4
22/08/14	8.8	1	15924	0.95	2	6.8	102.9	8.8	1	73599.2	0.8	2	6.8	400.4	503.2	2.6
23/08/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	2.3
24/08/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	2.4
25/08/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	2.8
26/08/14	3.8	1	15924	0.95	2	1.8	27.2	3.8	1	73599.2	0.8	2	1.8	106.0	133.2	2.3
27/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.4
28/08/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.2
29/08/14	25	1	15924	0.95	2	23	347.9	25	1	73599.2	0.8	2	23	1354.2	1702.2	1.9
30/08/14	48.6	1	15924	0.95	2	46.6	705.0	48.6	1	73599.2	0.8	2	46.6	2743.8	3448.7	1.8
31/08/14	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0	2.1
01/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.5
02/09/14	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0	1.7
03/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.3
04/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.6
05/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.3
06/09/14	2.4	1	15924	0.95	2	0.4	6.1	2.4	1	73599.2	0.8	2	0.4	23.6	29.6	2.5
07/09/14	21.2	1	15924	0.95	2	19.2	290.5	21.2	1	73599.2	0.8	2	19.2	1130.5	1420.9	2.5
08/09/14	19.2	1	15924	0.95	2	17.2	260.2	19.2	1	73599.2	0.8	2	17.2	1012.7	1272.9	3
09/09/14	12.6	1	15924	0.95	2	10.6	160.4	12.6	1	73599.2	0.8	2	10.6	624.1	784.5	2.6
10/09/14	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0	2.7
11/09/14	4.6	1	15924	0.95	2	2.6	39.3	4.6	1	73599.2	0.8	2	2.6	153.1	192.4	2.6
12/09/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	3.4
13/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.3
14/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.2
15/09/14	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0	3.3
16/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.1
17/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.4
18/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.9
19/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.5
20/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.5
21/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.3
22/09/14	34.2	1	15924	0.95	2	32.2	487.2	34.2	1	73599.2	0.8	2	32.2	1895.9	2383.1	3.5
23/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2
24/09/14	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.2

Date	Pond loss evaporation (m^3)	Infiltration (m^3/day)	Total Pond loss (m^3/day)	Volume at start of period (m^3)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (corrected for max level) (m3/day)	Required process water (m3/day)	Vol abstracted (m^3)	Pond Vol after abstraction (m^3)	Max pond capacity (m^3)	Overflow (m^3)	Overflow Flag	Pond Empty Flag	Pond surface area (m^2)	Pond Volume (m^3)	Storage volume
	Losses										Demand	Abstraction								
26/05/14	4.37	279.94	284.31	[illegible]	677.3	1458.0	142.2	-142.2	819.9	819.9	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
27/05/14	3.21	279.94	283.14	[illegible]	0.3	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
28/05/14	4.08	279.94	284.02	[illegible]	996.1	1458.0	142.0	-142.0	1138.3	1138.3	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
29/05/14	4.37	279.94	284.31	[illegible]	0.3	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
30/05/14	4.08	279.94	284.02	[illegible]	0.3	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
31/05/14	3.79	279.94	283.73	[illegible]	0.3	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
01/06/14	4.37	279.94	284.31	[illegible]	0.3	729.0	71.1	-213.2	150.9	150.9	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
02/06/14	4.08	279.94	284.02	[illegible]	0.3	729.0	71.0	-213.0	47.4	47.4	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
03/06/14	3.79	279.94	283.73	[illegible]	0.3	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
04/06/14	4.37	279.94	284.31	[illegible]	0.3	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
05/06/14	5.25	279.94	285.18	[illegible]	0.3	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
06/06/14	5.83	279.94	285.77	[illegible]	0.3	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
07/06/14	7.00	279.94	286.93	[illegible]	0.3	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
08/06/14	4.96	279.94	284.89	[illegible]	0.3	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
09/06/14	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
10/06/14	4.37	279.94	284.31	[illegible]	722.1	1458.0	142.2	-142.2	864.3	864.3	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
11/06/14	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
12/06/14	4.08	279.94	284.02	[illegible]	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
13/06/14	3.21	279.94	283.14	[illegible]	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
14/06/14	2.92	279.94	282.85	[illegible]	0.0	729.0	70.7	-212.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
15/06/14	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
16/06/14	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
17/06/14	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
18/06/14	5.54	279.94	285.48	[illegible]	3474.1	2916.0	285.5	0.0	3474.1	3474.1	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
19/06/14	2.92	279.94	282.85	[illegible]	531.3	1458.0	141.4	-141.4	672.7	672.7	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
20/06/14	3.50	279.94	283.44	[illegible]	0.8	729.0	70.9	-212.6	195.6	195.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
21/06/14	5.83	279.94	285.77	[illegible]	232.3	729.0	71.4	-214.3	446.6	446.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
22/06/14	4.08	279.94	284.02	[illegible]	1314.5	1458.0	142.0	-142.0	1456.5	1456.5	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
23/06/14	2.92	279.94	282.85	[illegible]	0.0	729.0	70.7	-212.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
24/06/14	3.21	279.94	283.14	[illegible]	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
25/06/14	3.21	279.94	283.14	[illegible]	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
26/06/14	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
27/06/14	4.08	279.94	284.02	[illegible]	0.0	729.0	71.0	-213.0	91.8	91.8	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
28/06/14	3.50	279.94	283.44	[illegible]	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
29/06/14	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
30/06/14	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
01/07/14	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	17.2	17.2	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
02/07/14	6.42	279.94	286.35	[illegible]	764.5	1458.0	143.2	-143.2	907.7	907.7	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
03/07/14	3.50	279.94	283.44	[illegible]	567.7	1458.0	141.7	-141.7	709.4	709.4	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
04/07/14	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
05/07/14	5.54	279.94	285.48	[illegible]	84.5	729.0	71.4	-214.1	298.7	298.7	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
06/07/14	4.96	279.94	284.89	[illegible]	174.0	729.0	71.2	-213.7	387.6	387.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
07/07/14	6.42	279.94	286.35	[illegible]	1223.4	1458.0	143.2	-143.2	1366.6	1366.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
08/07/14	4.96	279.94	284.89	[illegible]	1269.3	1458.0	142.4	-142.4	1411.7	1411.7	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
09/07/14	3.21	279.94	283.14	[illegible]	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
10/07/14	3.50	279.94	283.44	[illegible]	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
11/07/14	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
12/07/14	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
13/07/14	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
14/07/14	6.71	279.94	286.64	[illegible]	1089.9	1458.0	143.3	-143.3	1233.2	1233.2	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
15/07/14	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	135.9	135.9	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
16/07/14	4.08	279.94	284.02	[illegible]	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
17/07/14	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
18/07/14	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
19/07/14	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
20/07/14	4.08	279.94	284.02	[illegible]	441.3	1458.0	142.0	-142.0	583.3	583.3	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
21/07/14	3.21	279.94	283.14	[illegible]	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
22/07/14	4.08	279.94	284.02	[illegible]	1581.0	2187.0	213.0	-71.0	1652.0	1652.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
23/07/14	3.50	279.94	283.44	[illegible]	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
24/07/14	4.08	279.94	284.02	[illegible]	352.4	1458.0	142.0	-142.0	494.5	494.5	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
25/07/14	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
26/07/14	4.08	279.94	284.02	[illegible]	1196.1	1458.0	142.0	-142.0	1338.1	1338.1	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
27/07/14	5.83	279.94	285.77	[illegible]	1446.0	2187.0	214.3	-71.4	1517.4	1517.4	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
28/07/14	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	150.5	150.5	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
29/07/14	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	150.7	150.7	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
30/07/14	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
31/07/14	4.96	279.94	284.89	[illegible]	0.0	725.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
01/08/14	5.54	279.94	285.48	[illegible]	0.0	725.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
02/08/14	4.67	279.94	284.60	[illegible]	0.0	725.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
03/08/14	5.25	279.94	285.18	[illegible]	0.0	725.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
04/08/14	6.42	279.94	286.35	[illegible]	0.0	725.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
05/08/14	7.58	279.94	287.52	[illegible]	0.0	725.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
06/08/14	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
07/08/14	3.50	279.94	283.44	[illegible]	0.0	729.0	70.9	-212.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
08/08/14	5.83	279.94	285.77	[illegible]	232.3	729.0	71.4	-214.3	446.6	446.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
09/08/14	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
10/08/14	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
11/08/14	9.04	279.94	288.98	[illegible]	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
12/08/14	8.75	279.94	288.68	[illegible]	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
13/08/14	10.50	279.94	290.43	[illegible]	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
14/08/14	9.33	279.94	289.27	[illegible]	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
15/08/14	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
16/08/14	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
17/08/14	10.21	279.94	290.14	[illegible]	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
18/08/14	6.42	279.94	286.35	[illegible]	557.3	1458.0	143.2	-143.2	700.5	700.5	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
19/08/14	5.54	279.94	285.48	[illegible]	735.8	1458.0	142.7	-142.7	878.6	878.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
20/08/14	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
21/08/14	7.00	279.94	286.93	[illegible]	245.9	729.0	71.7	-215.2	461.1	461.1	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
22/08/14	7.58	279.94	287.52	[illegible]	215.7	729.0	71.9	-215.6	431.4	431.4	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
23/08/14	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
24/08/14	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
25/08/14	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
26/08/14	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	61.6	61.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
27/08/14	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
28/08/14	9.33	279.94	289.27	[illegible]	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
29/08/14	5.54	279.94	285.48	[illegible]	1416.7	2187.0	214.1	-71.4	1488.1	1488.1	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
30/08/14	5.25	279.94	285.18	[illegible]	3163.5	2916.0	285.2	0.0	3163.5	3163.5	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
31/08/14	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
01/09/14	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
02/09/14	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
03/09/14	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
04/09/14	7.58	279.94	287.51	[illegible]	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
05/09/14	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
06/09/14	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
07/09/14	7.29	279.94	287.23	[illegible]	1133.7	1458.0	143.6	-143.6	1277.3	1277.3	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
08/09/14	8.75	279.94	288.68	[illegible]	984.3	1458.0	144.3	-144.3	1128.6	1128.6	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
09/09/14	7.58	279.94	287.52	[illegible]	497.0	1458.0	143.8	-143.8	640.7	640.7	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
10/09/14	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
11/09/14	7.58	279.94	287.52	[illegible]	0.0	729.0	71.9	-215.6	120.5	120.5	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
12/09/14	9.91	279.94	289.85	[illegible]	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
13/09/14	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
14/09/14	9.33	279.94	289.27	[illegible]	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
15/09/14	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
16/09/14	11.96	279.94	291.89	[illegible]	0.0	729.0	73.0	-218.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
17/09/14	12.83	279.94	292.77	[illegible]	0.0	729.0	73.2	-219.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
18/09/14	11.37	279.94	291.31	[illegible]	0.0	729.0	72.8	-218.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
19/09/14	10.21	279.94	290.14	[illegible]	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
20/09/14	18.95	279.94	298.89	[illegible]	0.0	729.0	74.7	-224.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
21/09/14	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
22/09/14	10.21	279.94	290.14	[illegible]	2092.9	2187.0	217.6	-72.5	2165.4	2165.4	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
23/09/14	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			
24/09/14	9.33	279.94	289.27	[illegible]	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	[illegible]	[illegible]			

Date	Rainfall (mm)	Roofless in Catchment	Catchment Area (m²)	Runoff Coefficient	Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)
25/09/14	0	2	15924	0.95	2	0
26/09/14	0	2	15924	0.95	2	0
27/09/14	28.8	2	15924	0.95	2	26.8
28/09/14	22	2	15924	0.95	2	20
29/09/14	9.2	2	15924	0.95	2	7.2
30/09/14	2.1	2	15924	0.95	2	0.1
01/10/14	0	2	15924	0.95	2	0
02/10/14	0.8	2	15924	0.95	2	0
03/10/14	0	2	15924	0.95	2	0
04/10/14	0	2	15924	0.95	2	0
05/10/14	14.4	2	15924	0.95	2	12.4
06/10/14	13.6	2	15924	0.95	2	11.6
07/10/14	0	2	15924	0.95	2	0
08/10/14	0	2	15924	0.95	2	0
09/10/14	5.2	2	15924	0.95	2	3.2
10/10/14	0	2	15924	0.95	2	0
11/10/14	0	2	15924	0.95	2	0
12/10/14	0	2	15924	0.95	2	0
13/10/14	0	2	15924	0.95	2	0
14/10/14	0	2	15924	0.95	2	0
15/10/14	0	2	15924	0.95	2	0
16/10/14	0	2	15924	0.95	2	0
17/10/14	0	2	15924	0.95	2	0
18/10/14	3	2	15924	0.95	2	1
19/10/14	4.9	2	15924	0.95	2	2.9

Date	Roof Catchment: Rainfall (mm)	Roofwater Catchment	Catchment Area (m^2)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m^3)	Rainfall (mm)	Stormwater Catchment: Stormwater Catchment	Catchment Area (m^2)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m^3)	[illegible]	Losses: Loss - evaporation (mm)
25/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	8.1
26/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	8.5
27/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	8.8
28/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	7.5
29/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6
30/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.9
31/01/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.2
01/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.1
02/02/15	1.1	1	15924	0.95	2	0	0.0	1.1	1	73599.2	0.8	2	0	0.0	0.0	4
03/02/15	8.8	1	15924	0.95	2	6.8	102.9	8.8	1	73599.2	0.8	2	6.8	400.4	503.2	6.7
04/02/15	4	1	15924	0.95	2	2	30.3	4	1	73599.2	0.8	2	2	117.8	148.0	6.3
05/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.1
06/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.4
07/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	7.2
08/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	8
09/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.4
10/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.6
11/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	7.8
12/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.8
13/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.7
14/02/15	0.9	1	15924	0.95	2	0	0.0	0.9	1	73599.2	0.8	2	0	0.0	0.0	5.8
15/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.7
16/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.7
17/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.7
18/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.5
19/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.1
20/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.8
21/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.7
22/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.3
23/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	7.5
24/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	7.1
25/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.4
26/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.3
27/02/15	0.5	1	15924	0.95	2	0	0.0	0.5	1	73599.2	0.8	2	0	0.0	0.0	5.3
28/02/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.3
01/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.9
02/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.7
03/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.8
04/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.4
05/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.7
06/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.4
07/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.1
08/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.2
09/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.7
10/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.5
11/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.9
12/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	6.4
13/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.4
14/03/15	8.2	1	15924	0.95	2	6.2	93.8	8.2	1	73599.2	0.8	2	6.2	365.1	458.8	3.7
15/03/15	17.4	1	15924	0.95	2	15.4	233.0	17.4	1	73599.2	0.8	2	15.4	906.7	1139.7	4.2
16/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.9
17/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.7
18/03/15	13.2	1	15924	0.95	2	11.2	169.4	13.2	1	73599.2	0.8	2	11.2	659.4	828.2	3.5
19/03/15	2.8	1	15924	0.95	2	0.8	12.1	2.8	1	73599.2	0.8	2	0.8	47.1	59.2	3
20/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.2
21/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.5
22/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.8
23/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5
24/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.1
25/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5.6
26/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.9
27/03/15	4.2	1	15924	0.95	2	2.2	33.3	4.2	1	73599.2	0.8	2	2.2	129.5	162.8	4
28/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.7
29/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.4
30/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3
31/03/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.7
01/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.2
02/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.5
03/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4
04/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.2
05/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	5
06/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.1
07/04/15	11.4	1	15924	0.95	2	9.4	142.2	11.4	1	73599.2	0.8	2	9.4	553.5	695.7	2.1
08/04/15	11.6	1	15924	0.95	2	9.6	145.2	11.6	1	73599.2	0.8	2	9.6	565.2	710.5	2
09/04/15	0.7	1	15924	0.95	2	0	0.0	0.7	1	73599.2	0.8	2	0	0.0	0.0	1.3
10/04/15	27.2	1	15924	0.95	2	25.2	381.2	27.2	1	73599.2	0.8	2	25.2	1483.8	1865.0	1.7
11/04/15	8.2	1	15924	0.95	2	6.2	93.8	8.2	1	73599.2	0.8	2	6.2	365.1	458.8	2.9
12/04/15	15.4	1	15924	0.95	2	13.4	202.7	15.4	1	73599.2	0.8	2	13.4	789.0	991.7	2.8
13/04/15	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0	2.7
14/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.6
15/04/15	3.6	1	15924	0.95	2	1.6	24.2	3.6	1	73599.2	0.8	2	1.6	94.2	118.4	3.6
16/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.5
17/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.3
18/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.4
19/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.9
20/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.2
21/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.4
22/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.1
23/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.1
24/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.3
25/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.3
26/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.5
27/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.4
28/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.7
29/04/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.9
30/04/15	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0	2.4
01/05/15	5.4	1	15924	0.95	2	3.4	51.4	5.4	1	73599.2	0.8	2	3.4	200.2	251.6	3.1
02/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.8
03/05/15	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0	2.9
04/05/15	11.4	1	15924	0.95	2	9.4	142.2	11.4	1	73599.2	0.8	2	9.4	553.5	695.7	2.2
05/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2
06/05/15	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0	2
07/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.4
08/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.2
09/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.1
10/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.2
11/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.4
12/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.9
13/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.3
14/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	3.4
15/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	4.4
16/05/15	4.4	1	15924	0.95	2	2.4	36.3	4.4	1	73599.2	0.8	2	2.4	141.3	177.6	2.9
17/05/15	26.6	1	15924	0.95	2	24.6	372.1	26.6	1	73599.2	0.8	2	24.6	1448.4	1820.6	1.5
18/05/15	24.2	1	15924	0.95	2	22.2	335.8	24.2	1	73599.2	0.8	2	22.2	1307.1	1643.0	1.7
19/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.6
20/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.1
21/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	2.3
22/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.7
23/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.5
24/05/15	5.8	1	15924	0.95	2	3.8	57.5	5.8	1	73599.2	0.8	2	3.8	223.7	281.2	1.5
25/05/15	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0	1.6
26/05/15	4	1	15924	0.95	2	2	30.3	4	1	73599.2	0.8	2	2	117.8	148.0	1.4

Date	Losses: Pond loss evaporation (m^3)	Infiltration (m^3/day)	Total Pond Loss (m^3/day)	Volume at start of period (m^3)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (Corrected for max level) (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m^3)	Pond Vol after abstraction (m^3)	Max pond capacity (m^3)	Overflow (m^3)	Overflow flag	Pond Empty flag	Pond surface area (m^2)	Pond Volume (m^3)	Storage volume
25/01/15	23.62	279.94	303.56	0	0.0	729.0	75.9	-227.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/01/15	24.79	279.94	304.72	0	0.0	729.0	76.2	-228.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/01/15	25.66	279.94	305.60	0	0.0	729.0	76.4	-229.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
28/01/15	21.87	279.94	301.81	0	0.0	729.0	75.5	-226.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/01/15	17.50	279.94	297.43	0	0.0	729.0	74.4	-223.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/01/15	14.29	279.94	294.22	0	0.0	729.0	73.6	-220.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
31/01/15	18.08	279.94	298.02	0	0.0	729.0	74.5	-223.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
01/02/15	17.79	279.94	297.72	0	0.0	729.0	74.4	-223.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/02/15	11.66	279.94	291.60	0	0.0	729.0	72.9	-218.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/02/15	19.54	279.94	299.47	0	203.8	729.0	74.9	-224.6	428.4	428.4	318.7	[illegible]	[illegible]	1624	0.0	0	0			
04/02/15	18.37	279.94	298.31	0	0.0	729.0	74.6	-223.7	73.4	73.4	318.7	[illegible]	0.0	1624	0.0	0	0			
05/02/15	17.79	279.94	297.72	0	0.0	729.0	74.4	-223.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/02/15	18.66	279.94	298.60	0	0.0	729.0	74.6	-223.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/02/15	21.00	279.94	300.93	0	0.0	729.0	75.2	-225.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/02/15	23.33	279.94	303.26	0	0.0	729.0	75.8	-227.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/02/15	18.66	279.94	298.60	0	0.0	729.0	74.6	-223.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/02/15	19.25	279.94	299.18	0	0.0	729.0	74.8	-224.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/02/15	22.74	279.94	302.68	0	0.0	729.0	75.7	-227.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/02/15	11.08	279.94	291.02	0	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
13/02/15	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/02/15	16.91	279.94	296.85	0	0.0	729.0	74.2	-222.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/02/15	19.54	279.94	299.47	0	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
16/02/15	19.54	279.94	299.47	0	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
17/02/15	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/02/15	16.04	279.94	295.97	0	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
19/02/15	17.79	279.94	297.72	0	0.0	729.0	74.4	-223.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/02/15	16.91	279.94	296.85	0	0.0	729.0	74.2	-222.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/02/15	16.62	279.94	296.56	0	0.0	729.0	74.1	-222.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/02/15	18.37	279.94	298.31	0	0.0	729.0	74.6	-223.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/02/15	21.87	279.94	301.81	0	0.0	729.0	75.5	-226.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/02/15	20.71	279.94	300.64	0	0.0	729.0	75.2	-225.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
25/02/15	15.75	279.94	295.68	0	0.0	729.0	73.9	-221.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/02/15	15.45	279.94	295.39	0	0.0	729.0	73.8	-221.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/02/15	15.45	279.94	295.39	0	0.0	729.0	73.8	-221.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
28/02/15	18.37	279.94	298.31	0	0.0	729.0	74.6	-223.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
01/03/15	17.20	279.94	297.14	0	0.0	729.0	74.3	-222.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/03/15	16.62	279.94	296.56	0	0.0	729.0	74.1	-222.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/03/15	16.91	279.94	296.85	0	0.0	729.0	74.2	-222.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/03/15	18.65	279.94	298.60	0	0.0	729.0	74.6	-223.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
05/03/15	19.54	279.94	299.47	0	0.0	729.0	74.9	-224.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/03/15	18.65	279.94	298.60	0	0.0	729.0	74.6	-223.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/03/15	17.79	279.94	297.72	0	0.0	729.0	74.4	-223.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/03/15	18.08	279.94	298.02	0	0.0	729.0	74.5	-223.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/03/15	16.62	279.94	296.56	0	0.0	729.0	74.1	-222.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/03/15	16.04	279.94	295.97	0	0.0	729.0	74.0	-222.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/03/15	17.20	279.94	297.14	0	0.0	729.0	74.3	-222.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/03/15	18.66	279.94	298.60	0	0.0	729.0	74.6	-223.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
13/03/15	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/03/15	10.79	279.94	290.73	0	168.1	729.0	72.7	-218.0	386.2	386.2	318.7	[illegible]	[illegible]	1624	0.0	0	0			
15/03/15	12.25	279.94	292.18	0	847.5	1458.0	146.1	-146.1	993.6	993.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
16/03/15	11.37	279.94	291.31	0	0.0	729.0	72.8	-218.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
17/03/15	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/03/15	10.21	279.94	290.14	0	538.7	1458.0	145.1	-145.1	683.8	683.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
19/03/15	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/03/15	15.16	279.94	295.10	0	0.0	729.0	73.8	-221.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/03/15	10.21	279.94	290.14	0	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/03/15	14.00	279.94	293.93	0	0.0	729.0	73.5	-220.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/03/15	14.58	279.94	294.52	0	0.0	729.0	73.6	-220.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/03/15	14.87	279.94	294.81	0	0.0	729.0	73.7	-221.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
25/03/15	16.33	279.94	296.27	0	0.0	729.0	74.1	-222.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/03/15	14.29	279.94	294.22	0	0.0	729.0	73.6	-220.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/03/15	11.66	279.94	291.60	0	0.0	729.0	72.9	-218.7	89.9	89.9	318.7	[illegible]	0.0	1624	0.0	0	0			
28/03/15	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/03/15	12.83	279.94	292.77	0	0.0	729.0	73.2	-219.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/03/15	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
31/03/15	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
01/04/15	12.25	279.94	292.18	0	0.0	729.0	73.0	-219.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
02/04/15	13.12	279.94	293.06	0	0.0	729.0	73.3	-219.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/04/15	11.66	279.94	291.60	0	0.0	729.0	72.9	-218.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/04/15	9.33	279.94	289.27	0	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
05/04/15	14.58	279.94	294.52	0	0.0	729.0	73.6	-220.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/04/15	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/04/15	6.12	279.94	286.06	0	409.6	1458.0	143.0	-143.0	552.6	552.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
08/04/15	5.83	279.94	285.77	0	424.7	1458.0	142.9	-142.9	567.6	567.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
09/04/15	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/04/15	7.87	279.94	287.81	0	1577.2	2187.0	215.9	-72.0	1649.1	1649.1	318.7	[illegible]	[illegible]	1624	0.0	0	0			
11/04/15	8.46	279.94	288.39	0	170.5	729.0	72.1	-216.3	386.7	386.7	318.7	[illegible]	[illegible]	1624	0.0	0	0			
12/04/15	8.16	279.94	288.10	0	703.6	1458.0	144.1	-144.1	847.6	847.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
13/04/15	7.87	279.94	287.81	0	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/04/15	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/04/15	10.50	279.94	290.43	0	0.0	729.0	72.6	-217.8	45.8	45.8	318.7	[illegible]	0.0	1624	0.0	0	0			
16/04/15	10.21	279.94	290.14	0	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
17/04/15	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
18/04/15	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
19/04/15	11.37	279.94	291.31	0	0.0	729.0	72.8	-218.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/04/15	9.33	279.94	289.27	0	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/04/15	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/04/15	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/04/15	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/04/15	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
25/04/15	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/04/15	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
27/04/15	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
28/04/15	7.87	279.94	287.81	0	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
29/04/15	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
30/04/15	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
01/05/15	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	179.4	179.4	318.7	[illegible]	0.0	1624	0.0	0	0			
02/05/15	8.16	279.94	288.10	0	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
03/05/15	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
04/05/15	6.42	279.94	286.35	0	409.3	1458.0	143.2	-143.2	552.5	552.5	318.7	[illegible]	[illegible]	1624	0.0	0	0			
05/05/15	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
06/05/15	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
07/05/15	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
08/05/15	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
09/05/15	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
10/05/15	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
11/05/15	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
12/05/15	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
13/05/15	9.62	279.94	289.56	0	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
14/05/15	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
15/05/15	12.83	279.94	292.77	0	0.0	729.0	73.2	-219.6	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
16/05/15	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	105.5	105.5	318.7	[illegible]	0.0	1624	0.0	0	0			
17/05/15	4.37	279.94	284.31	0	1536.3	2187.0	213.2	-71.1	1607.3	1607.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
18/05/15	4.96	279.94	284.89	0	1358.1	1458.0	142.4	-142.4	1500.5	1500.5	318.7	[illegible]	[illegible]	1624	0.0	0	0			
19/05/15	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
20/05/15	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
21/05/15	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
22/05/15	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
23/05/15	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
24/05/15	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	210.1	210.1	318.7	[illegible]	0.0	1624	0.0	0	0			
25/05/15	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	0.0	0.0	1624	0.0	0	1			
26/05/15	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	77.0	77.0	318.7	[illegible]	0.0	1624	0.0	0	0			

Date	Roof Catchment: Rainfall (mm)	Roof Catchment: Roofwater Catchment	Roof Catchment: Catchment Area (m²)	Roof Catchment: Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Absorption and wetting: Applied rainfall after loss (absorption and wetting)	Absorption and wetting: Runoff volume (m³)	Rainfall (mm)	Stormwater Catchment: Stormwater Catchment	Stormwater Catchment: Catchment Area (m²)	Stormwater Catchment: Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Absorption and wetting: Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	[illegible]
26/01/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
27/01/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/01/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/01/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/01/16	2.6	1	15924	0.95	2	0.6	9.1	2.6	1	73599.2	0.8	2	0.6	35.3	44.4
31/01/16	11.4	1	15924	0.95	2	9.4	142.1	11.4	1	73599.2	0.8	2	9.4	553.5	[illegible]
01/02/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
02/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
08/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/02/16	5.4	1	15924	0.95	2	3.4	51.4	5.4	1	73599.2	0.8	2	3.4	200.2	251.6
23/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/02/16	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
25/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
27/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/02/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/03/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
02/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
08/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/03/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
21/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
25/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/03/16	15.4	1	15924	0.95	2	13.4	202.7	15.4	1	73599.2	0.8	2	13.4	789.0	[illegible]
27/03/16	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0
28/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
29/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
31/03/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/04/16	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0
02/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
08/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/04/16	5.2	1	15924	0.95	2	3.2	48.4	5.2	1	73599.2	0.8	2	3.2	188.4	236.8
12/04/16	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0
13/04/16	1.6	1	15924	0.95	2	0	0.0	1.6	1	73599.2	0.8	2	0	0.0	0.0
14/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/04/16	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0
16/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/04/16	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
18/04/16	10.4	1	15924	0.95	2	8.4	127.1	10.4	1	73599.2	0.8	2	8.4	494.6	621.7
19/04/16	12.8	1	15924	0.95	2	10.8	163.4	12.8	1	73599.2	0.8	2	10.8	635.9	799.3
20/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/04/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
25/04/16	13.2	1	15924	0.95	2	11.2	169.4	13.2	1	73599.2	0.8	2	11.2	659.4	828.9
26/04/16	5.2	1	15924	0.95	2	3.2	48.4	5.2	1	73599.2	0.8	2	3.2	188.4	236.8
27/04/16	3.2	1	15924	0.95	2	1.2	18.2	3.2	1	73599.2	0.8	2	1.2	70.7	88.8
28/04/16	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
29/04/16	2.4	1	15924	0.95	2	0.4	6.1	2.4	1	73599.2	0.8	2	0.4	23.6	29.6
30/04/16	9.2	1	15924	0.95	2	7.2	[illegible]	9.2	1	73599.2	0.8	2	7.2	423.9	[illegible]
01/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
02/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/05/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
04/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/05/16	1.2	1	15924	0.95	2	0	0.0	1.2	1	73599.2	0.8	2	0	0.0	0.0
07/05/16	10.2	1	15924	0.95	2	8.2	124.0	10.2	1	73599.2	0.8	2	8.2	482.8	606.9
08/05/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
09/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
11/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/05/16	11.4	1	15924	0.95	2	9.4	[illegible]	11.4	1	73599.2	0.8	2	9.4	553.5	[illegible]
15/05/16	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	0.8	2	0	0.0	0.0
16/05/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
17/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/05/16	2	1	15924	0.95	2	0	0.0	2	1	73599.2	0.8	2	0	0.0	0.0
19/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/05/16	27.6	1	15924	0.95	2	25.6	367.3	27.6	1	73599.2	0.8	2	25.6	1527.3	1894.6
22/05/16	18	1	15924	0.95	2	16	242.0	18	1	73599.2	0.8	2	16	942.1	1184.1
23/05/16	10.2	1	15924	0.95	2	8.2	124.0	10.2	1	73599.2	0.8	2	8.2	482.8	606.9
24/05/16	31	1	15924	0.95	2	29	[illegible]	31	1	73599.2	0.8	2	29	1707.5	2146.2
25/05/16	2	1	15924	0.95	2	0	0.0	2	1	73599.2	0.8	2	0	0.0	0.0
26/05/16	5.6	1	15924	0.95	2	3.6	54.5	5.6	1	73599.2	0.8	2	3.6	212.0	266.4

Date	Losses: Loss - evaporation (mm)	Pond loss evaporation (m³)	Infiltration (m³/day)	Total Pond Loss (m³/day)	Volume at start of period (m³)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (corrected for max level) (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m³)	Abstraction: Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow (m³)	Overflow flag	Pond Empty flag	Pond surface area (m²)	Pond Volume (m³)	Storage volume
26/01/16	6.8	19.83	279.94	299.76	0	0.0	729.0	74.9	-224.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
27/01/16	8.9	25.95	279.94	305.89	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
28/01/16	10.2	29.74	279.94	309.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
29/01/16	11	32.08	279.94	312.01	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
30/01/16	4.3	12.54	279.94	292.47	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
31/01/16	3.8	11.08	279.94	291.02	0	[illegible]	1458.0	[illegible]	[illegible]	550.2	550.2	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
01/02/16	5.1	14.87	279.94	294.81	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
02/02/16	6.4	18.66	279.94	298.60	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
03/02/16	8.3	24.20	279.94	304.14	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
04/02/16	8.4	24.49	279.94	304.43	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
05/02/16	8.5	24.79	279.94	304.72	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
06/02/16	8	23.33	279.94	303.26	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
07/02/16	10.5	30.62	279.94	310.55	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
08/02/16	11.2	32.66	279.94	312.60	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
09/02/16	9.6	27.99	279.94	307.93	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
10/02/16	9.1	26.54	279.94	306.47	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
11/02/16	7.3	21.29	279.94	301.22	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
12/02/16	6.7	19.54	279.94	299.47	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
13/02/16	8.2	23.91	279.94	303.85	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
14/02/16	9.2	26.83	279.94	306.76	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
15/02/16	10.2	29.74	279.94	309.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
16/02/16	10.6	30.91	279.94	310.85	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
17/02/16	8.1	23.62	279.94	303.56	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
18/02/16	7.5	21.87	279.94	301.81	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
19/02/16	8.7	25.37	279.94	305.31	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
20/02/16	8.2	23.91	279.94	303.85	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
21/02/16	4.1	11.96	279.94	291.89	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
22/02/16	4.8	14.00	279.94	293.93	0	0.0	729.0	[illegible]	[illegible]	178.1	178.1	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
23/02/16	3.8	11.08	279.94	291.02	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
24/02/16	5.3	15.45	279.94	295.39	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
25/02/16	7.6	22.16	279.94	302.10	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
26/02/16	8.9	25.95	279.94	305.89	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
27/02/16	8.2	23.91	279.94	303.85	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
28/02/16	4.7	13.71	279.94	293.64	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
29/02/16	4.4	12.83	279.94	292.77	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
01/03/16	5.2	15.16	279.94	295.10	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
02/03/16	6.4	18.66	279.94	298.60	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
03/03/16	4.5	13.12	279.94	293.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
04/03/16	5.7	16.62	279.94	296.56	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
05/03/16	6.4	18.66	279.94	298.60	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
06/03/16	6.9	20.12	279.94	300.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
07/03/16	7.8	22.74	279.94	302.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
08/03/16	7.4	21.58	279.94	301.51	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
09/03/16	7.1	21.00	279.94	300.93	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
10/03/16	5.1	14.87	279.94	294.81	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
11/03/16	6.2	18.08	279.94	298.02	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
12/03/16	6.9	20.12	279.94	300.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
13/03/16	9.1	26.54	279.94	306.47	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
14/03/16	12.1	35.28	279.94	315.22	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
15/03/16	5.3	15.45	279.94	295.39	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
16/03/16	5.8	16.91	279.94	296.85	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
17/03/16	7.2	21.00	279.94	300.93	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
18/03/16	7	20.41	279.94	300.35	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
19/03/16	3.8	11.08	279.94	291.02	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
20/03/16	5.2	15.16	279.94	295.10	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
21/03/16	5.2	15.16	279.94	295.10	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
22/03/16	4.3	12.54	279.94	292.47	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
23/03/16	4.2	12.25	279.94	292.18	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
24/03/16	5.3	15.45	279.94	295.39	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
25/03/16	5.6	16.33	279.94	296.27	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
26/03/16	1.3	3.79	279.94	283.73	0	[illegible]	1458.0	[illegible]	[illegible]	[illegible]	[illegible]	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
27/03/16	3.9	11.37	279.94	291.31	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
28/03/16	4.5	13.12	279.94	293.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
29/03/16	4.7	13.71	279.94	293.64	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
30/03/16	4.9	14.29	279.94	294.22	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
31/03/16	4.1	11.96	279.94	291.89	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
01/04/16	3.3	9.62	279.94	289.56	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
02/04/16	4.6	13.41	279.94	293.35	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
03/04/16	5.4	15.75	279.94	295.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
04/04/16	3.6	10.50	279.94	290.43	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
05/04/16	4.9	14.29	279.94	294.22	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
06/04/16	4.7	13.71	279.94	293.64	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
07/04/16	4.9	14.29	279.94	294.22	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
08/04/16	4.4	12.83	279.94	292.77	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
09/04/16	3	8.75	279.94	288.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
10/04/16	5.3	15.45	279.94	295.39	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
11/04/16	3.1	9.04	279.94	288.98	0	0.0	729.0	[illegible]	[illegible]	[illegible]	[illegible]	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
12/04/16	2.1	6.12	279.94	286.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
13/04/16	2.5	7.29	279.94	287.23	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
14/04/16	2.5	7.29	279.94	287.23	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
15/04/16	4.1	11.96	279.94	291.89	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
16/04/16	5.3	15.45	279.94	295.39	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
17/04/16	1.5	4.37	279.94	284.31	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
18/04/16	1.9	5.54	279.94	285.48	0	[illegible]	729.0	[illegible]	[illegible]	550.3	550.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
19/04/16	3.2	9.33	279.94	289.27	0	[illegible]	1458.0	[illegible]	[illegible]	654.6	654.6	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
20/04/16	3.2	9.33	279.94	289.27	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
21/04/16	3.8	11.08	279.94	291.02	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
22/04/16	4.7	13.71	279.94	293.64	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
23/04/16	5.4	15.75	279.94	295.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
24/04/16	3.2	9.33	279.94	289.27	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
25/04/16	1.6	4.67	279.94	284.60	0	[illegible]	1458.0	[illegible]	[illegible]	[illegible]	[illegible]	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
26/04/16	3	8.75	279.94	288.68	0	0.0	729.0	[illegible]	[illegible]	184.7	184.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
27/04/16	1.8	5.25	279.94	285.18	0	0.0	729.0	[illegible]	[illegible]	17.5	17.5	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
28/04/16	2.7	7.87	279.94	287.81	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
29/04/16	3.1	9.04	279.94	288.98	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
30/04/16	2.5	7.29	279.94	287.23	0	[illegible]	729.0	[illegible]	[illegible]	461.0	461.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
01/05/16	2.2	6.42	279.94	286.35	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
02/05/16	2.1	6.12	279.94	286.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
03/05/16	1.9	5.54	279.94	285.48	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
04/05/16	2.1	6.12	279.94	286.06	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
05/05/16	1.6	4.67	279.94	284.60	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
06/05/16	1.9	5.54	279.94	285.48	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
07/05/16	2.4	7.00	279.94	286.93	0	[illegible]	729.0	[illegible]	[illegible]	535.1	535.1	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
08/05/16	2.2	6.42	279.94	286.35	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
09/05/16	2.2	6.42	279.94	286.35	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
10/05/16	2.2	6.42	279.94	286.35	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
11/05/16	3	8.75	279.94	288.68	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
12/05/16	2.8	8.16	279.94	288.10	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
13/05/16	2.5	7.29	279.94	287.23	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
14/05/16	2.3	6.71	279.94	286.64	0	[illegible]	1458.0	[illegible]	[illegible]	552.3	552.3	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
15/05/16	2.7	7.87	279.94	287.81	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
16/05/16	2	5.83	279.94	285.77	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
17/05/16	1.9	5.54	279.94	285.48	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
18/05/16	1.8	5.25	279.94	285.18	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
19/05/16	1.8	5.25	279.94	285.18	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
20/05/16	1.8	5.25	279.94	285.18	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
21/05/16	2.9	8.46	279.94	288.39	0	1606.2	2187.0	[illegible]	[illegible]	[illegible]	[illegible]	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
22/05/16	2.2	6.42	279.94	286.35	0	[illegible]	1458.0	[illegible]	[illegible]	[illegible]	[illegible]	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
23/05/16	3	8.75	279.94	288.68	0	[illegible]	729.0	[illegible]	[illegible]	534.7	534.7	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
24/05/16	2.8	8.16	279.94	288.10	0	[illegible]	2187.0	[illegible]	[illegible]	[illegible]	[illegible]	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			
25/05/16	2.8	8.16	279.94	288.10	0	0.0	729.0	[illegible]	[illegible]	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
26/05/16	2.8	8.16	279.94	288.10	0	0.0	729.0	[illegible]	[illegible]	194.4	194.4	318.7	[illegible]	[illegible]	[illegible]	0.0	0	0			

Date	Rainfall (mm)	Roof Catchment: Rooftop Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	Rainfall (mm)	Stormwater Catchment: Stormwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	[illegible]
27/05/16	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0
28/05/16	8.8	1	15924	0.95	2	6.8	102.9	8.8	1	73599.2	0.8	2	6.8	400.4	503.2
29/05/16	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	0.8	2	0.2	11.8	14.8
30/05/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
31/05/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
02/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/06/16	2.6	1	15924	0.95	2	0.6	9.1	2.6	1	73599.2	0.8	2	0.6	35.3	44.4
05/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/06/16	21.2	1	15924	0.95	2	19.2	290.5	21.2	1	73599.2	0.8	2	19.2	1130.5	1421.0
08/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
09/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/06/16	5.2	1	15924	0.95	2	3.2	48.4	5.2	1	73599.2	0.8	2	3.2	188.4	236.8
11/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
12/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/06/16	25.4	1	15924	0.95	2	23.4	354.0	25.4	1	73599.2	0.8	2	23.4	1377.8	1731.8
14/06/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
15/06/16	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
16/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
17/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/06/16	10	1	15924	0.95	2	8	121.0	10	1	73599.2	0.8	2	8	471.0	592.1
21/06/16	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	0.8	2	0.2	11.8	14.8
22/06/16	3.4	1	15924	0.95	2	1.4	21.2	3.4	1	73599.2	0.8	2	1.4	82.4	103.6
23/06/16	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
24/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
25/06/16	8.6	1	15924	0.95	2	6.6	99.8	8.6	1	73599.2	0.8	2	6.6	388.6	488.4
26/06/16	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
27/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/06/16	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	0.8	2	0	0.0	0.0
29/06/16	13.8	1	15924	0.95	2	11.8	178.5	13.8	1	73599.2	0.8	2	11.8	694.8	873.3
30/06/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
01/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
02/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/07/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
04/07/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
05/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
08/07/16	18.2	1	15924	0.95	2	16.2	245.1	18.2	1	73599.2	0.8	2	16.2	953.9	1198.9
09/07/16	13.2	1	15924	0.95	2	11.2	169.4	13.2	1	73599.2	0.8	2	11.2	659.4	828.8
10/07/16	25.2	1	15924	0.95	2	23.2	351.0	25.2	1	73599.2	0.8	2	23.2	1366.0	1717.0
11/07/16	2	1	15924	0.95	2	0	0.0	2	1	73599.2	0.8	2	0	0.0	0.0
12/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/07/16	1.8	1	15924	0.95	2	0	0.0	1.8	1	73599.2	0.8	2	0	0.0	0.0
17/07/16	14.4	1	15924	0.95	2	12.4	187.6	14.4	1	73599.2	0.8	2	12.4	730.1	917.7
18/07/16	8.2	1	15924	0.95	2	6.2	93.8	8.2	1	73599.2	0.8	2	6.2	365.1	458.8
19/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
20/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/07/16	15.4	1	15924	0.95	2	13.4	202.7	15.4	1	73599.2	0.8	2	13.4	789.0	991.7
22/07/16	5.4	1	15924	0.95	2	3.4	51.4	5.4	1	73599.2	0.8	2	3.4	200.2	251.6
23/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/07/16	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
25/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
27/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
28/07/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
29/07/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/07/16	1	1	15924	0.95	2	0	0.0	1	1	73599.2	0.8	2	0	0.0	0.0
31/07/16	12.6	1	15924	0.95	2	10.6	160.4	12.6	1	73599.2	0.8	2	10.6	624.1	784.5
01/08/16	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	0.8	2	0.2	11.8	14.8
02/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
04/08/16	6	1	15924	0.95	2	4	60.5	6	1	73599.2	0.8	2	4	235.5	296.0
05/08/16	3	1	15924	0.95	2	1	15.1	3	1	73599.2	0.8	2	1	58.9	74.0
06/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/08/16	14.6	1	15924	0.95	2	12.6	190.6	14.6	1	73599.2	0.8	2	12.6	741.9	932.5
08/08/16	11.2	1	15924	0.95	2	9.2	139.2	11.2	1	73599.2	0.8	2	9.2	541.7	680.9
09/08/16	4.6	1	15924	0.95	2	2.6	39.3	4.6	1	73599.2	0.8	2	2.6	153.1	192.4
10/08/16	10.4	1	15924	0.95	2	8.4	127.1	10.4	1	73599.2	0.8	2	8.4	494.6	621.7
11/08/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
12/08/16	8.4	1	15924	0.95	2	6.4	96.8	8.4	1	73599.2	0.8	2	6.4	376.8	473.6
13/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/08/16	6.2	1	15924	0.95	2	4.2	63.5	6.2	1	73599.2	0.8	2	4.2	247.3	310.8
17/08/16	3.8	1	15924	0.95	2	1.8	27.2	3.8	1	73599.2	0.8	2	1.8	106.0	133.2
18/08/16	21	1	15924	0.95	2	19	287.4	21	1	73599.2	0.8	2	19	1118.7	1406.1
19/08/16	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0
20/08/16	9.6	1	15924	0.95	2	7.6	115.0	9.6	1	73599.2	0.8	2	7.6	447.5	562.5
21/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/08/16	10.4	1	15924	0.95	2	8.4	127.1	10.4	1	73599.2	0.8	2	8.4	494.6	621.7
23/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
24/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
25/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
26/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
27/08/16	39.8	1	15924	0.95	2	37.8	571.8	39.8	1	73599.2	0.8	2	37.8	2225.6	2797.4
28/08/16	4.4	1	15924	0.95	2	2.4	36.3	4.4	1	73599.2	0.8	2	2.4	141.3	177.6
29/08/16	1.2	1	15924	0.95	2	0	0.0	1.2	1	73599.2	0.8	2	0	0.0	0.0
30/08/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
31/08/16	15	1	15924	0.95	2	13	196.7	15	1	73599.2	0.8	2	13	765.4	962.1
01/09/16	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
02/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
03/09/16	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	0.8	2	0	0.0	0.0
04/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
05/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
06/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
07/09/16	12.6	1	15924	0.95	2	10.6	160.4	12.6	1	73599.2	0.8	2	10.6	624.1	784.5
08/09/16	11	1	15924	0.95	2	9	136.2	11	1	73599.2	0.8	2	9	529.9	666.1
09/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
10/09/16	1.2	1	15924	0.95	2	0	0.0	1.2	1	73599.2	0.8	2	0	0.0	0.0
11/09/16	2.4	1	15924	0.95	2	0.4	6.1	2.4	1	73599.2	0.8	2	0.4	23.6	29.6
12/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
13/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
14/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
15/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
16/09/16	9.8	1	15924	0.95	2	7.8	118.0	9.8	1	73599.2	0.8	2	7.8	459.3	577.3
17/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
18/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
19/09/16	14.4	1	15924	0.95	2	12.4	187.6	14.4	1	73599.2	0.8	2	12.4	730.1	917.7
20/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
21/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
22/09/16	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
23/09/16	10.2	1	15924	0.95	2	8.2	124.0	10.2	1	73599.2	0.8	2	8.2	482.8	606.9
24/09/16	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	0.8	2	0	0.0	0.0
25/09/16	3.8	1	15924	0.95	2	1.8	27.2	3.8	1	73599.2	0.8	2	1.8	106.0	133.2

Date	Losses: Loss - evaporation (mm)	Pond loss evaporation (m³)	Infiltration (m³/day)	Total Pond Loss (m³/day)	Volume at start of period (m³)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (corrected for max level) (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m³)	Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow (m³)	Overflow flag	Pond Empty Flag	Pond surface area (m²)	Pond Volume (m³)	Storage volume
27/05/16	2.3	6.73	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
28/05/16	2.6	7.58	279.94	287.52	0	215.7	729.0	71.9	-215.6	411.4	411.4	318.7	[illegible]	[illegible]	1624	0.0	0	0			
29/05/16	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
30/05/16	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
31/05/16	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
01/06/16	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
02/06/16	3.1	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
03/06/16	3	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
04/06/16	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
05/06/16	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
06/06/16	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
07/06/16	1.9	5.54	279.94	285.48	0	1135.5	1458.0	142.7	-142.7	1278.2	1278.2	318.7	[illegible]	[illegible]	1624	0.0	0	0			
08/06/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
09/06/16	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
10/06/16	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	165.8	165.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
11/06/16	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
12/06/16	3.2	9.33	279.94	289.27	0	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
13/06/16	1.7	4.96	279.94	284.89	0	1446.9	2187.0	213.7	-71.2	1518.1	1518.1	318.7	[illegible]	[illegible]	1624	0.0	0	0			
14/06/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
15/06/16	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
16/06/16	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
17/06/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
18/06/16	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
19/06/16	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
20/06/16	1.1	3.21	279.94	283.14	0	308.9	729.0	70.8	-212.4	521.3	521.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
21/06/16	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
22/06/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	32.3	32.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
23/06/16	1.3	3.79	279.94	283.73	0	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
24/06/16	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
25/06/16	1.7	4.96	279.94	284.89	0	203.6	729.0	71.2	-213.7	417.2	417.2	318.7	[illegible]	[illegible]	1624	0.0	0	0			
26/06/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
27/06/16	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
28/06/16	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
29/06/16	1.7	4.96	279.94	284.89	0	588.4	1458.0	142.4	-142.4	730.8	730.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
30/06/16	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
01/07/16	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
02/07/16	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
03/07/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
04/07/16	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
05/07/16	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
06/07/16	2.1	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
07/07/16	1.5	4.37	279.94	284.31	0	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
08/07/16	2.3	6.71	279.94	286.64	0	912.3	1458.0	143.3	-143.3	1055.6	1055.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
09/07/16	2.3	6.71	279.94	286.64	0	542.2	1458.0	143.3	-143.3	685.6	685.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
10/07/16	2.3	6.71	279.94	286.64	0	1430.3	2187.0	215.0	-71.7	1502.0	1502.0	318.7	[illegible]	[illegible]	1624	0.0	0	0			
11/07/16	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
12/07/16	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
13/07/16	3.5	10.21	279.94	290.14	0	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
14/07/16	4.3	12.54	279.94	292.47	0	0.0	729.0	73.1	-219.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
15/07/16	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
16/07/16	2.7	7.87	279.94	287.81	0	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
17/07/16	1.9	5.54	279.94	285.48	0	632.2	1458.0	142.7	-142.7	775.0	775.0	318.7	[illegible]	[illegible]	1624	0.0	0	0			
18/07/16	1.8	5.25	279.94	285.18	0	173.7	729.0	71.3	-213.9	387.5	387.5	318.7	[illegible]	[illegible]	1624	0.0	0	0			
19/07/16	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
20/07/16	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
21/07/16	2.1	6.12	279.94	286.06	0	705.6	1458.0	143.0	-143.0	848.7	848.7	318.7	[illegible]	[illegible]	1624	0.0	0	0			
22/07/16	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	180.3	180.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
23/07/16	1.4	4.08	279.94	284.02	0	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
24/07/16	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
25/07/16	1.6	4.67	279.94	284.60	0	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
26/07/16	1.9	5.54	279.94	285.48	0	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
27/07/16	1.8	5.25	279.94	285.18	0	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
28/07/16	2.9	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
29/07/16	3.3	9.62	279.94	289.56	0	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
30/07/16	2.8	8.16	279.94	288.10	0	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
31/07/16	2	5.83	279.94	285.77	0	498.7	1458.0	142.9	-142.9	641.6	641.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
01/08/16	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
02/08/16	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
03/08/16	1.1	3.21	279.94	283.14	0	0.0	729.0	70.8	-212.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
04/08/16	1.3	3.79	279.94	283.73	0	12.3	729.0	70.9	-212.8	225.1	225.1	318.7	[illegible]	[illegible]	1624	0.0	0	0			
05/08/16	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	2.3	2.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
06/08/16	3.5	10.21	279.94	290.14	0	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
07/08/16	2.5	7.29	279.94	287.23	0	645.3	1458.0	143.6	-143.6	788.9	788.9	318.7	[illegible]	[illegible]	1624	0.0	0	0			
08/08/16	2.1	6.12	279.94	286.06	0	394.8	1458.0	143.0	-143.0	537.8	537.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
09/08/16	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	121.0	121.0	318.7	[illegible]	[illegible]	1624	0.0	0	0			
10/08/16	2.3	6.71	279.94	286.64	0	335.0	729.0	71.7	-215.0	550.0	550.0	318.7	[illegible]	[illegible]	1624	0.0	0	0			
11/08/16	2	5.83	279.94	285.77	0	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
12/08/16	2.1	6.12	279.94	286.06	0	187.6	729.0	71.5	-214.5	402.1	402.1	318.7	[illegible]	[illegible]	1624	0.0	0	0			
13/08/16	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
14/08/16	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
15/08/16	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
16/08/16	2.3	6.71	279.94	286.64	0	24.2	729.0	71.7	-215.0	239.2	239.2	318.7	[illegible]	[illegible]	1624	0.0	0	0			
17/08/16	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	61.6	61.6	318.7	[illegible]	[illegible]	1624	0.0	0	0			
18/08/16	2	5.83	279.94	285.77	0	1120.4	1458.0	142.9	-142.9	1263.3	1263.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
19/08/16	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
20/08/16	2.3	6.71	279.94	286.64	0	275.8	729.0	71.7	-215.0	490.8	490.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
21/08/16	2.8	8.16	279.94	288.10	0	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
22/08/16	2.4	7.00	279.94	286.93	0	334.7	729.0	71.7	-215.2	549.9	549.9	318.7	[illegible]	[illegible]	1624	0.0	0	0			
23/08/16	3	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
24/08/16	3.5	10.21	279.94	290.14	0	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
25/08/16	4.1	11.96	279.94	291.89	0	0.0	729.0	73.0	-218.9	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
26/08/16	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
27/08/16	2.6	7.58	279.94	287.52	0	2510.0	2187.0	215.6	-71.9	2581.8	2581.8	318.7	[illegible]	[illegible]	1624	0.0	0	0			
28/08/16	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	105.9	105.9	318.7	[illegible]	[illegible]	1624	0.0	0	0			
29/08/16	2.1	6.12	279.94	286.06	0	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
30/08/16	2.5	7.29	279.94	287.23	0	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
31/08/16	2.6	7.58	279.94	287.52	0	674.6	1458.0	143.8	-143.8	818.3	818.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			
01/09/16	2.2	6.42	279.94	286.35	0	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
02/09/16	3	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
03/09/16	3.4	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
04/09/16	3	8.75	279.94	288.68	0	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
05/09/16	2.9	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
06/09/16	3.8	11.08	279.94	291.02	0	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
07/09/16	3.1	9.04	279.94	288.98	0	495.5	1458.0	144.5	-144.5	640.0	640.0	318.7	[illegible]	[illegible]	1624	0.0	0	0			
08/09/16	2.2	6.42	279.94	286.35	0	379.7	1458.0	143.2	-143.2	522.9	522.9	318.7	[illegible]	[illegible]	1624	0.0	0	0			
09/09/16	2.3	6.71	279.94	286.64	0	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
10/09/16	3.3	9.62	279.94	289.56	0	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
11/09/16	4.5	13.12	279.94	293.06	0	0.0	729.0	73.3	-219.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
12/09/16	4.2	12.25	279.94	292.18	0	0.0	729.0	73.0	-219.1	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
13/09/16	3.7	10.79	279.94	290.73	0	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
14/09/16	2.9	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
15/09/16	3.4	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
16/09/16	3.2	9.33	279.94	289.27	0	288.0	729.0	72.3	-217.0	504.9	504.9	318.7	[illegible]	[illegible]	1624	0.0	0	0			
17/09/16	2.9	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
18/09/16	2.9	8.46	279.94	288.39	0	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
19/09/16	3.1	9.04	279.94	288.98	0	628.7	1458.0	144.5	-144.5	773.2	773.2	318.7	[illegible]	[illegible]	1624	0.0	0	0			
20/09/16	3.6	10.50	279.94	290.43	0	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
21/09/16	2.4	7.00	279.94	286.93	0	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
22/09/16	3.1	9.04	279.94	288.98	0	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
23/09/16	2.7	7.87	279.94	287.81	0	319.0	729.0	72.0	-215.9	534.9	534.9	318.7	[illegible]	[illegible]	1624	0.0	0	0			
24/09/16	3.4	9.91	279.94	289.85	0	0.0	729.0	72.5	-217.4	0.0	0.0	318.7	[illegible]	[illegible]	1624	0.0	0	1			
25/09/16	2.6	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	61.3	61.3	318.7	[illegible]	[illegible]	1624	0.0	0	0			

Date	Rainfall (mm)	Roofwater Catchment	Catchment Area (m²)	Runoff Coefficient	Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)
26/09/16	0	-	15924	0.95	-	0	0.0
27/09/16	10.4	-	15924	0.95	-	8.4	[illegible]
28/09/16	5.2	-	15924	0.95	-	3.2	48.4
29/09/16	0.2	-	15924	0.95	-	0	0.0
30/09/16	0	-	15924	0.95	-	0	0.0
01/10/16	6	-	15924	0.95	-	4	60.5
02/10/16	4.4	-	15924	0.95	-	2.4	36.1
03/10/16	0.2	-	15924	0.95	-	0	0.0
04/10/16	3.4	-	15924	0.95	-	1.4	21.2
05/10/16	0.2	-	15924	0.95	-	0	0.0
06/10/16	0	-	15924	0.95	-	0	0.0
07/10/16	2.2	-	15924	0.95	-	0.2	[illegible]
08/10/16	11.2	-	15924	0.95	-	9.2	[illegible]
09/10/16	11.2	-	15924	0.95	-	9.2	[illegible]
10/10/16	0.2	-	15924	0.95	-	0	0.0
11/10/16	0	-	15924	0.95	-	0	0.0
12/10/16	0	-	15924	0.95	-	0	0.0
13/10/16	0	-	15924	0.95	-	0	0.0
14/10/16	0.6	-	15924	0.95	-	0	0.0
15/10/16	8.8	-	15924	0.95	-	6.8	[illegible]
16/10/16	1	-	15924	0.95	-	0	0.0
17/10/16	0	-	15924	0.95	-	0	0.0
18/10/16	0	-	15924	0.95	-	0	0.0
19/10/16	0	-	15924	0.95	-	0	0.0
20/10/16	2.2	-	15924	0.95	-	0.2	3.0
21/10/16	0	-	15924	0.95	-	0	0.0
22/10/16	0	-	15924	0.95	-	0	0.0
23/10/16	0	-	15924	0.95	-	0	0.0
24/10/16	0	-	15924	0.95	-	0	0.0
25/10/16	0	-	15924	0.95	-	0	0.0

Water Balance Model

Central Main Pit

Date	Rainfall (mm)	Rainwater Catchment	Catchment Area (m²)	Runoff Coefficient	Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
27/01/17	0	[illegible]	15924	0.95	[illegible]	0
28/01/17	0	[illegible]	15924	0.95	[illegible]	0
29/01/17	1	[illegible]	15924	0.95	[illegible]	0
30/01/17	8.6	[illegible]	15924	0.95	[illegible]	6.6
31/01/17	7	[illegible]	15924	0.95	[illegible]	5
01/02/17	1	[illegible]	15924	0.95	[illegible]	0
02/02/17	0	[illegible]	15924	0.95	[illegible]	0
03/02/17	0	[illegible]	15924	0.95	[illegible]	0
04/02/17	0	[illegible]	15924	0.95	[illegible]	0
05/02/17	0	[illegible]	15924	0.95	[illegible]	0
06/02/17	0	[illegible]	15924	0.95	[illegible]	0
07/02/17	0	[illegible]	15924	0.95	[illegible]	0
08/02/17	0	[illegible]	15924	0.95	[illegible]	0
09/02/17	0	[illegible]	15924	0.95	[illegible]	0
10/02/17	131.4	[illegible]	15924	0.95	[illegible]	109.4
11/02/17	16.4	[illegible]	15924	0.95	[illegible]	14.4
12/02/17	0	[illegible]	15924	0.95	[illegible]	0
13/02/17	0	[illegible]	15924	0.95	[illegible]	0
14/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
15/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
16/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
17/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
18/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
19/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
20/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
21/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
22/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
23/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
24/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0
25/02/17	[illegible]	[illegible]	15924	0.95	[illegible]	0

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Date	Road Catchment: Rainfall (mm)	Roofwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	Stormwater Catchment: Rainfall (mm)	Stormwater Catchment	Catchment Area (m²)	Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Applied rainfall after loss (absorption and wetting)	Runoff volume (m³)	[illegible]
28/05/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
29/05/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
30/05/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
31/05/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
01/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
02/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
03/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
04/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
05/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
06/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
07/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
08/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
09/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
10/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
11/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
12/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
13/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
14/06/17	9.2	1	15924	0.95	2	7.2	108.9	9.2	1	73599.2	[illegible]	2	7.2	423.9	532.9
15/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
16/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
17/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
18/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
19/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
20/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
21/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
22/06/17	21.8	1	15924	0.95	2	19.8	299.5	21.8	1	73599.2	[illegible]	2	19.8	1165.8	1465.3
23/06/17	15.6	1	15924	0.95	2	13.6	[illegible]	15.6	1	73599.2	[illegible]	2	13.6	800.8	1006.5
24/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
25/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
26/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
27/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
28/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
29/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
30/06/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
01/07/17	33.8	1	15924	0.95	2	31.8	491.1	33.8	1	73599.2	[illegible]	2	31.8	1972.4	2153.4
02/07/17	16.8	1	15924	0.95	2	14.8	223.9	16.8	1	73599.2	[illegible]	2	14.8	871.4	1095.3
03/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
04/07/17	8	1	15924	0.95	2	6	90.8	8	1	73599.2	[illegible]	2	6	353.3	444.0
05/07/17	7	1	15924	0.95	2	5	75.6	7	1	73599.2	[illegible]	2	5	294.4	370.0
06/07/17	11	1	15924	0.95	2	9	136.2	11	1	73599.2	[illegible]	2	9	529.9	666.1
07/07/17	8.4	1	15924	0.95	2	6.4	96.8	8.4	1	73599.2	[illegible]	2	6.4	376.8	473.6
08/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
09/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
10/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
11/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
12/07/17	5	1	15924	0.95	2	3	45.4	5	1	73599.2	[illegible]	2	3	176.6	222.0
13/07/17	10.6	1	15924	0.95	2	8.6	130.1	10.6	1	73599.2	[illegible]	2	8.6	506.4	636.5
14/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
15/07/17	0.4	1	15924	0.95	2	0	0.0	0.4	1	73599.2	[illegible]	2	0	0.0	0.0
16/07/17	15.2	1	15924	0.95	2	13.2	199.7	15.2	1	73599.2	[illegible]	2	13.2	777.2	976.9
17/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
18/07/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
19/07/17	8	1	15924	0.95	2	6	90.8	8	1	73599.2	[illegible]	2	6	353.3	444.0
20/07/17	10.6	1	15924	0.95	2	8.6	130.1	10.6	1	73599.2	[illegible]	2	8.6	506.4	636.5
21/07/17	3.6	1	15924	0.95	2	1.6	24.2	3.6	1	73599.2	[illegible]	2	1.6	94.2	118.4
22/07/17	27.4	1	15924	0.95	2	25.4	384.2	27.4	1	73599.2	[illegible]	2	25.4	1495.5	1879.8
23/07/17	4	1	15924	0.95	2	2	30.3	4	1	73599.2	[illegible]	2	2	117.8	148.0
24/07/17	8.6	1	15924	0.95	2	6.6	99.8	8.6	1	73599.2	[illegible]	2	6.6	388.6	488.4
25/07/17	5.4	1	15924	0.95	2	3.4	51.4	5.4	1	73599.2	[illegible]	2	3.4	200.2	251.6
26/07/17	3	1	15924	0.95	2	1	15.1	3	1	73599.2	[illegible]	2	1	58.9	74.0
27/07/17	3	1	15924	0.95	2	1	15.1	3	1	73599.2	[illegible]	2	1	58.9	74.0
28/07/17	14.2	1	15924	0.95	2	12.2	184.6	14.2	1	73599.2	[illegible]	2	12.2	718.3	902.9
29/07/17	15	1	15924	0.95	2	13	196.7	15	1	73599.2	[illegible]	2	13	765.4	962.1
30/07/17	5	1	15924	0.95	2	3	45.4	5	1	73599.2	[illegible]	2	3	176.6	222.0
31/07/17	0.6	1	15924	0.95	2	0	0.0	0.6	1	73599.2	[illegible]	2	0	0.0	0.0
01/08/17	27.6	1	15924	0.95	2	25.6	387.3	27.6	1	73599.2	[illegible]	2	25.6	1507.3	1894.6
02/08/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
03/08/17	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	[illegible]	2	0	0.0	0.0
04/08/17	5	1	15924	0.95	2	3	45.4	5	1	73599.2	[illegible]	2	3	176.6	222.0
05/08/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
06/08/17	0	1	15924	0.95	2	[illegible]	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
07/08/17	0	1	15924	0.95	2	[illegible]	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
08/08/17	2	1	15924	0.95	2	0	0.0	2	1	73599.2	[illegible]	2	0	0.0	0.0
09/08/17	48.2	1	15924	0.95	2	46.2	698.9	48.2	1	73599.2	[illegible]	2	46.2	2720.2	3419.1
10/08/17	9.4	1	15924	0.95	2	7.4	111.9	9.4	1	73599.2	[illegible]	2	7.4	435.7	547.7
11/08/17	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	[illegible]	2	0	0.0	0.0
12/08/17	38.6	1	15924	0.95	2	36.6	553.7	38.6	1	73599.2	[illegible]	2	36.6	2155.0	2708.7
13/08/17	19.4	1	15924	0.95	2	17.4	263.2	19.4	1	73599.2	[illegible]	2	17.4	1024.5	1287.7
14/08/17	11.2	1	15924	0.95	2	9.2	139.2	11.2	1	73599.2	[illegible]	2	9.2	541.7	680.9
15/08/17	8.6	1	15924	0.95	2	6.6	99.8	8.6	1	73599.2	[illegible]	2	6.6	388.6	488.4
16/08/17	2.8	1	15924	0.95	2	0.8	12.1	2.8	1	73599.2	[illegible]	2	0.8	47.1	59.2
17/08/17	3.4	1	15924	0.95	2	1.4	21.2	3.4	1	73599.2	[illegible]	2	1.4	82.4	103.6
18/08/17	1.2	1	15924	0.95	2	0	0.0	1.2	1	73599.2	[illegible]	2	0	0.0	0.0
19/08/17	10.4	1	15924	0.95	2	8.4	127.1	10.4	1	73599.2	[illegible]	2	8.4	494.6	621.7
20/08/17	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	[illegible]	2	0	0.0	0.0
21/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
22/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
23/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
24/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
25/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
26/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
27/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
28/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
29/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
30/08/17	[illegible]	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
31/08/17	[illegible]	1	15924	0.95	2	3	45.4	5	1	73599.2	[illegible]	2	3	176.6	222.0
01/09/17	[illegible]	1	15924	0.95	2	1	15.1	3	1	73599.2	[illegible]	2	1	58.9	74.0
02/09/17	2.2	1	15924	0.95	2	0.2	3.0	2.2	1	73599.2	[illegible]	2	0.2	11.8	14.8
03/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
04/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
05/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
06/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
07/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
08/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
09/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
10/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
11/09/17	6.6	1	15924	0.95	2	4.6	69.6	6.6	1	73599.2	[illegible]	2	4.6	270.8	340.4
12/09/17	0.8	1	15924	0.95	2	0	0.0	0.8	1	73599.2	[illegible]	2	0	0.0	0.0
13/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
14/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
15/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
16/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
17/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
18/09/17	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	[illegible]	2	0	0.0	0.0
19/09/17	0	1	15924	0.95	2	0	0.0	0	1	73599.2	[illegible]	2	0	0.0	0.0
20/09/17	6.4	1	15924	0.95	2	4.4	66.6	6.4	1	73599.2	[illegible]	2	4.4	259.1	325.6
21/09/17	8.8	1	15924	0.95	2	6.8	102.9	8.8	1	73599.2	[illegible]	2	6.8	400.4	503.2
22/09/17	17.8	1	15924	0.95	2	15.8	239.0	17.8	1	73599.2	[illegible]	2	15.8	930.3	1169.3
23/09/17	11.6	1	15924	0.95	2	9.6	145.2	11.6	1	73599.2	[illegible]	2	9.6	565.2	710.5
24/09/17	5.4	1	15924	0.95	2	3.4	51.4	5.4	1	73599.2	[illegible]	2	3.4	200.2	251.6
25/09/17	21.4	1	15924	0.95	2	19.4	293.5	21.4	1	73599.2	[illegible]	2	19.4	1142.3	1435.7
26/09/17	1.4	1	15924	0.95	2	0	0.0	1.4	1	73599.2	[illegible]	2	0	0.0	0.0

Date	Losses: Loss - evaporation (mm)	Pond loss evaporation (m³)	Infiltration (m³/day)	Total Pond Loss (m³/day)	Volume at start of period (m³)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (corrected for max level) (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m³)	Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow m³	Overflow flag	Pond Empty flag	Pond surface area (m²)	Pond Volume (m³)	Storage volume
28/05/17	[illegible]	7.58	279.94	287.52	0	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
29/05/17	3	8.75	279.94	288.68	[illegible]	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
30/05/17	2.4	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
31/05/17	1.3	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
01/06/17	1.6	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
02/06/17	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
03/06/17	2	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
04/06/17	2.9	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
05/06/17	3.3	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
06/06/17	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
07/06/17	3.3	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
08/06/17	3.8	11.08	279.94	291.02	[illegible]	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
09/06/17	3.5	10.21	279.94	290.14	[illegible]	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
10/06/17	3.6	10.50	279.94	290.43	[illegible]	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
11/06/17	3.8	11.08	279.94	291.02	[illegible]	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
12/06/17	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
13/06/17	1.7	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
14/06/17	1.7	4.96	279.94	284.89	[illegible]	248.0	729.0	71.2	-213.7	461.6	461.6	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
15/06/17	1.7	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
16/06/17	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
17/06/17	2.2	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
18/06/17	2.2	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
19/06/17	2.2	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
20/06/17	2.6	7.58	279.94	287.52	[illegible]	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
21/06/17	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
22/06/17	2.4	7.00	279.94	286.93	[illegible]	1178.4	1458.0	143.5	-143.5	1321.9	1321.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
23/06/17	2.3	6.71	279.94	286.64	[illegible]	719.9	1458.0	143.3	-143.3	863.2	863.2	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
24/06/17	1.8	5.25	279.94	285.18	[illegible]	0.0	729.0	71.3	-213.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
25/06/17	1.6	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
26/06/17	1.7	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
27/06/17	2.1	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
28/06/17	2.5	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
29/06/17	3.2	9.33	279.94	289.27	[illegible]	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
30/06/17	1.3	3.79	279.94	283.73	[illegible]	0.0	729.0	70.9	-212.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
01/07/17	1.3	3.79	279.94	283.73	[illegible]	2069.7	2187.0	212.8	-70.9	2140.6	2140.6	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
02/07/17	1.5	4.37	279.94	284.31	[illegible]	811.0	1458.0	142.2	-142.2	953.2	953.2	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
03/07/17	1	2.92	279.94	282.85	[illegible]	0.0	729.0	70.7	-212.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
04/07/17	1.7	4.96	279.94	284.89	[illegible]	159.1	729.0	71.2	-213.7	372.8	372.8	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
05/07/17	1.4	4.08	279.94	284.02	[illegible]	86.0	729.0	71.0	-213.0	299.0	299.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
06/07/17	1.8	5.25	279.94	285.18	[illegible]	380.9	1458.0	142.6	-142.6	523.5	523.5	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
07/07/17	1.7	4.96	279.94	284.89	[illegible]	188.8	729.0	71.2	-213.7	402.4	402.4	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
08/07/17	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
09/07/17	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
10/07/17	3.1	9.04	279.94	288.98	[illegible]	0.0	729.0	72.2	-216.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
11/07/17	2.8	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
12/07/17	1.5	4.37	279.94	284.31	[illegible]	0.0	729.0	71.1	-213.2	150.9	150.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
13/07/17	1.6	4.67	279.94	284.60	[illegible]	351.9	1458.0	142.3	-142.3	494.2	494.2	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
14/07/17	2.1	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
15/07/17	2.3	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
16/07/17	2.1	6.12	279.94	286.06	[illegible]	690.8	1458.0	143.0	-143.0	833.9	833.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
17/07/17	4.5	13.12	279.94	293.06	[illegible]	0.0	729.0	73.3	-219.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
18/07/17	3	8.75	279.94	288.68	[illegible]	0.0	729.0	72.2	-216.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
19/07/17	2.6	7.58	279.94	287.52	[illegible]	156.5	729.0	71.9	-215.6	372.1	372.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
20/07/17	3.1	9.04	279.94	288.98	[illegible]	347.5	1458.0	144.5	-144.5	492.0	492.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
21/07/17	2	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	47.0	47.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
22/07/17	1.8	5.25	279.94	285.18	[illegible]	1594.6	2187.0	213.9	-71.3	1665.9	1665.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
23/07/17	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	76.6	76.6	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
24/07/17	2.3	6.71	279.94	286.64	[illegible]	201.8	729.0	71.7	-215.0	416.8	416.8	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
25/07/17	2.1	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	180.1	180.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
26/07/17	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	2.1	2.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
27/07/17	3.1	9.04	279.94	288.98	[illegible]	0.0	729.0	72.2	-216.7	1.8	1.8	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
28/07/17	2.7	7.87	279.94	287.81	[illegible]	615.1	1458.0	143.9	-143.9	759.0	759.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
29/07/17	2	5.83	279.94	285.77	[illegible]	676.3	1458.0	142.9	-142.9	819.2	819.2	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
30/07/17	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	150.7	150.7	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
31/07/17	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
01/08/17	1.9	5.54	279.94	285.48	[illegible]	1609.1	2187.0	214.1	-71.4	1680.5	1680.5	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
02/08/17	2.1	6.12	279.94	286.06	[illegible]	0.0	729.0	71.5	-214.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
03/08/17	1.7	4.96	279.94	284.89	[illegible]	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
04/08/17	1.9	5.54	279.94	285.48	[illegible]	0.0	729.0	71.4	-214.1	150.7	150.7	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
05/08/17	2.2	6.42	279.94	286.35	[illegible]	0.0	729.0	71.6	-214.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
06/08/17	2	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
07/08/17	1.4	4.08	279.94	284.02	[illegible]	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
08/08/17	2	5.83	279.94	285.77	[illegible]	0.0	729.0	71.4	-214.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
09/08/17	2.1	6.12	279.94	286.06	[illegible]	3139.1	2916.0	286.1	0.0	3133.1	3133.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
10/08/17	2.9	8.46	279.94	288.39	[illegible]	259.3	729.0	72.1	-216.3	475.6	475.6	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
11/08/17	2.5	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
12/08/17	3.2	9.33	279.94	289.27	[illegible]	2419.4	2187.0	217.0	-72.3	2491.7	2491.7	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
13/08/17	3.6	10.50	279.94	290.43	[illegible]	997.3	1458.0	145.2	-145.2	1142.5	1142.5	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
14/08/17	3.1	9.04	279.94	288.98	[illegible]	391.9	1458.0	144.5	-144.5	536.4	536.4	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
15/08/17	3.3	9.62	279.94	289.56	[illegible]	198.9	729.0	72.4	-217.2	416.1	416.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
16/08/17	2.8	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
17/08/17	3.3	9.62	279.94	289.56	[illegible]	0.0	729.0	72.4	-217.2	31.2	31.2	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
18/08/17	2.4	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
19/08/17	2.4	7.00	279.94	286.93	[illegible]	334.7	729.0	71.7	-215.2	549.9	549.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
20/08/17	1.6	4.67	279.94	284.60	[illegible]	0.0	729.0	71.2	-213.5	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
21/08/17	2.5	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
22/08/17	2.9	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
23/08/17	4	11.66	279.94	291.60	[illegible]	0.0	729.0	72.9	-218.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
24/08/17	3.2	9.33	279.94	289.27	[illegible]	0.0	729.0	72.3	-217.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
25/08/17	2.6	7.58	279.94	287.52	[illegible]	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
26/08/17	4.8	14.00	279.94	293.93	[illegible]	0.0	729.0	73.5	-220.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
27/08/17	3.7	10.79	279.94	290.73	[illegible]	0.0	729.0	72.7	-218.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
28/08/17	1.4	4.08	279.94	284.02	[illegible]	0.0	729.0	71.0	-213.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
29/08/17	2.5	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
30/08/17	2.3	6.71	279.94	286.64	[illegible]	0.0	729.0	71.7	-215.0	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
31/08/17	2.8	8.16	279.94	288.10	[illegible]	0.0	729.0	72.0	-216.1	150.0	150.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
01/09/17	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	2.1	2.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
02/09/17	2.5	7.29	279.94	287.23	[illegible]	0.0	729.0	71.8	-215.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
03/09/17	2.6	7.58	279.94	287.52	[illegible]	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
04/09/17	3.6	10.50	279.94	290.43	[illegible]	0.0	729.0	72.6	-217.8	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
05/09/17	4.9	14.29	279.94	294.22	[illegible]	0.0	729.0	73.6	-220.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
06/09/17	4.8	14.00	279.94	293.93	[illegible]	0.0	729.0	73.5	-220.4	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
07/09/17	3.5	10.21	279.94	290.14	[illegible]	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
08/09/17	2.9	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
09/09/17	2.6	7.58	279.94	287.52	[illegible]	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
10/09/17	2.7	7.87	279.94	287.81	[illegible]	0.0	729.0	72.0	-215.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
11/09/17	4	11.66	279.94	291.60	[illegible]	48.8	729.0	72.9	-218.7	267.5	267.5	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
12/09/17	4.1	11.96	279.94	291.89	[illegible]	0.0	729.0	73.0	-218.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
13/09/17	4.2	12.25	279.94	292.18	[illegible]	0.0	729.0	73.0	-219.1	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
14/09/17	5	14.58	279.94	294.52	[illegible]	0.0	729.0	73.6	-220.9	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
15/09/17	4	11.66	279.94	291.60	[illegible]	0.0	729.0	72.9	-218.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
16/09/17	3.5	10.21	279.94	290.14	[illegible]	0.0	729.0	72.5	-217.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
17/09/17	3.8	11.08	279.94	291.02	[illegible]	0.0	729.0	72.8	-218.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
18/09/17	2.9	8.46	279.94	288.39	[illegible]	0.0	729.0	72.1	-216.3	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
19/09/17	4	11.66	279.94	291.60	[illegible]	0.0	729.0	72.9	-218.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
20/09/17	3.5	10.21	279.94	290.14	[illegible]	35.5	729.0	72.5	-217.6	251.1	251.1	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
21/09/17	3.9	11.37	279.94	291.31	[illegible]	211.9	729.0	72.8	-218.5	430.4	430.4	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
22/09/17	3.5	10.21	279.94	290.14	[illegible]	879.2	1458.0	145.1	-145.1	1024.3	1024.3	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
23/09/17	2.5	7.29	279.94	287.23	[illegible]	423.2	1458.0	143.6	-143.6	566.9	566.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
24/09/17	2.4	7.00	279.94	286.93	[illegible]	0.0	729.0	71.7	-215.2	179.9	179.9	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
25/09/17	3.8	11.08	279.94	291.02	[illegible]	1144.7	1458.0	145.5	-145.5	1290.2	1290.2	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			
26/09/17	2.6	7.58	279.94	287.52	[illegible]	0.0	729.0	71.9	-215.6	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]			

Date	Rainfall (mm)	Roof Catchment: Stormwater Catchment	Roof Catchment: Catchment Area (m²)	Roof Catchment: Runoff Coefficient	Absorption and wetting: Loss associated with absorption and wetting (mm)	Absorption and wetting: Applied rainfall after loss (absorption and wetting)	Absorption and wetting: Runoff volume (m³)	Rainfall (mm)	Stormwater Catchment: Stormwater Catchment	Stormwater Catchment: Catchment Area (m²)	Stormwater Catchment: Runoff Coefficient	Absorption and wetting: associated with absorption and wetting (mm)	Absorption and wetting: Applied rainfall after loss (absorption and wetting)	Absorption and wetting: Runoff volume (m³)	[illegible]
29/01/18	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
30/01/18	0	1	15924	0.95	2	0	0.0	0	1	73599.2	0.8	2	0	0.0	0.0
31/01/18	0.2	1	15924	0.95	2	0	0.0	0.2	1	73599.2	0.8	2	0	0.0	0.0

Date	Losses: Loss - evaporation (mm)	Losses: Pond loss evaporation (m³)	Losses: Infiltration (m³/day)	Losses: Total Pond Loss (m³/day)	Volume at start of period (m³)	Vol at end - corrected for zero (no negatives)	Pond surface area for loss calc	Adjusted total loss (m3/day)	Loss correction applied (m3/day)	Volume at end (corrected losses) (m3/day)	Volume at end (Corrected for max level) (m3/day)	Demand: Required process water (m3/day)	Abstraction: Vol abstracted (m³)	Abstraction: Pond Vol after abstraction (m³)	Max pond capacity (m³)	Overflow (m³)	Overflow flag	Pond Empty flag	Pond surface area (m²)	Pond Volume (m³)	Storage volume
29/01/18	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
30/01/18	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			
31/01/18	1.7	4.96	279.94	284.89	0	0.0	729.0	71.2	-213.7	0.0	0.0	318.7	[illegible]	[illegible]	[illegible]	0.0	0	1			

Please note: in January 2018 there was a large storm event (equivalent to approximately 1% AEP or 2% AEP). This is an uncommon rainfall event. In order to have the water balance simulating a more 'average' year for prediction purposes, the rainfall from the day the storm event occurred was removed from the model and replaced with a more typical rainfall reading for that time of year.

Appendix 10 Manufacturing Basin Sizing

Basin Size Options:							Harvesting Results:		Overflow Results:			Basin Results:	
	Base width (m)	Top of basin width (m)	Depth (m)	Side slopes (1:x)	Volume (m3)	Area at TWL (m2)	Volume able to be reused in process (m3)	As a percentage of tota process usage	Average number of days overflowing	Volume overflowing per year (m3)	% reduction in runoff to Cardup compared to if	Days empty per year	% of year empty
Option 1	10	34.0	2	6	1064	1156	17318	14.9%	14.2	41080	75%	296	81%
Option 2	20	44.0	2	6	2144	1936	17149	14.7%	4.2	5142	91%	298	82%
Option 3	30	54.0	2	6	3624	2916	16612	14.3%	1	2056	96%	299	82%
Option 4	40	64.0	2	6	5504	4096	16031	13.8%	0.4	857	98%	302	83%
Option 5	60	104	2	6	17024	10816	13264	11.4%	0	0	100%	316	87%

Recommended

Appendix 11 Flood Modelling Log

COTERRA
ENVIRONMENT

HYDROLOGICAL INPUT DATA AND KEY ASSUMPTIONS

Job Number: MGACAR02
Job Name: Cardup Flood Modelling

Hydrological Model Component	Input data	Method	Key assumptions	Comments
No hydrological model prepared for the catchment upstream of Cardup. Inflow taken from existing study - Byford Drainage Management Plan (DoW, 2007				

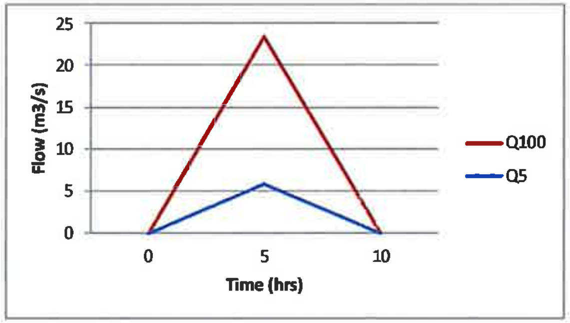
Return Period (X year ARI)	Peak flow (m3/s)
5	5.8
100	23.5

Q5

Time (hrs)	Flow (m3/s)
0	0
5	5.8
10	0

Q100

Time (hrs)	Flow (m3/s)
0	0
5	23.5
10	0



COTERRA ENVIRONMENT

HYDRAULIC INPUT DATA AND KEY ASSUMPTIONS

Job Number: MGACAR02
Job Name: Cardup Flood Modelling

Hydraulic Model Component	Input data [date / source]	Method	Key assumptions	Comments
Background Image	Aerial Photography (Perth Metropolitan Area Central, ecw, Best, 0.15, GDA94, MGA50) - Metadata.txt [Landgate / 22.04.2013]		Accurately reflects current land shape and use. Georeferenced accurately.	
Channel and floodplain topography	LiDAR data supplied in ESRI raster format [Department of Water / 12.04.13]	Converted into xyz data for upload into XPSWMM. Used to generated all cross-sections and node elevations upstream of South Western Hwy.	LiDAR accurate to specification. Conversion process is accurate.	Channel and floodplain highly vegetated. Channel poorly represented - channel capacity under-estimated.
	1m contour data in Perth Groundwater Atlas [Department of Water / accessed 22.04.2013]	Manual inspection and conversion to cross-sections downstream of South Western Hwy.	Linear interpolation between 1m contour provides a reasonable representation of cross-section.	This method only used downstream of the study area.
	Site observations and measurements [Coterra Staff / 23.04.2013]	Engineering judgement. Ground-truth lidar.		
Structure details	Site observations and measurements [Coterra Staff / 23.04.2013]	Engineering judgement and measuring stave. Estimate structure sizing.		
Mannings 'n' values	Site observations [Coterra Staff / 23.04.2013]	Reference to standard engineering texts (i.e. Chow). Roughness not modelled as varying with depth.		
	2D digitised from aerial photography [Landgate / 22.04.2013]	Manual digitisation. Mannings values from standard literature (i.e. Chow)	Aerial photography accurately reflects existing surface features and cover	
Downstream boundary		Located at CAR01. Model generated as Type 1 Free Outfall. Use minimum of critical or normal depth.	No backwater effects.	Located <30m downstream of study area and downstream of South Western Highway culvert so no issue with downstream boundary affecting model results within study area.
Hydrological inflows	Q5 and Q100 peak flows generated in Byford Townsite Drainage and Water Management Plan [Department of Water, 2008]	Triangular hydrograph used to represent inflow.	System conveyance driven.	Sensitivity testing undertaken. Duration has minimal impact on results.

COTERRA ENVIRONMENT

STRUCTURE DETAILS

Job Number: MGACAR02
Job Name: Cardup Flood Modelling

Link Name	Location	Physical Description	Special Conduit Factors	Q100 Head Loss	Sensitivity	Other Comments	Photo
Link02.03	Culverts under South Western Highway	3 x circular concrete culverts, 1.2m diameter. 45 deg concrete wingwalls.	0.5 entry / 1.0 exit			Road level approx 61mAHD (DoW, 2013) ~6m above channel bed. No weir included for over-topping of road.	
Link13.14	Culvert under Main Pit Road	2 x circular concrete culvert. 1.2m diameter. 45 deg wingwall.	0.5 entry / 1.0 exit			Channel invert 67mAHD is 2.5m below road level (65.5mAHD). Site visit indicated that it should be more like 3.5m below. Channel poorly represented in LiDAR data. Flood estimate will be conservative.	
	Over-topping of road	Flat weir - 50m wide.	1.7 weir coefficient used.			Default weir coefficient.	
Link19.20	Culvert under secondary pit road	2 x circular concrete culvert. 1m diameter. 45 deg wingwall.	0.5 entry / 1.0 exit			Road level approx. 77.7mAHD from LiDAR. US invert 76.2mAHD (1.5m below top). Should be 2.15m below. Channel bed poorly defined in LiDAR. Flood estimate will be conservative.	
Link24.25	Culvert under driveway road	1x1.2m circular concrete culvert. No wingwalls.	0.5 entry / 1.0 exit			Road level 82.2 in LiDAR. 1.6m measured from top of road to channel bed (~80.6mAHD invert). LiDAR shows invert at 82mAHD. Channel has been missed. Conservative flood estimate.	
	Over-topping of road	User defined weir. Depth extracted from LiDAR data.	1.7 weir coefficient used.			Default weir coefficient.	

COTERRA ENVIRONMENT

MODEL BUILD LOG

Job Number: MGACAR02
Job Name: Cardup Flood Modelling

Software: XPSWMM
Version: 2012 [SP1]

Model version	Amendments to the model	Data Inclusions / removal	Date run	Comments
MGACAR01_100_01	1d network and cross-sections.	Cross-sections from Perth Groundwater Atlas.	12/04/2013	
MGACAR01_100_02	Cross-sections, downstream boundary, inflow.	Channel orientation and cross-sections from LiDAR data. Downstream boundary self-generated. Inflow from Byford Study (DoW, 2007) with assumed 10hr duration.	22/04/2013	Weir over driveway road not being read by model.
MGACAR01_100_03	Cross-sections and 1d network.	Cross-sections widened. Weir over driveway road converted to natural channel cross-section for the purpose of model build.	29/04/2013	Road overtopping will need to be converted back to weir.
MGACAR01_100_04	Changed overtopping across driveway to weir.	Depth/width table calculated from LiDAR.	29/04/2013	Unstable around main pit road.
MGACAR01_100_05	Added weir over main pit road.	Elevation taken from LiDAR.	29/04/2013	Slight instability in channel upstream of South Western Hwy.
MGACAR01_100_06	Check and amend structure details and losses.	Adjust weirs.	29/04/2013	Head loss across driveway ~1m. Head loss across secondary pit road ~1m. Head loss across main pit road ~1.8m. Head loss across SW Hwy ~3.7m.
MGACAR01_100F_1D_01	Amend naming convention to reflect additional scenarios to be undertaken. Run sensitivity analysis for inflow hydrograph duration	Inflow hydrographs adjusted to reflect sensitivity analysis.	16/05/2013	Most of the model is not sensitive to hydrograph duration (conveyance-driven system). Reach immediately upstream of South Western Highway is most sensitive as the culvert under the road constricts flow.
MGACAR01_100F_1D_06	Minor amendments to model during self checking. Channel inverts predominantly.	Review of LiDAR, aerial photos and site observations to most accurately define model.	16/05/2013	Concern that 1D mapping technique may be over-estimating flood extent as it does not conserve volume.
MGACAR01_100F_1D_07	Lowered channel inverts to that used in 2D model		22/05/2013	Flood results reduced to similar extents as 2D model. It is likely that with additional survey the flood model would reduce even more. Channel inverts were estimated, so to be conservative the previous model will be taken forward.
MGACAR01_5F_1D_06	Same as MGACAR02_100F_1D_06 except 5 year ARI hydrology	Peak flow lowered to 5.8m3/s as per Byford Drainage Study	23/05/2013	Still floods around small bridge at eastern side of brickworks
MGACAR01_5F_1D_07	Same as MGACAR02_100F_1D_07 except 5 year ARI hydrology	Peak flow lowered to 5.8m3/s as per Byford Drainage Study	23/05/2013	Still floods around small bridge at eastern side of brickworks
MGACAR01_100F_1D2D_01	Amend naming convention to reflect 2D element. Addition of 2D element in eastern portion of brickworks where substantial 2D flow was observed.	5m grid added. 2D landuse, 1D/2D connections, null cells generated from analysis of DTM, aerial photo and 1D only model results.	17/05/2013	Flood extent slightly larger than 1d only results. Proceed with 1D/2D model as it provides a more accurate result and is more conservative in this instance.
MGACAR01_100F_1D2D_02	Minor amendments to model parameters and setup to reflect self-QA. Sensitivity testing of structure losses. Add WLLs. Add flag to link 1d nodes to 2d. Lower node spill crest to ground level.	Structure losses increased to 0.6 entrance, and reduced to 0.9 exit.	22/05/2013	Model not sensitive to structure losses. Flood results reduced to similar to those in 1D.
MGACAR01_100F_1D2D_04	Remove 1d element upstream and downstream of development. Move hydrological inflow to CAR024. Move downstream boundary to CAR017.		22/05/2013	Final 1D2D model. However not used as some channel inverts had been lowered for model stabilisation. It is likely that they are more accurate than 1D but require survey to confirm. On this basis and to be conservative at this stage of planning, use MGACAR02_100F_1D_06
MGACAR01_100F_1D_08 MGACAR01_005F_1D_08	Lowered channel inverts upstream of brickworks to reflect site observations (CAR019 to CAR024) - to reduce slopes adjacent to site.		27/05/2013	**FINAL MODEL RESULTS** Flood results are more sensible. No flooding in Q5 as expected. Still flooding in southern corner of brickworks site during Q100.

landinsights
PLANNING DESIGN ENVIRONMENT

DUST MANAGEMENT PLAN

CARDUP BRICKWORKS

PREPARED FOR AUSTRAL BRICKS (WA) PTY LTD

OCTOBER 2020

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Sep-20	831 Cardup Factory Dust Management Plan Rev1a	SR	Initial Draft	Sep-20
Oct-20	831 Cardup Factory Dust Management Plan Rev1c	SR	Final	Oct-20

Table of Contents

Appendices

1 Introduction

1.1 Background

Austral Bricks (WA) Pty Ltd operate a brick-making factory and maintain a decommissioned clay extraction operation in Cardup, WA. The factory is located on Lots 10, 12, 30, 50 and 53 Kiln Road, Byford. The decommissioned clay extraction operation is located on Lots 7, 50 and 101 Kiln Road, Byford.

Dust is comprised of solid airborne particles that are dispersed into the air from soil disturbance. Within the context of the Austral Bricks Cardup operations, dust could potentially be caused by activities such as traffic moving along gravel access tracks and into/out of the site, crushing of material and movement of clay from stockpiles.

This Dust Management Plan outlines the appropriate procedures implemented by Austral Bricks to manage any potential dust nuisance from the site.

1.2 Objectives

The objectives of the Dust Management Plan are to:

- manage the potential for dust generation
- ensure any dust does not disperse past the site boundary

2 Site description

2.1 Site Use

Clay extraction occurred in the northern portion of the site and was essentially completed around 5 years ago. Rehabilitation has occurred over portions of the decommissioned pit and the remainder is used for stormwater management and drainage.

The brickworks manufacturing plant is located on the southern boundary of the site adjacent to Kiln Road. The earlier plant was located towards the eastern end of the property, with expansions to the west containing newer equipment to be constructed. The site is also used for the storage of bricks and masonry products and this will continue into the foreseeable future.

There are plans to redevelop the brickmaking facility with upgraded equipment. In summary, the redevelopment includes:

- Expanding the current factory footprint (including internal equipment replacement)
- Upgraded baghouse scrubber
- New hopper and conveyor
- New primary crusher
- Clay storage area located in existing unused pit area
- Internal road upgrades, including widening of creek crossings
- Rearrangement of storage areas
- Clearing of a small area of vegetation to facilitate the development

The site entrance is from Kiln Road at the south-west corner of the site. As part of the redevelopment it is proposed that this access track will be sealed up to the clay shed. This is to reduce the potential for dust generation from trucks moving along unsealed tracks. Other access tracks ('haul roads') are located from the clay shed further into the site and around the clay stockpiles.

The kilns are located in the buildings at the south-western side of the property. The clay storage shed is to the northern side of Cardup Brook. As part of the redevelopment it is proposed to construct a new crusher located to the north-east of the clay shed. The clay stockpiles are located within the decommissed pit.

Bush Forever Site 271 covers a portion of Cardup Brook, and extends along the western boundary of the site. In total, the Bush Forever site covers around 35 hectares of remnant bushland, of which approximately 75% is on the site.

2.2 Surrounding land uses

The site was historically in a rural area, however over the last 10-15 years Byford has become more urbanised. Apart from Byford, the surrounding land uses are largely rural in nature. The land to the east rises sharply to the Darling Scarp, while to the south are several land parcels owned by Austral Bricks, some of which are currently used for clay extraction.

2.3 Separation distances

The closest sensitive land uses (residential homes) are shown on the plan at Appendix B. The five closest homes located around the brickmaking factory are shown on the plan. There are also four dwellings owned by Austral Bricks on properties around the factory. The separation distances from the brickmaking factory, as well as the decommissioned clay pit are discussed below.

Separation distances to the existing and proposed factory

- The closest occupied residence (H3) is approximately 422m to the north-west of the proposed factory. The same residence is approximately 335m from the main haul road into the site.
- To the south, the closest occupied residence (H5) is approximately 455m from the site boundary and 520m from the factory.
- The closest occupied residence to the east (H4) is approximately 807m from the proposed location of the new crusher.

- The closest dwelling owned by Austral Bricks is approximately 213m to the west of the proposed factory.

Separation distances to the decommissioned clay pit

- The closest occupied residence to the access track around the perimeter of the decommissioned pit is approximately 360m to the west. The new proposed residential lots will be approximately 180m from the same internal access track.
- To the east, the nearest occupied residence is approximately 310m from the decommissioned pit.
- The nearest occupied residence to the north is approximately 270m from the decommissioned pit.

2.4 Topography and landform

The topography of the site is variable owing to the previous excavations within thc northern part of the site. In general, the decommissioned excavation part of the site is at a lower elevation than the surrounding land to the west, east and north. Similarly, land to the east and south of the factory rises in elevation.

The land on which the factory sits at the southern end of the site is relatively flat at approximately 75-80 metres Australian Height Datum (AHD).

Cardup Brook flows from east to west from approximately 80 metres AHD to 65 metres AHD on the northern side of the factory and south of the decommissioned excavation area and the location of the new crusher.

The highest part of the property is on the eastern side of the previous excavation area. The terrain in this section rises to approximately 125 metres AHD. The excavated floor of the excavation area is approximately 80 metres AHD and the land rises again to the west and to the north to approximately 110 metres AHD.

2.5 Geology and soils

Geological information has been mapped by the Department of Mines, Industry Regulation and Safety (DMIRS). The State interpreted bedrock geology is 'Cardup Group (P_-CD-s)' which is described as '*Predominantly white to black shale with bands of conglomerate, quartz sandstone, and sandstone.* The surface geology identified by the 500 metres grid Regolith Map of WA (DMIRS 2019) as '*exposed rock, saprolite and saprock*'.

The soil-landscape units across the site are listed in the table below.

Table 2.1 – Soil-landscape Units

CODE	NAME	DESCRIPTION	SOIL TYPES	LOCATION
213Fo_F4	Forrestfield F4 Phase	Incised stream channels within gentle slopes with deep acidic yellow duplex soils and sandy alluvial gradational brown earths.	• Semi-wet soil • Yellow/brown shallow sandy duplex • Duplex sandy gravel	Cardup Brook (Lot 50).
213Fo_Ff2	Forrestfield (D Range) F2 Phase	Foot and low slopes < 10%. Well drained gravelly yellow or brown duplex soils with sandy topsoil. Woodland of E.marginata, E. calophylla and some B.grandis	• Yellow/brown deep sandy duplex • Acid shallow duplex • Duplex sandy gravel	Factory at the southern end of the site (Lots 50, 12 and 53).
213Fo_Ff3	Forrestfield (D Range) F3 Phase	Foot and low slopes <10%. Well drained gravelly yellow or red duplex soils with sandy loam to loam topsoil. Woodland of E. wandoo and E. marginata.	• Duplex sandy gravel • Yellow/brown shallow loamy duplex • Loamy gravel • Duplex sandy gravel	Eastern side of the site (Lot 50) and western side of the pit area.
213FoX_MINE	Forrestfield disturbed mine land	Mine. Disturbed land.	Disturbed land.	South-east corner of the factory (Lot 30) and the central section of the site associated with the pit area (Lot 50).
213FoX_URBAN	Forrestfield disturbed land, urban phase	Urban	Disturbed land.	Bush Forever site (Lot 101).

Source: DPIRD, 2019

Soil qualities (wind and water erosion, land instability etc.) are provided in the table below for each soil-landscape unit.

Table 2.2 – Soil Qualities

SOIL-LANDSCAPE UNIT	LAND INSTABILITY	WIND EROSION	WATER EROSION	FLOOD	WATERLOGGING
213Fo_F4	Low risk	Moderate risk	High risk	High risk	High risk
213Fo_Ff2	Low risk	Low risk	Low risk	Low risk	Low risk
213Fo_Ff3	Low risk	High risk	Low risk	Low risk	Low risk
213FoX_MINE	Low risk	Low risk	Low risk	Low risk	Low risk
213FoX_URBAN	Low risk	Low risk	Low risk	Low risk	Low risk

Source: DPIRD, 2019

A wind erosion study was undertaken by Ramboll (2019) to provide a more detailed review of the nature of soil, in particular clay soil, and the ability to form dust. This report provides a better understanding of the nature of clay soils and the wind erosion risk potential, particularly when the site is non-operational and soil is not being actively disturbed. A copy of the report is provided at Appendix A. While it should be noted that this report was prepared for an Austral Bricks quarry in Upper Swan, the discussions and conclusions about the wind erosion potential of clay soils also applies to this site.

The report states that '*despite clay composing of smaller particles as compared with sand or loam, clay-rich soil has the capacity to clump together forming soil clods, which form aggregates large and heavy enough to resist wind erosion'*. It also points out that the DPIRD recommends spreading clay-rich soils to control wind erosion.

When not disturbed, moisture in the soil can turn surface aggregates into crusts. Clay soils are particularly prone to soil crusting. This natural crusting binds the erodible material, producing a sealed surface that requires much higher wind speeds for particle dislodgment. A crusted surface has a finite availability of erodible material that once removed means that wind erosion from that source is likely to be negligible until a disturbance significant enough to generate new erodible material occurs (Ramboll, 2019).

The report concludes that '*an undisturbed clay pit has a very low wind erosion potential. Wind erosion of an undisturbed clay pit with no operations is unlikely to present a significant risk of generating nuisance dust at nearby receptors'.*

2.6 Vegetation and fauna

The site is partially vegetated and some parts of the decommissioned pits have been rehabilitated over the years.

Bush Forever number 271 is located on Lot 101, to the west of the decommissioned pits and brickworks. The Bush Forever site is located between the site and the Byford residential area.

Remnant vegetation is located at the northern end of the decommissioned pits and regrowth and rehabilitation is located at the eastern side. The brickworks is surrounded by screening vegetation to the south, east and west and the Cardup Brook (located in-between the brickworks and decommissioned pits) is vegetated.

3 Impact Analysis and Risk Assessment

3.1 Introduction

The purpose of the impact analysis and risk assessment is to identify where the potential for dust generation exists and how the impact can be reduced. The risk assessment considers the potential for dust generation for the different types of activities that might generate dust. It determines the risk for impact without management and the revised risk with management as proposed in this Plan.

The impact analysis and risk assessment has been prepared in accordance with the following policies:

- *Guidelines for Managing the Impacts of Dust and Associated Contaminants from land Development Sites, Contaminated Sites, Remediation and Other Related Activities* (Department of Environment and Conservation, 2011)
- *Guidance Statement: Risk Assessments* (Department of Environment Regulation, 2017).

It should be noted that the *Guidelines for Managing the Impacts of Dust and Associated Contaminants from land Development Sites, Contaminated Sites, Remediation and Other Related Activities* (Department of Environment and Conservation, 2011) are not specific to extractive industries or the brickmaking operation. The impact analysis and suggested management are more suited to a construction site and not applicable to extractive industries. Therefore, the Guidelines have only been used where relevant for the site. To complement this and to provide additional information, the risk assessment as provided in *Guidance Statement: Risk Assessments* (Department of Environment Regulation, 2017) has been used for this Management Plan.

3.2 Site Conditions

The physical characteristics of the site are described in Chapter 2. Some of the key points that relate to the Dust Management Plan are outlined below:

- Separation distances are described in Chapter 2.3 and shown on the plan at Appendix B.
- The 'Clay Pit Wind Erosion Study' (Ramboll, 2019) describes clay-rich soil as having low wind erosion risk potential.
- The local area experiences a Mediterranean climate which experiences cool, wet winters and hot dry summer. A majority of rain occurs in the Winter months (May-August) and summer months can be typically dry. The area is known to experience katabatic winds which come off the Darling Scarp, blowing in a westerly direction.
- The decommissioned pit is surrounded by vegetation (and Bush Forever Site) to the west and north. Portions of the decommissioned pit have been revegetated and regrowth is also forming. The Cardup Brook, which runs to the north of the factory, is vegetated. The remainder of the factory to the south, west and east is surrounded by perimeter vegetation.
- The topography of the site is variable, in general the land slopes up to the east (up the Darling Scarp), slopes down to the north and west.

The 'Clay Pit Wind Erosion Study' (Ramboll, 2019) states that clay soils are particularly prone to 'soil crusting' which is when moisture in the soil turns surface aggregates into crusts. This natural crusting binds the erodible material, producing a sealed surface that requires much higher wind speeds for particle dislodgment. Clay-rich soil with relatively high moisture content is very prone to crusting. A crusted surface has a finite availability of erodible material that once removed means that wind erosion from that source is likely to be negligible until a disturbance significant enough to generate new erodible material occurs.

3.3 Impact analysis and risk assessment

Site features and characteristics

The plans at Appendix B display the features of the site and the operation such as:

- Aerial photo
- Topography
- Surrounding land uses
- Cadastre (property boundaries)

- Access tracks, roads and site entrance/exit
- Existing and proposed development
- Surrounding natural features such as vegetation and watercourses.

Risk Assessment

As is explained above, the risk assessment is based on *Guidance Statement: Risk Assessments* (Department of Environment Regulation, 2017) with integration of relevant components from *Guidelines for Managing the Impacts of Dust and Associated Contaminants from land Development Sites, Contaminated Sites, Remediation and Other Related Activities* (Department of Environment and Conservation, 2011). It is considered that this will result in a more comprehensive assessment of the potential impacts and risks.

Dust management is summarised in the risk matrix below. The matrix is based on the criteria in *Guidance Statement: Risk Assessments (2017).* It lists the activity(s) which have the potential to cause dust impact, the unmanaged risk and the managed risk. The 'risk' is determined by considering the likelihood and consequence of the environmental impact. The likelihood and consequence criteria are defined in Tables 3.3 and 3.4.

The purpose of the risk assessment is to demonstrate that risk identified as 'medium' or 'high' can be effectively managed.

Table 3.1 – Risk Matrix

ITEM	ACTIVITY	POTENTIAL IMPACT	UNMANAGED RISK			MANAGEMENT OR CONTROL METHODS	MANAGED RISK		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
1	Vehicle and truck movements entering and exiting the site.	Dust and mud on the road (Kiln Road). When dry, the mud and dust on the road can be disturbed and dispersed into the air when vehicles drive over.	Possible	Minor	Med	• The raw materials exit has been sealed with asphalt to reduce the amount of dust and mud that can be tracked onto Kiln Road. • Sealing and draining of internal vehicle tracks to the clay storage shed. • Vehicles must drive over the cattle grids (to dislodge any loose material) after driving on unsealed areas. • Weather conditions will be monitored by the operator. If conditions are likely to increase risk of dust generation operations should cease until weather permits. • A street sweeper will be used on Kiln Road on a weekly basis as a minimum. • Site Manager to inspect the road each day that the site is operational and trucks are entering/exiting and will run a street sweeper if required. • Continue training programmes on dust control requirements to all workers and contractors.	Unlikely	Slight	Low

ITEM	ACTIVITY	POTENTIAL IMPACT	UNMANAGED RISK			MANAGEMENT OR CONTROL METHODS	MANAGED RISK		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
2	Machinery and vehicle movements on internal access tracks throughout the site.	Dust can be generated by machinery and vehicles driving along gravel and dirt access tracks. Dust particles in the air could move off-site (i.e. outside of the property owned by Austral Bricks).	Possible	Moderate	Med	• Watercarts will be utilised during dry weather conditions to wet down unsealed roads to prevent dust generation. Water for the carts should be obtained from the ponds onsite. Should the ponds run dry, water may be obtained from the Shale Road pit or from the bore located on South Western Highway. • Chemical dust suppressants will be used on unsealed areas if they are planned to be unused for extended periods. • Dustex (or similar) is also used on the haul roads within the site. • Weather conditions will be monitored by the operator. If conditions are likely to increase risk of dust generation operations should cease until weather permits. • Maintain vegetation screening around the perimeter. • Maintain all equipment in good condition. • Continue training programmes on dust control requirements to all workers and contractors.	Unlikely	Slight	Low

ITEM	ACTIVITY	POTENTIAL IMPACT	UNMANAGED RISK			MANAGEMENT OR CONTROL METHODS	MANAGED RISK		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
3	Raw material stockpiling	Dust can be generated by moving raw material (clay) from trucks to the stockpile. Dust particles in the air could potentially move off-site (i.e. outside of the property owned by Austral Bricks).	Possible	Moderate	Med	• A cannon attachment to the watercart will be utilised to wet down stockpiles as required which will form a crust on the surface, preventing dust generation. • The watercart will be available at the stockpile during unloading of raw materials, especially when unloading very dry clay. • Site Manager to review the Bureau of Meteorology forecast regarding wind and temperature on the day prior to this activity and make the judgement decision as to whether to proceed with stockpiling or not at the start of the day. • Site Manager to inspect the stockpiling area on days that movement of raw material takes place to review dust management. • When winds are sufficiently strong to negate the effects of dust management, operations will cease until conditions improve and compliance can be achieved. • Continue training programmes on dust control requirements to all workers and contractors.	Unlikely	Slight	Low

ITEM	ACTIVITY	POTENTIAL IMPACT	UNMANAGED RISK			MANAGEMENT OR CONTROL METHODS	MANAGED RISK		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
4	Clay preparation and processing	Dust can be generated by the processing (crushing) and movement of raw material (clay) at the factory. Dust particles in the air could potentially move off-site (i.e. outside of the property owned by Austral Bricks).	Possible	Moderate	Med	• The existing primary crusher is designed to generate low dust emissions, however if dust generation becomes a cause for concern, water sprays will be fitted to the area and maintained. • The proposed new primary crusher will be enclosed on three sides and located on the pit floor, therefore significantly reducing the potential for dust to be generated on the site. • All conveyors are fitted with conveyor covers. If covers are damaged, they will be replaced as soon as possible and the area will be visually monitored for dust generation. • The clay grinding shed 2 was fully enclosed during the 2017 recommissioning, therefore significantly reducing the potential for dust to be generated on the site. • Clay processing equipment will be inspected by the Maintenance Manager. The Plant Manager has overall responsibility for the functioning of the site. • The watercart must be available at the stockpile during movement of raw materials.	Unlikely	Slight	Low

ITEM	ACTIVITY	POTENTIAL IMPACT	UNMANAGED RISK			MANAGEMENT OR CONTROL METHODS	MANAGED RISK		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
						• Site Manager will review the Bureau of Meteorology forecast regarding wind and temperature on the day prior to this activity and make the judgement decision as to whether to proceed with stockpiling or not at the start of the day. • When winds are sufficiently strong to negate the effects of dust management, operations will cease until conditions improve and compliance can be achieved. • Continue training programmes on dust control requirements to all workers and contractors.			

The risk matrix is defined in the table below.

Table 3.2 – Risk Matrix Ratings

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

Source: DWER 2017

The following criteria has been used to determine the likelihood of the risk occurring.

Table 3.3 – Likelihood Criteria

Likelihood				
Almost certain	Likely	Possible	Unlikely	Rare
The risk event is expected to occur in most circumstances.	The risk event will probably occur in most circumstances.	The risk event could occur at some time.	The risk event will probably not occur in most circumstances.	The risk event may only occur in exceptional circumstances.

Source: DWER 2017

The consequence criteria are described in the table below.

Table 3.4 – Consequence Criteria

Criteria	Consequence				
	Slight	**Minor**	**Moderate**	**Major**	**Severe**
Environment	• On-site impact: minimal (No discernible adverse impact). • Off-site impacts local scale: minimal • Off-site impacts wider scale: not detectable	• On-site impacts: low level (discernible effect on the environment but no adverse impact) • Off-site impacts local scale: minimal • Off-site impacts wider scale: not detectable • Minor number of individuals of species may be affected locally.	• On-site impacts: mid-level (Minor adverse effect to the environment) • Off-site impacts local scale: low level • Off-site impacts wider scale: minimal • Moderate loss of individuals of species locally.	• On-site impacts: high level (moderate impact to the environment) • Off-site impacts local scale: mid-level • Off-site impacts wider scale: low level • Short term impact to an area of high conservation value or special significance^ • Moderate damage to ecosystem function and major loss of individuals of species locally.	• On-site impacts: catastrophic (significant impact to the environment) • Off-site impacts local scale: high level or above • Off-site impacts wider scale: mid-level or above • Mid to long term or permanent impact to an area of high conservation value or special significance^ • Significant long-term damage/loss of ecosystem function and loss of individuals of species locally.
Public Health and Amenity	• Local scale: minimal to amenity.	• Local scale impacts: low level impact to amenity.	• Adverse health effects: low level or occasional medical treatment • Local scale impacts: mid-level impact to amenity.	• Adverse health effects: mid-level or frequent medical treatment • Local scale impacts: high level impact to amenity.	• Loss of life • Adverse health effects: high level or ongoing medical treatment • Local scale impacts: permanent loss of amenity.

Source: DWER 2017

^ Determination of areas of high conservation value or special significance should be informed by the Guidance Statement: Environmental Siting.

* 'onsite' means within the Lot boundary.

Site classification

The site risk assessment/classification has been prepared for the site in accordance with the Department's Guidelines (2011) and has been classified as 'medium risk'. The management measures set out in the Guidelines are more applicable to development sites (rather than extractive industry) and are therefore not relevant to this site, however there are a number of recommendations can be used in this plan such as the following:

- Ensuring that a water cart of not less than 10,000 litres capacity per 7.5ha of disturbed site is available on site when potentially dust-generating activities are occurring.
- Ensure that there is a process to address dust-related complaints
- A notice placed on site with contact details of the site supervisor.

4 Management Plan

4.1 Introduction

The Dust Management Plan aims to describe the measures that will be used by Austral Bricks to reduce the creation and effect of dust. It includes actions relating to dust control measures, corrective procedures and complaints protocol. These actions are described further below. The plan has been prepared in accordance with the *Guidelines for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites, Remediation and Other Related Activities* (Department of Environment and Conservation, 2011).

4.2 Complaints Procedure

The complaints procedure is described below. It is also important that all complaints are recorded. The following activities will be conducted:

- Complaints made to the operator (Austral Bricks) will be documented and dealt with expeditiously
- Complaints will be dealt with by the Plant Manager and the WA Environmental Manager and managed in accordance with Brickworks Safety Health Environment Management System (SHEMS).
- Complaints received either directly from the complainant or via the Shire of Serpentine-Jarrahdale will be reviewed by Austral Bricks and interested parties to assess:
    (i) the legitimacy of the complaint;
    (ii) the aspects of the operation that triggered the complaint;
    (iii) management actions required to address the issues raised to bring operations into line with conditions imposed on the extractive operation by the Shire of Serpentine-Jarrahdale under the Extractive Industries Licence and/or Planning Approval.
- Actions deemed necessary to bring operations into line with relevant legislation, regulation and license conditions will be undertaken immediately and before works are recommenced.

- Summaries of complaints and actions taken to address each specific issue will be recorded in the Complaints Register (See Appendix C).

Complainants and the Shire of Serpentine-Jarrahdale will be notified of the date, time and nature of the complaint received, results of the investigation, remedial actions undertaken and date and time of recommencement of works. If any complaints are received, necessary action will take place to help rectify the issue.

The complaints response is applicable at all times (i.e. not just during site operation) and there will always be a prompt response from Austral Bricks whether onsite or not. Complaints are generally sent to the Shire of Serpentine-Jarrahdale. The Shire will then contact Austral Bricks as required should a complaint be received by them.

It should be noted that this complaints procedure has worked very well for Austral Bricks at numerous other sites in the past.

4.3 Dust Control Measures

Dust control measures are summarised in Table 4.1 below.

Table 4.1 – Dust Management Plan

POTENTIAL IMPACT	MANAGEMENT/ACTION	TIMING
Vehicle and truck movements entering and existing the site.	1. The raw materials exit has been sealed with asphalt to reduce the amount of dust and mud that can be tracked onto Kiln Road.	Ongoing
	2. Vehicles must drive over the cattle grids after driving on unsealed areas.	Ongoing
	3. Weather conditions will be monitored by the operator. If conditions are likely to increase risk of dust generation operations should cease until weather permits.	Ongoing
	4. A street sweeper will be used on Kiln Road on a weekly basis as a minimum.	Ongoing – Weekly

POTENTIAL IMPACT	MANAGEMENT/ACTION	TIMING
	5. Site Manager to inspect the road each day that the site is operational and trucks are entering/exiting and will run a street sweeper if required.	Ongoing – When trucks are on site
	6. Continue training programmes on dust control requirements to all workers and contractors.	Ongoing
Machinery and vehicle movements on internal access tracks throughout the site.	7. Watercarts will be utilised during dry weather conditions to wet down roads to prevent dust generation. Water for the carts should be obtained from the ponds either at the plant or at the Shale Road pit in the first instance. Should the ponds run dry, water may be obtained from the bore located on South Western Highway.	Ongoing – during dry weather conditions.
	8. Chemical dust suppressants will be used on unsealed areas if they are planned to be unused for extended periods.	Ongoing – If roads will be used for extended periods.
	9. Dustex (or similar) is also used on the haul roads within the site.	Ongoing
	10. Weather conditions will be monitored by the operator. If conditions are likely to increase risk of dust generation operations should cease until weather permits.	Ongoing
	11. Maintain internal access roads in good condition.	Ongoing
	12. Maintain vegetation screening around the perimeter of the site.	Ongoing
	13. Maintain all equipment in good condition.	Ongoing
	14. Continue training programmes on dust control requirements to all workers and contractors.	Ongoing
Raw material stockpiling.	15. A cannon attachment to the watercart will be utilised to wet down stockpiles as required which should form a crust on the surface, preventing dust generation.	Ongoing as required.
	16. The watercart must be available at the stockpile during unloading of raw materials, especially when unloading very dry clay.	Ongoing – on days that raw material stockpiling occurs.
	17. Site Manager to review the Bureau of Meteorology forecast regarding wind and temperature on the day prior to this activity and make the judgement decision as to whether to proceed with stockpiling or not at the start of the day.	Ongoing – on days that raw material stockpiling occurs.

POTENTIAL IMPACT	MANAGEMENT/ACTION	TIMING
	18. Site Manager to inspect the stockpiling area on days that movement of raw material takes place to review dust management.	Ongoing – on days that raw material stockpiling occurs.
	19. When winds are sufficiently strong to negate the effects of dust management, operations will cease until conditions improve and compliance can be achieved.	Ongoing
	20. Continue training programmes on dust control requirements to all workers and contractors.	Ongoing
Clay preparation and processing (existing factory)	21. The existing primary crusher is designed to generate low dust emissions, however if dust generation becomes a cause for concern, water sprays will be fitted to the area and maintained.	Ongoing
	22. The proposed new primary crusher will be enclosed on three sides and located on the pit floor, therefore significantly reducing the potential for dust to be generated on the site.	Ongoing
	23. All conveyors are fitted with conveyor covers. If covers are damaged, they will be replaced as soon as possible and the area will be visually monitored for dust generation.	Ongoing
	24. The clay grinding shed 2 was fully enclosed during the 2017 recommissioning, therefore significantly reducing the potential for dust to be generated on the site.	Ongoing
	25. Clay processing equipment will be inspected by the Maintenance Manager. The Plant Manager has overall responsibility for the functioning of the site.	Ongoing – on days that raw material is moved.
	26. The watercart must be available at the stockpile during movement of raw materials.	Ongoing – on days that raw material is moved.
	27. Site Manager will review the Bureau of Meteorology forecast regarding wind and temperature on the day prior to this activity and make the judgement decision as to whether to proceed with stockpiling or not at the start of the day.	Ongoing – On operational days
	28. When winds are sufficiently strong to negate the effects of dust management, operations will cease until conditions improve and compliance can be achieved.	Ongoing
	29. Continue training programs on dust control requirements to all workers and contractors.	Ongoing
General	30. All non-conformances and dust related complaints immediately reported to the Site Manager.	Ongoing
	31. Comply with the 'Complaints Procedure' at all times.	Ongoing

POTENTIAL IMPACT	MANAGEMENT/ACTION	TIMING
	32. Following complaints, the source of any excessive dust will be identified and work practices will be modified or re-scheduled to reduce or eliminate the risk of future events.	Ongoing
	33. A notice should be placed on site with contact details of the site supervisor	Ongoing

APPENDIX A

CLAY PIT WIND EROSION STUDY

RAMBOLL

ENVIRONMENT
& HEALTH

MEMO

Project name	**Clay Pit Wind Erosion Study**
Project no.	**318000871**
Client	**Austral Bricks**
Memo no.	**001**
Version	**Draft**
To	**Matthew Gordon**
From	**Martin Parsons**
Prepared by	**Nathalie Fischer**
Checked by	**Martin Parsons**
Approved by	**John Miragliotta**

Date 04/12/2019

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1 Introduction

Austral Bricks WA Pty Ltd (Austral Bricks) has requested Ramboll Australia Pty Ltd (Ramboll) assess the risks associated with wind erosion of an undisturbed clay pit located in Upper Swan, WA. Clay for brick production is planned to be extracted from the pit for approximately two weeks a year, when a dust management plan will be in place. For the remainder of the year, there will be no operations and the pit is planned to be kept undisturbed.

2 Soil Characterisation

Clay is a natural material formed by the mechanical and chemical breakdown of rocks (US EPA 1995a). The percentage of clay, silt and sand present in soil determines its texture. Table 1 presents a summarised list of soil classification by texture class as outlined in the Unified Soil Classification System (USCS). Soil stability is directly related to the fineness of texture, i.e., it is clay content dependent (Chepil 1957).

Table 1 Soil textures and composition (Carlile et al. 2001)

Texture Class	Mean % Sand	Mean % Silt	Mean % Clay
Sands	86.8	6.1	7.2
Sandy loams	68.3	13.2	18.5
Loams	51.5	28.1	20.3
Clay loams	27.5	34.1	38.4
Light clays	44.6	13.1	42.3
Clays	21.4	15.7	62.9

3 Wind Erosion

Fugitive dust is the term used for atmospheric dust generated by mechanical disturbance of granular material on exposed surfaces. Turbulent air currents associated with wind speeds of over 4 to 5 m/s are often able to generate

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

RAMBOLL

fugitive dust from soil surfaces, and this process is called wind erosion (US EPA 1995b).

Erodibility of soil by wind occurs in dry conditions and depend primarily on the soil structure and its stability (Chepil 1957). Soil particles are transported by wind in three ways:

- Suspension: small sized particles (< 100 µm) become airborne and depending on the wind speed can travel many kilometres before deposition,
- Saltation: middle sized particles (100–500 µm) bounce on the surface travelling some meters,
- Surface creep: larger particles (500–2,000 µm) roll and slide across the surface, moving no more than a few meters (DERM 2011, Chepil 1957, NRETA 2007).

Particles with an equivalent diameter of 100 µm are the most erodible by wind as compared to larger or smaller ones. Particles larger than 10,000 µm are considered non-erodible. Despite clay composing of smaller particles as compared with sane or loam, clay-rich soil has the capacity to clump together forming soil clods, which form aggregates large and heavy enough to resist wind erosion. Sand-rich soils, with low silt, clay, and organic-matter content, are the most susceptible to erosion as they form the weakest clods (DERM 2011, Burton 2004).

Several Australian states and territories departments have published documents encouraging clay spreading and mixing into sandy topsoils to increase soil aggregation and mitigate wind erosion (Young et al. 2017, DPIPWE 2014). The Agriculture and Food division of the WA Department of Primary Industries and Regional Development states that, the spreading of clay-rich soil at about 75-100 tonnes per hectare is recommended to control wind erosion (DPIRD 2019). A study conducted in South Australia showed that clay spreading on very sandy post-fire soils presented immediate results in the form of reduced wind erosion (DEW 2019).

When not disturbed, moisture in the soil can turn surface aggregates into crusts. Clay soils, especially the ones rich in magnesium and/or sodium, are particularly prone to soil crusting. This natural crusting binds the erodible material, producing a sealed surface that requires much higher wind speeds for particle dislodgment. Clay-rich soil with relatively high MC is very prone to crusting. Typically, the moisture content (MC) of raw material used in the brick manufacturing varies from 3 to 15%. When MC is greater than 10%, particulate matter (PM) emissions during grinding and screening operations are low, and some industries use no control measures for dust suppression (US EPA 1997).

A crusted surface has a finite availability of erodible material that once removed means that wind erosion from that source is likely to be negligible until a disturbance significant enough to generate new erodible material occurs. Dust monitoring of stockpiles and exposed areas conducted during erosion events have shown a rapid decrease of particulate emission rates, with recorded half-life of a few minutes (US EPA 2006).

4 Conclusion

Due to factors outlined above, an undisturbed clay pit has a very low wind erosion potential. Wind erosion of an undisturbed clay pit with no operations is unlikely to present a significant risk of generating nuisance dust at nearby receptors.

5 References

Burton, T 2004, Indiana Soils: Evaluation and Conservation Online Manual, Chapter Vi. Soil Erosion and Compaction, Purdue University, Purdue Agronomy: Crop, Soil and Environmental Sciences, viewed 3 December 2019, <https://www.agry.purdue.edu/soils_judging/new_manual/ch6-wind.html>.

Carlile, P et al. 2001, Estimating soil particle size distributions and percent sand, silt and clay for six texture classes using the Australian Soil Resource Information System point database, CSIRO Land and Water, Canberra, ACT.

Chepil, WS 1957, 'Erosion of Soil by Wind', Yearbook of Agriculture, pp. 308–314.

DERM 2011, Wind Erosion, Department of Environment and Resource Management, Queensland Government, <https://www.qld.gov.au/__data/assets/pdf_file/0021/65217/wind-erosion.pdf>.

DEW 2019, Study shows clay protects post-fire soils, Natural Resources Adelaide and Mt Lofty Ranges , Department for Environment and Water, Government of South Australia, viewed 4 December 2019, <https://www.naturalresources.sa.gov.au/adelaidemtloftyranges/news/190826-clay-spreading-protects-post-fire-soils-pinery>.

DPIPWE 2014, Wind Erosion, Department of Primary Industries, Parks, Water and Environment, Tasmanian Government, viewed 3 December 2019, <https://dpipwe.tas.gov.au/agriculture/land-management-and-soils/soil-management/soil-erosion/soil-erosion-types/wind-erosion>.

DPIRD 2019, Managing wind erosion in southern Western Australia, Department of Primary Industries and Regional Development: Agriculture and Food, Government of Western Australia, viewed 4 December 2019, <https://www.agric.wa.gov.au/wind-erosion/managing-wind-erosion-southern-western-australia>.

GRDC 2011, Spread, delve, spade, invert: a best practice guide to the addition of clay to sandy soils, Grains Research and Development Corporation and Agricultural Bureau of South Australia, Kingston, ACT.

NRETA 2007, Erosion and Sediment Control Guidelines: Built Environment, Department of Natural Resources, Environment and the Arts, Northern Territory Government, Darwin.

US EPA 1995a,'Chapter 11.25 Clay Processing', in, AP-42: Compilation of Air Emissions Factors.

US EPA 1995b,'Chapter 13.2 Introduction to Fugitive Dust Sources', in, AP-42: Compilation of Air Emissions Factors.

US EPA 1997,'Chapter 11.3 Bricks and Related Clay Products', in, AP-42: Compilation of Air Emissions Factors.

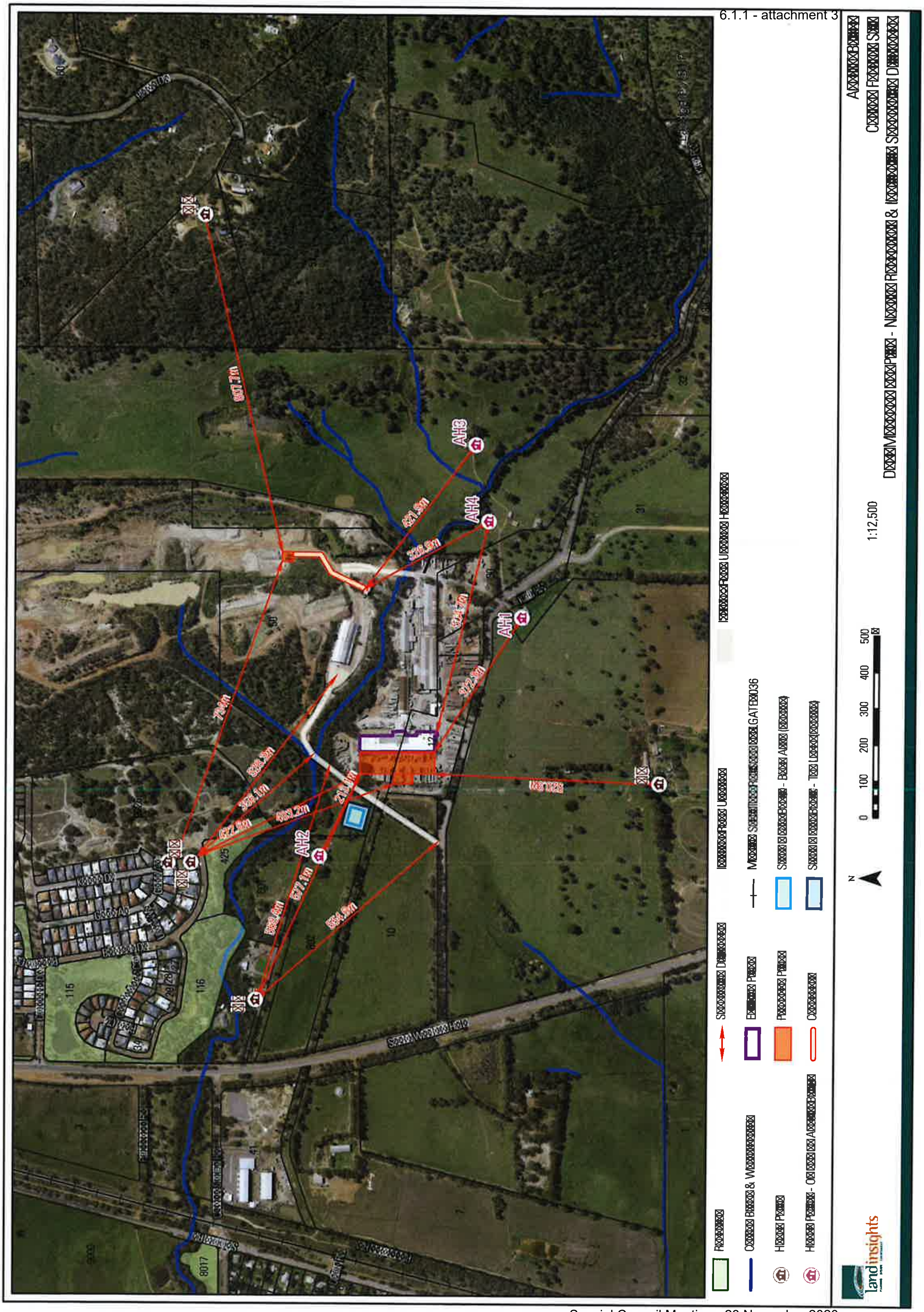
US EPA 2006,'Chapter 13.2.5 Industrial Wind Erosion', in, AP-42: Compilation of Air Emissions Factors.

USDA 2008, Soil Quality Indicators, United States Department of Agriculture, Natural Resources Conservation Service.

Young, M-A et al. 2017, Emergency measures to curb wind erosion, Primary Industries and Regions South Australia (PIRSA).

APPENDIX B

PLANS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APPENDIX C

COMPLAINTS REGISTER

ENVIRONMENTAL COMPLAINTS FORM – Complaint No XX

PLAINTIFF:	**POSITION:**
COMPANY	**ADDRESS**
PHONE NO:	**MOBILE NO:**
DATE:	**TIME:**
PLANT:	**KILN SPEED:**
WIND SPEED:	**WIND DIR:**
PRODUCT IN DRYER:	**PRODUCT IN KILN:**
EXTERNAL TEMP:	

COMPLAINT

INVESTIGATION

OUTCOMES & RECOMMENDATIONS

Harper Street, Caversham, WA, 6055
Telephone: (08) 9261 9999
Facsimile: (08) 9279 6566

59650 M001 Austral Cardup Brickworks JDAP RevB

Name:	Tanya Gilders	Date:	28 October 2020
Company:	Austral Bricks	Job/Doc. No.:	59650/133,493
Email:	Tanya.Gilders@australbricks.com.au	Inquiries:	Peter Forster

Austral Cardup Brickworks expansion development application
Responses to Responsible Authority Report

1. Background

Austral Bricks (Austral) has submitted a Development Application to the Metro Outer Joint Development Assessment Panel (JDAP) on 29 November 2019 for an expansion of the Cardup Brickworks (DAP/19/01712). In its Responsible Authority Report, the Shire of Serpentine Jarrahdale recommended refusing the application on the basis that the potential impacts (of the proposal) had not been clearly demonstrated. Specific reasons for refusal were indicated as:

1. Insufficient information has been provided to adequately demonstrate that the proposal will not adversely impact the current and intended future amenity of the locality, specifically in respect of amenity impacts associated with dust and air emissions.

2. Insufficient information has been provided to adequately demonstrate that the proposal will not adversely impact the environment, specifically being Cardup Brook, the associated riparian vegetation and the quality of groundwater.

3. The subject land is designated to be zoned 'Rural' under the Council adopted proposed Local Planning Scheme No. 3. This represents a serious document likely to be adopted, to which regard must be given. The proposal represents a non-conforming use under the 'Rural' zone of the land in the new Scheme. While the new Scheme contains a provision at Clause 23(1)(a) that enables a merits based assessment to be performed to consider an extension of a non-conforming use, there is no precise manner of use intensity or extension prescribed in the new Scheme. Therefore, taking into account Reasons 1 and 2, an extension of a non-conforming use which this proposal would represent under the new Scheme, is not consistent with orderly and proper planning.

Austral has asked Strategen-JBS&G to review the comments made by the Authorising Officer in the Responsible Authority Report in relation to Reason 1 (air quality impacts on amenity). This memo describes the findings from a review of those comments to support a submission from Austral to the Metro Outer JDAP.

2. Review of comments on air quality impacts

The relevant comments on air quality and related amenity matters have been extracted from the Responsible Authority Report (*Document 10.1.4 – attachment 1 of Ordinary Council Meeting minutes, 17 August 2020*) and summarised in Table 2.1. Responses to the comments are provided for each comment listed.

Table 2.1: Responses to air quality and related amenity comments in Responsible Authority Report

Responsible Authority Report reference	Authorising Officer comment/conclusion	Response
Officer recommendation: Item 1, Reason 1 (page 1)	Insufficient information has been provided to adequately demonstrate that the proposal will not adversely impact the current and intended future amenity of the locality, specifically in respect of amenity impacts associated with dust and air emissions	Adequate information has been presented to demonstrate that the maximum predicted concentrations and all averaging periods for gaseous pollutants are below the relevant air quality guideline values (AGVs), which are protective of both health and amenity (Strategen-JBS&G 2020).
Gaseous emissions (page 26, third paragraph)	The assessment uses meteorological data taken from the Bureau of Meteorology (BOM) between 2010 and 2014 from the Perth airport site, situated approximately 35km to the north. Officers, as part of the assessment, are not sufficiently confident in the use of meteorological data which from a site that is contextually different to the site in question. For example, a key influencing factor to the conditions of the area are the backdrop of the escarpment generating strong katabatic winds, and such winds are not noted as a feature common to the Perth Airport Site given its proximity away from the immediate rise of the escarpment.	Site-specific meteorological data were not available for the site. Prognostic models (such as TAPM) that can predict meteorological data for the site have been strongly criticised by the Department of Water and Environmental Regulation (DWER) as being unacceptable in the Perth region both in the scarp and along the coastal plain (DEC 2006). The scarp essentially runs parallel to the coast; as a consequence, there is alignment between the katabatic winds flowing up and down the scarp with the on/off-shore winds (i.e. the "Fremantle doctor"). This alignment in direction (up/down the scarp) and on/off-shore coincides with temperature changes which drive these strong winds. Therefore, there is temporal alignment in wind direction and changing wind speeds across the coastal plain both at the site and at the Perth Airport. While there may be minor discrepancies with the magnitude of the winds, it is incorrect to state that the winds at the two sites are contextually different. Furthermore, strong winds are indicative of better dispersion conditions and lower ground level concentrations and indicate conservatism in the assessment.
Gaseous emissions (page 26, fourth paragraph)	The assessment also uses AERMOD air quality dispersion modelling which has not been verified for use in WA in accordance with the DWER Air Emission Guideline, however the report identifies that it is widely used across America and throughout Australia	This is incorrect. DWER's Air Emission Guideline (2019) does not describe requirements for verification of dispersion models for use in WA. The Guideline does reference the DWER Air Quality Modelling Guidance Notes (DoE 2006) in respect of its expectations for air quality dispersion modelling. It also notes that the 2006 modelling guidance is scheduled for review. Of note, in relation to models commonly utilised at the time that the 2006 guidance was issued, is a comment on the capability of AERMOD - in particular, *"The USEPA-approved models AERMOD and CALPUFF have significantly improved scientific formulations and more advanced capabilities than AUSPLUME or ISCST3."* AERMOD is the approved regulatory model for the USEPA and has been adopted by most Australian states as their preferred model. It has been extensively validated in numerous studies to secure approval from the USEPA. Furthermore, DWER requires that model input and output data files be provided with modelling reports, such that DWER can verify the modelling has been conducted appropriately. Those data files have been provided in support of the application.

Responsible Authority Report reference	Authorising Officer comment/conclusion	Response
Gaseous emissions (page 26, fifth paragraph)	The assessment states that consideration has been given to the emissions from the brickworks under 'normal operations' however it is worth noting that no further information has been provided in relation to what the 'normal operations' entail. It is also noted that the scrubber can be bypassed if required due to fault or maintenance, which would result in different levels of emissions. The report does not consider the emissions in the scenario of the scrubber being bypassed, nor how potentially frequent this may occur	Emissions from the brickworks are described in Table 3.1 of the modelling report. These represent emissions from normal operations, which are those operations which will produce 250,000 tpa of bricks. The processes involved in normal operations are detailed in Section 1.5 of the modelling report. The Authorising Officer appears to misunderstand the difference between the existing cascade scrubber and the proposed dry injection fabric filters (DIFF). The cascade scrubber must be bypassed for maintenance or to deal with failures or breakdowns. Under those conditions, the brick production push-rate is reduced to maintain HF emissions below 1 g/s as required by the DWER operating licence for the brickworks (Licence L9025/2017/1). The DIFF involves the addition of a dry reagent (lime) into the kiln exhaust gas stream, which mixes with the gas and then deposits on the surface of fabric filters. Acid gases react with the lime either in the flowing gas or on the surface of the filters, removing those gases from the exhaust gas as well as capturing the particulates (spent adsorbent). As described in the modelling report, the DIFF will have four compartments (chambers) that can be individually isolated for maintenance, leaving the rest of the unit in operation. The scrubber will not be bypassed, and emissions will continue to be scrubbed at those times. If a significant failure in the DIFF occurs, such as with the lime dosing system, then the push rate can be reduced to reduce acid gas emissions, until such time as the fault is rectified. The residual reagent in the gas stream and coated on the filters will continue to remove acid gases and provide low emissions outcomes.
Gaseous emissions (page 26, last paragraph)	In terms of the reliability of systems, officers noted that the DWER Licence for the Austral site at Bellevue, made specific recommendations in relation to improvements required due to instances whereby abatement plant bypass has occurred. Officers would have a greater degree of confidence if modelling extended to consider the likelihood, magnitude and consequence of bypass events, given the similar technology being proposed was documented at the Bellevue site as having a high number of bypass events	The Bellevue plant requires bypass of the emissions control systems for essential maintenance, operational or safety reasons. The vast majority of bypass events are process control system generated, typically for temperature control purposes and are of short duration. The new technology provided by the proposed upgrade will include improved control systems that will minimise a requirement for bypass. However bypass is a safety feature required to protect the system. Further management actions take effect where situations may require safety bypass and Austral enacts its Bypass Management Procedure to ensure potential emissions do not exceed the licence limits.

Responsible Authority Report reference	Authorising Officer comment/conclusion	Response
Gaseous emissions (page 27, first paragraph)	Given the risk of amenity impact on nearby residential communities, and that a number of submissions also raise concerns on this risk, officers would be better informed by analysis to show what likely number of bypass events could occur, and what impact in respect of air emissions this may have	The most significant risk is provided by normal operations, which has been addressed in the modelling assessment. Bypass is not required.
Gaseous emissions (page 28, second paragraph)	Officers note that averaged data ranges are used in terms of depicting what may be the air emission amenity outcome. While Officers note that the table demonstrates compliance with air quality guideline value, expressed as a percentage, the use of an average of values may not show what could be the maximum impact, nor the likely magnitude (number) of such impact events	The Authorising Officer appears to misunderstand the use of various averaging times for the respective pollutants. These averages reflect the various exposure scenarios for human health impacts and (for HF) impacts on vegetation. For example, a 1-hour average AGV of 140 µg/m³ for HCl is determined from toxicological studies as a safe limit for acute impacts. In other words, a person can be exposed to HCl in the air at that concentration for an hour and not be expected to experience adverse health impacts. The maximum ground-level concentrations (GLCs) of pollutants in the modelling domain or at receptors represent the higher predicted GLC for the respective time averages. For example, the maximum 1-hour HCl GLC in the domain (103 µg/m³) is the highest GLC for the 8,760 hours in the modelling year. All other GLCs for that pollutant are predicted to have lower concentrations. As such, this is the "maximum impact" as referred to by the Authorising Officer. The number of maximum GLCs is by definition one per modelling year.
Gaseous emissions (page 28, second paragraph)	Also, in noting the reliance on meteorological data from a site distant from the Kiln Road location, and different in its weather conditions in terms of wind, creates further uncertainty as to this amenity issue.	See previous comments on meteorology. The airport data provides the most representative meteorological monitoring data for the site. The modelling has used five years of meteorological data and is showing that the predicted worst-case scenarios are below air quality guidelines.
Gaseous emissions (page 28, third paragraph)	Submissions raise concerns of emission impacts on amenity, and thus officers consider it important to be able to conclude with greater certainty on this point.	This information presented in Table 4.1 of the modelling report is conclusive in that predicted impacts are below guideline levels. Note that the AGVs used in the assessment are protective of both health and amenity.
Dust and gaseous emissions (page 28, fourth paragraph)	In respect of the assessment undertaken by Officers, the issue of dust and air emissions is not able to be conclusively determined at this specific stage, based on the level of information presented.	This level of information on gaseous air emissions conclusively demonstrates acceptable risk at sensitive receptors. In respect of dust emissions, the existing dust management practices, which are proven industry best practice, will continue to provide low dust risk outcomes. Emission estimating methodologies for fugitive dust emissions have been developed and validated as part of the National Pollution Inventory (NPI) program. Control measures as detailed in the DMP are included as part of the NPI emissions estimation, indicating the suitability of those measures.

3. Concluding remarks

The key air emission issues identified by the Authorising Officer in the Responsible Authority Report that can be summarised as:

- Normal operations are not described
- Inappropriate meteorology data and dispersion model used
- Absence of an assessment of fugitive dust emissions
- Scrubber bypass is not assessed
- Maximum impacts are not described
- Insufficient information is presented to provide adequate certainty in emissions impacts.

These issues have been addressed in the responses. Some misunderstandings are apparent in the Authorising Officer's comments in respect of scrubber operation and bypass, interpretation of dispersion model predictions and suitability of the model used for the assessment. These have also been addressed in the responses provided.

Dr Peter Forster
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SigmaTheta Pty Ltd

BRICKWORKS
LIMITED

ENVIRONMENTAL POLICY

23 August 2017

Our mission: Establish, operate and rehabilitate Brickworks sites in a manner that promotes optimum environmental outcomes.

Our behaviour: Consider and prioritize the environmental impact of our actions.

Our values: We care about the environment.

Brickworks accepts responsibility for environmental protection which is integral to the conduct of its commercial operations. Brickworks' overriding objective is to comply with environmental laws and regulations which relate to its environmental aspects, and minimise environmental harm by operating in a manner that reaches an appropriate balance between environmental, technical, economic and social objectives.

Brickworks is committed to the following for our operations:

- **Maintaining our Environmental Management System** to meet the requirements of AS/NZS ISO 14001:2004
- **Utilising operating practices** which seek to minimise environmental impact through work and management practices and the use of technology in operations to assist in the prevention of pollution
- **Implementing energy efficiency and greenhouse gas reduction** initiatives to improve energy efficiency and greenhouse gas emissions
- **Investigating sustainable business practices**, including suitable renewable energy options and the use of alternative raw materials

australbricks · australmasonry · australprecast · bristileroofing · auswesttimbers
terracade · Daniel Robertson · nubrik · Bowral Bricks · Pronto Panel · INEX BOARDS

- **Considering environmental issues** and the conservation of resources in new product development

- **Identifying and implementing water management initiatives** for reuse, and rainwater harvesting

- **Identifying and implementing waste management** initiatives to ensure the proper handling and disposal of waste, to increase our recycling efforts and to minimise waste produced

- **Setting and regularly reviewing performance objectives and targets**, identifying and implementing corrective and preventative actions that contribute to continually improving the environmental performance of our operations

- **Communicating** and consulting with our employees on environmental matters.

We recognise that all employees have a major role to play in protecting the environment. To achieve our environmental policy commitments, the company will actively provide for, encourage, and support training in environmental issues and sustainability.

Lindsay Partridge
Managing Director

SHAWMAC

Transport Impact Statement

Project:	Cardup Development
Client:	Austral Bricks WA Pty Ltd c/o Land Insights
Author:	Anthony Anastas / Paul Nguyen
Date:	3rd September 2020
Document #	1909003-001

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Disclaimer

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1. Introduction

Shawmac has been engaged by Land Insights on behalf of Austral Bricks WA Pty Ltd to undertake a transport impact assessment of the proposed expansion of the existing brickworks facility in Cardup on South Western Highway.

The City of Serpentine-Jarrahdale policy *PLN 5.1 - Highway Development* applies to all developments adjacent to Primary Distributor Roads including South Western Highway. The City has therefore requested that the transport impact of the proposed development on the highway is assessed to satisfy the objectives of the policy which are as follows:

- To encourage the uninterrupted movement of traffic.
- To minimise conflicts between traffic passing, entering or leaving a property.
- To minimise conflicts between pedestrians and motor vehicles.

The format of the assessment is generally in accordance with a Transport Impact Statement as per the Western Australian Planning Commission's (WAPC) *Transport Impact Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)* and includes the following:

- Assessment of existing and future traffic generation from the site.
- Review of existing and forecast traffic flows on the surrounding road network.
- Assignment of predicted traffic flows onto the road network.
- Review of relevant crash history on the surrounding road network.
- Assessment of traffic impacts to South Western Highway.

1.1. Site Location

The site is located on 69 Kiln Road, Cardup as shown in **Figure 1**. An aerial photo of the site is shown in **Figure 2**.

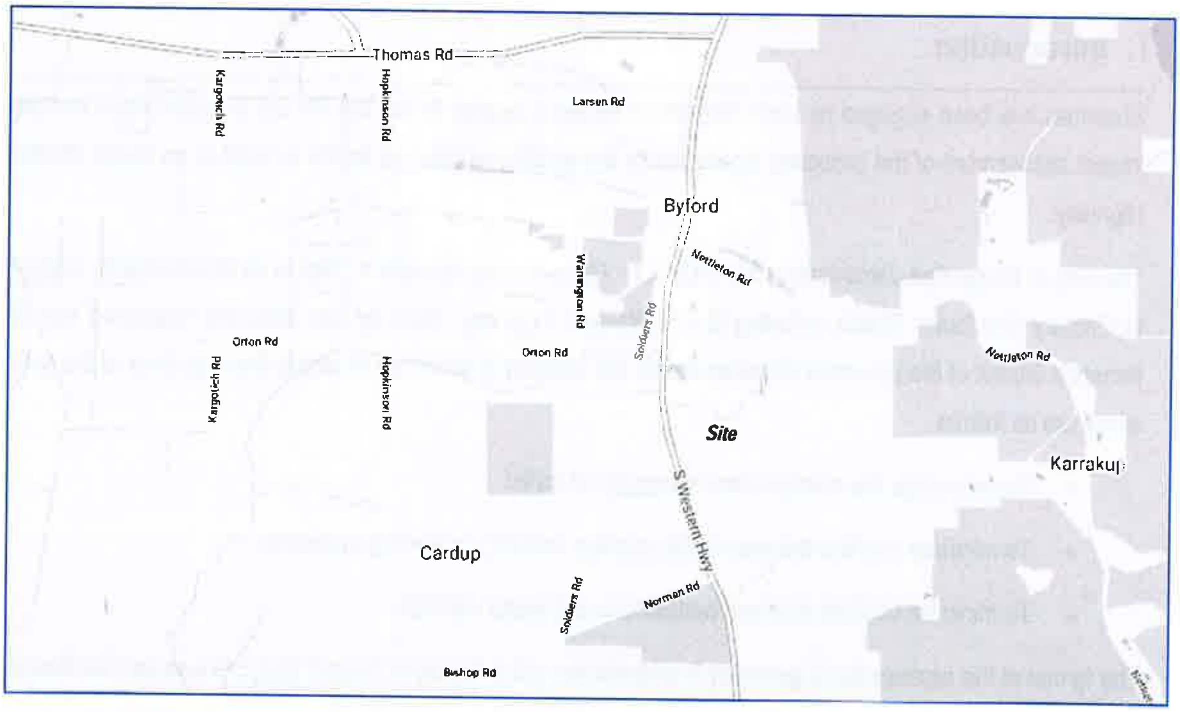

Figure 1: Site Location

Figure 2: Aerial Photo of Site (March 2020)

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2. Existing Situation

2.1. Site and Surrounding Land Use

The site is currently used as a brickworks as it has been for an extended period of time. Material is transported to the site and the bricks are made on the site. The land immediately surrounding the site is mostly rural, with residential developments further north of the site.

2.2. Road Network

The site is accessed from South Western Highway then onto Kiln Road.

South Western Highway is a Primary Distributor Road controlled by Main Roads Western Australia (MRWA). It is constructed as an unkerbed, two-lane, undivided road adjacent to the site, with a left-turning lane into Kiln Road. South Western Highway has a speed limit of 110km/h in the close vicinity to Kiln Road.

Kiln Road is classified as an Access Road and is constructed as an unkerbed, two-lane, undivided road. Kiln Road intersects with South Western Highway, with all the movements in and out allowable at the intersection. According to the MRWA Road Information Mapping System, Kiln Road has a 110km/h speed limit that applies outside of the built-up areas.

2.3. RAV Network

South Western Highway and Kiln Road adjacent to the site has a Restricted Access Vehicle (RAV) network 4 status.

2.4. Traffic Volumes

The latest available traffic data for South Western Highway was sourced from MRWA as summarised in **Table 1**.

Table 1: South Western Highway Traffic Data

Road and Location	Average Weekday Traffic	AM Peak Hour (8AM to 9AM)	PM Peak Hour (3PM to 4PM)	Heavy Vehicles	Date
South Western Highway - South of Kiln Road	6,710 vpd 3,288 northbound 3,422 southbound	463 vph 264 northbound 199 southbound	579 vph 275 northbound 304 southbound	22.5%	2017/18

3. Proposed Development

It is proposed to continue to use the site for the same brickworks activities, with the existing operations to be expanded further.

4. Vehicle Access and Parking

Vehicle access to the site will be the same as the existing arrangement.

The main crossovers are located on Kiln Road on the southern boundary of the site, with the access to the parking located in the same vicinity of the crossovers.

The access and parking arrangement are illustrated in **Figure 3**.

Figure 3: Vehicle Access and Parking Arrangement

5. Hours of Operation

The clay delivery times are expected to be made five days a week between 7:00am and 5:00pm, with Saturday morning from 7:00am to 12:00pm.

Brick deliveries from the site will occur on weekdays between 5:00 a.m. and 4:00 p.m. Brick plant staff typically arrive at 5:00 a.m. and leave at 4:45 p.m. and then night shift staff arrive at 5:00 p.m. and leave at 5:00 a.m.

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6. Daily Traffic Volumes and Vehicle Types

6.1. Site Traffic Movements

The expected traffic movements for the site have been provided by Austral Bricks, as outlined in **Table 2**.

Table 2: Site Traffic Movement Summary

Truck Type	Yearly Throughput	Truck Capacity	Yearly Loads	Yearly Movements	Operation Days/Hours	Frequency	Days Per Year	Daily Movements	AM Peak / PM Peak	Direction
Clay Trucks RAV 2 Truck and Dog Trailers	432,000	44T	9,818	19,636	5 days per week 7am to 5pm Saturday 7am to 12pm	8 months per year	240	82	8 / 8	All North
Brick Trucks Prime Mover and Semi-Trailer RAV 2 Pocket Road Trains	324,000	44T	7,364	14,728	Weekdays 5am to 4pm	Year Round	260	58	5 / 5	90% North / 10% South
Light Vehicles (Staff and Sales Centre)								50	25 in / 25 out	90% North / 10% South

6.2. Background Traffic

Kiln Road is a no through road and the only other traffic generators are approximately 10 rural residential properties. It has been estimated that these properties would generate eight daily movements per property with a total of 80 daily movements as outlined in **Table 3**.

Table 3: Background Traffic Movement Summary

Truck Type	Daily Movements	AM Peak / PM Peak	Direction
Residential Vehicles (Estimated 8 daily movements per residence)	80	8 / 8	90% North / 10% South

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6.3. Intersection Capacity Assessment

The morning peak hour (8:00 a.m. to 9:00 a.m.) and afternoon peak hour (3:00 p.m. to 4:00 p.m.) has been assessed at the South Western Highway and Kiln Road intersection using SIDRA Intersection 8.0 in accordance with the MRWA Operational Modelling Guidelines.

SIDRA is a commonly used intersection modelling tool used by traffic engineers for all types of intersections. Outputs for four standard measures of operational performance can be obtained, being Degree of Saturation (DoS), Average Delay, Queue Length, and Level of Service (LoS).

- Degree of Saturation is a measure of how much physical capacity is being used with reference to the full capability of the particular movement, approach, or overall intersection. A DoS of 1.0 equates to full theoretical capacity although in some instances this level is exceeded in practice. SIDRA uses maximum acceptable DoS of 0.90 for signalised intersections for its Design Life analysis. Design engineers typically set a maximum DoS threshold of 0.95 for new intersection layouts or modifications.
- Average Delay reports the average delay per vehicle in seconds experienced by all vehicles in a particular lane, approach, or for the intersection as a whole. For severely congested intersections the average delay begins to climb exponentially.
- Queue Length measures the length of approach queues. In this document we have reported queue length in terms of the length of queue at the 95th percentile (the maximum queue length that will not be exceeded for 95 percent of the time). Queue lengths provide a useful indication of the impact of signals on network performance. It also enables the traffic engineer to consider the likely impact of queues blocking back and impacting on upstream intersections and accesses.

Level of Service is a combined appreciation of queuing incidence and delay time incurred, producing an alphanumeric ranking of A through F. A LoS of A indicates an excellent level of service whereby drivers delay is at a minimum and they clear the intersection at each change of signals or soon after arrival with little if any queuing. Values of B through D are acceptable in normal traffic conditions. Whilst values of E and F are typically considered undesirable, within central business district areas with significant vehicular and pedestrian numbers, corresponding delays/queues are unavoidable and hence, are generally accepted by road users.

The peak hour flows along South Western Highway were taken from MRWA data. During the peak hour, the site is estimated to generate 8 clay truck deliveries (4 in and 4 out) and 5 brick deliveries (rounded to 3 in and 3 out). For simplicity, the clay and brick trucks are assumed to be distributed 100% along South Western Highway. The input volumes are shown in **Figure 4** and **Figure 5** and the results are shown in **Figure 6** and **Figure 7**.

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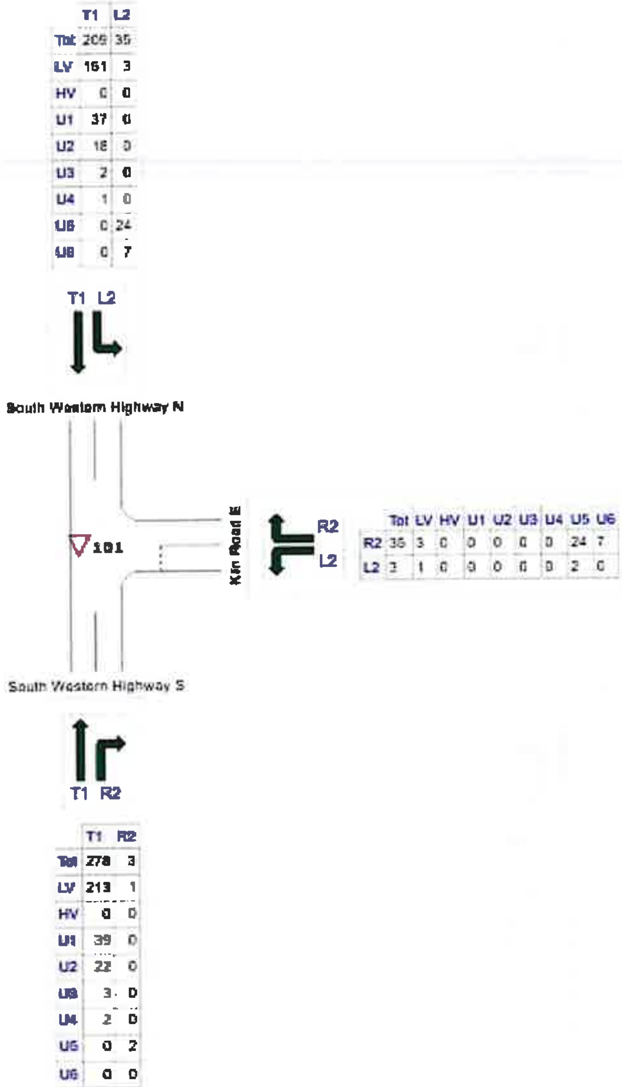
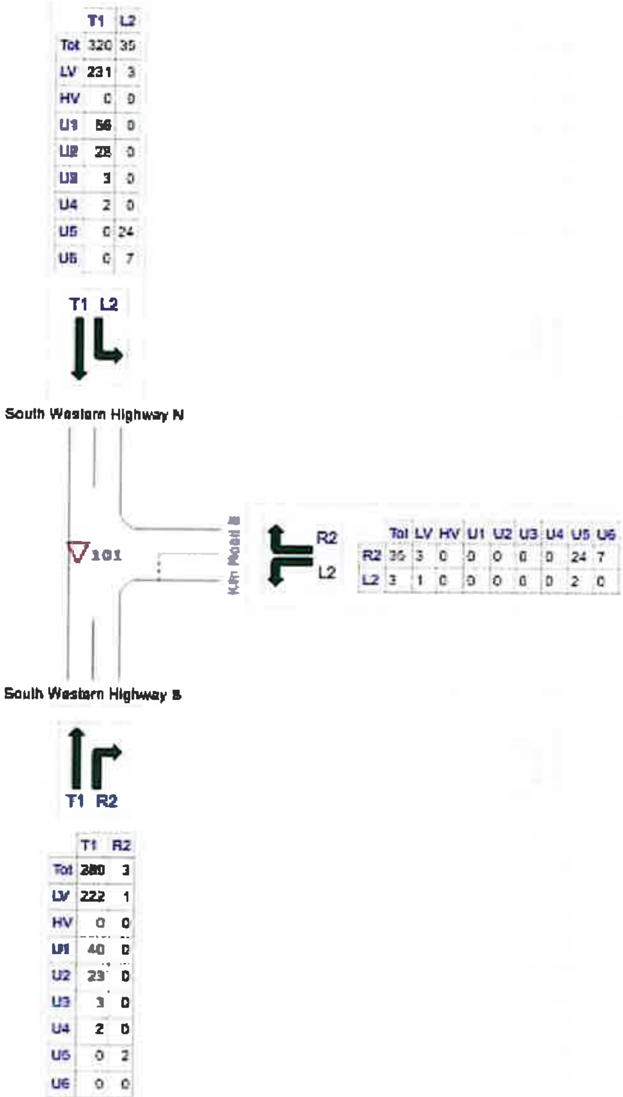


	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	2-5 (U1)	6-9 (U2)	10 (U3)	11 (U4)	LV - Site (U5)	HV - Site (U6)
S: South Western Highway S	281	214	0	39	22	3	2	2	0
E: Kiln Road E	38	4	0	0	0	0	0	26	7
N: South Western Highway N	244	155	0	37	18	2	1	24	7
Total	563	373	0	75	40	4	3	53	15

Figure 4: South Western Highway – Kiln Road Intersection AM Distribution



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)	2-5 (U1)	6-9 (U2)	10 (U3)	11 (U4)	LV - Site (U5)	HV - Site (U6)
S: South Western Highway S	293	223	0	40	23	3	2	2	0
E: Kiln Road E	38	4	0	0	0	0	0	26	7
N: South Western Highway N	355	235	0	56	28	3	2	24	7
Total	685	462	0	97	51	5	4	53	15

Figure 5: South Western Highway – Kiln Road Intersection PM Distribution

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MOVEMENT SUMMARY

Site: 101 [South Western Highway - Kiln Road - AM Peak]

Give-way / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Western Highway S												
2	T1	278	23.4	0.178	0.0	LOS A	0.0	0.3	0.01	0.01	0.01	109.4
3	R2	3	0.0	0.178	9.2	LOS A	0.0	0.3	0.01	0.01	0.01	83.9
Approach		281	23.1	0.178	0.1	NA	0.0	0.3	0.01	0.01	0.01	109.0
East: Kiln Road E												
4	L2	3	0.0	0.048	8.9	LOS A	0.2	1.9	0.47	0.74	0.47	67.7
6	R2	35	21.2	0.048	11.6	LOS B	0.2	1.9	0.47	0.74	0.47	64.1
Approach		38	19.4	0.048	11.4	LOS B	0.2	1.9	0.47	0.74	0.47	64.4
North: South Western Highway N												
7	L2	35	21.2	0.029	8.8	LOS A	0.0	0.0	0.00	0.67	0.00	67.1
8	T1	209	27.7	0.150	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach		244	26.8	0.150	1.3	NA	0.0	0.0	0.00	0.10	0.00	100.7
All Vehicles		563	24.5	0.178	1.4	NA	0.2	1.9	0.04	0.09	0.04	100.7

Figure 6: South Western Highway – Kiln Road Intersection AM Peak SIDRA Results

MOVEMENT SUMMARY

Site: 101 [South Western Highway - Kiln Road - PM Peak]

Give-way / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Western Highway S												
2	T1	289	23.4	0.186	0.0	LOS A	0.0	0.3	0.01	0.01	0.01	109.4
3	R2	3	0.0	0.186	10.2	LOS B	0.0	0.3	0.01	0.01	0.01	83.9
Approach		293	23.1	0.186	0.2	NA	0.0	0.3	0.01	0.01	0.01	109.0
East: Kiln Road E												
4	L2	3	0.0	0.057	9.5	LOS A	0.2	2.2	0.53	0.79	0.53	66.5
6	R2	35	21.2	0.057	12.7	LOS B	0.2	2.2	0.53	0.79	0.53	63.0
Approach		38	19.4	0.057	12.4	LOS B	0.2	2.2	0.53	0.79	0.53	63.3
North: South Western Highway N												
7	L2	35	21.2	0.029	8.8	LOS A	0.0	0.0	0.00	0.67	0.00	67.1
8	T1	320	27.7	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.8
Approach		355	27.1	0.228	0.9	NA	0.0	0.0	0.00	0.07	0.00	103.3
All Vehicles		685	25.0	0.228	1.2	NA	0.2	2.2	0.04	0.08	0.04	102.0

Figure 7: South Western Highway – Kiln Road Intersection PM Peak SIDRA Results

The results indicate that the intersection will operate at an acceptable level with all measures of performance within typically accepted values.

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6.4. Intersection Capacity – 10 years after Opening

A secondary analysis has been undertaken to assess the access capacity 10 years after commencing operations (assumed to be the year 2030 after the development commences in 2020) to assess the impact of general traffic growth. Historical traffic counts for South Western Highway indicate an annual growth rate between 2 and 5%. The through traffic volumes along South Western Highway were increased by 5% per year to 2030 to be conservative.

The results of the assessment are shown in **Figure 8** and **Figure 9**. The results show that the access intersection would still perform within capacity 10 years after commencement.

It is noted that Tonkin Highway is planned for extension from Thomas Road through to South Western Highway, south of Mundijong. The extension will be a four-lane dual carriageway with intersection upgrades at Thomas Road, Orton Road, Mundijong Road and South Western Highway. The project is currently in planning and construction is estimated to be completed in late 2023. It is likely that some of the existing traffic along South Western Highway will transfer to Tonkin Highway which would increase the capacity of the South Western Highway / Kiln Road intersection.

MOVEMENT SUMMARY

Site: 101 South Western Highway - Kiln Road - AM Peak 2030

Give-way / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Western Highway S												
2	T1	500	23.6	0.321	0.0	LOS A	0.1	0.5	0.01	0.00	0.01	109.6
3	R2	3	0.0	0.321	11.5	LOS B	0.1	0.5	0.01	0.00	0.01	84.0
Approach		503	23.4	0.321	0.1	NA	0.1	0.5	0.01	0.00	0.01	109.4
East: Kiln Road E												
4	L2	3	0.0	0.087	9.8	LOS A	0.3	3.2	0.69	0.88	0.69	62.8
6	R2	35	21.2	0.087	16.2	LOS C	0.3	3.2	0.69	0.88	0.69	59.7
Approach		38	19.4	0.087	15.7	LOS C	0.3	3.2	0.69	0.88	0.69	59.9
North: South Western Highway N												
7	L2	35	21.2	0.029	8.8	LOS A	0.0	0.0	0.00	0.67	0.00	67.1
8	T1	378	27.9	0.271	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
Approach		413	27.3	0.271	0.8	NA	0.0	0.0	0.00	0.06	0.00	104.1
All Vehicles		954	24.9	0.321	1.0	NA	0.3	3.2	0.03	0.06	0.03	103.7

Figure 8: South Western Highway – Kiln Road Intersection AM Peak SIDRA Results – 2030

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MOVEMENT SUMMARY

Site: 101 [South Western Highway - Kiln Road - PM Peak 2030]

Give-way / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Western Highway S												
2	T1	519	23.5	0.335	0.1	LOS A	0.1	0.8	0.02	0.00	0.02	109.3
3	R2	3	0.0	0.335	15.0	LOS B	0.1	0.8	0.02	0.00	0.02	83.8
Approach		522	23.4	0.335	0.2	NA	0.1	0.8	0.02	0.00	0.02	109.1
East: Kiln Road E												
4	L2	3	0.0	0.126	11.4	LOS B	0.4	4.5	0.80	0.93	0.80	58.6
6	R2	35	21.2	0.126	20.6	LOS C	0.4	4.5	0.80	0.93	0.80	55.8
Approach		38	19.4	0.126	19.8	LOS C	0.4	4.5	0.80	0.93	0.80	56.1
North: South Western Highway N												
7	L2	35	21.2	0.029	8.8	LOS A	0.0	0.0	0.00	0.67	0.00	67.1
8	T1	576	27.8	0.411	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	109.5
Approach		611	27.4	0.411	0.6	NA	0.0	0.0	0.00	0.04	0.00	105.7
All Vehicles		1171	25.4	0.411	1.0	NA	0.4	4.5	0.03	0.05	0.04	104.1

Figure 9: South Western Highway – Kiln Road Intersection PM Peak SIDRA Results - 2030

6.5. Auxiliary Lanes

The requirement for turning treatments at the access was calculated using the Intersection Warrants calculator provided in Main Roads WA *Supplement to Austroads Guide to Road Design - Part 4 A.8*. The Intersection Warrants calculator has modified the Austroads warrants equation to account for the high percentage of heavy vehicles on Western Australian Roads.

The through and turning volumes were calculated as per Austroads GTM Part 6 – 2017 as shown in **Figure 10**. The volumes from **Table 1** and **Table 2** were used for this assessment, with the results of the assessment summarised in **Figure 11**.

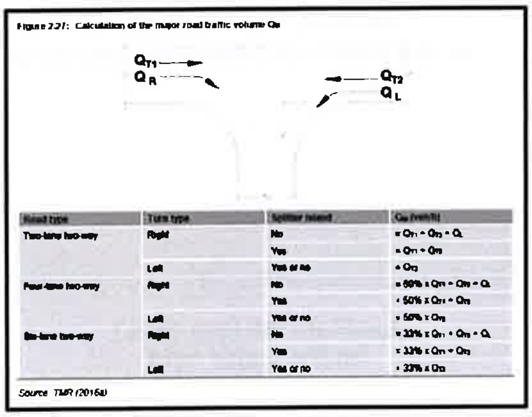

Figure 10: Calculation of the Major Road Traffic Volume Q_m

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INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Road Design - Part 4 A.8

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	HV (%)
Q_{T1} =	278	23.4
Q_R =	3	0
Q_{T2} =	209	27.7
Q_L =	35	21.2

RIGHT TURN ASSESSMENT

Q_m =	522
% HV =	24.974
x =	1.18
TREATMENT =	BAR

LEFT TURN ASSESSMENT

Q_m =	209
% HV =	27.700
x =	1.42
TREATMENT =	AUL(S)

AM Peak

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Road Design - Part 4 A.8

DESIGN SPEED =	120km/h
SPLITTER ISLAND YES / NO =	No
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	HV (%)
Q_{T1} =	289	23.4
Q_R =	3	0
Q_{T2} =	320	27.7
Q_L =	35	21.2

RIGHT TURN ASSESSMENT

Q_m =	644
% HV =	25.417
x =	1.44
TREATMENT =	BAR

LEFT TURN ASSESSMENT

Q_m =	320
% HV =	27.700
x =	2.09
TREATMENT =	AUL(S)

PM Peak

Figure 11: Warrants for Turn Treatments on Major Roads at Unsignalised Intersections

The required treatments, as calculated according to Main Roads WA standards, are a short Auxiliary Left (AUL) and a Basic Right (BAR) turn treatment.

It has been noted by Main Roads WA that the assessment result for the right turn is very sensitive to a small increase in right turn movements and so an Auxiliary Right (AUR) turn treatment is justified at this intersection. An example layout of an AUR and AUL treatment is shown in Figure 12.

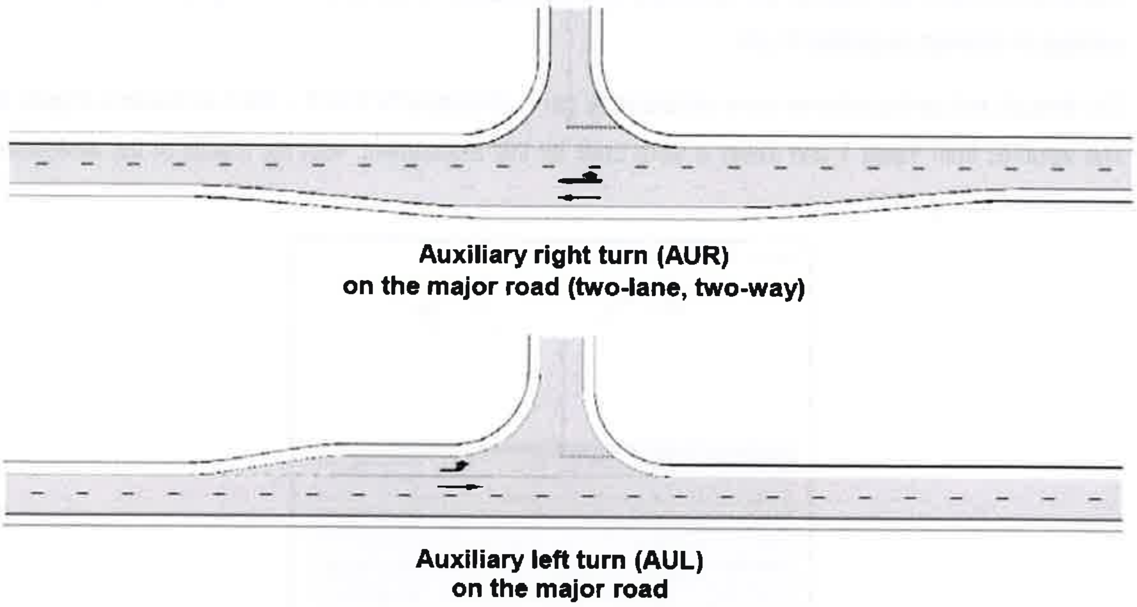

Figure 12: Rural Auxiliary Right (AUR) and Auxiliary Left (AUL) Turn Treatments

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7. Traffic Management on Frontage Streets

7.1. Road Width and Number of Lanes

The cross section and geometry of the frontage streets are summarised in **Table 4**.

Table 4: Frontage Road Cross Section and Geometry

Road and Location	Number of Lanes	Cross Section
South Western Highway	2	Unkerbed single carriageway Typically 10m sealed width (4 - 4.5m traffic lanes) Wide unsealed shoulders
Kiln Road	2	Unkerbed single carriageway Typically 7m pavement (3.5m lanes)

7.2. Parking Provision and Restrictions

There are an estimated 60 parking bays available at the southern side of the site.

7.3. Posted Traffic Speed

The posted speed limit along South Western Highway is 110 km/h in the vicinity of Kiln Road.

7.4. Intersections

As mentioned previously, Kiln Road intersects South Western Highway with all movements allowable in and out. The intersection operates under give-way control and provides a left-turn lane into Kiln Road.

7.5. Access

Property access is at the southern side of the site on Kiln Road which connects onto South Western Highway.

8. Swept Path Analysis

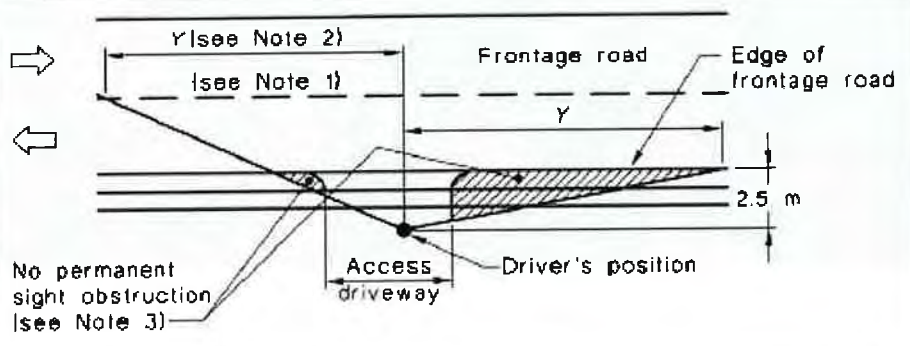
A preliminary swept path analysis has been undertaken using the Main Roads WA RAV 2 vehicle template (27.5m B-double with an 18m turning circle) at the South Western Highway – Kiln Road intersection as shown in **Figure 13**. Although both South Western Highway and Kiln Road are RAV 4 approved roads, the existing intersection layout does not allow the lane-correct movement for RAV2-4 vehicles and the intersection will need to be widened.

Figure 13: South Western Highway – Kiln Road Intersection Swept Path

The land in the north-east corner of the intersection is owned by Austral Bricks and so it is possible to relocate the intersection and turn treatments towards the north to avoid the need to acquire land from other landowners to the south. A section of Kiln Road could be realigned into the Austral Bricks land and the required land ceded to the Shire and Main Road WA. A preliminary concept design for the intersection relocation and upgrade is being prepared for submission to MRWA.

9. Sight Distance

The proposed crossovers have been assessed for entering sight distance (ESD) in accordance with Australian Standard AS 2890.1-2004 *Parking Facilities - Off-street car parking* (AS2890.1). Figure 3.2 of AS2890.1, shown as **Figure 14**, outlines the minimum required ESD for access driveways based on the approach speed of vehicles on the frontage road.



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Figure 14: AS2890.1 Access Sight Distance Requirements

Based on the frontage road speed of 110 km/h, the minimum required sight distance is 190 metres. A desktop review of the available sight distance from each of the exit crossovers using the latest aerial imagery and Google Street view concludes that in order to achieve the minimum 190 metres of sight distance, some pruning of the vegetation along Kiln Road may be required as shown in **Figure 15** and **Figure 16**. However, due to the length and geometry of Kiln Road it is unlikely that vehicles would be travelling at 110km/h and so the actual ESD required would be less and so pruning is not considered to be essential.

Figure 15: AS2890.1 Access Sight Distance Assessment

Figure 16: AS2890.1 Access Sight Distance Assessment

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10. Public Transport Access

There are no public transport routes in close vicinity to the site. The public transport demand of the site is likely to be low and therefore the existing services are considered to be adequate.

11. Pedestrian / Cycle Access

There is no pedestrian / cycle access in the vicinity of the site, with demand expected to be low based on the proposed site use.

12. Site Specific or Safety Issues

12.1. Crash History

Detailed crash statistics for the entire length of Kiln Road between January 2015 and December 2019 were obtained from the MRWA *Reporting Centre*. One incident was recorded in the vicinity of the site over the period of five years. The crash was recorded at the intersection of South Western Highway and Kiln Road, which involved an out of control utility vehicle colliding with an SEC pole.

The crash history of the surrounding road network indicates a relatively low number of crashes for the amount traffic volume near the site. As the volume of traffic generated by the proposed development will not increase significantly, the development is not expected to increase the risk profile on South Western Highway and Kiln Road intersection or Kiln Road accesses.

13. Conclusion

An assessment of the proposed expansion of the existing brickworks facility in Cardup concluded that the proposed development would not have unacceptable adverse impact on the surrounding road network including South Western Highway intersection.

A peak hour capacity analysis of the South Western Highway / Kiln Road intersection under the peak traffic scenario indicates that the intersection would perform at a satisfactory level.

A swept path assessment indicates that the intersection would need to be upgraded to accommodate the turning movement of the proposed trucks. The peak hour traffic at the intersection also warrant the provision of an Auxiliary Right (AUR) and a short Auxiliary Left (AUL(S)) turn treatment.

Project:	South Western Highway (H009) Kiln Road (SLK10.98) Intersection Realignment and Upgrade 15% 2D Concept Design
Client:	Austral Bricks
Author:	Paul Nguyen
Date:	23rd October 2020
Document #:	2010014-DR-001

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Document Status

Version	Prepared By	Reviewed By	Approved By	Date
1	Paul Nguyen	James Bridge	James Bridge	23/10/20

File Reference: Y:\Jobs Active 2020\CE - Roads and Drainage\Austral Bricks_Cardup 15% Intersection Design_2010014\3. Documents\3.3 Design Report\2010014-DR-001_V1.docx

Contents

Figures

Tables

1. Introduction

1.1. Background

Austral Bricks are proposing to expand the existing brickworks facility on Kiln Road in Cardup. The site location is shown in **Figure 1**.

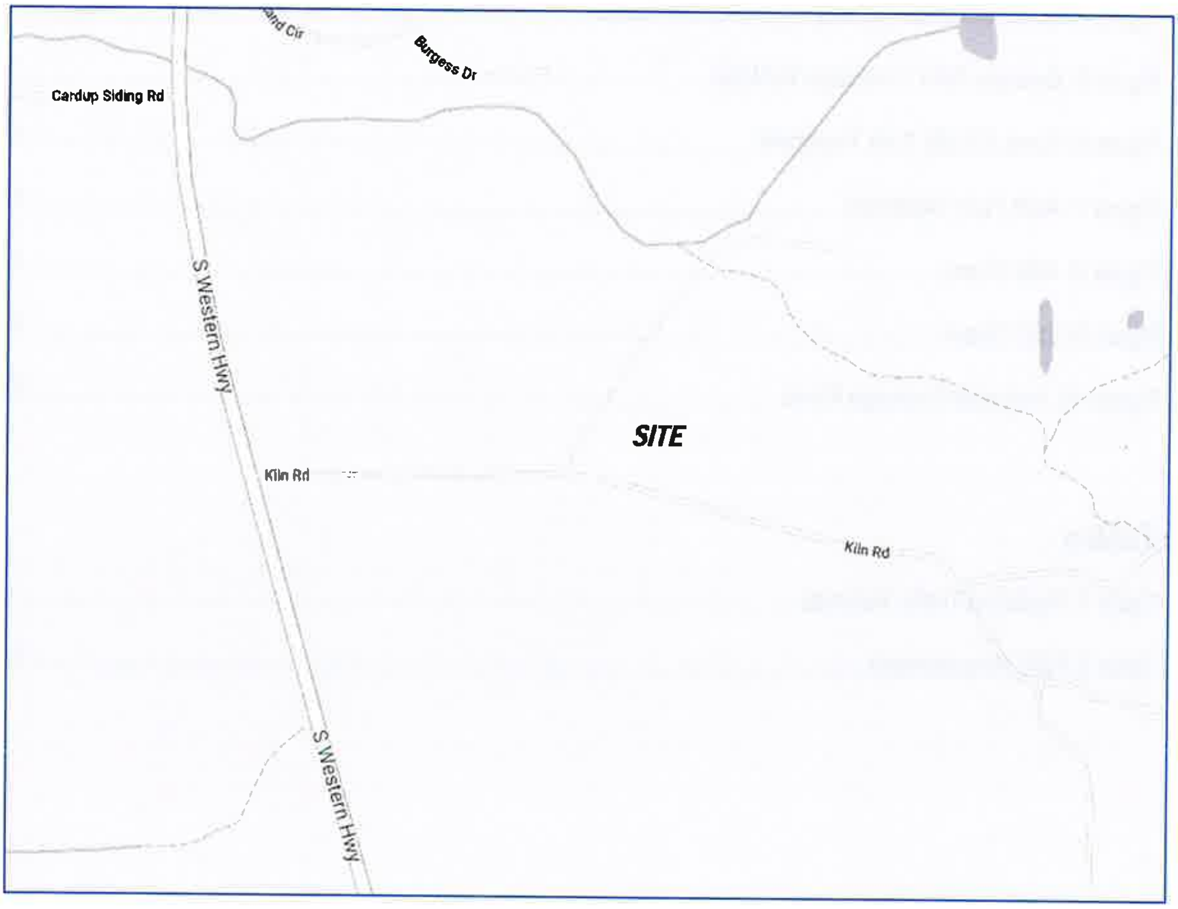

Figure 1: Site Location

The site will generate incoming clay trucks and outgoing brick tricks ranging from semi-trailers to Restricted Access Vehicle (RAV) Category 2 truck and dog trailers and pocket road trains. Although Kiln Road and South Western Highway are both approved to carry vehicles up to RAV 4, the existing intersection of these two roads is currently below standard and is it likely that some trucks need to overturn at the intersection.

The existing intersection is shown in **Figure 2**. There is an existing short Auxiliary Left (AUL(S)) turn treatment and there appears to be a Basic Right (BAR) turn treatment at the intersection.

Figure 2: Existing Intersection

1.2. History

A Shawmac Traffic Impact Statement (TIS), Document 1909003-TIS-001 Version 3, was prepared on behalf of Austral Bricks.

The TIS concluded the following:

- An assessment of the proposed expansion of the existing brickworks facility in Cardup concluded that the proposed development would not have unacceptable adverse impact on the surrounding road network including South Western Highway intersection.
- A peak hour capacity analysis of the South Western Highway / Kiln Road intersection under the peak

traffic scenario indicates that the intersection would perform at a satisfactory level.

- A swept path assessment indicates that the intersection would need to be upgraded to accommodate the turning movement of the proposed trucks. The peak hour traffic at the intersection also warrant the provision of an Auxiliary Right (AUR) and a short Auxiliary Left (AUL(S)) turn treatment.

Main Roads WA reviewed the TIS and requested a preliminary intersection design (15% 2D Concept) including the AUR and AUL(S) turn treatments and demonstrating that the intersection could be upgraded without the need for third party land.

The property in the north-east corner of the intersection is currently owned by Austral Bricks. To avoid the need for land acquisition from the property in the south-east corner it is proposed to relocate the intersection towards the north. Austral Bricks has advised that they will cede the land required to accommodate the intersection relocation and upgrade.

The existing cadastral boundaries around the intersection are shown in **Figure 3**.

Figure 3: Existing Cadastral Boundaries

1.3. Purpose

The purpose of this design report is to document the design criteria and assumptions adopted for the 15% concept design of the intersection design.

2. Existing Roads

2.1. South Western Highway

South Western Highway is a broadly north-south aligned road to the west of the site. South Western Highway is a Primary Distributor road under the care and control of Main Roads WA. It is a two-lane rural road with an approximately 11.0m sealed width including 1.5m wide sealed shoulders on both sides. The cross-section of South Western Highway in the vicinity of the site is shown in **Figure 4**.

Figure 4: South Western Highway Typical Cross Section

As per Main Roads WA RAV network mapping tool, South Western Highway allows vehicles up to RAV Category 4 (with concessional loading allowed up to Level 3).

South Western Highway has a 110km/h speed limit which reduces to 80km/h towards the north near Cardup Siding Road and then reduces further to 60km/h north of Pinebrook Road.

Kiln Road also allows vehicles up to RAV category 4 (with no concessional loading). There are no RAV conditions on Great Southern Highway and Kiln Road or at the intersection.

3. Design Data

3.1. Proposed Haulage Vehicle

It is proposed to use RAV 2 truck and dog trailers to delivery clay to the site. Bricks will be delivered from the site using prime mover/semi-trailers and RAV 2 pocket road trains.

Example RAV 2 vehicle combinations are shown in **Figure 5**.

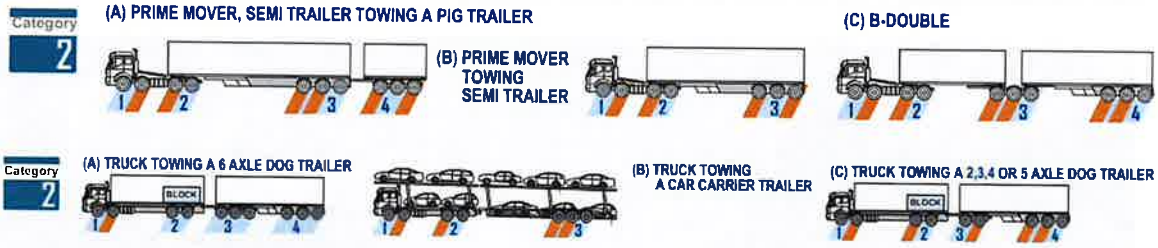

Figure 5: Example RAV 2 Haulage Vehicles

3.2. Proposed Haulage Route

As advised by the client, the majority of vehicle movements generated by the site will be to and from the north (90% from the north). It is noted that half of the truck movements will be unloaded.

3.3. Operating Hours

The clay delivery times are expected to be made five days a week between 7:00am and 5:00pm, with Saturday morning from 7:00am to 12:00pm.

Brick deliveries from the site will occur on weekdays between 5:00 a.m. and 4:00 p.m. Brick plant staff typically arrive at 5:00 a.m. and leave at 4:45 p.m. and then night shift staff arrive at 5:00 p.m. and leave at 5:00 a.m.

3.4. Proposed Traffic Volumes

Refer to **Table 1** for the proposed peak hour traffic volumes as discussed previously in the TIS.

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Table 1: Predicted Traffic Volumes

Truck Type	Yearly Throughput	Truck Capacity	Yearly Loads	Yearly Movements	Operation Days/Hours	Frequency	Days Per Year	Daily Movements	AM Peak / PM Peak	Direction
Clay Trucks RAV 2 Truck and Dog Trailers	432,000	44T	9,818	19,636	5 days per week 7am to 5pm Saturday 7am to 12pm	8 months per year	240	82	8 / 8	All North
Brick Trucks Prime Mover and Semi-Trailer RAV 2 Pocket Road Trains	324,000	44T	7,364	14,728	Weekdays 5am to 4pm	Year Round	260	58	5 / 5	90% North / 10% South
Light Vehicles (Staff and Sales Centre)								50	25 in / 25 out	90% North / 10% South

4. Design

4.1. Design Drawings

The design drawings have been provided along with this report. The list of drawings is provided below:

- Locality Plan and Drawing List 2010014-101
- General Arrangement Plan 2010014-201
- Intersection Plan 2010014-202
- Typical Cross Section 2010014-501
- Swept Path 1 of 2 2010014-901
- Swept Path 2 of 2 2010014-902

4.2. Intersection Design

Based on the TIS (Shawmac Document 1909003-TIS-001 Version 3), the intersection warrants a short Auxiliary Left (AUL(S)) and an Auxiliary Right (AUR) turn treatment. The intersection will also need to be wide enough to accommodate the swept path of RAV 2 vehicles.

The AUL(S) treatment has been designed as per Figure 8.3 of Austroads *Guide to Road Design Part 4A*, as shown in **Figure 6**, based on a 110km/hr design speed. The proposed AUL(S) has been extended based on the relocation of the intersection towards the north.

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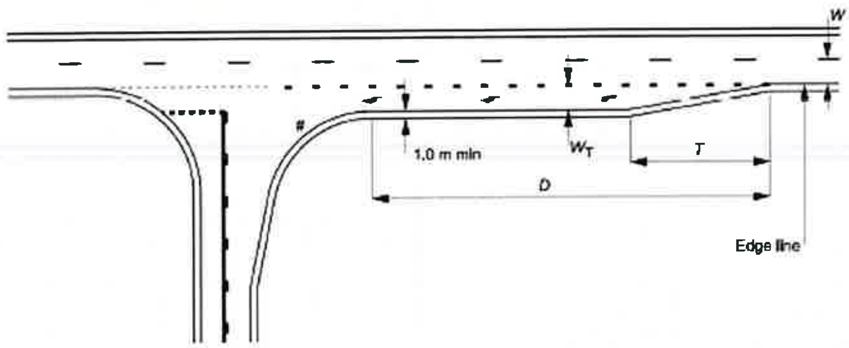
Figure 8.3: Rural AUL(S) treatment with a short left-turn lane



Notes:

- *# For setting out details of the left-turn geometry, use vehicle turning path templates and/or Table 8.2.*
- *Approaches to left-turn slip lanes can create hazardous situations between cyclists and left-turning motor vehicles. Treatments to reduce the number of potential conflicts at left-turn slip lanes are given in AGRD Part 4 (Austroads 2017).*
- *The dimensions of the treatment are defined as follows. Values of D and T are provided in Table 8.2.*
  - *W = Nominal through lane width (m) (including widening for curves). For a new intersection on an existing road, the width is to be in accordance with the current link strategy.*
  - *W_T = Nominal width of the turn lane (m), including widening for curves based on the design turning vehicle = 3.0 m minimum.*
  - *T = Physical taper length (m) given by Equation 5 being: $T = \frac{0.33VW_T}{3.6}$*
  - *V = Design speed of major road approach (km/h).*

Source: Department of Main Roads (2006)[37].

Table 8.2: Dimensions for AUL(S) treatment on major leg

Design speed of major road approach (km/h)	Diverge/deceleration length *D* (m)[1]	Taper length *T* (m)[2]
50	15	15
60	25	15
70	35	20
80	45	20
90	55	25
100	70	30
110	85	30
120	100	35

1 *Based on a 20% reduction in through road speed at the start of the taper and a value of deceleration of 3.5 m/s^2 (Table 5.2). Adjust for grade using the 'correction to grade', (Table 5.3).*
2 *Based on a turn lane width of 3.0 m.*

Source: Department of Main Roads (2006)[38].

Figure 6: Rural AUL(S) Turn Treatment

The AUR treatment has been designed as per Figure A 47 of Main Roads WA's supplement to Austroads *Guide to Road Design* Part 4 as per **Figure 7**.

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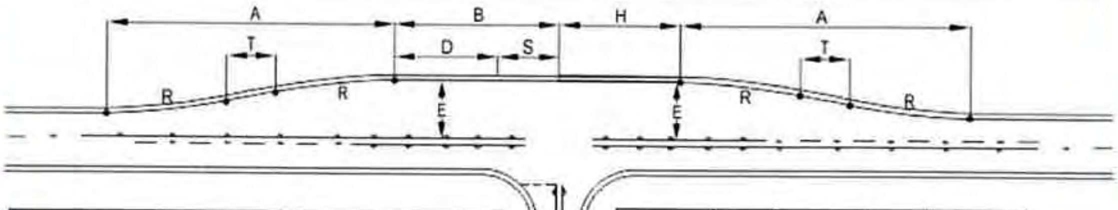

LEGEND

A = Tangent to Tangent

H = Refer to Table A

B = S (Storage) + D (Deceleration)

S = Storage length (m) to cater for one design turning vehicle

D = Deceleration length (m) refer to Table B (Based on Guide to Road Design Part 4 Table A4)

E = Two Lane Width (2 x 3.5m)

R = Radius (m)

Design vehicle	H (m) min
Prime Mover and Semi-Trailer (19 m)	20
B-Double (27.5 m)	25
B-Triple (36.5 m)	30
Double B-Double (53.5 m)	30

Table A:
Minimum Distance for H

Design Speed (km/h)	A (min) (m)	Radius (R) (m)	D (min) (m)	T (Desirable) (m)
50	85	500	15	14
60	100	690	25	17
70	115	920	35	19
80	130	1170	45	22
90	150	1560	55	25
100	165	1900	70	28
110	180	2250	85	30

Table B: Minimum Distance for D.

Figure A 47: Typical Main Roads Type AUR treatment

Figure 7: AUR Turn Treatment

As mentioned previously, the intersection will be relocated slightly towards the north to avoid land acquisition from the property in the south-east corner of the intersection.

4.3. Sight Distance Assessment

4.3.1. Approach Sight Distance

The required and available ASD at the relocated intersection has been determined from the Main Roads WA *Standard Restricted Access Vehicle Route Assessment Guidelines*. Based on the 110km/h speed limit (100km/h for trucks) and an approximately 1.5% downgrade towards South Western Highway, the required ASD is 263m. A preliminary check of the concept design indicates that the required ASD is achievable as shown in **Figure 8**.

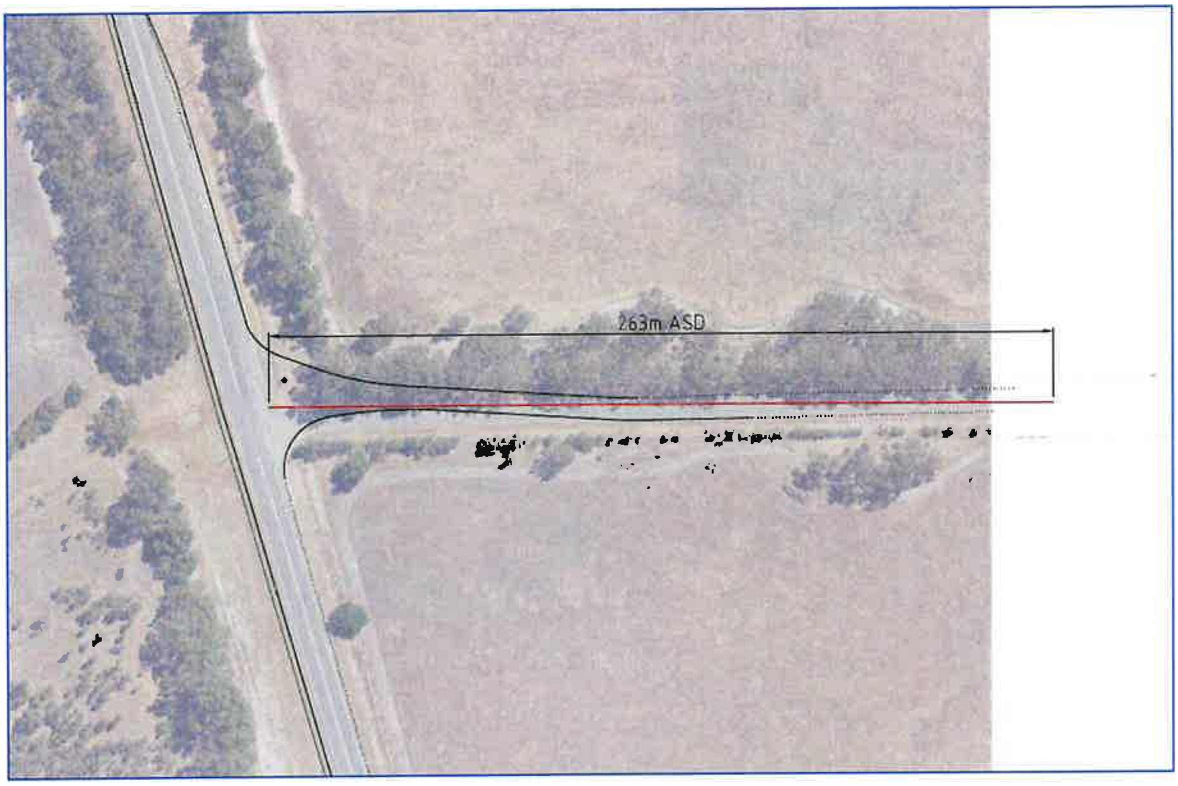

Figure 8: ASD Check

The available ASD will be checked and maintained during the detailed design stages.

4.3.2. Entering Sight Distance

The required ESD at the intersection has also been determined from the Main Roads WA *Standard Restricted Access Vehicle Route Assessment Guidelines* as detailed in

Table 2. The ESD is measured from the driver's eye height to the top of the opposing vehicle. The approach grades have been estimated from Landgate contours.

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Table 2: ESD Requirements

Vehicle Type	Direction	Design Speed (km/h)	Approach Grade	Required ESD (m)
Heavy Vehicles	North	100	1%	247
Heavy Vehicles	South	100	-1%	258

Figure 9 shows that the minimum ESD is achieved horizontally in both directions. There are no significant crests that would impede or restrict the sight distance vertically.

Figure 9: ESD Check

The available ESD will be checked and maintained during the detailed design stages.

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4.4. Pavement and Surfacing Design

A geotechnical investigation will need to be undertaken prior to detailed design to determine the required pavement and surfacing design

4.5. Vertical Alignment

The existing intersection is relatively flat. The vertical geometry of the relocated intersection is unlikely to change and will be designed in accordance with the relevant design standards.

4.6. Drainage Design

The drainage design will be completed during the detailed design stages. There is an existing culvert at the intersection under Kiln Road that will need to be removed and replaced to suit the relocated intersection. The indicative culvert layout and drainage flows at the upgraded intersection is shown in **Figure 10**.

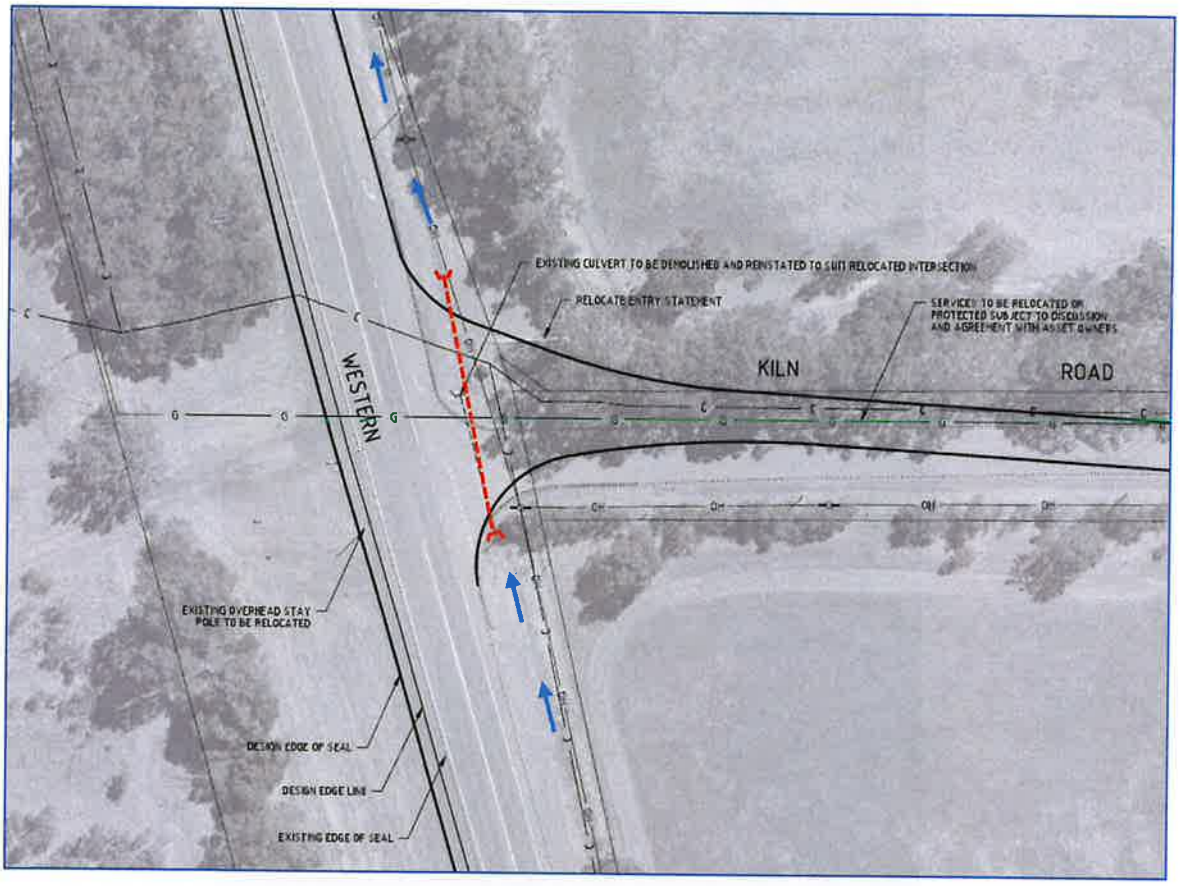

Figure 10: Indicative Drainage Flows

4.7. Services

The existing services have been identified from Dial Before You Dig data, aerial imagery and Google Street View. There is overhead power, high pressure gas and communications infrastructure around the intersection. The intersection upgrade is likely to require relocation or protection (lowering or coating) of the gas and communications infrastructure. Additionally, an existing overhead stay pole on the western side of the intersection will need to be relocated to accommodate the AUR.

Depending on the cost of service relocation/protection, another option involving relocation of the intersection further north may be investigated which may reduce the impacts to the existing services.

The various asset owners will be contacted to discuss the proposed intersection design and any relocation or protection requirements.

4.8. Lighting Design

The proposed intersection is considered an isolated intersection as defined in Main Roads WA Road Lighting Policy and Guidelines, as it is located within an unlit section of South Western Highway.

As per Section 3.8.5 of MRWA Part B: Application & Approval Guidelines isolated intersections generally do not require road lighting unless the intersection:

- Is a Roundabout.
- Is controlled by Traffic Signals.
- Has a median island in the through road, or
- Qualifies for lighting as a Special Case.

The intersection does not meet any of the above-mentioned requirements and therefore, lighting is not considered to be required.

4.9. Environmental

A clearing permit is likely to be required for any vegetation that needs to be removed within the road reserve.

AUSTRAL BRICKS CARDUP

SOUTH WESTERN HIGHWAY (H009) / KILN ROAD (SLK 10.98)

15% INTERSECTION DESIGN

LOCALITY PLAN
NTS

DRAWINGS LIST	
DRAWING TITLE	DRAWING No.
LOCALITY PLAN & DRAWING LIST	2010014-101
GENERAL ARRANGEMENT PLAN	2010014-201
INTERSECTION PLAN	2010014-202
TYPICAL CROSS SECTION	2010014-501
SWEPT PATH - SHEET 1 OF 2	2010014-901
SWEPT PATH - SHEET 2 OF 2	2010014-902

No.	DESCRIPTION	APPROVED & DATE
A	15% INTERSECTION DESIGN	PN 23.10.20

AMENDMENTS

AMENDMENTS

METADATA
GROUND SURVEY STANDARD:
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

Government of Western Australia
mainroads WESTERN AUSTRALIA
METROPOLITAN REGION
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent East Perth WA 6004
Telephone (08) 9323 41.. Fax (08) 9323 4430

DESIGNED PN
DRAWN JG
VERIFIED JB
APPROVED PN
FILE NUMBER

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AUSTRAL BRICKS CARDUP
SOUTH WESTERN HWY (H009) / KILN RD (SLK10.98)
15% INTERSECTION DESIGN
LOCALITY PLAN & DRAWING LIST
LOCAL AUTHORITY SERPENTINE-JARRAHDALE
MRWA DRAWING NUMBER
2010014-101

A1

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION

DIAL BEFORE YOU DIG
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WARNING
SERVICES AND CADASTRAL BOUNDARY LOCATIONS SHOWN ARE INDICATIVE ONLY AND MUST NOT BE USED FOR EXCAVATION.
THE "ONE CALL 1100" SYSTEM SHALL BE USED TO OBTAIN ACCURATE SERVICE LOCATIONS.

LEGEND

- EXISTING CADASTRAL BOUNDARY
- EXISTING EDGE OF SEAL
- EXISTING KERBLINE
- EXISTING OVERHEAD POWER
- EXISTING COMMUNICATIONS
- EXISTING GAS
- EXITING POWER POLE
- EXISTING CULVERT
- DESIGN EDGE OF SEAL
- DESIGN EDGE LINE

SCALE 1:1000

A1

No.	DESCRIPTION	APPROVED & DATE
	15% INTERSECTION DESIGN	PN 23.10.20

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD:
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

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AUSTRAL BRICKS CARDUP
SOUTH WESTERN HWY (H009) / KILN RD (SLK10.98)
15% INTERSECTION DESIGN
GENERAL ARRANGEMENT PLAN
LOCAL AUTHORITY SERPENTINE-JARRAHDALE_108
MRWA DRAWING NUMBER
2010014-201

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE
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- EXISTING CADASTRAL BOUNDARY
- EXISTING EDGE OF SEAL
- EXISTING KERBLINE
- EXISTING OVERHEAD POWER
- EXISTING COMMUNICATIONS
- EXISTING GAS
- EXISTING POWER POLE
- EXISTING CULVERT
- DESIGN EDGE OF SEAL
- DESIGN EDGE LINE

SCALE 1:1000 — A1

No.	DESCRIPTION	APPROVED & DATE
	15% INTERSECTION DESIGN	PN 23.10.20

AMENDMENTS

METADATA
GROUND SURVEY STANDARD
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

Government of Western Australia — mainroads WESTERN AUSTRALIA
METROPOLITAN REGION
ROAD AND TRAFFIC ENGINEERING BRANCH
Waterloo Crescent, East Perth WA 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

DESIGNED PN
DRAWN JG
VERIFIED JB
APPROVED PN
FILE NUMBER

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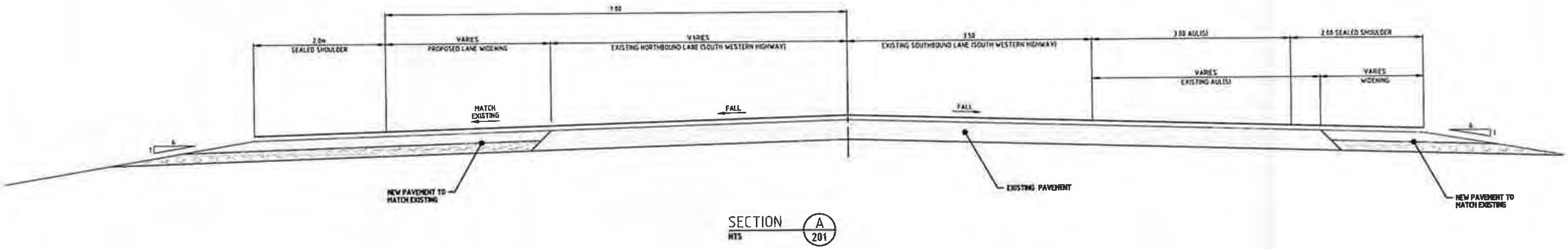
CONSULTING CIVIL AND TRAFFIC ENGINEERS

AUSTRAL BRICKS CARDUP
SOUTH WESTERN HWY (H009) / KILN RD (SLK10.98)
15% INTERSECTION DESIGN
INTERSECTION PLAN

LOCAL AUTHORITY: SERPENTINE-JARRAHDALE 108
MRWA DRAWING NUMBER: 2010014-202

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION



SCALE 1:1000 A1

No.	DESCRIPTION	APPROVED & DATE
	15% INTERSECTION DESIGN	PN 23.10.20

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

Government of Western Australia
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APPROVED	PN
FILE NUMBER	

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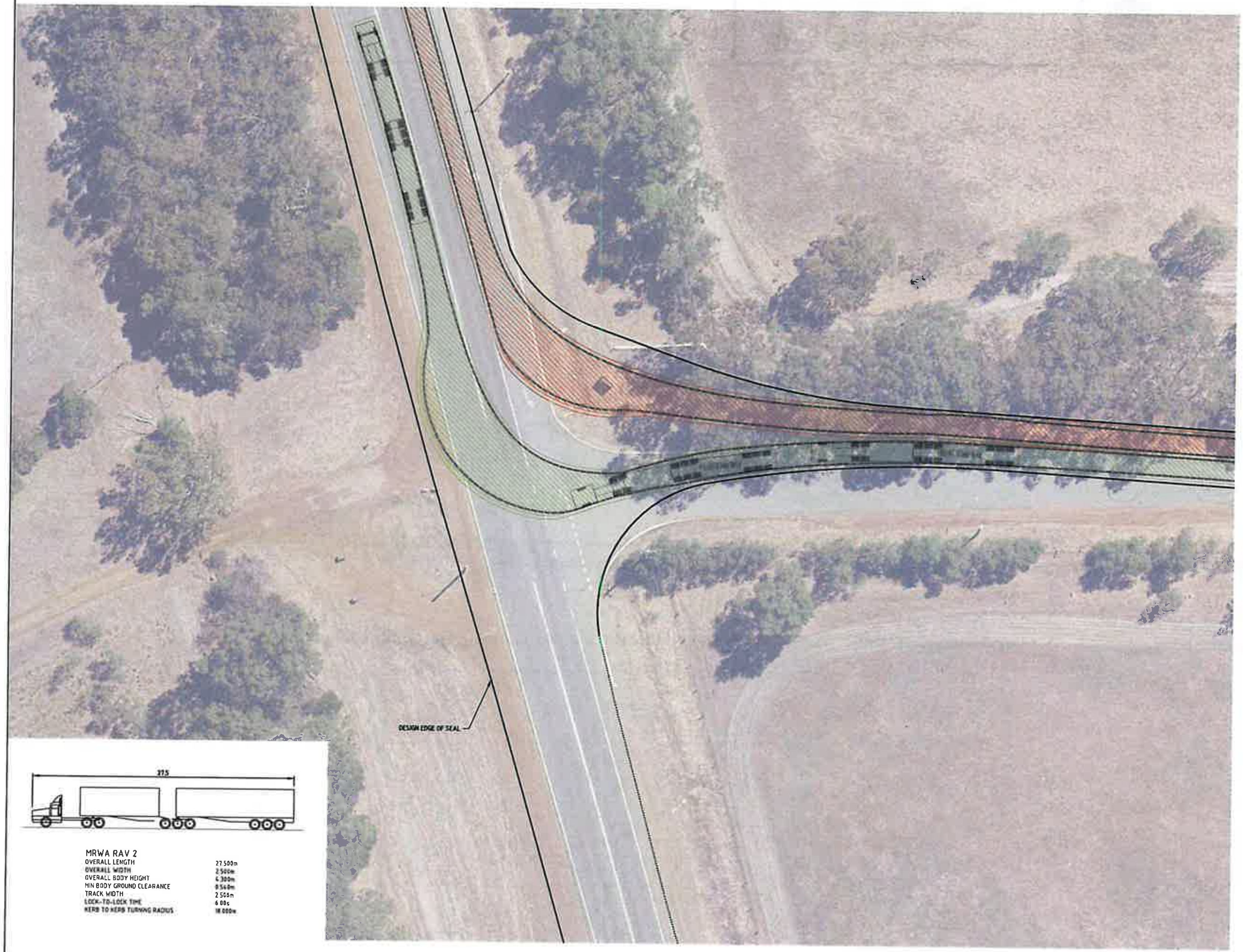
AUSTRAL BRICKS CARDUP
SOUTH WESTERN HWY (H009) / KILN RD (SLK10.98)
15% INTERSECTION DESIGN
TYPICAL CROSS SECTION

LOCAL AUTHORITY SERPENTINE-JARRAHDALE_108
MRWA DRAWING NUMBER
2010014-501

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE



LEGEND

- EXISTING EDGE OF SEAL
- DESIGN EDGE OF SEAL
- MRWA RAV 2 27.5m TURNING TEMPLATE TURNING RIGHT
- MRWA RAV 2 27.5m TURNING TEMPLATE TURNING LEFT

No.	DESCRIPTION	APPROVED & DATE
	15% INTERSECTION DESIGN	PN 23.10.20

AMENDMENTS

METADATA
GROUND SURVEY STANDARD:
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

Government of Western Australia
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DESIGNED PN
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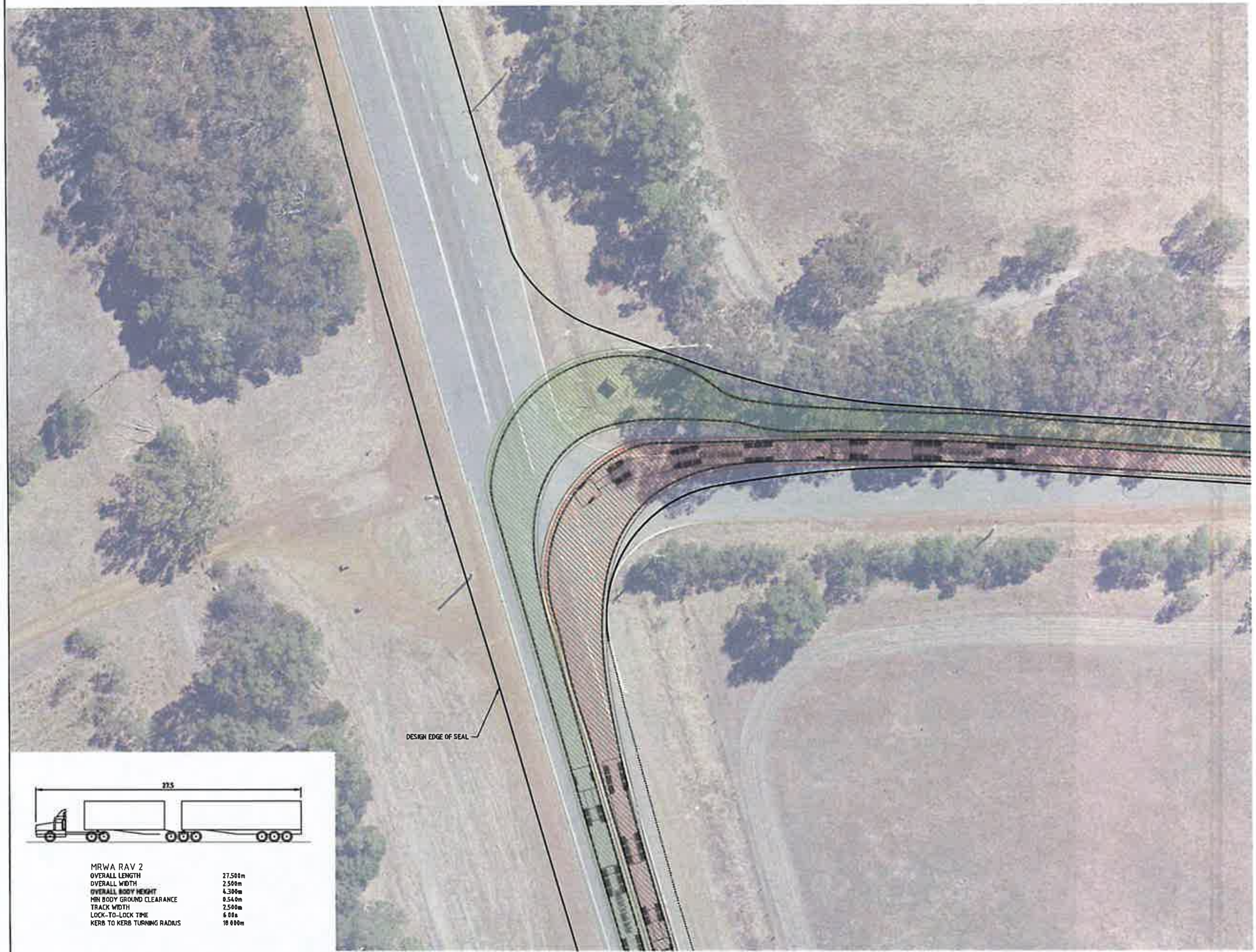
AUSTRAL BRICKS CARDUP
SOUTH WESTERN HWY (H009) / KILN RD (SLK10.98)
15% INTERSECTION DESIGN
SWEPT PATH 1 OF 2

LOCAL AUTHORITY SERPENTINE-JARRAHDALE
MRWA DRAWING NUMBER
2010014-901

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE



LEGEND

- EXISTING EDGE OF SEAL
- DESIGN EDGE OF SEAL
- MRWA RAV 2 27.5m TURNING TEMPLATE TURNING RIGHT
- MRWA RAV 2 27.5m TURNING TEMPLATE TURNING LEFT

SCALE 1:1000

A1

No.	DESCRIPTION	APPROVED & DATE
	15% INTERSECTION DESIGN	PN 23.10.20

AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE

AMENDMENTS

METADATA

GROUND SURVEY STANDARD:
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM:

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FILE NUMBER	

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ROAD_PROJECT&NUMBER
SOUTH WESTERN HWY (H009) / KILN RD (SLK10.58)
15% INTERSECTION DESIGN
SWEPT PATHS 2 OF 2

LOCAL AUTHORITY SERPENTINE-JARRAHDALE, 108
MRWA DRAWING NUMBER
2010014-902

EAQ Consulting

WORKS APPROVAL ODOUR IMPACT ASSESSMENT

AUSTRAL BRICKWORKS (WA) PTY LTD: CARDUP BRICKWORKS

Austral Brickworks (WA) Pty Ltd: Cardup Brickworks

Prepared for: Austral Brickworks

Project Ref: EAQ-20001
January 2020

EAQ Consulting

Environment | Air Quality

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Report Revision(s)				
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Draft_1.0	Draft Released to Client	09.01.2020	J. Hurley	Brickworks
Final	Final Report	21.01.2020	J. Hurley	

Approved for Release		
Name	**Position**	**File Reference**
John Hurley	Principal Air Quality Consultant	EAQ20001-CardupBrickworksWorksApprovalOIA_Final Report

Signature

Contents

Figures

Tables

1 Background

Environmental & Air Quality Consulting Pty Ltd (EAQ) was engaged by Austral Brickworks (WA) Pty Ltd (Brickworks) to undertake a Desktop Odour Impact Assessment (OIA) of Brickworks' Cardup Brick Making Facility (the Site) that will support Brickworks' Works Approval Application for an upgrade of the Site, specifically Plant 3 where the upgrade will see production increased from 200,000 tonnes per annum (tpa) to 250,000 tpa.

The production increase will include an upgrade to the existing lime cascade scrubber where the existing scrubber will be upgraded to a DIFF Bag House Scrubber. Additionally, further upgrades within the production line will include a replacement upgrade of the existing primary crusher within the pit floor.

The Works Approval application process is regulated by the WA Department of Water and Environmental Regulation (DWER) under Part V of the *Environmental Protection Act 1986* (EP Act). The Brickworks, under the EP Act is classified as a Category 41 Prescribed Premise; *Clay bricks or ceramic products manufacturing*, EPA Licence: L9025/2017/1.

Air Emissions modelling (excluding odour) has already been undertaken pursuant to Condition 13 of the EPA Licence. This OIA supports the Air Emissions assessment by determining the risk of odour impacts on the nearest sensitive receptors.

1.1 Regulatory Guidance for OIA

The OIA follows the most recent Government of WA DWER Guideline "Odour Emissions" June 2019 document [1] where the Guideline provides assessment methods for delivering adequate odour data and information to the DWER for the assessment of applications under Part V of the EP Act; where, *"Part V Division 3 of the EP Act provides the Department with mechanisms for regulating odour, by way of conditions on works approvals and licences applied to prescribed premises".*

The DWER employs a risk-based approach to its assessment of applications for instruments under Part V of the EP Act.

In determining the risk posed by odour, DWER considers:

- the location, proximity and sensitivity of receptors;
- the management of odour sources and activities;
- the intensity and offensiveness of the odour;
- potential odour impacts from other nearby sources;
- the topography and complexity of terrain;
- the size and / or complexity of the facility when compared with other Australian operations;
- any unusual configuration of odour sources or technology compared with other Australian operations;

[1] https://www.der.wa.gov.au/images/documents/our-work/licences-and-works-approvals/licensing%20guidelines/Guideline%20-%20Odour%20emissions%20v1.0%20FINAL%20(June%202019).pdf

- whether the proposal is located in a Strategic Industrial Area (SIA);
- the presence of multiple industry categories which may emit odours on the same site;
- current and cumulative impacts from odour; and
- pathways and impacts on sensitive receptors.

The key components of the OIA in following the DWER Guideline are:

a. Screening analysis; and
b. Detailed analysis (where required).

The DWER's odour analysis procedure (step-wise) is as follows:

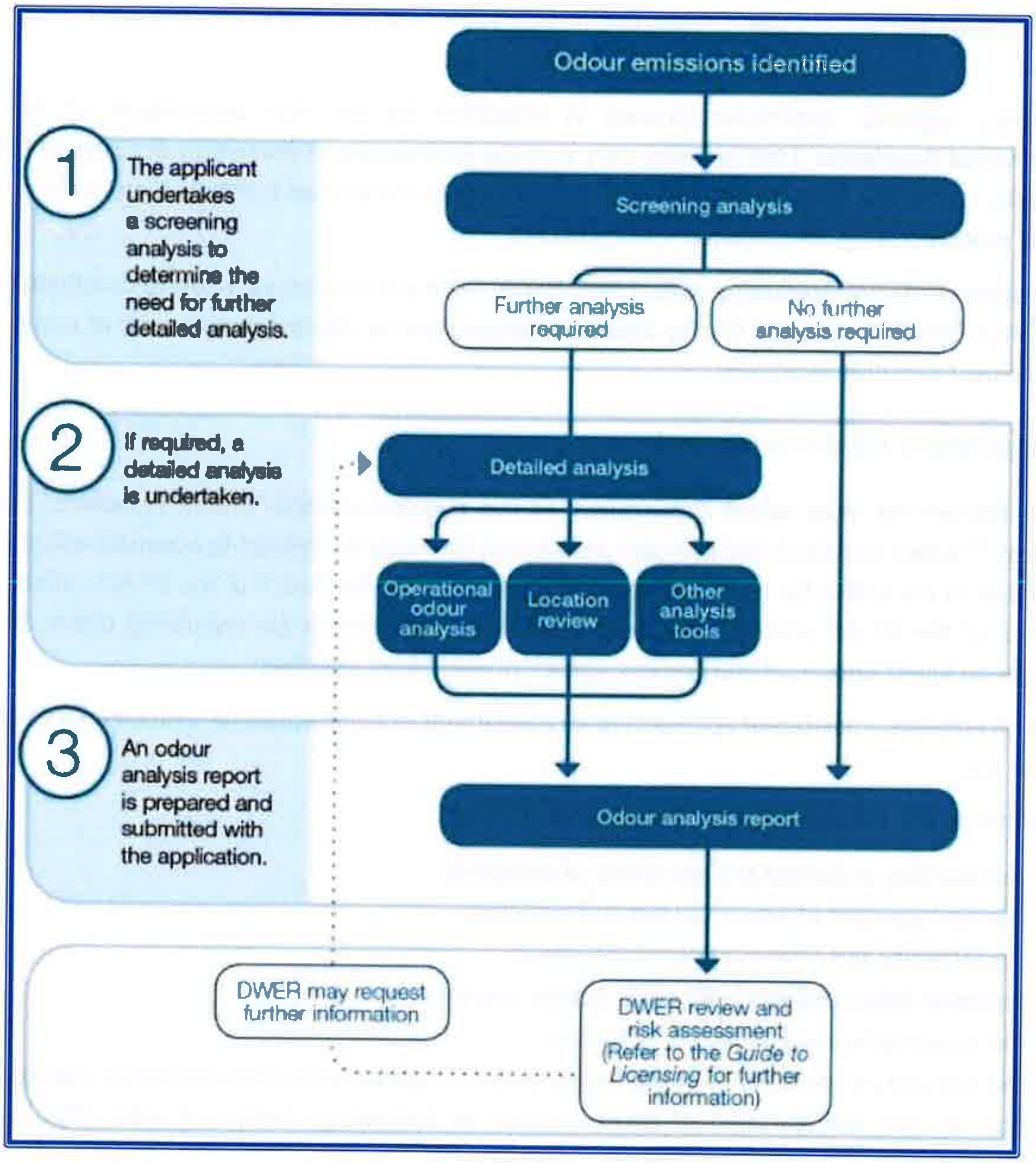

Figure 1-1: DWER Odour Guideline – Odour Analysis Procedure

2 Cardup Brickworks Locality

The Brickworks Site is located on Kiln Road, Byford Western Australia within the Shire of Serpentine-Jarrahdale.

The Site is approximately 35 kilometres (kms) south of the Perth Metropolitan Area, 24kms inland from the nearest coastline and sits at the base of the Darling Escarpment (Scarp).

The land between the Site and the coast is referred to as the 'coastal plain'.

With the Site sitting at the base of the Scarp at an elevation of approximately 80 metres (m) Australian Height Datum (AHD), the terrain elevations dramatically ascend heading west upward along the Scarp

The Scarp influences local wind characteristics by generating both katabatic winds (drainage flows) down the Scarp and along the coastal plain, and Anabatic winds (upslope flows). These winds influence the way in which local winds flow during seasonal variations in temperature and as such can have notable effects on odour impacts downwind of an odour source.

The land use within and immediately surrounding the Site is *Rural* and is not included in the Shire of Serpentine-Jarrahdale's Local Planning Strategy (LPS3). The Site is *Special Use* zoning under the Town Planning Scheme (TPS2).

Immediately north-west of the Site is *Residential* and *Public Open Space* zoning under both the LPS3 and TPS2. These land uses fall into the TPS2 Special Area Name under *Environmental Conditions*.

To the immediate east of the South Western Highway (east of the Site) the land uses is Service Commercial zoning (LPS3) and future Urban Development under TPS2.

Further east of the Site are *Rural Residential* (LPS3) and *Urban Development* (LPS3, TPS2) land uses that are existing and within the future town planning scheme.

The nearest urban development land use is approximately 460 m from the Sites' existing Kiln Stack in a north-west direction. Following the upgrade from a Cascade Scrubber to a DIFF Bag House, the new Bag House exhaust will be located approximately 500 m from the nearest urban development land use.

The Locality of the Site is illustrated in **Figure 2-1** to follow.

The Sites' proposed upgrade configuration layout is presented in **Figure 2-2.**

Figure 2-1: Locality of Cardup Brickworks (Shire of Serpentine-Jarrahdale)

Figure 2-2: Cardup Brickworks Existing Site and planned Upgrades

3 Screening Analysis

The Brickworks' Site (Category 41), with a 200,000 tpa production throughput has a prescribed DWER Screening Distance [2] of 500 m. Given the Site is an existing emissions source, the Screening Analysis as required by the DWER is as follows:

Table 3-1: Screening analysis for existing premises

Description of odour emissions	
Activity / Odour Source	Description, Including proposed controls. New source (Yes/No)
Crusher	Upgraded Crusher of a modern technology to crush raw materials for brick manufacturing. New Source: No (upgrade to existing and new Site location)
Dryer Stacks (2)	Extraction of fumes during the drying process where freshly produced brick pallets are moved into the drying ovens to pre-dry the bricks prior to kiln drying and curing. Dryer fumes are less odorous than Kiln odours. New Source: No
DIFF Bag House Stack	Proposed replacement of existing Lime Cascade Scrubber that receives all Kiln vapours and captures nuisance and fine dust particles (bag house). The bag house design is primarily to ameliorate dust emissions to atmosphere as well as capture vapours. As per EPA Licence the existing Kiln Stack must be no less than 29.5 m above ground, this condition is to be replicated for the DIFF Bag House Stack. New Source: **Yes**
Clay Shed	Storage and blending of clay materials. No odour emissions of significance.
Identification of current odour impacts	
Have odour impacts occurred as a result of the current operational configuration and/or practices? ☒Complaints ☐Odour diaries ☐Field odour assessments ☐Community feedback ☐Other______________	Yes – **Go to Flowchart**

[2] https://www.der.wa.gov.au/images/documents/our-work/licences-and-works-approvals/licensing%20guidelines/Guideline%20-%20Odour%20emissions%20v1.0%20FINAL%20(June%202019).pdf

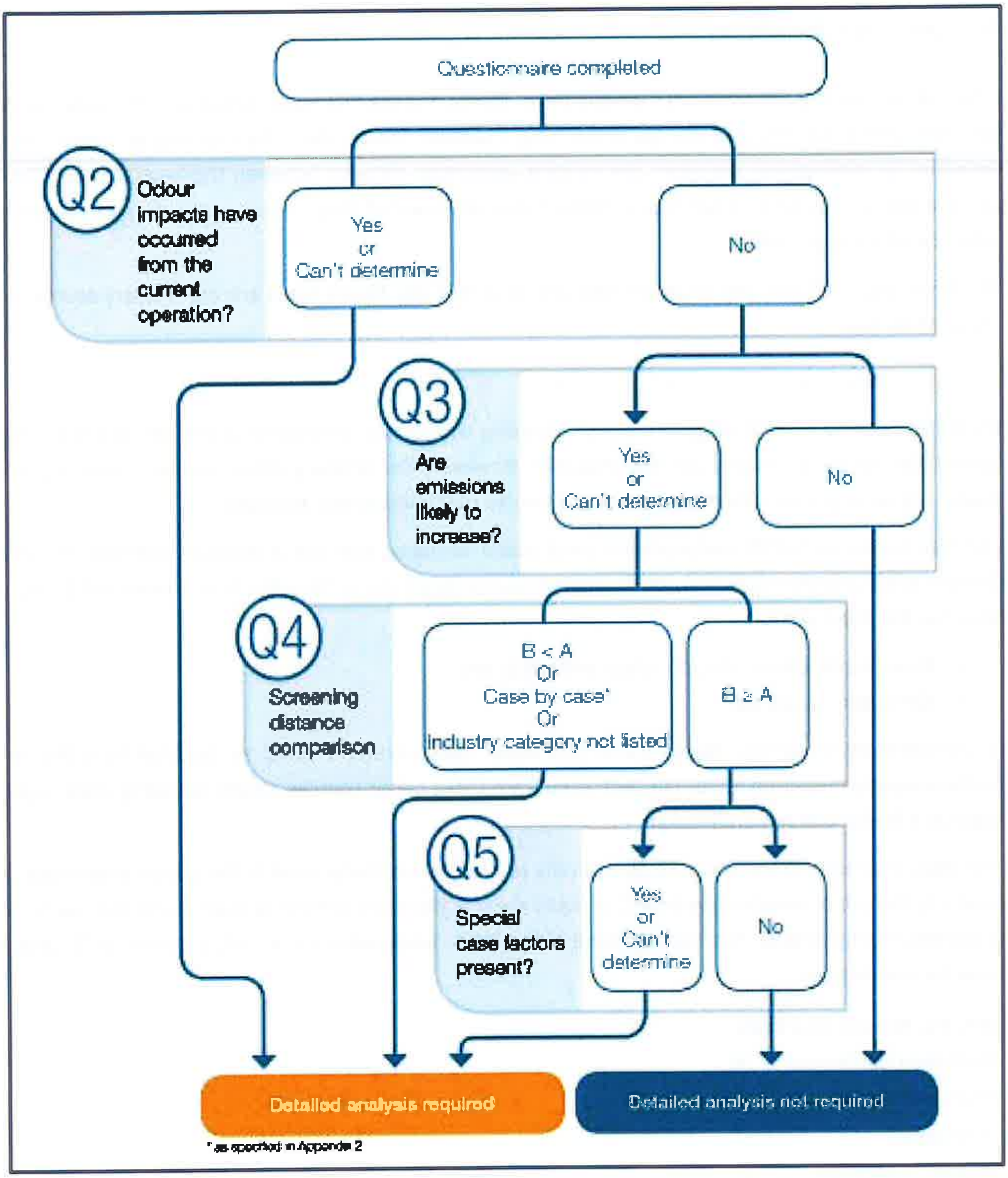

Figure 3-1: Screening analysis for existing premises (flowchart)

On the basis of the screening analysis, a Detailed Analysis is required.

4 Detailed Analysis

Odours from the Site are primarily from the Dryer Stacks and the Kiln Stack. Other odours onsite would be emitted from the clay shed storage and mixing. However, these other odour sources are not primary emissions to atmosphere and given the existing separation distance between the nearest urban land use and that of the existing Kiln Stack (460 m), the likelihood of these other odour sources causing a nuisance offsite is unlikely.

The Dryer Stacks (2) and the proposed upgrade to a DIFF Bag House Stack are the primary sources of odour at the Site.

Existing Brickworks Odour Emission Characters

There has been no current or historic odour sampling and testing undertaken at the Site and therefore quantifiable odour emissions are not available. However, the primary odour emission sources, the stacks, are synonymous with other Austral Brickworks sites' throughout Australia.

EAQ has previously (2019) undertaken a small odour sampling exercise at Austral's Adelaide (Golden Grove) Facility and the measured odour concentrations (Appendix A) from the Dryer Stacks and Cascade Scrubber Kiln Stack were:

- Dryer Stacks (Dextrin) – 250 odour units (ou); and
- Kiln Stack – 2,000 ou.

In consideration of sample decay, these two odour concentrations could be doubled to reflect an instantaneously measured odour concentration from these odour sources. Odour sampling using Liquid Sugar as a binder was not undertaken.

The odour character of the Dryer Stacks typically resembles the binder used in the brickmaking process. Currently the use of dextrin (powdered) or liquid sugar is the most commonly used binder for clay brick manufacturing by Austral. The hedonic tone of the Dryer Stack odours is in EAQ's opinion a '0', which reflect a neutral tone.

Table 4-1: Hedonic Tone Scale

Extremely Unpleasant	-4
Moderate Unpleasant	-3
Unpleasant	-2
Slightly Unpleasant	-1
Neutral	0
Slightly Pleasant	1
Pleasant	2
Moderate Pleasant	3
Extremely Pleasant	4

The Kiln Stack hedonic tone is in EAQ's opinion at least a -2.

It can be seen from the odour data that the Kiln odours are of a higher strength than the Dryer Stack odours. Kiln odours resemble a sharp sulphur dioxide/burnt match character, stifling exhaust (monoxide) sensory response, and as expected a clay/brick character.

Proposed Brickworks Odour Emission Characters

The proposed upgrade of the Site to an increased production throughput of 250,000 tpa will not increase the volume of odour emissions released to atmosphere or add additional odour sources to the Site.

The Cascade Scrubber will be replaced with a modern DIFF Bag House which will have improved particulate capture and vapour emissions control.

An Air Emissions assessment has been previously undertaken by Strategen-JBS&G (Appendix B) for acid gases (SOx, HF and HCL) and the modelled predictions of ground level impacts on human health demonstrated that pollutants were below assessment criteria for surrounding receptors, with exception to maximum hourly HCL and seven-day HF concentrations at one receptor location north-east of the Site. The exceedances at this receptor location were during 'bypass' where the cascade scrubber is offline due to essential maintenance, operational or safety reasons. During bypass the kiln emissions are vented to atmosphere untreated and consequently exceedances may occur.

The odour emissions characters are not expected to change from the existing Dryer Stacks and Kiln Stack emissions, however; the strength of the odours emitted from the new DIFF Bag House Stack are expected to be lower than the existing Cascade Scrubber emissions since the Bag House technology is a current and modern technology, having a performance guarantee with respect to pollutant limiting values, and with a much larger particulate capture and acid gas vapour control.

4.1 Operational Odour Analysis (OOA)

The following Operational Odour Analysis **Tables** summarise the current and proposed processes, odour emissions, process controls, triggers and corrective actions and overall risk rating for odour impacts.

Table 4-2: Summary of Normal Current Operations (Existing Cascade Scrubber)

Odour Source	Operational Emissions	Process Control	Triggers & Corrective Actions	Corrective Action Evaluation	Contingency Actions	Residual Odour Impact Potential			
						Consequence	Likelihood	Impact Potential (onsite)	Impact Potential (nearest receiver)
Normal Operations									
Raw Materials Delivery	Delivery of Clay	Nil – Physical handling of materials may result in uncontrolled dust emissions	Nil	Nil	Nil	Minor	Rare	Low	Low
Crusher	Negligible odour emissions from the crushing of clays and shales.	Nil – Physical handling of materials may result in uncontrolled dust emissions.	Nil	Nil	Nil	Minor	Rare	Low	Low
Clay Shed	Green waste (wet brick offcuts, etc) storage, clay materials for reuse. Negligible low level odours from green wastes and wet clays.	Nil	Nil	Nil	Nil	Minor	Rare	Low	Low
Brick Making	Raw Clay Materials are passed through extruders and moulds and conveyed to automated machines that stack the green bricks onto kiln cars.	Nil	Nil	Nil	Nil	Minor	Rare	Low	Low
Dryer Stacks (2)	Railed kiln cars are moved into the Dryers on a timed basis (automated). Emissions are released via short stacks above roof height.	Cooling air from the Kiln is diverted to the Dryers to an approximate temperature of 420°C where cool air (ambient) is introduced to attain a temperature of approximately 300°C within the Dryers. Dryer emissions are exhausted through roof top short stacks	Temperature controlled conditions regulate the timing of the kiln cars inside the Dryers to achieve the desired moisture levels inside each green brick prior to Firing in the Kiln.	Fan speeds can be modulated. Bricks are tested for moisture on exit and can be recirculated through the Dryer if required.	The kiln is shut down in a controlled manner stopping the airflow to the Dryers.	Moderate	Unlikely	**Medium**	Low
Firing (Kiln)	Dried Bricks moved (via automated rail cars) into Kiln. Preheating zone reaches temperatures of 750°C. Combustion zone reaches approximately 1130°C where acid gases are evolved. Fired bricks are rapidly cooled by air injection and the heat recovered and fed to the Dryers.	Temperature controlled during preheating and Firing. Timing of the Firing and extraction rate of emissions is controlled to ensure that the Firing temperature is maintained to optimum.	Alarms and automated systems alert to inefficient Firing temperatures and/or insufficient or excessive air extraction rates.	Kiln Control System alarms when kiln parameters are outside set levels forcing a change to speed, air flow, Firing and temperature.	Bypass Management Procedure can be enacted to reduce push rate and lower emissions output. The kiln is shutdown in a controlled manner.	Moderate	Unlikely	**Medium**	Low

Limestone Cascade Scrubber	Kiln emissions are controlled and pass through the limestone cascade scrubber. Emissions released at a height of 29.5 m above ground	Limestone scrubber is maintained operationally where the peeling drum peels the limestone creating a new surface for absorption. New limestone is added as required when spent limestone goes to waste.	Regular stack testing (quarterly) for acid gases provides emissions data for criteria pollutants allowing operations to control the peeling drum timing. Daily weighing of limestone waste.	Weighing of limestone waste daily to ensure correct fresh limestone injection to meet volume parameters.	Lime dosage is adjusted as required to meet emission limits.	Moderate	Unlikely	**Medium**	Low

Table 4-3: Summary of Upset Current Operations (Cascade Scrubber Bypass)

Odour Source	Operational Emissions	Process Control	Triggers & Corrective Actions	Corrective Action Evaluation	Contingency Actions	Residual Odour Impact Potential			
						Consequence	Likelihood	Impact Potential (onsite)	Impact Potential (nearest receiver)
Upset Conditions (Bypass)									
Dryer Stacks (2)	Railed kiln cars are moved into the Dryers on a timed basis (automated)	Cooling air from the Kiln is diverted to the Dryers to a maximum temperature of 210^{0}C. Dryer emissions are exhausted through roof top short stacks	Temperature controlled conditions regulate the timing of the kiln cars inside the Dryers to achieve the desired moisture levels inside each green brick prior to Firing in the Kiln.	Fan speeds can be modulated. Bricks are tested for moisture on exit and can be recirculated through the Dryer if required.	The kiln is shut down in a controlled manner stopping the airflow to the Dryers.	Moderate	Unlikely	**Medium**	Low
Firing (Kiln) during Bypass	Dried Bricks moved (via automated rail cars) into Kiln. Preheating zone reaches temperatures of 750^{0}C. Combustion zone reaches approximately 1130^{0}C where acid gases are typically liberated. Fired bricks are rapidly cooled by air injection and the heat recovered and fed to the Dryers	Temperature controlled during preheating and Firing. Timing of the Firing and extraction rate of emissions is controlled to ensure that the Firing temperature is maintained to optimum.	Alarms and automated systems alert to inefficient Firing temperatures and/or insufficient or excessive air extraction rates. Enact Bypass Management Procedure.	Kiln Control System alarms when kiln parameters are outside set levels forcing a change to speed, air flow, Firing and temperature. Bypass Management Procedure is enacted to reduce push rate and lower emissions output to meet emission limits.	The kiln is shutdown in a controlled manner.	Moderate	Unlikely	**Medium**	Low
Lime Dosed Cascade Scrubber (offline)	Kiln emissions are bypassed	Bypass dampers are opened and closed as required.	Alarms and automated systems alert to bypass of scrubber. Bypass Management Procedure enacted.	Bypass Management Procedure is enacted to reduce push rate and lower emissions output to meet emission limits.	The kiln is shutdown in a controlled manner.	Major	Unlikely	**Medium**	**Medium (until the Kiln is shut down)**

Table 4-4: Summary of Normal Proposed Operations (Upgraded DIFF Bag House)

Odour Source	Operational Emissions	Process Control	Triggers & Corrective Actions	Corrective Action Evaluation	Contingency Actions	Residual Odour Impact Potential			
						Consequence	Likelihood	Impact Potential (onsite)	Impact Potential (nearest receiver)
Normal Operations									
Raw Materials Delivery	Delivery of Clay	Nil – Physical handling of materials may result in uncontrolled dust emissions	Nil	Nil	Nil	Minor	Rare	Low	Low
Crusher	Negligible odour emissions from the crushing of clays and shales	Nil – Physical handling of materials may result in uncontrolled dust emissions	Nil	Nil	Nil	Minor	Rare	Low	Low
Clay Shed	Green waste (wet brick offcuts, etc) storage, clay materials for reuse. Negligible low level odours from green wastes and wet clays	Nil	Nil	Nil	Nil	Minor	Rare	Low	Low
Brick Making	Raw Clay Materials are passed through extruders and moulds and conveyed to automated machines that stack the green bricks onto kiln cars	Nil	Nil	Nil	Nil	Minor	Rare	Low	Low
Dryer Stacks (2)	Railed kiln cars are moved into the Dryers on a timed basis (automated). Emissions are released via short stacks above roof height.	Cooling air from the Kiln is diverted to the Dryers to an approximate temperature of 420^{0}C where cool air (ambient) is introduced to attain a temperature of approximately 300^{0}C within the Dryers. Dryer emissions are exhausted through roof top short stacks	Temperature controlled conditions regulate the timing of the kiln cars inside the Dryers to achieve the desired moisture levels inside each green brick prior to Firing in the Kiln.	Fan speeds can be modulated. Bricks are tested for moisture on exit and can be recirculated through the Dryer if required.	The kiln is shut down in a controlled manner stopping the airflow to the Dryers.	Moderate	Unlikely	**Medium**	Low
Firing (Kiln)	Dried Bricks moved (via automated rail cars) into Kiln. Preheating zone reaches temperatures of 750^{0}C. Combustion zone reaches approximately 1130^{0}C where acid gases are evolved. Fired bricks are rapidly cooled by air injection and the heat recovered and fed to the Dryers.	Temperature controlled during preheating and Firing. Timing of the Firing and extraction rate of emissions is controlled to ensure that the Firing temperature is maintained to optimum.	Alarms and automated systems alert to inefficient Firing temperatures and/or insufficient or excessive air extraction rates.	Kiln Control System alarms when kiln parameters are outside set levels forcing a change to speed, air flow, Firing and temperature.	Bypass Management Procedure can be enacted to reduce push rate and lower emissions output. The kiln is shutdown in a controlled manner.	Moderate	Unlikely	**Medium**	Low

DIFF Bag House	Kiln emissions are controlled and pass through the DIFF Bag House. Emissions released at a height of 29.5 m above ground	Lime dosed scrubber is maintained operationally with new lime introduced at high speed and spent lime collected in the fabric filters.	Alarms and automated systems alert to bypass of scrubber. Bypass Management Procedure enacted.	Bypass Management Procedure is enacted to reduce push rate and lower emissions output to meet emission limits.	The kiln is shutdown in a controlled manner.	Moderate	Unlikely	**Medium**	Low

Table 4-5: Summary of Upset Proposed Operations (DIFF Bag House Bypass)

Odour Source	Operational Emissions	Process Control	Triggers & Corrective Actions	Corrective Action Evaluation	Contingency Actions	Residual Odour Impact Potential			
						Consequence	Likelihood	Impact Potential (onsite)	Impact Potential (nearest receiver)
Upset Conditions (Bypass)									
Dryer Stacks (2)	Railed kiln cars are moved into the Dryers on a timed basis (automated)	Cooling air from the Kiln is diverted to the Dryers to a maximum temperature of 210^{0}C. Dryer emissions are exhausted through roof top short stacks	Temperature controlled conditions regulate the timing of the kiln cars inside the Dryers to achieve the desired moisture levels inside each green brick prior to Firing in the Kiln.	Fan speeds can be modulated. Bricks are tested for moisture on exit and can be recirculated through the Dryer if required.	The kiln is shut down in a controlled manner stopping the airflow to the Dryers.	Moderate	Unlikely	**Medium**	Low
Firing (Kiln) during Bypass	Dried Bricks moved (via automated rail cars) into Kiln. Preheating zone reaches temperatures of 750^{0}C. Combustion zone reaches approximately 1130^{0}C where acid gases are typically liberated. Fired bricks are rapidly cooled by air injection and the heat recovered and fed to the Dryers	Temperature controlled during preheating and Firing. Timing of the Firing and extraction rate of emissions is controlled to ensure that the Firing temperature is maintained to optimum.	Alarms and automated systems alert to inefficient Firing temperatures and/or insufficient or excessive air extraction rates. Enact Bypass Management Procedure.	Kiln Control System alarms when kiln parameters are outside set levels forcing a change to speed, air flow, Firing and temperature. Bypass Management Procedure is enacted to reduce push rate and lower emissions output to meet emission limits.	The kiln is shutdown in a controlled manner.	Moderate	Unlikely	**Medium**	Low
DIFF Bag House (offline)	Kiln emissions are bypassed	Bypass dampers are opened and closed as required. Scrubber shut down to protect the bags.	Alarms and automated systems alert to bypass of scrubber. Bypass Management Procedure enacted.	Bypass Management Procedure is enacted to reduce push rate and lower emissions output to meet emission limits.	The kiln is shutdown in a controlled manner.	Major	Unlikely	**Medium**	**Medium (until the Kiln is shut down)**

The unknown within this OIA is the improvement in vapour emissions from the upgraded DIFF Bag House Stack. However, the technology does have a performance guarantee with respect to pollution limits for criteria pollutants which in turn will provide reliable odour emissions control.

Given the Stack height must be at least 29.5 m above ground; this height represents assumedly a wake-free configuration where emissions from this stack would not be prematurely brought to ground by building wake effects below it. Additionally, the emissions temperature of this stack is significantly high and the plume itself is buoyant. As a result impacts close to the Site from the DIFF Bag House will fall back to ground at distances farther away from the Site than, for example, the Dryer Stacks which are wake affected given their low height and moderately low exit temperatures.

Since operations within the Dryers will remain unchanged, any ground level odours observed from these Dryer Stacks, once the Site is upgraded, will not change from current operational conditions.

FIDOL factors are also important in considering the risk of odour impacts on sensitive receptors. These factors are dimensions of odour nuisance, and are:

- Frequency of odour impacts;
- Intensity (or strength) of the odour;
- Duration of the exposure events;
- Offensiveness of the odour; and
- Location of the impacts (the sensitivity of the receiving environment).

When considering the FIDOL factors within this OIA, the Dryer Stack emissions are less likely to cause an offsite odour nuisance given their low odour concentrations, their low odour intensity and relatively neutral hedonic tone. Moreover, the existing distance between the Dryer Stacks and the nearest urban receiver (460 m) is in EAQ's opinion sufficient enough to overcome nuisance odour impacts from these Dryer Stacks. This was the findings from EAQ's investigation of Austral's Adelaide (Golden Grove) Facility in 2019 where Dryer odours were only observable in the near-field of approximately 100 m from the nearest Dryer Stack.

4.2 Location Review

The Site is allocated at the base of the Scarp. The terrain elevation ascends from 80 m (AHD) to >300 m as you travel east from the Site and up and over the Scarp.

The Scarp will have a notable effect on air emissions from the Site, in particular those emissions from the DIFF Bag House Stack. Differences in air temperatures above and below the Scarp will trap the emissions from the Site near to the ground. As a result the katabatic drainage downward from the top of the Scarp, and Anabatic flows up the Scarp will influence how the emissions are dispersed. Recirculation of the emissions nearer to the Scarp is expected and a resultant increase in concentrations is likely to occur due to this recirculation.

Local Terrain incorporating the Scarp is presented in **Figure 4-1**.

The most recent Shire of Serpentine-Jarrahdale Local Planning Strategy (Draft, July 2019), together with the Town Planning Scheme 2 indicates that the Site and its surrounding locality will remain Special Use and zoned Rural. The Draft Local Planning Strategy can be viewed at https://www.sjshire.wa.gov.au/assets/Uploads/OCM/OCM-2019/OCM-19-August-2019/10.1.2.4.reduced.pdf.

The Local Planning Strategy and Town Planning Scheme 2 indicate that future development, in particular urban development, will occur to the north and west of the Site and will be centred on the township north of the Site.

The existing location of the Site and the potential for urban development to encroach the Site to distances less than 500 m from the proposed DIFF Bag House Stack is unforeseeable in the immediate and longer term future. However, the existing separation distances between the Site and Urban and Rural receptors are likely to be sufficient to provide adequate protection from nuisance odours once the Site is upgraded.

4.2.1 Local Meteorological Analysis

The nearest Bureau of Meteorology (BoM) Automatic Weather Station (AWS) is located at Jandakot AERO which is approximately 20kms north, north-west of the Site and at an altitude of approximately 30m i.e. within the coastal plain.

The nearest BoM AWS that is likely to represent wind conditions related to Scarp influences is the Perth Airport which is approximately 37kms north of the Site at an elevation of approximately 20m.

Whilst the Perth Airport AWS is close to the Scarp, there is likely to be localised meteorological conditions that differ from the Site location. The Perth Airport AWS shows dominant north-east and south-west airflows.

EAQ has produced a localised meteorological dataset using The Air Pollution Model (TAPM, CSIRO) v4.04 over a recent five (5) year meteorological period.

A Wind Rose analysis of the inner most nest of the TAPM meteorological output is presented in **Figure 4-2**. Of importance are the wind direction trends which show strong easterly winds likely to be influenced by katabatic drainage. Additionally, the general prevailing winds are from the south-east, in particular under wind speeds less than 4 metres per second.

On the basis of this meteorological dataset, the origin of odour complaints is likely to arise from receivers to the north-west of the Site. The surface roughness within the proximity of the Site is likely to improve dispersion of ground level odours westerly due to increased mechanical turbulence, however; elevated stack sources such as the Kiln Stack will be pushed further westward under normal prevailing wind conditions.

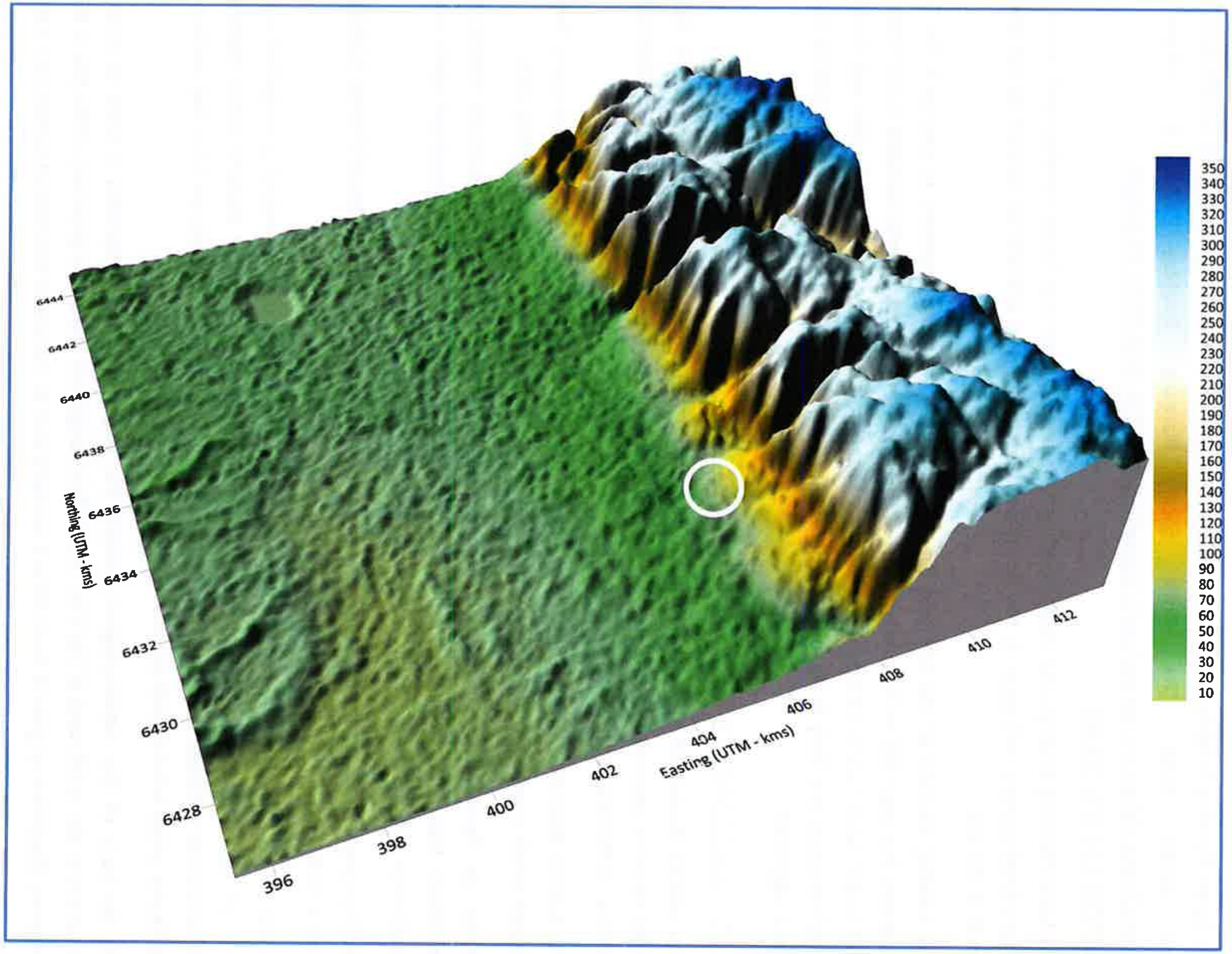

Figure 4-1: Terrain Characteristics of Locality and Brickworks Site Location

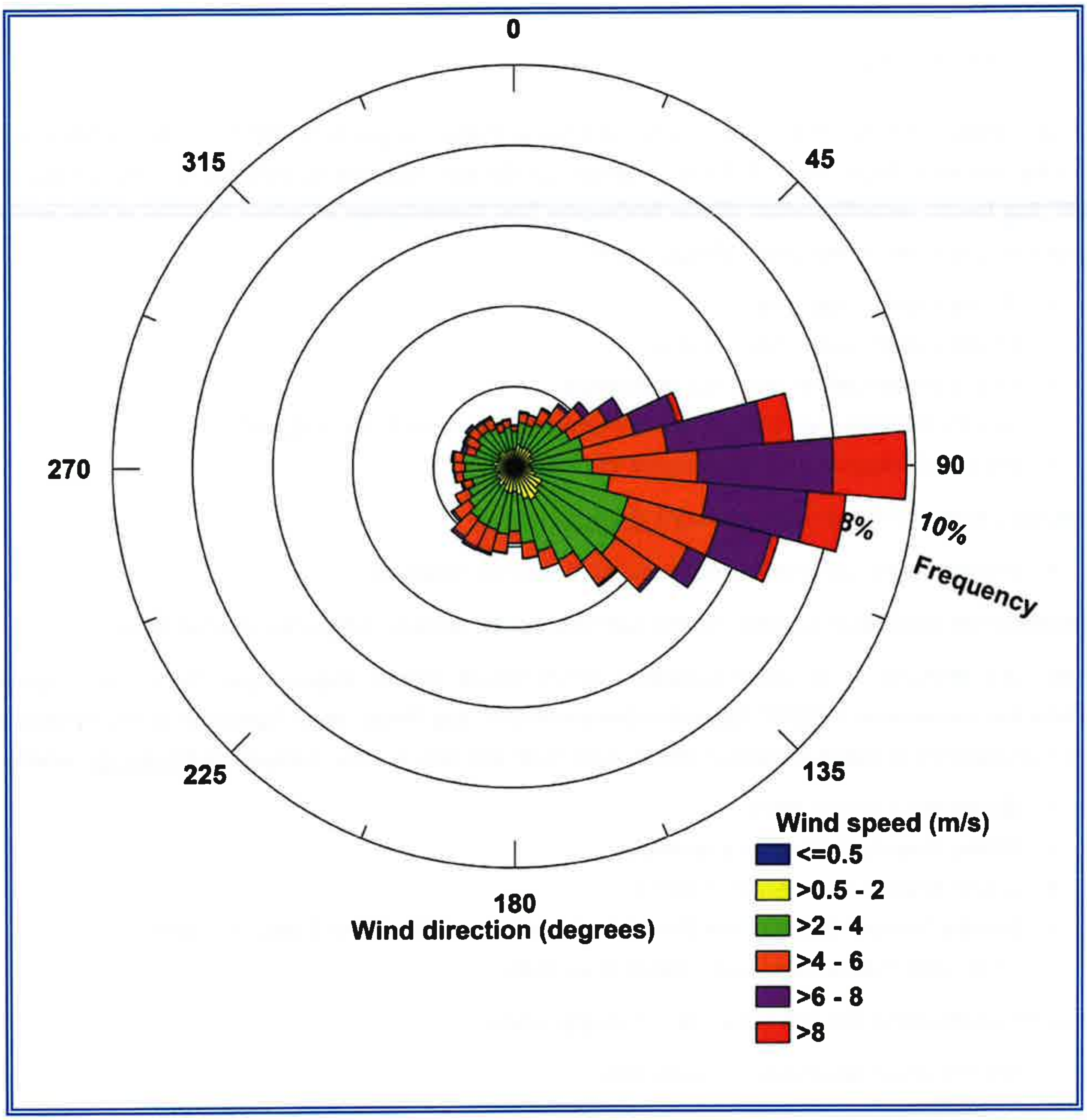

Figure 4-2: Wind Characteristics of Direction and Velocity Frequencies (5-Year Annual Trend)

4.3 Risk Evaluation

In consideration of the (then) Department of Environmental Regulation (DER)'s Guidance Statement: Risk Assessments (February 2017), the proposed production increase to 250,000 tpa and subsequent DIFF Bag House reconfiguration of the Brickworks Site *Consequence* of odour impacts at the nearest rural and future urban receptor is Minor; where:

- Onsite impacts: low-level;
- Offsite impacts local scale: minimal;
- Offsite impacts wider scale: not detectable;
- Specific Consequence Criteria (for Environment) are likely to be met; and
- Local scale impacts: low-level impact to amenity.

And, the *Likelihood* of the risk occurring is Unlikely, where:

- The risk event will probably not occur in most circumstances.

The above risk evaluation is under normal operations with no bypassing or upset conditions.

Under the scenario of an upset condition, which would include bypass operations, the proposed production increase to 250,000 tpa and subsequent DIFF Bag House reconfiguration of the Brickworks Site *Consequence* of odour impacts at the nearest rural and future urban receptor is Moderate; where:

- Onsite impacts: mid-level;
- Offsite impacts local scale: low-level;
- Offsite impacts wider scale: minimal;
- Specific Consequence Criteria (for Environment) are at risk of not being met; and
- Local scale impacts: mid-level impact to amenity.

And, the *Likelihood* of the risk occurring is Possible, where:

- The risk event could occur at some time.

The above risk evaluation is under upset conditions to include bypassing.

Based on the above, and in consideration of the OOA (refer Section 4) the future risk is considered to be **Medium** and under a Medium risk the incidence of odour impacts is expected only to occur under upset conditions and/or bypassing operations.

It should be noted though that bypass operations are typically planned and short lived with respect to normal daily operations.

A Medium risk, in accordance with the DER's Risk Assessment document, is an Acceptable risk, generally subject to regulatory controls. The DER's Risk Treatment in this case is "Risk event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied".

4.4 Additional Detailed Analysis Methods

Other tools in the Odour Guidance for a Detailed Analysis are not necessary for this desktop OIA. It is expected that the future odour emissions from the increased production and subsequent upgrade of the pollution control DIFF Bag House technology that odour emissions are expected to decrease under normal operations.

Relative dispersion modelling of the existing and proposed Brickworks Site can be undertaken to show if the ground level mass odour footprint will have a demonstrable impact on nearby receptors. However, the Air Emissions assessment by Strategen-JBS&G showed that criteria pollutants on average met the guidelines for ground level impacts and that only under upset conditions of bypass were there shown to be an exceedances of these pollutants.

5 Summary of Odour Impact Assessment

- Brickworks proposes to upgrade their Cardup Brickworks Site to increase production from 200,000 tpa to 250,000 tpa;
    - The upgraded Site will;
        - Upgrade its Crusher technology; and
        - Replace the existing Cascade Scrubber with an upgraded DIFF Bag House Treatment technology.
- The current and future land use surrounding the Site is rural and urban with the nearest urban receptor at a distance of approximately 460 m north of the Site;
- There is no estimated increase in mass odour emission rates from the proposed upgrade;
- There is no long term planning designed to encroach the Site with urban receptors within a distance of 500 m from the proposed DIFF Bag House stack;
- The normal and foreseeable upset conditions for the upgraded Site will not change from current operations;
- The Site contingency actions during bypass and maintenance upset conditions have been proven to be effective in minimizing odour impacts to discrete complaints, additionally, the Brickworks' environmental officer(s) have consistently been shown to address all complaints in a timely and diligent manner;
- Historic Complaints of the existing Brickworks Site have shown that the Site is sufficiently managed and maintained, where:
    - **2017:** two (2) complaints related to odour from the existing Kiln Stack;
        - Odour source found to be caused by commissioning of the existing scrubber.
    - **2018:** two (2) complaints related to odour from the existing Kiln Stack;
        - Odour source found to be caused by ongoing commissioning of the existing scrubber; and
        - Second complaint not able to be tracked to the Site given operations were as normal.

6 Summary Table for Detailed Analysis

Detailed analysis tools	Tick if used	Comments
Emission source		
Operational odour analysis (OOA) (priority tool)	☒	Section 4.1, page 14
Odour source assessment (OSA)	☐	No – Mass Odour Emission Rates not increasing
Pathway and receptor		
Location review ("highly recommended")	☒	Section 4.2, page 19
Odour field assessment (OFA)	☒	n/a other than standard site visit for familiarization
Complaints data analysis	☐	Limited complaints over past 2 years
Community surveys	☐	Not required - as above for complaints
Comparative dispersion modelling	☐	As required, but not within this OIA
Comparison with similar operations	☒	Limited only to Odour Concentration measured at Adelaide (Golden Grove) Facility

EAQ Consulting

Appendix A

Austral Brickworks Golden Grove Odour Concentration Results

Ektimo

Address (Head Office)
7 Redland Drive
MITCHAM VIC 3132

Postal Address
52 Cooper Road
COCKBURN CENTRAL WA 6164

Office Locations
VIC NSW WA QLD

Freecall: 1300 364 005
www.ektimo.com.au
ABN: 86 600 381 413

190523

CERTIFICATE OF ANALYSIS

Testing Laboratory:	Ektimo ABN 86 600 381 413
Laboratory Location:	52 Cooper Road, Cockburn Central, WA 6164
Report Number:	WO-00045
Job Number:	R007972
Date of Issue:	25/07/2019
Attention:	John Hurley
Company Name:	EAQ Consulting
Address:	PO Box 897 Joondalup DC, WA 6919
Date Samples Received:	24/07/2019
Number of samples received:	2
No of samples analysed:	2
Test Method(s) Used:	AS4323.3
Olfactometer Calibration Date:	February 2019

QC Acceptance Criteria:

Parameter	Criteria	Result	Pass/Fail
Panel Butanol Threshold	20-80 ppb	34.72	PASS
r	≤ 0.477	0.262	PASS
10r	≤ 3.00	1.83	PASS
A	< 0.217	0.072	PASS
Max Room Temperature	< 25°C	21.00	PASS
Temperature Variation	< 3°C	0	PASS

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

Comments: NA

SUBCONTRACTOR INFORMATION (IF APPLICABLE)

Testing Laboratory:
Laboratory Accreditation Number :
Report Number:
Date of Issue:

Test Method(s) Used:

REPORT AUTHORISATION

Tom Manton
Ektimo Signatory

NATA

NATA Accredited Laboratory 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports

RESULTS

Date received: 24/07/2019
Date and time of analysis: 24/07/2019, 1100-1130
Date of last calibration: February 2019

Sample ID	Dilution ratio		Odour concentration (ou)	Confidence Interval* (ou)	Hedonic Tone	Odour Character
Dryers	1,	All sample gas	250	170 - 360	ND	ND
Stack	1,	All sample gas	2,000	1,400 - 2,900	ND	ND

* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

QUALITY CONTROL / QUALITY ASSURANCE INFORMATION

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world –wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

DEFINITIONS

The following symbols and abbreviations may be used in this test report:

~	Approximately
<	Less than
>	Greater than
≤	Less than or equal to
≥	Less than or equal to
ND	Not determined
Odour Emission Rate	The product of the odour level of the waste discharged and the volume rate of the discharge (in wet cubic metres per minute referred to a temperature of 0°C and a pressure of 101.325 kilopascals). Expressed as Odour Unit Volumes per Minute, ouv/min.
Odour Threshold	The concentration of a substance, or of a mixture of substances, which is distinguished from odourless air at 50% panel response. By definition, the odour threshold corresponds to an odour concentration of 1 odour unit per m³.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).

Ektimo

EAQ Consulting

Appendix B

Strategen-JBS&G Air Emissions Assessment

strategen JBS&G

Austral Brickworks (WA) Pty Ltd
Air dispersion model update
Cardup Brickworks

15 October 2019

56954/125317 (Rev 0)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

www.jbsg.com.au

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Abbreviations

Term	Definition
GLC	Ground level concentration
USEPA	United States Environmental Protection Agency
AERMOD	A steady-state plume model
AERMAP	AERMAP is a terrain pre-processor for AERMOD
DWER	Department of Water and Environmental Regulation
NASA	National Aeronautics and Space Administration (United States)

1. Introduction

1.1 Background

Austral Brickworks (WA) Pty Ltd (Austral) own and operate the Cardup Brickworks located on Kiln Road in Byford, approximately 10 km south of Armadale and 35 km southeast of Perth. The brickworks produce a variety of bricks and has the capacity to produce approximately 200,000 tonnes of bricks per year.

In May 2012, the brickworks was placed into care and maintenance. In January 2016, Works Approval W5925/2015/1 was granted by the Department of Water and Environmental Regulation (DWER) for Austral to construct a new limestone scrubber for the existing kiln (Kiln 3) and to upgrade existing infrastructure and commission new and existing infrastructure.

The brickworks was restarted in January 2017 to commission the new scrubber and infrastructure. Commissioning under the works approval was completed in April 2018 after an extended commissioning period due to significant project delays and setbacks.

In June 2019, DWER granted Licence L9025/2017/1 for the operation of the brickworks. As part of the Licence application process, DWER completed an assessment of emissions to air from the Kiln Exhaust Stack and two Dryer Stacks using emissions monitoring data obtained during commissioning and air dispersion modelling that was completed to support the works approval and licence applications.

The key findings of DWER's assessment of emissions to air from the brickworks were (DWER 2019):

1. The maximum predicted ground level concentration of combined acid gases at sensitive receptors was 50.9 µg/m^3 or 51% of the relevant health guideline.
2. The maximum predicted 24-hour ground level concentration of hydrogen chloride (HCl) was 35.1 µg/m^3 or 35% of the relevant health guideline.
3. Predicted ground level concentrations (GLCs) of hydrogen fluoride (HF) and sulfur dioxide (SO_2) were well below relevant health guidelines.

However, the assessment noted that the air dispersion model showed a 'lack of clarity and terminology' and did not include a consideration of acid gas emissions from the two dryer stacks.

The assessment concluded that air emission impacts at sensitive receptors would have a minor consequence and were unlikely to occur, and, therefore, presented a medium risk. DWER placed controls (conditions) on the Licence including emission to air limits for HCl, HF and particulates from the kiln exhaust stack and quarterly stack testing of emissions from the kiln exhaust stack.

The licence also includes a requirement for Austral to carry out additional air emissions investigations; specifically, Condition 13 of the Licence requires Austral to update the air dispersion model that was used to support the works approval and licence applications.

> Condition 13:
>
> *The Licence Holder must by 31 July 2019 retain the services of a person qualified and experienced in the area of modelling of air emissions to predict ground level concentrations to:*
>
> a. *update the model submitted in Austral Bricks – Cardup Brickworks Works Approval and Licence Supporting Document, Strategen October 2015...*

1.2 Purpose and scope

This report describes the methodology, emissions inputs, meteorology, and results of the updated air dispersion modelling of emissions from the brickworks. The scope of the report is in accordance with the specification provided in Condition 14 of the Licence.

> Condition 14:
>
> *The report prepared pursuant to Condition 13 must include:*
>
> a. *measured emission rates for HF, HCl and Oxides of Sulphur from the kiln stack exhaust under normal operating conditions and during bypass as input data and clearly stating which emission rates are adopted for the model;*
>
> b. *the contribution of emission of acid gas emissions from dryer stacks on predicted ground level concentrations;*
>
> c. *predicted ground level concentrations and contours of the gases individually and as a total acid gas level;*
>
> d. *defined terminology when reporting results for the modelling grid and sensitive receptors; and*
>
> e. *an assessment of predicted ambient concentrations of acid gases at sensitive receptors and grid points against the following standards:*
>
>   i. *combined acid gas concentration of 500 µg/m^3 as a 10-minute average;*
>
>   ii. *combined acid gas concentration of 100 µg/m^3 as a 24 hour average;*
>
>   iii. *HCl concentrations of 100 µg/m^3 as a 24 hour average;*
>
>   iv. *HCl concentrations of 140 µg/m^3 as a 1 hour average;*
>
>   v. *HF concentrations of 100 µg/m^3 as a 24 hour average: and,*
>
>   vi. *HF concentrations of 1.7 µg/m^3 as a 7 day average.*

1.3 Site description

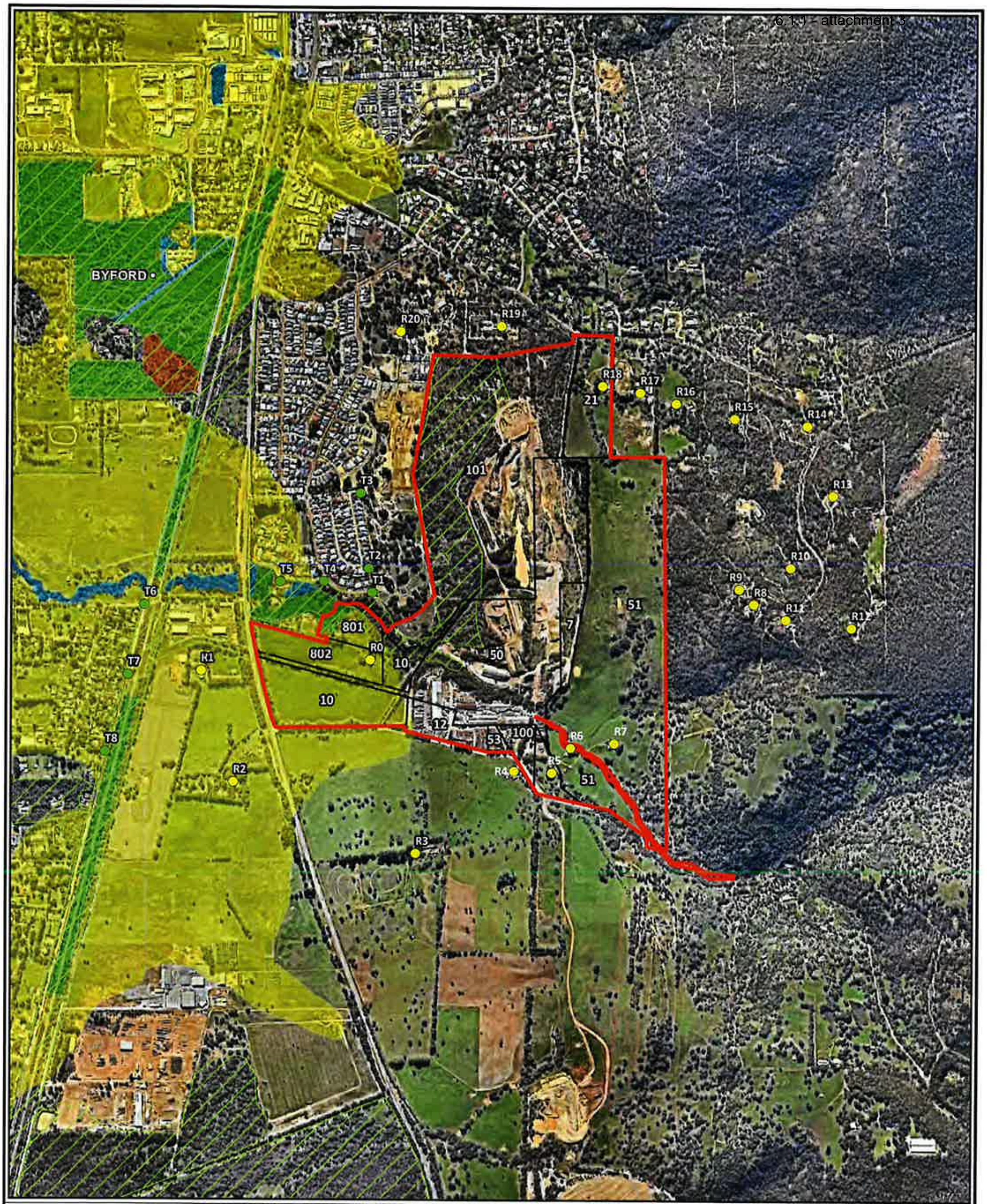
The brickworks is located on Kiln Road in Byford in the Shire of Serpentine-Jarrahdale, approximately 10 km south of Armadale and 35 km southeast of Perth.

Land uses surrounding the site include established and developing residential urban areas, rural properties, and natural areas including Bush Forever sites and wetlands. Cardup Brook also flows through the brickworks.

Sensitive receptors in the vicinity of the brickworks are shown in Figure 1.1.

1.4 Topography

The brickworks is located on the Swan Coastal Plain at the foot of the Darling Scarp as shown in Figure 1.2. The brickworks is sited at approximately 80 m above sea level. To the east of the brickworks, the land rises steeply up the scarp to a height of over 280 m.



Legend:

- Prescribed premises boundary
- Cardup property boundaries
- Bush Forever site (DOP)

Geomorphic Wetlands (DBCA)

- Conservation
- Resource Enhancement
- Multiple Use
- Not Applicable
- Rural receptor
- Urban receptor

Scale 1:20,000 at A4 — 0 250 500 metres		
Coord. Sys. GDA 1994 MGA Zone 50		SENSITIVE RECEPTORS
Job No: 56954		
Client: Austral Bricks		FIGURE 1.1
Version: A	Date: 05-Sep-2019	strategen JBS&G
Drawn By: cthatcher	Checked By: JB	

File Name: W:\Projects\1)Open\Austral Bricks\56954 Cardup air quality model update\GIS\Maps\R01 Rev A\56954_01_1_SensitiveReceptors.mxd
Image Reference www.nearmap.com© - Imagery Date: 16 July 2019

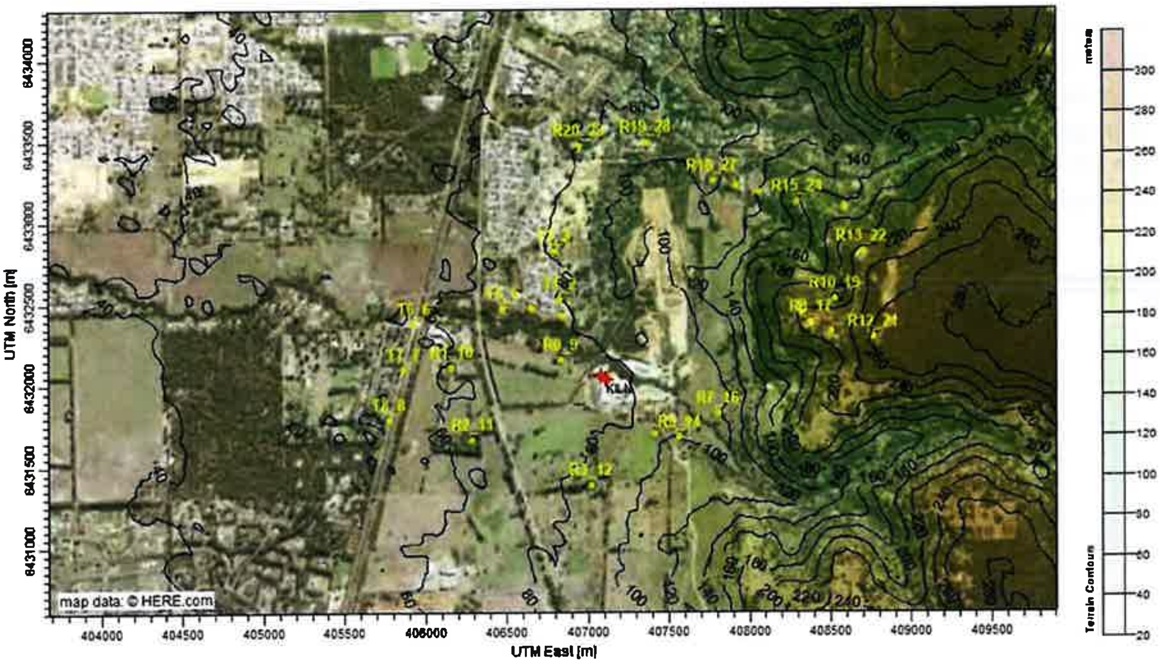


Figure 1.2: Local topography (20 m contours)

1.5 Premises description

The brickworks has the capacity to produce approximately 200,000 tonnes of clay products per year using the following process steps:

Clay preparation: Different clays and shale are crushed, ground and blended with water. Materials to improve the mechanical properties and colour of the finished product such as limestone, lime, sand and sugar are also added.

Product shaping: The blended raw materials are shaped using moulds or by extrusion, forming green bricks. During or after shaping, additives (such as saw dust or pigments) are applied to the surface of the green bricks to achieve desired colour or texture effects.

Drying: The green bricks are stacked onto kiln cars which enter one of two dryers; the dryers are heated by hot air from the cooling zone of the kiln. Dryer temperatures reach a maximum of 210 °C. and exhaust gases from the dryers are discharged to atmosphere by vents on the building roof.

Firing: The dried bricks pass through a high temperature tunnel kiln. The bricks are preheated in the first zone at 750 °C, followed by firing in the combustion zone at approximately 1050 to 1180 °C. The firing process is the main source of emissions to air as fluoride, chloride, oxides of sulfur (SOx) and other elements naturally present in clay are released in the kiln, along with water vapour and carbon dioxide from the combustion of natural gas. The fired bricks are rapidly cooled to approximately 700 °C by air injection in the rapid cooling zone with high temperature take-off air from the rapid cooling zone is recovered and fed to the dryers.

Gas treatment: The kiln exhaust gases pass through a cascade scrubber dosed with limestone. Acidic pollutants (HF, HCl, SOx) flow through the scrubber and react with the limestone which is then collected in the solids discharge hopper and removed with a screw conveyor. The reacted surface of the limestone chippings is abraded in a rotating screen drum (peeling drum) and the remaining limestone chips reused in the scrubber.

The scrubber is almost always available when the brickworks is operating at required production rates. However, in some cases such as for essential plant maintenance, operational or safety reasons, gases from the kiln bypass the scrubber. During bypass, Austral implement a Bypass Management Plan which reduces the kiln push rate (i.e. the number of cars containing bricks fired in the kiln) and the gaseous emissions from the kiln. Gases from the scrubber are emitted to atmosphere from a 29.5 m high stack.

2. Modelling methodology

2.1 Air dispersion model

Air dispersion modelling has been carried out using the American Meteorological Society / Environmental Protection Agency Regulatory Model (AERMOD), version 18081 (USEPA 2018). AERMOD is a United States Environmental Protection Agency (USEPA) recommended air dispersion model that has been designed to support regulatory modelling programs in the United States. It is widely used throughout Australia and internationally for regulatory modelling applications. Informal advice from DWER is that AERMOD is the current preferred model for assessments of air quality impacts for new projects in Western Australia.

AERMOD is a current-generation air dispersion model that incorporates concepts such as planetary boundary layer theory and advanced methods for handling complex terrain. AERMOD incorporates the Plume Rise Model Enhancements (PRIME) building downwash algorithms, which provide a more realistic handling of downwash effects than previous approaches.

2.2 Meteorological data

The Bureau of Meteorology supplied five years of meteorological data (2010 to 2014) from the Perth Airport site situated approximately 35 km to the north (BOM 2019). Those data were utilised for modelling at the brickworks that supported the application for Works Approval W5925/2015/1 and have been used for the current modelling for consistency. Figure 2.1 presents the wind roses for the available data, as four seasons and a total annual rose. These were derived from the hourly average wind speed and direction data.

Winds in the region are predominantly east and westerly winds as depicted in the wind roses. The wind roses also show the seasonal wind fluctuations. During summer and spring, the winds are predominantly from the southwest and east, and relatively strong. In contrast, during winter, the winds are predominantly from the northeast, and winds tend to be lighter in strength.

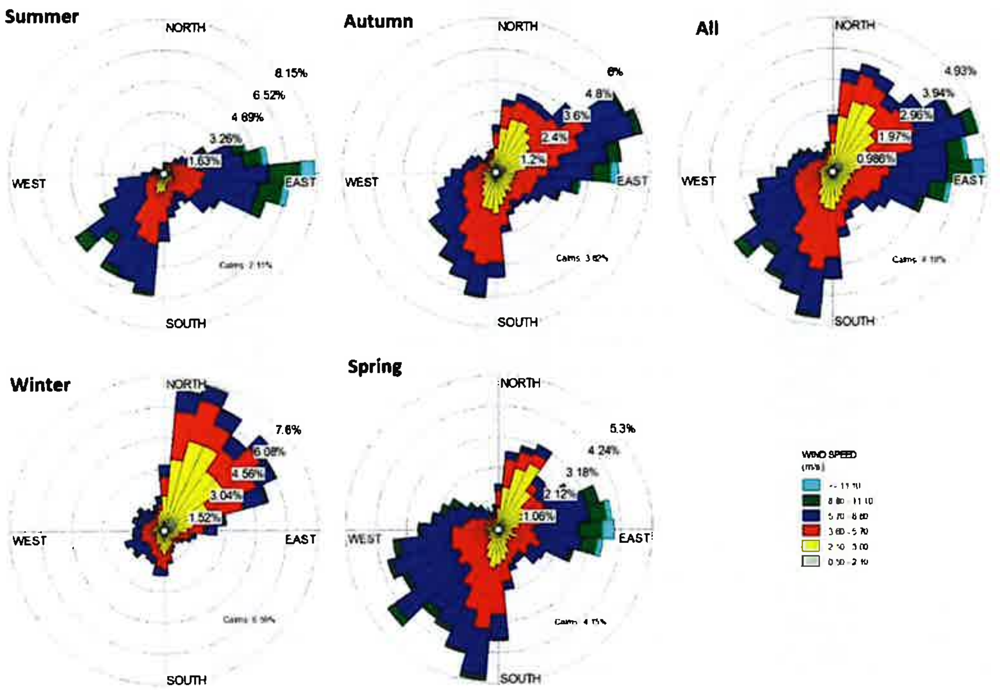


Figure 2.1: Seasonal (summer-spring) and annual wind roses at Perth Airport (2010-2015)

2.3 Model approach

Air dispersion modelling was used to predict GLCs across the model domain from the following emissions scenarios:

1. Normal operation.
2. Scrubber bypass.

2.4 Model parametrisation

AERMOD was used to predict GLCs across the model domain of 6 km x 6 km. A fine grid of 200 m x 200 m cells was used within the domain because of the proximity to local residences. Terrain elevation data, at 30 m resolution across the model domain, was obtained from the US National Aeronautics and Space Administration's (NASA) Shuttle Radar Topography Mission (SRTM3/SRTM1), and incorporated into AERMOD using the AERMAP terrain processor.

Rural dispersion coefficients were used in the AERMOD simulation because of the surrounding land use and buffer zone to the residential houses in the immediate area, which provides a reduced heat-island effect compared to urban areas. Building wake effects were included using the Building Profile Input Program (BPIP) using building data provided by Austral.

Twenty nine (29) specific sensitive receptors sites were used to illustrate the predicted impacts to residential areas close to the brickworks. Receptor locations are shown in Figure 1.1 and Table 2.1.

Table 2.1: Sensitive receptors

Receptor ID	X	Y	Type
R0	406838	6432155	Rural
R1	406162	6432110	Rural
R2	406293	6431665	Rural
R3	407024	6431380	Rural
R4	407411	6431696	Rural
R5	407567	6431677	Rural
R6	407630	6431779	Rural
R7	407808	6431820	Rural
R8	408379	6432383	Rural
R9	408320	6432443	Rural
R10	408526	6432530	Rural
R11	408507	6432322	Rural
R12	408769	6432291	Rural
R13	408692	6432818	Rural
R14	408589	6433097	Rural
R15	408298	6433124	Rural
R16	408062	6433184	Rural
R17	407918	6433227	Rural
R18	407769	6433253	Rural
R19	407360	6433491	Rural
R20	406954	6433468	Rural
T1	406846	6432426	Urban
T2	406832	6432523	Urban
T3	406798	6432823	Urban
T4	406653	6432470	Urban
T5	406478	6432468	Urban
T6	405931	6432374	Urban
T7	405867	6432094	Urban
T8	405778	6431786	Urban

3. Atmospheric emissions

3.1 Emission sources

The kiln exhaust dryer exhaust gases and are the principal emission source associated with the operation of the brickworks. The pollutants of concern for this assessment are acid gases (HCl, HF and SO_2).

No nearby significant sources of acid gases were identified in the National Pollution Inventory database. Therefore, the model has considered the brickworks in isolation.

The emission sources used in the model are shown on Figure 3.1.

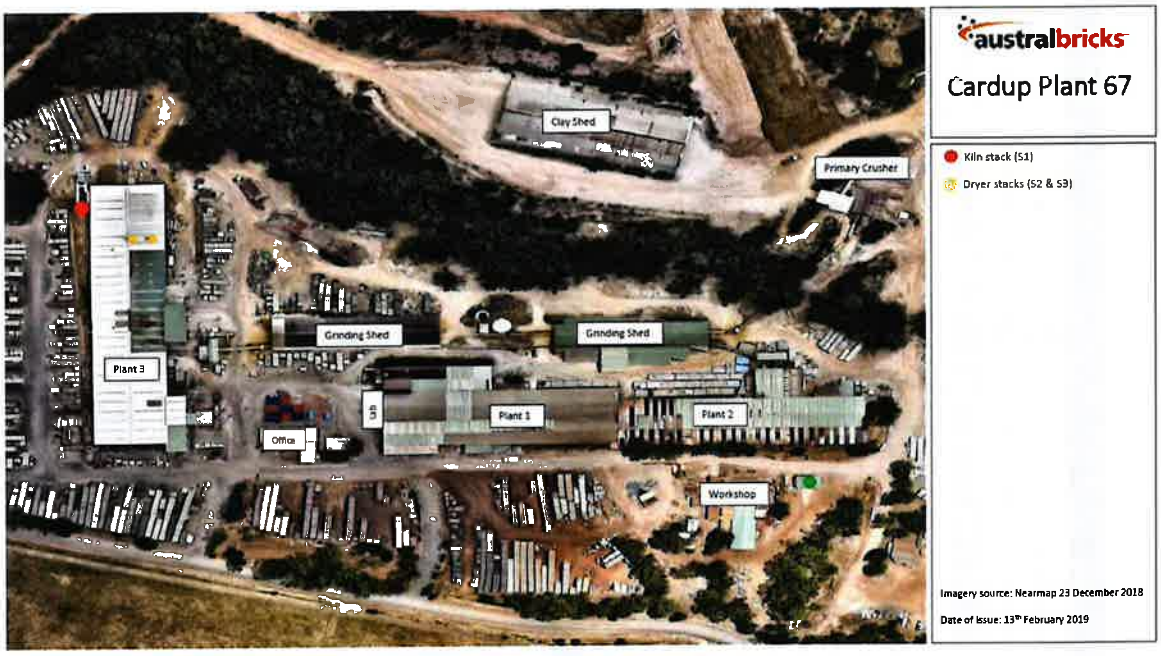


Figure 3.1: Site layout

3.2 Emission estimation

This assessment has considered emissions from the brickworks under two operating scenarios - normal operations and scrubber bypass.

Normal operational data have been derived from stack testing carried out during and post commissioning of the new scrubber as summarised in Table 3.1 (kiln stack), Table 3.3 (west dryer stack) and Table 3.4 (east dryer stack).

Bypass data were obtained from stack testing carried out between 2010 to 2012 when no scrubber was installed (Table 3.2). Austral has confirmed that production rates and types of brick manufactured during this time are consistent with the current brickworks operation. As such, the un-scrubbed emissions represent bypass emissions from current operations.

Data obtained from monitoring carried out at the scrubber inlet (as representing scrubber bypass) has not been used. The sampling plane used at this location is not compliant with the relevant standard and the data obtained are potentially not representative of actual pollutant flows to the scrubber.

Table 3.1: Kiln stack data (normal operation)

Parameter	Units	Value												
Stack reference	-	S1												
Stack height	m	29.5												
Stack diameter	mm	1750												
Stack test date	-	8/11/2017	8/11/2017	1/03/2018	1/03/2018	16/05/2018	16/05/2018	27/09/2018	27/09/2018	18/03/2019	18/03/2019	5/06/2019	5/06/2019	Avg
Test no.	-	1	2	1	2	1	2	1	2	1	2	1	2	-
Temp	°C	204	204	230	230	223	223	197	197	243	243	229	229	22
Velocity	m/s	8.5	8.5	9.8	9.8	8.5	8.5	10.0	10.0	11.0	11.0	10.0	10.0	9.6
HCl	mg/m³	250	140	170	210	200	150	91	100	160	270	120	120	165
HCl	g/s	2.8	1.4	2.1	2.5	2.2	1.5	1.3	1.4	1.9	3.4	1.5	1.5	2.0
HF	mg/m³	33	16	28	29	36	29	50	56	29	35	80	85	42
HF	g/s	0.37	0.16	0.34	0.34	0.40	0.30	0.70	0.74	0.36	0.45	1.00	1.00	0.51
SO_2	mg/m³	95	73	58	49	64	83	2.5	140	76	79	63	68	71
SO_2	g/s	0.97	0.78	0.70	0.58	0.70	0.88	0.03	1.90	0.95	1.00	0.79	0.85	0.85

Table 3.2: Kiln stack data (bypass operation)

Parameter	Units	Value						
Stack reference	-	S1						
Stack height	m	29.5						
Stack diameter	mm	1750						
Stack test date	-	25/11/2010	25/11/2010	17/02/2011	17/02/2011	7/02/2012	7/02/2012	Avg
Test no.	-	1	2	1	2	1	2	-
Temp	°C	193	194	185	184	199	199	192
Velocity	m/s	9.5	9.5	9.3	9.3	8.7	8.7	9.2
HCl	mg/m³	310	300	250	250	210	220	257
HCl	g/s	2.1	2.0	1.6	1.6	2.4	2.5	2.0
HF	mg/m³	82	80	180	190	140	140	135
HF	g/s	0.55	0.54	1.2	1.2	1.5	1.6	1.1
SO_2	mg/m³	160	n/a	130	170	140	170	150
SO_2	g/s	0.12	n/a	0.086	0.13	1.5	1.7	0.73

Table 3.3: West dryer stack

Parameter	Units	Value								
Stack reference	-	S2								
Stack height	m	8.4								
Stack diameter	mm	1450								
Stack test date	-	8/02/2018	28/02/2018	28/02/2018	17/05/2019	17/05/2019	28/09/2018	28/09/2018	21/03/2019	21/03/2019	Avg
Test no.	-	1	1	2	1	2	1	2	1	2	-
Temp	°C	45	54	54	56	56	54	54	70	70	57
Velocity	m/s	8.3	8.4	8.4	6.6	6.6	7.3	7.3	7.9	7.9	7.6
HCl	mg/m^3	8.8	3.3	4.7	2.0	2.6	6.0	6.5	8.8	7.4	5.6
HCl	g/s	0.099	0.003	0.053	0.018	0.022	0.057	0.061	0.086	0.072	0.052
HF	mg/m^3	n/a	0.30	0.32	1.40	1.80	0.18	0.16	*0.04*	*0.04*	0.53
HF	g/s	n/a	0.003	0.004	0.012	0.015	0.002	0.002	0.0004	0.0004	0.005
SO_2	mg/m^3	n/a	0.38	0.34	0.38	0.15	0.22	0.19	0.20	0.14	0.25
SO_2	g/s	n/a	0.004	0.004	0.004	0.001	0.002	0.002	0.002	0.001	0.003

(1) Figures in italics reported as less than (<) detection limits
(2) n/a = data not available

Table 3.4: East dryer stack

Parameter	Units	Value								
Stack reference	-	S2								
Stack height	m	8.4								
Stack diameter	mm	1450								
Stack test date	-	8/02/2018	28/02/2018	28/02/2018	17/05/2019	17/05/2019	28/09/2018	28/09/2018	21/03/2019	21/03/2019	Avg
Test no.	-	1	1	2	1	2	1	2	1	2	-
Temp	°C	43	49	49	55	55	55	55	65	65	55
Velocity	m/s	8.5	8.7	8.7	7.0	7.0	7.4	7.4	8.1	8.1	7.9
HCl	mg/m^3	2.6	2.8	3.3	2.5	n/a	4.7	6.0	5.5	5.2	4.1
HCl	g/s	0.030	0.032	0.039	0.024	n/a	0.045	0.059	0.057	0.053	0.042
HF	mg/m^3	n/a	0.30	0.26	1.90	n/a	0.27	0.15	*0.03*	*0.03*	0.42
HF	g/s	n/a	0.003	0.003	0.018	n/a	0.003	0.001	*0.0003*	*0.0003*	0.004
SO_2	mg/m^3	n/a	0.32	0.31	0.69	0.27	0.26	0.26	0.10	0.08	0.29
SO_2	g/s	n/a	0.004	0.004	0.007	0.003	0.003	0.003	0.001	0.001	0.003

(1) Figures in italics reported as less than (<) detection limits
(2) n/a = data not available

Average stack emission data from the above tables has been used as inputs to the model. The emission information and stack release parameters used as inputs to the model are shown in Table 3.5.

Table 3.5: Stack emission model input parameters

Parameter	Units	Kiln stack (S1) Normal operation	Kiln stack (S1) bypass	West dryer stack	East dryer stack
Location	m N	407083	407083	407108	407118
	m E	6432057	6432057	6432034	6432033
Height	m	29.5	29.5	8.4	8.4
Internal diameter	m	1.75	1.75	1.45	1.45
Velocity	m/s	9.63	9.17	7.63	7.88
Temperature	°C	221	192	57	48
HCl	g/s	1.96	2.03	0.05	0.04
HF	g/s	0.51	1.12	0.005	0.004
SO_2	g/s	0.85	0.73	0.003	0.003

3.3 Ambient air quality assessment criteria

Modelled GLCs have been compared to ambient air quality assessment criteria as specified by DWER as shown in Table 3.6.[1]

Table 3.6: Ambient air quality assessment criteria

Pollutant	Air quality assessment criteria (µg/m³)	Averaging period	Reference
Combined acid gas	500	10 minute	Condition 14(e); Licence L9025/2017/1 issued 18 June 2019 (DWER 2019)
	100	24 hour	
HCl	140	1 hour	
	100	24 hour	
HF	100	24 hour	
	1.7	7 day	

Ground level concentrations of combined acid gases have been calculated by summation of the modelled ground level concentrations of HCl, HF and SO_2 at the various receptors

[1] Draft guidelines issued by DWER (October 2019) include air quality assessment criteria, known as ambient air quality guideline values (AGVs). The AGVs in the draft guidelines have not been used for the current assessment.

4. Results

The modelled GLCs for the pollutants of interest are shown in Table 4.1 for normal operation and Table 4.3 for scrubber bypass. The modelled GLCs expressed as a percentage of the assessment criteria are shown in Table 4.2 for normal operation and Table 4.4 for scrubber bypass.

The contribution of each of the sources to the ground level concentrations is shown in Table 4.5.

Isopleths of the predicted concentrations from both scenarios are presented in Appendix A.

In summary:

- Under normal operation, the maximum GLCs of combined acid gases, HCl and HF are below the assessment criteria at all receptors except R15.
  - The maximum 1 hour average GLC of HCl at receptor R15 (162 µg/m^3) exceeds the assessment criteria (140 µg/m^3).
  - The maximum 7 day average GLC of HF at receptor R15 (2.3 µg/m^3) exceeds the assessment criteria (1.7 µg/m^3).
- Under bypass, the maximum GLCs of combined acid gases, HCl and HF are below the assessment criteria at most receptors.
  - The maximum 1 hour average GLC of HCl at receptor R15 (168 µg/m^3) exceeds the assessment criteria (140 µg/m^3).
  - The maximum 7 day average GLCs of HF at receptors R15, R14, R5, R4, R6 and R0 exceed the assessment criteria (1.7 µg/m^3).
- The main source of emissions at receptor R15 is the kiln stack (61%); whereas, at receptor R14, the emission sources contribute equally; and at all other receptors the dryers are the main source of emissions.

Table 4.1: Ground level concentrations at receptors – normal operations

Emission	Averaging period	Assessment Criteria (µg/m³)	Ground level concentration at receptors (µg/m³)																											
			R15	R14	R5	R16	R4	R6	R3	R0	R10	R7	R2	T1	R1	T2	R17	T4	T8	R18	T5	T3	T7	T6	R19	R13	R11	R12	R9	R8	R20
Acid gases	10 minute	500	392	195	42	119	51	32	39	62	99	23	19	28	16	26	75	23	13	66	21	21	13	13	30	28	30	28	26	19	13
	24 hour	100	20	10	9.0	6.0	8.0	7.3	6.1	11	3.3	6.0	5.6	7.4	6.2	6.7	3.2	4.9	3.6	3.7	4.8	2.9	4.3	3.8	2.5	1.2	1.5	1.3	1.5	1.3	1.9
HCl	1 hour	140	162	80	18	50	22	14	17	27	41	12	10	12	8.9	11	32	9.8	7.9	29	8.8	8.7	6.2	5.5	14	12	12	12	11	7.9	5.6
	24 hour	100	12	6.1	5.7	3.6	5.0	4.5	4.1	7.1	2.0	3.7	3.6	4.7	3.7	4.1	2.0	3.0	2.2	2.3	2.9	1.8	2.6	2.3	1.6	0.7	0.9	0.8	0.9	0.8	1.2
HF	24 hour	100	3.0	1.6	1.3	0.9	1.1	1.1	0.8	1.6	0.5	0.9	0.8	1.1	0.9	1.0	0.5	0.7	0.5	0.5	0.7	0.4	0.6	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.3
	7 day	1.7	2.3	1.2	1.0	0.7	0.9	0.8	0.6	1.2	0.4	0.7	0.6	0.8	0.7	0.7	0.4	0.5	0.4	0.4	0.5	0.3	0.5	0.4	0.3	0.1	0.2	0.1	0.2	0.1	0.2

Table 4.2: Comparison to assessment criteria – normal operations

Emission	Averaging period	Assessment Criteria (µg/m³)	Ground level concentration at receptors (percentage of assessment criteria)																											
			R15	R14	R5	R16	R4	R6	R3	R0	R10	R7	R2	T1	R1	T2	R17	T4	T8	R18	T5	T3	T7	T6	R19	R13	R11	R12	R9	R8	R20
Acid gases	10 minute	500	78%	39%	8%	24%	10%	6%	8%	12%	20%	5%	4%	6%	3%	5%	15%	5%	3%	13%	4%	4%	3%	3%	6%	6%	6%	6%	5%	4%	3%
	24 hour	100	20%	10%	9%	6%	8%	7%	6%	11%	3%	6%	6%	7%	6%	7%	3%	5%	4%	4%	5%	3%	4%	4%	2%	1%	1%	1%	1%	1%	2%
HCl	1 hour	140	116%	57%	13%	36%	16%	10%	12%	19%	29%	9%	7%	9%	6%	8%	23%	7%	6%	20%	6%	6%	4%	4%	10%	8%	9%	8%	8%	6%	4%
	24 hour	100	12%	6%	6%	4%	5%	5%	4%	7%	2%	4%	4%	5%	4%	4%	2%	3%	2%	2%	3%	2%	3%	2%	2%	1%	1%	1%	1%	1%	1%
HF	24 hour	100	3%	2%	1%	1%	1%	1%	1%	2%	0%	1%	1%	1%	1%	1%	0%	1%	1%	1%	1%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
	7 day	1.7	134%	70%	57%	40%	50%	48%	36%	72%	22%	39%	37%	47%	41%	43%	21%	32%	23%	24%	32%	19%	29%	25%	15%	8%	10%	9%	10%	8%	13%

Table 4.3: Ground level concentrations at receptors – bypass

Emission	Averaging period	Assessment Criteria (µg/m³)	Ground level concentration at receptors (µg/m³)																											
			R15	R14	R5	R16	R4	R6	R3	R0	R10	R7	R2	T1	R1	T2	R17	T4	T8	R18	T5	T3	T7	T6	R19	R13	R11	R12	R9	R8	R20
Acid gases	10 minute	500	457	226	49	150	60	42	45	74	92	27	22	35	20	31	87	28	14	79	25	25	16	15	37	39	35	31	32	22	16
	24 hour	100	24	12	11	7.9	9.3	8.7	6.8	13	3.0	7.2	7.3	8.9	7.3	7.9	3.7	6.0	4.3	4.4	5.7	3.4	5.0	4.5	2.9	1.4	1.8	1.6	1.7	1.5	2.3
HCl	1 hour	140	168	83	19	56	23	16	17	28	34	10	8.6	13	7.3	12	33	10	5.3	30	9.4	9.3	5.8	5.8	14	14	13	11	12	8.2	6.0
	24 hour	100	13	6.3	6.1	4.2	5.1	4.7	4.0	7.2	1.6	3.9	4.0	4.9	3.9	4.3	2.0	3.3	2.3	2.4	3.1	1.8	2.6	2.4	1.6	0.8	0.9	0.8	0.9	0.8	1.2
HF	24 hour	100	6.9	3.4	3.0	2.2	2.5	2.4	1.7	3.5	0.9	2.0	1.9	2.4	2.1	2.2	1.0	1.6	1.2	1.2	1.6	0.9	1.4	1.3	0.8	0.4	0.5	0.4	0.5	0.4	0.6
	7 day	1.7	5.1	2.6	2.2	1.7	1.9	1.8	1.3	2.6	0.6	1.5	1.4	1.8	1.5	1.6	0.7	1.2	0.9	0.9	1.2	0.7	1.1	0.9	0.6	0.3	0.4	0.3	0.4	0.3	0.5

Table 4.4: Comparison to assessment criteria – bypass

Emission	Averaging period	Assessment Criteria (µg/m³)	Ground level concentration at receptors (percentage of assessment criteria)																												
			R15	R14	R5	R16	R4	R6	R3	R0	R10	R7	R2	T1	R1	T2	R17	T4	T8	R18	T5	T3	T7	T6	R19	R13	R11	R12	R9	R8	R20
Acid gases	10 minute	500	91%	45%	10%	30%	12%	8%	9%	15%	18%	5%	4%	7%	4%	6%	17%	6%	3%	16%	5%	5%	3%	3%	7%	8%	7%	6%	6%	4%	3%
	24 hour	100	24%	12%	11%	8%	9%	9%	7%	13%	3%	7%	7%	9%	7%	8%	4%	6%	4%	4%	6%	3%	5%	4%	3%	1%	2%	2%	2%	1%	2%
HCl	1 hour	140	120%	59%	13%	40%	16%	11%	12%	20%	24%	7%	6%	9%	5%	8%	24%	7%	4%	21%	7%	7%	4%	4%	10%	10%	9%	8%	8%	6%	4%
	24 hour	100	13%	6%	6%	4%	5%	5%	4%	7%	2%	4%	4%	5%	4%	4%	2%	3%	2%	2%	3%	2%	3%	2%	2%	1%	1%	1%	1%	1%	1%
HF	24 hour	100	7%	3%	3%	2%	2%	2%	2%	4%	1%	2%	2%	2%	2%	2%	1%	2%	1%	1%	2%	1%	1%	1%	1%	0%	0%	0%	0%	0%	1%
	7 day	1.7	303%	151%	131%	97%	109%	106%	74%	154%	37%	87%	84%	105%	91%	95%	44%	72%	53%	53%	70%	40%	62%	55%	34%	18%	22%	19%	21%	18%	28%

Table 4.5: Contribution of emission sources to ground level concentrations

Source	Contribution to ground level concentration at receptors (%)																												
	R15	R14	R5	R16	R4	R6	R3	R0	R10	R7	R2	T1	R1	T2	R17	T4	T8	R18	T5	T3	T7	T6	R19	R13	R11	R12	R9	R8	R20
Kiln stack	61%	49%	3%	13%	3%	2%	3%	4%	21%	2%	2%	3%	2%	3%	10%	3%	1%	9%	3%	3%	2%	2%	6%	14%	11%	15%	9%	6%	4%
East dryer stack	18%	24%	50%	44%	49%	49%	51%	50%	41%	49%	45%	46%	52%	48%	47%	46%	51%	46%	47%	48%	52%	54%	48%	44%	41%	39%	48%	51%	50%
West dryer stack	21%	26%	48%	43%	48%	48%	46%	46%	39%	49%	54%	51%	46%	50%	43%	51%	48%	45%	50%	49%	46%	44%	46%	41%	48%	47%	43%	43%	46%

5. Conclusions

Air dispersion modelling has been completed to assess the potential air quality impacts associated with emissions from the Cardup Brickworks. The air dispersion model, AERMOD, has been used to predict GLCs across the model domain. Emissions from both normal operation and scrubber bypass have been included in the modelling assessment.

With the exception of the maximum hourly HCl and seven day HF concentrations at receptor R15, during normal operation, all pollutants are below assessment criteria at all receptors for all averaging periods.

During bypass, the maximum seven day HF GLC exceeds the assessment criteria at several receptors. However, the model approach is conservative in that it assumes the bypass occurs for the duration for the whole year. In reality, bypass occurs for short periods of time, typically less than 30 minutes. For bypass events that last longer than 30 minutes, Austral are required to implement its Bypass Management Procedure which includes reducing production rate so that the HF emission rates is restricted to less than 1.0 g/s, thereby reducing the potential risk of impacts during bypass events

The highest emissions occur to the east of the brickworks where there are fewer numbers and lower densities of sensitive receptors, as shown in the isopleths in Appendix A. The main contribution to GLCs at receptor R15 is the kiln stack, with the dryers being the dominant source for most other receptors.

As the kiln plume is buoyant, it travels outwards before descending; therefore, impacts at ground level occur further away from the stack. The topography of the area is such that the emissions will likely concentrate at the foot of the escarpment. The emissions from the dryers are expected to be heavily wake-affected by the production (Plant 3) building as the dryer stacks exhaust at roof level.

Movement of air will generally be horizontal, based on its density and temperature, with little mixing vertically under stable conditions. As this air mass reaches the scarp it is 'trapped' by the air above it which has a different density and temperature. Air flow at ground level is forced around the scarp with the changing direction causing a decline in wind velocity, which causes the concentration to rise. The plume eventually dissipates around the scarp.

A similar (but reverse) action occurs when the wind originates from the east. The scarp slows the wind with stagnate conditions expected within the wind-shielded area. Air is constrained and channelled along the downstream-line with minimal air movement in other directions. This air eventually dissipates to the east.

Overall, the conservatism in the modelling and air quality criteria selected for assessment of model predictions suggests low risk of material harm at sensitive receptors from operation of the brickworks.

6. Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

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Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

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7. References

BOM. (2016). *Basic Climatological Station Metadata - Perth Airport.* Retrieved from Bureau of Meteorology: http://www.bom.gov.au/clim_data/cdio/metadata/pdf/siteinfo/IDCJMD0040.009021.SiteInfo.pdf.

DWER. (2019). *Licence L9025/2017/1.* Retrieved from Department of Water and Environmental Regulation: https://www.der.wa.gov.au/our-work/licences-and-works-approvals/current-licences.

USEPA. (2018). *Air Quality Dispersion Modeling - Preferred and Recommended Models.* Retrieved from Support Center for Regulatory Atmospheric Modeling: https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models.

Appendix A Model isopleths

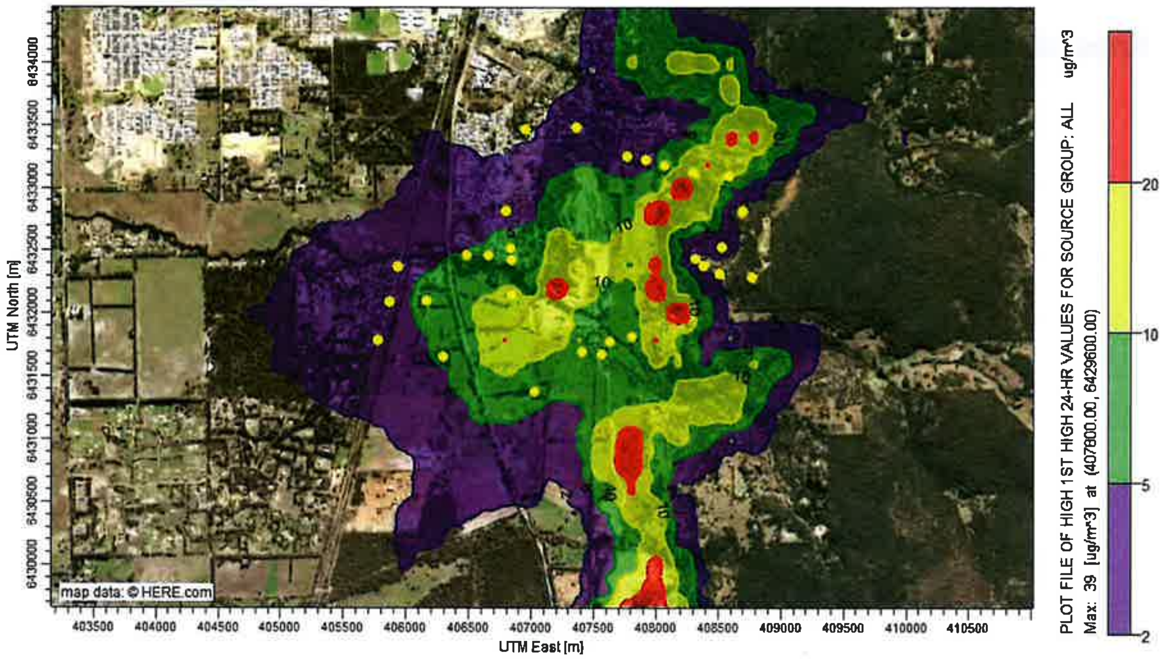

Figure A.1: Combined acid gases (24 hour) – normal operation

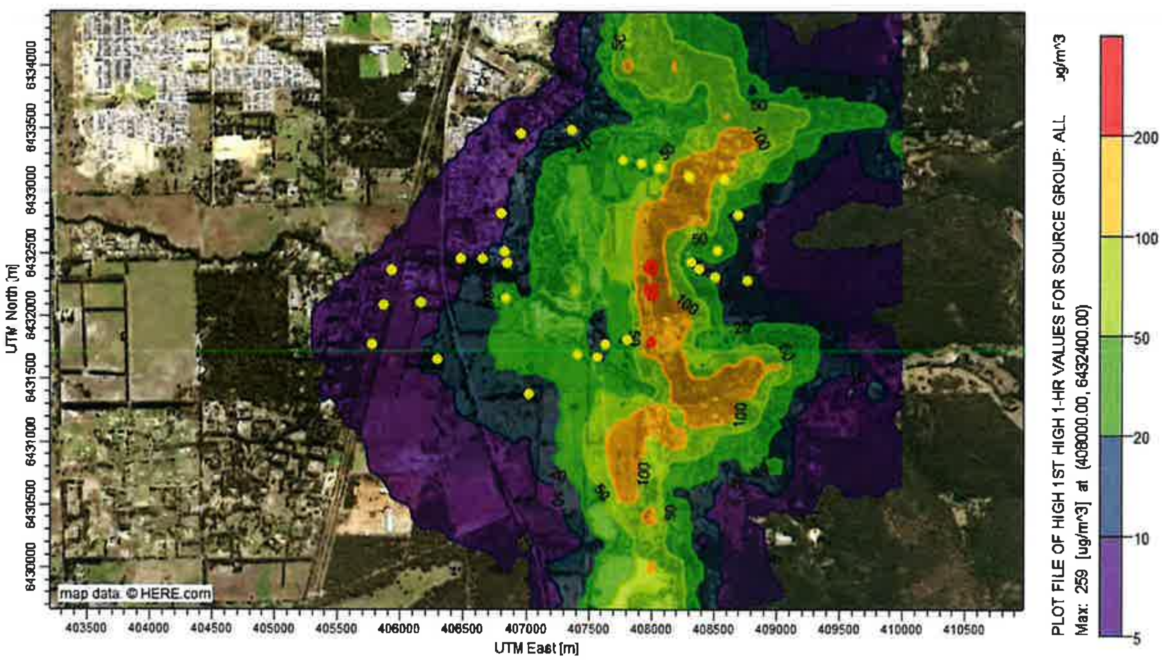

Figure A.2: HCl (1 hour) – normal operation

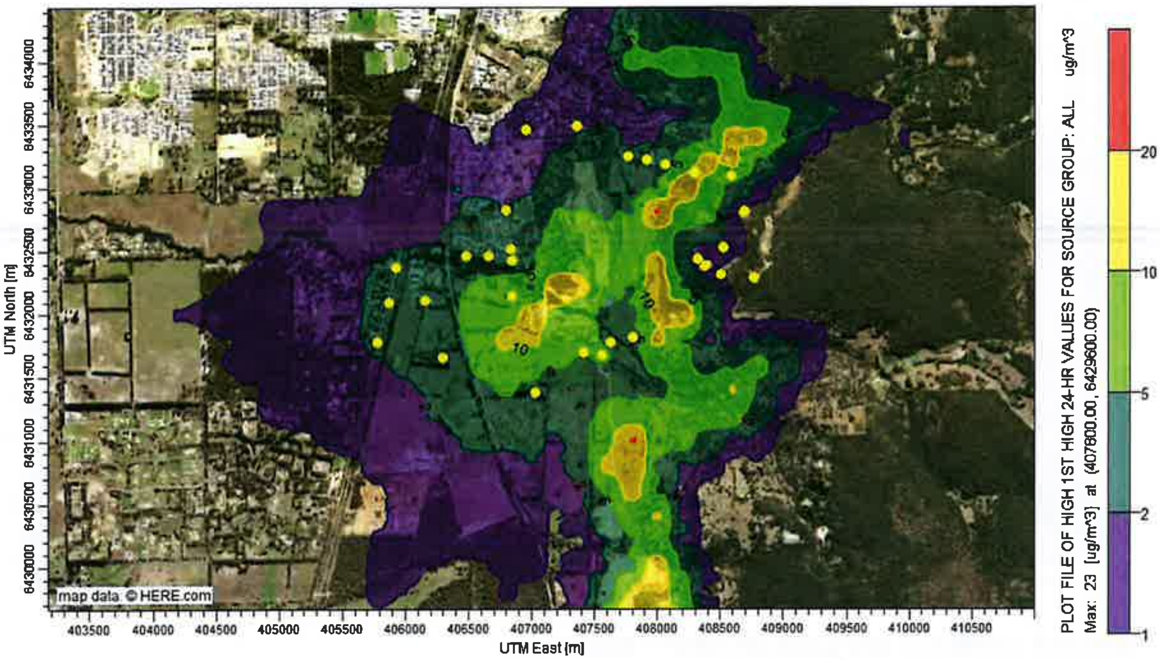

Figure A.3: HCl (24 hour) – normal operation

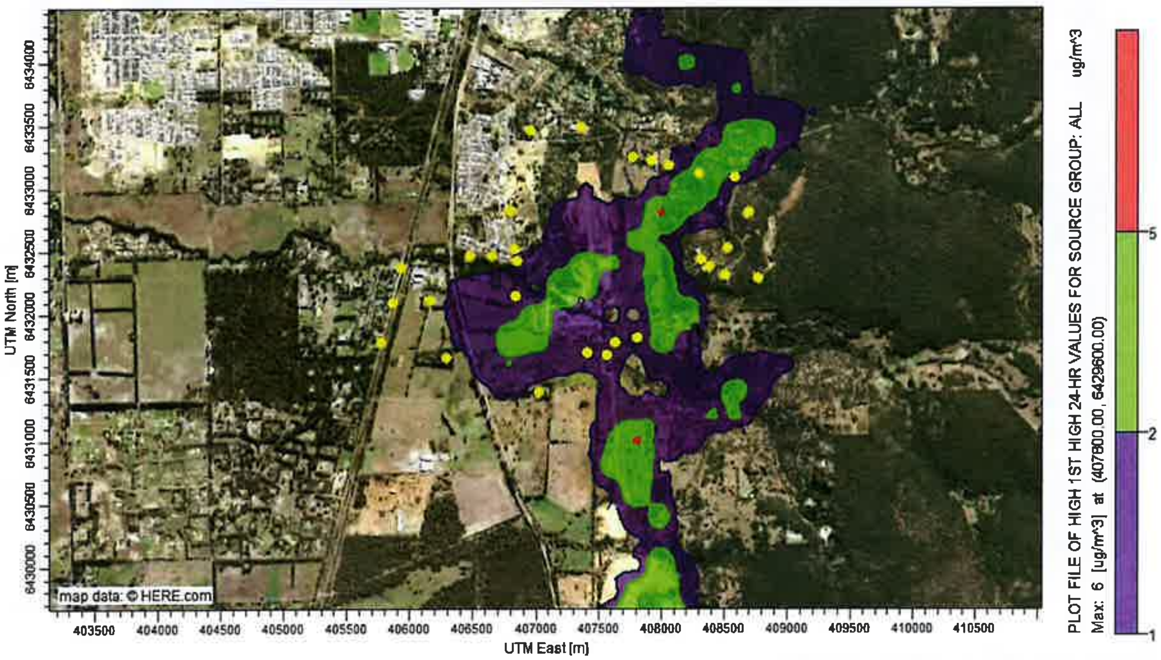

Figure A.4: HF (24 hour) – normal operation

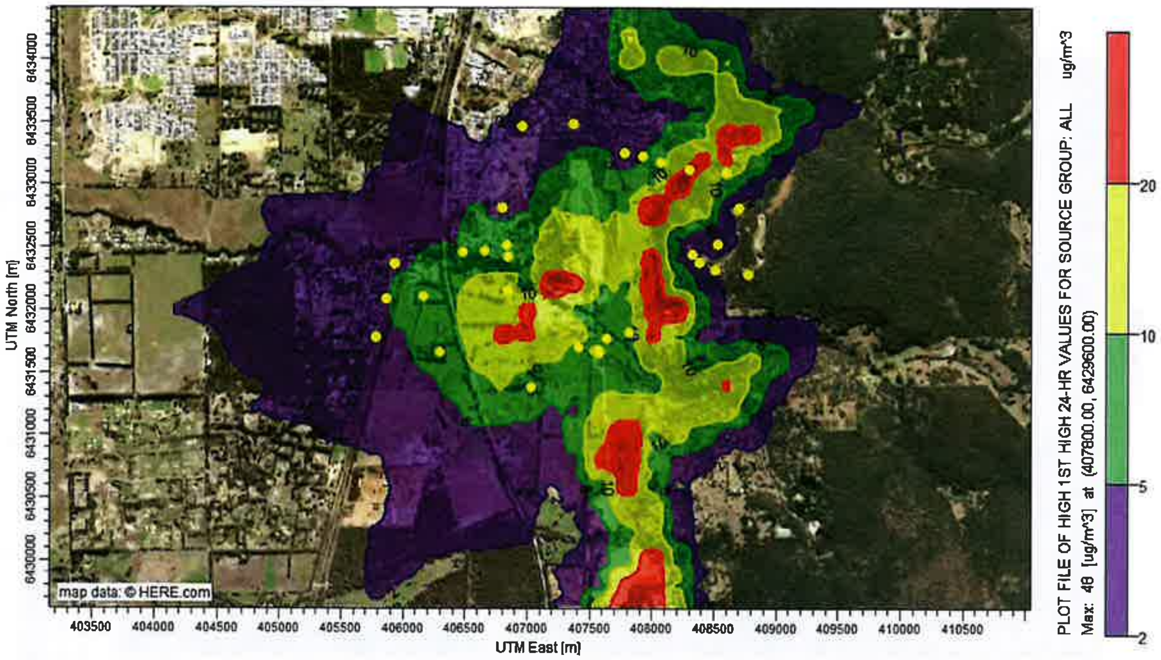

Figure A.5: Combined acid gases (24 hour) – bypass

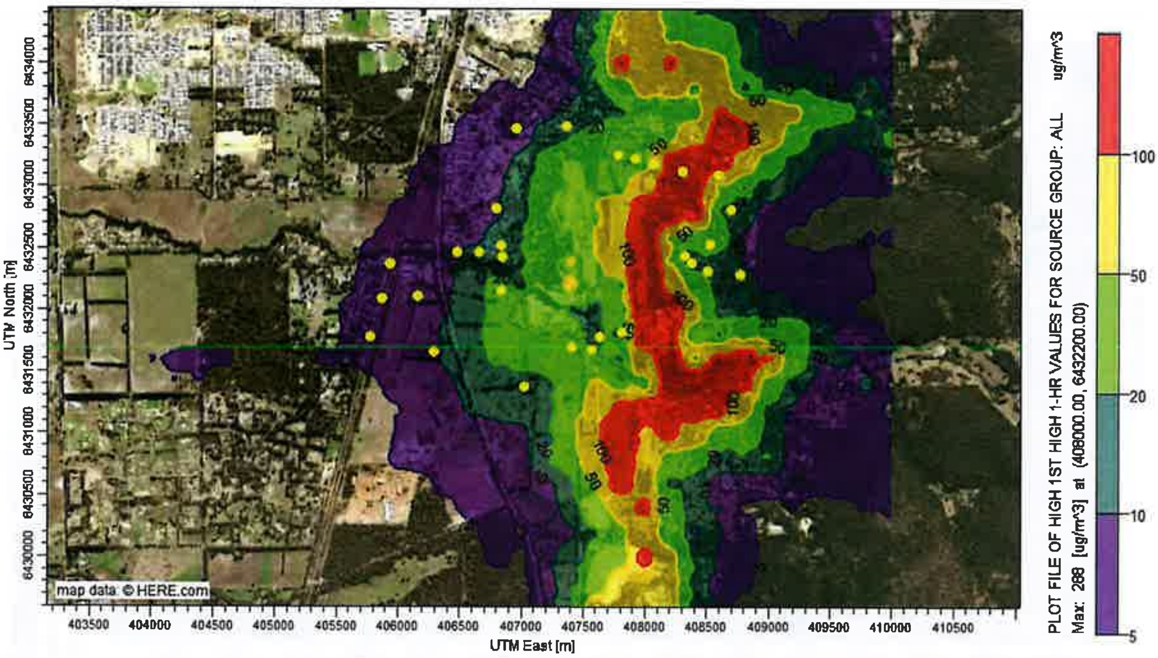

Figure A.6: HCl (1 hour) – bypass

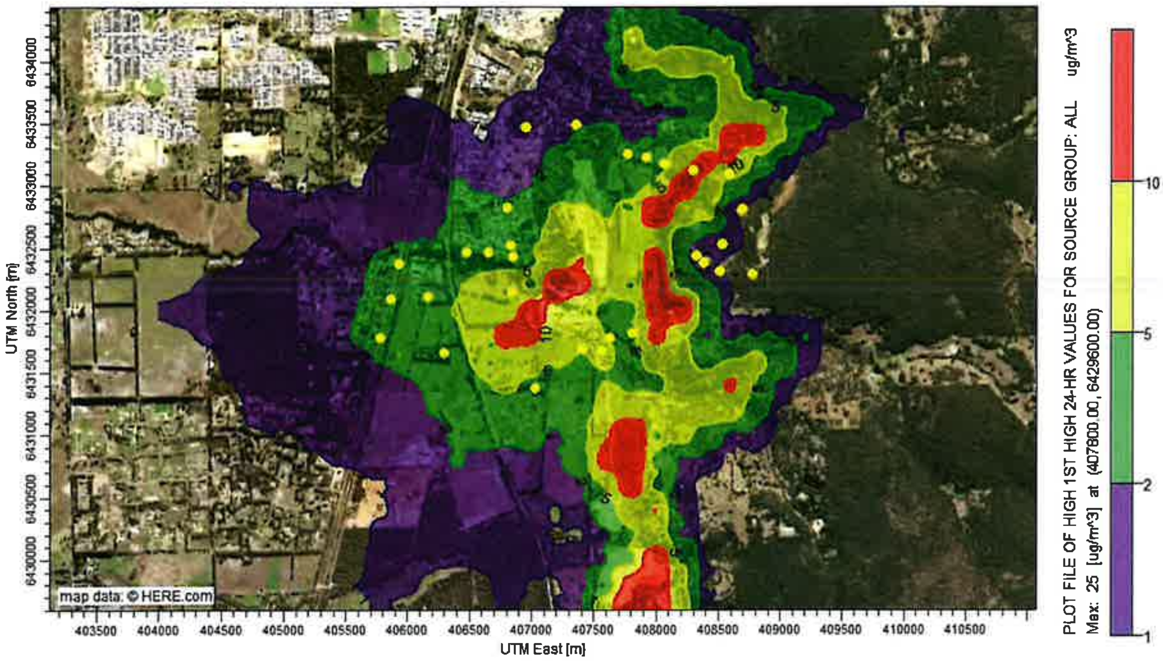

Figure A.7: HCl (24 hour) – bypass

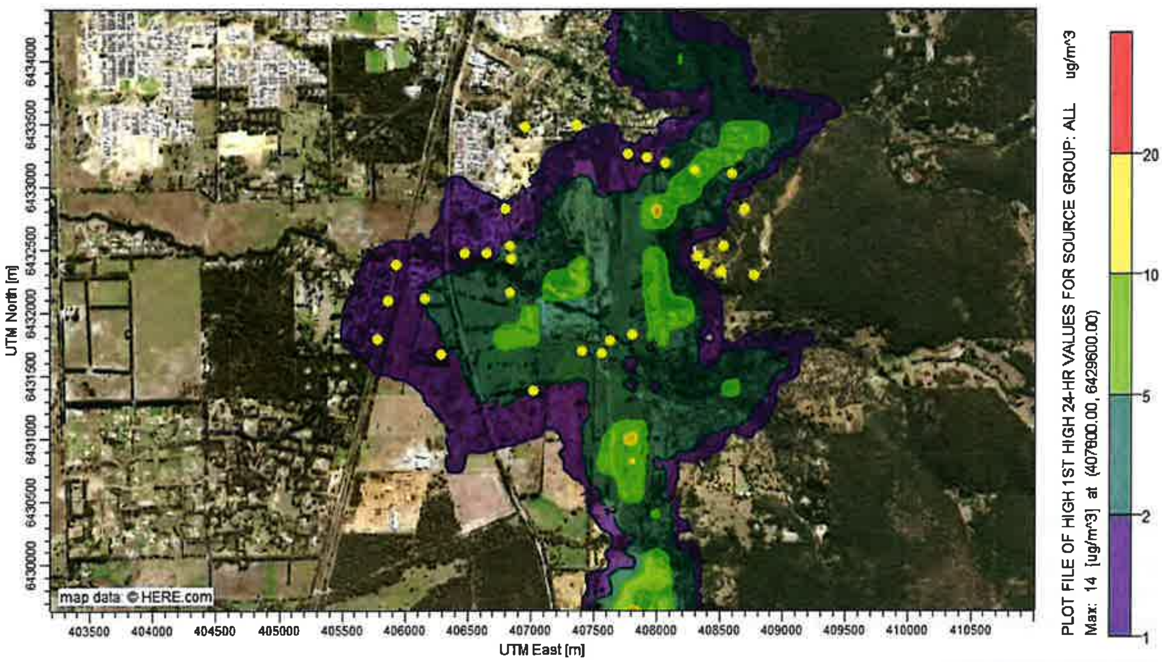

Figure A.8: HF (24 hour) – bypass

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