APPENDIX J

Amenity

J-1 Air Quality Impact Assessment

J-2 Noise and Vibration (Terrestrial)

J-3 Landscape Character and Visual Amenity Impact Assessment

J-4 Traffic Impact Assessment

NORTHERN
WATER PROJECT

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Appendix J-1:
Air Quality Assessment



NORTHERN WATER PROJECT

Department for Infrastructure and Transport

Air Quality Assessment

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Northern Water Project
Air Quality Impact Assessment

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Executive summary

The Northern Water Project (the Project) aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 gigalitre per year (GL/year) seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, product water storages) and electricity infrastructure.

This report outlines the air quality assessment undertaken for the Project, in accordance with the *Ambient air quality assessment* guideline (Environment Protection Authority, 2016) (the AAQA Guideline). The AAQA Guideline provides a framework to assess and control risks associated with air pollutant emissions. The assessment describes air emissions expected from the Project, and identification of appropriate mitigation methods and management practices (where necessary) to reduce and control emissions to air.

The main objectives of this assessment were to assess the potential effects of construction and operation activities on air quality, which included the following:

- Review local meteorological and air quality conditions to identify any existing air quality issues and conditions that may influence air quality.
- Identify potential air quality issues associated with the Project, and qualitatively assess the effects of the construction, operation, and decommissioning of Project components. Dust emissions were the primary focus of the assessment.
- Make recommendations regarding means to avoid, minimise or mitigate any potential air quality impacts during the design, post planning (construction), post construction (operation) and decommissioning phases.

Construction

Sensitive receptors for dust are defined as locations where a person would be reasonably expected to be present for 24-hours or more and typically means private or commercial residential/accommodation properties, hospitals and other similar facilities. A majority of the Project alignment passes through land used for grazing and/or remote areas, with large separation distances to sensitive receptors - with the exception being isolated rural residences and a small number of commercial properties for short sections of the transfer system alignment (and other construction sites) which pass in proximity to Pimba, Woomera and Roxby Downs.

The air pollutant emissions (including dust and odour emissions) from construction of the Project have been considered over many construction sites, including the desalination plant, along the 406 km transfer system alignment, transmission line routes and ancillary infrastructure, such as pump stations and storages, as well as laydown areas and construction camps.

Construction of the Project is anticipated to occur over three years and will involve vegetation and topsoil clearing, construction of the desalination plant, excavation, earthworks and backfill to facilitate pipelaying and construction of ancillary infrastructure, and site rehabilitation. The construction of the transfer system (main transfer and lateral branch pipelines) is anticipated to be completed by two concurrent work crews to maximise efficiency.

The total excavated volume for the transfer system is expected to be approximately 2,293,000 cubic metres (m^3), which equates to 566 m^3 per 100 m of pipeline. The main air pollutant of interest was therefore particulate emissions with the key air pollutant indicators identified as particulate matter 10 (PM_{10}), and particulate matter 2.5 ($PM_{2.5}$). Estimates for total emissions of the Project's construction were calculated to be: 377 kilotonne p.a. (PM_{10}); and 56.5 kilotonne p.a. ($PM_{2.5}$).

While the air pollutant emissions quantities are not insignificant, they are distributed over many construction sites, over more than 400 km of linear infrastructure. With the implementation of dust mitigation measures, the risk of air quality impact due to nuisance dust, PM_{10} and $PM_{2.5}$ in a specific location is expected to be low and / or short in duration.

Measurements of deposited dust can be useful indicators for nuisance dust impacts. There is no assessment criterion for nuisance dust in South Australia, however New South Wales assessment criteria has been widely adopted. The AAQA Guideline states the focus is on "control and management systems that effectively prevent or mitigate offsite impacts".

Operation

The main operational air emissions will be limited to dust emissions by light vehicles utilising unsealed roads at the desalination plant, along the pipeline, and near other Project infrastructure for small and infrequent operational and maintenance tasks. Dust impacts from these vehicles are expected to be insignificant.

Desalinated water is not odorous, as such there is a low risk of odour impact from pipeline air valves and scour valves, during events when the water is released and/or open to air.

Potential for the desalination plant to cause odour emissions from fine solids storage was considered during the assessment, as well as the occasional odour sources associated with the seawater intake. As such, a review of the intake design parameters, experience with waste management practices at the Adelaide desalination plant, and comparisons with EPA (2023) evaluation distances for wastewater treatment plants and Project distances to sensitive receptors was undertaken. The review determined that there is a low risk of odour impact from the operation of the desalination plant.

Decommissioning

It is assumed that during decommissioning, the pipeline would not be removed, therefore dust emissions would be significantly lower than during construction. Demolition of Project infrastructure at Mullaquana Station may result in dust generation and emissions from plant and equipment. In accordance with the General Environmental Duty (GED) obligations under the *Environment Protection Act 1993*, a dust management plan and appropriate mitigation measures would need to be developed to address activities proposed during decommissioning, including at the desalination plant and other project infrastructure.

Important note about your report

The sole purpose of this report and the associated services performed by Jacob Group (Australia) (Jacobs) is to provide air quality assessment services in accordance with the scope of services set out in the contract between Jacobs and the Client, JBS&G, and head client, Department for Infrastructure and Transport (DIT).

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Jacobs derived the data in this report using various information sourced from DIT and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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Acronyms and abbreviations

AAQA	Ambient air quality assessment
AMO	Australian Meteorological Office (BoM)
AS	Australian Standard
AQ EPP	Environment Protection (Air Quality) Policy 2016 (South Australia)
BATEA	Best available technology economically available
BOM	Bureau of Meteorology
CO	Carbon monoxide (molecular formula)
DBOM	Design-build-operate-maintain
DMP	Dust Management Plan
EP ACT	*Environment Protection Act (SA), 1993* (last update 1 March 2024)
EPA	Environment Protection Authority, South Australia, unless otherwise stated
G/M^2/MONTH	Grams per square metre per month – unit of deposited dust (AS 5380.10-1 2016)
GED	General Environmental Duty; section 25 of the *Environment Protection Act, 1993*
GLC	Ground Level Concentration – GSA (2023a) maximum ground-level air pollutant concentration based on evaluations use of prescribed testing, assessment, monitoring or modelling
GSA	Government of South Australia
HA	Hectare
JACOBS	Jacobs Group (Australia) Pty Ltd
MM	Micrometre or micron – one millionth of a metre, or 10^{-6} m
MG/M^3	microgram per m^3 – unit of air pollutant concentration
NO_X	Oxides of nitrogen (nitric oxide and nitrogen dioxide)
NO_2	Nitrogen dioxide (molecular formula)
PM_{10}	Particulate Matter 10 – airborne particles with an equivalent aerodynamic diameter of <= 10 μm
$PM_{2.5}$	Particulate Matter 2.5 – airborne particles with an equivalent aerodynamic diameter of <= 2.5 μm
RH	Relative humidity

SO_2	Sulphur dioxide
TEOM	Tapered Element Oscillating Microbalance
TSP	Total Suspended Particulates (total suspended particulate matter)
VKT	Vehicle Kilometres Travelled – number of vehicles by number of kilometres travelled

1. Introduction

1.1 Background

The Northern Water Project (the Project) aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 gigalitre per year (GL/year) seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, product water storages) and electricity infrastructure.

Figure 1-1 shows a geographical overview of the Project.

1.2 Project components

The Project comprises the following key elements:

- A 51 GL/year seawater reverse osmosis desalination plant.
- Sea water intake and outfall pipelines within the marine tunnels extending underneath the seabed, and associated intake structure and pumps.
- Diffuser structures for discharge of return water.
- A transfer system consisting of:
    - a ~360 km main transfer pipeline, largely constructed underground terminating at the delivery point at the Olympic Dam copper-gold mine.
    - a ~46 km lateral branch pipeline to a delivery point at the Carrapateena copper-gold mine (which may be constructed above or below ground).
    - a transfer pump station and storage at the desalination plant.
    - three transfer pump stations and storages along the main transfer pipeline.
- High voltage electricity supply including new transmission and distribution lines and new network and facility substations to provide power to the desalination plant and transfer pump stations.
- New access tracks and upgrades of existing tracks.
- Enabling roadworks and road upgrades.
- Associated temporary construction-related infrastructure (e.g. construction camps, site offices and amenities, yards, storages and laydown areas).

A Reference Design (GHD 2025) for the desalination plant and transfer system from Mullaquana Station to Olympic Dam has been completed for the Project. The Project design is preliminary and is expected to change through the detailed design process, or in response to cultural heritage matters or other refinements to minimise impacts as design and technical studies continue.

1.3 Study Area definition

The Project Area is based on a 2.5 km buffer surrounding all Project infrastructure including the alignment of linear infrastructure (i.e. a 5 km wide corridor). Linear infrastructure includes pipelines, transmission lines and the desalination plant intake and outfall. The buffer effectively incorporates all Project infrastructure for the purposes of approvals.

The Project Area is used as a guide for the assessment of impacts and final location of infrastructure is expected to remain inside this corridor. Most of the Project alignment passes through land used for grazing and/or remote areas, with large separation distances to sensitive receptors. The location of sensitive receptors is discussed in Section **5.3** and illustrated in **Appendix B**.

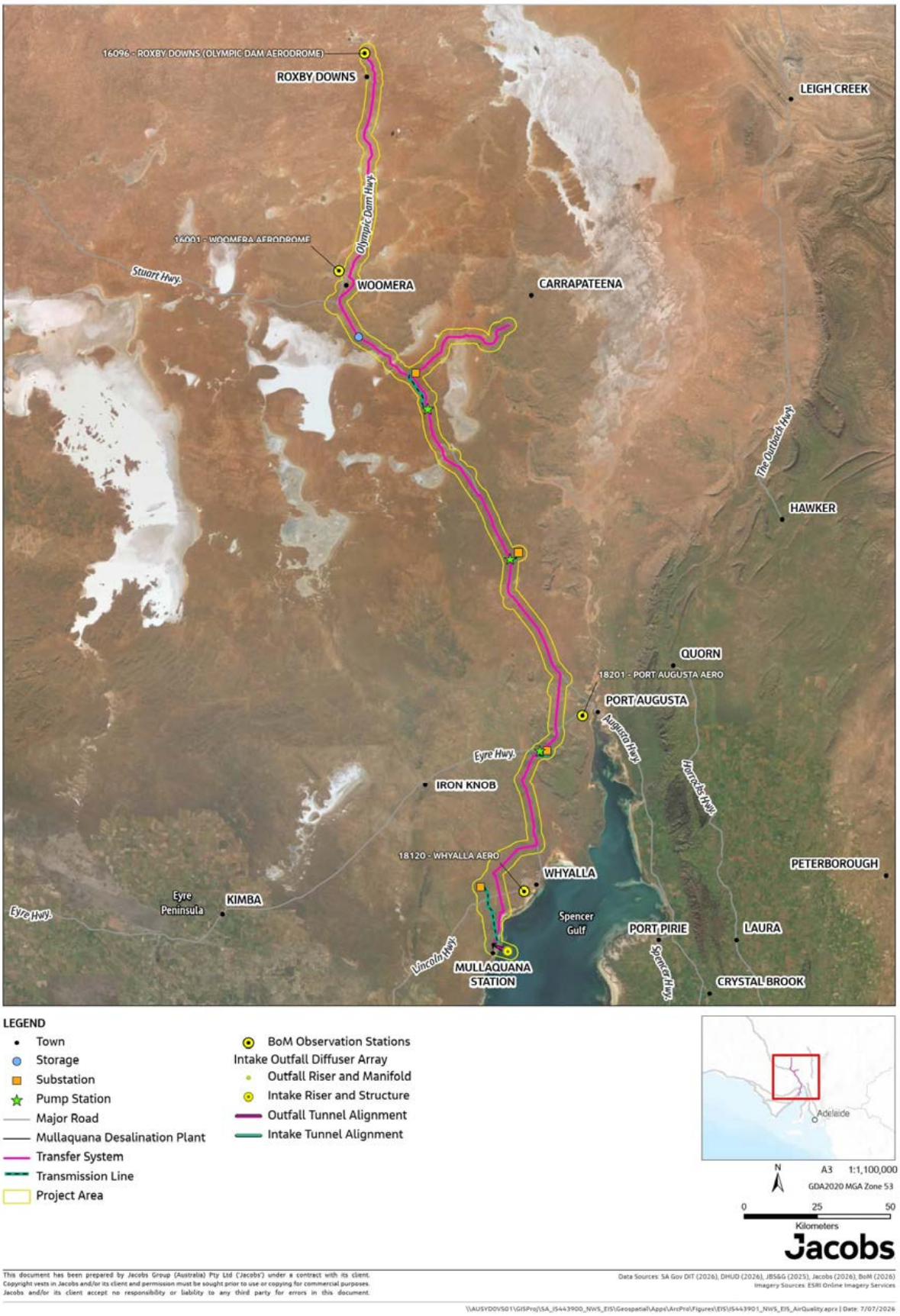


Figure 1-1. Project overview in geographical context

1.4 Air Quality Assessment Scope

This air quality assessment, prepared by Jacobs on behalf of the proponent, addresses the air quality impacts for the Project as part of the Project's Environmental Impact Statement (EIS) as required under the *Planning, Development and Infrastructure Act, 2016*.

The air quality assessment was undertaken in accordance with the South Australian (SA) Environment Protection Authority (EPA) guideline, *Ambient Air Quality Assessment* (EPA 2016) (the AAQA Guideline) and the Evaluation Distances for Effective Air Quality and Noise Management Publication (EPA 2023).

Under the *Environment Protection Act 1993* (EP Act), activities which pollute, or might pollute, the environment must not be undertaken unless all reasonable and practicable measures to prevent or minimise any environmental harm have been taken.

Under the *Local Nuisance and Litter Control Act 2016*, a local nuisance includes "dust generated on premises…[which] has travelled to neighbouring premises; and the nature, extent, smell, density or texture of the dust is such as to constitute an unreasonable interference with the enjoyment of the neighbouring premises by persons occupying those premises".

The AAQA Guideline provides a framework to assess and control risks associated with air pollution and constitutes guidance under the EP Act.

The main objectives of this assessment were to assess the potential effects of construction and operation activities on air quality, which included the following:

- Review local meteorological and air quality conditions to identify any existing air quality issues and conditions that may influence air quality.
- Identify potential air quality issues and qualitatively assess the effects of the Project components' construction, operation, and decommissioning. Dust emissions were the primary focus of the assessment.
- Make recommendations regarding means to manage, avoid or mitigate any potential air quality impacts during the design, post planning (construction), post construction (operation) and decommissioning phases.

Correspondence with the EPA confirmed the assessment should include a discussion of the Project air emissions followed by identification of appropriate mitigation methods and management practices to reduce and control emissions to air.

2. Air Quality Standards

2.1 Overview

This section sets out ambient air quality and deposited dust standards and indicators to assist with interpretation of measurements reviewed for this assessment.

2.2 Air Quality Assessment Standards

The Government of South Australia air quality standards are set out in the *Environment Protection (Air Quality) Policy 2016* (AQ EPP) (GoSA, 2023a). The air quality standards are defined as maximum Ground Level Concentrations (GLCs). The GLCs are used in testing, by modelling and/or monitoring, whether an activity causes, or has the potential to cause, air quality impacts. GLCs determined to be relevant for the Project are those for particulate matter 10 micrometres or less (PM_{10}), particulate matter 2.5 micrometres or less ($PM_{2.5}$) and the combustion gases, nitrogen dioxide (NO_2) and carbon monoxide (CO); see **Table 2-1**.

Table 2-1. South Australia Environment Protection (Air Quality) Policy 2016 GLCs

Pollutant, Classification	Averaging Time	Maximum Concentration (µg/m^3)
Particles as PM_{10}, Toxicity	24 hours	50
Particles as $PM_{2.5}$, Toxicity	24 hours	25
	Annual	8
Nitrogen Dioxide (NO_2), Toxicity	1 hour	164
	Annual	30
Carbon Monoxide (CO), Toxicity	1 hour	31,240
	8 hours	11,250

2.2.1 Environment Protection Regulations

The *Environment Protection Regulations 2023* (which replaced the *Environment Protection Regulations 2009*) become operational on 1 April 2024.

The changes made to the Regulations were minor, and consisted mainly of updates to numbering, and lists of prescribed bodies and Acts to ensure consistency. There were no alterations to the GLCs listed in **Table 2-1** as a result of the revised legislation, and the AQ EPP 2016 remains applicable for air quality in South Australia (GoSA, 2023a).

2.3 General Environmental Duty

Section 25 of the EP Act sets out the General Environmental Duty (GED). The GED emphasises the responsibility of individuals and organisations to take reasonable and practical measures to prevent or minimize harm to air quality.

When determining what measures are reasonable and practical, consideration is given to:

- the nature of the pollution or potential pollution and the sensitivity of the receiving environment.
- the financial implications of the various measures that might be taken as those implications relate to the class of persons undertaking activities of the same or a similar kind.
- the current state of technical knowledge and likelihood of successful application of the various measures that might be taken.

In general terms, the legislative focus of the GED is a prevention and risk reduction approach, rather than one of compliance. The air quality assessment standards in Section **2.2** are therefore not concentrations one can 'pollute up to' and are not concentrations below which no action is required, but rather they provide a benchmark for assessing ambient air quality.

2.4 Air Quality Assessment Guidance

The EPA has a suite of guidance documents to assist owners and operators of facilities with meeting their regulatory requirements for air quality.

This air quality assessment was conducted in accordance with this guidance, specifically against two guidelines:

- The AAQA Guideline (EPA 2016) – this guideline describes the EPA's risk-based approach to air quality assessment. The approach begins with considering the indicators of risk, specifically the evaluation distances, and the health and environmental indicators such as GLCs and nuisance dust.
- *Evaluation distances for effective air quality and noise management* (EPA 2023) – this guideline recommends distances between specified activities and sensitive receptors within which the air quality effects of the activity on the receptor should be assessed.

To qualitatively assess the Project's emissions (particularly with regard to dust during the construction phase), estimates were used based on the Commonwealth Government's National Pollutant Inventory (NPI) Emission Estimate Techniques Manual for Mining (CoA, 2012). This guidance includes emissions factors and equations relating to mining overburden, which are relevant for construction of the Project. The NPI database also contains reports from other industries in the area which generate particulate matter as a part of their operations, and these publicly available emissions reports were included for the purpose of comparison.

Section **5** contains the assessment of air quality impacts from the Project, guided by these documents and resources.

2.5 Deposited Dust

Deposited dust has the potential to impact on amenity, e.g. by deposits on and in houses, on vehicles, and on clothes, or impact in other ways including surface run-off (e.g. rainwater collection from roofs or effects on ecology such as vegetation smothering). In relation to nuisance dust, the AAQA Guideline states the focus is on "control and management systems that effectively prevent or mitigate offsite impacts". While measurements of deposited dust can be useful indicators of nuisance dust impacts, there are no South Australian standards for deposited dust for the protection of amenity (EPA, 2016), however NSW assessment criteria (NSW EPA, 2022) are widely adopted.

There is a connection between nuisance dust and the smaller particles described in the previous sub-sections. Plumes of visible nuisance dust include fractions of PM_{10} and $PM_{2.5}$. Typically, dust is measured, analysed and, in South Australia, regulated via the health-based standards of PM_{10} and $PM_{2.5}$ (see also EPA (2022)).

Measurement of dust deposition is usually undertaken on a monthly or multi-month cycle, so does not provide an effective means of monitoring real-time nuisance impacts. Dust deposition monitoring is therefore better applied to document compliance retrospectively or assess long-term trends in nuisance dust impacts rather than to inform real-time on-site dust mitigation measures.

Monitoring for deposited dust is therefore not recommended for the Project, however the NSW assessment criteria is included in **Table 2-2** for reference.

Table 2-2. NSW assessment criteria for deposited dust

Pollutant, Classification	Averaging Time	Maximum Concentration ($g/m^2/month$)[1]
Deposited Dust (as insoluble solids)	Maximum increase in deposited dust	2
	Maximum total deposited dust	4

The AAQA guidance states that the GED may be applied to avoid environmental nuisance through the use of 'best available technology economically achievable' (BATEA) and dust management plans (DMPs).

Dust impacts on vegetation health are influenced by a range of factors including the size, shape and composition of the dust, the dust deposition load and the morphology of the vegetation being impacted (Doley (2006); Doley and Rossato (2010)). However, also, there are no Australian standards for assessing dust impacts on vegetation. This assessment focussed on the protection of human health and amenity by the establishment of dust controls, which also affords a level of protection for vegetation health.

[1] Dust is assessed as insoluble solids as defined by AS 3580.10.1

3. Local Climate

3.1 Introduction

This section describes the local climate expected for the Project locality, by a review of available meteorological observations. The Project spans some 400 km via the transfer system.

Local climate for the Project sites studied was estimated based on measurements from four Bureau of Meteorology (BoM) stations along the transfer system (Figure 1-1); from south-to-north:

1) Whyalla Aero(drome) – 8.5 km from the Project, approximately 5 km inland (BoM 018120) therefore affected by coastal influences.
2) Port Augusta Aero(drome) – 9 km from the Project, and approximately 2.4 km inland therefore affected by coastal influences (BoM 018201).
3) Woomera Aero(drome) – adjacent to Project pipeline, approximately 170 km inland (BoM 016001).
4) Roxby Downs (Olympic Dam Aerodrome) – 1 km from the Project, approximately 240 km inland (BoM 016096).

The Project desalination plant is to be located on the coast at Mullaquana Station, and the transfer system ranges up to ~230 km inland (i.e. the distance to the edge of the nearest Coastal Areas planning overlay location). The meteorology for any Project site could be determined for practical purposes by selecting the closest BoM monitoring station from the list above.

3.2 Winds

3.2.1 Overview

The following sub-sections review BoM long-term wind observations to determine the likely characteristics of wind patterns and wind speeds for the Project.

3.2.2 Wind Patterns

Over Australia, during the warmer months, high pressure systems move eastwards along the subtropical ridge with their centres in the Southern Ocean. In the cooler months, the subtropical ridge moves north and is centred over the continent. The shifting tracks of these large weather systems over the continent controls the dominant, seasonal winds (BoM, 2008). In summer, southerly winds are dominant for locations along the Great Australian Bight, and inland of the Bight. Example wind roses for the summer period are provided in Appendix **A.1**.

Wind roses were also created from all hourly average wind speed and wind direction data, for:

- Whyalla and Port Augusta weather stations: 2013-2023.
- BoM Woomera weather station: 2008-2019.
- BoM Roxby Downs weather station: 2011-2019.

Annual wind roses for each year for all stations are provided in Appendix **A.2**, **A.3**, **A.4**, and **A.5**, and seasonal wind roses in Appendix **A.6**, **A.7**, **A.8**, and **A.9**. The seasonal wind roses are re-plotted in **Figure 3-1**, **Figure 3-2**, **Figure 3-3**, and **Figure 3-4**, for ease of comparison.

These plots highlight the dominance of the southerly winds (Whyalla Aero and Roxby Downs), and south-easterly sector winds for Woomera and Port Augusta Aero during summer.

A summary of the seasonal winds expected for the Project is:

Summer:	Dominant southerly or south-easterly winds.
Autumn:	Southerlies become less dominant and wind speeds reduce overall.
Winter:	Dominant wind direction may be northerly overall and not very pronounced, with the exception of Whyalla, where winds dominate from the north and northwest.
Spring:	Returning to summer pattern with more southerly winds; wind speeds increasing.

