



31st December 2022

# HYDRAULIC SERVICES UTILITY SERVICES REPORT

## Broken Hill Hospital Redevelopment

# HYDRAULIC SERVICES UTILITY SERVICES REPORT

## Wentworth Health Service Redevelopment

02	04 October 2023	Utility Report
01	31st December 2022	Utility Report
Rev #	Date	Description

### APPROVALS

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# 1 INTRODUCTION

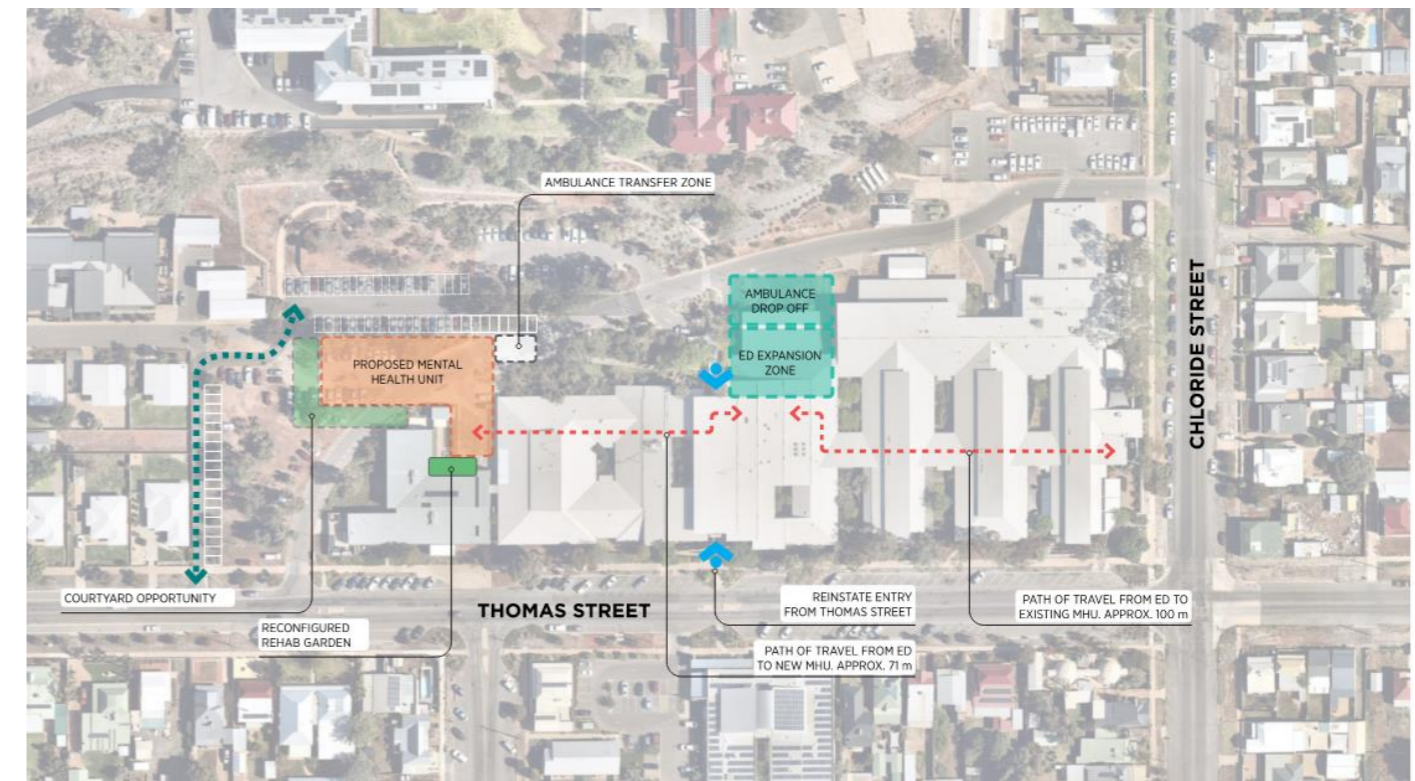
Warren Smith Consulting Engineers (WSCE) have been engaged by Steensen Varming on behalf of Health Infrastructure (HI) to prepare a Utility Services Report for the proposed works at the Broken Hill Hospital Redevelopment relating to the hydraulic services.

The Broken Hill Hospital Redevelopment site ("the site") is located at 176 Thomas Street, Broken Hill, NSW 2880 and is shown in **Figure 1** (approximate site location identified in red) below.



**Figure 1:** Aerial view of property boundary (Source: Nearmap)

The proposed redevelopment works involves the addition of a new Mental Health Unit and an expansion of the existing Emergency Department (**Figure 2**).



**Figure 2:** New Site Layout Plan (STH)

## 2 DEMOLITION

The existing driveway will be demolished and diverted to make space for the new Mental Health Unit on the Southwest of the site. The Emergency Department is to remain in-use and be staged in a way that the installation of new services does not disrupt the operation of the existing ED.

## 3 WATER SERVICES DEMAND

### 3.1 EXISTING WATER DEMAND

#### 3.1.1 EXISTING MAIN HOSPITAL BUILDING

The Main Hospital Building is an existing building that will be remaining for the redevelopment.

The average daily water demand for the existing Main Hospital Building has been calculated using the Water Directorate (Section 64), under the classification of Accommodation (Medical Care) – Hospital. The summary of average daily water demand for this building classification is given in Table 3.1.1-1.

**Table 3.1.1-1 Average Daily Water Demand per Bed for a Hospital**

Classification	Metric Unit	Water Directorate Assessment (ET)
Accommodation (Medical Care)	Bed	0.90 ET

This data was used to calculate the demand and is surmised in Table 3.1.3-2

**Table 3.1.1-2 Average Daily Water Demand for the Main Hospital**

Total Beds	Water Directorate Assessment (ET)	Total Average Daily Water Demand (L/day)
98	0.90 ET	55,566 L/day

*A Standard ET for Water is equal to 230 kL/annum or 630 L/day, as per Water Directorate - Section 64*

#### 3.1.2 EXISTING EMERGENCY DEPARTMENT

The upgrade to the Emergency Department will include the refurbishment and extension of the existing Emergency Department services. The average daily water demand for the existing ED has been calculated using the Water Directorate (Section 64), under the classification of Accommodation (Medical Care) – Hospital. The summary of average daily water demand for this building classification is given in 3.1.2-1

**Table 3.1.2-1 Average Daily Water Demand per Bed for a Hospital**

Classification	Metric Unit	Water Directorate Assessment (ET)
Accommodation- (Medical Care)	Bed	0.90 ET

This data was used to calculate the demand is surmised in Table 3.1.2-2

**Table 3.1.2-2 Average Daily Water Demand for the Emergency Department**

Total Beds	Water Directorate Assessment (ET)	Total Average Daily Water Demand (L/day)
11	0.90 ET	6,237 L/day

*A Standard ET for Water is equal to 230 kL/annum or 630 L/day, as per Water Directorate - Section 64*

#### 3.1.3 EXISTING MENTAL HEALTH

The existing Mental Health unit will be relocated to a new building adjoining the Rehab building Southwest of the site.

The average daily water demand for the existing Mental Health unit has been calculated using the Water Directorate (Section 64), under the classification of Accommodation (Medical Care) – Hospital. The summary of average daily water demand for this building classification is given in 3.1.3-1

**Table 3.1.3-1 Average Daily Water Demand per Bed for a Hospital**

Classification	Metric Unit	Average Water Demand (ET/Metric Unit/Day)
Accommodation – (Medical care)	Bed	0.90 ET

This data was used to calculate the demand and is surmised in Table 3.1.3-2

**Table 3.1.3-2 Average Daily Water Demand for the Mental Health Unit**

Total Beds	Average Demand (ET/Metric Unit/Day)	Total Average Daily Water Demand (L/day)
6	0.90 ET	3,402 L/day

*A Standard ET for Water is equal to 230 kL/annum or 630 L/day, as per Water Directorate - Section 64*

### 3.2 NEW WATER DEMAND

#### 3.2.1 EMERGENCY DEPARTMENT

The upgrade to the Emergency Department will include the refurbishment and extension of the existing ED services. There are currently 11 beds within the ED. The summary of the average daily water demand for this building classification is given in Table 3.2.2-1.

**Table 3.2.2-1 Average Daily Water Demand per Bed**

Classification	Metric Unit	Average Water Demand (ET/Metric Unit/Day)
Accommodation – (Medical care)	Bed	0.9 ET

This data was used to calculate the demand and is surmised in Table 3.2.2-2

**Table 3.2.2-2 Average Daily Water Demand for the Emergency Department**

No. Beds	Average Water Demand (ET/Metric Unit)	Total Average Daily Water Demand (ET)	Total Average Daily Water Demand (L/day)
11	0.9 ET	9.9 ET	6,237 L/day

*A Standard ET for Water is equal to 230 kL/annum or 630 L/day, as per Water Directorate - Section 64*

#### 3.2.2 MENTAL HEALTH UNIT

The new Mental Health Unit will be located next to the existing Rehab building. The MHU will include replacing 6 existing beds with an additional 2 new beds providing 8 beds in total. The summary of the average daily water demand for this building classification is given in Table 3.2.2-1.

**Table 3.2.2-1 Average Daily Water Demand per Bed**

Classification	Metric Unit	Average Water Demand (ET/Metric Unit/Day)
Accommodation – (Medical care)	Bed	0.9 ET

This data was used to calculate the demand and is surmised in Table 3.2.2-2

**Table 3.2.2-2 Average Daily Water Demand for the New Mental Health Unit**

No. Beds	Average Water Demand (ET/Metric Unit)	Total Average Daily Water Demand (ET)	Total Average Daily Water Demand (L/day)
8	0.9 ET	7.2 ET	4,536 L/day

*A Standard ET for Water is equal to 230 kL/annum or 630 L/day, as per Water Directorate - Section 64*

### 3.3 TOTAL CHANGE IN WATER DEMAND

The Broken Hill Hospital Redevelopment will increase the total water demand by 1.8 ET or 1.1 kL/day, and surmised in Table 3.1.4

**Table 3.1.4 Total Change Water Demand for Broken Hill Hospital Redevelopment**

Building	Total Existing Demand (ET)	Total New Demand (ET)	Net Change (ET)
Emergency Department	9.9 ET	0 ET	0 ET
Mental Health Unit	5.4 ET	7.2 ET	1.8 ET
<b>TOTAL (ET)</b>	15.3 ET	17.1 ET	1.8 ET
<b>TOTAL (L/day)</b>	9,639 L/day	10,773 L/day	1,134 L/day
<b>TOTAL BHHR LOAD</b>	55,566 L/day	56,700 L/day	1,134 L/day

*\*A Standard ET for Water is equal to 230 kL/annum or 630 L/day, as per Water Directorate - Section 64.*

## 4 SEWAGE SERVICES DEMAND

### 4.1 EXISTING SEWAGE DEMAND

#### 4.1.1 EXISTING MAIN HOSPITAL BUILDING

The Main Hospital Building is an existing building that will be remaining for the redevelopment.

The average daily sewerage demand for the existing Main Hospital Building has been calculated using the Water Directorate (Section 64), under the classification of Accommodation (Medical Care) – Hospital. The summary of average daily water demand for this building classification is given in Table 4.1.1

**Table 4.1.1 Average Daily Sewer Demand for Existing Main Hospital Building**

Total Beds	Average Demand (ET/Metric Unit/Day)	Total Average Daily Sewage Demand (ET/day)	Average Sewage Demand (L/day)
98	1.43 ET	140.14 ET	53,913.6 L/day

*\*A Standard ET for Sewage is equal to 140 kL/annum or 384 L/day, as per Water Directorate - Section 64*

#### 4.1.2 EXISTING EMERGENCY DEPARTMENT

The upgrade to the Emergency Department will include the refurbishment and extension of the existing ED services. The average daily sewerage demand for the existing Emergency Department has been calculated using the Water Directorate (Section 64), under the classification of Accommodation (Medical Care) – Hospital. The summary of average daily water demand for this building classification is given in Table 4.1.2

**Table 4.1.2 Average Daily Sewer Demand for the Existing Emergency Department**

Total Beds	Average Demand (ET/Metric Unit/Day)	Total Average Daily Sewage Demand (ET/day)	Average Sewage Demand (L/day)
11	1.43 ET	15.73	6,040.32 L/day

*\*A Standard ET for Sewage is equal to 140 kL/annum or 384 L/day, as per Water Directorate - Section 64*

#### 4.1.3 EXISTING MENTAL HEALTH UNIT

The existing Mental Health unit will be relocated to a new building adjoining the Rehab building Southwest of the site.

The average daily sewerage demand for the existing Mental Health Unit has been calculated using the Water Directorate (Section 64), under the classification of Accommodation (Medical Care) – Hospital. The summary of average daily water demand for this building classification is given in Table 4.1.3

**Table 4.1.3-1 Average Daily Sewage Demand for the Existing Mental Health Unit**

Total Beds	Average Demand (ET/Metric Unit/Day)	Total Average Daily Sewage Demand (ET/day)	Average Sewage Demand (L/day)
6	1.43 ET	8.58 ET	3,294.72 L/day

*\*A Standard ET for Sewage is equal to 140 kL/annum or 384 L/day, as per Water Directorate - Section 64*

### 4.2 NEW SEWAGE DEMAND

#### 4.2.1 EMERGENCY DEPARTMENT

The upgrade to the Emergency Department will include the refurbishment and extension of the existing ED services. There are currently 11 beds within the ED. The summary of the average daily sewer demand for this building classification is given in Table 4.2.2-1.

**Table 4.2.1-1 Average Daily Sewage Demand per Bed**

Classification	Metric Unit	Average Water Demand (ET/Metric Unit/Day)
Accommodation – (Medical care)	Bed	1.43 ET

This data was used to calculate the demand and is summarised in Table 4.2.1-2

**Table 4.2.1-2 Average Daily Sewage Demand for the Emergency Department**

No. of Beds	Average Sewage Demand (ET/Metric Unit)	Total Average Daily Sewage Demand (ET)	Total Average Daily Sewage Demand (L/day)
11	1.43 ET	15.78 ET	6,040 L/day

*A Standard ET for Sewage is equal to 140 kL/annum or 384 L/day, as per Water Directorate - Section 64*

## 4.2.2 NEW MENTAL HEALTH UNIT

The new Mental Health Unit will be located next to the existing Rehab building. The MHU will include replacing 6 existing beds with an additional 2 new beds providing 8 beds in total. The summary of the average daily sewer demand for this building classification is given in Table 4.2.2-1.

**Table 4.2.2-1 Average Daily Sewage Demand per Bed**

Classification	Metric Unit	Average Water Demand (ET/Metric Unit/Day)
Accommodation – (Medical care)	Bed	1.43 ET

This data was used to calculate the demand and is surmised in Table 4.2.2-2

**Table 4.2.2-2 Average Daily Sewage Demand for the Mental Health Unit**

No. of Beds	Average Sewage Demand (ET/Metric Unit)	Total Average Daily Sewage Demand (ET)	Total Average Daily Sewage Demand (L/day)
8	1.43 ET	11.44 ET	4,392.96 L/day

*A Standard ET for Sewage is equal to 140 kL/annum or 384 L/day, as per Water Directorate - Section 64*

## 4.3 TOTAL CHANGE IN SEWAGE DEMAND

The Broken Hill Hospital Redevelopment will increase in total sewage demand by 2.86 ET or 1251.84 L/day and surmised in Table 4.3

**Table 4.3 Total Change Sewage Demand for Broken Hill Hospital Redevelopment**

Building	Total Existing Demand (ET)	Total New Demand (ET)	Net Change (ET)
Emergency Department	15.73 ET	0 ET	0 ET
Mental Health Unit	8.58 ET	11.44 ET	2.86 ET
<b>TOTAL(ET)</b>	24.31 ET	27.17 ET	2.86 ET
<b>TOTAL (L/day)</b>	9,335.04 L/day	10,433.28 L/day	1,098.24 L/day
<b>TOTAL BHHR LOAD</b>	53,913.6 L/day	55,011.84 L/day	1,098.24 L/day

*\*A Standard ET for Sewage is equal to 140 kL/annum or 384 L/day, as per Water Directorate - Section 64*

## 5 FIRE SERVICES WATER DEMAND AND USAGE

MHU- Wet fire Services for MHU includes a fire hydrant system, fire sprinkler system and fire hose reel system.

Water Demand and Usage

Fire hydrant system- 20 L/s

Fire sprinkler system- 6 L/s

Fire hose reel system-0.66 L/s

As part of MHU works the existing fire hydrant booster assembly in Thomas St will be relocated to coordinate with the new site layout. The booster assembly will be reconfigured to include the demand for the new sprinkler system.

ED -- Wet fire Services for MHU includes a fire hydrant system and fire hose reel system.

Water Demand and Usage

Fire hydrant system- 20 L/s

Fire hose reel system-0.66 L/s

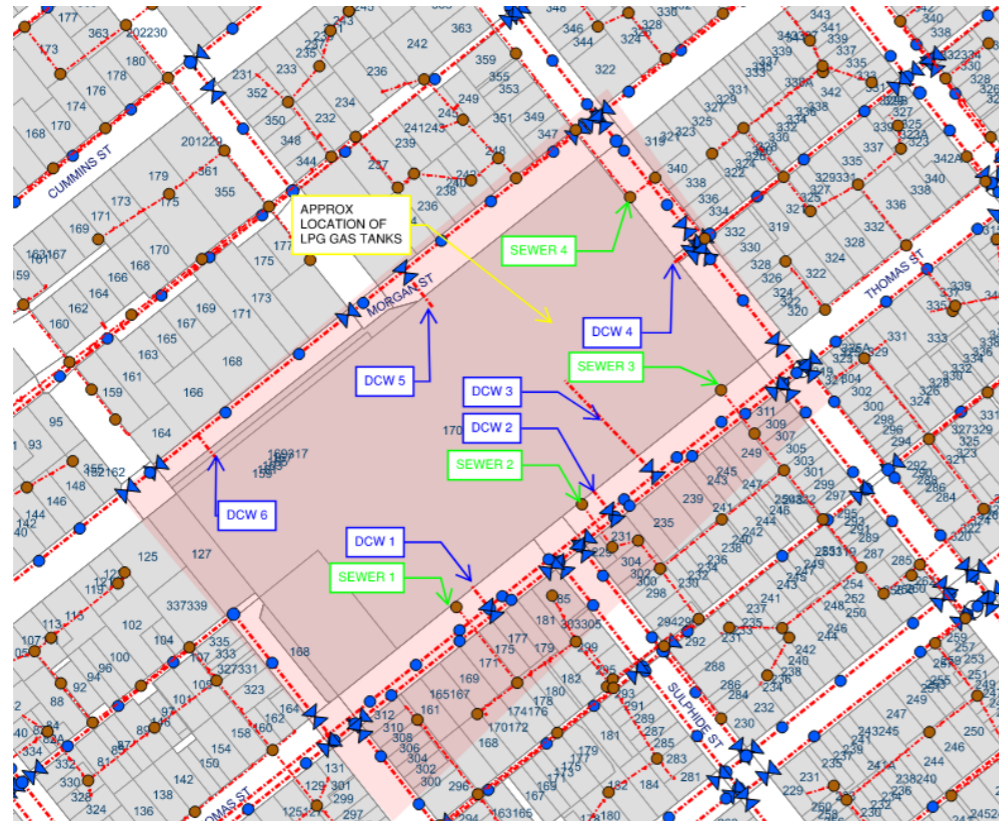
As part of ED works the existing fire hydrant pipework in the footprint of the new ED expansion will be relocated to avoid reticulation under the building. The existing fire hydrant in front of ED will require minor coordination with the new ED footprint.

## 6 HYDRAULIC SERVICES CONNECTIONS

### 6.1 WATER & SEWER

Existing water supply and sewer discharge connections will be retained for the proposed main works. These existing connection locations have been illustrated in Figure 7.1 below.

Essential Water have advised both utility water and sewer mains have available capacity for the minor increase in flow.



**Figure 7.1: Existing water and sewer connections**

## 7 LPG GAS

No additional gas load is required for the ED extension and the new MHU building. This will be co-ordinated further with the design team in a later stage in case the cooking and laundry load increases.