



Willow Tree Waste Management Facility Expansion

Traffic Assessment

Liverpool Plains Shire Council

19 December 2022

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Contents

1. Introduction	1
1.1 Overview	1
1.2 Purpose of this report	1
1.3 Subject site location	1
2. Existing conditions	3
2.1 Current operation	3
2.2 Existing road network	3
2.2.1 Road hierarchy	3
2.2.2 New England Highway	4
2.2.3 Merriwa Road	4
2.3 Crash data	5
2.4 Freight routes	6
2.5 Traffic data	6
2.6 Road network performance	9
3. The project	10
3.1 Project description	10
3.2 Access	10
3.3 Haulage routes	10
3.4 Proposal activity	11
3.4.1 Operational	11
3.4.2 Construction	12
3.5 Traffic impacts	12
3.6 Swept path analysis	12
4. Summary and conclusion	14

Table index

Table 1.1	SEARs requirements traffic and transport	1
Table 1.2	Site information summary	2
Table 3.1	Operational vehicle activity	11

Figure index

Figure 1.1	Site location	2
Figure 2.1	Site access roads	3
Figure 2.2	New England Highway looking north to Merriwa Road	4
Figure 2.3	Merriwa Road looking towards New England Highway	5
Figure 2.4	Crash Data	5

Figure 2.5	Restricted Access Vehicle Map	6
Figure 2.6	Count location - 1	7
Figure 2.7	Count location – 2	8
Figure 2.8	Traffic volumes on New England Highway	8
Figure 3.1	WMF Haulage Route	11
Figure 3.2	Access in and out of site	13

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1. Introduction

1.1 Overview

In 2018, Liverpool Plains Shire Council (LPSC) developed a 10-year strategy for the ongoing management of waste within their region (MRA, 2018). Landfilling forms an essential part of this strategy, along with waste avoidance and reduction, increased recycling, and diversion of waste from landfills. The waste management strategy proposes to rationalise the landfilling operations across the region by establishing the Willow Tree Management Facility (WMF) (the site) as the primary landfill, servicing LPSC's Local Government Area (LGA) via an expansion of this existing landfill with the existing lot boundary (the project).

The expanded WMF would receive a range of wastes, including:

- Landfill waste from LPSC 'red bin' garbage collection.
- 'Clean fill' (such as soil, sand, gravel, bricks or other excavated or hard material).
- Solid or liquid organic materials.

The project will involve:

- Site establishment, including preparation of construction compound, suitable stockpile and bunding areas, and sediment and erosion controls.
- Site preparation and vegetation clearing.
- Construction of the WMF expansion.
- Operation of the expanded WMF to service the Liverpool Plains LGA.

1.2 Purpose of this report

The Department of Planning and Environment (DPE) have reviewed the proposed development and issued Secretary's Environmental Assessment Requirements (SEARs). The SEAR requirements relating to traffic and transport are detailed in Table 1.1.

Table 1.1 SEARs requirements traffic and transport

SEARs requirement	Addressed
Details of road transport routes and access to the site	Detail of the access arrangements at the site are provided in Section 2.1 and Section 2.2. The haulage route to and from the site is detailed in Section 2.4 and Section 3.3.
Road traffic predictions for the development during construction and operation	The projected operational and construction volumes associated with the project are detailed in Section 3.4.
Swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site	Swept path diagrams are displayed in Section 3.6.
An assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.	An assessment of the expected impacts of the proposed development are provided in Section 3.5.
A traffic impact assessment (TIA) in accordance with Transport for NSW's requirements.	This report addresses the requirement for a TIA.

The purpose of this report is to prepare a TIA that quantifies the impacts of the proposed development and responds to each of the SEARs requirements.

1.3 Subject site location

A summary of key site location details is provided in Table 1.2. The site locality and surrounding lands is shown in Figure 1.1.

Table 1.2 Site information summary

Item	Details
Address	Merriwa Road, Willow Tree, NSW, 2339
Land title	Lot 213, DP 1173230
Site land owner	Liverpool Plains Shire Council
Land zoning	SP1: Special Activities RU1: Primary Production
Overview of site location and surrounds	The site is surrounded by rural land within the Willow Tree township located 2 km northeast of the site. A privately run gravel quarry (Willow Tree Gravel Quarry) is located adjacent to the landfill site.
Access	The site is accessed via New England Highway and Merriwa Road.