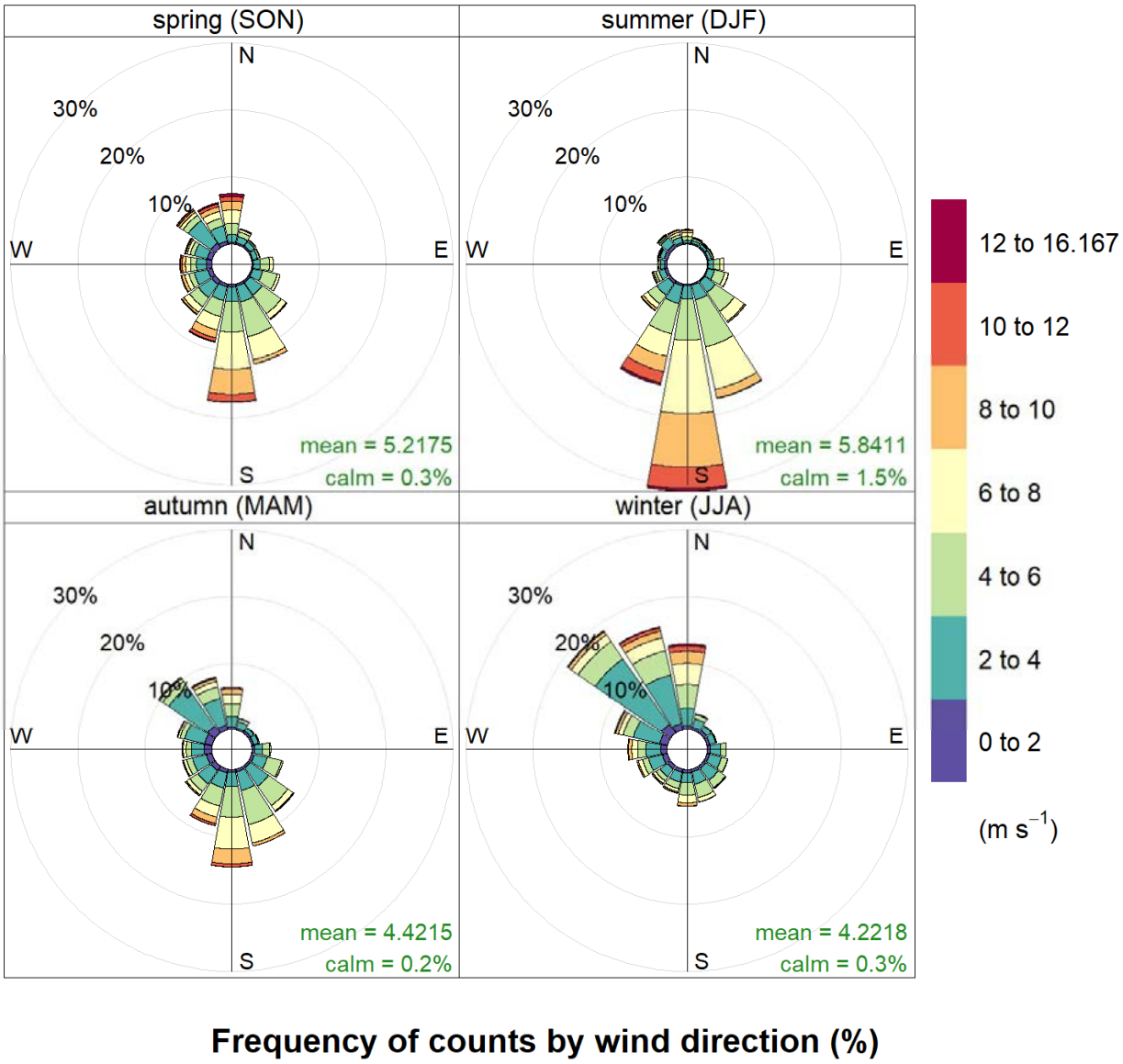


Figure 3-1. BoM Whyalla Aero seasonal wind roses – all hours 2013-2023

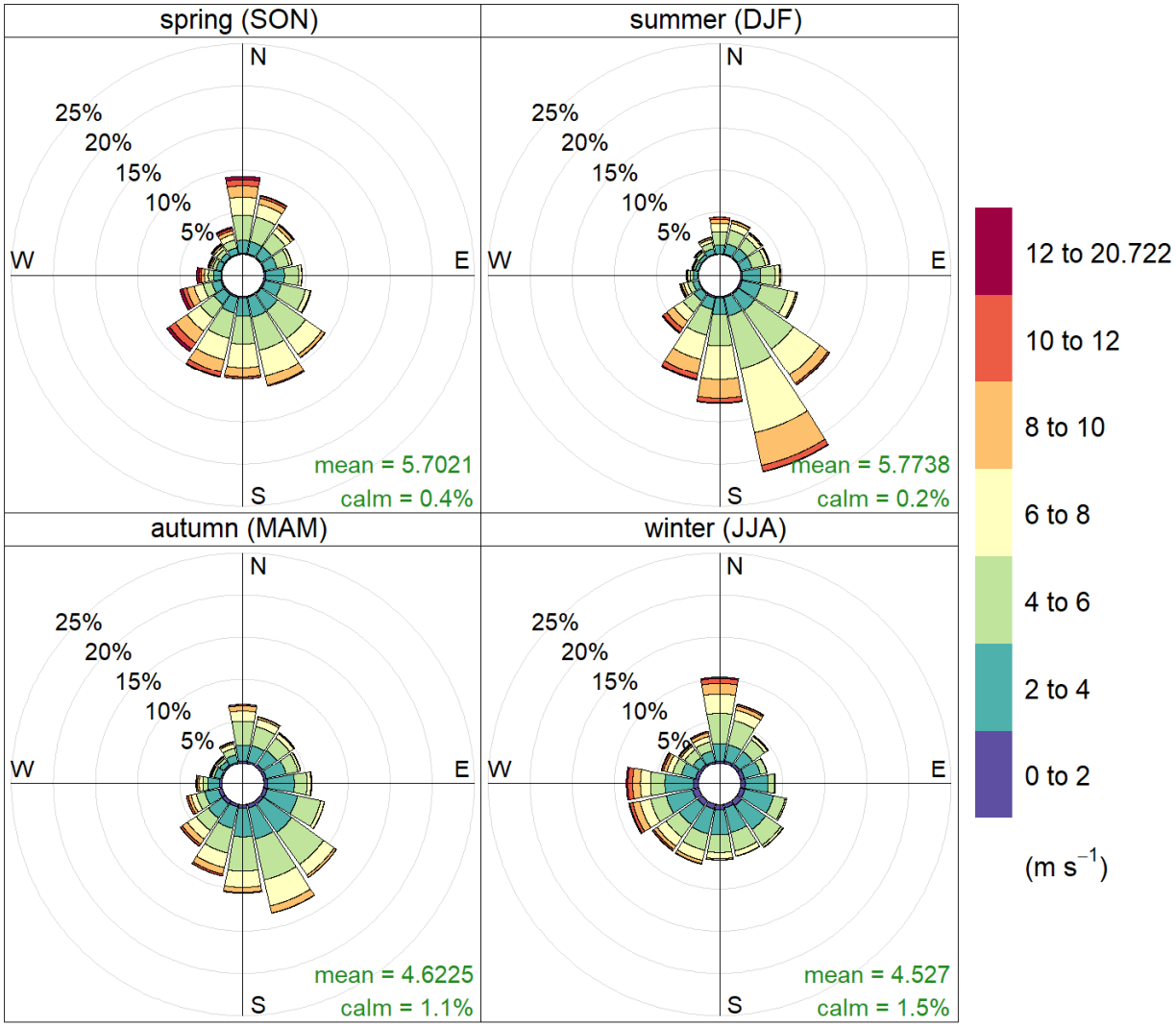


Figure 3-2. BoM Woomera seasonal wind roses – all hours 2008-2019

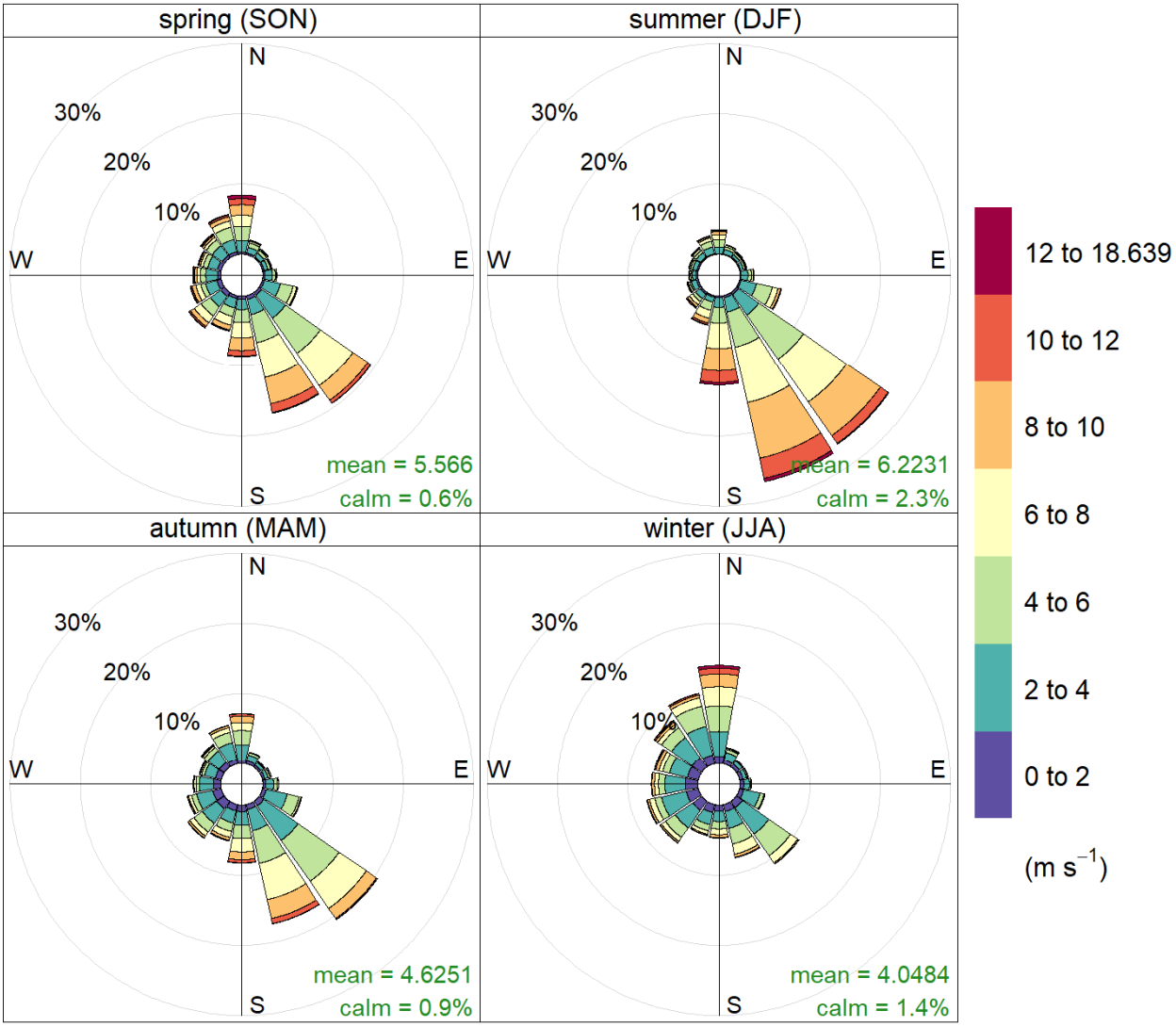


Figure 3-3. BoM Port Augusta Aero seasonal wind roses – all hours 2013-2023

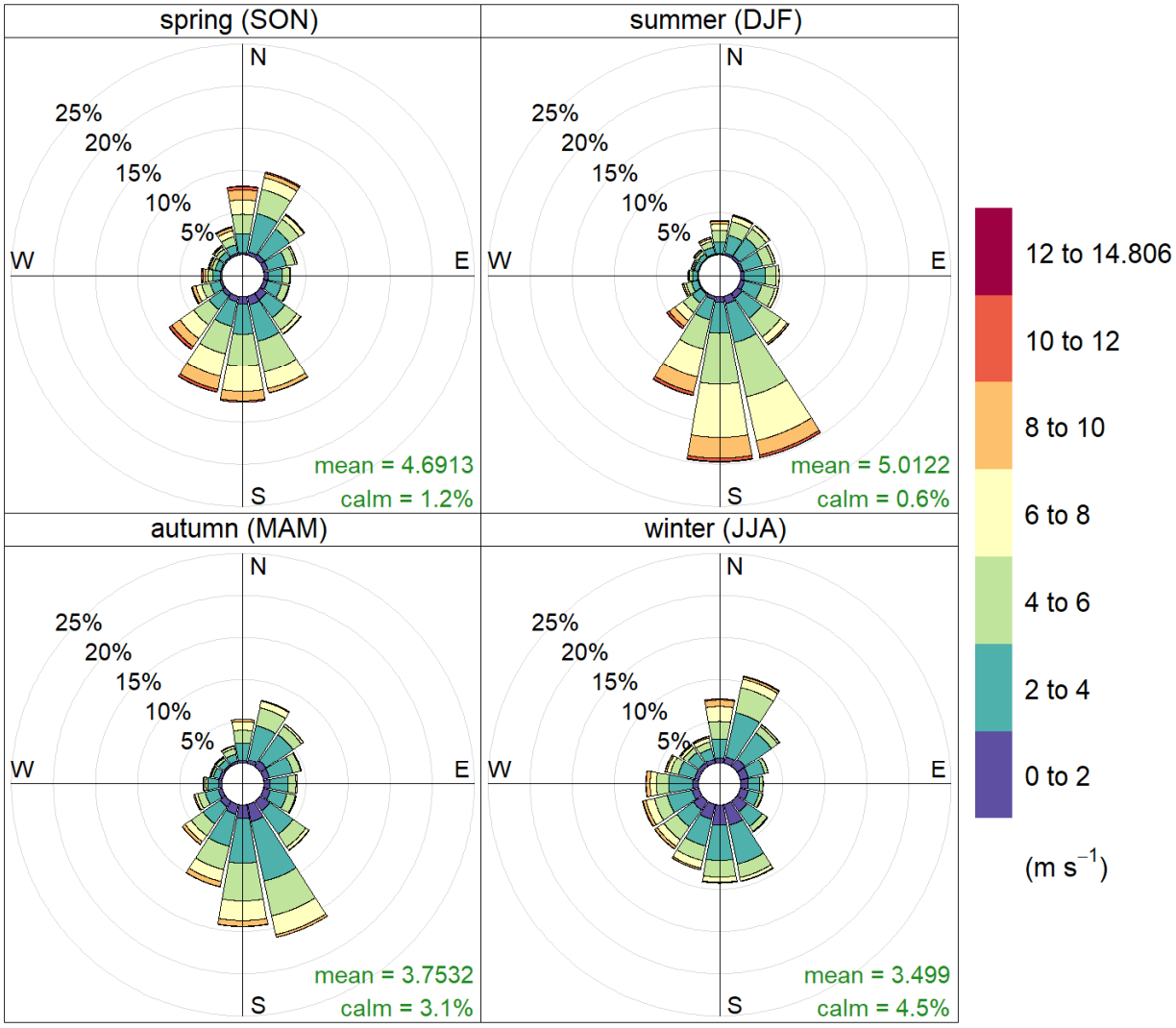


Figure 3-4. BoM Roxby Downs seasonal wind roses – all hours 2011-2019

3.2.3 Wind Speed

Monthly mean daily average wind speeds for the four BoM weather stations: Whyalla Aero, Port Augusta Aero, Woomera and Roxby Downs, are illustrated in **Figure 3-5**.

The observations show clearly maximum wind speeds occurring in the summer months, and minimum occurring around the winter months.

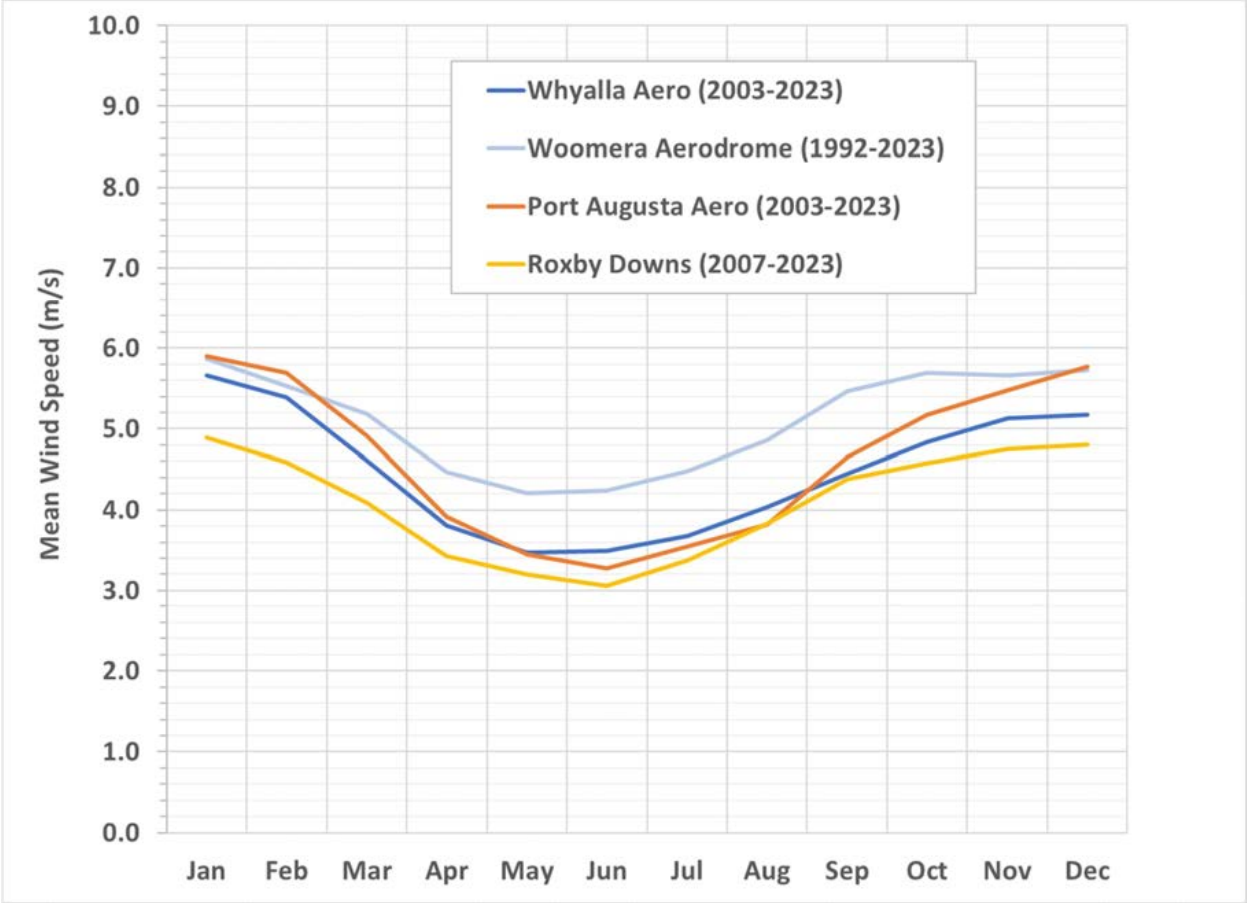


Figure 3-5. Mean daily average wind speed: Selected BoM stations

A summary of monthly wind speed and wind gust data is provided in **Table 3-1**.

Table 3-1. Summary of monthly wind speed observations: Selected BoM stations

Period	Mean daily wind speed (m/s)				Max. wind gust (m/s)			
	Whyalla Aero	Woomera	Port Augusta Aero	Roxby Downs	Whyalla Aero	Woomera	Port Augusta Aero	Roxby Downs
Jan	5.7	5.9	5.9	4.9	23.6	32.8	28.3	27.8
Feb	5.4	5.5	5.7	4.6	21.7	31.9	23.1	21.1
Mar	4.6	5.2	4.9	4.1	23.6	25.3	26.1	26.1
Apr	3.8	4.5	3.9	3.4	24.2	25.3	22.5	19.4
May	3.5	4.2	3.4	3.2	22.5	30.8	22.2	23.6
Jun	3.5	4.2	3.3	3.1	31.9	35.0	28.3	20.6
Jul	3.7	4.5	3.5	3.4	26.1	25.8	26.7	19.4
Aug	4.0	4.9	3.8	3.8	27.2	29.4	24.2	20.6
Sep	4.4	5.5	4.7	4.4	27.8	31.9	29.4	25.8
Oct	4.8	5.7	5.2	4.6	29.4	34.4	28.9	27.2
Nov	5.1	5.7	5.5	4.7	25.3	46.4	28.3	30.3
Dec	5.2	5.7	5.8	4.8	25.8	39.2	29.4	25.8

3.3 Temperature

The range and variation of temperature varies along the Project transfer system.

Mean monthly minimum and maximum temperatures for the four BoM stations are shown in **Figure 3-6**.

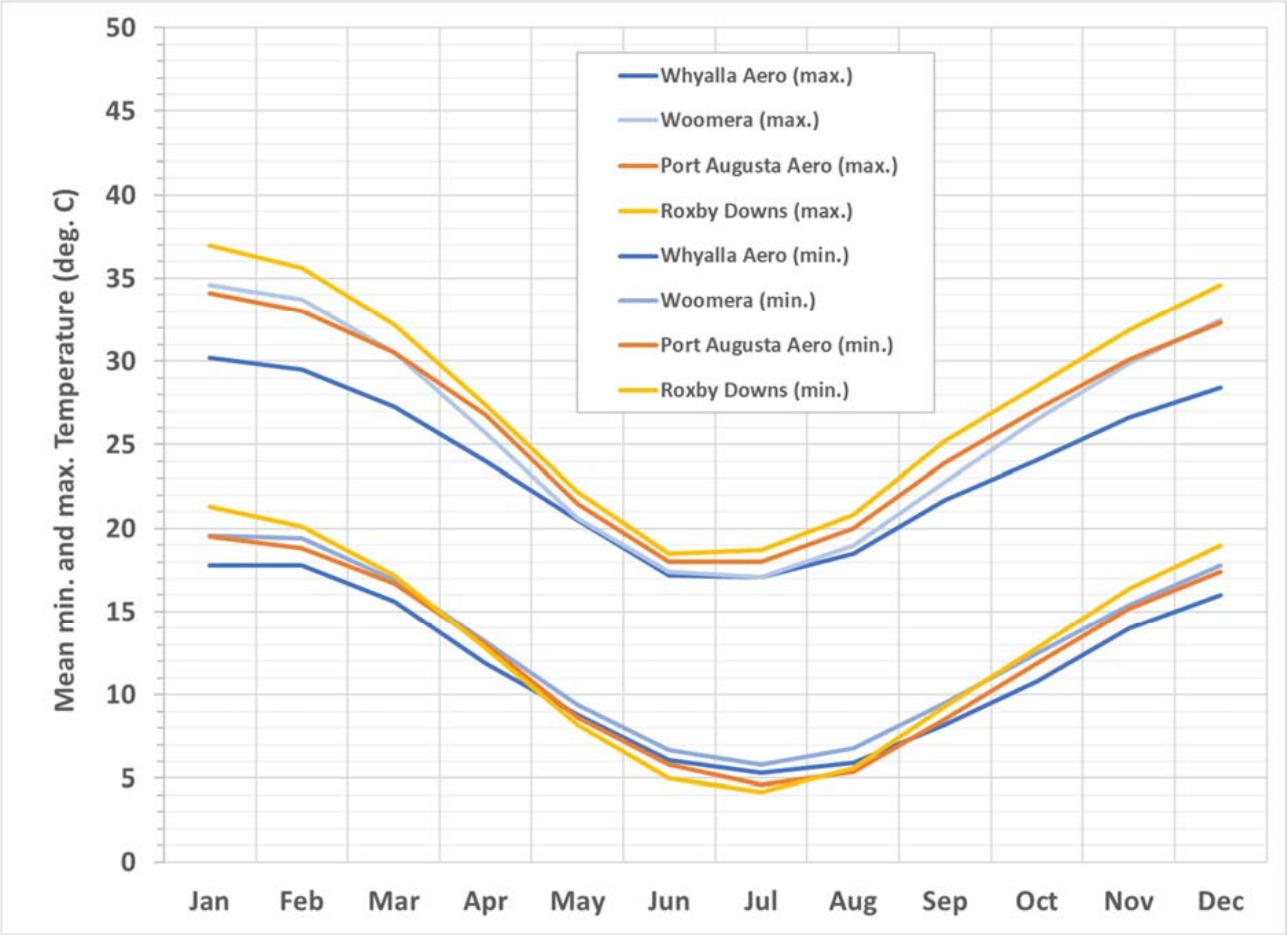


Figure 3-6. Mean temperature: monthly maxima and minima (lower): Selected BoM stations

3.4 Rainfall and Relative Humidity

The Project is located across hot and dry regions.

Mean monthly rainfalls for the four BoM weather stations are shown in **Figure 3-7**. Mean monthly 9am and 3pm Relative Humidity (RH, %), are provided in **Figure 3-8** for three out of four of the BoM weather stations (data excluded from Port Augusta Aero dataset due to lack of availability). Relative humidity for the inland sites (Roxby Downs and Woomera) is overall significantly lower than for Whyalla, which is expected due to the hot and dry nature of the inland locations.

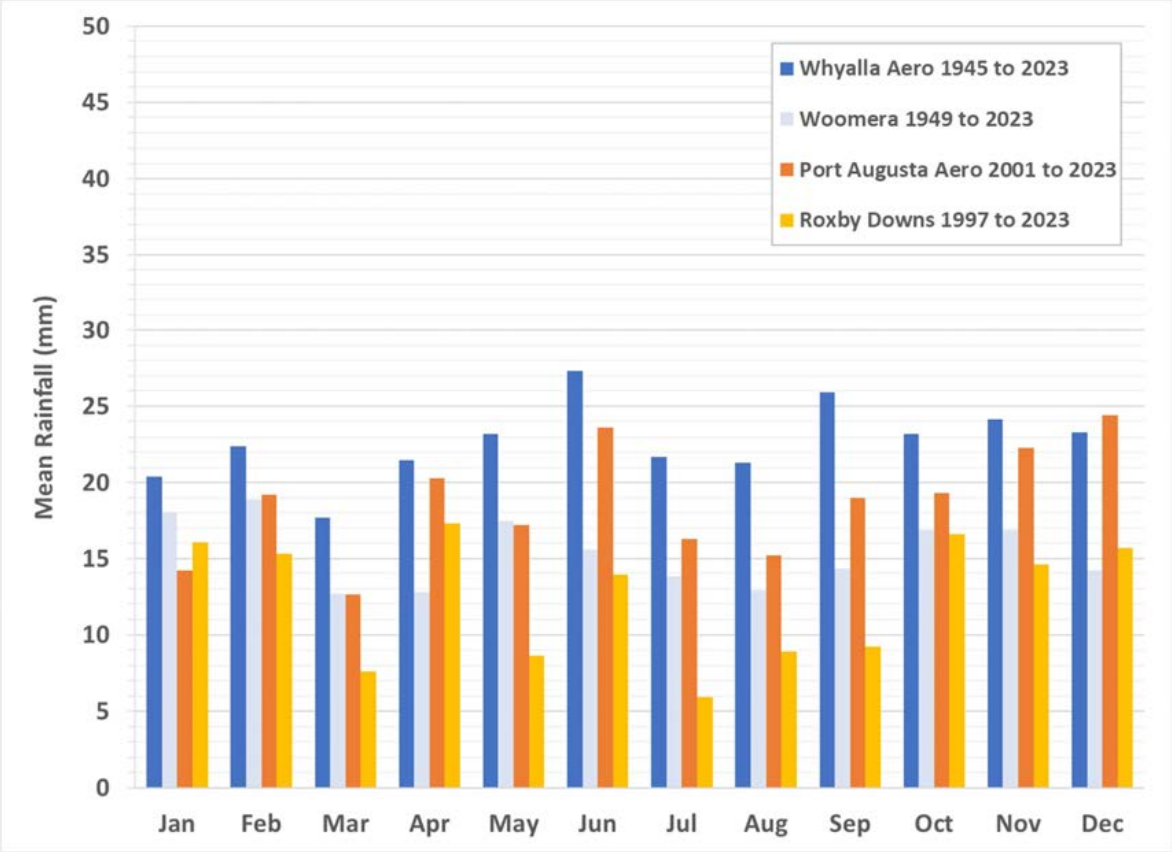


Figure 3-7. Mean monthly rainfall (mm): Selected BoM stations

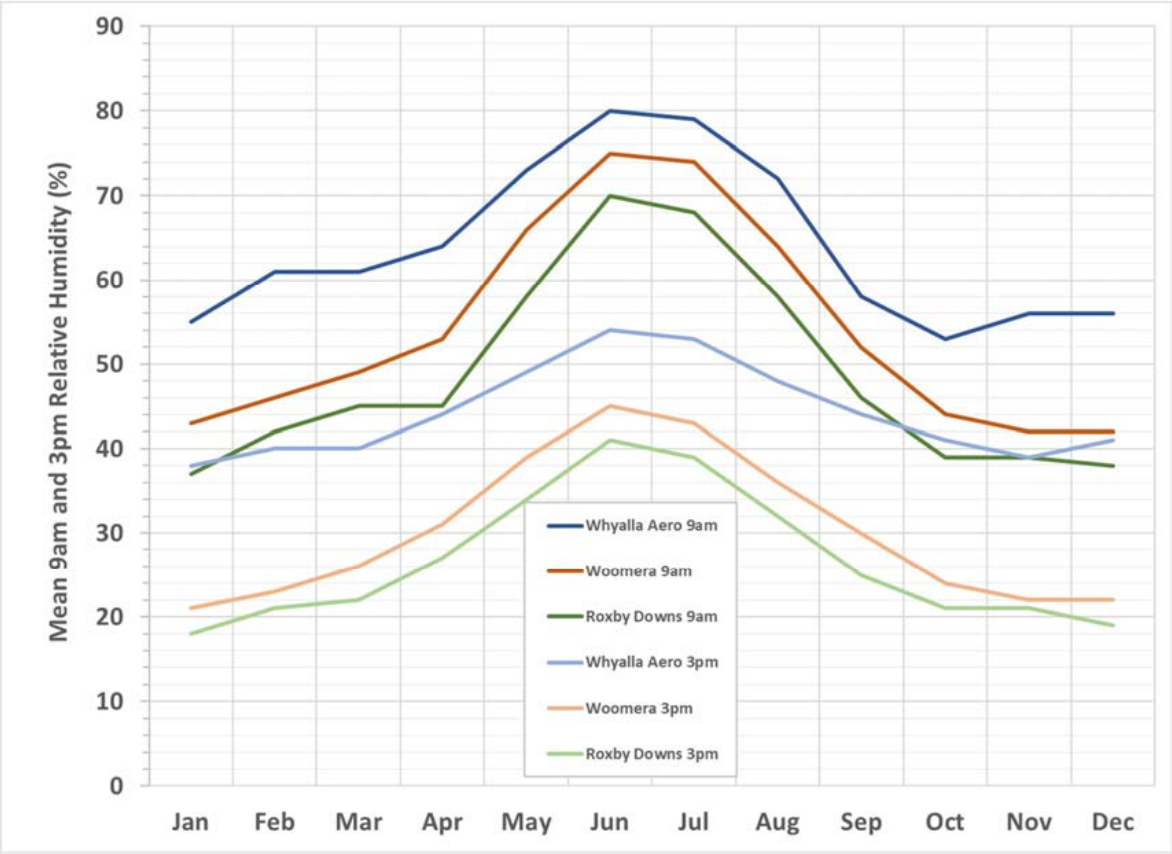


Figure 3-8. Mean monthly 9am and 3pm Relative Humidity (%): Selected BoM stations

4. Existing Air Quality

4.1 Introduction

The purpose of this section is to describe the existing or baseline air quality for the Project.

4.2 Estimates for Background Deposited Dust

There are no criteria for deposited dust in South Australia (Section **2.5**), as such, deposited dust was not assessed for this report. However, deposited dust is a simply measured parameter in common use as an indicator for nuisance dust, so estimates for background deposited dust are provided in this section.

Deposited dust can assist with interpretation of nuisance dust complaints such as deposited dust on vehicles, house roofs, etc. (EPA, 2016; EPA, 2022).

A typical, conservative estimate for background deposited dust is 2.0 g/m^2/month, for most regions of Australia. OZ Minerals (2020) (now BHP) provided examples for some arid and semi-arid locations in SA and WA; see **Table 4-1**. The mineral component of the dust is not expected to vary by much at coastal sites (excluding soluble sea salt).

Table 4-1. Examples of background dust deposition (from OZ Minerals, 2020)

Project Site	Average dust deposition rate (g/m^2/month)	
Carrapateena SA (BHP)	1.6	
Olympic Dam SA (BHP)	1.9	
Tarcoola Gold SA (WPG Resources)	2.0	
West Musgrave WA (BHP)	0.9	remote inland site; probably less affected by pastoral activity
Mulga Rock WA (Vimy Resources)	0.6	
Kintyre WA (Cameco)	2.0	

4.3 Estimates for Background PM_{10}

The EPA collects PM_{10} data from air quality monitoring stations (AQMS) in several regional and metropolitan locations including Whyalla, Port Augusta and Port Pirie. The two Whyalla air quality monitoring stations are closest to the Project alignment and provide the most representative estimates for background PM_{10} for the Project. EPA measurements of PM_{10} in Port Augusta[2] are available up to June 2020 only and there has been a complex history of wind-blown dust issues in Port Augusta, e.g., see EPA (2018b) which make this data unsuitable for estimating regional background PM_{10}. The next closest stations are in Port Pirie and Adelaide and would not be representative of the Project sites; these were therefore not considered in the assessment.

The EPA monitoring stations in Whyalla are Schulz Reserve and Walls Street. The Schulz Reserve site is better described as a background site for baseline purposes compared to Walls Street, given the proximity of the Walls Street station location to Whyalla industrial activities. Airborne particulate data as PM_{10} were measured by Tapered Element Oscillating Microbalance (TEOM) at the Schulz Reserve site since 2015, obtained in accordance with the sampling standard AS 3580.9.8 (current version AS 3580.9.8:2022).

Three years of hourly PM_{10} data from the Schulz Reserve were used to estimate background PM_{10} levels for the Project. The Schulz Reserve results for 24-hour average PM_{10} (μg/m^3) over 2023-2025 are shown

[2] The Port Augusta EPA monitoring site was a temporary air quality station which operated from March 2017 to June 2020.

overlaid in **Figure 4-1**. As expected, overall the PM_{10} concentrations are higher in spring and summer, during conditions of higher wind speeds and drier conditions. The relevant EPA standard of 50 µg/m^3 is plotted also, showing that while a few exceedances of the standard occurred in 2025, generally PM_{10} levels are less than the standard.

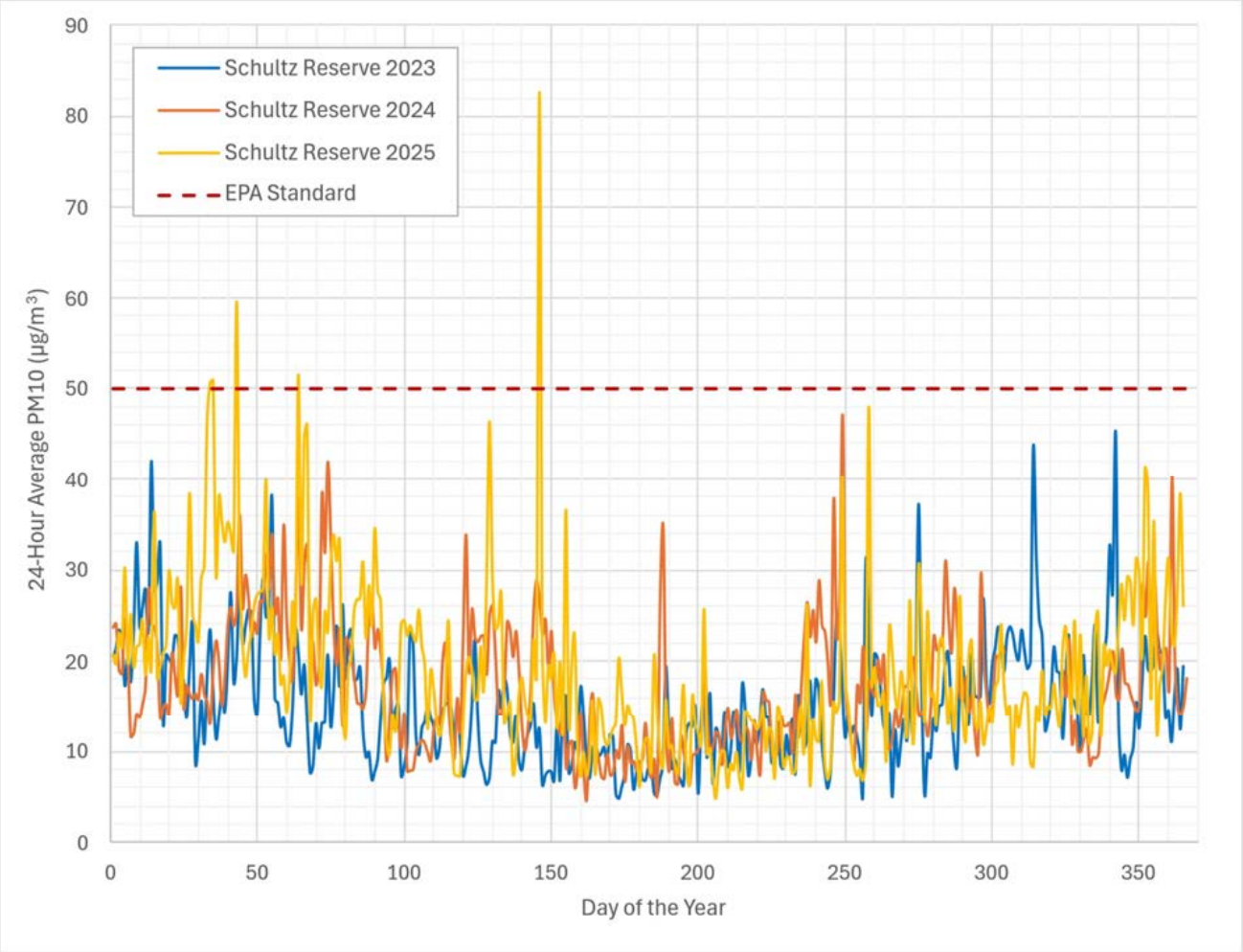


Figure 4-1. EPA Whyalla–Schulz Reserve 24-hour average PM_{10} 2023-2025 (µg/m^3)

A statistical summary of the results is provided in **Table 4-2**.

