INTEGRATED WATER MANAGEMENT STRATEGY

PROPOSED WAREHOUSE AND DISTRIBUTION FACILITY

2 HUME HIGHWAY, CHULLORA

Prepared For and On Behalf of:

Charter Hall Core Plus Industrial Fund

Bieson Pty Limited as trustee of the CPIF Hume Highway Logistics Trust

Commercial & Industrial Property Pty Limited

Report No **S.CIP-0108.ESD.R01.03**

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engineering sustainable environments

REPORT AUTHORISATION

PROJECT: 2 Hume Highway, Chullora

REPORT NO.: S.CIP-0108.ESD.R01.03

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EXECUTIVE SUMMARY

Umow Lai have been engaged to prepare a Water Cycle Management Strategy on behalf of CIP to address the following Site Significant Development Environmental Assessment Requirements (SEARs) for the Proposed Warehouse and Distribution Facility located at 2 Hume Highway, Chullora, NSW.

This report addresses the following environmental issues relating to Water:

- Details of water supply including any licensing requirements or other approvals under teh water act 1912 and/or the Water Management Act 2000
- Detailed water balance for the development, outlining the measures in place to minimise water use and potential for sustainable water supply; and
- Waste water predictions and measures that will be implemented to treat, reuse and/or dispose of waste water

The use of water sensitive urban design principles including the collection and reuse of rainwater, and the use of water efficient fixtures will result in a reduction in the potable water demand of the development relative to a comparable benchmark.

Careful consideration has been given to the use of appropriately sourced potable and non potable water supply streams supplying the various end uses.

We would recommend that the proposed water management measures are in accordance with the current regulatory requirements and that the scheme should be adopted as an acceptable method of addressing the water management issues relevant to the site.

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1.0 REPORT OBJECTIVE

The aim of this report is to outline the strategy for water management for the proposed Warehouse and Distribution Facility located at 2 Hume Highway, Chullora, NSW.

This water management strategy has been prepared to identify;

- Site conditions and available infrastructure;
- Site water demands;
- Water efficiency measures;
- Available sources of potable and non potable water to meet site demands;
- A practical water management strategy for the site; and
- Waste water discharge.

The water management strategy has been prepared in consideration of relevant Sydney Water and local authority requirements.

This report should be read in conjunction with the following documents:

- DA Drawings
  - 150907-DA-050 Site Plan
  - 150907-DA-100 Warehouse Floor Plan
  - 150907-DA-112 Office Floor Plans
  - 150907-DA-113 Dock Office Floor Plan
  - 150907-DA-150 Warehouse Roof Plan
  - 150907-DA-200 Warehouse Elevations
  - 150907-DA-210 Office Elevations
  - 150907-DA-215 Warehouse Office Elevations

2.0 SITE DESCRIPTION

The site for the proposed industrial facility (Lot 12 DP 834734) is bordered by the Hume Highway to the south/south east, Worth Street to the north/north west and existing industrial warehousing and grounds (Australia Post) to the south/south-west.

Currently the site consists of a printing and distribution facility with a Gross Lettable Area (GLA) of 20,275 sqm, situated within a total land area of 102,800 sqm with existing access points off Worth Street and Beaufort Place.

The site around the warehouse is split between hardstanding car park areas and vegetation, with vehicular access all the way around.

The site is approximately 15km west of the Sydney CBD and provides access to both the M4 and M5 motorways.

Figure 1 Existing Site Plan

2.1 AREAS AND OCCUPANCY

A conservative approach has been taken to occupancy, for the purpose of this report the following building areas and profiles have been assumed.

Description	Area (m^2)	Occupancy		Operational Profile
		(m^2/person)	Total	
Warehouse & Bulk Building	39,225	100	393	24 hrs, 7 days
Gate House	30	15	2	24 hrs, 7 days
Main Ops Office	500	15	33	24 hrs, 7 days
Main Office (2 Levels)	3,000	12	250	12 hrs, 5 days
TOTAL			**678**	

Table 1 Areas and Profiles

2.2 WATER INFRASTRUCTURE

Existing water infrastructure in the area consists of:

- 450mm diameter Ductile Iron Cement (mortar) Lined (DICL) water main running from the Hume Highway intersection along the southern side of Worth Street. This reduces to a 250mm DICL water main opposite the entrance to the recycling plant on Worth Street.
- 600mm diameter Cast Iron Cement Lined water main running down the centre of the Hume Highway. Not suitable for connection.
- 2475mm diameter Steel Cement Lined Internal Bitumen Lined (SCL IBL) recycled water main. Expected to be very deep (>10m) and not expected to create an issue for future development.

The site is supplied via a 100mm connection, located at the current vehicular entrance from the 450mm diameter DICL water main in Worth Street and it is assumed that this connection will be utilised.

There is a water tank and pump house to the west of the site and this provides a supply for the existing fire hydrant system. As this will be removed to accommodate new buildings, an alternative similar fire supply infrastructure will be required.

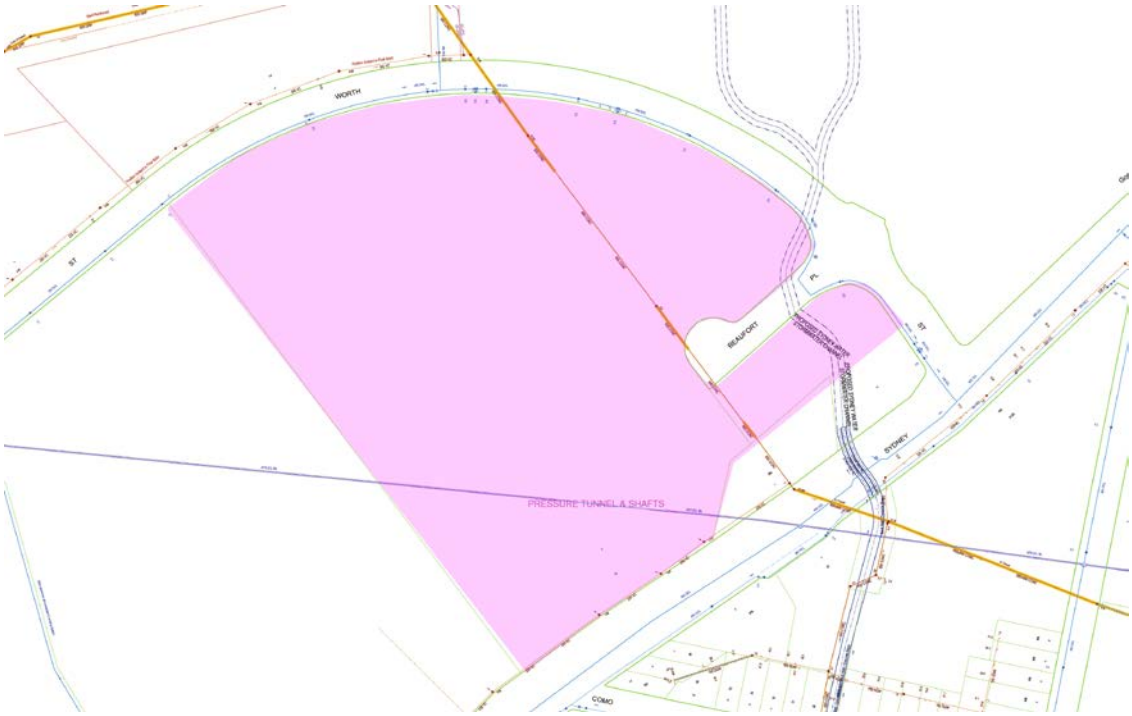

Figure 2 Dial Before You Dig – Sydney Water Authority

2.3 SEWER INFRASTRUCTURE

Existing sewer infrastructure in the area consists of:

- 600mm diameter concrete encased sewer with an existing easement crosses the site from the Hume Highway to Worth Street, running through the end of Beaufort Place. Not suitable for connection.
- 225mm diameter vitrified clay within the property boundary running parallel to the Hume Highway.

The 225mm diameter vitrified clay sewer located on the south east boundary is suitable for connection.

2.4 STORMWATER

Please refer to the separate civil report for details of stormwater infrastructure.

3.0 WATER DEMAND

3.1 SITE WATER DEMAND ASSESSMENT

The following water demands suitable for the development have been considered for the proposed facility:

- Staff and administration; kitchen, staff change room toilets and ablutions;
- Heating ventilation and air conditioning demand;
- Fire Systems testing water; and
- Landscape Irrigation.

3.2 AMENITIES

It has been assumed that all fixtures and fittings will be specified to comply with watermark licence and be 4 star Water Efficiency Labelling Scheme (WELS) rated.

Description	WELS rating	Flow Rate
WC's	4 star	4 L/flush
Urinals	4 star	2.5 L/flush
Basins Taps	4 star	7.5 L/m
Showers	3 star	9 L/m
Dishwashers	3 star	16 L/cycle

Table 2 Fixtures and Fittings Schedule

The following assumptions have been made

- Four visits to the WC a day
  - 50/50 male/female split
  - 3:1 ration for male urinal visits
  - 10 second hand washing
- 1 shower per 100 employees used 2 times a day for 8 mins
- 1 dishwasher per 50 employees within main office space used once a day

3.3 HVAC DEMANDS

For the purpose of this report we have assumed the following:

- The warehouse area, inclusive of the bulk building, is naturally ventilated with mechanical exhaust for potential smoke and exhaust fumes;
- Main Ops offices and gatehouse (where required) are cooled and heated via air cooled split systems; and
- Main office (3,000sqm) is served by an air cooled VRV system for cooling and heating, with no water demand.

Based on the above scenario the HVAC system will make no demand on water infrastructure.

3.4 FIRE WATER

A fire water tank will be provided to the site. Sprinklers, Hydrants and Hose reels will be served via the fire tank Fire test water will be utilised recirculated from the sprinkler tank, making no demand on infrastructure. Minor losses will be incurred from sprinkler zone switch testing (approx. 1kL/month)

3.5 IRRIGATION

The development will feature a 10m landscape set back to the boundary. Landscaping shall be selected with plant species that require minimal water and irrigating with appropriate systems to minimize water loss and evaporation. This includes using native plant species, using mulch deeply around garden beds, avoiding watering when it's windy, watering during the coolest parts of the day and using a drip irrigation system with rain sensors. An allowance of 500sqm of drip fed irrigation has been made for new plantings with a demand of 100mm/sqm/week.

4.0 RAINWATER HARVESTING

Rainwater harvesting involves the collection, storage and re-use of rainwater from the roof areas of a development for internal and external uses. In relation to the proposed development site, harvested rainwater could potentially be used for toilet and urinal flushing and irrigation of landscaped areas.

Rainwater harvesting contributes to the conservation of drinking quality water, improves the reliability of our water supplies, frees up water for the environment and reduces the potential export of pollutants into the natural environment downstream.

The following measures will need to be adhered to with respect to the rainwater tank installation:

- Tanks to be installed and maintained to prevent cross connection with the potable mains water supply, including provision of a backflow prevention device at water meters;
- Provision of a low-level potable water top-up switch or tank bypass facility to ensure continual supply during drier periods;
- All rainwater services to be clearly labelled "Non-Potable Water" with appropriate hazard identification;
- Pipe work used for rainwater services to be coloured lilac in accordance with AS1345. All valves and apertures to be clearly and permanently labelled with safety signs to comply with AS1319.

4.1 RAINWATER COLLECTION

It is assumed that rainwater will be collected from a portion of the warehouse roof (39,225 sqm). A roof collection area of 2,500m^2 has been considered for the purpose of these calculations. A roof co-efficient of 0.8 has been allowed for a flat roof collection area. We have assumed a 20kL Rainwater collection tank.

Month	Average Monthly Rainfall (mm)	Average Daily Production, inclusive of tank losses (L/day)
January	76	1917
February	103.6	2241
March	73.3	2382
April	113.4	1672
May	84.9	1165
June	98.8	1634
July	57.6	1063
August	63.2	799
September	45.7	1087
October	62.4	1788
November	81.4	2122
December	64.7	2712

Table 3 Average Monthly Non-Potable Water Production

5.0 SITE WATER BALANCE

A water balance model has been undertaken to assess a suitable volume of rainwater storage to adequately meet the projected non potable water demand.

The water balance assumed the roof rainwater catchment area to be 2,500 m^2 and the total rainwater tank volume of 20 kL.

The water balance modelled daily rainfall vs. consumption utilising over ten years of daily rainfall data supplied from the Bureau of Meteorology (BOM). Data sourced from the BOM station ;

Strathfield Golf Club (2.0 km away)

Number: *66070*

Lat: *33.89° S*

Lon: *151.07° E*

Elevation: *21 m*

5.1 WATER BALANCE ASSESSMENT

The water demands best suited to rainwater supply include toilet and urinal flushing, and landscape irrigation. A further breakdown of the site water demand assessment follows, noting the resulting potable and non potable demands;

Month	Non Potable Demand Met (L/day)	Non Potable Demand Not Met (L/day)	Mains Demand (L/day)	Total Mains Usage (L/day)	Tank Level @ 9am (L)
January	1917	4591	3086	7677	3766
February	2241	4569	3092	7661	4784
March	2382	3947	3093	7040	5084
April	1672	4423	3082	7505	3469
May	1165	4828	2557	7385	2601
June	1634	4014	2547	6561	3478
July	1063	4716	2544	7260	1969
August	799	5125	2557	7682	1543
September	1087	5183	3075	8258	2160
October	1788	4868	3100	7967	3310
November	2122	4768	3099	7867	4433
December	2712	3564	3076	6640	5398

Table 4 Average Water Balance

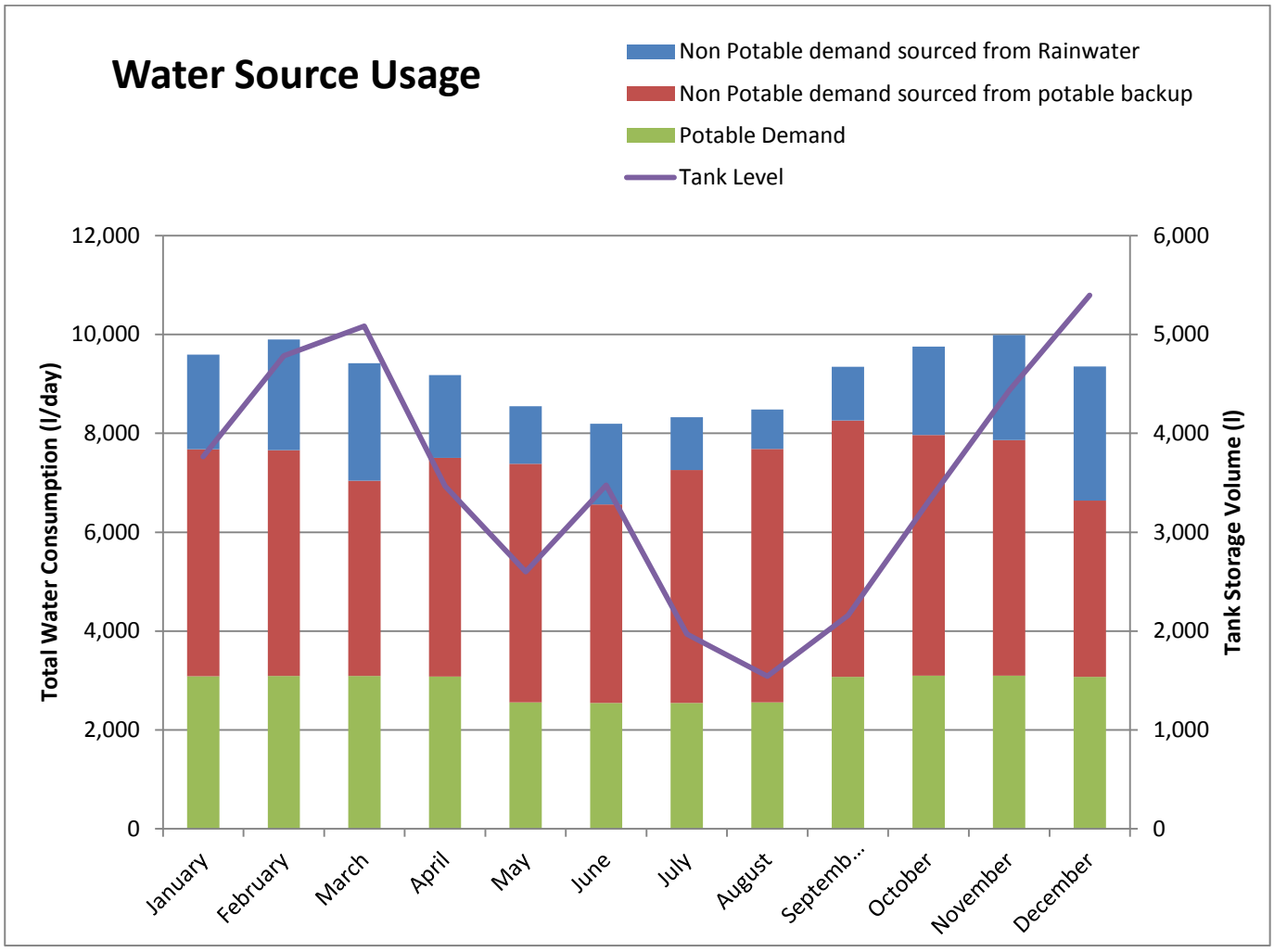

Figure 3 Typical Monthly Potable vs Non Potable Water Consumption

6.0 WASTE WATER DISCHARGE

The proposed site is a warehouse and distribution facility, including a cafe area. Waste Water from the cafe will be pre-treated via a grease arrestor in accordance with Sydney Water pre-treatment requirements. The grease arrestor will be sized in accordance with the amount of trade waste generated by the cafe.

There are no additional waste water treatment requirements.

Source	Daily Discharge (kL)	Monthly Discharge (kL)	Annual Discharge (kL)	Treatment Requirements
Amenities	12.2	327.9	3,934.5	No special treatment required
Cafe	1.2	31.2	374.4	Grease Arrestor

Table 5 Anticipated Waste Water Discharge

7.0 SUMMARY AND RECOMMENDATIONS

The report addresses the water management requirements of the proposed development.

The major water management results and recommendations for the proposed development are as follows:

- Efficient fixtures and fittings will be installed throughout the facility to minimise site water consumption
- A minimum 20kL rainwater harvesting system will be provided for the site. Due to the large catchment area, the rainwater harvesting system will provide a significant contribution to the non potable water demands for the site
- Water demand and discharge for the site is generally consistent throughout the year, due to the nature of the site

We recommend that the design philosophy detailed in this report be accepted as an appropriate approach to addressing the water management issues relevant to the proposed development.