Figure 1.1 Site location

Source: Google Maps modified by GHD

2. Existing conditions

2.1 Current operation

The current Willow Tree WMF accepts a wide range of waste types, including general garbage, green waste, tyres, scrap metal and white goods.

The facility is open to the public as follows:

- Tuesdays, Wednesdays and Saturdays – 1:00 pm - 4:00 pm
- Thursday, Fridays and Sundays – 9:00 am – 12:00 pm

Access to Willow Tree Gravels (refer to Figure 2.1) is via a sealed access road that intersects with Merriwa Road. An unsealed access road branches off from this sealed access road and provides access to the existing WMF. The drop-off point for the general public is located adjacent to the north of Merriwa Road.

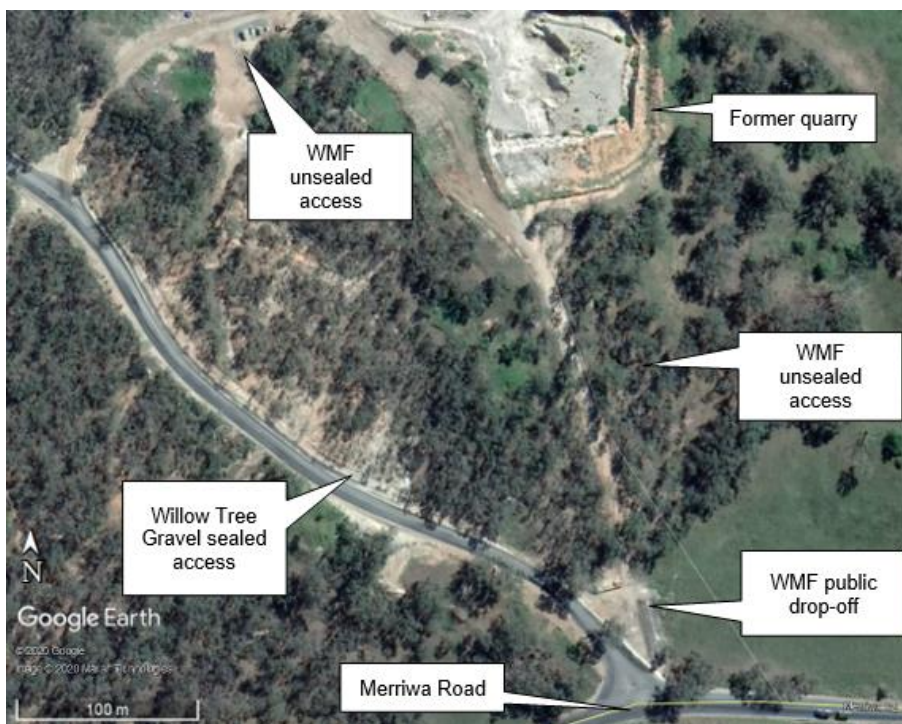


Figure 2.1 Site access roads

Source: Google Maps modified by GHD

2.2 Existing road network

2.2.1 Road hierarchy

Functional road classification involves the relative balance of mobility and access functions. TfNSW define four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility to high accessibility and low mobility. These road classes are:

- **Arterial Roads** – generally controlled by TfNSW, typically no limit in flow and designed to carry vehicles long distance between regional centres.
- **Sub-Arterial Roads** – can be managed by either TfNSW or local council. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a subregion or provide connectivity from arterial road routes (regional links).

- **Collector Roads** – provide connectivity between local roads and the arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local Roads** – provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

A summary of the key roads in proximity to the proposed subdivision is provided below.

2.2.2 New England Highway

The New England Highway (refer to Figure 2.2) is a sub-arterial road that connects Newcastle with South Queensland and runs through the Willow Tree township in a north/south direction.

Within the township and in proximity to the intersection of Merriwa Road, the New England Highway

- Has a 50 km/h speed limit within Willow Tree. Outside of the township it has a speed limit of 80 km/h.
- Provides a single travel lane in either direction.
- Provides on-street parking, however parking is not typically provided on the New England Highway.

At its intersection with Merriwa Road, the New England Highway provides channelised right (CHR) and left (CHL) short deceleration lanes.



Figure 2.2 New England Highway looking north to Merriwa Road

2.2.3 Merriwa Road

Merriwa Road (refer to Figure 2.3) is a local road that links the New England Highway to the current WMF and Willow Tree Gravel.