Table 4-2. Statistical summary of EPA Whyalla–Schulz Reserve 24-hour average PM_{10} (µg/m^3)

Statistic	January 2023 to December 2025
Number of 24-hour averages	1077 (98.3% of available)
EPA standard	50 µg/m^3
99th percentile*	44.8 µg/m^3
90th percentile	26.8 µg/m^3
70th percentile	20.4 µg/m^3
Average	17.3 µg/m^3
*99% of results <44.8 µg/m^3	

4.4 Estimates for Background $PM_{2.5}$

Measurements of $PM_{2.5}$ are more limited than for PM_{10}, and more common for the Adelaide metropolitan area than regional locations. There are no current $PM_{2.5}$ monitoring data available outside the Adelaide metropolitan area, however some recent $PM_{2.5}$ monitoring has been conducted at Port Augusta and was considered representative for the Project sites. While PM_{10} data from Port Augusta was considered less representative of regional background PM_{10} conditions than Whyalla, $PM_{2.5}$ is less influenced by local dust sources and is the only recent $PM_{2.5}$ data available in the region. Monitoring stations in and around Adelaide would be less representative due to the significant contribution from road traffic. Therefore, Port Augusta was the best option for estimating background $PM_{2.5}$ for the Project sites.

EPA Port Augusta TEOM measurements of $PM_{2.5}$ from January 2018 to June 2020 were analysed to determine estimates for background $PM_{2.5}$ for the Project. A statistical summary is provided in **Table 4-3**.

Table 4-3. Statistical summary of EPA Port Augusta 24-hour average $PM_{2.5}$ (µg/m³)

Statistic	January 2018 to June 2020
Number of 24-hour averages	805 (88.2% of available)
EPA standard	25 µg/m³
99th percentile	25.6 µg/m³
90th percentile	10.8 µg/m³
70th percentile	7.5 µg/m³
Average	7.4 µg/m³
*99% of results <25.6 µg/m³	

4.5 Background Levels of Gaseous Pollutants

Project sources of gaseous emissions will include vehicles and construction equipment during construction, and there will be some minimal emissions during desalination plant operations and maintenance works for the transfer system, transmission lines, pump stations, storages and substations.

The emissions of gaseous air pollutants from construction and operations are expected to be negligible in relation to their potential for impacts, given the sparse distribution of sensitive receptors along the Project alignment and/or proximity of construction activities to nearby townships. As such, estimates for background levels of gaseous pollutants such as CO and NO_2 were not considered for the Project.

4.6 Background Odour

There may be odorous, gaseous emissions from natural sources at the Project sites near the coast, such as decomposing seaweed or other marine vegetation and muds. This may lead to odorous background concentrations of hydrogen sulphide (H_2S), for example.

It is assumed that the background odour levels for the Project sites are negligible. If a non-Project odour source is identified during construction or operations, the cumulation of background plus Project odours and their nuisance values would need to be determined on a case-by-case basis.

4.7 Existing Sources of Air Pollutants

There are several industries in the vicinity of the Project alignment which generate particulate matter emissions from their activities, and who report their emissions to the National Pollutant Inventory (NPI) (CoA,

2026). **Table 4-4** lists industrial sites located within 50 km of the Project and their reported PM_{10} and $PM_{2.5}$ emissions from the 2023-2024 reporting period (the most recent reporting period at the time of writing).

The reported emissions from these industries provide context when interpreting the project emissions estimated in Section **5**.

Table 4-4. Existing sources of particulate matter (2023-24 reporting period)

Facility	Description	PM_{10} (kg)	$PM_{2.5}$ (kg)
Nyrstar Port Pirie	Integrated multi-metals smelting	180,000	30,000
Oz Minerals Carrapateena	Metal Ore Mining and processing plant	1,500,000	22,000
Holcim Roxby Downs Quarry Note 1	Quarry Rock Processing	86,000	700
BHP Olympic Dam Mine	Copper, uranium, silver & gold mining & processing plant	3,400,000	83,000
OneSteel Whyalla Steelworks	Integrated Steelworks producing structural steel, rails and semi-finished slabs, blooms and billets. Export facility for iron ore and ore products	1,700,000	96,000
OneSteel Iron Knob Mining Area Note 2	Reclamation of old stockpiles and mining Iron Ore	2,500,000	41,000
OneSteel Iron Baron Mining Area	Iron Ore Mining	6,400,000	26,000
OneSteel South Middleback Range Mining Area	Mining, sizing and crushing iron ore, undertaken by contractors on behalf of OneSteel	2,900,000	44,000
Boral Whyalla Quarry	Extractive mining	56,000	160

Notes:

1) *Data provided for year 2022/23 for Holcim Roxby Downs Quarry. Data for 2023/24 was not available.*

2) *Although dust emissions were reported for the 2023/24 NPI reporting period for the OneSteel Iron Knob mining area, this facility is not currently active and entered into a care and maintenance phase in January 2025.*

5. Air Quality Impact Assessment

5.1 Overview

This section describes the air quality assessment methodology and sets out the assessment results.

5.2 Assessment Methodology

The air quality assessment for the Project was conducted in accordance with the relevant EPA air quality guidelines as outlined in section **2.4**.

When considering health and environmental risk indicators such as GLCs and nuisance dust, the AAQA Guideline lists a range of possible risk assessment techniques including modelling, consideration of air quality objectives or community complaints, economic factors, and proximity of receptors.

It was confirmed by EPA on 17th October 2023 that this assessment should include a discussion of the Project air emissions followed by identification of appropriate mitigation methods and management practices to reduce and control emissions to air. It was agreed that no modelling or monitoring were necessary.

Likely sources of air pollutants are discussed in sections **5.4**, **5.5** and **5.6** for the construction, operation and decommissioning phases of the Project, respectively.

Mitigation and management methods are discussed in Section **5.7**.

5.3 Sensitive Receptors

The AAQA Guideline (EPA 2016) defines a sensitive receptor as a house, building or other premises or open areas where health, property or amenity is affected by emissions that increase the concentration of the emitted air pollutant above background levels.

The EPA guidance document 'evaluation distances for effective air quality and noise management' (EPA, 2023) defines sensitive land use under the EP Act as:

- Any fixed location (including a house, building, other premises or open area) where:
  - human health may be affected by air emissions from existing or proposed development, and/or
  - property damage or loss of amenity may be caused by air emissions from the existing or proposed development, and/or
- Plants, animals or ecosystems that may be affected by air and/or noise emissions.

Note: In the case of air quality, the type of sensitive receptors will vary depending on the pollutant(s), as different pollutants have impacts at different concentrations and over different periods of time. An important consideration when identifying potential sensitive receptors is the length of exposure. The averaging time of GLCs and odour level criteria in the AQ EPP can be used as a guide when determining whether a given location is a potential sensitive receptor. For example, the GLC for nitrogen dioxide has a 1-hour averaging period, and any location where people spend an hour or more would be considered a sensitive receptor. In the case of particles (PM10 and PM2.5), sensitive receptors are those places where people are located for 24 hours or more, due to the GLCs having a 24-hour averaging time.

Sensitive receptors for dust are therefore defined as locations where a person would be reasonably expected to be present for 24-hours or more and typically means private or commercial residential/accommodation properties, hospitals and other similar facilities.

The EPA evaluation distance guideline (EPA, 2023) provides recommended evaluation distances for specific industries or activities. An evaluation distance provides an envelope around an activity (or multiple activities)

within which environmental risks need to be assessed (against current knowledge, technologies and practices) and managed. Where a proposed separation is greater than the relevant evaluation distance, it is unlikely that the proponent would be required to provide specific evaluation of predicted impacts.

The EPA guidance documents do not specify evaluation distances for construction or excavation type activities and requires an 'individual assessment' for such activities.

Of the industries with an evaluation distance listed, concrete batching works undertake the most similar activities to those expected during Project construction - with dust generated from vehicle movements on unsealed working areas, disturbance by vehicles of cement and aggregate dust on the ground and vehicle loading and unloading - being described as the typical activities for concrete batching. The guidance specifies an evaluation distance of 200 m for concrete batch plants.

As a component of the individual assessment being undertaken for the Project, the identification of sensitive receptors within a set distance from the Project alignment has been included in **Appendix B** and allows for identification of sections of the Project which may require additional mitigation to avoid or reduce impacts from dust generation.

For the Project, the distance from the alignment and construction areas for which sensitive receptors were considered to be potentially affected by air quality emissions was set at 250 m. This distance was determined from the 200 m evaluation distance for concrete batching plants and the pipeline construction footprint width (up to 50 m wide).

The main sections of the Project alignment where sensitive receptors are within 250 m of Project infrastructure, include:

- Within 50 m of residences on Pimba Rd in Woomera (HV access track upgrade).
- Within 250 m of residences in Pimba (HV access track upgrade and construction laydown area).

Other receptor sites which are within 250 m of the Project infrastructure, but are not expected to have occupancy for 24 hours or more (and so not defined as sensitive receptors), include:

- Within 150 m of a truck roadhouse/restaurant along Olympic Dam Highway at Olympic Dam (transfer system alignment).
- Within 100 m of commercial/industrial buildings on the north side of Whyalla (construction laydown areas).

5.4 Air Emissions Assessment - Construction

Construction of the Project is anticipated to occur over approximately three years, with a majority of the air emissions associated with earthworks to accommodate the desalination plant and the 20-month construction of the transfer system. It will broadly involve vegetation and topsoil clearing, excavation, earthworks and backfill, and subsequent site rehabilitation.

The construction approach for the Project will be confirmed during detailed design to be prepared under the future design, build, operate and maintain (DBOM) contract. This assessment assumes a construction scenario as described in the Reference Design Constructability Report (Systra, Nov 2025), where construction will begin with earthworks at the desalination plant area. Following the completion of these bulk earthworks, construction of the transfer system and the pump station/storages will be initiated.

The bulk earthworks for the desalination plant site are expected to take approximately 5 months and will involve clearing and grubbing of the site, followed by cut and fill earthworks using excavators, dump trucks, scrapers and graders. There are no sensitive receptors within 250 metres of the desalination plant construction area. The total earth movements at the desalination plant site are expected to be significantly lower than those for the transfer system and will be undertaken largely ahead of the transfer system works.

The dust emissions for the transfer system construction are therefore the focus of the construction emissions assessment.

Emissions associated with the three pump station and storage sites along the transfer system alignment have also been included in the assessment as the construction of these sites may occur concurrently with the transfer system, however these will be significantly lower than for the transfer system.

The transfer system construction will be completed by two concurrent work crews along the pipeline route working at each of a:

a) Southern work front – Mullaquana to Kootaberra, and

b) Northern work front – Kootaberra to Olympic Dam.

Land clearing, construction, and rehabilitation will be staged, such that only a limited section of the transfer system alignment would be exposed and susceptible to wind and water erosion at any one time. This construction model also enables progressive rehabilitation as construction progresses.

Installation of the majority of the transfer system will be via trenching, with the exception for main road and rail crossings, some creek crossings, and possible discrete areas subject to cultural heritage or geotechnical constraints, which will be under-bored or pipe-jacked, i.e. trenchless technologies.

The construction methodology sets out the proposed trenching method which will allow the excavation and installation of the pipeline at the average rate of approximately 500 m/day, equating to approximately 1,600 m^3/day of excavated material.

The under bored or pipe-jacked sections will require shafts for the launching and receival of the under bored pipeline. These shafts will be open for the duration for the under boring works.

When constructing laydown areas, preference will be given to land which has previously been disturbed, to reduce the amount of clearing necessary. There will be no drilling and blasting operations undertaken as part of the Project construction.

The total excavated soil volume for the transfer system is expected to be approximately 2,292,750 m^3 over the Project construction period (Systra, 2025b), which equates to 566 m^3 per 100 m of pipeline. The pipeline excavation and fill volumes are expanded in **Table 5-1**. Note the disposal volumes and imported special fill volumes (**Table 5-1**) are considered worst-case, when the excavated material is not suitable for backfilling, and would need to be replaced by imported fill. For the majority of the alignment, the excavated material is expected to be able to be used as backfill material. In addition, substantial amounts of the total re-use volume will be used for mounding at the construction sites; the total re-use volume of 2,271,650 m^3 comprises 765,000 m^3 for mounding, and 1,506,650 m^3 for backfill.

Table 5-1. Transfer System excavation and fill volumes

Transfer System Segment	Length (km)	Nominal Size (mm)	Excavation Volume (m^3)	Imported Special Fill (m^3)	Re-used (fill and mounding Volume (m^3)
Main Transfer Pipeline					
Desalination Plant to Lincoln Gap	80	DN1100 – DN1200	580,800	118,800	528,000
Lincoln Gap to Kootaberra	70	DN1000	394,800	73,850	404,600
Kootaberra to Olympic Dam	210	DN1000 – DN1100	1,241,100	236,600	1,243,200
Total	**360**	**-**	**2,216,700**	**429,250**	**2,175,800**
Lateral Branch Pipeline					
Lateral Branch Pipeline	46	DN450	76,050	18,000	95,850
Total	**46**	**-**	**76,050**	**18,000**	**95,850**
Transfer System (Main Transfer Pipeline + Lateral Branch Pipeline)					
Total	**406**	**-**	**2,292,750**	**447,250**	**2,271,650**

The NPI emissions estimation methodology provides many emissions factors and equations relating to overburden, which are relevant for construction of the Project. The estimated dust emissions for the Project were developed based on published emission factors from the NPI Emission Estimate Techniques Manual for Mining (CoA, 2012).

Table 5-2 lists key estimation parameters, **Table 5-3** lists NPI emissions factors and proposed mitigation measures, and **Table 5-4** lists the resulting predicted Project emissions.

All estimates are indicative only and may not accurately reflect the DBOM contractor work methods or capture all activities, however the estimates are useful to assist in identifying the main potential sources of dust and the key areas of focus for mitigation measures.

Table 5-2: Key emission estimation parameters – transfer system and pump station/tank site construction

Parameter	Value	Units	Source
Operational days	365	Days per year	Assumption
Operational hours	9	Hours per day	Assumption
Volume of spoil excavated	1,645,000	m^3/year	Systra (2025a) and Systra (2025b) Based on concurrent excavations for southern and northern work fronts for transfer system across a 12-month period
Soil density	1.2	tonnes / m^3	Assumption
Total tpa of spoil excavated	1,974,000	tonnes / year	Systra (2025a) Systra (2025b)
Total special fill imported	383,700	tonnes / year	Systra (2025a) Systra (2025b)
Total spoil loaded and end-dumped *	21,100	tonnes / year	Systra (2025a) Systra (2025b)

Average trip length of haul trucks (unsealed roads)	10	km	Assumptions: Average distance on unpaved roads approx. 10km per trip (5 km each way).
Total area of active stockpiles	7	ha	Includes stockpile areas for the transfer system and the TBM launch box/laydown area – these stockpiles may be active concurrently.
Total exposed surface	107	ha	Includes exposed areas for transfer system, TBM launch box/laydown areas and desalination plant area - each of these areas may contribute to wind erosion concurrently.

** Total spoil removed from site for the project is 25,300 tonnes (21,100 m^3). It is assumed that the majority of this is removed from site in the first year of the pipeline construction. The majority of excavated material is to be reused at the construction sites (as backfill and mounding).*

Table 5-3: Adopted NPI emission factors and mitigation measures

Emission source	Units	Emission factors		Mitigation measures
		PM_{10}	$PM_{2.5}$[3]	
Dozer	kg/hr/vehicle	4.1	0.615	None
Excavation of spoil to haul truck and from stockpiles to backfill area	kg/t	0.01175	0.00176	None
Grading and levelling	kg/VKT	0.085	0.01275	None
Placement of spoil on stockpiles (end dumping)	kg/t	0.0043	0.000645	50% - water sprays
Placement of backfill in trench area and pump station/tank areas	kg/t	0.0043	0.000645	50% - water sprays
Vehicles on unpaved roads (26 m^3 side tipper two trailer road train)	kg/VKT	0.92	0.14	None
Wind erosion of stockpiles	kg/ha/hr	0.2	0.03	50% - water sprays
Wind erosion of exposed land	kg/ha/hr	0.2	0.03	30% - primary rehabilitation

[3] A $PM_{10}/PM_{2.5}$ ratio of 0.15 was adopted (Cowherd et al., 2006).

Table 5-4: Summary of calculated emissions estimates

Source	Description	PM_{10} kg/year	$PM_{2.5}$ kg/year
Land clearing	1x bulldozer (operating 9 hours per day, 365 days per year) Top soil removed by excavator for 40m corridor, 500m/day, depth of 0.1 m (assumed). Grader operation with speed at 8 km/hr (assumed)	50,501	7,575
Spoil excavation	Volume of spoil excavated is 1,652,000 m^3/year, equivalent to 1,982,200 tonne per annum (tpa) for transfer system and pump stations. Includes use of 45t excavators, front end loaders and bucket/wheel excavator.	23,291	3,494
Backfilling and levelling	Fill material placed in excavated trench and pump station sites, total of 1,964,172 m^3/year. Includes use of 30t excavator, front end loaders and grader	31,040	4,601
Removal of spoil to haul truck	Volume of spoil removed for off-site disposal is 21,100 m^3/year, equivalent to 25,300 tpa.	298	45
Placement of spoil on stockpiles	Volume of spoil placed is 1,652,000 m^3/year, equivalent to 1,982,200 tpa (assumes that excavated material will be placed at stockpile initially, before being used for bedding/backfill).	4,262	639
Placement of backfill in trench area	Volume of backfill placed is 1,926,500 m^3/year, equivalent to 2,311,900 tpa (includes placement of imported and reused backfill/bedding)	5,068	746
Vehicles on unpaved roads – pipeline	Vehicle kilometres travelled (VKT) = average trip length (~10 km) by number of trips (assuming 26 m3 capacity, by 340,900 m3 material moved for total import and export for pipeline), equals 131,100 VKT/year	120,483	18,072
Vehicles on unpaved roads – pump stations and storage tanks	Vehicle kilometres travelled (VKT) = average trip length (~3.5 km) by number of trips (assuming 26 m3 capacity, by 37,600 m3 material moved for total import of material), equals 5,062 VKT/year	4,651	698
Wind erosion of stockpiles	Area of stockpiles active at any one time is approximately 7 ha (70,000 m^2)	6,132	920
Exposed surface	Cleared land at any one time is assumed as 107 ha (1,070,000 m^2)	131,470	19,721
Total		**377,196**	**56,510**

Most of the Project transfer system alignment passes through pastoral land and/or remote areas, with large separation distances to sensitive receptors. However, there are occasional sensitive receptors within 250 m of the pipeline construction areas (refer Section **5.3**).

The major sources of dust for the Project construction will be vehicle movements on unpaved roads, material handling and wind generated dust from exposed areas. Mitigating these risks will be essential to minimise the Project dust impacts on the surrounding environment and any sensitive receptors.

Based on the expectation that approximately 500 m of pipe is to be installed in one day for each of the two work fronts, much of the construction work will bypass a single receptor (or a small township) within a short, two to three-day period. As such, it is the clearing of land pre pipe construction/installation, and rehabilitation of the land post pipe construction/installation that presents the greater risk of dust generation and impact to sensitive receptors.

Emissions from mobile concrete batch plant proposed for use at the two northern pump stations/storages (Mangata Pump Station (at Oakden Hills) and Pimba Storage Tank (at Pimba)) and pours along the transfer system are expected to be minor compared to the total emissions resulting from excavation works and are not detailed in the emissions inventory. EPA licensing for the batch plants will be required, with operation to adhere to the Air and Water Quality Guideline – Concrete Batching (EPA, 2016).

As per the GED, the DMP and dust mitigation measures will be applied at all Project construction sites, regardless of location. However, additional measures and attention should be applied when construction is within 250 m to sensitive receptors to minimise impacts, including nuisance dust.

To effectively mitigate the Project's dust impacts, the following should be considered by the DBOM contractor:

- Transport on unsealed roads should be minimised wherever practicable (by routing unsealed roads to minimise distances and preventing unnecessary travel).
- Material reused onsite wherever possible.
- The time that cleared land remains exposed/cleared prior to pipe construction/installation to be minimised by progressive scheduling.
- Additional water application to reduce wind-blown and wheel generated dust.
- When construction works occur within 250 m of sensitive receptors, monitor wind direction and speed, and adjust construction activities where practicable to reduce dust impacts.
- Land rehabilitation to be undertaken progressively, and as soon as possible after pipe construction/ installation.
- Measures investigated to enhance or accelerate land rehabilitation.

Other measures to minimise dust impacts that should be considered by the DBOM contractor are provided in Section **5.7**.

Comparisons of the totals for annual particulate matter emissions in Table 5-4, with the emissions listed in **Table 4-4** for surrounding industries, indicates that construction will be a relatively small source of particulate matter emissions when compared to other industries. Also, the Project's emissions will be spread over many construction sites, over hundreds of kilometres. Provided dust mitigation measures are implemented (see Section **5.7**), the risk of air quality impact is expected to be low for any single location.

In determining the 'low' risk rating, the consequence of air quality impacts is of isolated and localised exceedances of recognised standards and / or complaints received about air quality that are resolved within days. The likelihood of air quality impacts was assessed as not likely to occur in any given year, but possible.

There is a potential for odour generation from construction of the desalination plant sea water intake and outflow pipelines, and riser structure. This will require tunnel boring machine (TBM), drilling or other methodology to construct the pipeline and riser and will generate spoil from the excavation of soil and rock, including material which may contain marine sediments. The potential for odour impacts (if any) is not expected to be significant due to the large separation distance of approximately 4km between the

desalination plant and the closest sensitive receptor, and the absence of public records regarding adverse odour impact during the construction of the similarly sized Adelaide desalination plant.

5.5 Air Emissions Assessment – Operations

Air emissions due to Project operations are expected to be limited to dust emissions by light vehicle movements at the desalination plant, along the pipeline, and near other Project infrastructure for small operational and maintenance tasks. The air emissions from this equipment are expected to be insignificant and would be similar to emissions from small farming activities. The operational air emissions are expected to be substantially lower than those during construction.

Along the pipeline, a number of air valves and scour valves will be installed for maintenance and safety. Air valves allow air to enter and leave the pipeline, and are typically at or close to ground level. They can sometimes be surrounded by solid chambers.

Scour valves allow the pipeline to be drained of water for emergencies or maintenance. The valve is typically surrounded by a solid chamber, which fills with water and runs off overland in a drainage event. The water in the pipeline will have been desalinated and is not odorous, as such, there is an insignificant risk of odour impact from this aspect of the operation.

There is potential for the desalination plant to cause odour emissions from fine solids storage after removal from pre-treatment filters, and occasionally there may be other odour sources associated with marine biota being drawn into the seawater intake.

Some intake design parameters relevant to odour control include (GHD, 2025):

- Intake structure to be located at a minimum water depth of approximately 13 m LAT (approximately ~15m AHD) to target favourable substrate and benthic conditions.
- Coarse bar screens on the seabed intake structure having a maximum 150 mm spacing between bars.
- Capped intake head horizontal flow structure with face velocity limited to 0.15 m/s at 20% blinding (marine growth assumptions). The low velocity horizontal inflow through the static screens of the intake head will minimise the impingement of larger marine organisms and debris.
- Sodium hypochlorite dosing to the top of the intake head for the control of marine growth and subsequent fouling.

The Project intake draws seawater from a point between 3 and 5km from the shore at a depth of 13 metres, which reduces drawing in biological and any other matter from shallower waters closer to the shore. This in turn reduces the potential for odour generation by reducing the volume of biological material which may need to be handled and disposed.

The nuisance potential of odours is a function of the amount of odour generated and the separation distance between the odour source and sensitive receptors. When assessing the potential for odour impacts from the Project, consideration of the SA EPA evaluation distance guideline provides context and states that for wastewater treatment works (an activity commonly associated with odour impacts) an evaluation distance of 100 m is applied for an affected population of 1000 people or less. For the Project, the nearest sensitive receptor is approximately 4 km from the desalination plant.

With consideration of the above, odour emissions and impacts associated with the desalination plant are not expected to be significant for the following reasons:

- The generation of odorous air emissions from operational activities would be significantly less than other activities such as wastewater treatment works.
- The separation distance is to the nearest sensitive receptor is substantially greater than the evaluation distance for wastewater treatment works.

In addition, a review of EPA and SA Water documentation including many monitoring reports, and a search for publicly available information for the similar sized Adelaide desalination plant, revealed no information about the potential for odour impact. The only mention of odour is licence operating condition 1.6.2, which states, "*ensure that sludge does not create odour detectable at the Premises boundary*". This is for a site that is far less remote than for the Project, adjacent areas comprising many more sensitive receptors on 'suburban allotments' (circa 700 m^2 in area), implying that odour is unlikely to be a significant concern for the Project.

Experience with the Adelaide desalination plant means that the amount of marine waste material of approximately one cubic metre is expected to be collected per month for the Project. The Project's waste bins will be covered and the waste removed every 2-3 days to a fortnight depending on need, to avoid odorous emissions from decaying material.

To conclude, should odour emissions be generated by the Project, especially due to the storage or disposal of organic material screened from the seawater intake, the risk from such odours is considered to be negligible (no odour impacts at sensitive receptor locations) for the reasons given above, and due to the significant separation distance to the nearest sensitive receptor. Also, the GED applies for all aspects of the operation (see Section **2.3**), and the potential for odour generation should be minimised wherever possible.

5.6 Air Emissions Assessment – Decommissioning

It is assumed that during decommissioning, the transfer system would not be removed, therefore the number of sites where dust emissions have the potential to cause air quality impacts would be fewer than for construction. Demolition of the desalination plant and other facilities, such as storages would create dust emissions comparable to those from construction.

In accordance with the GED, a DMP and appropriate mitigation measures would be developed to address activities proposed during decommissioning, similar to those drafted for construction.

5.7 Mitigation and Management

Under the EP Act, the Project construction, operation and decommissioning will need to address the requirements of the GED to minimise risks of dust emissions. Under the GED, a person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm. The definition of "reasonable" and "practicable" in this context includes:

- the nature of pollution.
- the sensitivity of the receiving environment.
- the financial implications of the measures.
- the current state of technical knowledge.
- the likelihood of successful application of the chosen measures.

Reasonable and practicable measures for eliminating or minimising risks of dust emissions to the environment from the Project will be outlined in a DMP (see Section**5.4**), which will form part of a broader Construction Environmental Management Plan (CEMP). Implementation of the CEMP will be imperative to the effective management of dust impacts.

The management of dust emissions from construction activities are well documented. DMPs are described briefly in the AAQA Guideline and a detailed example of structuring and content of DMPs can be found in the EPA Victoria guideline for assessing and minimising air pollution (EPAV, 2025) (Section 7.3.2). A range of more focussed guidelines have been published by EPA Victoria including *Managing soil disturbance: Publication 1894* (EPAV, 2020a), *Managing stockpiles: Publication 1895* (EPAV 2020b), and *Guideline for stockpile management* (EPA 2020), amongst others.

Key dust mitigations that are recommended to be incorporated in the DMP based on location and site-specific risk applicable to the Project area are shown in **Table 5-5**. In the generation of the DMP, the overarching approach should be to prevent the generation of dust in the first instance, in lieu of applying dust suppression measures. For example, avoiding stockpiling soils, where possible, to minimise dust generation. Where prevention is not practicable, site-specific, best practice design controls and management practices should be implemented to minimise dust.

Table 5-5. Summary of possible dust mitigation measures

Dust generating activity	Possible dust mitigation measures (subject to further detail in the CEMP)
General dust controls	Minimise the area of cleared land during the drier months of the year, when potential for dust generation is at its greatest.
	Stage land clearing to minimise the amount of land exposed to wind and water erosion
	Rehabilitate inactive stockpiles and disturbed areas to reduce wind erosion as soon as practicable. Possible construction management measures include: ▪ Limit construction footprint (area). ▪ Limit the area that is stripped for construction. ▪ Limit the period an area is stripped prior to pipe construction/installation with rehabilitation progressively occurring as construction continues. ▪ Strip and stockpile the seed bank of top soil (approximately 100 mm in depth). ▪ When reinstating the construction footprint, limit water flow paths to reduce flow velocity and the risk of erosion. ▪ Spread stripped soil to allow the area to regenerate naturally. Gibber stones (see **Figure 5-1**) may be found in some parts of the Project area. Where they are found, gibber stones play a part in preventing dust emissions due to, at least, surface coverage of the soil, and compaction of the surface soil. If a well-defined layer of gibber stones is removed at a Project construction site, consideration should be given to using the gibbers to reform the surface layer during rehabilitation. The related construction management measures for gibber stone areas are similar: ▪ Limit construction footprint (area). ▪ Limit the area that is stripped for construction. ▪ Limit the period an area is stripped prior to pipe construction/installation with rehabilitation progressively occurring as construction continues. ▪ Strip and stockpile the seed bank of topsoil (approximately 100 mm in depth). ▪ When reinstating the construction footprint, limit water flow paths to reduce flow velocity and the risk of erosion. ▪ Spread stripped soil to allow the area to regenerate naturally – allowing vegetation to regrow and begin to realign gibbers as ground armour.
	Use water sprays where practicable, to reduce wind erosion from exposed areas.
	If additives in the water are used to increase its dust suppression properties, the chemical should have no adverse environmental impacts.
	During construction, ensure smooth surfaces are deep ripped and left rough and cloddy to reduce the wind velocity at the soil surface; noting subsequent rehabilitation needs.
	Construct wind fences wherever appropriate, e.g. install shade cloth as a wind break on longer term stockpiles.

Dust generating activity	Possible dust mitigation measures (subject to further detail in the CEMP)
	Monitor for extreme weather events and define stop-work procedures in cases of high environmental dust. Note the weathering of disturbed surfaces e.g. by construction activity is exacerbated by rainfall creating new areas of sediment available for dust emissions (after they dry out). Consideration should be given to rainfall and storm effects creating new dust sources.
	Vegetation to be retained on site, wherever possible, to minimise erosion.
	Dust-generating activities will be minimised during windy conditions, particularly when dust is visible in the air.
	Rolling vegetation at laydown areas and construction compounds (rather than clearing), where possible and will not compromise safety.
Haul/access roads, material handling and transport	Temporary haul road construction to consider the use of compacted gravel or crushed rock, or similar. Stabilised materials to be used in high traffic areas.
	Implement watering of unsealed haul roads and access tracks to reduce wheel generated dust where practical. The frequency and amount of watering will be determined by weather conditions and the erodibility of the soil.
	Particular attention paid to minimising dust by water application at higher traffic areas, e.g. site access points, at construction/maintenance compound sites.
	Vehicle movement procedures to consider specific controls to avoid unnecessary damage to vegetation, which may lead to an increase in dust generation.
	Minimise traffic speed and movement during dry and warm conditions.
	Procedures developed to consider the appropriate cleaning of vehicles to minimise transfer of dusts from site.
	Minimise drop height for unloading operations.
	Develop strategies for minimising dust generated from material transfer operations (e.g. water sprays).
	All materials transported to and from the construction sites to be covered.
Management of stockpiles and batters	Minimise the number of stockpiles, and the area and the time stockpiles are exposed.
	Locate stockpiles where they will be least susceptible to wind erosion.
	Stockpile construction to use appropriate heights, slope angles and designs to reduce exposure to wind erosion. A less steep slope may be required where the erosion risk is high.
	Stabilise stockpiles and batters that will remain bare for extended periods of time, e.g. by covering with mulch or anchored fabrics or seeding with appropriate vegetation.
	Develop strategies for the minimising dust from temporary stockpiles of soil or other material, e.g. covering or spraying with water or suitable chemical wetting agents, particularly during dry or windy conditions.
	All stockpiles to be located as far from residences and any other sensitive receptors as far as practicable.

Dust generating activity	Possible dust mitigation measures (subject to further detail in the CEMP)
	Potential impacts from odour from TBM spoil and spoil from the marine environment should be considered when stockpiling and/or dewatering spoil. All stockpiles and dewatering locations to be located as far from residences and any other sensitive receptors as far as practicable.
Equipment and infrastructure	Select construction equipment which has appropriate dust control features.
	Should establishment of a concrete batching plant be required, works at the concrete batching plant to be undertaking in adherence with the Air and Water Quality Guideline – Concrete Batching (EPA, 2016).
	Vehicles and machinery will be maintained and operated to minimise emissions of gaseous and particulate pollutants.

In addition to setting out the specific activity-based mitigation measures in **Table 5-5**, the DMP would include:

- Regular visual monitoring of dust, with results recorded in a dust management database.
- Monitoring of forecast and / or real time local wind parameters e.g. wind speed, wind direction, and adjustment or temporary cessation of dust generating activities, or implementation of additional dust mitigation methods, as required, to reduce impact to sensitive receptors.
- Trigger actions in response to visual dust observation events including temporary cessation of dust generating activities, or implementation of additional dust mitigation methods, as required, to reduce impact to sensitive receptors.
- Regular monitoring of the effectiveness of dust control measures. If dust controls are found to be ineffective, these would be reviewed (internally and / or by an external dust specialist, if required), and amended as necessary.
- Dust management training would be undertaken for construction workforce as part of the site-specific induction, outlining controls to be implemented during construction to manage potential air quality impacts.
- A complaint investigation and response plan.
- Documentation of the proponent's on-site authority to call for cessation of activities or implementation of additional mitigation measures if dust becomes problematic. There should be an on-site authority at each work location with this responsibility at all times.

In sections of the transfer system alignment where the construction passes within 250 m of sensitive receptors, consideration should be given to applying additional mitigations to minimise impacts. This could include:

- Additional water application to reduce wind-blown and wheel generated dust.
- Scheduling work to minimise the period between land clearing and rehabilitation.
- Measures to enhance or accelerate land rehabilitation.



Figure 5-1 Example of gibber plain; west of Lake Torrens (M Pickett 20/4/2012)

6. Conclusion

An air quality assessment was undertaken to inform and support an EIS for the Project, in accordance with the AAQA Guideline and associated guidelines and legislation. Correspondence with the EPA confirmed the assessment should include a discussion of the Project air emissions followed by identification of appropriate mitigation methods and management practices to reduce and control emissions to air. In this endeavour the assessment:

- Reviewed meteorology and existing air quality representative of the Project locations.
- Estimated air pollutant emissions from activities associated with the proposed construction, operation, and decommissioning of the Project.
- Identified key air pollutants and air quality indicators associated with Project activities and assessed their risks of air quality impact.
- Made recommendations to manage, avoid or mitigate potential air quality impacts due to the Project.

6.1 Construction

While the air pollutant emissions quantities are not insignificant, they are distributed over many construction sites, over more than 400 km of linear infrastructure.

The key air pollutants / indicators were associated with dust emissions: deposited dust, PM_{10} and $PM_{2.5}$. A review of construction activities, emissions estimates, dust mitigation measures, and separation distances to sensitive receptors was undertaken. The assessment concluded that provided dust mitigation measures are implemented, the risk of air quality impact due to nuisance dust, PM_{10} and $PM_{2.5}$ in a specific location is expected to be low and / or short in duration.

Spoil from the TBM and intake riser installation has potential to be odorous. Whilst the nearest sensitive receptor is approximately 4 km from the desalination plant site, potential impacts from odour from TBM spoil and spoil from the marine environment should be considered when stockpiling and/or dewatering spoil. All stockpiles and dewatering locations should be located as far from residences and any other sensitive receptors as far as practicable.

6.2 Operation

The main air emissions due to Project operations are expected to be insignificant, primarily limited to dust emissions by light vehicle movements at the desalination plant, along the transfer system, and near other Project infrastructure for small operational and maintenance tasks.

The desalinated water is not anticipated to be odorous, as such there is a low risk of odour impact from pipeline air valves and scour valves.

There is potential for the desalination plant to cause odour emissions from fine solids storage, and occasionally there may be other odour sources associated with the seawater intake. A review of the intake design parameters, experience with waste management at the Adelaide desalination plant, and comparisons between EPA (2023) evaluation distances for wastewater treatment plants and Project distances to sensitive receptors, indicates there is a low risk of odour impact from operations by the proposed desalination plant.

6.3 Decommissioning

It is assumed that during decommissioning the transfer system would not be removed, therefore the number of sites where dust emissions have the potential to cause air quality impacts would be fewer than for construction. Demolition of the desalination plant and other facilities such as water storage would create dust emissions comparable to those from construction.

In accordance with the GED, a DMP and appropriate mitigation measures would need to be developed to address activities proposed during decommissioning.

The plan and measures would be similar to those drafted for construction.

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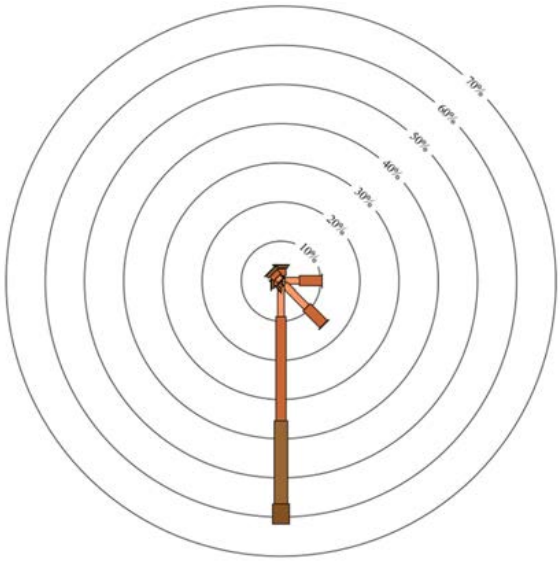
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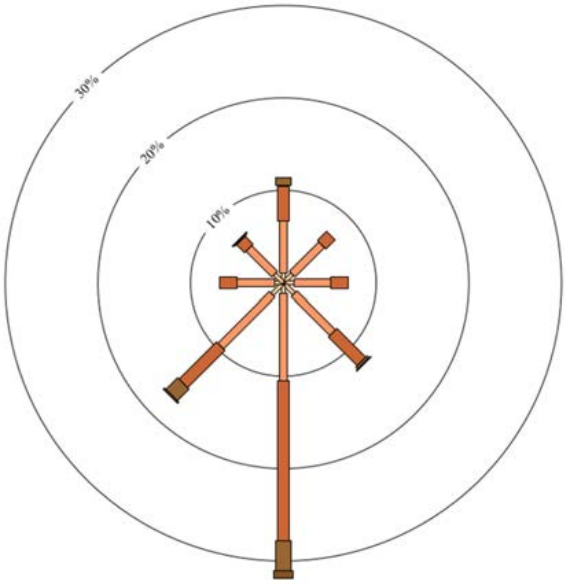
Appendix A. Wind Roses

A.1 Summer Examples: Long-Term Average January 3pm Wind Roses

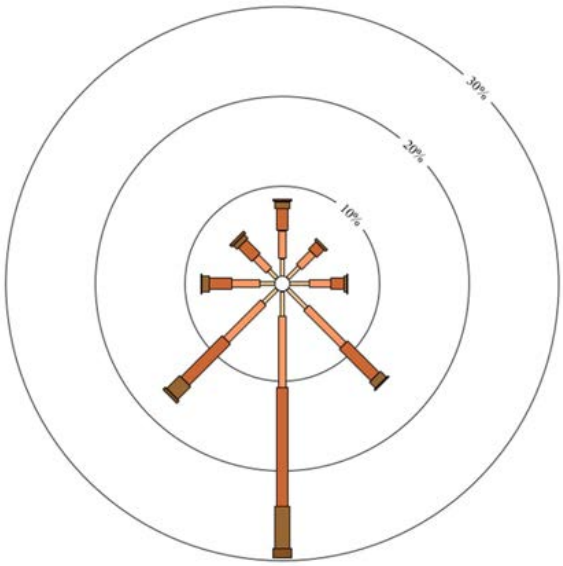
This Appendix provides examples of wind roses for summer (January 3pm), created from long-term observations from four BoM weather stations. The wind roses illustrate the differences between the weather stations located at varying distances inland along the pipeline: the Whyalla Aero station is 5 km from the coast, whereas the Woomera Aerodrome and Roxby Downs stations are much further inland at 170 km and 240 km from the coast respectively. All four wind roses show the dominant southerly winds, which is a synoptic scale effect; see Section 3.2.2.



BoM Whyalla Aero January 3pm: 1982-2023

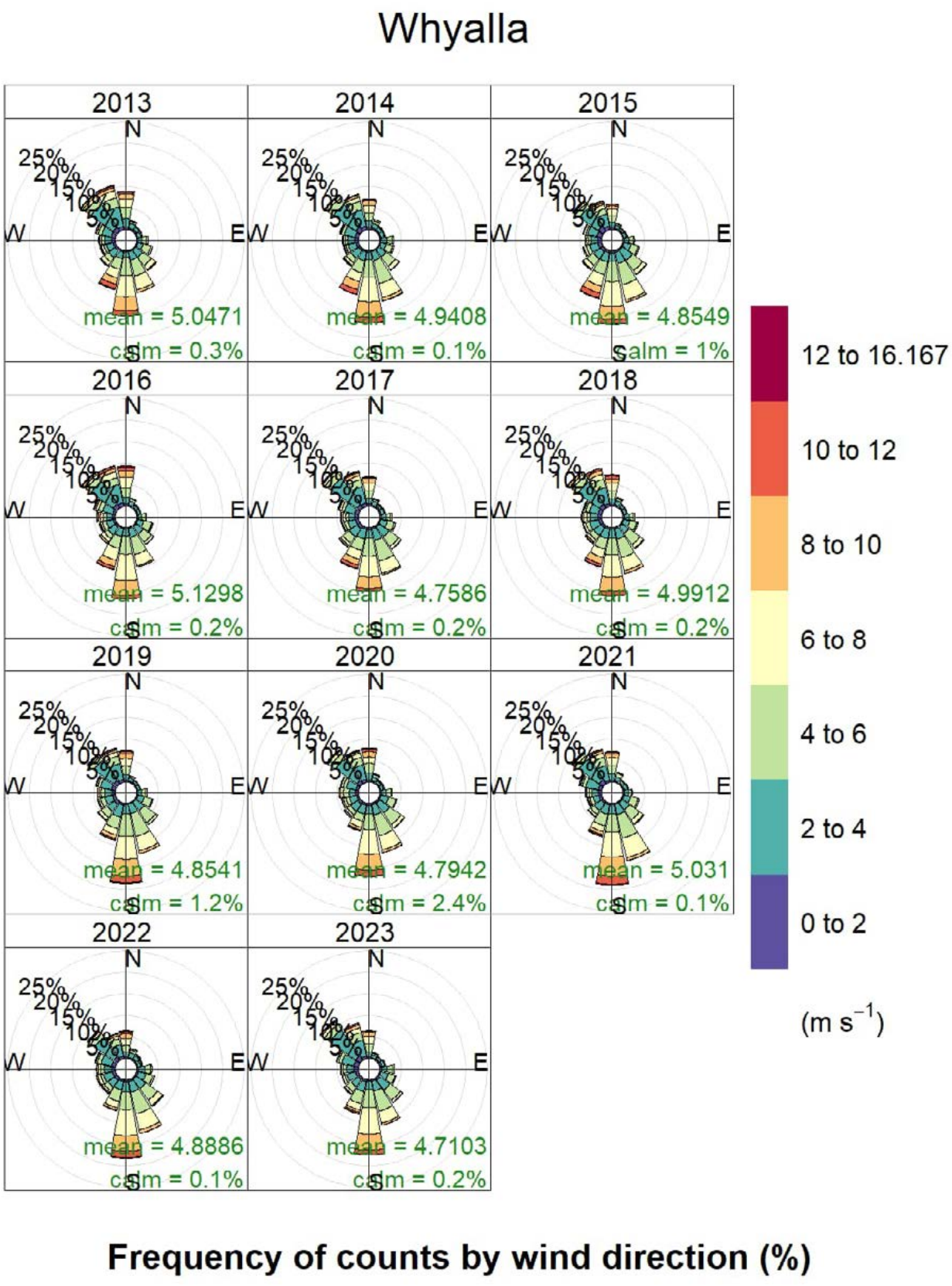


BoM Roxby Downs 3pm: 1997-2023

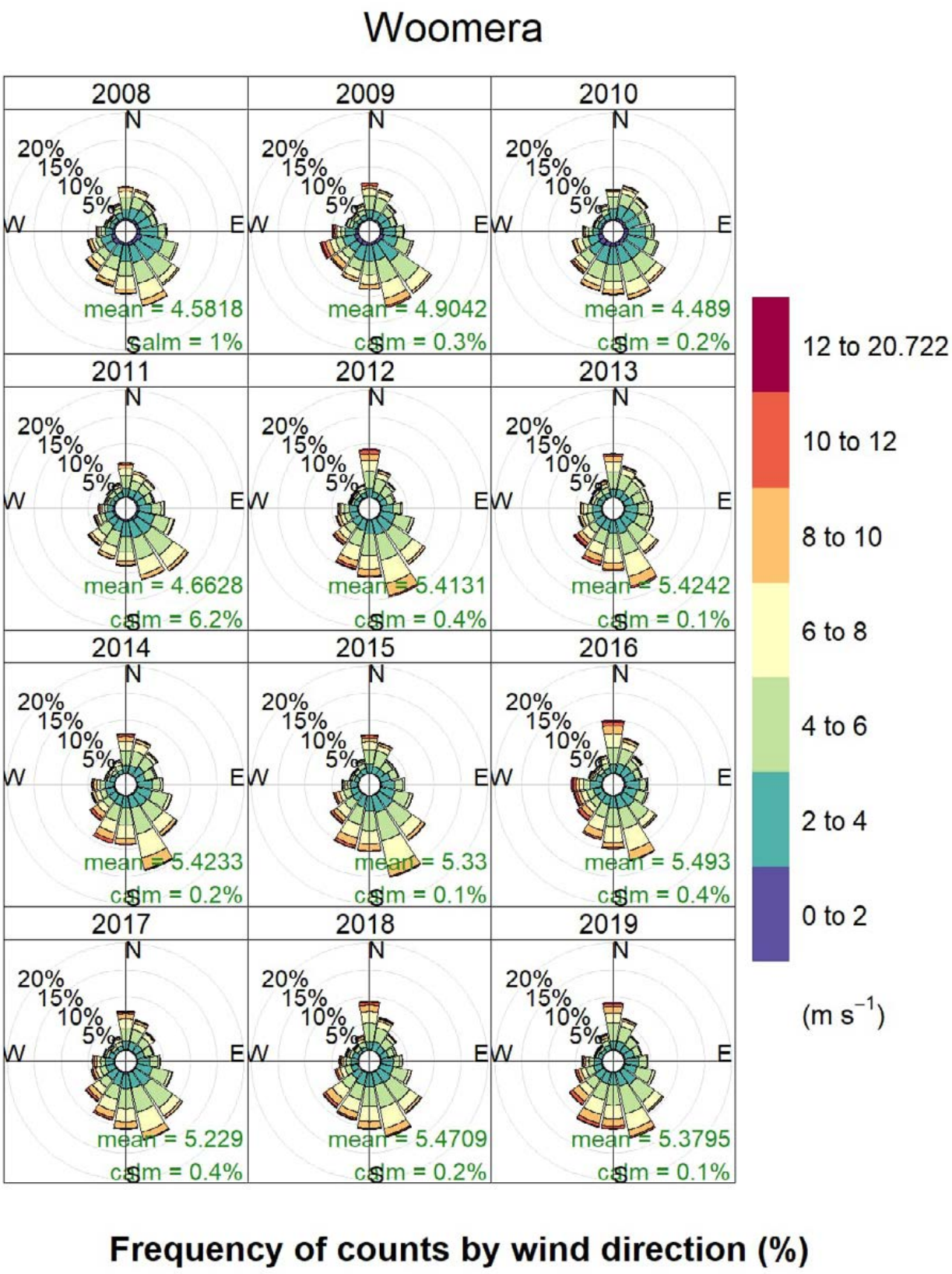


BoM Woomera Aerodrome January 3pm: 1954-2023

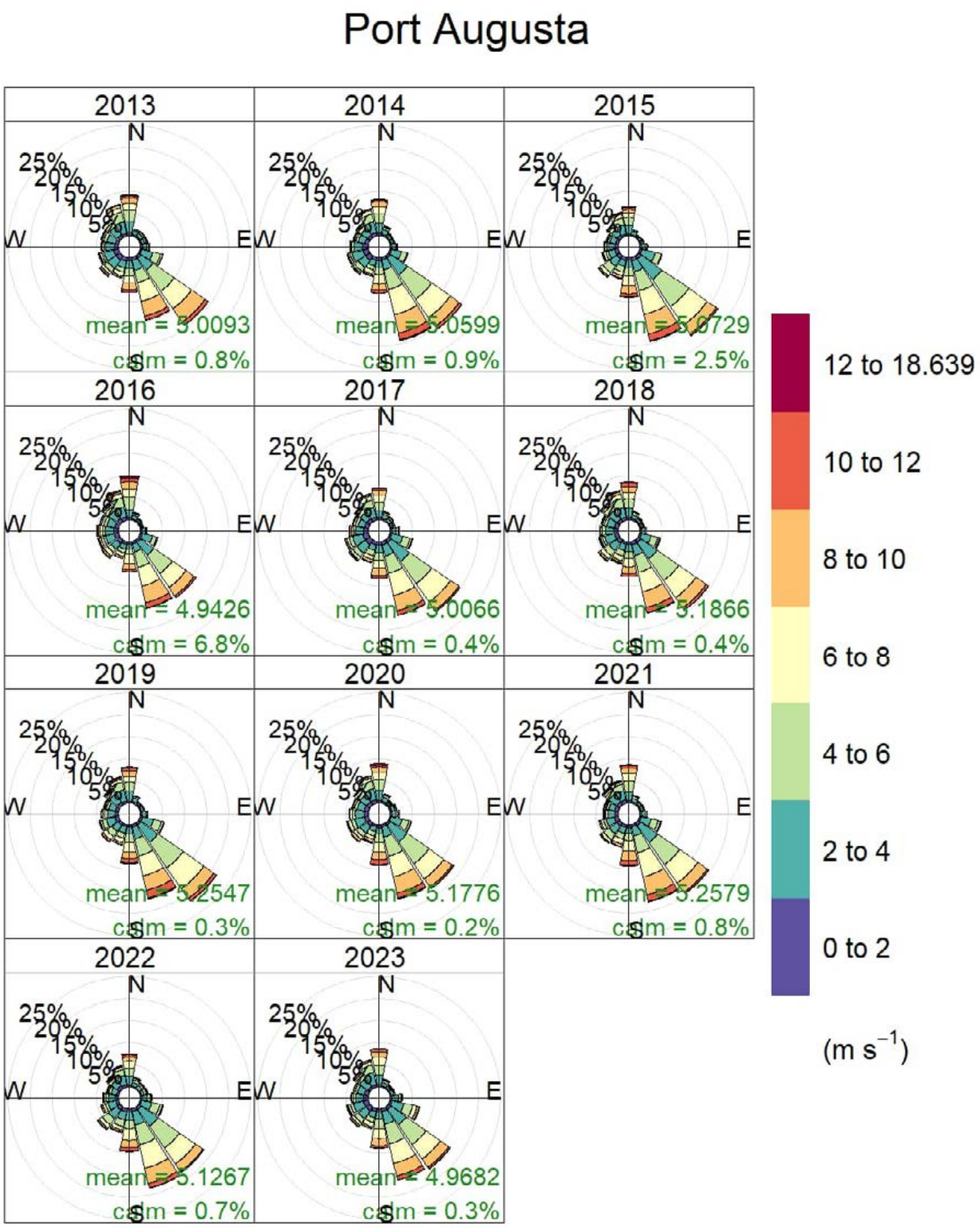
A.2 Annual Wind Roses – BoM Whyalla Aero All Hours 2013-2023



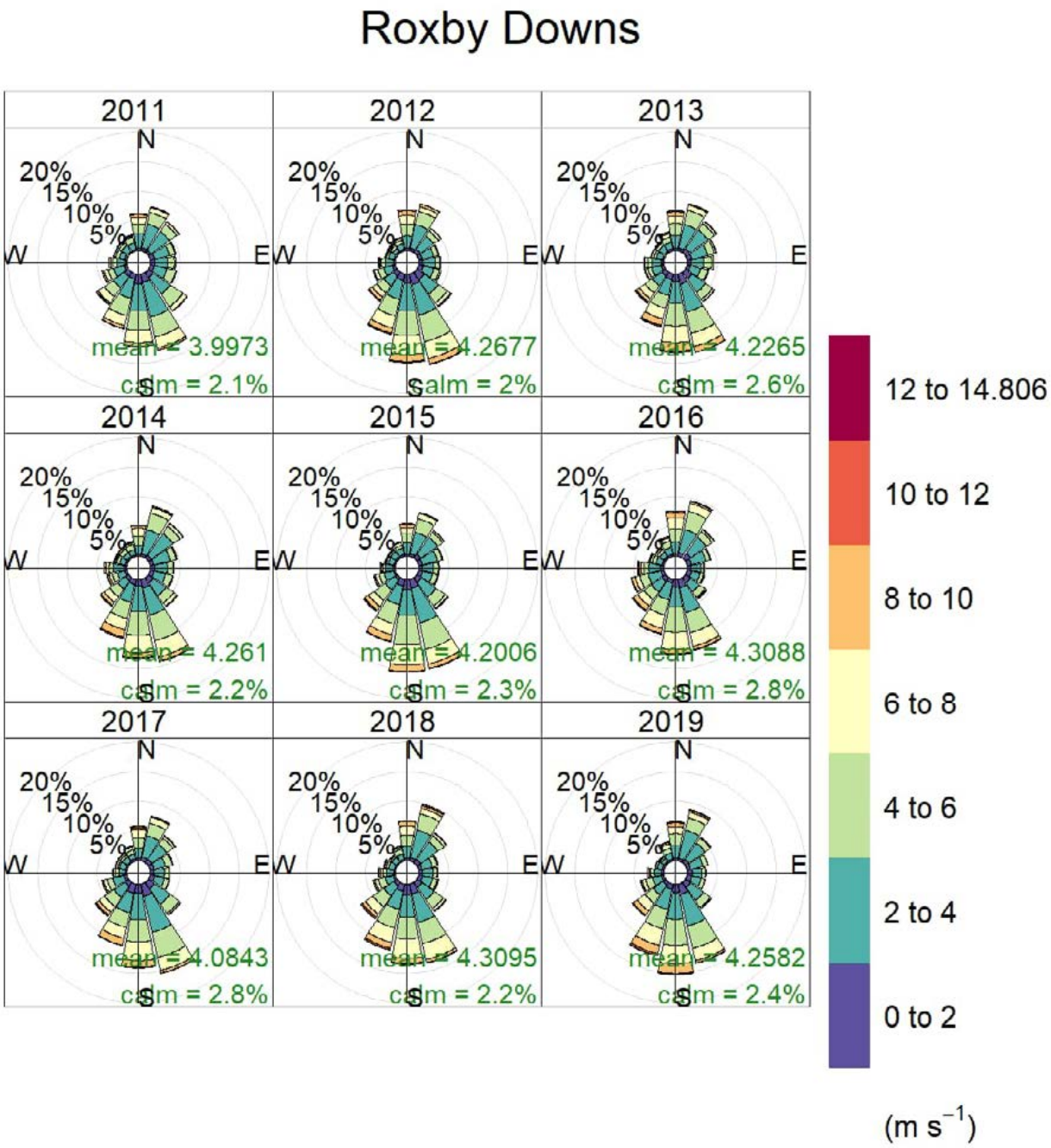
A.3 Annual Wind Roses – BoM Woomera All Hours 2008-2019



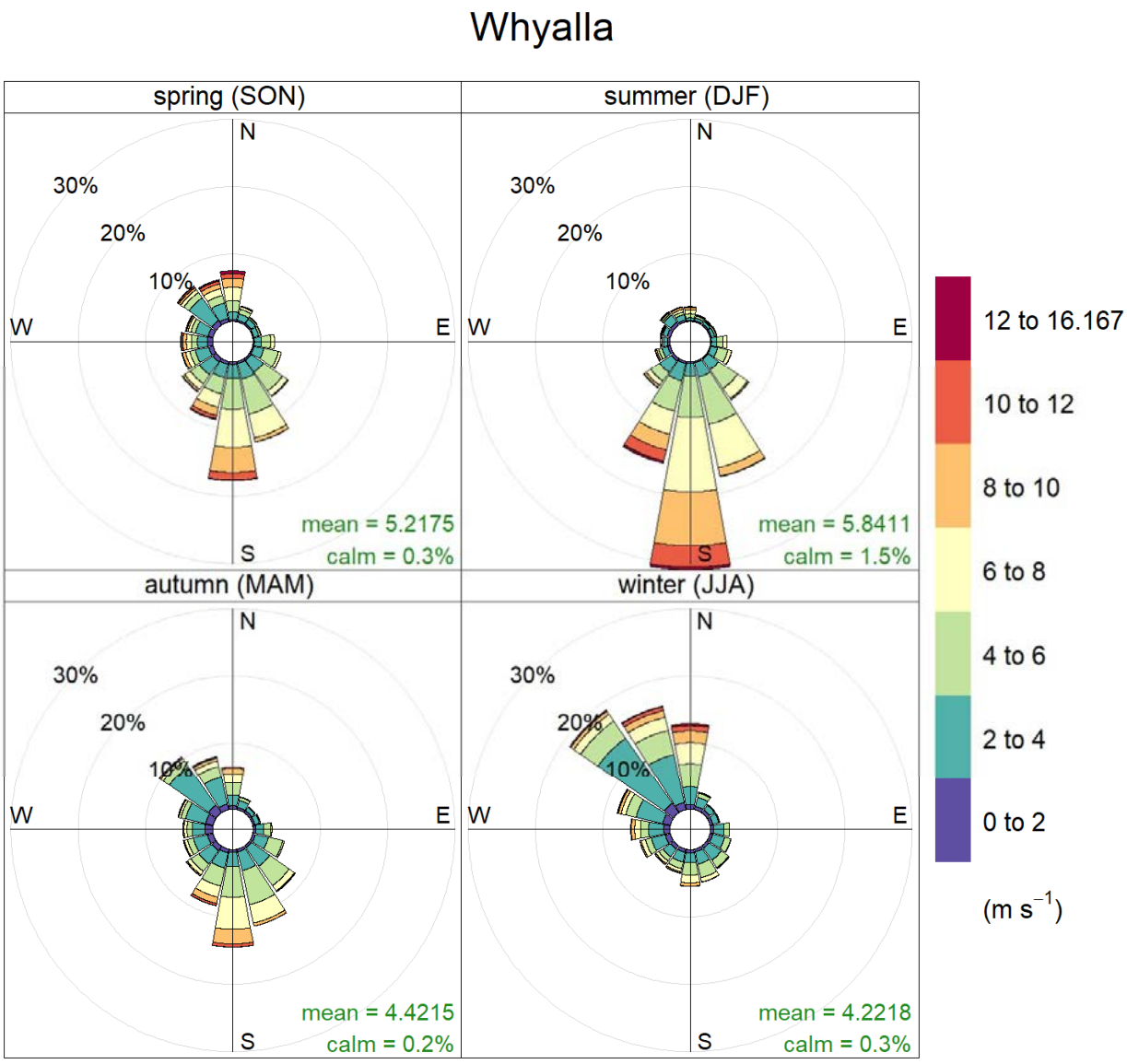
A.4 Annual Wind Roses – BoM Port Augusta Aero All Hours 2013-2023



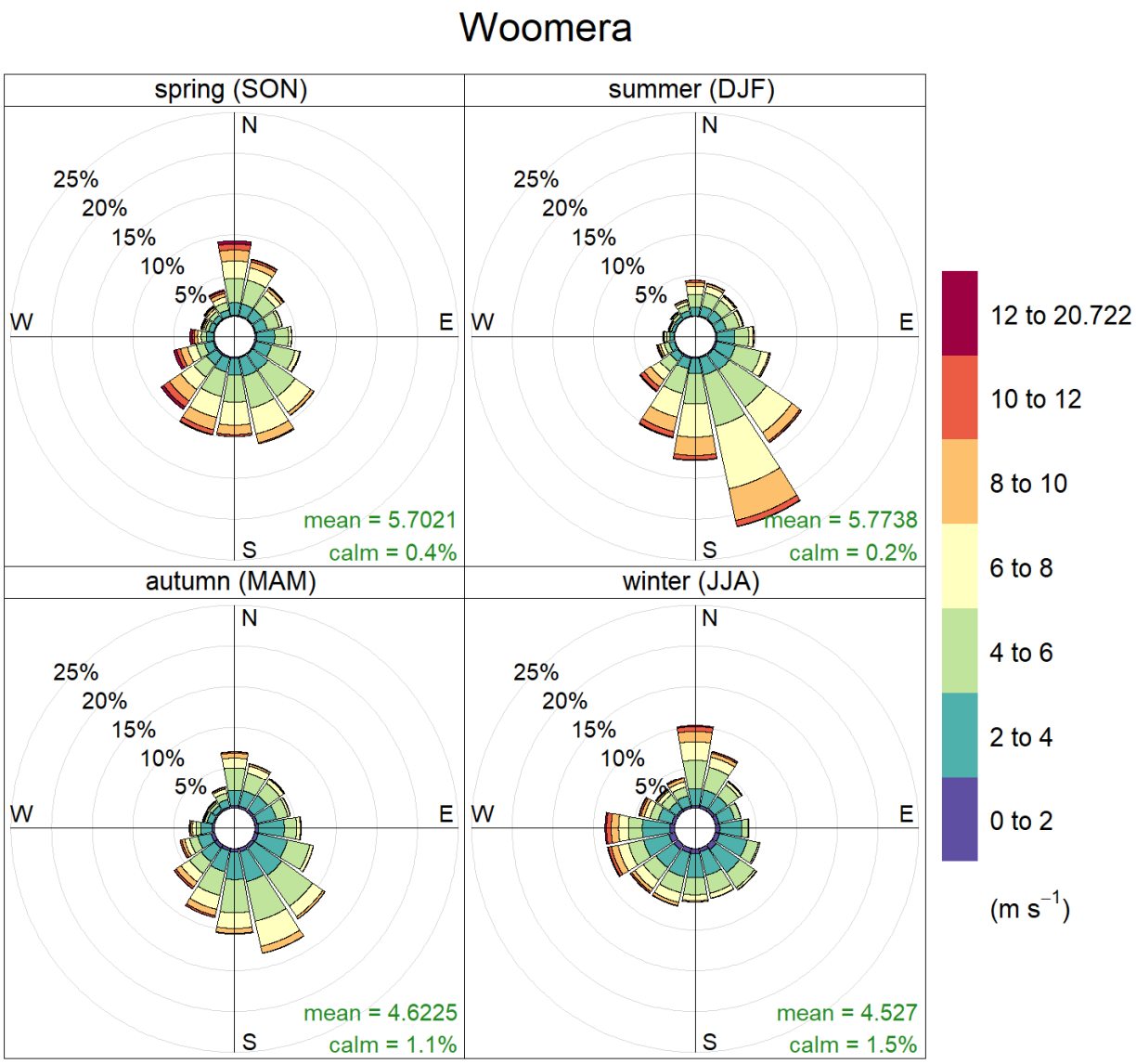
A.5 Annual Wind Roses – BoM Roxby Downs All Hours 2011-2019



A.6 Seasonal Wind Roses – BoM Whyalla Aero All Hours 2013-2023

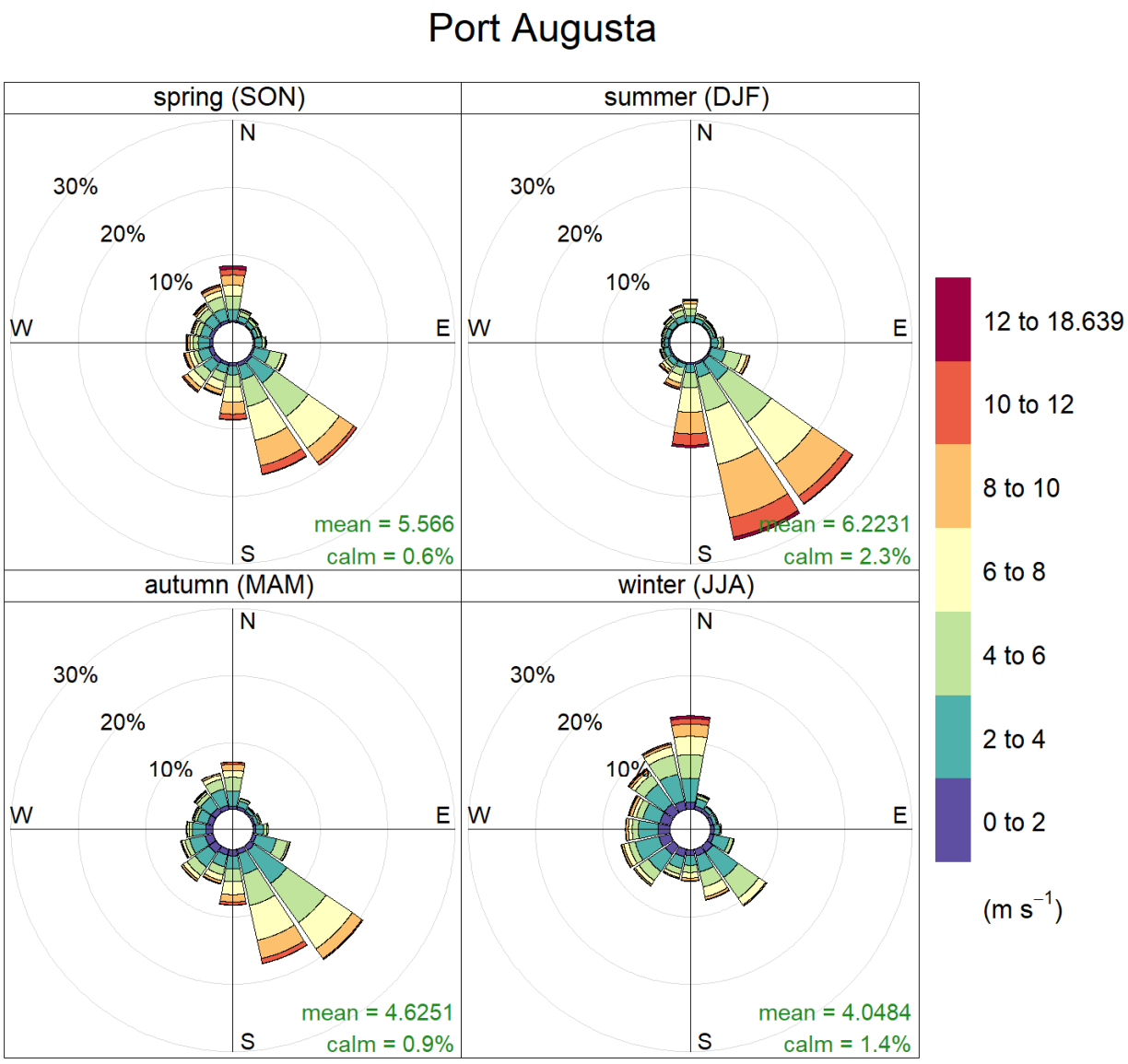


A.7 Seasonal Wind Roses – BoM Woomera All Hours 2008-2019

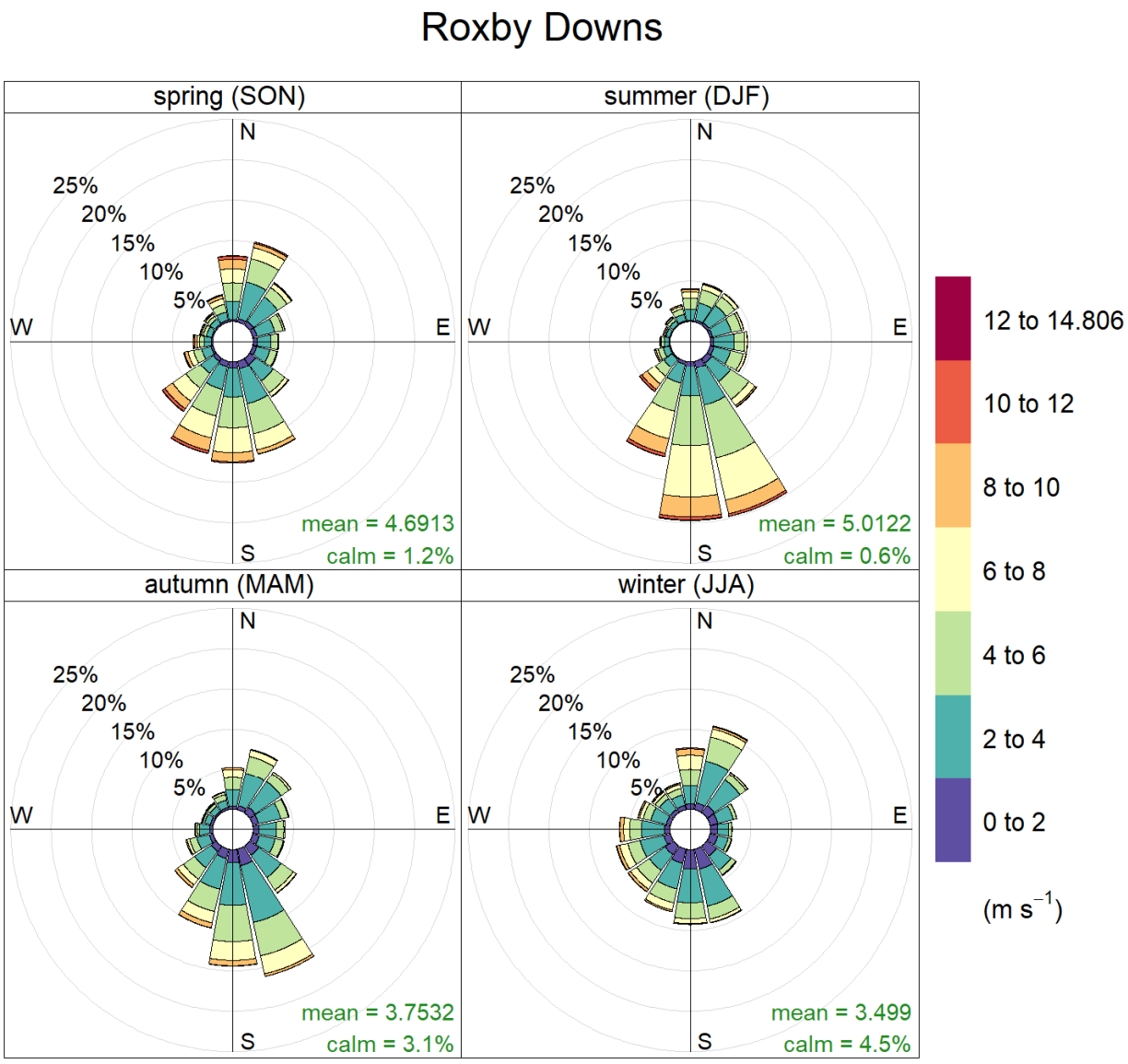


Frequency of counts by wind direction (%)

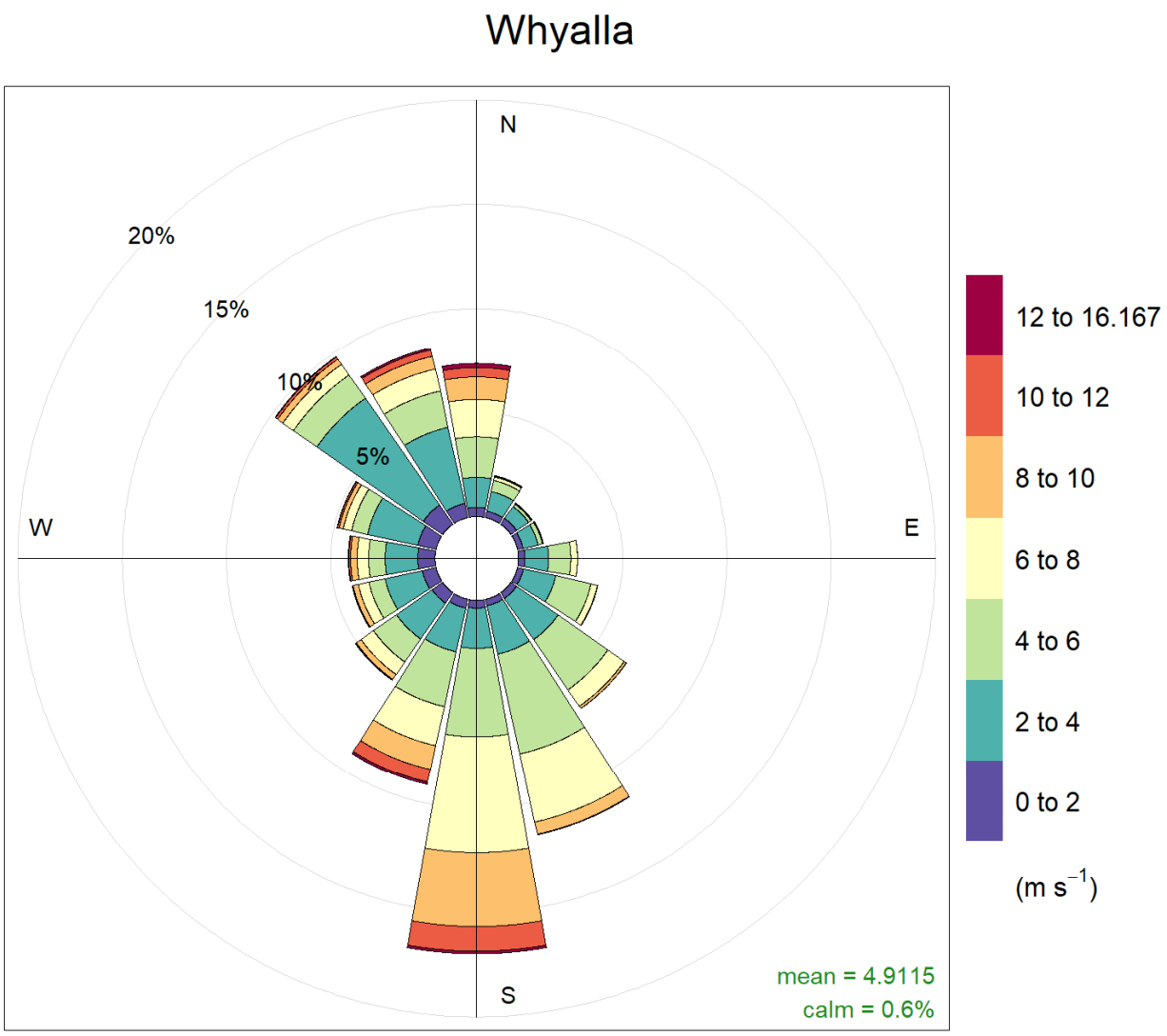
A.8 Seasonal Wind Roses – BoM Port Augusta Aero All Hours 2013-2023



A.9 Seasonal Wind Roses – BoM Roxby Downs All Hours 2011-2019

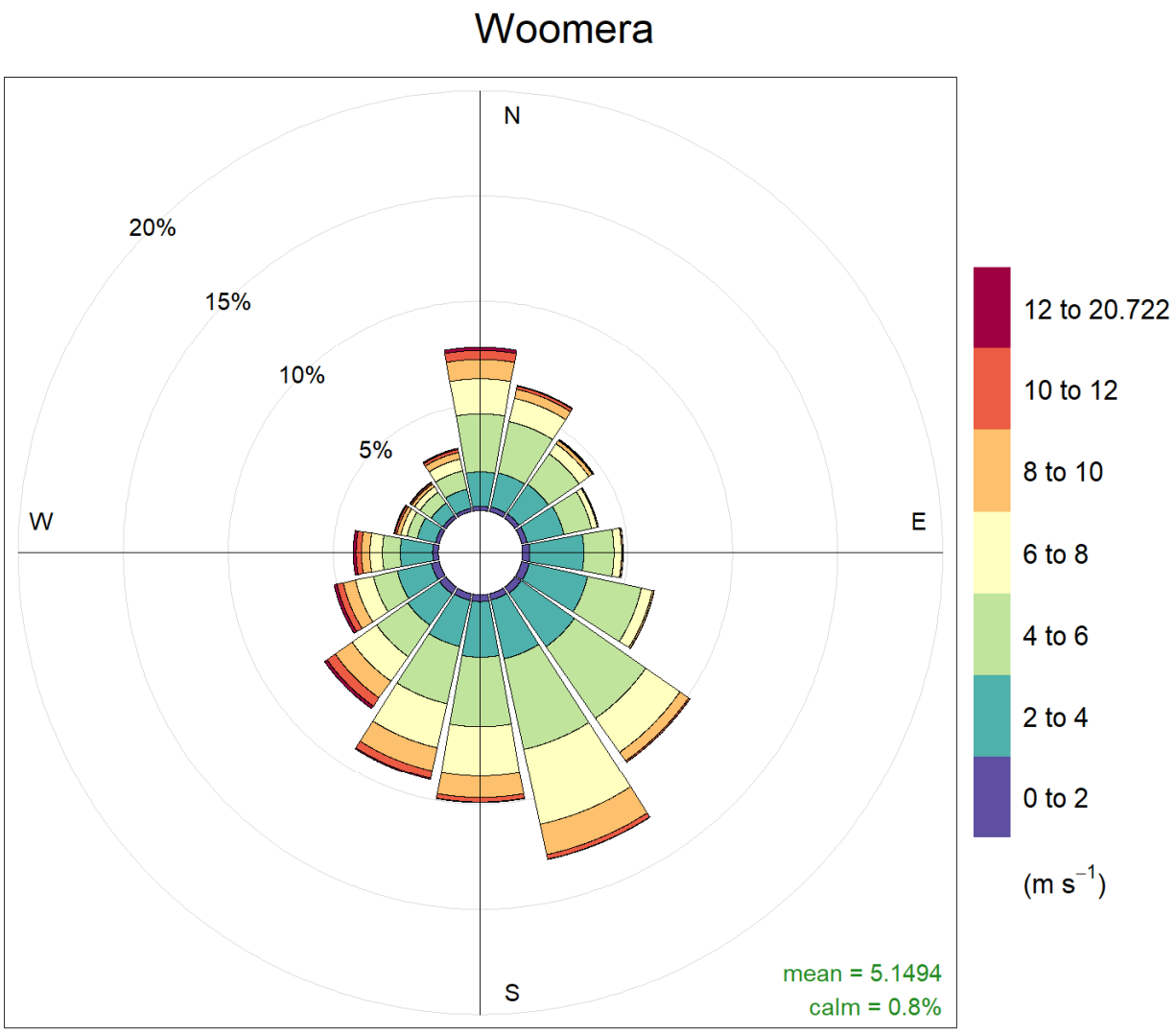


A.10 Annual Wind Roses – BoM Whyalla Aero All Hours 2013-2023



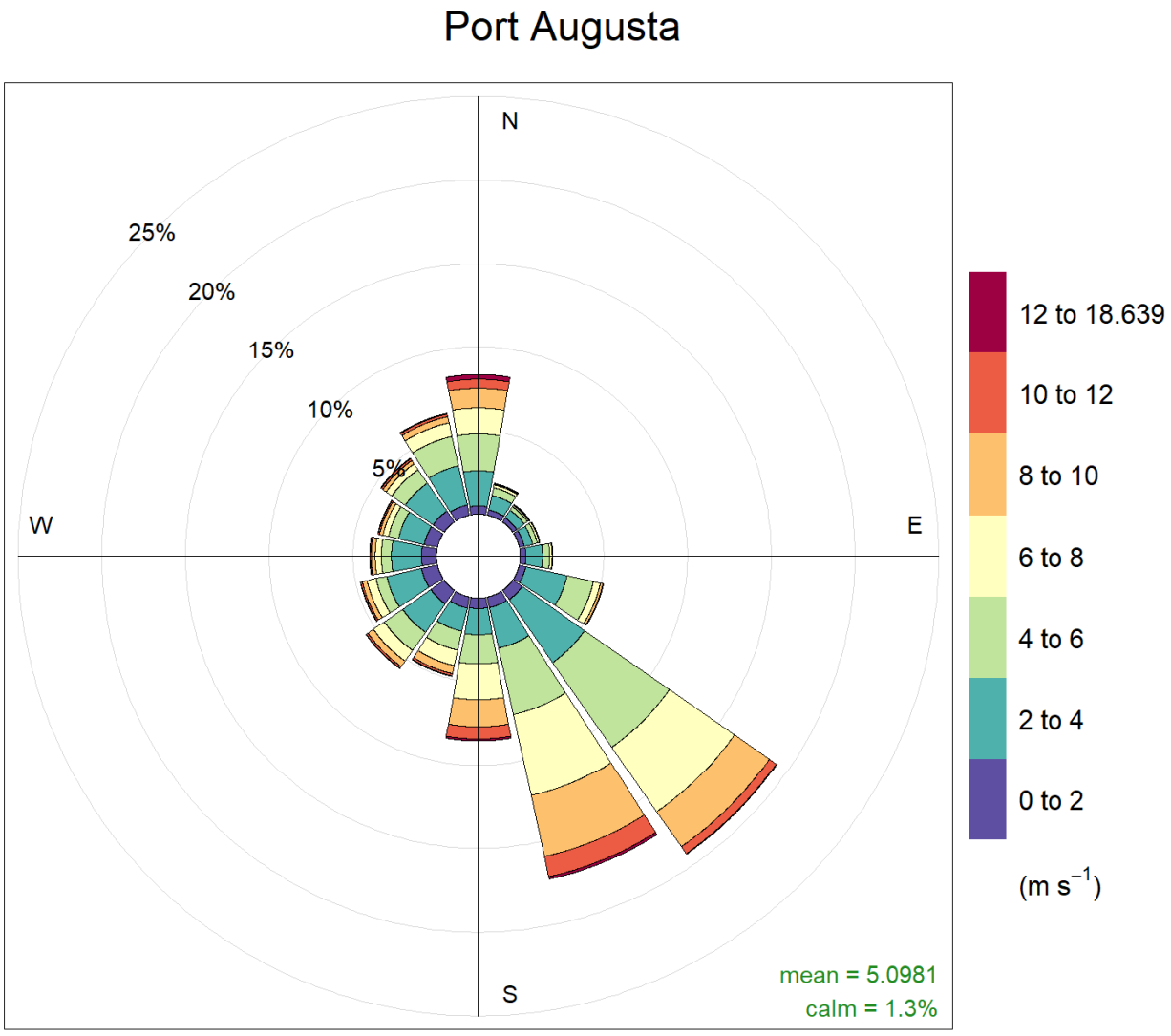
Frequency of counts by wind direction (%)

A.11 Annual Wind Roses – BoM Woomera All Hours 2008-2019



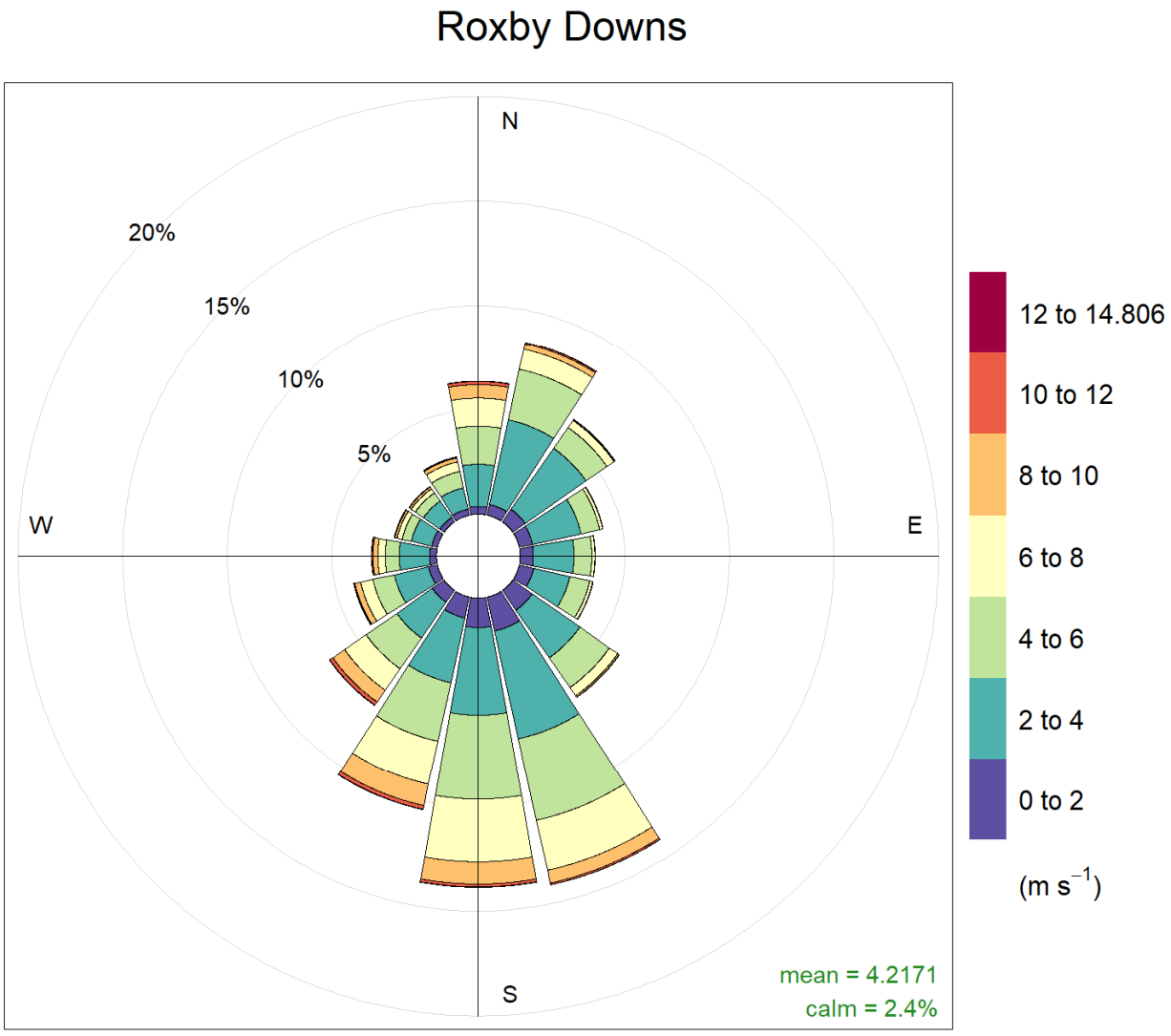
Frequency of counts by wind direction (%)

A.12 Annual Wind Roses – BoM Port Augusta Aero All Hours 2013-2023



Frequency of counts by wind direction (%)

A.13 Annual Wind Roses – BoM Roxby Downs All Hours 2011-2019



Frequency of counts by wind direction (%)

Appendix B. Sensitive Receptor Locations

9
ROXBY DOWNS
LEIGH CREEK
8
WOOMERA
7
6
CARRAPATEENA
5
HAWKER
4
3
QUORN
PORT AUGUSTA
IRON KNOB
2
WHYALLA
1
KIMBA
MULLAQUANA STATION
PORT PIRIE
LAURA

LEGEND

Sensitive Receivers

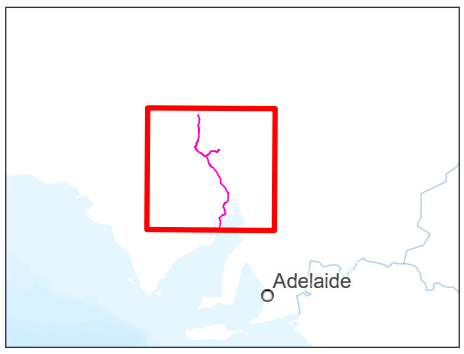
Residential Receivers (distance from construction footprint)

- Sensitive Receivers (<100m)
- Sensitive Receivers (100m-250m)

Commercial Receivers (distance from construction footprint)

- Sensitive Receivers (<100m)
- Sensitive Receivers (100m-250m)

- Storage
- Substation
- Pump Station
- Pipeline
- Transmission Line
- Mullaquana Desalination Plant
- Mullaquana Intake Alignment
- Mullaquana Outlet Alignment
- Project Area
- Construction footprint



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Kilometers

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Lincoln Hwy.

WHYALLA

Lincoln Hwy.

Lincoln Hwy.

MULLAQUANA STATION

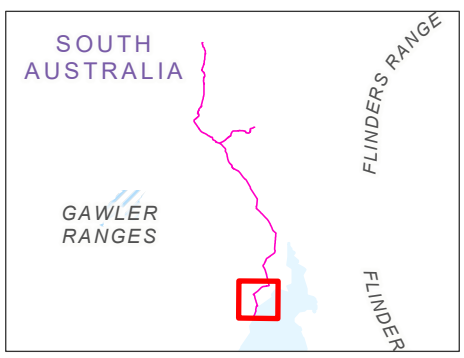
LEGEND

Sensitive Receivers

Commercial Receivers (distance from construction footprint)

- Sensitive Receivers (<100m)
- Sensitive Receivers (100m-250m)

- Substation
- Pipeline
- Transmission Line
- Heavy Vehicle Access Track
- Mullaquana Desalination Plant
- Mullaquana Intake Alignment
- Mullaquana Outlet Alignment
- Major Road
- Project Area
- Construction footprint
- Infrastructure 250m buffer



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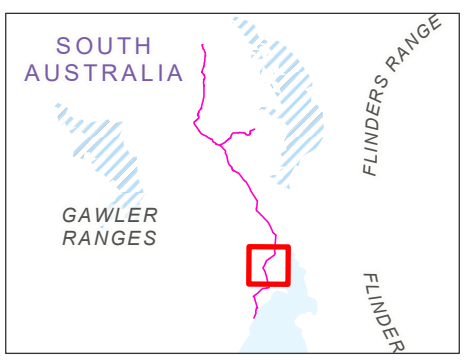
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Eyre Hwy.

Lincoln Hwy.

LEGEND

- Substation
- Pump Station
- Pipeline
- Transmission Line
- Heavy Vehicle Access Track
- Major Road
- Project Area
- Construction footprint
- Infrastructure 250m buffer



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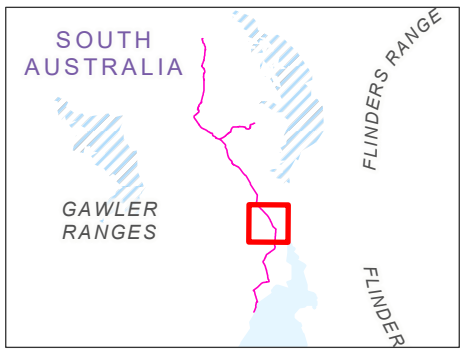
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Stuart Hwy.

Eyre Hwy.

LEGEND

- Pipeline
- Heavy Vehicle Access Track
- Major Road
- Project Area
- Construction footprint
- Infrastructure 250m buffer



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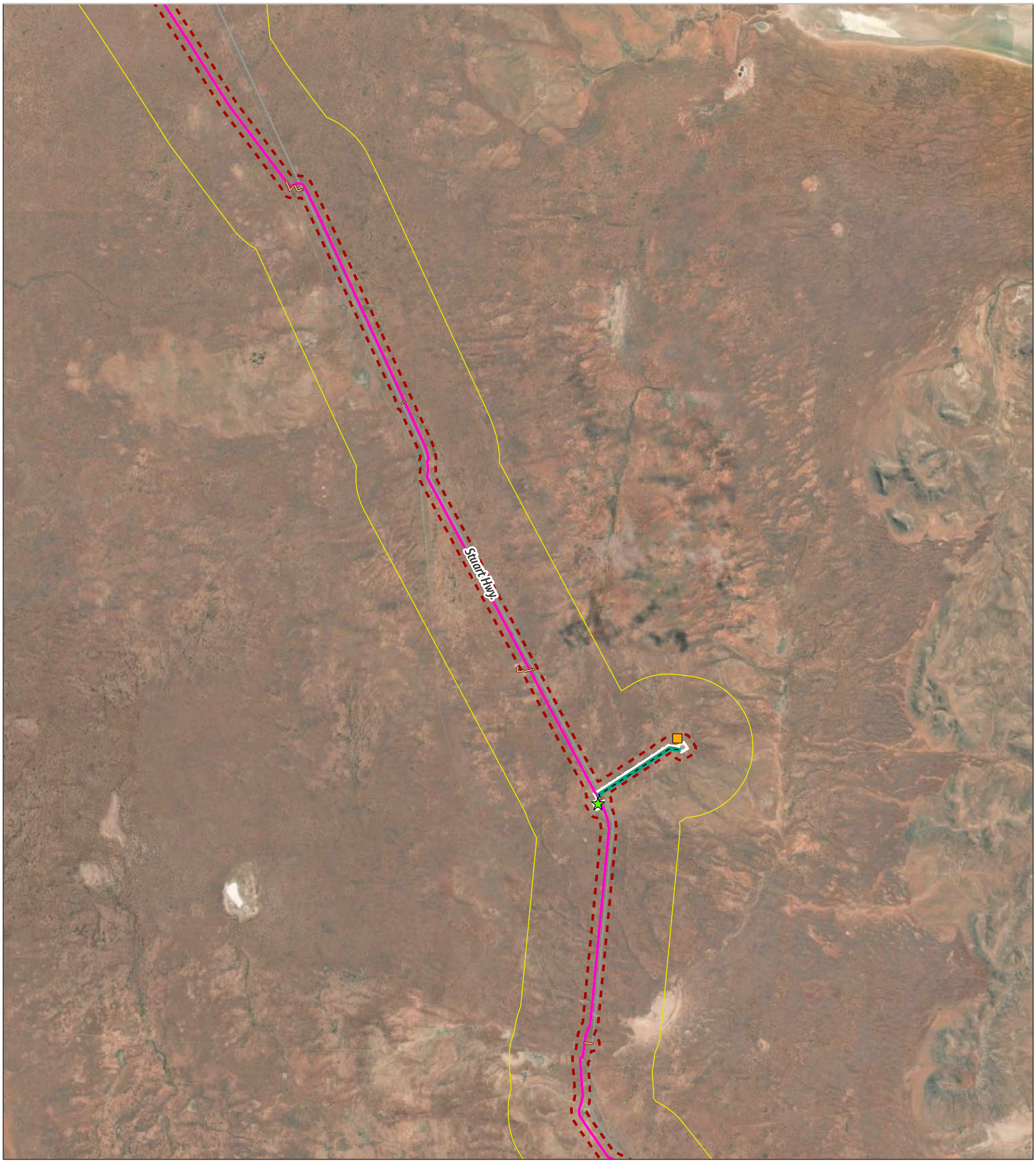
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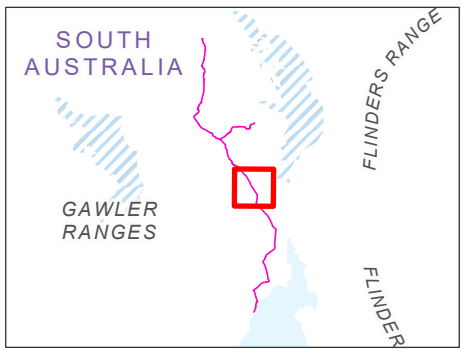
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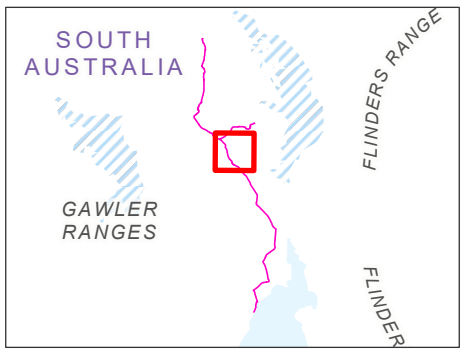
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Stuart Hwy.

LEGEND

- Substation
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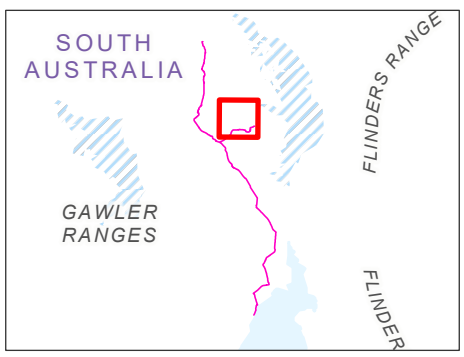
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- Project Area
- Construction footprint
- Infrastructure 250m buffer



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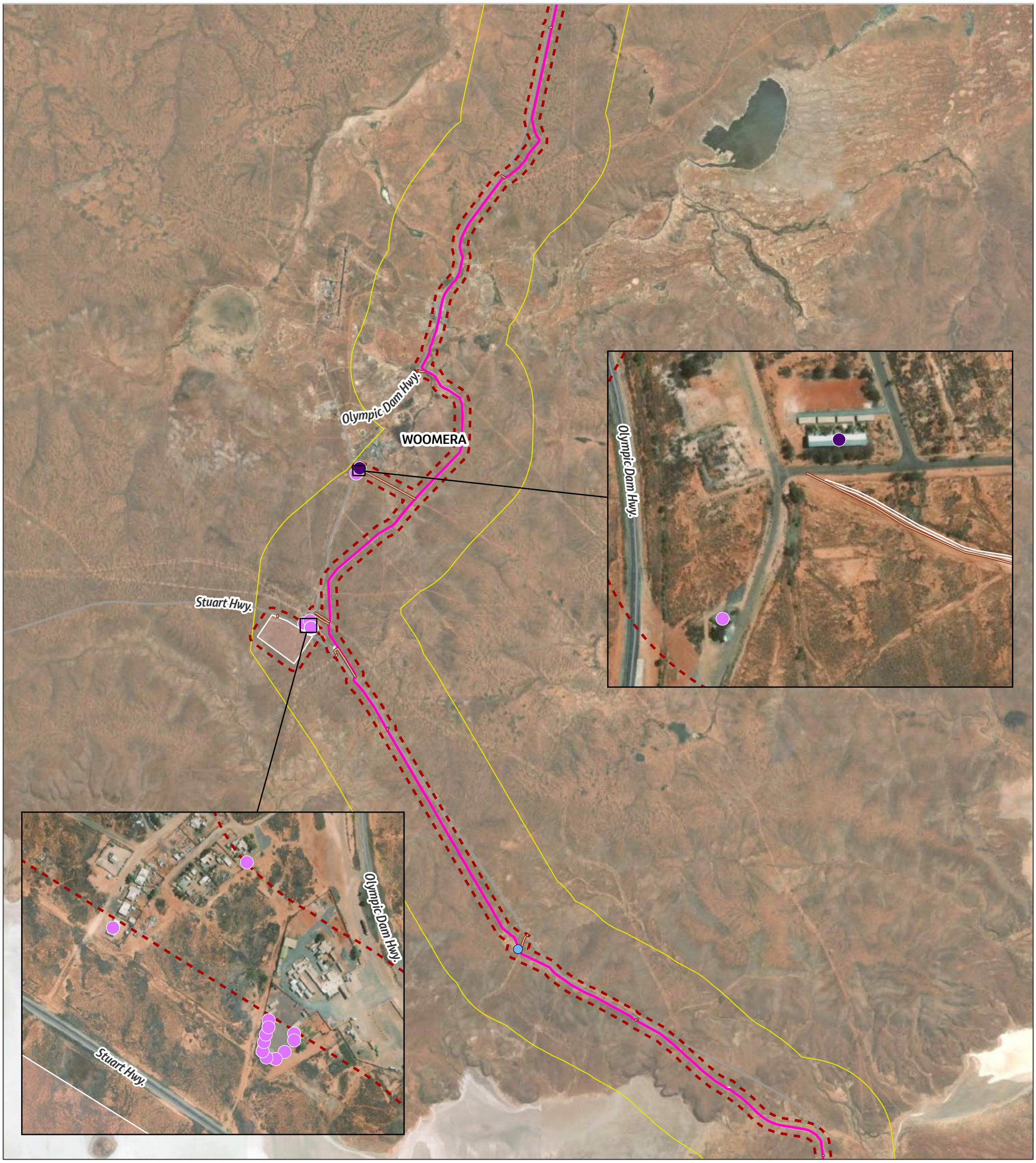
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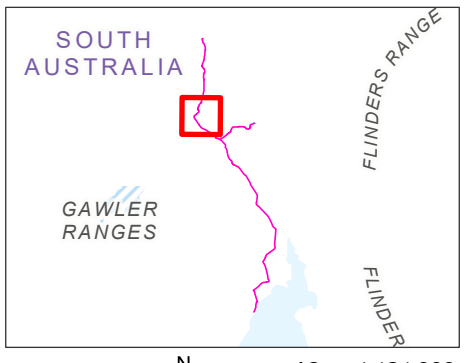
LEGEND

Sensitive Receivers

Residential Receivers (distance from construction footprint)

- Sensitive Receivers (<100m)
- Sensitive Receivers (100m-250m)

- Storage
- Pipeline
- Heavy Vehicle Access Track
- Major Road
- Project Area
- Construction footprint
- Infrastructure 250m buffer



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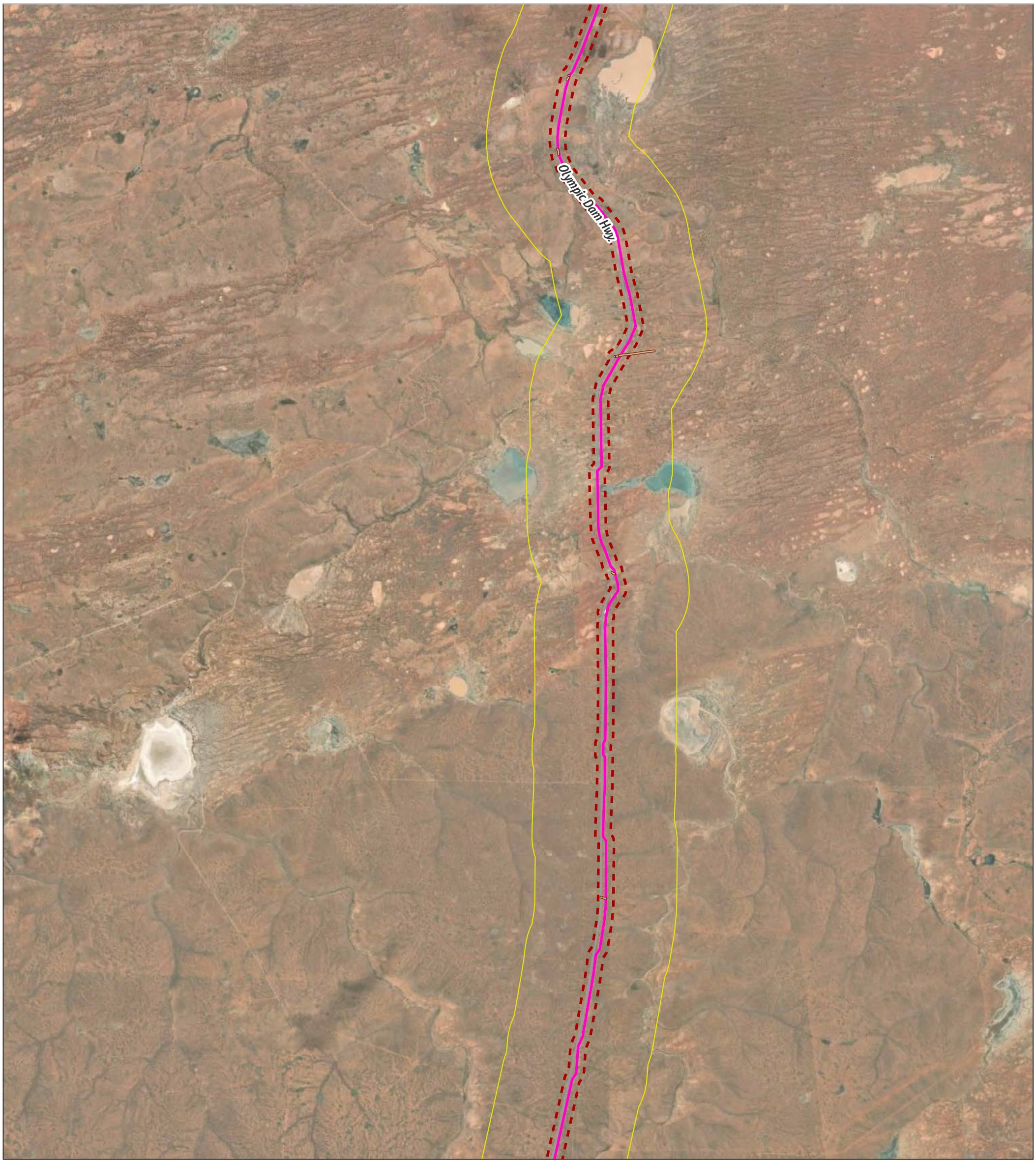
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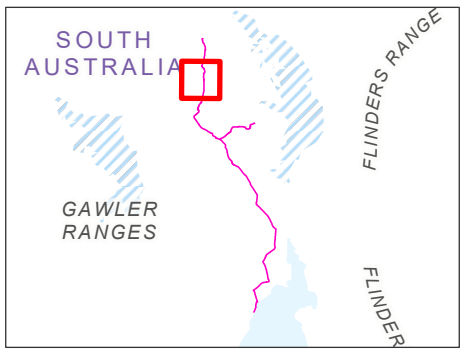
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LEGEND

- Pipeline
- Heavy Vehicle Access Track
- Major Road
- Project Area
- Construction footprint
- Infrastructure 250m buffer



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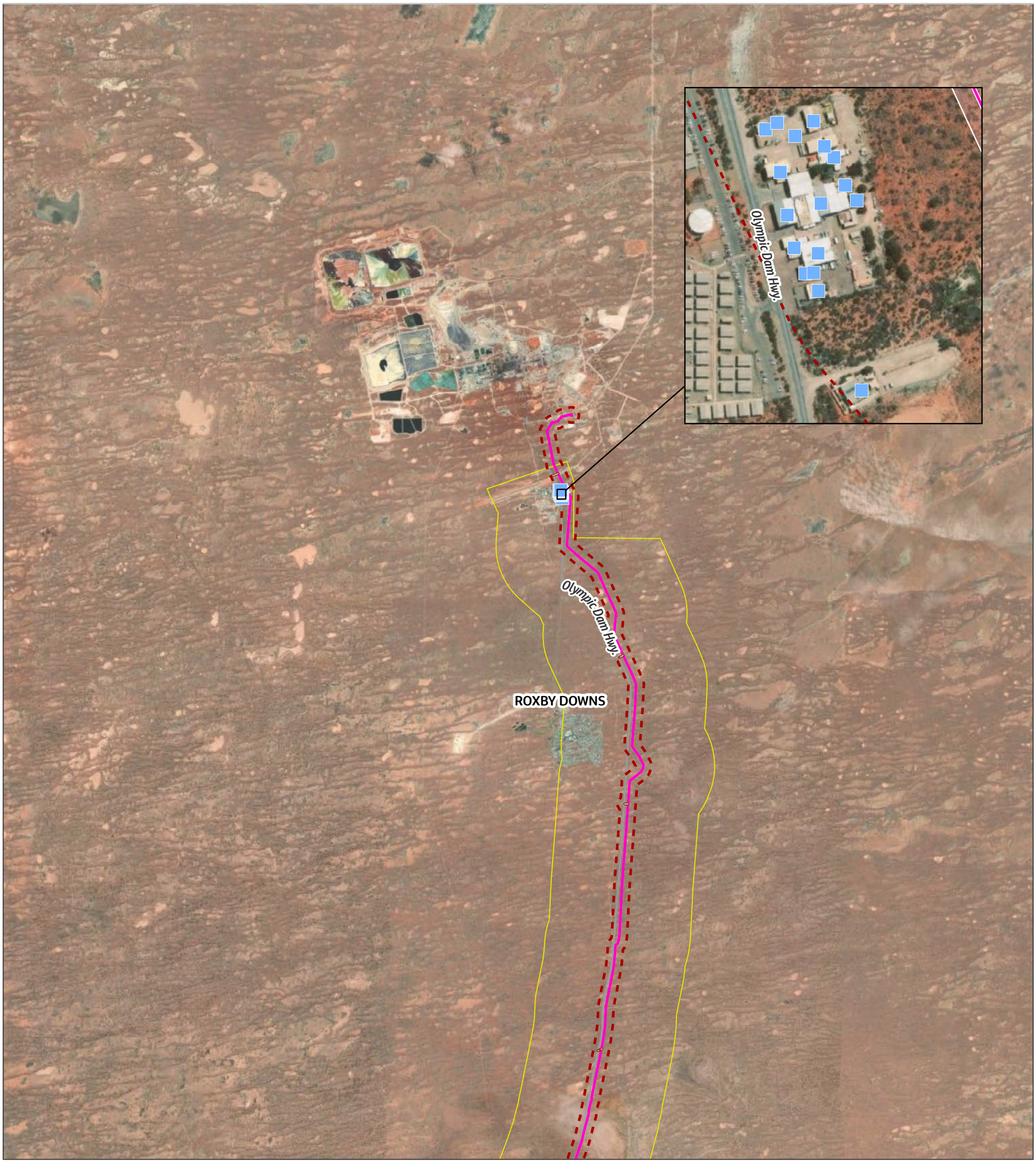
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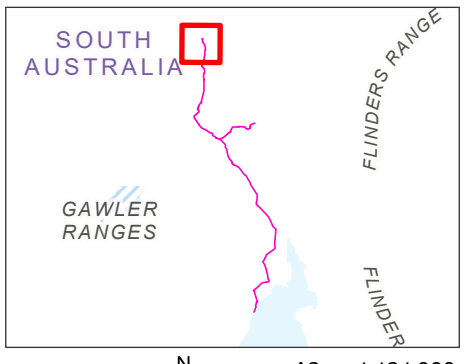
LEGEND

Sensitive Receivers

Commercial Receivers (distance from construction footprint)

- Sensitive Receivers (100m-250m)

- Pipeline
- Heavy Vehicle Access Track
- Major Road
- Project Area
- Construction footprint
- Infrastructure 250m buffer



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GDA2020 MGA Zone 53

0 3.5 7

Kilometers

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Appendix J-2:

Terrestrial Noise and Vibration Impact Assessment

Northern Water Project

Terrestrial Noise and Vibration Impact Assessment

A220729RP2 Revision C

Friday, 22 May 2026

Document Information

Project	Northern Water Project
Client	JBS&G Pty Ltd
Report title	Terrestrial Noise and Vibration Impact Assessment
Project Number	A220729

Revision Table

Report revision	Date	Description	Author	Reviewer
0	21 November 2025	Draft for comment	Chyi Jie Low/ Jon Cooper	Nick Henrys
A	20 February 2026	Updated draft report	Chyi Jie Low/ Jon Cooper	Nick Henrys
B	13 March 2026	For issue	Chyi Jie Low/ Jon Cooper	Nick Henrys
C	22 May 2026	Updated issue	Chyi Jie Low/ Jon Cooper	Nick Henrys

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The information, findings, and recommendations are based on the conditions and data available at the time of preparation. Any opinions or recommendations expressed are subject to the assumptions, limitations, and conditions as stated. Any reliance on external information has been accepted in good faith as being accurate and valid.

Glossary

A-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing. A-weighted levels are used as human hearing does not respond equally at all frequencies.
Characteristic	Associated with a noise source, means a tonal, impulsive, low frequency, intermittent, or modulating characteristic of the noise that is determined in accordance with the *Guidelines for the use of the Environment Protection (Commercial and Industrial Noise) Policy 2023* to be fundamental to the nature and impact of the noise.
Continuous noise level	A-weighted noise level of a continuous steady sound that, for the period over which the measurement is taken using fast time weighting, has the same mean square sound pressure as the noise level which varies over time when measured in relation to a noise source and noise-affected premises in accordance with the Noise Policy
Day	Between 7 am and 10 pm as defined in the Noise Policy
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of loudness.
dB(A)	Units of the A-weighted sound level.
Frequency (Hz)	The number of times a vibrating object oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second.
Indicative noise level	Indicative noise level determined under clause 5 of the Noise Policy.
L_{90}	Noise level exceeded for 90 % of the measurement time. The L_{90} level is commonly referred to as the background noise level.
L_{eq}	Equivalent Noise Level—Energy averaged noise level over the measurement time.
L_{max}	The maximum instantaneous noise level.
Night	Between 10 pm on one day and 7 am on the following day as defined in the Noise Policy
Noise source	Means a commercial or industrial premises at which an activity is undertaken, or a machine or device is operated, resulting in the emission of noise
Quiet noise designated area	A noise designated area is a quiet noise designated area if the land uses under the Planning and Design Code provisions that make land use rules for the noise designated area are principal land uses that all fall within either or both of the following land use categories (a) Residential; (b) Rural Living.
SWL	Sound power level (SWL) is the total acoustic power emitted by a noise source expressed in the decibel (dB) scale. Units: dB re 1 pW.
SPL	Sound pressure level (SPL) is the root-mean-square sound pressure expressed in the decibel (dB) scale. Units: dB re 1 μPa^2 (underwater), dB re 20 µPa (air).

Abbreviations

ACARP	Australian Coal Industry Research Program
AS	Australian Standard
AS/NZS	Australian/New Zealand Standard
BOM	Bureau of Meteorology
CFA	Continuous Flight Auger
CNVMP	Construction Noise and Vibration Management Plan
CONCAWE	Conservation of Clean Air and Water in Europe
DICL	Ductile Iron Cement Lined
DIN	Deutsches Institut für Normung (German Standard)
DIT	Department for Infrastructure and Transport
DN	Nominal Diameter
EHTM	Environment and Heritage Technical Manual
EIS	Environmental Impact Statement
EP Act	Environment Protection Act 1993
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EWPs	Elevated Work Platforms
FM Act	Fisheries Management Act 2007
GED	General Environmental Duty
GL/y	Gigalitres per Year
HP Act	Heritage Places Act 1993
INL	Indicative Noise Level
LNLC Act	Local Nuisance and Litter Control Act 2016
MNES	Matters of National Environmental Significance
MSCL	Mild Steel Cement Lined
MVA	Megavolt Ampere
NATA	National Association of Testing Authorities
NPW Act	National Parks and Wildlife Act 1972
NSR	Noise Sensitive Receiver
NVIA	Noise and Vibration Impact Assessment
PDI Act	Planning, Development and Infrastructure Act 2016
PN	Pressure Nominal
PPV	Peak Particle Velocity

PS	Pump Station
RA	Remote Areas
RO	Reverse Osmosis
SAPN	SA Power Networks
SPC	State Planning Commission
SPL	Sound Pressure Level
SWL	Sound Power Level
TBM	Tunnel Boring Machine
TNVIA	Terrestrial Noise and Vibration Impact Assessment
UNVIA	Underwater Noise and Vibration Impact Assessment
VSR	Vibration Sensitive Receiver

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Executive summary

The Terrestrial Noise and Vibration Impact Assessment (TNVIA) provides a quantitative evaluation of construction and operational noise and vibration from the Northern Water Project, covering the desalination plant, intake facility, pump stations, transmission lines and pipeline construction. Assessments were undertaken in accordance with the Environment Protection (Commercial & Industrial Noise) Policy 2023 (Noise EPP), Local Nuisance and Litter Control Act 2016 (LNLC Act), DIT Environment and Heritage Technical Manual Attachment 7D (DIT EHTM 7D), Australian Standard AS 2436, Australian Standard AS 2670.2 and German Standard DIN 4150-3.

Operational noise levels have been assessed against the more stringent night-time Noise EPP criteria to reflect 24/7 operation. Results prior to the application of acoustic attenuation measures indicated a minor exceedance of 1 dB(A) at the nearest residence to the desalination plant and exceedances of up to 3 dB(A) at isolated residential receptors near Pump Station 2 (Lincoln Gap Pump Station). Higher exceedances occur at short-term rest areas, which are not permanent noise-sensitive receivers under the Noise Policy. Noise levels at all other permanent residential receptors are expected to be within Noise EPP criteria.

For locations where noise modelling identified potential exceedances of night time noise criteria during operation of the Project, mitigated scenarios were modelled incorporating practicable acoustic treatments, including acoustic louvres and improved wall and roof façade performance. With these measures in place, noise levels from operation of the desalination plant and pump stations are predicted to comply with the applicable night-time Noise EPP criteria at all surrounding residential receptors.

Construction noise modelling, based on a conservative assumption of simultaneous plant operation, identifies that there is potential for short-term exceedances of night time or out-of-hours works (OOHW) targets along parts of the pipeline where works occur close to dwellings and rest areas. More localised and longer-duration construction activities associated with the desalination plant and pump stations may also generate elevated construction noise levels at nearby receivers. These impacts would be managed through implementation of a Construction Noise and Vibration Management Plan (CNVMP) consistent with DIT EHTM 7D.

Vibration levels for both operation and construction are predicted to comply with DIN 4150-3 structural damage limits and AS 2670.2 human comfort criteria, with low risk to heritage features such as Phillips Ponds ruins.

Potential fauna impacts are expected to primarily comprise temporary behavioural disturbance, including startle responses, possible displacement from habitat near active construction areas, masking of communication and predator-detection cues, and short-term disruption to foraging, roosting and breeding behaviour. Based on the predicted construction and operational noise levels, the likelihood of long-term ecological impacts or auditory injury is considered low, with impacts expected to be localised and manageable through standard construction management and mitigation measures.

Overall, predicted noise and vibration impacts are manageable and technically controllable through recommended design and construction mitigation, and are compatible with existing and future land uses.

1 Introduction

1.1 Overview

The Northern Water Project (the Project) aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 GL/y seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, and water storages) and electricity infrastructure. The Project comprises the following key elements:

- a 51 GL/y seawater reverse osmosis desalination plant located at Mullaquana Station approximately 25 km south-west of central Whyalla
- marine intake and outfall tunnels extending underneath the seabed and into Spencer Gulf
- diffuser structures for discharge of return water into Spencer Gulf
- a transfer system consisting of:
    - ~360 km main transfer pipeline, largely constructed underground
    - ~46 km lateral branch pipeline to a delivery point at the Carrapateena copper-gold mine
    - associated transfer pump stations and storage tanks
- high voltage electricity supply including powerlines, network and facility substations to provide power to the desalination plant and transfer pump stations
- associated temporary construction-related infrastructure (e.g. construction camps, site offices and amenities, yards, storages and laydown areas)
- access tracks including upgrading existing tracks and establishing new tracks
- enabling roadworks and road upgrades.

1.2 Purpose of this report

This report outlines the Terrestrial Noise and Vibration Impact Assessment (TNVIA) for the proposed Northern Water Project, including both existing conditions and the predicted noise impacts from the construction and operation of the proposed infrastructure. For the purpose of this report, assessment of operational noise is based on the 'Design capacity' of 51 GL/y, the 73 GL/y hypothetical highest case scenario would be subject to further assessment.

We note that underwater noise and vibration impacts are addressed separately in the Underwater Noise and Vibration Impact Assessment (UNVIA), also undertaken by Resonate (report A220729RP3A). For clarity, the UNVIA also addresses the potential impacts of airborne noise on marine fauna.

The scope of this report is to do the following:

- Summarise the desalination plant, associated pump stations, and pipeline works, highlighting construction, commissioning, operation, and closure activities likely to produce significant terrestrial noise and vibration.
- Identify the development site and major terrestrial noise sources.
- Map and describe nearby noise- and vibration-sensitive receivers, including residential, commercial, industrial, and ecological (terrestrial and marine fauna) receptors.
- Summarise existing background noise levels at identified receivers and describe how these levels were measured and defined.
- Applicable noise and vibration criteria for both construction and operational phases will be identified, referencing the
    - *Environment Protection (Commercial & Industrial Noise) Policy 2023,*
    - *Environment Protection Act 1993,*
    - *Local Nuisance and Litter Control Act 2016,*
    - *AS 2436 Guide to noise and vibration control on construction, demolition and maintenance sites*
    - *DIT Guideline for the Management of Noise and Vibration (2021).*
- Describe modelling parameters, assumptions, and methods used to predict noise and vibration emissions.

- Present worst-case noise predictions during the following scenarios:
  - Desalination Plant & Intake Pumpstation construction
  - Lincoln Gap Pump Station (PS2) construction
  - Kalaya Pump Station (PS3) construction
  - Mangata Pump Station (PS4) construction
  - Desalination Plant & Intake Pumpstation operation
  - Lincoln Gap Pump Station (PS2) operation
  - Kalaya Pump Station (PS3) operation
  - Mangata Pump Station (PS4) operation
  - Pipeline construction
  - Transmission line construction
  - Storage facility construction
  - Mitigation scenarios
- Outline noise and vibration control measures across all phases to ensure compliance with legislative and environmental requirements.

The TNVIA has been undertaken in consideration of the State Planning Commission Assessment Requirements (September 2024), which references the following legislation, policy and guidelines:

- *Environment Protection (Commercial & Industrial Noise) Policy* 2023 (Noise Policy)
- *Environment Protection Act* 1993
- *Local Nuisance and Litter Control Act* 2016
- *Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities*, DIT, October 2021.
- AS 2436 *Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*.

This TNVIA is based primarily on input information contained in the following documents:

- Systra Constructability Report version 3 ref SYS-R-NWSP-006-R3, dated November 2025
- SB-DIT-PR-SB000129-007-R2 Reference Design Constructability Presentation, dated October 2025

2 Proposed Project

2.1 Project Description

Northern Water (the Project) proposes to deliver a new climate-resilient water supply to support industrial growth in South Australia's Far North and Upper Spencer Gulf. The Project comprises the construction and operation of a large-scale seawater desalination plant in Spencer Gulf, connected to northern South Australia via several hundred kilometres of pipeline, on the traditional lands of the Barngarla and Kokatha peoples.

The Project will will enable the growth of industries and key mining resources crucial for contributing to decarbonisation initiatives, sustainability and unlocking long term economic prosperity for South Australia.

The overview of the construction activities, project location, and key components of the development. Details are as outlined in Table 1.

Table 1 Project description for each component

Project component	Description
Desalination plant	
Location	• Mullaquana Station (Crown lease) located 25 km south-west of central Whyalla • Proposed site located ~14 km east of the Lincoln Highway. Currently accessed by unsealed local roads and private station tracks. • Desalination plant main site is ~1.5 km from the coastline of the Upper Spencer Gulf • Possible sensitive receptors are: - Mullaquana Station homestead – 5 km west - Cowleds Landing (small area of houses) – 8 km north - Murninnie Beach – 10.5 km south
Access	• Access proposed from Lincoln Highway via Eight Mile Creek Road.
Desalination plant	• Seawater reverse osmosis desalination plant - sized for design conditions of an average annual capacity of 51 GL/y and turn down capacity of 40 ML/day (and a hypothetical highest capacity understood to be 73 GL/y) - one pass reverse osmosis (RO) system operating at 40% overall plant recovery (assumed)
Intake and outfall pipe	• Marine intake and outfall tunnels and pipes constructed under the seabed using tunnel boring machines (TBMs) • TBMs to be launched from a temporary box cut and decline constructed in south-east corner of the construction site • A water intake pump station and pipeline tunnel extending under the seabed to approximately 13 m depth into the Spencer Gulf with associated intake pumps and intake head (overall length of approximately 3.9 km) • An outfall pipeline tunnel extending under the seabed and terminating at a minimum 17 m water depth at the tunnel riser / outfall diffuser (approximate length 4.8 km)[1].

[1] An alternative construction method may be considered for part of the outfall pipe. This would involve a 'float and sink' method, which involves floating the pipeline into position after tunnelling reaches a suitable depth, then lowering and securing it to the seabed using piling. The outfall pipe landward of the intake location would still be tunnelled under the seabed.

Project component	Description
Operating hours	• Desalination plant is expected to be staffed twenty-four hours per day / 7 days per week with most maintenance activities being undertaken during daylight hours or from 7:30 am to 4:00 pm, or as negotiated by the Contractor. • The Project, including desalination plant, intake pump station and water transfer system, will operate on a 24/7 basis.
Construction hours	• Standard construction hours will be 7am-7pm Monday to Saturday. Depending on construction scheduling, some work may need to occasionally be undertaken outside these hours in accordance with regulatory requirements.
Construction	• Civil and building works will be sized and constructed for the design capacity of 51GL/y • Reverse Osmosis trains will be designed and built for the design capacity of 51GL/y
Total construction footprint	• Approximately 200 ha of land would be required for the purposes of construction
Water transfer system	
Water transfer pipeline	• Total length ~406 km • ~360 km main transfer pipeline extending north from the desalination plant to Olympic Dam • ~46 km Carrapateena lateral branch to the existing Carrapateena mine. • provision (i.e. blank interface flanges) for future additional offtake points • ~1050 air valves, 250 scour valves • ~140,000 tonne of pipeline (or 7000 semi-trailers) • ~2 million m^3 of excavation • standard width for construction corridor = 40 m which can be constrained in areas of high sensitivity • Nominal construction rate of 500 linear metres per day (spread length ~200m)
Pipeline materials and sizing	• PN35 mild steel cement lined (MSCL) pipeline • Pipe diameters will vary along the length of the pipeline alignment. Nominal size leaving the desalination plant of DN1200, reducing to DN1000 at Olympic Dam (noting some sections of DN1100). • Carrapateena lateral branch nominal diameter DN450 (DICL) pipeline
Pipeline construction	• Main trunk and branch pipeline are proposed to be buried, constructed using trench and cover fill for the majority of the alignment (note that the Carrapateena branch pipeline may be constructed above or below ground) • Trenchless installation (e.g. micro-tunnelling / auger-boring) will be used for rail and major road / highway crossings and some watercourse crossings. Above ground sections of pipeline (where the pipeline will be constructed on raised structure on footings) may be designed for crossing of environments sensitive to excavation. • Current estimates for trenchless crossings: - 9 x major creeks - 1 x No Go Zone - 5 x rail crossings • Depth of the buried pipeline will depend on the pipe diameter for the various sections of the pipeline, and in line with minimum cover values calculated using AS/NZS 2566.1:1998 Buried Flexible Pipelines. • Minimum depth of cover will also vary with prevailing land use, with a minimum of 600 mm depth of cover provided in pastoral areas. Where pipeline crosses major roads, cover will be minimum of 1000 mm.

Project component	Description
Transfer pump stations (PS) and water storage (south to north alignment)	• 4 transfer pump stations - PS 1 – Mullaquana pump station (desalination plant site) - PS 2 – Lincoln Gap pump station and storage - PS 3 – Kalaya pump station (Kootaberra) and storage - PS 4 – Mangata pump station (Oakden Hills) and storage • Bimba (Pimba) high point storage
Electricity supply	
Transmission lines	• 4 new transmission lines (connections to desalination plant and pump stations) - Mullaquana 132 kV (approx. 20 km) - Pandurra 275 kV (approx. 3 km) - Bookaloo 132 kV (approx. 4 km) - Oakden Hills 33 kV (approx. 15 km)
Network substations	• 2 new network substations - Mullaquana substation (serves 132kV line and desalination plant and intake pump station) - Kootaberra substation • 2 upgraded network substations - Corraberra Hill substation (ElectraNet) (275kV) - Mount Gunson substation (SAPN) (33 kV)
Pump station substations	• Mullaquana Station desalination plant pump station • Lincoln Gap • Kalaya pump station (Kootaberra) • Mangata pump station (Oakden Hills)
Power supply to storage tanks	• Bimba storage – solar panels array • Carrapateena and Olympic Dam storage will utilise existing power sources

2.2 Location

The transfer pipeline will extend approximately 360 km north from Mullaquana Station to Olympic Dam, with a 46 km × 450 mm branch pipeline to Carrapateena. The route broadly follows existing road corridors: north along Eight Mile Creek Road, then Lincoln Highway, Eyre Highway, and Stuart Highway to Pimba, before continuing along Olympic Dam-Pimba Road to Olympic Dam. Key infrastructure, including pump stations, storage tanks, and valves, will be located along this corridor.

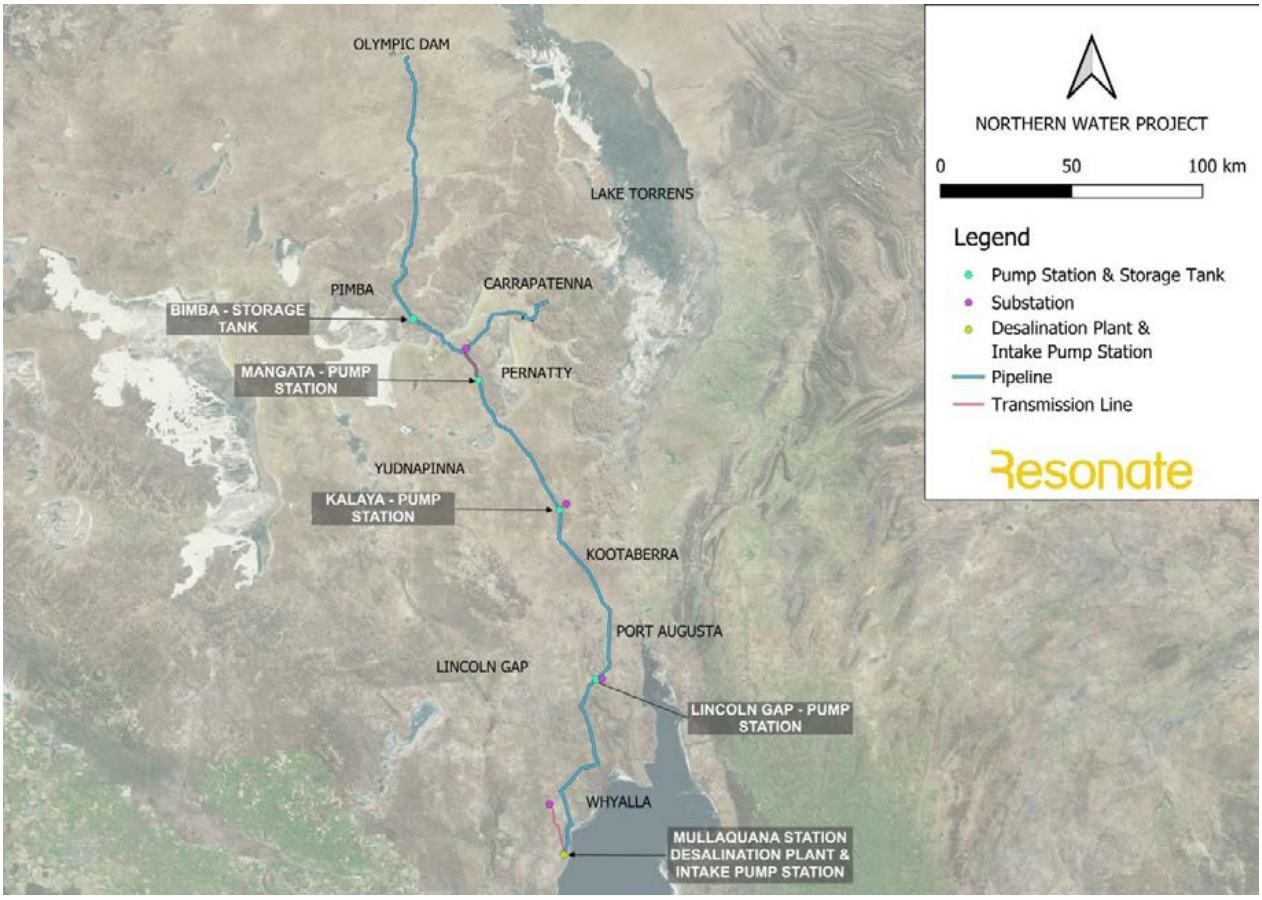


Figure 1 Project map of the indicative desalination plant and pump station locations

2.3 Construction

2.3.1 Construction programme

Based on information provided by Systra, construction of the Project is planned to commence in 2027 and be completed in 2030, with commissioning complete in 2031. It should be noted that the duration of transfer pipeline construction works would be significantly less at any one location as the work front(s) progress.

The majority of construction activities will be undertaken from 7am to 7pm, Monday to Saturday. However, some activities are expected to occur on a 24/7 basis, including (but not limited to):

- Tunnel boring
- Construction of the transfer pipeline in locations such as road or rail crossings, where night works may be necessary to minimise traffic disruption

2.3.2 Construction activities

The plant and equipment to be used for construction of the Project are derived from the Systra Constructability Report and are summarised in Table 2.

Table 2: Construction activities and typical equipment

Project element	Activity	Typical plant/equipment
Transfer system	Trenched pipeline construction	• Graders • Excavators • Dozers • Bucket wheel excavators • Front end loaders • Water trucks • Compaction plant (e.g. rollers) • Trucks
	Trenchless pipeline construction	• Micro-tunnelling machine / auger bore machine • Generators • Excavators • Trucks
	Laydown areas	• Crane • Franna Pozi Track • Telehandler • Semi-truck • Watercart • Handtools
	Pump station construction	• Grader • D9 Dozer • Excavator • Concrete pump • Telehandler • Trucks • Cranes • Knuckle boom Elevated Work Platforms (EWPs) • Generator (as required)
	Storage tank construction	• Excavator • Trucks • Rollers • Loaders • Pumps • Vibrators • Generator • Mobile crane • EWPs • Welding equipment • Handtools

Project element	Activity	Typical plant/equipment
Intake and outlet tunnels	Launch box	• Excavators • Grader • D9 Dozer • Moxy • Concrete agitator • Piling machines • Crawler cranes • Telehandlers • Continuous Flight Auger (CFA) pile cropper • Trucks • Shotcrete machine • Pumps
	Tunnelling(1)	• Excavator • D9 Dozer • Grader • Trucks • Franna • Cranes • Concrete pump • Concrete agitator • Forklifts • Cooling towers • Cooling water pumps • Generator
	Construction of sub-sea structures(2)	• Welding equipment • Crane • Compressor • Grout • Piling vibratory hammer • Excavator • Gen set • Jack up barge
Desalination plant	Earthworks	• Excavator • Trucks • Water truck • Pumps • Dozer • Grader • Cranes • Vibrator • Telehandler • Compactor • Roller • Rock breakers • Moxy • Semi-trailers • Concrete agitator • EWPs • Chainsaws

Project element	Activity	Typical plant/equipment
	Construction of buildings located in the desalination plant	• Crane (100t) • Crane (80t) • EWP • EWP (Scissor) • Telehandler • Excavator • Pump • Scaffold
Transmission line	Access	• Grader • Bulldozer • Roller • Truck
	Foundations	• Drill rig • Excavator • Augers • Vibration hammers • Bobcats • Frannas • Trucks
	Tower assembly	• Cranes • Frannas • Helicopter(3)
	Line Stringing	• Cranes • Frannas • Winches

(1) Note that potential vibration impacts from tunnelling under the seabed are assessed separately in the UNVIA.

(2) Noise underwater noise impacts from marine works are assessed in the UNVIA (including potential impacts of airborne noise on marine fauna).

(3) A helicopter may be used for tower assembly and line stringing.

3 Assessment requirements

The Assessment Requirements issued by the State Planning Commission (SPC, 2024) outline the matters that must be investigated, assessed, and documented within the Environmental Impact Statement (EIS). The key requirement relevant to the Noise and Vibration Impact Assessment (NVIA) is AEQ2, which addresses acoustic environment quality. Table 3 summarises the specific sub-requirements of AEQ2 where each requirement has been addressed.

Table 3 Noise impact assessment requirements (Source: State Planning Commission, 2024)

Environmental Attribute	Requirement
AEQ2	• Identify and illustrate the locations of all noise and vibration-sensitive receivers, both existing and proposed, including terrestrial and marine fauna. Additionally, describe any other environmental values that could be affected by noise generated by, or impacting, the development. • Provide current baseline noise and vibration levels at sensitive receivers, including their locations, the identity of the receivers, and the methodology used to define them. The analysis should clearly differentiate all types of sensitive receivers, which may include commercial or industrial sites and their workers. • Describe the sources and characteristics of noise and vibration likely to be generated during all stages of the project, including construction, commissioning, operation, upset conditions, and closure. • If Matters of National Environmental Significance (MNES) are present, assess the potential noise impacts on these receptors. • Evaluate the compatibility of the development's noise emissions with existing and potential land uses in the surrounding area. Consider cumulative impacts from other current and approved developments as outlined in project approvals and planning documents. • Assess noise and vibration impacts on fauna, including nocturnal species, and outline management approaches to mitigate these effects. • Develop strategies to minimize noise and vibration impacts during all project phases (construction, commissioning, operation, upset events, and closure) and demonstrate compliance with relevant legislation, guidelines, and standards, including but not limited to: - Environmental Protection (Commercial & Industrial Noise) Policy 2023 - *Environmental Protection Act 1993* (including environmental duty and relevant authorisations) - *Local Nuisance and Litter Control Act 2016* - *Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities, DIT, October 2021* - *AS 2436 Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites* • Conduct an underwater noise assessment covering both construction and operation of the desalination plant. The assessment should consider: - Noise generated by the development, including piling, dredging, drilling, shipping movements, onshore blasting, and plant operations - Impacts on marine flora and fauna, including cetaceans - Base case and future case scenarios, including any approved developments - Potential short-term and long-term impacts • Demonstrate how the development will comply with the General Environmental Duty under the EP Act regarding underwater noise. • Develop environmental management strategies to mitigate underwater noise impacts on marine flora and fauna.

4 Noise and vibration sensitive receivers

This section identifies and describes the locations of existing and potential noise sensitive receivers (NSR) and vibration-sensitive receivers (VSR), including residential properties, public use areas (i.e., rest areas), heritage areas, and relevant terrestrial fauna. Key environmental values that may be affected by noise emissions from the Project are outlined, supported by tables and figures showing the nearest sensitive receivers to the desalination plant, pump stations, transmission lines, and pipeline alignment, focusing on receptors that may be impacted by the project infrastructure.

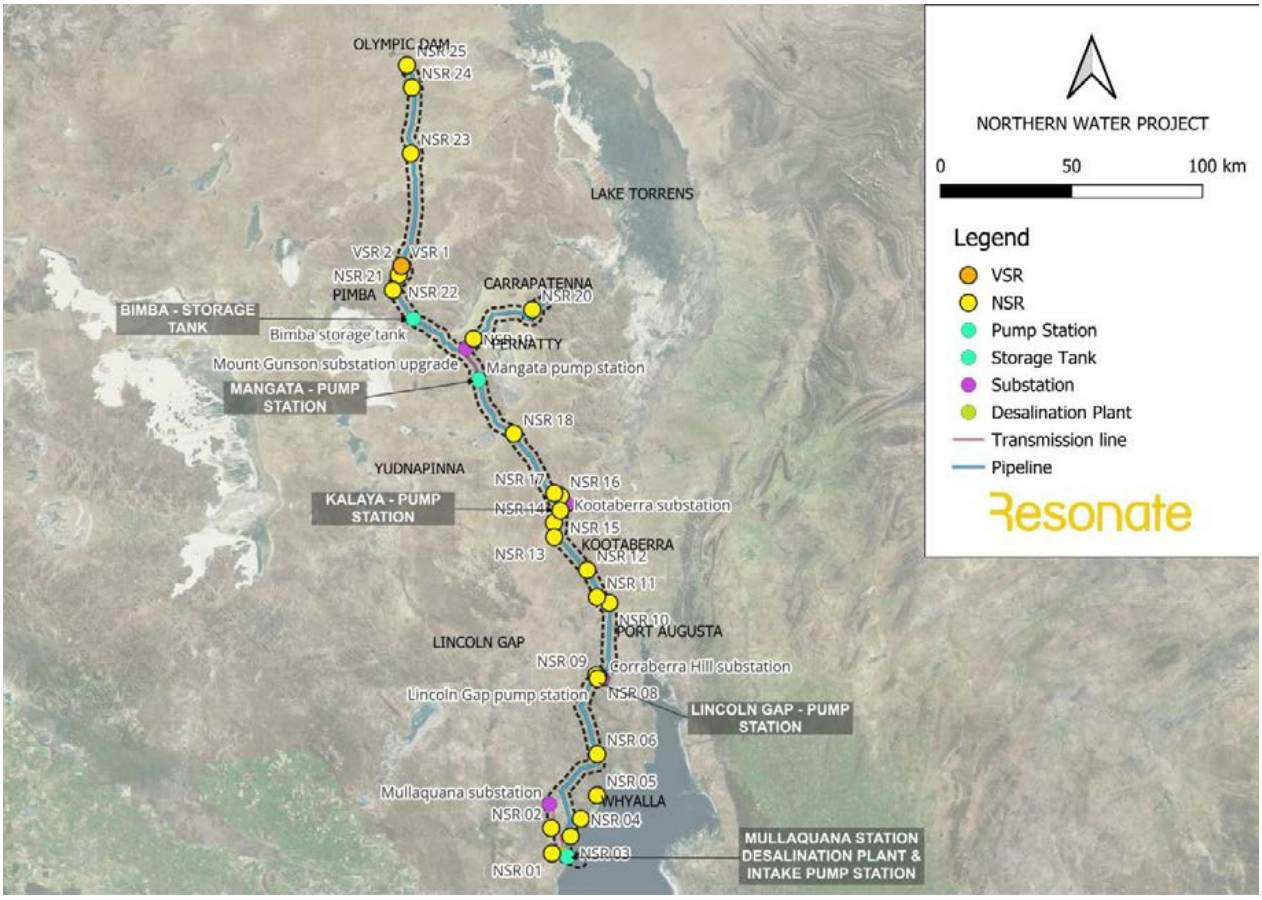


Figure 2 Identified noise sensitive receivers (NSR) and vibration sensitive receivers (VSR)

4.1 Residential and non-residential receptors

Table 4 identifies the nearest noise-sensitive receptors (NSRs) and their corresponding IDs. NSRs located within the defined Project Area for the pipeline have the potential to be affected by construction noise and were therefore included in the assessment. Additional NSRs situated outside the immediate Project Area were also identified where there is potential for operational noise impacts from key project components, including the pump stations, desalination plant, substations and transmission lines.

Table 4 List of identified Noise Sensitive Receivers (NSR)

Project element	Nearest noise sensitive receiver(s)	NSR ID	Type[1]	Distance (m)	NSR zone[2]	Figure reference
Desalination Plant; Pipeline – PS1 to PS2	Mullaquana Station homestead	NSR 01	Residential	4500	Remote Areas	Figure 4
	Whyalla outer West	NSR 04	Residential	4100	Remote Areas	
	Cowleds Landing	NSR 03	Residential	1100	Rural Shack Settlement	
	Whyalla	NSR 05	Residential	7500	General Neighbourhood	
	Nonowie Station	NSR 02	Residential	2200	Remote Areas	
	Whyalla Airstrip	NSR 06	Non - Residential	850	Remote Areas	
PS2 to PS3	The Tanks rest area	NSR 07	Non - Residential	60	Remote Areas	Figure 5
	Lincoln Gap	NSR 08	Residential	420	Remote Areas	
		NSR 09	Residential	1200	Remote Areas	
	Mount Arden	NSR 10	Residential	1700	Rural	
	Carriewerloo area	NSR 11	Residential	1200	Remote Areas	
	North Tent Hill Rest Area	NSR 12	Non - Residential	80	Remote Areas	
	Kootaberra/Yudna pinna	NSR 13	Residential	1900	Remote Areas	
	Hesso Pump Station, Kootaberra	NSR 14	Residential	2350	Remote Areas	
	Ranges View Rest Area	NSR 15	Non - Residential	95	Remote Areas	
PS3 to PS4	Kootaberra rd	NSR 16	Residential	3000	Remote Areas	Figure 6
	Kootaberra	NSR 17	Residential	1500	Remote Areas	
	Oakden Hills Area	NSR 18	Non - Residential	450	Remote Areas	
PS4 to Olympic Dam & Carrapatena	Pernatty area	NSR 19	Non - Residential	900	Remote Areas	Figure 7
	Camel Dam Area	NSR 20	Non - Residential	1400	Remote Areas	
	Purple Downs station	NSR 23	Residential	1850	Remote Areas	
	Roxby Downs Residences	NSR 24	Residential	1000	Remote Areas	

Project element	Nearest noise sensitive receiver(s)	NSR ID	Type(1)	Distance (m)	NSR zone(2)	Figure reference
	Olympic Dam Village	NSR 25	Residential	300	Remote Areas	
	Woomera	NSR 22	Residential	1600	Remote Areas	Figure 7
	Pimba	NSR 21	Residential	500	Remote Areas	
	Philips Pond Homestead Ruins	VSR 1	Non - Residential	60	Remote Areas	
	Philips Pond Cemetery	VSR 2	Non - Residential	200	Remote Areas	

(1) In accordance with the Noise EPP, 'noise affected premises' (i.e. NSR) includes both residential and non-residential land uses, with criteria based on zoning rather than actual, current use. However, the actual land use is a key factor in determining likely noise *impacts*. Indicative NSR type (residential or non-residential) has therefore been determined based on a desktop review of publicly aerial imagery and mapping data. This type classification should be interpreted as preliminary and indicative, noting that some receiver classifications could not be definitively confirmed from available information (for example some Rural stations that are shown as residential in the above table may be abandoned or used for temporary seasonal accommodation only).

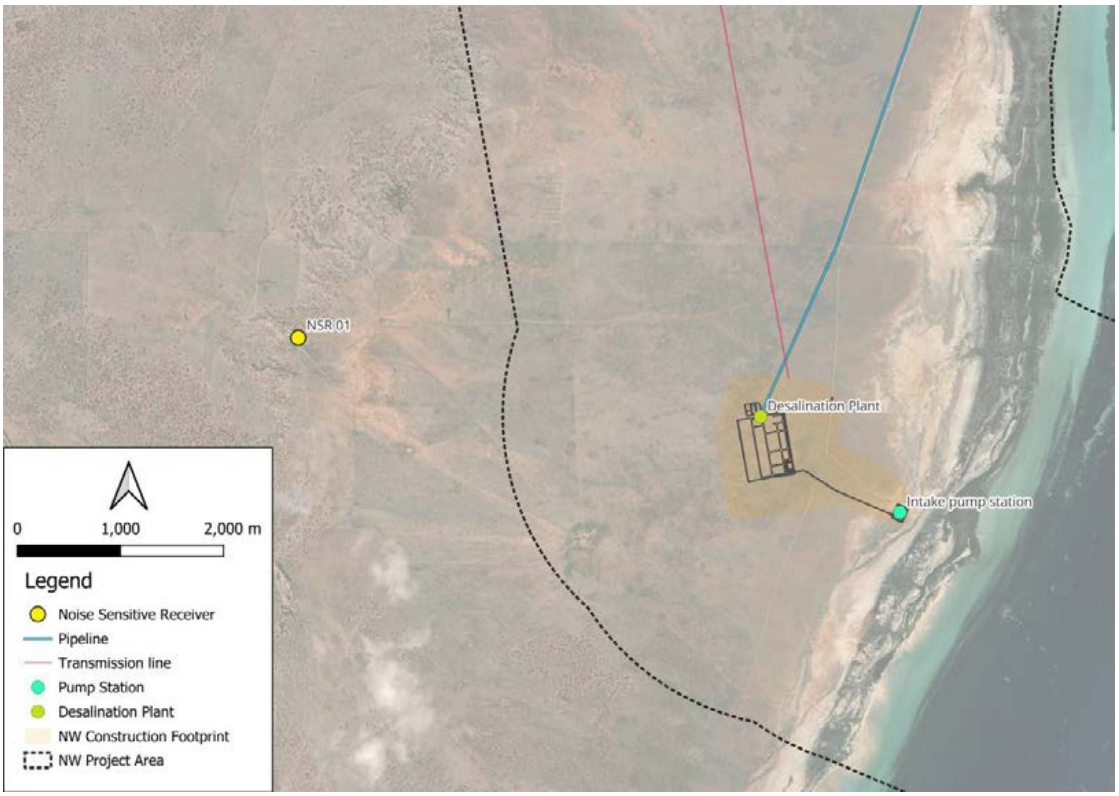


Figure 3 Desalination plant and intake pump station noise sensitive receiver

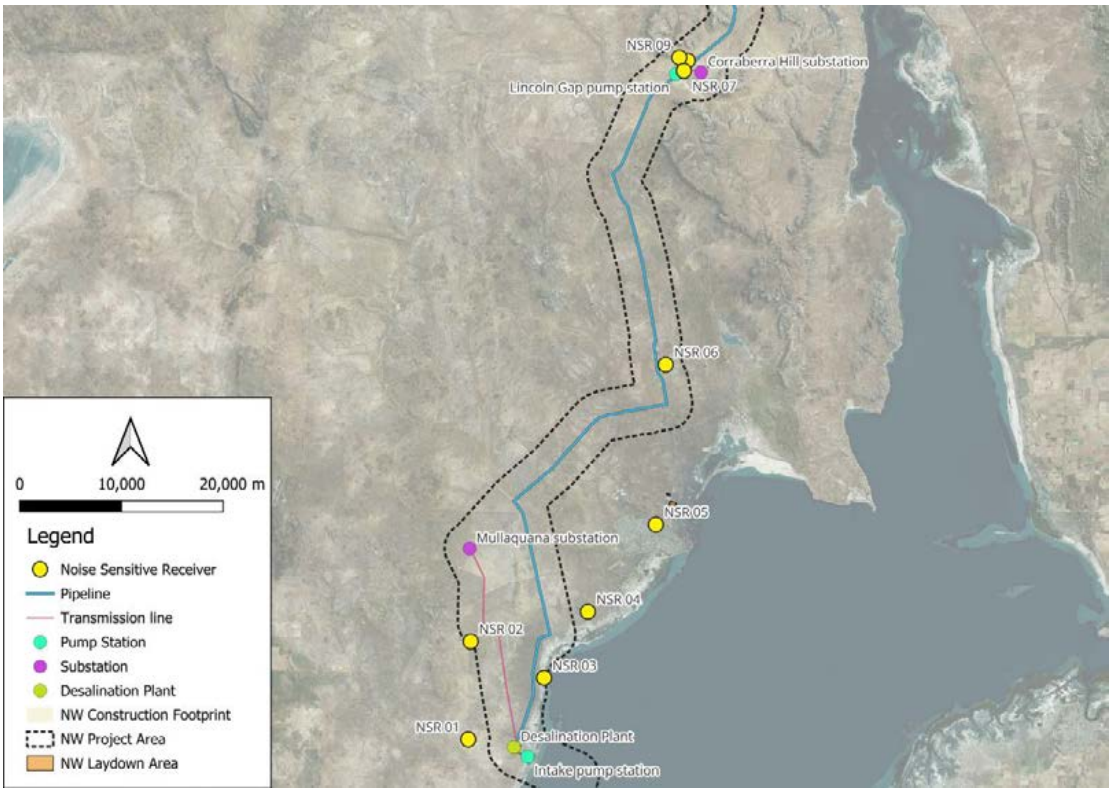


Figure 4 Noise sensitive receivers from Desalination plant to Lincoln Gap Pump station

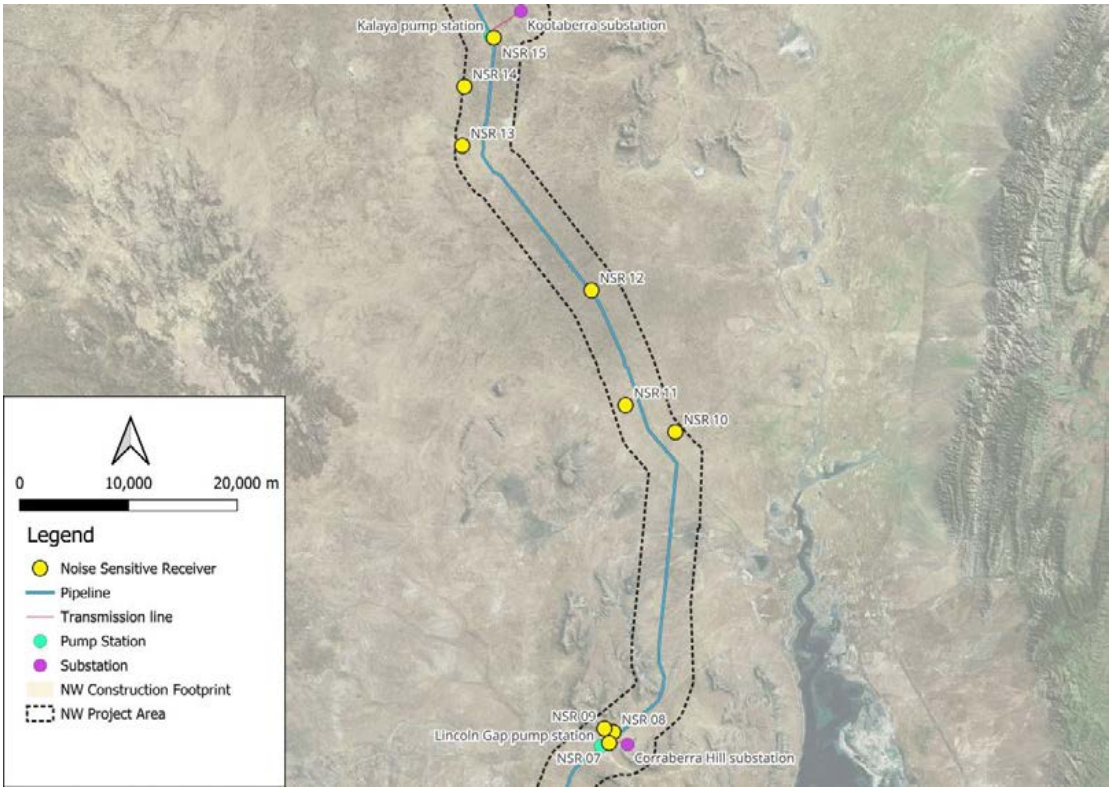


Figure 5 Noise sensitive receivers from Lincoln Gap Pump station Kalaya Pump Station

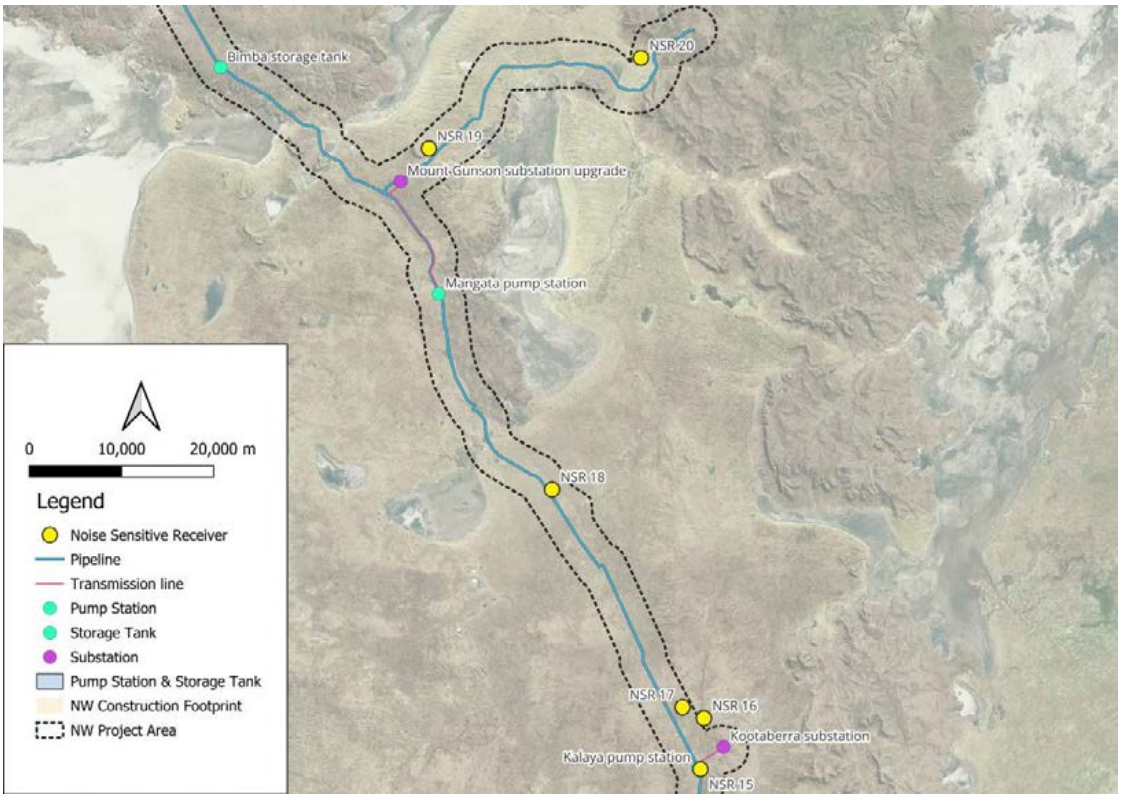


Figure 6 Noise sensitive receivers from Kalaya Pump Station to Mangata Pump Station

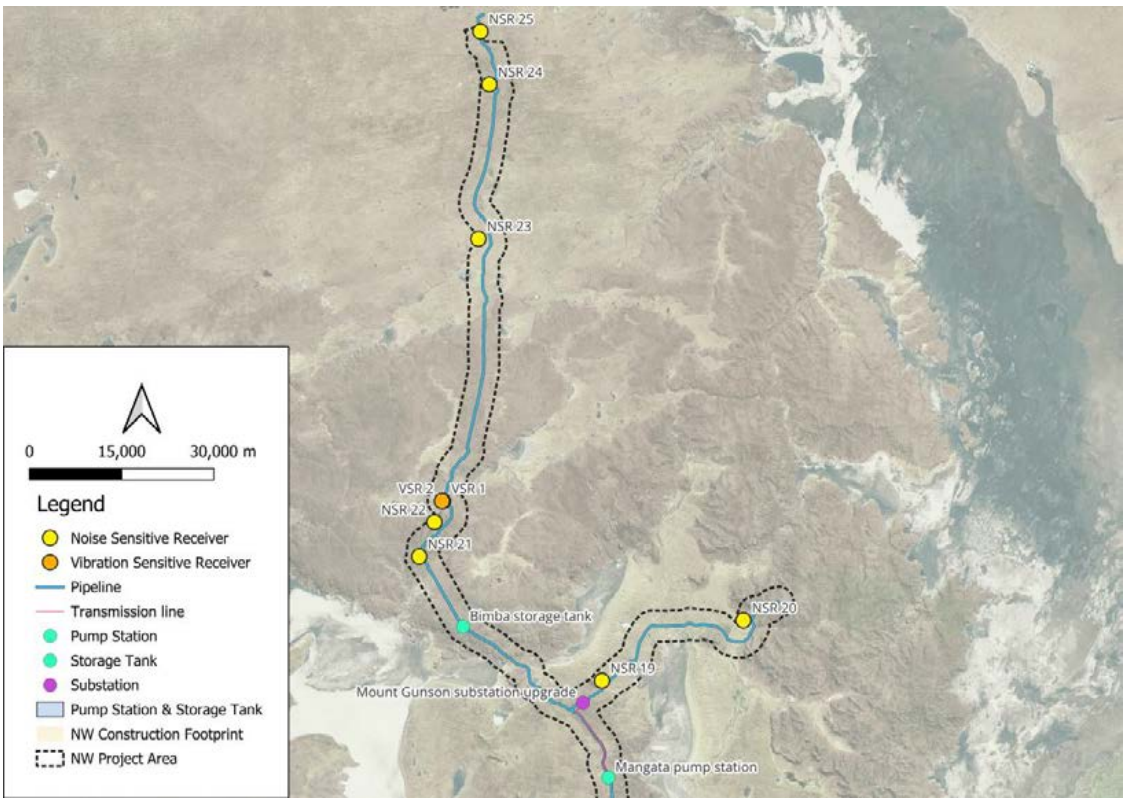


Figure 7 Noise sensitive receivers from Mangata Pump Station to Olmypic Dam & Carapateena

4.2 Heritage structures

The nearest heritage structure to the proposed works is the *Phillips Ponds Homestead ruins* and *graveyard*, a non-Aboriginal heritage site, located approximately 50 metres southwest of the proposed pipeline alignment. While the Phillips Ponds ruins are not formally protected under heritage legislation nor recorded on any heritage register, they remain a notable local landmark familiar to remote area travellers. Refer to Table 5 for further details.

Table 5 Identified heritage structures near the pipeline construction

Name	Image	Description
Phillips Ponds Homestead ruins – VSR 1		Ruins located approximately 50 m west from proposed pipeline construction
Phillips Ponds Outstation Cemetery – VSR 2		Cemetery located approximately 200 m west from the pipeline construction

4.3 Flora and fauna

The project team identified several terrestrial fauna species, including threatened birds and mammals, that may be sensitive to construction and operational noise associated with the Northern Water Project. Potential noise impacts on fauna include masking of communication and predator-detection cues, temporary behavioural responses (such as startle or flight), and short-term disruption to foraging, roosting and breeding.

There are three threatened species listed under the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) and/or National Parks and Wildlife Act 1972 (SA) (NPW Act) may occur within or adjacent to the alignment: the Western Grasswren, Plains Mouse and Southern Whiteface. Of these, the Western Grasswren is the most sensitive and forms the basis of the fauna noise criteria.

5 Assessment criteria

5.1 National Legislation

5.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the central piece of environmental legislation relevant to this assessment. It provides the legal framework to protect and manage nationally and internationally important biota, ecological communities and heritage places, which are defined in the Act as 'matters of National Environmental Significance' (MNES). Under the provisions of the Act, it is an offence for any person to take an action that is likely to have a significant impact on MNES without approval.

5.2 State Legislation

5.2.1 Environment Protection Act 1993

The general environmental duty in section 25 of the *Environment Protection Act 1993* (EP Act) states that:

> A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

5.2.2 Fisheries Management Act 2007

Section 77 of the *Fisheries Management Act 2007* (FM Act) states that a person must not engage in an operation involving or resulting in interference with aquatic animals of any waters forming part of an aquatic reserve, except as authorised by the regulations or a permit issued by the Minister.

5.2.3 Heritage Places Act 1993

The *Heritage Places Act 1993* (*HP Act*) makes provision for the identification, recording and conservation of places and objects of non-Aboriginal heritage significance; to establish the South Australian Heritage Council; and for other purposes.

5.2.4 Local Nuisance and Litter Control Act 2016

The *Local Nuisance and Litter Control Act 2016* (*LNLC Act*) is administered by local government and provides the community with an effective and consistent local service for the management of nuisance complaints and heightened deterrence for littering and illegal dumping. The *LNLC Act* is designed so that the majority of activities licensed by the EPA are excluded as these are already regulated under the *EP Act*.

In most cases, the responsible authority for managing construction noise that is not associated with public infrastructure works is the local council under the *LNLC Act*. However, the Environment Protection Authority (EPA) is responsible for managing construction noise at sites where an authorisation to conduct an activity of environmental significance applies.

The LNLC Act declares construction noise a local nuisance in Part 2 (section 4 (a)(i)):

> (c) in the case of construction noise—the noise has travelled from the location of the construction activity to neighbouring premises—
>
> on any Sunday or public holiday; or
>
> after 7pm or before 7am on any other day;
>
> …

and

(ii) that the level, nature or extent of the noise (including its volume, pitch, vibrational frequency, prevalence or frequency of occurrence) is such as to constitute an unreasonable interference with the enjoyment of the neighbouring premises by persons occupying those premises.

5.2.5 National Parks and Wildlife Act 1972

Section 68 of the *National Parks and Wildlife Act 1972* (NPW Act) states that a person must not interfere with, harass or molest a protected animal, or undertake or continue an act or activity that is, or is likely to be, detrimental to the welfare of a protected animal unless authorised by a permit granted by the South Australian Department for Environment and Water. The marine mammal species listed as 'protected animals' under the Act are also listed under the EPBC Act.

5.2.6 Planning, Development and Infrastructure Act 2016

The *Planning, Development and Infrastructure Act 2016* (*PDI Act*) provides for matters that are relevant to the use, development and management of land and buildings, including by providing a planning system to regulate development within the State, rules with respect to the design, construction and use of buildings, and other initiatives to facilitate the development of infrastructure, facilities and environments that will benefit the community. The Project is an impact assessed development under the PDI Act, with this NVIA forming part of the Environmental Impact Statement (EIS).

5.3 Operational phase noise criteria

5.3.1 Planning & Design Code

The zoning of the subject site (noise source) and the nearest noise-affected premises are as outlined in Table 6.

Table 6 Summary of zones/subzones

Site Location	Zone / Subzone	Receiver Zone / Subzone
Desalination Plant – Mullaquana Station	Remote Areas (RA)	Remote Areas (RA)
Intake Pump Station – Mullaquana Station	Conservation (Con)/ Visitor Experience (Vex)	Remote Areas (RA)
Pump Station 2 – Lincoln Gap	Remote Areas (RA)	Remote Areas (RA)
Pump Station 3 – Kalaya	Remote Areas (RA)	Remote Areas (RA)
Pump Station 4 – Mangata	Remote Areas (RA)	-Nil-(1)

(1) No nearby noise sensitive receivers identified within a 5km radius

The Desired Outcomes, Performance Outcomes, and Designated Performance Features of the zones/subzones have been used by the EPA in their *Indicative Noise Factor Guidelines* to determine appropriate land use categories and indicative noise factors used to derive environmental noise criteria (refer to Section 5.3.1 for further details).

5.3.2 Environmental noise policy

Environmental noise emissions from the operation of the plant on the subject site should comply with the *Environment Protection (Commercial & Industrial Noise) Policy* 2023 (the Noise Policy).

As noted in Section 5.3.1, the environmental noise criteria are based on the land use categories determined based on the principal land uses outlined in the Planning & Design Code for the noise source and noise-affected premises. The land uses and indicative noise factors are as shown in Table 7 and Table 8. Note that the indicative noise factors in Table 7 are used where the noise source and noise affected premises falls within the same land use category (being only General Industry and Special Industry). In all other cases the indicative noise factors in Table 8 are to be used.

Table 7 Excerpt from Noise Policy—Table 1(subclause(1)(a))

Land use category	Indicative noise factor dB(A)	
	Day (7 am to 10 pm)	Night (10 pm to 7 am)
General industry	65	65
Special industry	70	70

Table 8 Excerpt from Noise Policy—Table 2(subclause(1)(b))

Land use category	Indicative noise factor dB(A)	
	Day (7 am to 10 pm)	Night (10 pm to 7 am)
Rural living	47	40
Residential	52	45
Rural industry	57	50
Light industry	57	50
Commercial	62	55
General industry	65	55
Special industry	70	60

Based on the land use categories as outlined in the EPA's *Indicative Noise Factor Guidelines*, the relevant criteria for the noise-affected premises in each zone are as outlined in Table 9. In accordance with Part 5 of the Noise Policy, the relevant criteria are the average of the relevant indicative noise factors less 5 dB(A).

Table 9 Summary of zones, land uses, and Noise Policy criteria

Site	Zone/subzone	Land use categories	Receiver zone/subzone	Noise Sensitive Receiver Land use categories	Criteria, L_{Aeq}	
					Day (7 am to 10 pm)	Night (10 pm to 7 am)
Desalination Plant	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	52	44
Intake pump station	Conservation (Con)/ Visitor Experience (Vex)	Rural Living	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	47	40
Desalination Plant + Intake pump station (1)	Remote Areas (RA) + Conservation (Con)/ Visitor Experience (Vex)	Rural Living, Residential, Rural Industry, Commercial, General Industry + Rural Living	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	50	42
Lincoln Gap Pump Station	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	52	44
Kalaya Pump Station	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	52	44
Mangata Pump Station	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	Remote Areas (RA)	Rural Living, Residential, Rural Industry, Commercial, General Industry	52	44

(1) This criterion will be applicable when both the Desalination Plant and Intake pump station are operating at the same time and as it would be considered a cumulative noise source.

For information, the land use categories as nominated in Table 9 are presented in Figure 8.

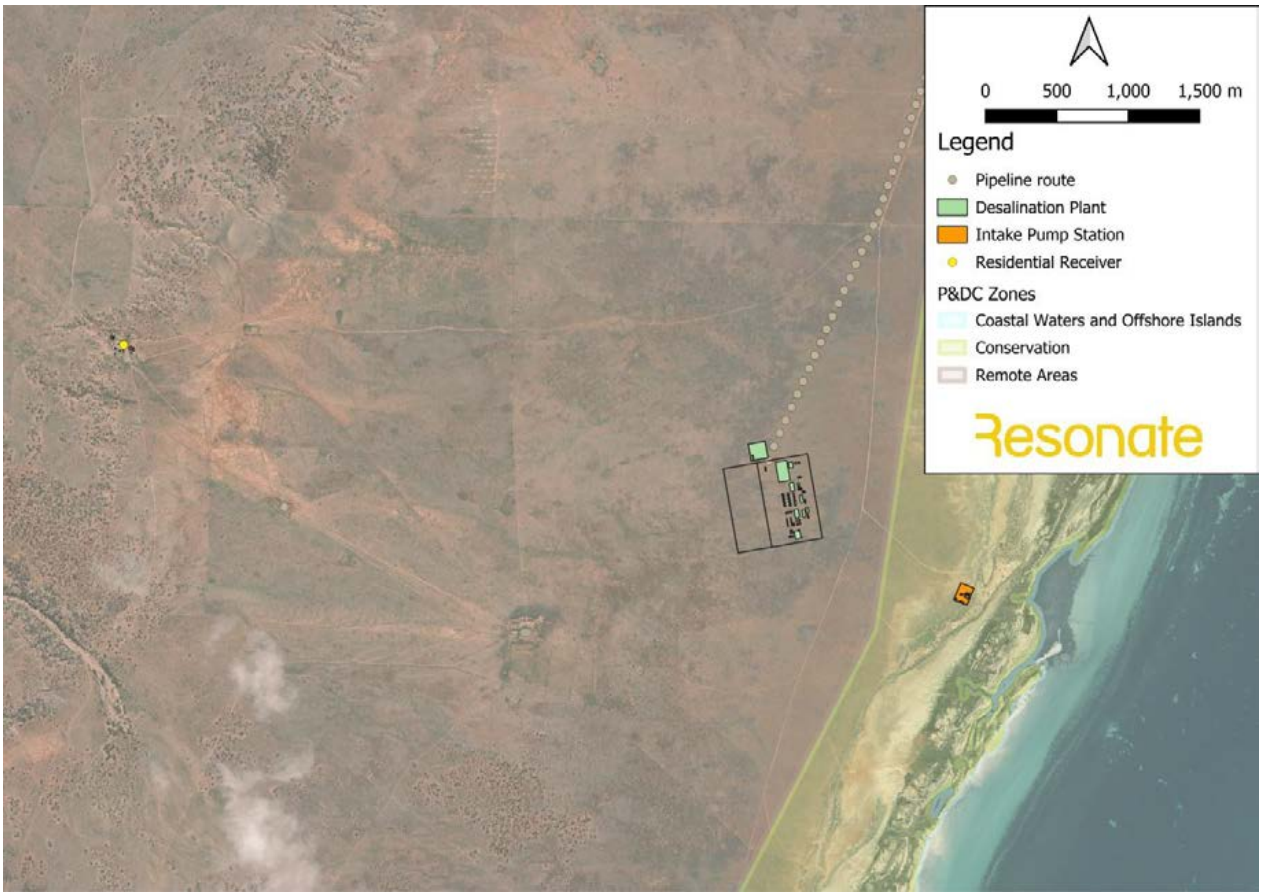


Figure 8 Land use categories for Desalination plant and Intake Pump Station land zoning

5.3.3 Noise characteristics

Under the Noise Policy, noise that exhibits annoying characteristics attracts a penalty to account for such noise being more noticeable and annoying when compared to constant, broadband or steady noise. For a penalty to be applied, the characteristic must dominate the overall noise impact at the receiver, rather than being part of it.

Table 10 outlines the noise characteristics and their subjective test as outlined under the *Guidelines for the use of the Environment Protection (Commercial and Industrial Noise) Policy 2023* (the Guidelines).

Table 10 Subjective tests for noise characteristics

Noise characteristic	Subjective test under the Guidelines[1]
Low frequency	A noise source that attracts a low frequency characteristic will often be described as something with a rumbling, rolling, roaring or booming noise that is clearly audible above everything else. Some examples include the noise from a freight train locomotive as it moves away from a resting position, a jet aircraft taking off or the rumbling sound of thunder in nature.

Noise characteristic	Subjective test under the Guidelines[1]
Tonal	A noise source that attracts a tonal characteristic will often be described as something with a pitch or sharply defined note that is clearly audible above everything else. Some examples include the noise from tonal reversing signal on a truck, a whistle, the squealing generated by train wheels going around curves, or the distinctive note that can be heard from an unmuffled high performance motor held at constant speed. Note that the reversing signal on a truck may attract a penalty for a modulating characteristic due to the rise and fall of sound and a penalty for a tonal characteristic due to the distinctive tone used to attract attention, but only if both dominate the noise impact and are not simply audible in the ambient noise. A tonal characteristic would not be applied to a noise that only exhibited tonality at an instant in time. An example is the noise from a wailing siren. At any instant in time, a wailing siren exhibits a tone, but this tone moves across the frequency spectrum over time to generate a modulating noise.
Impulsive	Impulsive noise characteristics can be described as the sudden onset of a sound. A noise source that attracts an impulsive characteristic will often be described as something with a thumping, banging or impact noise that is clearly audible above everything else. It is distinguished by a sharp rise in noise level. Some examples include the noise from a heavy mechanical press that consistently produces an impact noise as it stamps out a metal template, the noise from the dropping of material that causes a short burst of loud sound as the material hits the ground, or the noise of heavy hammering and banging from a workshop area. An impulsive characteristic would not be applied to a noise that simply varies in level. The modulating characteristic is established to deal with such a noise. A short burst or impact, or series of impacts, need to be present to apply the impulsive characteristic.
Modulating	A noise source that attracts a modulating characteristic will often be described as something with a cyclical, varying, fluctuating, pulsating, or changing noise characteristic that is clearly audible above everything else. Modulation can occur to the measured noise level of a source. The most common case for noise with such characteristics is moving equipment that are out of balance (such as a fan) or in the case of a forklift moving about on a loading zone. It can also occur due to a change to the frequency content, as in the case of a wailing siren. Modulation noise characteristics would also apply to regular truck movements coming in and out of a subject site. The modulation, or rise and fall of the sound, can also occur over a short period, such as the bark from an engine brake, which rises and falls in level many times over a one-second period, or the noise experienced when the rear window of a car is left down, and the speed of the vehicle is sufficient such that the wind noise produces a pulsing sound.
Intermittent[2]	Subjectively, a noise source has intermittent noise characteristics if it is described as a noise that comes and goes, or starts and stops. This could apply to a generator that operates sporadically (starts and stops multiple times) during an assessment period. The intermittent noise characteristics may also be applicable for situations when the noise characteristics themselves are intermittent in nature.

(1) The descriptions for the subjective tests are directly from the Guidelines.

(2) Only applicable during the nighttime period (10 pm to 7 am).

These characteristics are considered in the assessment of the predicted noise levels at the receivers. Refer to Section 8 for further information.

5.4 Operational vibration criteria

5.4.1 Vibration targets for human comfort

Vibration screening criteria applicable to occupied spaces within buildings are detailed in Table 11.

The screening criteria are derived from British Standard BS 6472-1:2008 *Guide to evaluation of human exposure to vibration in buildings* and the guidance document *Assessing Vibration: A technical guideline* (NSW Department of Environment and Conservation, 2006).

The vibration criteria are given as a range, with the lower value indicating the preferred vibration level and the upper value representing the maximum.

Table 11: Human comfort vibration screening criteria

Sensitive receiver	Vibration Screening Criteria Vibration Velocity (PPV) mm/s	
	Day	Night
Critical working areas(1) (for example, hospital operating theatres)	0.14 – 0.28	
Residential	0.28 – 0.56	0.2 – 0.4
Other non-residential buildings	0.56 – 1.1	

(1) This does not include sensitive research or manufacturing equipment (for example lithography or microscopy) which may be affected by vibration levels below the threshold of human perception. Specialist advice should be sought where this equipment exists adjacent the project area of works.

The vibration criteria presented above are conservative screening levels and it does not necessarily follow that an exceedance will result in disturbance.

5.5 Waste collection

Noise from waste collection activities is not regulated under the Noise Policy; however the *Local Nuisance and Litter Control Act* 2016 (LNLC Act) provides a means to assess noise from waste collection at a commercial premises.

The requirements for under the LNLC Act for this source are outlined in Table 8.

Table 12 Requirements of the LNLC Act

Description	Example noise sources	Nuisance trigger
Waste collection	Waste collection	If it is considered that that the noise has travelled from the place at which it was generated to neighbouring premises: • before 9am or after 7pm on any Sunday or public holiday; or • after 7pm or before 7am on any other day.

With respect to noise, the LNLC Act was written to utilise subjective compliance assessments and therefore does not include any specific noise goals.

We note that the LNCL Act is used to assess whether an existing noise source constitutes a local nuisance. It is not intended to be used during the planning stage. However, the LNLC Act requirements regarding noise associated with waste collection are to provide a restriction on the hours on when the waste collection activities to be occurred once the development is operational and should be considered at the planning stage.

6 Construction noise and vibration criteria

6.1 Construction noise

Schedule 1 of the *Environment Protection (Commercial and Industrial Noise) Policy 2023* excludes all construction noise, including demolition, site preparation, building works, vehicle movements, and worker activities at or near a construction site. Instead, construction noise is regulated under the LNLC Act and/or under the general environmental duty GED applicable under the EP Act.

The LNLC Act was written to utilise subjective compliance assessments and therefore does not include any specific noise goals. As a result, reference is made to several other guidelines which are generally used for setting noise targets for construction activities.

6.1.1 DIT EHTM Attachment 7D Guidelines (noise)

The Department of Infrastructure and Transport (DIT) *Guideline for the management of noise and vibration: Construction and maintenance activities,* 2021 (EHTM Attachment 7D) are considered the most appropriate guidance for management of construction noise.

Noise level targets for short, medium and long-term infrastructure construction works are outlined in EHTM 7D (also based on NZS 6803:1999 "Acoustics – Construction Noise") and are given here in Table 13. The project will fall under the "Long Term Works" duration.

Table 13: Construction Noise Level Targets for Noise Sensitive Land Uses

Day and time of works		Noise level targets in dB(A) for different duration works					
Day of week	Time period	Short Term Works Up to 2 nights		Medium Term Works 3 – 14 nights		Long Term Works Exceeds 14 nights	
		$L_{eq,15min}$	L_{max}	$L_{eq,15min}$	L_{max}	$L_{eq,15min}$	L_{max}
Weekdays	0600-0700	65	75	60	75	55	75
	0700-1900	See EPA Information Sheet "*Construction Noise*" *					
	1900-2200	75	90	70	85	65	80
	2200-0600	45	75	45	75	45	75
Saturdays	0000-0700	45	75	45	75	45	75
	0700-1900	See EPA Information Sheet "*Construction Noise*" *					
	1900-2400	45	75	45	75	45	75
Sundays and Public Holidays	0000-0900	45	75	45	75	45	75
	0900-1900	See EPA Information Sheet "*Construction Noise*" *					
	1900-2400	45	75	45	75	45	75

* During standard hours, EHTM 7D states that construction noise should be managed in accordance with SA EPA requirements to take reasonable efforts to minimise daytime construction noise.

In accordance with EHTM Attachment 7D, all reasonable and practicable mitigation measures are to be implemented for works where the construction noise level targets are predicted or measured to be exceeded.

6.1.2 Australian Standard 2436

Australian Standard AS 2436 *Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites* provides general guidance in relation to noise and vibration from construction, demolition and maintenance sites as it affects persons working on these sites and also those living and working in the neighbourhood.

We note that the intent of AS 2436 is consistent with DIT's *EHTM Attachment 7D* and has significant overlap in relation to management and mitigation requirements for construction noise and vibration. However, DIT *EHTM 7D* specifically addresses management of noise and vibration from construction and maintenance activities on South Australian major public infrastructure projects and is therefore of greater relevance to assessment of noise and vibration impacts from this Project.

6.1.3 Summary of construction noise criteria

Construction noise is regulated under the LNLC Act and the general environmental duty of the EP Act, both of which provide broad, overlapping requirements for managing nuisance and avoiding unreasonable noise impacts. Where construction works are associated with activities of environmental significance requiring EPA authorisation (such as concrete batching plants or water treatment facilities), noise may also be regulated directly by the EPA under the EP Act. AS 2436:2010 also offers general guidance on construction noise and vibration control, but like the LNLC Act, it is not project-specific and applies broadly across construction activities.

The DIT *EHTM Attachment 7D* guideline is the most appropriate framework for this Project because it consolidates and builds on the intent of the EP Act, LNLC Act and AS 2436; provides explicit noise level targets; and is specifically designed for major public infrastructure works in South Australia. It therefore offers clearer, more relevant and more practical direction for setting and managing construction noise criteria for the Project.

6.2 Construction vibration

Ground vibrations from construction works as part of the Project can have the following effects:

- Human disturbance – disturbance to building occupants: vibration which inconveniences or interferes with the activities of the occupants or users of the building.
- Effects on building structures, including underground pipework – vibration which may compromise the condition of the building structure itself.
- