KINESIS

flow systems

BOX HILL NORTH

WATER BALANCE SUMMARY REPORT

27 SEPTEMBER 2019

FINAL

PREPARED BY KINESIS FOR FLOW SYSTEMS

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Note: This report is provided subject to some important assumptions and qualifications:

The results presented in this report are modelled estimates using mathematical calculations. The data, information and scenarios presented in this report have not been separately confirmed or verified. Accordingly, the results should be considered to be preliminary in nature and subject to such confirmation and verification.

Energy, water and greenhouse consumption estimates are based on local climate and utility data available to the consultant at the time of the report. These consumption demands are, where necessary, quantified in terms of primary energy and water consumptions using manufacturer's data and scientific principles.

Generic precinct-level cost estimates provided in this report are indicative only based on Kinesis's project experience and available data from published economic assessments. These have not been informed by specific building design or construction plans and should not be used for design and construct cost estimates.

The Kinesis software tool and results generated by it are not intended to be used as the sole or primary basis for making investment or financial decisions (including carbon credit trading decisions). Accordingly, the results set out in this report should not be relied on as the sole or primary source of information applicable to such decisions.

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EXECUTIVE SUMMARY

Box Hill North is an urban release area close to Richmond, NSW. The scheme proposes to provide recycled water to 4,800 houses on 330 ha of land, approximately 30 ha of which are comprised of sporting fields, neighbourhood parks and other public open spaces that either require irrigation or are able to be irrigated with recycled water. In addition, the recycled water system is proposed to establish connections with customers on the fringe of the Box Hill North urban release area for irrigation.

The Box Hill Water system for the development will operate a recycled water scheme that incorporates a membrane bioreactor system with associated recycled water storage. The system will take inflows from all grey and black waste water in the precinct and provide recycled water for:

- Toilets
- Washing Machines (cold only)
- Car washing
- Hardstand cleaning
- Dust suppression
- Street cleaning
- Irrigation
- Water features

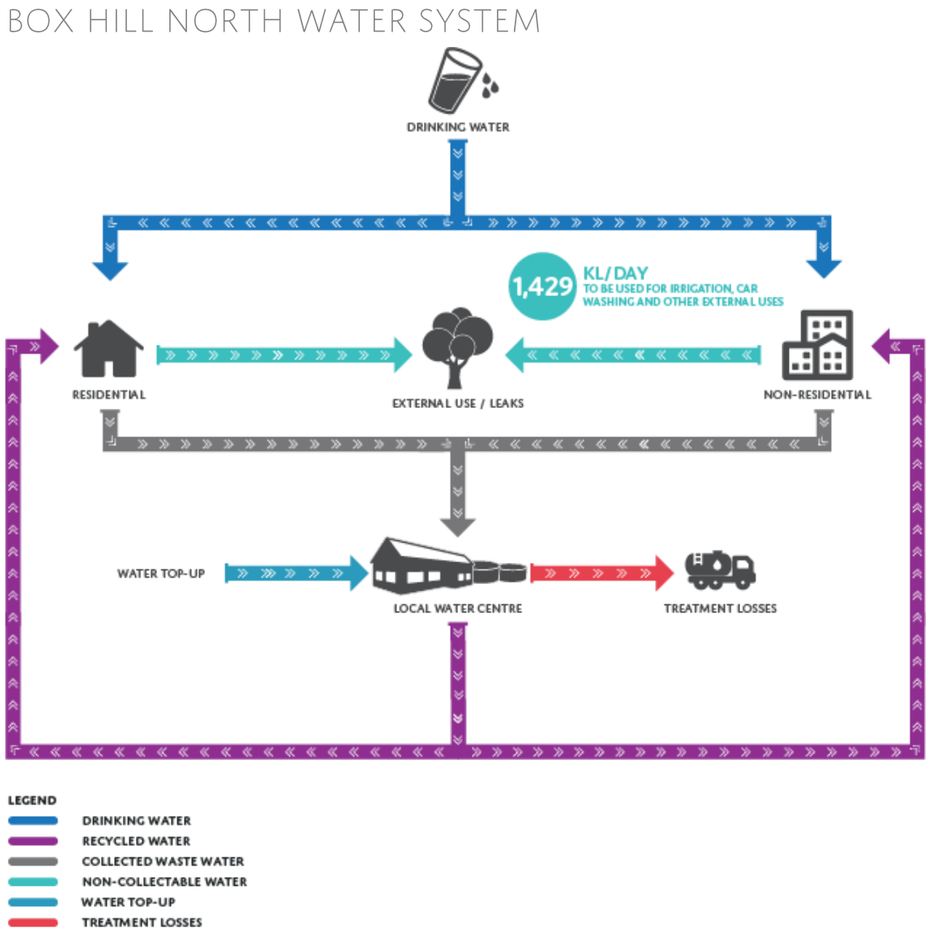

Figure 1: Box Hill Water System

Note: External use includes irrigation, car washing & other external uses such as hardstand cleaning.
* Other uses may be external customers or other internal uses such as cooling towers top-up with appropriate treatment.

1. PROJECT DETAILS

This report documents the water balance analysis of Box Hill North urban release area development in order to inform the delivery of a recycled water scheme. Box Hill urban release area is a residential development at Box Hill North close to Richmond, NSW. Ultimately it will comprise of **4,800 dwellings** on **330 ha** of land and include approximately **30 ha** of sporting fields, neighbourhood parks and other public open spaces that either require irrigation or are able to be irrigated with recycled water.

Analysis in this report outlines the results and performance outcomes for Box Hill North. This analysis is undertaken based on development figures provided by Flow Systems (see Figure 2 and Table 1) using Kinesis's CCAP Precinct modelling tool. CCAP Precinct is a land use and planning tool that models key environmental, economic, social and infrastructure implications and requirements for precinct-scale development projects.

The report is structured as follows:

- Water Demands
- Source Water Production
- Recycled Water System Performance

Recycled water irrigation areas as categorised into Essential, Highly Preferable, Non-essential and Not to be irrigation as per Figure 2.

Land Use	Area/Number
Total Development Area	**330 ha**
Public Space (Irrigation)	
Essential Irrigation	7.9 ha
Highly Preferable	2.9 ha
Total public space	**10.8 ha**
Non-residential	
Retail	7,900 m^2
Commerce/Office	500 m^2
Entertainment	1,150 m^2
Day clinic	450 m^2
Primary & Secondary School	25,000 m^2 (1,920 students)
Fringe Customers	330 ha
Residential Dwellings	
Standard house lots (>240 m^2)	2,793
Integrated house lots (<240 m^2)	355
Large lots (>2,000 m^2)	86
Apartments	866
Dwellings by Third Party Developers	700
Total dwellings	**4,800**

Table 1: Dwelling yield and floor space for Box Hill North urban release area.

MASTER PLAN

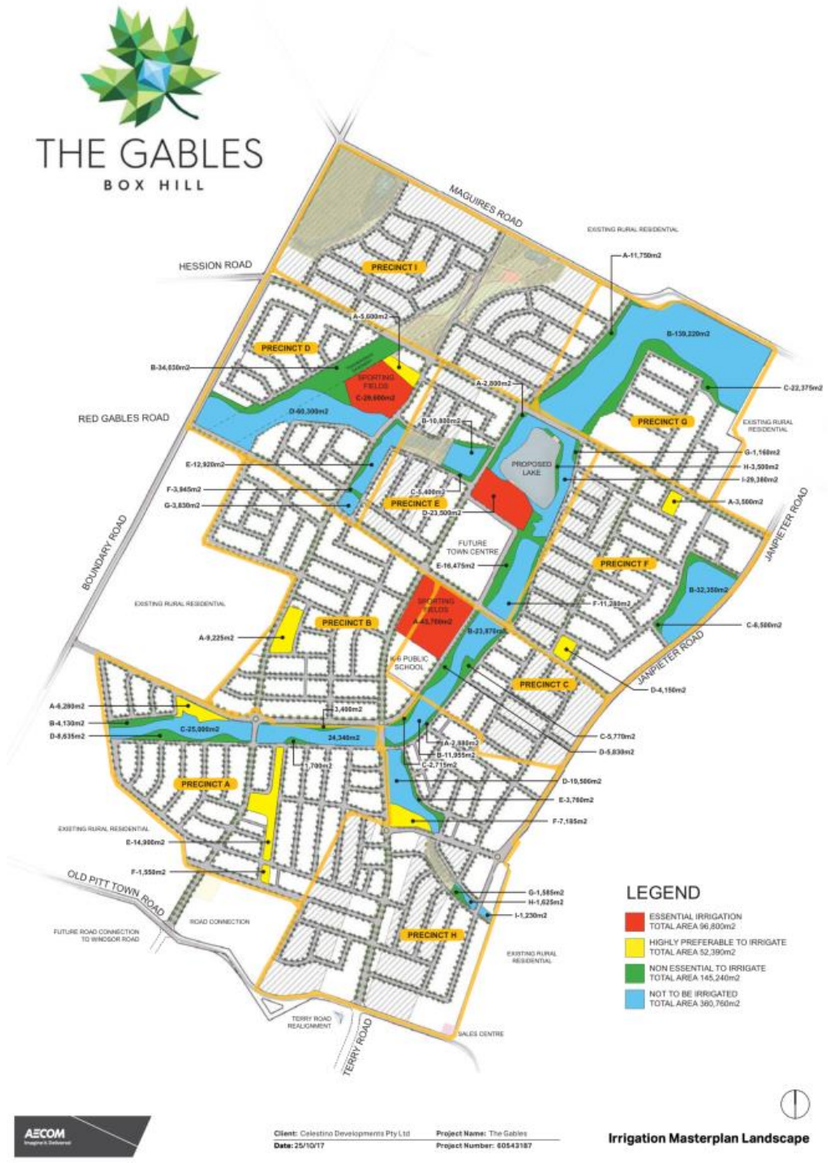

Figure 2: Development Master Plan

2. WATER DEMANDS

2.1 RESIDENTIAL WATER DEMANDS

Residential water demands were calculated based on the specific residential building types proposed for The Box Hill North urban release area. A water balance for an average Box Hill North dwelling, with a specific focus on water quality, is outlined in Figure 3. The details of the dwelling type configuration for modelling are outlined in Table 2. Figure 4 and Figure 5 display historical dry-bulb temperature and rainfall data from the local climate zone that was used to model the development water demand. Table 3 outlines the technology assumptions and associated demands that was used in the modelling process. Monthly total and daily average residential water demands by end use are outlined in Figure 6 and 7. Month to month variation is evident due to changes to irrigation water demands based on rainfall and evaporation profiles. Monthly internal total demands vary slightly due to differences in the number of days per month.

AVERAGE BOX HILL NORTH DAILY WATER BALANCE (PER DWELLING)

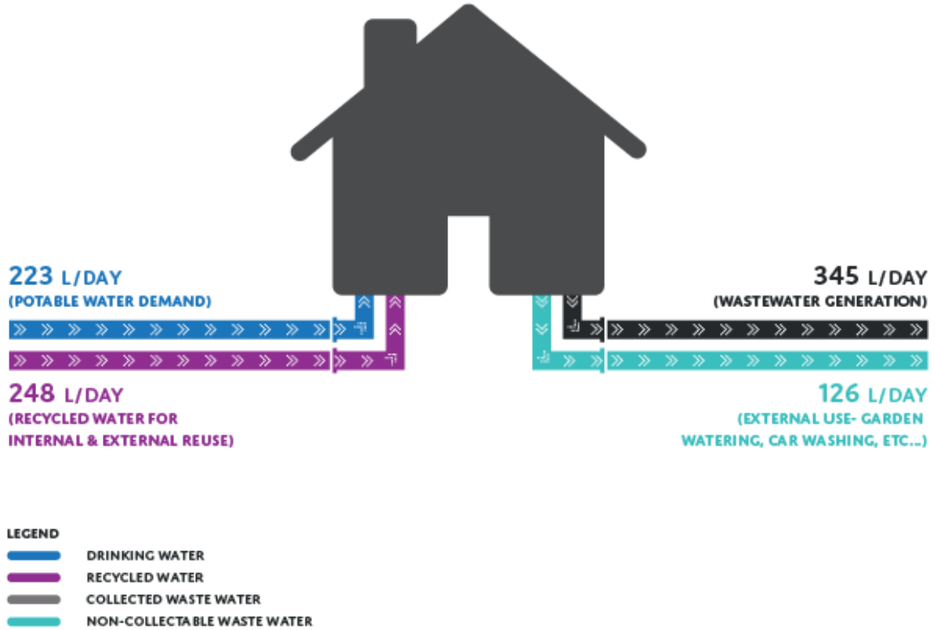

Figure 3: Schematic showing an average dwelling in The Box Hill North (including detached dwelling and apartments) expected daily drinking and recycled water consumption, including common area and irrigation demands.

RESIDENTIAL DWELLING SPECIFICATIONS

Dwelling Type	Number	Bedrooms	Occupancy	Est. Population
7 Bedroom Detached Houses; 2000 m^2 lots	101	7	5.3	
5 Bedroom Detached Houses; 700 m^2 lots	142	5	4.0	
4 Bedroom Detached Houses; 700 m^2 lots	142	4	3.4	
5 Bedroom Detached Houses; 450 m^2 lots	1,079	5	4.0	
4 Bedroom Detached Houses; 450 m^2 lots	1,078	4	3.4	
5 Bedroom Detached Houses; 240 m^2 lots	165	5	4.0	
4 Bedroom Detached Houses; 240 m^2 lots	496	4	3.4	
3 Bedroom Detached Houses; 240 m^2 lots	167	3	2.7	
5 Bedroom Attached Houses; 240 m^2 lots	59	5	3.9	
4 Bedroom Attached Houses; 240 m^2 lots	240	4	3.5	
3 Bedroom Attached Houses; 240 m^2 lots	117	3	2.6	
4 Bedroom Multi Apartment	254	4	3.2	
3 Bedroom Multi Apartment	507	3	2.6	
2 Bedroom Multi Apartment	253	2	2.0	
TOTAL	**4,800**		**-**	**16,474**
AVE. DWELLING		**4**	**3.4**	

Table 2: Residential dwelling specifications used in the analysis

DRY-BULB TEMPERATURE AT BOX HILL NORTH

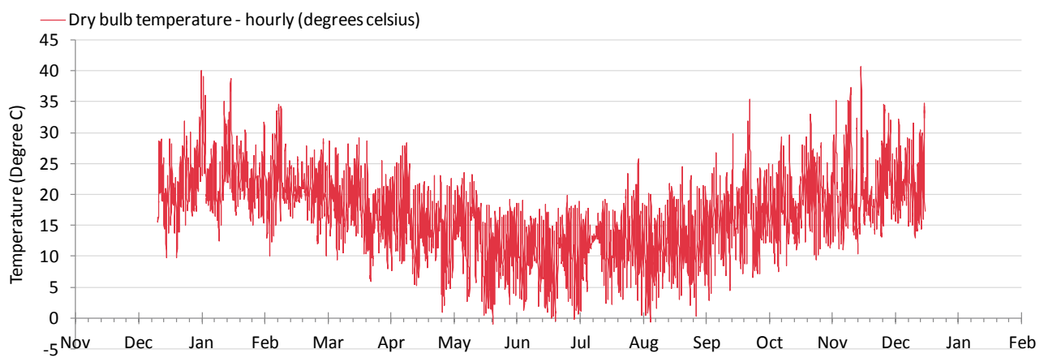

Figure 4: Dry-bulb temperature for local climate zone.

RAINFALL AT BOX HILL NORTH

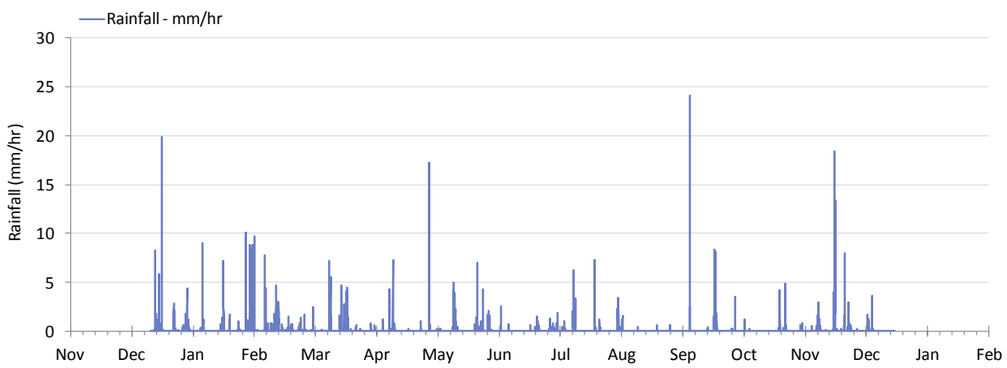

Figure 5: Historic average rainfall for local climate zone.

RESIDENTIAL END USE SPECIFICATIONS AND AVERAGE DEMANDS

Water End Use	Technology	Per Person Demand (L/day)			Average Development Demand (kL/day)		
		DW	RW	Total	DW	RW	Total
Shower	4 Star WELS	28.5	-	28.5	468.7	-	468.7
Kitchen sink	4 Star WELS	7.5	-	7.5	124.3	-	124.3
Bathroom basin	4 Star WELS	2.6	-	2.6	43.0	-	43.0
Dishwasher	4 Star WELS	2.3	-	2.3	37.9	-	37.9
Laundry trough	-	5.0	-	5.0	82.4	-	82.4
Bath	-	8.7	-	8.7	143.3	-	143.3
Fire testing*	-	1.5	-	1.5	24.7	-	24.7
Toilet	4 Star WELS	-	17.5	17.5	-	288.8	288.8
Washing machine	4 Star WELS	4.1	23.0	27.0	66.7	378.1	444.8
Car washing	-	-	0.7	0.7	-	10.7	10.7
Leaks (DW and RW grade)	-	4.7	5.5	10.2	77.0	90.6	167.6
Other external**		-	4.0	4.0	-	65.9	65.9
Irrigation***	-	-	21.5	21.5	-	354.9	354.9
TOTAL	**-**	**64.8**	**72.2**	**137.0**	**1,068.0**	**1,189.0**	**2,257.0**
AVE. DWELLING		**222.5**	**247.7**	**470.2**			

Table 3: Residential dwelling end use specifications and average per person daily demands used in the analysis

(DW = Drinking water demand, RW = Recycled water demand)

*Estimated using the proportion of Box Hill North residents in apartment dwellings and fire test water use as per BASIX

** Other external includes hose down, household cleaning, etc.
*** Irrigation areas estimated for dwellings based on lot area. Irrigation demand calculated as a product of this area and applied irrigation rate of approx. 0.3 kL per sqm per year derived from Department of Planning Industry and Environment, BASIX data.

TOTAL RESIDENTIAL WATER DEMANDS

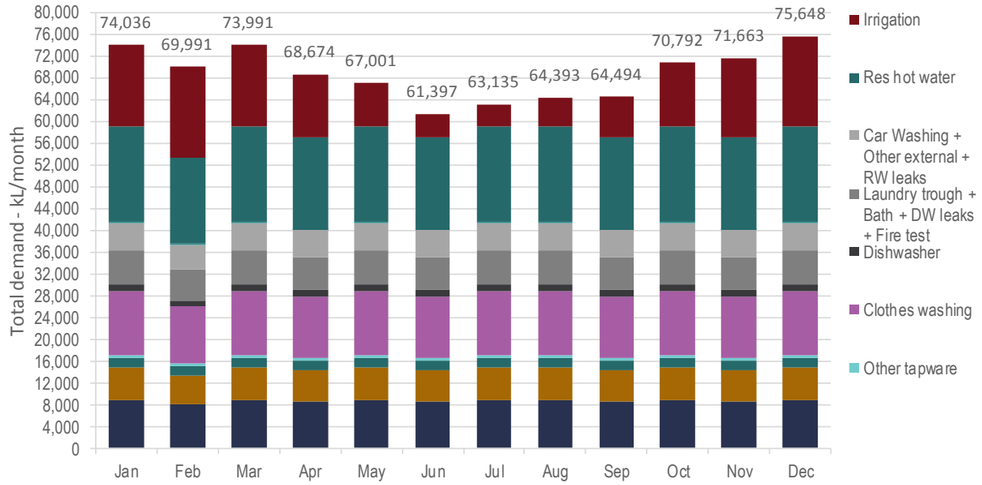

Figure 6: Total residential total water demands by end use, by month

AVERAGE DAILY RESIDENTIAL WATER DEMANDS

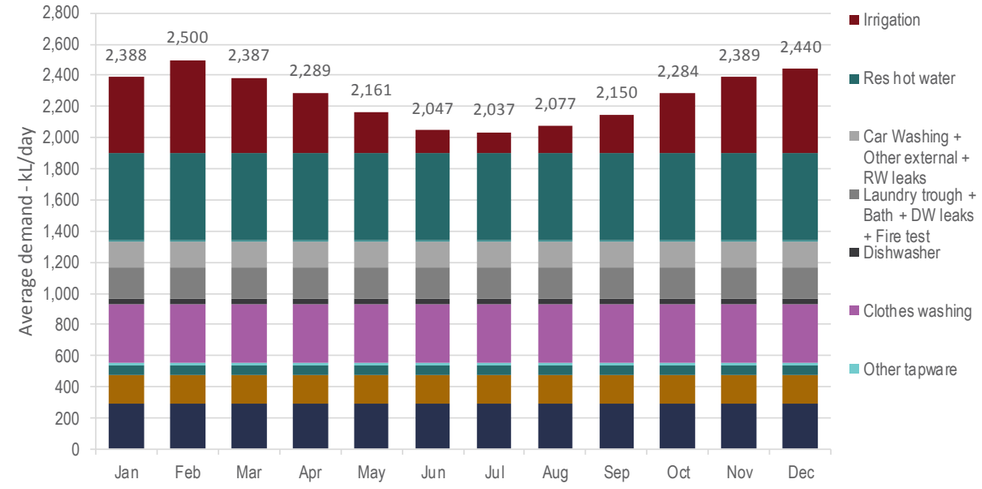

Figure 7: Average daily residential water demands by end use, by month

Note: Other external includes hose down, household cleaning, etc.

2.2 NON-RESIDENTIAL WATER DEMANDS

Non-Residential water demand was calculated based on the retail, commercial, community and open space areas proposed. Details of the building and open space configuration are outlined in Table 4. It should be noted that non-residential water demand modelling only considered public open spaces for which irrigation is deemed either essential or highly preferable in the HydroPlan *Irrigation Strategy Master Plan* document for Box Hill North urban release area.

Monthly total and daily average non-residential water demands by end use are outlined in Figures 8 and

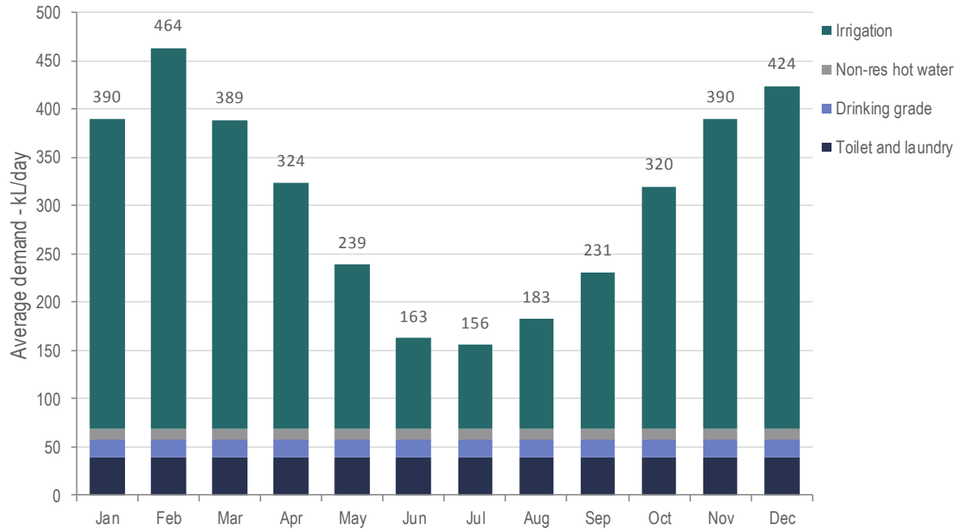

Figure 9. Monthly internal total demands vary due to differences in the number of days per month. Month to month variation is only evident in changes to irrigation water demand based on rainfall and evaporation profiles.

NON-RESIDENTIAL SPECIFICATIONS – TOTAL

Demand Hierarchy	Water End Use	Area (m^2)	Per m^2 demand (L/day)			Development Demand (kL/day)		
			DW	RW	Total	DW	RW	Total
1	Retail	7,900	1.4	0.5	1.9	10.7	3.7	14.4
1	Commercial	500	0.5	2.2	2.7	0.2	1.1	1.3
1	Entertainment	1,150	3.4	0.8	4.2	3.8	0.9	4.7
	Commercial Total	**9,550**				**14.7**	**5.7**	**20.4**
1	Education	27,000 ** (1,920 students)	5.8	17.3	23.0	11.1	33.2	44.2
1	Day clinic	450	9.6	0.6	10.2	4.3	0.3	4.6
	Community Total	**4,850**				**15.4**	**33.5**	**48.8**
2	Open Space Irrigation (Essential + High Preferable)	107,948	-	1.3*	1.3*	-	141.1	141.1
3	On lot irrigation of non-residential buildings	7,125	-	1.3*	1.3*	-	9.3	9.3
	Public Open Space Total	**115,073**				-	**150.4**	**150.4**
4	**Fringe customers**	**330,000 *****	-	**2.0 ********	**2.0 ********	**-**	**679.1**	**679.1**
	TOTAL					**30.1**	**868.7**	**898.8**

Table 4: Non-Residential specifications and average annual demands used in the analysis

DW = Drinking water demand, RW = Recycled water demand

*1.3 L/m^2 per day is the irrigation rate based on the HydropPlan Irrigation Strategy's calculated irrigation depths of 0.477m in an average year

** 25,000 m^2 land area and 2,000 students are assumed for the Santa Sophia Catholic College.

*** Irrigation demands from fringe customers assumed to be approximately 10% of total area identified

**** 2 L/m2 per day irrigation rate based on the Whitehead & Associates Environmental Consultants' local Land Capability Assessment for Recycled Water

TOTAL NON-RESIDENTIAL WATER DEMANDS

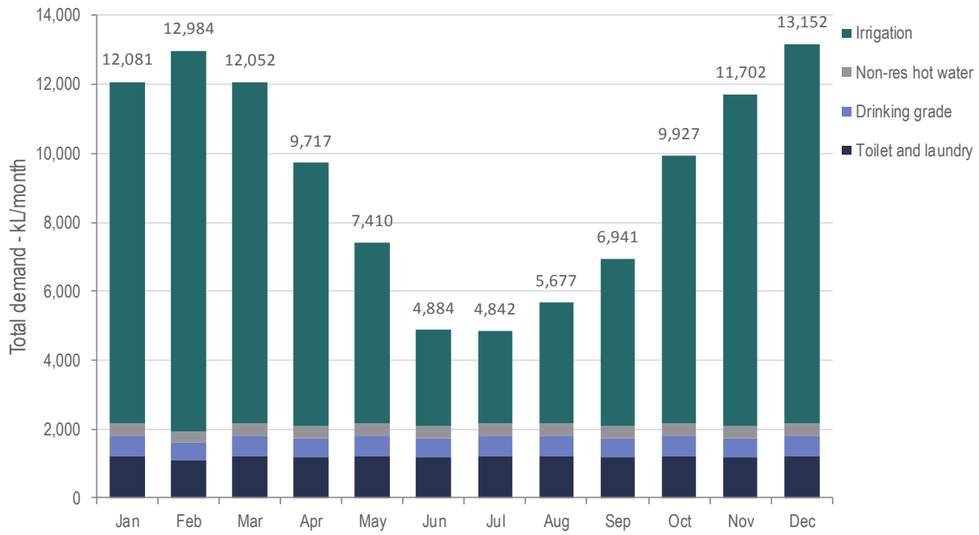

Figure 8: Non-Residential total water demands by end use, by month

AVERAGE DAILY NON-RESIDENTIAL WATER DEMANDS

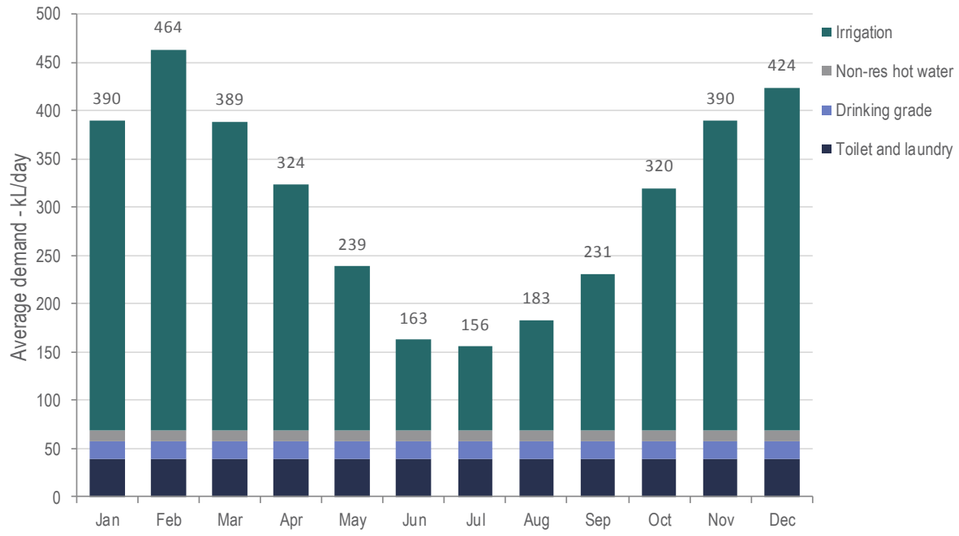

Figure 9: Average daily Non-Residential water demands by end use, by month

2.3 TOTAL AND PEAK WATER DEMANDS

Total water consumption, drinking water demand and recycled water demands are outlined in Tables 5 to 7. These tables show both total and peak demands for each use.

Total water demands are outlined in Figures 10 to 12 (monthly totals) and Figures 13 to 15 (daily average), summarising the results of the residential and non-residential demands for both drinking and recycled water demands.

As with the individual residential and non-residential demands, month to month variation is predominantly due to changes in irrigation demands. The irrigation demand analysis takes into account hourly rainfall data and cumulative period since the last rain event and irrigation to predict the time and water use of the next irrigation event. Predictions are also calibrated against real irrigation data for better alignment and accuracy (see *Key Data Sources* in Appendix).

Peak water demand (kilolitres per hour) for each month is provided in Figure 16. Peak demands for drinking and recycled water are also shown separately in Figures 17 and 18. The peak demand was determined based on the hourly maximum demand for each month, calculated based on the following variables:

- Hourly internal water demands based on a standard hourly internal water demand profile for each end use and building type.
- Hourly irrigation demands based on the irrigation area and local hourly rainfall and evaporation rates.

Due to the fact that internal water demand is relatively consistent over time, in all cases, outdoor irrigation demand is the key contributor towards peak water demands. It should also be noted that peak demands for drinking water and recycled water (Figures 17 and 18) do not necessarily add up to the total peak demand (Figure 16) as the individual peak demands may occur at different times.

TOTAL WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand (kL/day)	2,259	305	2,564
Peak day (kL/day)	3,406	652	3,942
Peak hour (kL/hr)	345	56	394

Table 5: Demand profile for Box Hill North urban release area.

DRINKING WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand (kL/day)	1,070	30	1,101
Peak day (kL/day)	1,563	44	1,608
Peak hour (kL/hr)	164	5	169

Table 6: Demand profile for Box Hill North urban release area.

RECYCLED WATER DEMAND PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Demand (kL/day)	1,189	275	1,464
Peak day (kL/day)	1,884	615	2,499
Peak hour (kL/hr)	184	53	228

Table 7: Demand profile for Box Hill North urban release area.

TOTAL WATER DEMAND

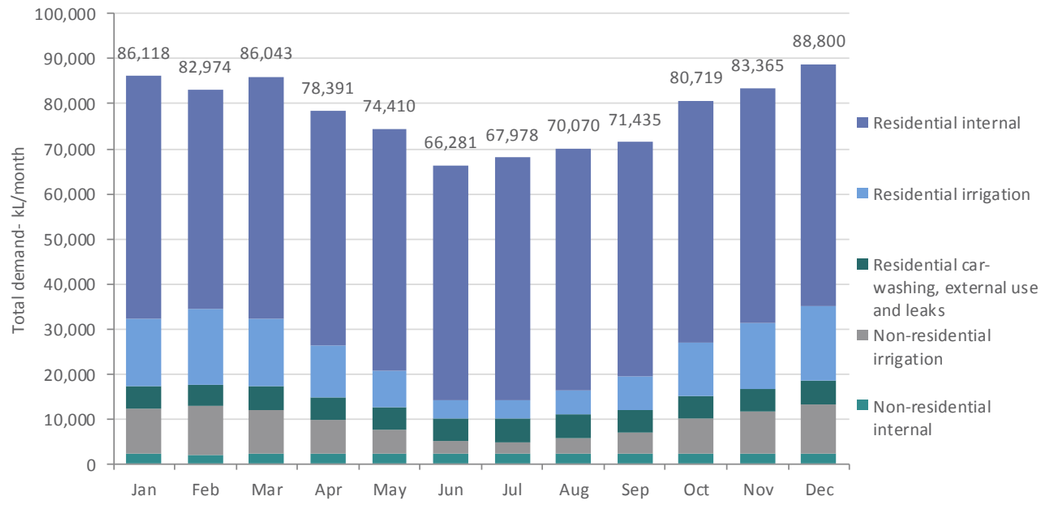

Figure 10: Total water demand by month

TOTAL DRINKING WATER DEMAND

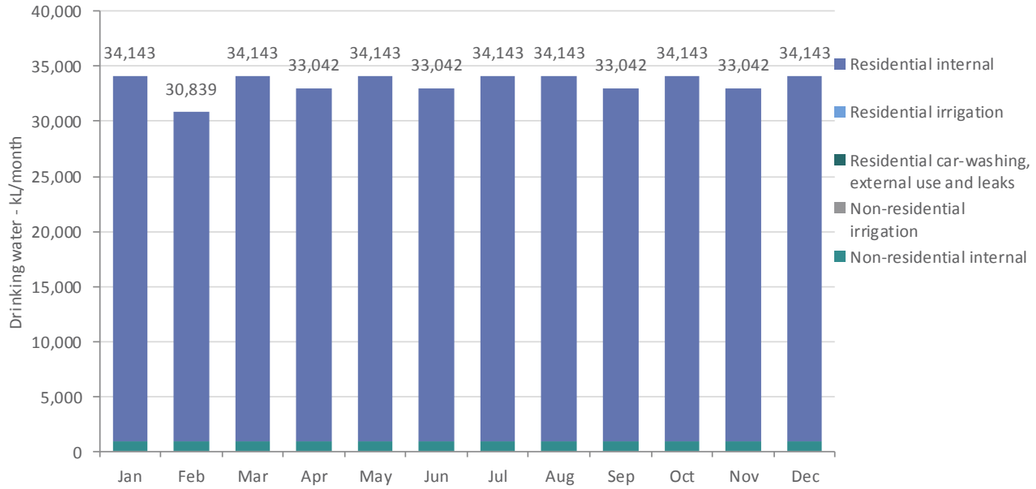

Figure 11: Total drinking water demand by month

TOTAL RECYCLED WATER DEMAND

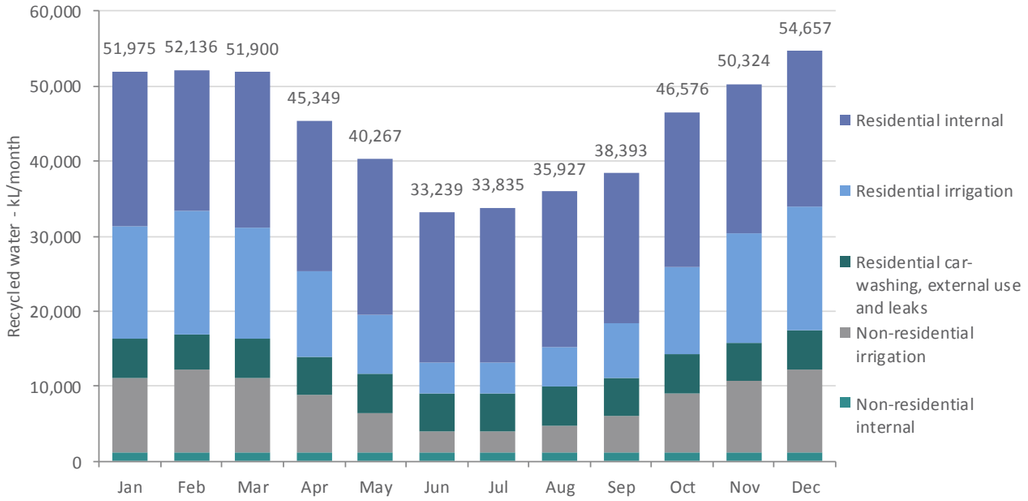

Figure 12: Total recycled water demands by month

DAILY AVERAGE WATER DEMAND

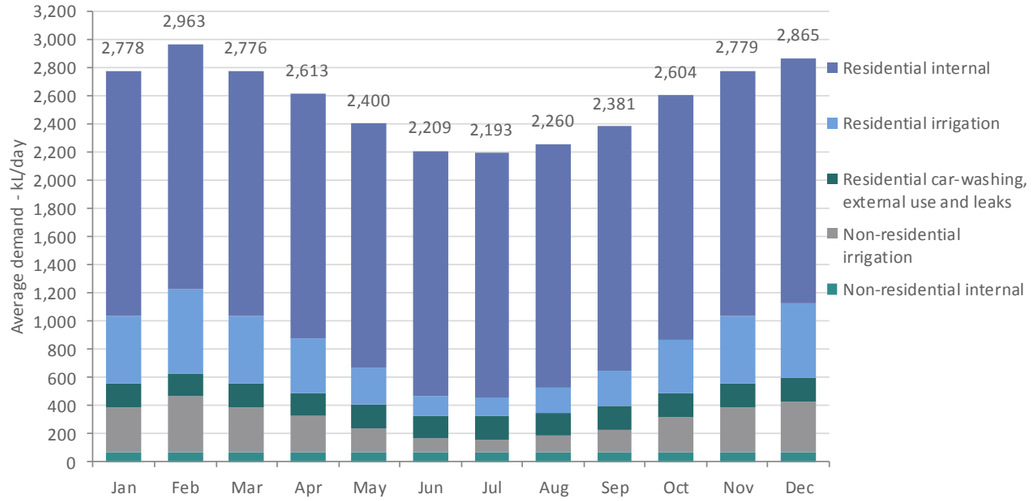

Figure 13: Daily average total water demands by month

DAILY AVERAGE DRINKING WATER DEMAND

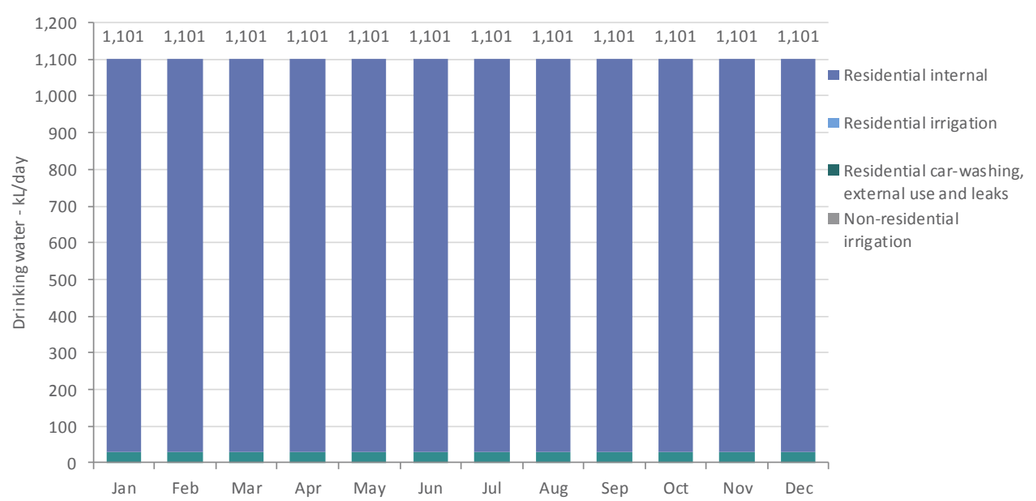

Figure 14: Daily average drinking water demand by month

DAILY AVERAGE RECYCLED WATER DEMANDS

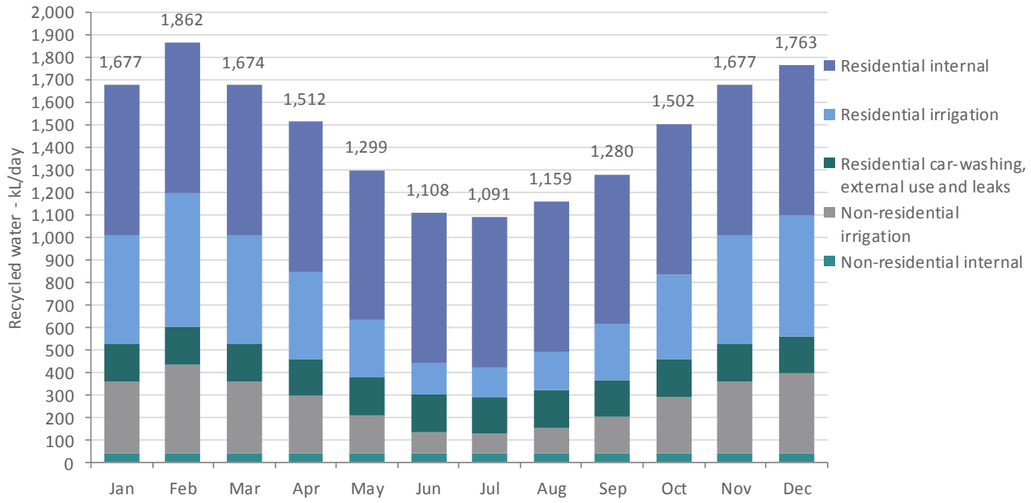

Figure 15: Daily average recycled water demand by month

PEAK TOTAL WATER DEMANDS

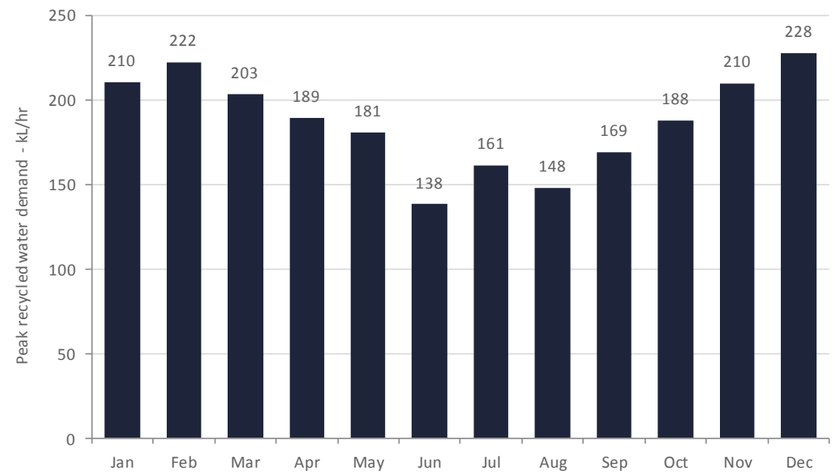

Figure 16: Peak total water demand by month

PEAK DRINKING WATER DEMANDS

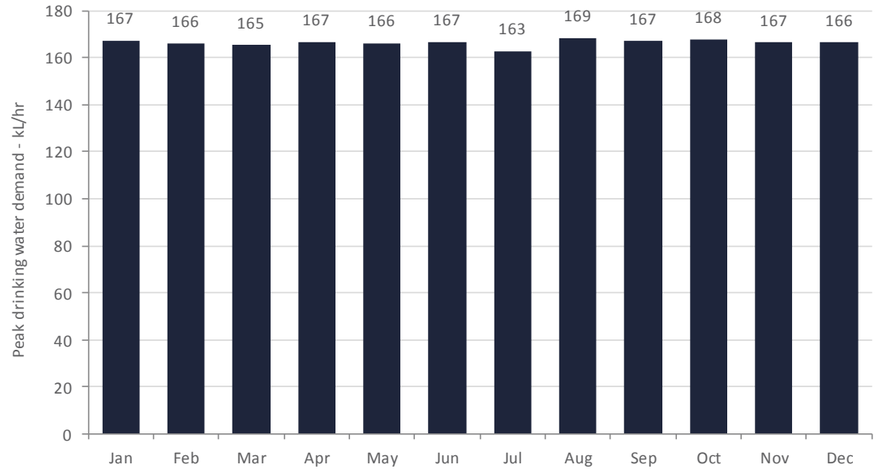

Figure 17: Peak drinking water demands by month

PEAK RECYCLED WATER DEMANDS

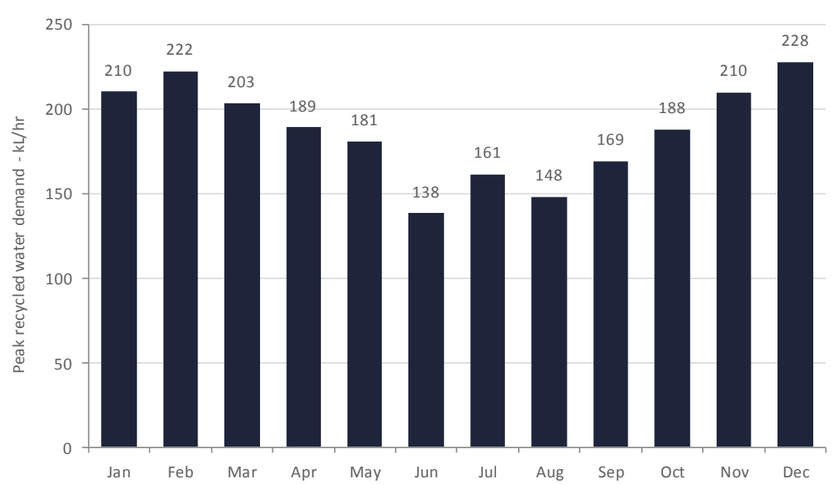

Figure 18: Peak recycled water demand by month

NOTE: Peak demands for drinking water and recycled water (Figures 17 and 18) do not necessarily add up to the total peak demand (Figure 16) as the individual peak demands may occur at different times.

3. SOURCE WATER PRODUCTION

3.1 SOURCE WATER PRODUCTION

Source water for the recycled water scheme is sourced from sewage production. Residential and non-residential sewage production is calculated based on the specific building types proposed for Box Hill North urban release area (as shown previously in Tables 3 and 4).

Table 10 outlines the average daily and peak sewer production for the residential and non-residential components of the development. Source water production from the residential and non-residential buildings is broken down further in Tables 8 and 9.

RESIDENTIAL SEWAGE PRODUCTION

Water End Use	Per Person Sewage Production (L/day)	Development Sewage Production (kL/day)
Shower	28.5	469.8
Kitchen sink	7.5	124.6
Bathroom basin	2.6	43.1
Dishwasher	2.3	38.0
Laundry trough	5.0	82.6
Bath	8.7	143.6
Fire testing*	1.5	24.8
Toilet	17.5	289.5
Washing machine	27.0	445.9
Car washing	-	-
Leaks (RW & DW grade)	-	-
Other external **	-	-
Irrigation	-	-
TOTAL	100.6	**1,661.9**
AVE. DWELLING	**345.4**	

Table 8: Residential dwelling end use specifications and per person daily sewage production used in the analysis
* Estimated using the proportion of Box Hill North residents in apartment dwellings and fire test water use as per BASIX
** Other external includes hose down, hardstand cleaning.

NON-RESIDENTIAL SEWAGE PRODUCTION

Water End Use	Sewage Production (L/m²/day)	Development Sewage Production (kL/day)
Retail	1.8	13.9
Commercial	1.8	0.9
Entertainment	4.1	4.7
Education	1.6	43.9
Day clinic	10.2	4.6
TOTAL		**68.0**

Table 9: Non-residential specifications and average annual demands used in the analysis. It should be noted that an estimated 1.1 kL/day is assumed to be lost through evaporative cooling in non-residential buildings.

SEWAGE PRODUCTION PROFILE

FACTOR	RESIDENTIAL	NON-RESIDENTIAL	TOTAL
Average Daily Production - kL/d	1,661	68	1,729
Peak day - kL/d	2,426	100	2,525
Peak hour – kL/hr	254	10	265

Table 10: Demand profile for Box Hill North urban release area

4. RECYCLED WATER SYSTEM PERFORMANCE

4.1 RECYCLED WATER SYSTEM CONFIGURATION

The recycled water system for Box Hill North urban release area was configured as follows:

- Connection to all dwellings for toilet and washing machine (cold tap) and garden irrigation
- Connection to open spaces deemed either essential or highly preferable to irrigate in the HydroPlan *Irrigation Strategy Master* Plan document for the Gables development
- Total recycled water storage capacity of 7.5 ML
- Volume losses of 2% are considered for the membrane bioreactor process

4.2 WATER BALANCE

The average daily performance of the recycled water system at full build out is outlined Figure 20 and the key water results are shown in Table 11.

Water Source	ML/year	kL/day
Total Precinct Water Demand	937	2,564
Sewage Production	631	1,729
Recycled Water Demand	535	1,464
Recycled Water Demand Met	533	1,459
Water top-up for Recycled Water Use	2	5
Drinking Water Demand	402	1,101
Water available for surplus irrigation	85	234

Table 11: Estimated development average water balance with recycled water system at full build out

Water Import for Recycled Water Use

The model shows that, at full build out, on average, 2 ML per year water top-up (stormwater/ rainwater or potable water import) will be required to service non-drinking water uses (see Figure 19). This is because sewage production and storage are sufficient to meet recycled water demand (on average), although peak demands will require additional top-up.

RECYCLED WATER SYSTEM PERFORMANCE AT FULL BUILD OUT

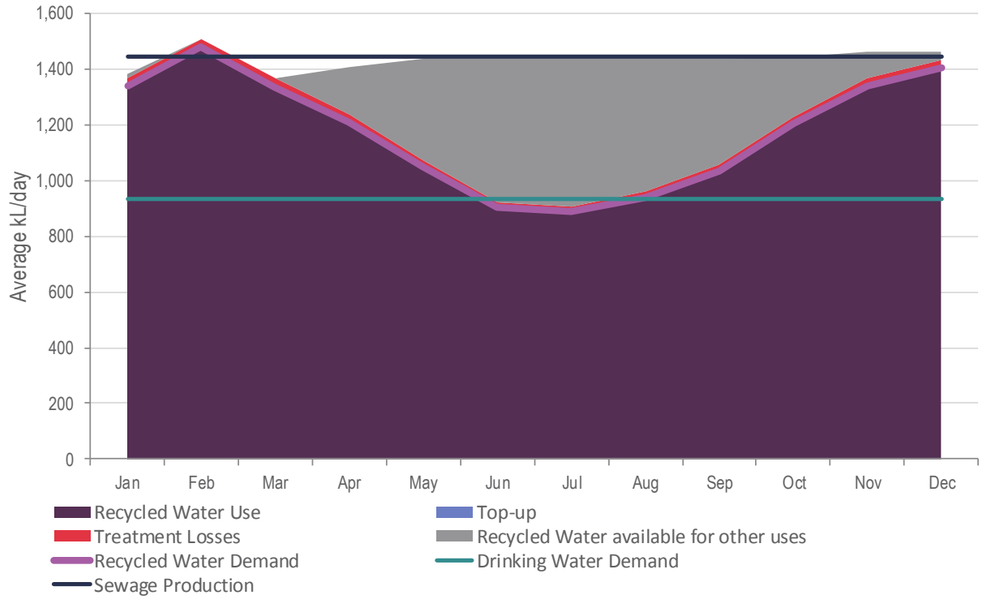

Figure 19: Recycled water system performance showing monthly recycled water use, demand and surplus that can be used to irrigate additional public open space areas. Note that daily averages have been calculated for each month. As such, daily variation in sewage production that results in the availability of recycled water for irrigation in summer is not apparent in this figure

ANNUAL AVERAGE DAILY FLOWS IN KL/DAY

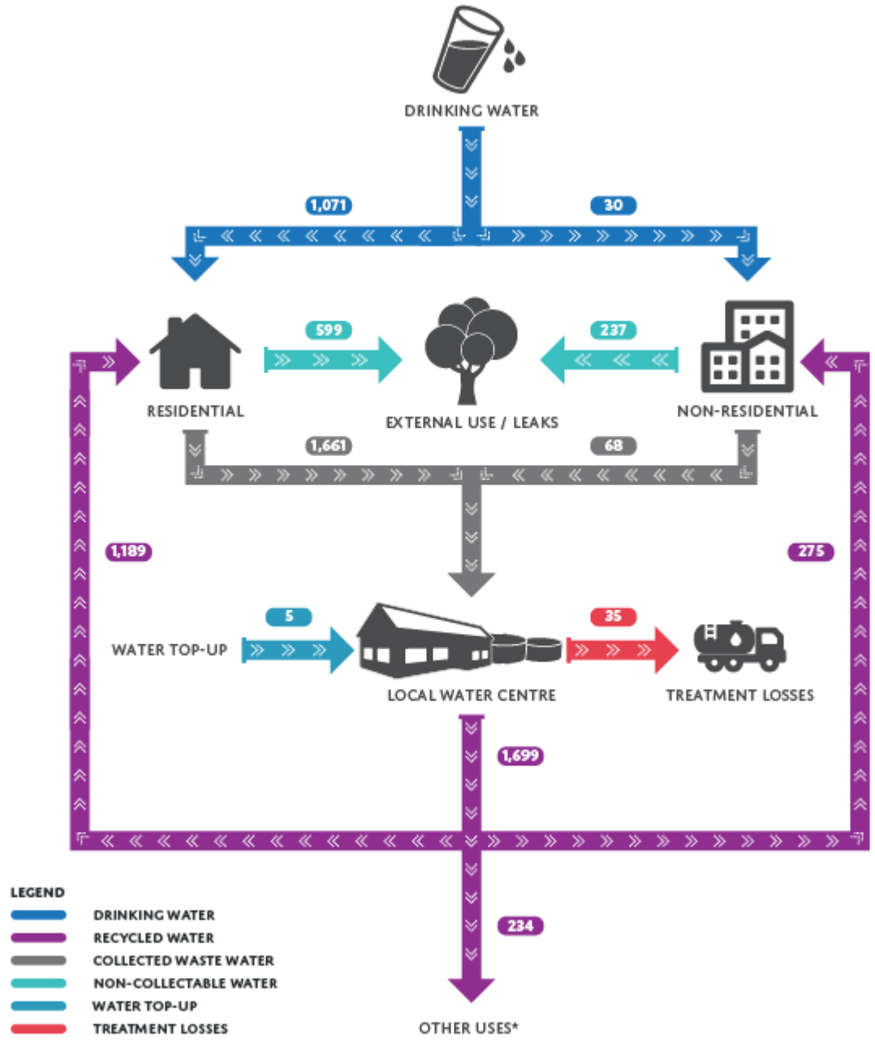

Figure 20: Schematic of the recycled water system showing annual average daily flows and treatment losses in kL/day.

Note - The sum of monthly recycled water use and discharge to sewerage does not always equal the total sewage production, due to the hourly analysis run by CCAP Precinct and the storage tank actively accepting and supplying water in order to minimize top-up, e.g. sewage production in excess of the recycled water demand is kept in the flow balance or recycled water is kept in the recycled water storage tanks, for periods where sewage production cannot meet the recycled water demand. External use includes irrigation, car washing & other external uses such as hose down.
* Other Uses may be external customers.

4.2 ADDITIONAL IRRIGATION RECYCLED WATER CONNECTIONS FOR OTHER USE

There are 38 additional lots on the fringe of the development with large open areas that require irrigation. If connections are established with the fringe customers on irrigation, a fully balanced, self-sustainable recycled water system could be achieved where all the treated water would be utilized and any 'other use' is fully accommodated.

Figure 21 and Figure 22 outline the recycled water system performance of the fully balanced system, visualizing the outcome of an established connection between the fringe customers and the development water network. The fringe customers will utilize the available other use recycled water for their irrigation purposes, at a rate of 2 mm/day suggested by Whitehead & Associates Environmental Consultants' *Land Capability Assessment for Recycled Water Management Scheme at Proposed Box Hill North Master Plan Development, Box Hill, NSW*. It is estimated that a total of 30.2 ha of land is required from fringe customers to fully utilize the 'other use' portion in the recycled water plant. However, it is also worth noting that, during summer periods, the connections from fringe customers will require sizable water top-up, increasing the annual top-up of the development to be 363 kL per day, or 133 ML per year.

RECYCLED WATER SYSTEM PERFORMANCE UTILIZING OTHER USE FOR IRRIGATION

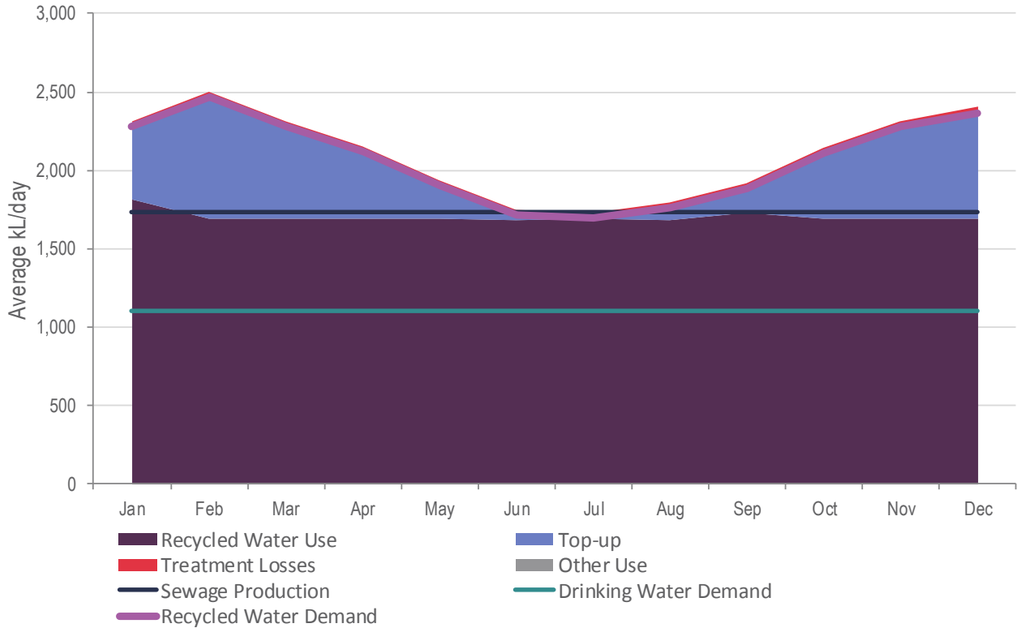

Figure 21: Recycled water system performance showing monthly recycled water use and demand, with additional irrigation connection to the fringe of the development to fully utilize the available recycled water for other uses.

ANNUAL AVERAGE DAILY FLOWS IN KL/DAY WITH FRINGE CUSTOMERS

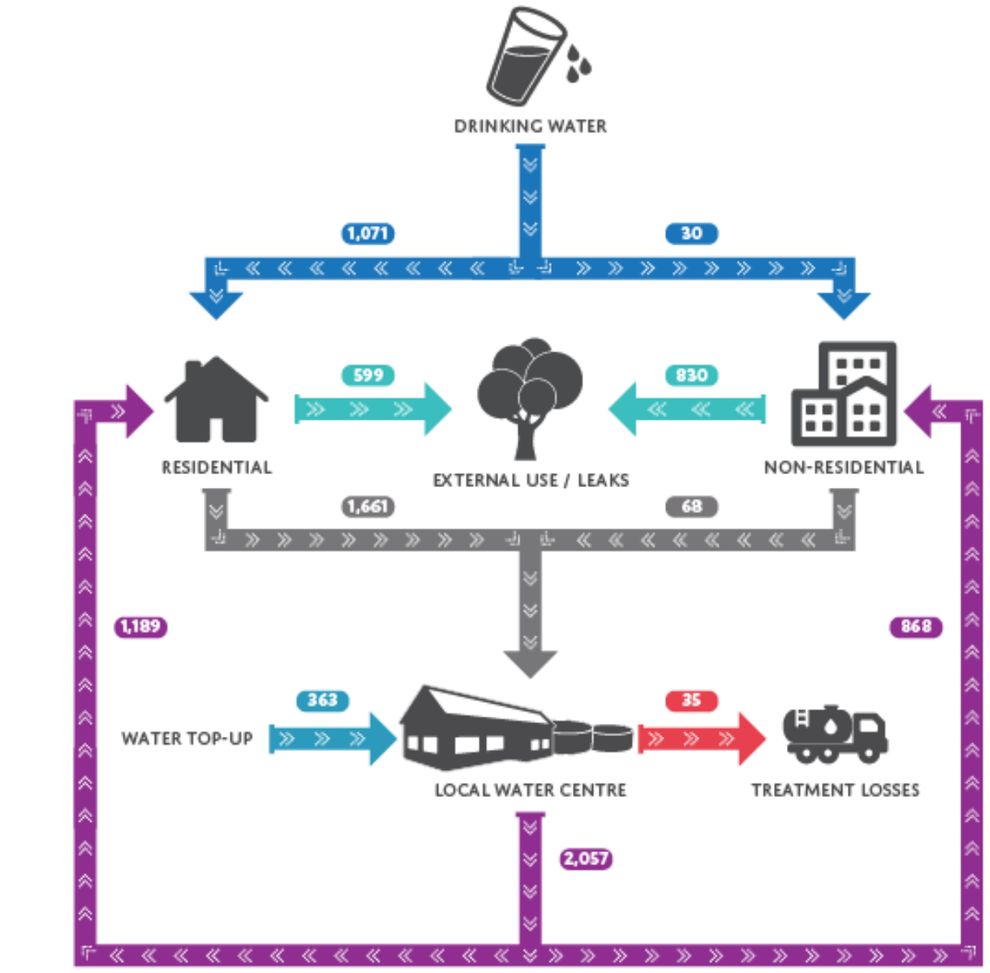

Figure 22: Schematic of the recycled water system with fringe customers, showing annual average daily flows and treatment losses in kL/day

APPENDIX

KEY DATA SOURCES

- ACADS-BSG Australian Climatic Data (Reference Meteorological Year, RMY) for hourly temperature, insulation and humidity.
- Bureau of Meteorology local rainfall and evaporation data (station 040842 – Richmond RAAF, 10 km Northwest from development, synthesized RMY)
  - Data is from the representative weather station for the local climate zone (NatHERS zone 10)
  - The RMY (Representative Meteorological Year) is synthesized from a composite of 12 typical meteorological months that best represent the historic average of the specified location using post-1986 data in addition to the earlier weather data for each of the 69 climate zones in Australia. The total rainfall and evaporation for this climate zone is:
    - Annual rainfall (mm) - 881
    - Annual evaporation (mm) – 1,738

DOCUMENT CHANGE LOG

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05/04/2018	3
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27/09/2019	5.0

- Department of Resources, Energy and Tourism, 2010, Energy in Australia – 2010, ABARE, Canberra
- Kinesis 2014, Additional water end use breakdowns derived from first principle analysis of residential and non-residential building types.
- National Water Commission, 2011, National performance report 2009-2010: urban water utilities, National Water Commission, Canberra.
- Whitehead & Associates Environmental Consultants, 2014, Land Capability Assessment for Recycled Water Management Scheme at Proposed Box Hill North Master Plan Development, Box Hill, NSW
- Hydroplan, 2017, Irrigation Strategy Master Plan – The Gables

Preliminary Risk Assessment Summary for Box Hill

Purpose

The purpose of undertaking the preliminary risk assessment was to:

- Identify potential risks that may impact the safe and reliable operation of the facility (and associated components), specifically focused on risks associated with the following:
  - Potential impacts to public health and/or water quality
  - Environmental impacts including noise, odour and general environmental impacts
  - Operational reliability and process performance
  - Financial viability
  - Customer service
- Identify early, potential risk mitigation/control measures that can be incorporated into the design, construction and operation of the facility to sufficiently mitigate these risks
- Facilitate further dialogue with all key stakeholders to ensure all key risks associate with the project are identified and effectively controlled.

Methodology

A risk assessment was conducted for provision of the following services:

- Sewage
- Recycled water

The assessment approach adopted for conducting the sewage and recycled water preliminary risk assessments was consistent with the recommendations in the Australian Guidelines for Water Recycling (AGWR). The assessment criteria are provided in Attachment A.

Business risks, or risks leading to a loss of service or complaints, were assessed using the Flow assessment criteria provided in Attachment B.

The preliminary risk assessment process included the following activities:

- **Risk Identification** – The identification of a range of risks related to the project (what might happen?)
- **Risk Categorisation** – The categorization of the risks into various types to aid understanding and to provide context.
- **Risk Assessment** – Determination of the likelihood and consequence of the unmitigated/uncontrolled risk (what is the likelihood and impact/consequence?)
- **Managing the Risk/Risk Mitigation** – the identification of appropriate controls to be further developed and implemented as appropriate should the project be approved to process (what can be done to stop it happening?)
- **Post Mitigation Risk Assessment** – the reassessment of the risk following implementation of appropriate controls to ensure that the risk is sufficiently mitigate (how effective do we anticipate the controls to be?)

Controls

Controls modify the likelihood or the impact of the risk (i.e. both the likelihood and consequence of a risk).

- Preventive controls apply at the beginning of a risk's life, at or near the root causes(s). As a device, they often act as a barrier to "nip it (the risk) in the bud". They primarily reduce the likelihood of the risk occurring. Examples are system passwords, locked doors, machinery maintenance etc.
- Detective controls usually apply somewhere in the middle of the risk's life. Detective controls rely on the analysis of information in order to detect that a risk is "in motion". Detective controls that are "early" in the risk's life usually modify likelihood and those that are "late" in the life, usually modify impact. Examples are online monitoring, inspections, complaints and incident monitoring etc.
- Reactive controls (sometimes also called Responsive or Corrective), apply towards the end of a risk's life when the impact is imminent or being felt. They are focused on modifying impact. Examples are plant shutdown, drinking water top up, incident and emergency response processes.

Risk rating before and after controls

The risk rating after controls is a risk assessment with controls in place. As explained above, controls can modify both the likelihood and consequence of a risk.

The qualitative descriptions for consequence or impact contained in the recommendations of the AGWR and ADWG (refer to Attachments A and B), use a combination of the scale of the impact and the size of population or ecosystem affected. If the controls can reduce the scale of the impact or size of the population or ecosystem affected, then the overall risk rating can be reduced.

Examples include:
Sewage – The risk of sewage overflow is mitigated by rapid response and isolation reducing the quantity of sewage released, and/or the flows to sensitive receiving environments being diverted, and therefore the scale and size of the ecosystems affected.
Recycled water - The risk of process failure is mitigated by a multi-barrier treatment approach and plant shutdown if critical control points are exceeded.

Outcomes

Sewage Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

Area	Descriptions
The Catchment	Risks associated with the catchment area including consideration of items such as contamination, volume changes, public health incidents, storage requirements, illegal discharge to sewers etc.
The Sewer Network	Risks associate with the network itself including blockages, pipe or equipment failure, loss of power etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment C as the detailed preliminary risk assessment contains information that is commercial in confidence.

Recycled Water Risk Assessment

In undertaking the preliminary risk assessment, risks were identified across the following areas:

Area	Descriptions
Local Water Centre	Consideration of the potential risk associated with the operation of the treatment facility including tank and/or equipment failure, odour, noise, process risks, capacity, power failure, telemetry, vandalism, operator error, flooding etc.
Recycled Water Reticulation and Use	Risks associated with the storage and distribution of recycled water to users and considered areas such as equipment failure, demand, unauthorized usage, water quality, security, power failure etc.
Management	General operation management issues risks that may impact operational reliability or supply surety.

Risks have been summarise at Attachment D as the detailed preliminary risk assessment contains information that is commercial in confidence.

Attachment A Qualitative Risk Assessment Criteria as per the AGWR

Risk Matrix - Australian Guidelines for Water Recycling

Likelihood							
	A Almost certain		Low	Moderate	High	Very High	Very High
	B Likely		Low	Moderate	High	Very High	Very High
	C Possible		Low	Moderate	High	Very High	Very High
	D Unlikely		Low	Low	Moderate	High	Very High
	E Rare		Low	Low	Low	High	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
			Consequence				

Likelihood (qualitative measures)

Level	Descriptor	Example description
A	**Almost certain**	Is expected to occur, with probability of multiple occurrences within a year.
B	**Likely**	Will probably occur within a 1-5 year period.
C	**Possible**	Might occur or should be expected to occur within 5-10 year period.
D	**Unlikley**	Could occur within 20 years or in unusual circumstances.
E	**Rare**	May occur in exceptional circumstances; may occur once in 100 years.

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	**Insignificant**	Insignificant impact or not detectable.
2	**Minor**	Health - minor impact for small population Environment - potentially harmful to local ecosystem with local impacts contained to site.
3	**Moderate**	Health - minor impact for large population Environment - potentially harmful to regional ecosystem with local impacts primarily contained on site.
4	**Major**	Health - major impact for small population Environment - potentially lethal to local ecosystem. Predominantly local, but potential for off-site impacts.
5	**Catastrophic**	Health - major impact for large population Environment - potentially lethal to regional ecosystem or threatened specias. Widespread on-site and off-site impacts.

Note:
1. The levels used for "Likelihood" have been changed to be the same as the ADWG i.e. A = Almost certain. In the AGWR A = Rare

Attachment B Flow's Qualitative Risk Assessment Criteria

Risk Matrix - Flow Systems

Likelihood							
	A Almost certain		Low	Medium	High	Very High	Very High
	B Likely		Low	Medium	High	Very High	Very High
	C Possible		Minimal	Low	Medium	High	Very High
	D Unlikely		Minimal	Minimal	Low	Medium	High
	E Rare		Minimal	Minimal	Low	Medium	High
			Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
			Consequence				

Attachment B Flow's Qualitative Risk Assessment Criteria *cont.*

Likelihood (qualitative measures)

Level	Descriptor	Example description (Flow)
A	Almost certain	Expected to occur in most circumstances. Greater than 90% chance of occurrence. More than once per year.
B	Likely	Will probably occur in most circumstances. 65%-90% chance of occurrence Once in 1-2 years
C	Possible	Might occur or should occur at some time. 35%-65% chance of occurrence Once in 2-5 years
D	Unlikley	Could occur in unusual circumstances. 10%-35% chance of occurrence. Once in 5- 20 years.
E	Rare	May occur only in exceptional circumstances. Less than 10% chance of occurrence. Once in 20 years

Consequence or impact (qualitative measures)

Level	Descriptor	Example description
1	Insignificant	No material financial consequence to Flow Cost <$10k 1-2 customers impacted. Little disruption to normal operation, low increase in normal operation costs.
2	Minor	Some financial consequences to Flow Cost $10k-100k. 2-10 customers or a whole street impacted. May require notification but no other extraordinary activities. Some manageable operation disruption, some increase in operating costs.
3	Moderate	Considerable financial consequences to Flow. Cost $100k-$250k. Subdivision of community or whole development stage impacted. Significant negative consequences requiring additional actions to rectify. Negative client / customer reaction but temporary. Significant modification to normal operation but manageable, operation costs increased, increased monitoring.
4	Major	Material financial consequences to Flow Cost $250k-$1 million. Whole community impacted. High likelihood of adverse client/ customer reaction (e.g. lawsuits). May lose some clients / customers permanently. Systems significantly compromised and abnormal operation if at all, high level of monitoring required.
5	Catastrophic	Such significant financial consequences to Flow that its ability to operate is threatened. Cost > $1 million. More than one community impacted. Adverse client / customer reaction (e.g. lawsuits). Permanent loss of multiple clients / customers. Flow's key point of contact with IPART in the short term. Complete failure of systems.

Attachment C – Preliminary Risk Assessment Summary - Sewage

Risk ID	Component	Potential Risk	Pre-mitigation Risk	Controls	Post-mitigation Risk (or residual risk)
SW 1.1	Whole of system	Failure of overarching sewer management plan	**Very High**	• Additional controls as listed for each individual risk below. • **Preventive:** • Business Management System (BMS) independently verified to the International Standards ISO 9001 for quality management, ISO 14001 for environmental management and ISO 45001 for safety management • Regular audits by auditors from the regulator's (IPART) independent panel of auditors. • Regular internal process and compliance audits are a component of the Flow BMS. • Review of resource requirements as part of Flow's business planning and budgeting process. • Annual review of BMS and water quality management plans. • Regulator oversight and enforcement action. • Skilled and trained operators. • Competency based training system. • **Detective:** • Consumer complaints • Operator inspections • **Reactive:** • Incident & Emergency Management Plan and associated processes to ensure a rapid and effective incident response and to prevent incident escalation. • Incident Notification Protocol with NSW Health to ensure risks to public health are controlled quickly • Qualified contractors engaged to provide rapid response to faults and emergencies including sewage overflows. • Pollution incident notification as per POEO Act requirements	**Low**
SDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	**Very High**	• Compliance Certificate only issued when developer completes works • If works delayed, developer pays bond to Flow and Flow will deliver infrastructure • Early identification of contingency measures through modelling. • Project management processes. • Generators if delay related to connection to power. • Other reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps	**Low**
SDW 1.2	Delivery of Local Water Centre	Delays in construction and delivery of Local Water Centre by Flow	**Very High**	• ISO 9001 certified project management processes to ensure timely delivery of infrastructure • Early identification of contingency measures through modelling. • Sewage tankering • Provision of drinking water through recycled water network.	**Low**
SC1.1 SC1.2	On lot plumbing and wastewater collection tanks	Overflow	**Very High**	• Office of Fair Trading Inspections • Monitoring of pump operation through telemetry and data collection • Alarms linked to telemetry • Customer complaints • Ability to isolate mains • Qualified contractors to manage wastewater spills	**Low**

SC 1.3 SC 1.4	Collection system (Sewer main)	Sewage escape from sewer main due to third party damage	**High**	• Dial Before You Dig (DBYD) • Survey prior to invasive site work • Physical and mechanical protection on mains • Customer and community complaints and response process • Customer communications	**Low**
SC1.5	Collection system (Sewer main)	Low flows in initial development stages	**High**	• Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures • Customer Complaints Program • Continuous monitoring and alarms	**Minimal**
SL 1.6 SL 1.10	Local Water Centre (Flow Balance Tank)	Overflow from tank	**Very High**	• Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures. • Standby pumps and emergency alarms • Storage within collection tanks • Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation.	**Low**
SL 1.8 SL 1.9 SL 1.10	Local Water Centre (Flow Balance Tank)	Operational failure	**Very High**	• Duty / standby of equipment • Monitoring and controls • Proactive maintenance regime • Experienced operators • Trade waste agreement • Tankering company on emergency callout contract. • Customer Complaints Program • Continuous monitoring and alarms	**Low**
SL 1.11	Local Water Centre	Inability to service customers	**Very High**	• Duty / standby of equipment • Storage within the Flow Balance Tank • Skilled operators • Monitoring and controls • Overflow relief • Tankering company on emergency callout contract • Drinking water top up to recycled water tanks.	**Low**

Attachment D – Preliminary Risk Assessment Summary – Recycled Water

Risk ID	Component	Potential Risk	Pre-mitigation Risk (or	Controls	Post-mitigation Risk (or residual risk)
RW 1.1	Whole of system	Failure of overarching recycled water quality plan	**Very High**	• See SW1.1	**Low**
RDW 1.1	Delivery of developer works	Delays in construction and delivery of infrastructure by developer	**Very High**	• Compliance Certificate only issued when developer completes works • If works delayed, developer pays bond to Flow and Flow will deliver infrastructure • ISO 9001 certified project management processes including project meetings, program updates, and reporting. • Generators if delay related to connection to power. • Other reactive contingency measures dependent on service i.e. : sewage tankering, drinking water tankering, deployment of extra pumps	**Low**
RDW 1.2	Delivery of Local Water Centre	Delays in construction and delivery of Local Water Centre by Flow	**Very High**	• ISO 9001 certified project management processes to ensure timely delivery of infrastructure • Early identification of contingency measures through modelling. • Sewage tankering • Provision of drinking water through recycled water network.	**Low**
RC 1.2 RC 1.3	Collection System	Raw sewage characteristics are outside of design influent parameters	**Very High**	• Design influent parameters based on industry guidelines for water efficient homes. • Community education i.e. new owner information packs, newsletters, school experience programmes etc. used to inform the public on what can be disposed of down the sewer. • Trade Waste Agreements with retail and commercial users • Multiple treatment barrier approach • Automatic plant shutdown when critical control points are breached. • Ability to tanker from LWC balance tank or divert to public water utility sewer (if applicable) Additional storage in wastewater collection tanks • Incident and Emergency Management Plan and Processes • Incident notification protocol with NSW Health	**Low**
RL 1.1 RL 1.6 RL 1.8 RL 1.13	Local Water Centre	Process equipment damage / failure	**Very High**	• Duty / standby of equipment • Spares of critical equipment on site • Monitoring and controls • Proactive maintenance regime • Experienced operators • Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation. • Tankering company on emergency callout contract • Drinking water top up.	**Low**
RL 1.2 RL 1. 4 RL 1. 7 RL 1. 9 RL 1.12	Local Water Centre	Process performance outside operational parameters	**Very High**	• Duty / standby of equipment • Multi-barrier treatment process • Spares of critical equipment on site • Monitoring and controls • Proactive maintenance regime • Experienced operators • Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation • Drinking water top up	**Low**

				• Tankering company on emergency callout contract.	
RL 1.3 RL 1.5	Local Water Centre	Tank failure	**High**	• Design, production, installation and testing by qualified contractors and quality assurance to AS3735 Water Retaining Structures • Level monitoring • Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation • Tankering company on emergency call out contract. • Drinking water top up	**Low**
RL 1.11	Local Water Centre	Supply of chemicals is exhausted or degraded/poor quality	**Very High**	• Tanks sized for adequate storage • Chemical supply from a reputable supplier. • Skilled operators with documented operational procedure • Chemical storage tanks are fitted with level devices to ensure levels are continuously monitored.	**Low**
RL 1.15	Local Water Centre	Chemical spill	**Very High**	• Chemicals stored within weatherproof, bunded area as per Australian standards • Chemical loading area within bunded area • Chemical delivery procedures • Trained and inducted delivery drivers • Operator inspections • Spill response procedure • Tankering company on emergency callout contract • Incident and Emergency Management Plan and processes	**Low**
RL 1.16	Local Water Centre	Incorrect chemical delivery	**Very High**	• Operators on site and supervise chemical deliveries • Chemical supply agreements and operational procedures • Chemical delivery procedures including signage and labelling • Trained and inducted delivery drivers • Tankering company on emergency callout contract • Incident and Emergency Management Plan and processes • Spill response procedure.	**Low**
RL 1.17 RL 1.18 RL 1.19 RL 1.20 RL 1.21	Local Water Centre	Disaster Emergency such as fire, lightning, vandalism, theft, power failure	**Very High**	• In the event of power failure onsite back-up generator used to maintain key process units. • Regular maintenance of back up generator • Ability to source an offsite generator as a backup • UPS system installed to ensure control and access to the plant is still maintained. • Top-up with drinking water • Firefighting system for the LWC • Incident and Emergency Management Plan and processes	**Low**
RL 1.23 RL 1.24	Local Water Centre	Poor aesthetics / Noise	**Very High**	• Local Water Centre has been designed to blend in with the local environment whilst not hiding its core activity. • Building layout has been designed to facilitate scheduled visits from interested stakeholders. • All odour generating equipment has been fitted with covers and odour treatment as required. • Odour modelling has been undertaken to confirm that expected impact on surrounding stakeholders is negligible. • All noise generating equipment has been fitted with acoustic covers. Further	**Minimal**

			Very High	• acoustic treatment has been provided on the Local Water Centre building. • Noise modelling has been used to confirm that expected impact on surrounding stakeholders is negligible. • Incident and Emergency Management Plan and processes	
RL 1.25	Local Water Centre	PLC / SCADA failure		• Local Water Centre can continue operation in the event telemetry is lost. • Automatic LWC shutdown on PLC failure • Operating procedure to respond to PLC failure • Data capture will continue on the local SCADA and PLC. • Plant would shut down if parameters were out of specification. • Top up with drinking water • Software and hardware back up • Supply agreement with telemetry with emergency response provision	**Low**
RD 1.1 RD 1.2	Recycled Water Distribution	Tank overflow / failure	**Low**	• Design, production, installation and testing by qualified contractors and quality assurance • Incident and Emergency Management Plan and associated processes to ensure rapid response and mitigation • Tankering company on emergency callout contract	**Low**
RD 1.3 RD 1.4	Recycled Water Distribution	Cross connection	**Very High**	• Recycled water kept at lower pressure than drinking water thereby mitigating recycled water entering the system • Colour coded, different materials, labelled pipes and marker tape • QA inspections of house plumbing by NSW Office of Trading prior to handover / operation • Plumbing inspections triggered by DA process • OFT inspection and Flow's cross-connection plumbing check pre-conditions to Flow's connection of sewerage • QA checks on reticulation installation prior to handover to Flow (and Flow's issue of Certificate of Compliance) • Home builder education (website, Builders Guide) • Customer education (website, home owners guide, including translated services) • Backflow prevention at each house connection • Telemetry monitoring of drinking and recycled water usage to identify anomalous use	**Low**
RD 1.5	Recycled Water Distribution	Recycled water is used for unauthorized purposes		• Colour coded, different materials, labelled pipes and marker tape • Information packs will be supplied to householders on initial connection or with change of ownership. These information packs will clearly define the authorised uses for the recycled water. • Community education on recycled water / website • Signage on recycled water taps • Monitoring of drinking and recycled water usage to identify anomalous use	
RD 1.6	Recycled Water Distribution	Process equipment damage / failure	**Moderate**	• Pumps are installed duty / standby with automatic changeover. • Maintenance contractor to be engaged under standard protocols to investigate cause of pump failure.	**Minimal**

				• Maintenance contractor to be engaged under emergency protocols to repair pump(s) or install temporary pump or repair leak. • Preventive maintenance on pumps • Reticulation pipe work will be provided with a number of valves enabling isolation of parts of the network • Incident and Emergency Management Plan and processes.	
RD 1.7	Recycled Water Distribution	Main break leading to discharge of recycled water	**Moderate**	• Reticulation pipe work will be provided with a number of valves enabling isolation of parts of the network. • Maintenance contractor to be engaged under emergency protocols to repair leak. • High quality recycled water • Dial Before You Dig (DBYD) • Automatic shut down on high flow • Looped reticulation design and construction • Highlighting of single supply mains as high priority on DBYD where looping not possible • Pressure monitoring of the network for early alert of leaks • Mechanical vehicle protection on storage tanks (height restrictions, bollards) • Detectable marker tape over all mains	**Low**
RD 1.9	Recycled Water Distribution	Demand exceeds supply	**Moderate**	• Recycled water storage sized at >5 days of average production. • Drinking water used to maintain supply if the recycled water storage tank drops below a minimum level. • Membrane tank over-sized to allow for the option of stormwater harvesting to supplement the source water supply.	**Minimal**
RD 1.10	Recycled Water Distribution	Health impact from exposure to water features	**Very High**	• Signage indicating use of recycled water in water features and proper use • High quality recycled water has low risk of health impact • Information packs and community education • Incident and Emergency Management Plan and processes	**Low**
RD 1.11	Recycled Water Distribution	Supply exceeds demand	**Very High**	• Implement Integrated Water Cycle Management (IWCM) Policy and regularly review scheme specific IWCM Plan. • Seek additional recycled water customers • Monitor volumes, demands and trends and adjust operations to suit.	**Low**
RI 1.1 RI 1.2 RI 1.3 RI 1.4 RI 1.5 RI 1.6	Recycled Water Irrigation in Designated Irrigation Zones	Increased flows to receiving waters from over-irrigation	**Moderate**	• Minimum 5m buffer area from waterways • Monitoring soil and water quality • Visual inspections • Metered connections to Designated Irrigation Zones (DIZs) • Water quality and flow monitoring.	**Low**
RI 1.7 RI 1.7a RI 1.11	Recycled Water Irrigation in Designated Irrigation Zones	Inappropriate irrigation	**High**	• Management in accordance with Recycled Water Irrigation Management Plan • DIZ Site selection criteria • Seasonal irrigation to meet water balance requirements • Remote/in person monitoring of DIZs • Visual inspection of DIZs • Metered connections to DIZs • Minimum 5m buffer area from waterways	**Low**

RI 1.8 RI 1.9. RI 1.10	Recycled Water Irrigation in Designated Irrigation Zones	Increased salinity, pathogens and nutrients	**Moderate**	• Treatment process (LWC) • DIZ Site selection • Vegetation selection and maintenance • Monitoring - water and soil quality	**Low**
EU 1.1 EU 1.2 EU 1.3 EU 1.5 EU 1.6 EU 1.7 EU 1.8 EU 1.9 EU 1.10	End Uses	Health impact from exposure to recycled water through customer end uses	**High**	• Multiple barrier treatment process • Regular audits by auditors from the regulator's (IPART) independent panel of auditors. • Regular internal process and compliance audits are a component of the Flow BMS. • Information packs will be supplied to householders on initial connection or with change of ownership. These information packs will clearly define the authorised uses for the recycled water. • Community education on recycled water / website	**Low**
EU1.3 EU 1.8 EU1.9	End Uses	Environmental impact from recycled water runoff	**High**	• Multiple barrier treatment process • Regular audits by auditors from the regulator's (IPART) independent panel of auditors. • Regular internal process and compliance audits are a component of the Flow BMS. • Flow/customer agreements which allow Flow to communicate authorised purposes, associated health and environmental risks and required risk controls. • Customer education for appropriate end uses (website, home owners guide, including translated services)	**Low**

flow

Infrastructure Operating Plan (IOP)

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Retail Supply Management Plan

flow systems

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Complaints and Dispute Resolution Policy

Our Policy and Code of Conduct

If you are a customer of Flow Systems Pty Ltd (**Flow**) in relation to any of the following services:

- water services[1]
- electricity services
- thermal services[2]

this policy applies in relation to those services.

For us, the term 'customer' means:

- the owner of premises to which we supply services, or
- a tenant of the premises to which we supply services and who uses those services, or
- a consumer of Flow's services.

At Flow, our mission is to create next generation utilities that enable self-sufficient communities, exceeding the expectations of our customers through sustainable innovation, leadership and smart thinking.

We are a customer-focused organisation, certified to the international standard for quality management (ISO 9001), and welcome all feedback including complaints.

If you are not happy with our services, or you want to give us any other feedback, we welcome your response. Please get in touch and we will try to resolve your issue as quickly as we can.

We are committed to treating complaints and disputes promptly, equitably, confidentially and professionally, at no cost to our customers. Our goal is to manage complaints and disputes in a way that results in continuously improving our customer services.

This Complaints and Dispute Resolution Policy[3] is made publicly available on our website.

Our complaints management and dispute resolution processes are in line with the Australian Standard *AS/NZS 10002:2014 Guidelines for complaint management in organizations*. We are committed to following the guiding principles set out in the Standard.

[1] Water services comprise drinking water, sewerage and recycled water services.
[2] Thermal services comprise central hot water, cooker gas and air conditioning services.
[3] This policy is also our code of conduct for customer complaints as required under the Water Industry Competition (General) Regulation 2008 as well as our standard complaints and dispute resolution procedure as required under the National Energy Retail Law 2011.

Complaints and Dispute Resolution Policy

What is a complaint?

We use the same definition as the Australian Standard *AS/NZS 10002:2014 Guidelines for complaint management in organizations*. A complaint is an '**expression of dissatisfaction made to or about an organization, related to its products, services, staff, or the handling of a complaint, where a response or resolution is explicitly or implicitly expected or legally required**'.

How to make a complaint?

You can contact us in the following ways:

- if you buy your electricity directly from Flow as authorised retailer, by calling us on **1300 806 806** or emailing us at **hi@flowsystems.com.au**
- for all other accounts (ie. electricity from Flow as agent for a body corporate/owners corporation, water services, or thermal services), by calling us on **1300 803 803** or emailing us at **contact@flowsystems.com.au**

How are complaints handled?

Once we receive your complaint, we will acknowledge, investigate, and respond promptly to resolve your complaint as quickly as we can.

Your complaint will be recorded, classified and tracked in our Customer Relationship Management system (CRM). You will be provided a unique ticket number which you can use for future reference relating to your enquiry.

Your complaint will be investigated by a Customer Services Agent. All comments, actions and resolutions are recorded in our CRM against the corresponding ticket number. After the complaint is investigated, you will be advised about the outcome.

How are complaints resolved?

If your complaint cannot be resolved immediately we will contact you to provide an update within two business days from receiving the complaint, unless a response is required in writing by post which may take longer.

More complex complaints may need to be investigated further and we will attempt to resolve complaints within 20 business days after notification. During this time, we may contact you for further information or you can contact us for an update. We will first confirm with you how, and how frequently, you want to be informed.

We will protect your personal information generated as part of handling your complaint and in accordance with our Privacy Policy, which is available on our website.

We will inform you of the outcome of your complaint, and if you are not satisfied with our response, you have the right to refer your complaint to the relevant Ombudsman.

How are complaints escalated?

You can let us know at any time if you want us to escalate your complaint to a higher level of management within Flow. If you are still not satisfied with our final resolution to your complaint, you are able to contact the relevant Ombudsman in the state in which your premises is located.

Ombudsman schemes provide an independent way to resolve complaints and can make decisions without any interference, based on what is fair and reasonable in the circumstances of each case. Ombudsman services are free to customers.

The details for the relevant Ombudsman scheme in each state and for each service are provided below.

Ombudsman for water and electricity customers in New South Wales

Energy and Water Ombudsman NSW (EWON)
Freecall: 1800 246 545
Freepost: Reply paid K1343, Haymarket NSW 1239
Email: omb@ewon.com.au
Website: www.ewon.com.au

Ombudsman for electricity customers on Electricity Supply Agreements with Flow in Queensland

Energy and Water Ombudsman Queensland (EWOQ)
Freecall: 1800 662 837
Freepost: PO Box 3640, South Brisbane QLD 4101
Email: complaints@ewoq.com.au
Website: www.ewoq.com.au

Assistance for electricity and water customers on other contracts in Queensland

Electricity and water customers on other contracts in Queensland also have a right to refer complaints or disputes to the Queensland Civil and Administrative Tribunal (QCAT) or any other relevant external dispute resolution body. Details on QCAT's services are available on the QCAT website http://www.qcat.qld.gov.au or by calling QCAT on 1300 753 228.

Missed Payments

Purpose

This document outlines our code of conduct for customers that have missed one or more payments.

Applicable to

This policy applies to all customers.

Code of Conduct

If a customer is having difficulty paying a bill or is concerned about not being able to pay on time, Flow will try to reach an achievable agreement with the customer to pay what is owing.

The options may include:

- a short extension of time;
- a payment plan to pay the account in regular instalments over an agreed time-frame;
- a budget plan where regular manageable amounts are debited from the customer's nominated account; or,
- access to a Payment Assistance Scheme that operates through local welfare agencies.

Collection

Reminder Notice:

If a customer fails to make a payment on the due date, Flow will contact the customer, including sending a reminder notice.

Warning Notice:

At least 7 days prior to taking action for non-payment, Flow Systems will send a payment warning notice that:

a. provides information about help that is available to the customer, including information about EWON and Flow's payment assistance policy; and
b. advises the customer that the payment is overdue and must be paid to avoid legal action or supply restriction; and
c. caution that, if legal action is taken or supply restricted, the customer may incur additional costs in relation to those actions.

In the case of a tenant

Our legal and billing relationship is with the owner of the property. We do not bill tenants for our services. Any arrangement that a tenant has with the landlord is a private matter between them.

If a landlord has missed an account payment, Flow may allow a short extension of time so the tenant can contact the property owner or managing agent. Flow will not begin any recovery action during this agreed period.

In the case of a business

For business customers, Flow may offer a short extension of time to allow settlement of the account, based on reasonable commercial considerations. In considering these options, overdue accounts attract interest charges.

Actions for Non Payment

Restriction and Legal Action

As a last resort, Flow may restrict the supply of services to a property and/or take legal action. This will happen if:

a. more than 14 days have elapsed since the issue of the reminder notice to the customer;
b. more than 7 days have elapsed since the issue of the warning notice to the customer;
c. Flow or its agent has attempted to make contact with the customer by telephone, email or in person, about the non-payment;
d. the customer has been notified of the proposed restriction or legal action and the associated costs, including the cost of removing the restriction device; and,
e. the customer has;
    i. been offered a flexible payment plan and has refused or failed to respond; or
    ii. agreed to a flexible payment plan and has failed to comply with the arrangement.

Limits on restriction and legal action

Flow will not begin legal action or take steps to restrict a customer's service due to non-payment if:

a. the customer has lodged an application for a government funded concession relating to amounts charged by Flow and the application remains outstanding; or

b. the customer is a landlord, and:
   i. the amount is in dispute between the Customer and the tenant; or
   ii. the amount in dispute is subject to an unresolved complaint procedure in accordance with Flow's Customer Complaints Code.

Additional limits on restriction

Flow will not take steps to restrict a Customer's service due to non-payment if:

a. it is a Friday, public holiday, weekend, day before a public holiday, or after 3pm; or
b. the customer is registered as medically dependant.

If the supply to a customer's property is restricted, Flow will continue to provide water for basic health and hygiene purposes and endeavour to notify the occupants either by email or a phone call when the supply is restricted.

Removal of restrictions

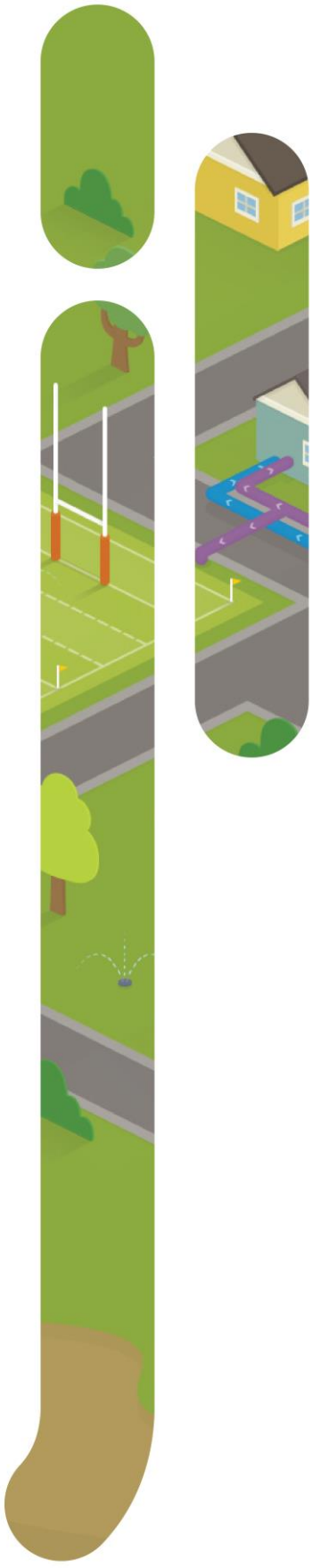
Flow will restore a restricted service within 24hours of becoming aware that the reason for the restriction has been resolved.

Before the service is restored, the customer needs to pay the overdue amount or agree a payment arrangement. Flow may impose a reasonable charge to cover its costs for the removal of the restriction.

Flow always prefers to help customers (and customer's tenants) with financial difficulties, rather than restrict its services.

If you have a problem with a missed payment please get in touch with us asap at contact@flowsystems.com.au or 1300 803 803.

Incident Management Plan **(IMP)**



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