Merriwa Road has a 50 km/h speed limit for approximately 750 metres south of New England Highway and a 100 km/h speed limit after this.

Merriwa Road provides a single travel lane in either direction, with marked centre lines.

A rail line passes through Merriwa Road, approximately 70 metres to the south-west of New England Highway.



Figure 2.3 Merriwa Road looking towards New England Highway

2.3 Crash data

A review of crash data provided from the TfNSW Centre for Road Safety has been undertaken. The review is based on five years (2016 – 2020) for roads within the vicinity of the subject site, as shown in Figure 2.4.

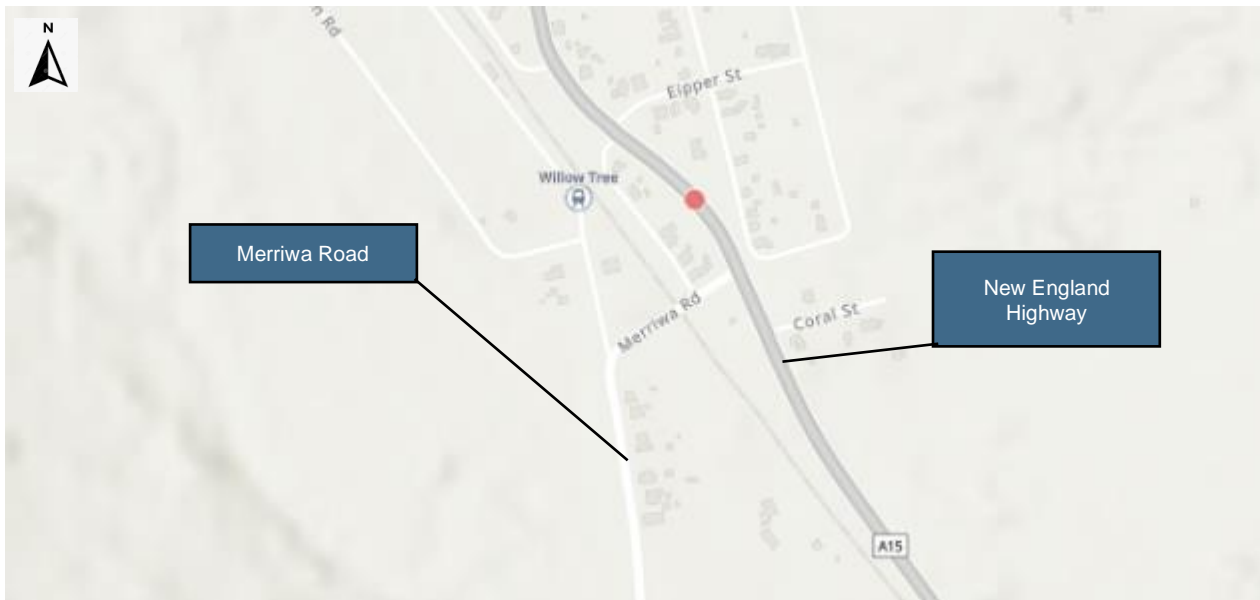


Figure 2.4 Crash Data

Source: TfNSW

The data indicates that in 2017 a single crash occurred on the New England Highway in proximity to Merriwa Road. The crash involved two vehicles travelling in the same direction and did not result in any injuries.

No crashes were recorded on Merriwa Road.

A single accident non-casualty accident in five years indicates that within the Willow Tree township, the New England Highway operates in a safe manner.

2.4 Freight routes

The TfNSW Restricted Access Vehicle (RAV) map indicates that the New England Highway and Merriwa Road are authorised to accommodate vehicles up to the size of the 26 metre B-doubles.

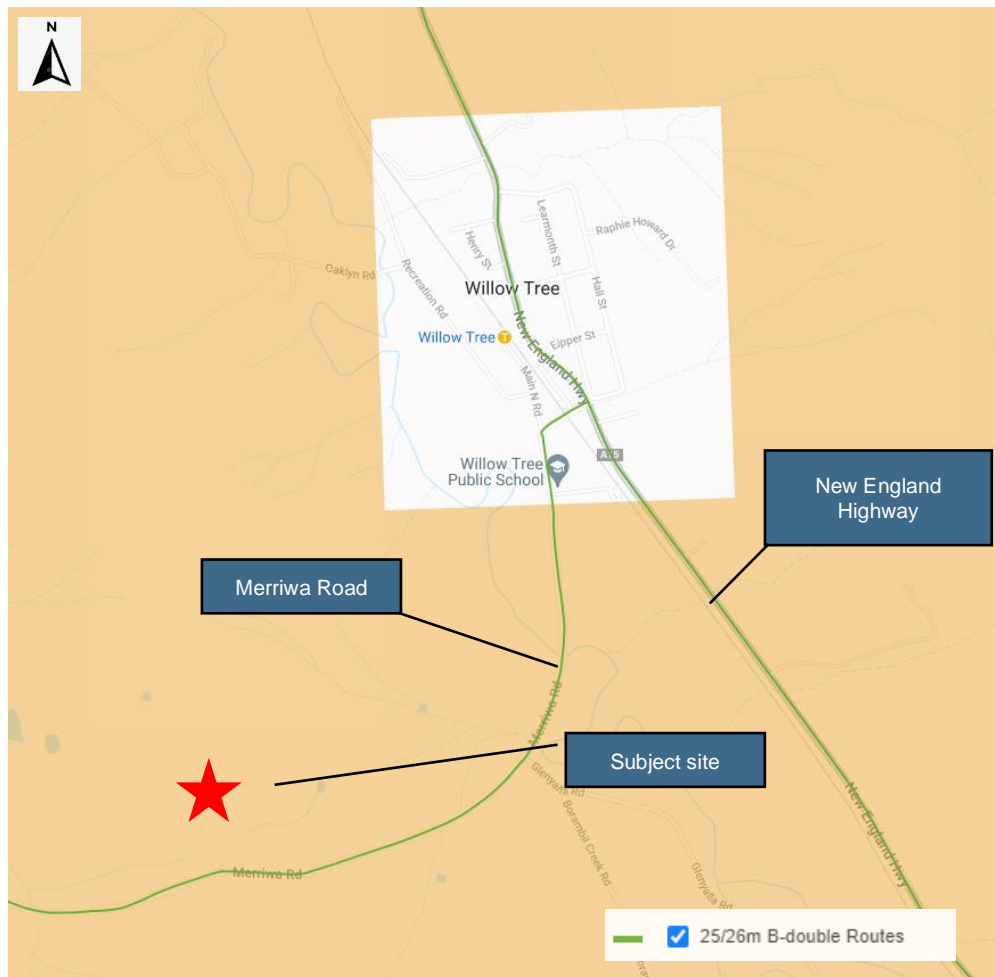


Figure 2.5 Restricted Access Vehicle Map

Source: TfNSW

2.5 Traffic data

TfNSW have provided traffic data for the New England Highway (A15), approximately 30 kilometers to the north of the Willow Tree (refer to Figure 2.6), which was collected between 01 May 2021 and 08 May 2021.

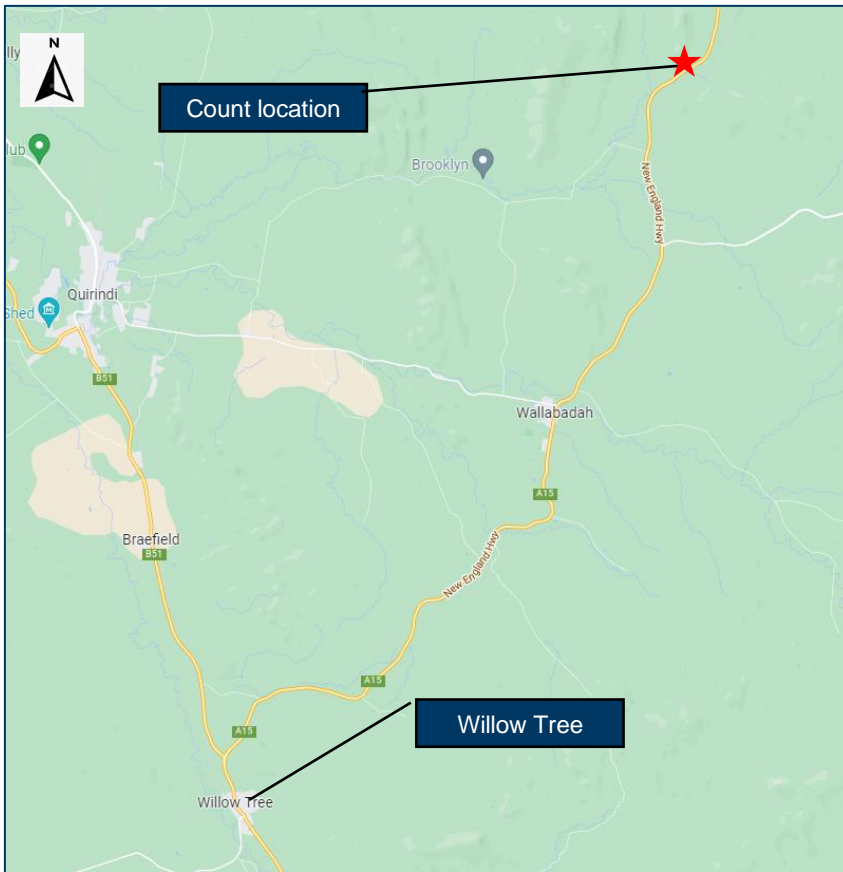


Figure 2.6 **Count location - 1**

Source: Google Maps modified by GHD

The data indicates that:

- The New England Highway accommodates 1,572 northbound vehicles per day and 1,569 southbound vehicles per day.
- Heavy vehicles constitute approximately 20 percent of overall vehicle activity.

A TfNSW count station (Id: 6158) is located on the New England Highway, south of Aberdeen, approximately 70 kilometers south of Willow Tree (refer to Figure 2.7).



Figure 2.7 Count location – 2

Source: Google Maps modified by GHD

The average weekday traffic volumes for 2021 are displayed in Figure 2.8.

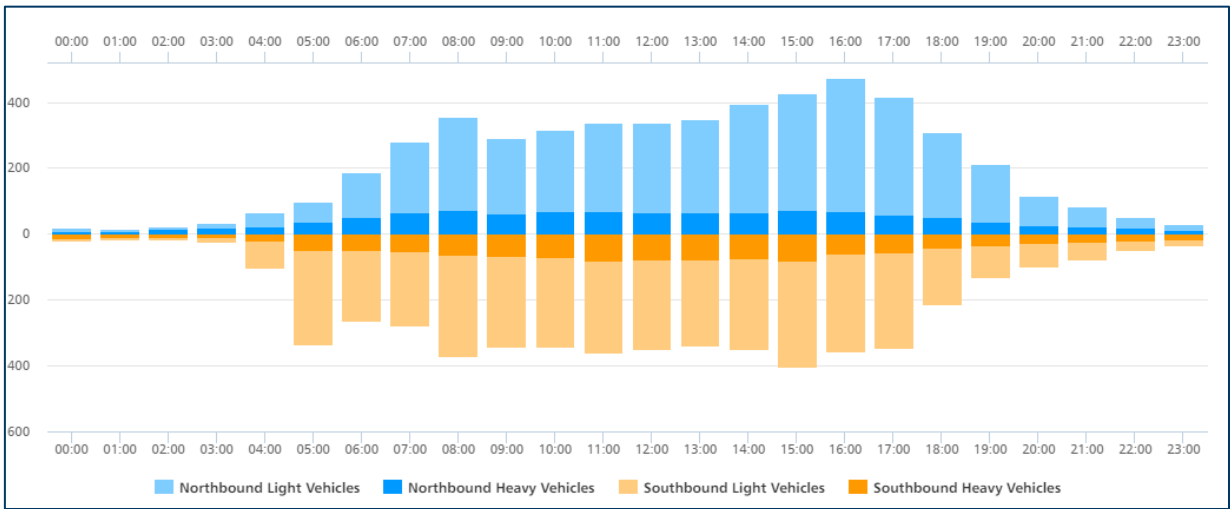


Figure 2.8 Traffic volumes on New England Highway

Source: TfNSW

The data in Figure 2.8 indicates that the New England Highway (in proximity to Aberdeen):

- Accommodates 5,222 northbound vehicles per day and 5,206 southbound vehicles per day.
- Heavy vehicles constitute approximately 21 percent of overall vehicle activity.
- Peak morning activity occurs between 8:00 am – 9:00 am, with 357 northbound vehicles and 371 southbound vehicles.
- Peak afternoon activity occurs between 4:00 pm – 5:00 pm, with 473 northbound vehicles and 355 southbound vehicles.

The traffic volumes recorded to the south of Willow Tree are significantly higher than those recorded to the north, suggesting that key destinations for vehicles on the New England Highway are Aberdeen and Scone.

2.6 Road network performance

The *TfNSW Guide to Traffic Generating Developments* specifies that for rural roads with a speed limit of 100 kilometres per hour, a single travel lane in each direction, level terrain and 15 percent heavy vehicles have a mid-block capacity (to a LOS D) of 1,410 vehicles ¹(bi-directional traffic).

Accounting for the higher traffic volumes at the TfNSW count station, the data in Figure 2.8 indicates that the New England Highway is operating well within its mid-block capacity.

¹ As detailed in Table 4.5 of the Roads and Maritime (now known as TfNSW) Guide

3. The project

3.1 Project description

LPSC are seeking to expand the capacity of the Willow Tree WMF to cater for the future needs of the local community. Key features of the project include:

- Establishment of a site compound.
- Establishment of landfill cells.
- Construction of a sealed access road from Merriwa Road.
- Construction of supporting infrastructure, including a weighbridge, as site office and amenities.

The project will involve:

- Site establishment, including preparation of construction compound, suitable stockpile and bunding areas, and sediment and erosion controls.
- Site preparation and vegetation clearing.
- Construction of the WMF expansion.
- Operation of the expanded WMF to service the Liverpool Plains LGA.

The project is expected to operate between 7:00 am – 5:00 pm, seven days per week.

3.2 Access

Access arrangements would comprise the following:

- Access from the Merriwa Road via formalisation of the existing access track running through the site for both domestic and commercial vehicles.
- Combined access to the weighbridge for domestic and commercial vehicles, followed by delineation of these vehicles to separate routes.

As the project is at the concept stage, no plan is available of the vehicle access, parking and circulation areas.

3.3 Haulage routes

All vehicles associated with the WMF will access/egress the site via New England Highway and Merriwa Road, as displayed in Figure 3.1.

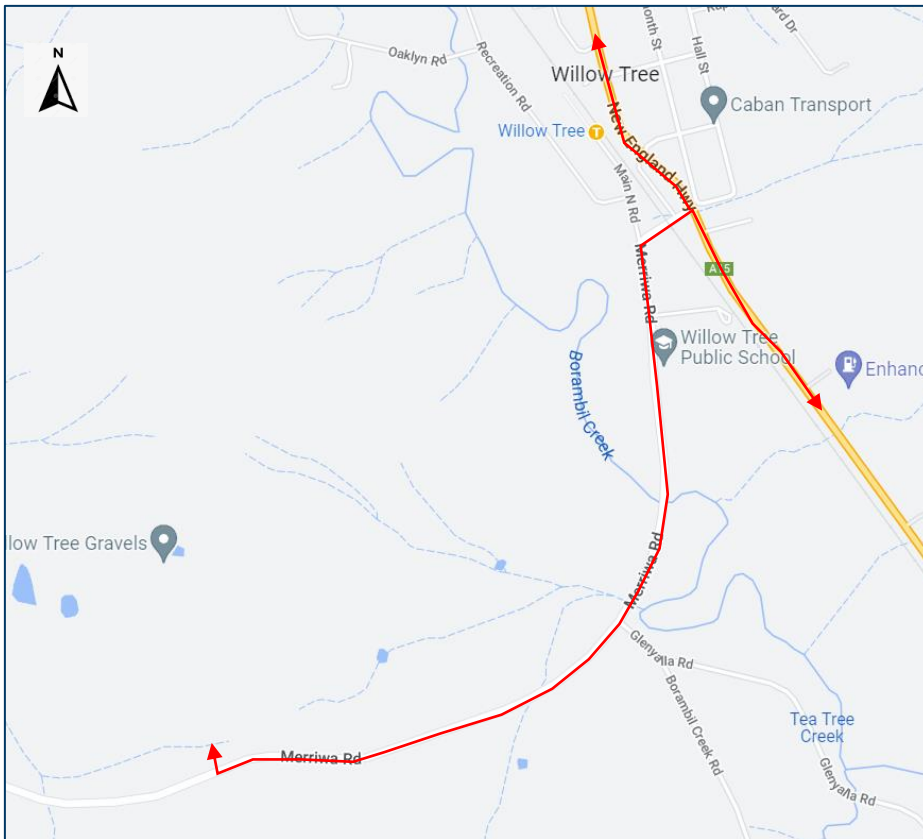


Figure 3.1 WMF Haulage Route

Source: Google Maps modified by GHD

As detailed in Section 2.4, New England Highway and Merriwa Road are authorised to accommodate vehicles up to the size of the 26 metre B-doubles

3.4 Proposal activity

3.4.1 Operational

Information contained in the Willow Tree WMF Expansion Preliminary Environmental Assessment (PEA) indicates that up to five staff additional staff would be employed at the project at any given time.

The Client has provided a summary of the existing weekly vehicle activity at the site (excluding staff) and the estimated maximum future weekly activity at the site (accounting for the project), as displayed in Table 3.1.

It is noted that commercial and recycling activity is undertaken by heavy vehicles, while self-haul activity is typically associated with utes, car trailers or similar.

Table 3.1 Operational vehicle activity

Activity	Current weekly activity	Estimated (maximum) weekly activity
Commercial	2	27
Recycling	1	3
Self-haul	15	28
Total	18	58

The data in Table 3.1 indicates:

- The current WMF currently generates 18 inbound and 18 outbound vehicle movements per week
- The project will generate an additional 40 inbound and 40 outbound vehicle movements per week

As detailed in Section 3.1, upon completion, the WMF will operate 7:00 am – 5:00 pm, seven days per week. On average, this will generate approximately six inbound and outbound heavy vehicles per day and less than one inbound and outbound heavy vehicle per hour.

3.4.2 Construction

Preliminary estimates indicate that:

- Between five and ten workers will be utilised to support the construction of the project.
- The main heavy vehicle activity will be associated with the import subsoil/topsoil materials for capping works. This activity is expected to generate up to 30 dog and truck trailers per week for a period of approximately three months.

For the purpose of analysis, it has been assumed that ten workers will access and egress the project site per day.

Assuming that construction works will occur six days per week (in accordance with the NSW Environmental Protection Agency Guidelines), the project construction works will generate (on average) five inbound and five outbound heavy vehicle movements per day.

3.5 Traffic impacts

As detailed in Section 3.4:

- During operation the project is expected to generate (on average):
 - Five inbound and outbound vehicle movements per day associated with workers
 - Six inbound and six outbound vehicle movements per day
- During construction the project is expected to generate (on average):
 - Ten inbound and outbound vehicle movements per day associated with workers
 - Six inbound and six outbound vehicle movements per day

These volumes are minor and are expected to fall within typical fluctuations of daily traffic movements on the adjoining road network and, therefore not adversely affect the operation of the existing road network in proximity to site. It is expected that there would not be any impact on the performance of the intersection of New England Highway and Merriwa Road.

New England Highway is expected to continue well within its mid-block capacity.

Additionally, the current crash data (refer to Section 2.3) indicates that Merriwa Road and New England Highway within the Willow Tree township operate in a safe manner.

Accordingly, no road upgrades are put forth to support the construction or operation of the project.

3.6 Swept path analysis

Swept path analysis based on a 12.5 metre truck indicates that heavy vehicles can access the site, manoeuvre internally and exit the site in a forward direction, as shown in Figure 3.2.

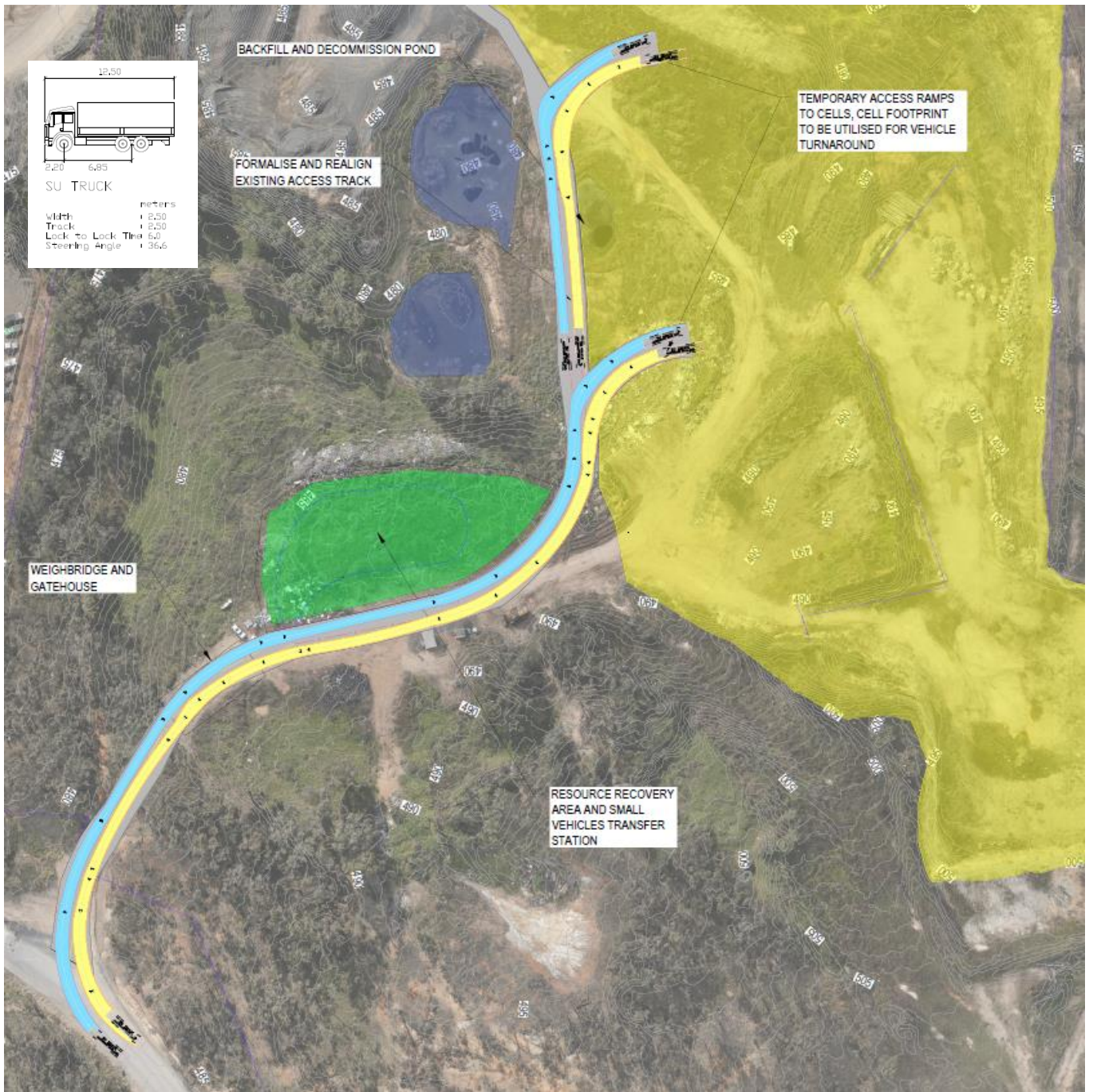


Figure 3.2 Heavy vehicle access in and out of site

4. Summary and conclusion

In 2018, Liverpool Plains Shire Council (LPSC) developed a 10-year strategy for the ongoing management of waste within their region (MRA, 2018). Landfilling forms an essential part of this strategy, along with waste avoidance and reduction, increased recycling, and diversion of waste from landfills. The waste management strategy proposes to rationalise the landfilling operations across the region by establishing the Willow Tree Management Facility (WMF) (the site) as the primary landfill, servicing LPSC's Local Government Area (LGA) via an expansion of this existing landfill site with the existing lot boundary (the project).

The project will involve:

- Site establishment, including preparation of construction compound, suitable stockpile and bunding areas, and sediment and erosion controls.
- Site preparation and vegetation clearing.
- Construction of the WMF expansion.
- Operation of the expanded WMF to service the Liverpool Plains LGA.

The DPE have reviewed the proposed development and issued SEARs.

The purpose of this report is to prepare a TIA that quantifies the impacts of the proposed development and responds to each of the SEARs requirements.

Data from TfNSW indicates that in 2017 a single crash occurred on the New England Highway in proximity to Merriwa Road. The crash involved two vehicles travelling in the same direction and did not result in any injuries. No crashes were recorded on Merriwa Road.

Available traffic data indicated that the New England Highway is operating well within its mid-block capacity.

During operation the project is expected to generate (on average):

- Five inbound and outbound vehicle movements per day associated with workers
- Six inbound and six outbound vehicle movements per day

During construction the project is expected to generate (on average)

- Ten inbound and outbound vehicle movements per day associated with workers
- Six inbound and six outbound vehicle movements per day

These volumes are minor and are expected to fall within typical fluctuations of daily traffic movements on the adjoining road network and therefore not adversely affect the operation of the existing road network in proximity to site. It is expected that there would not be any impact on the performance of the intersection of New England Highway and Merriwa Road.

Accordingly, no road upgrades are put forth to support the construction or operation of the project.



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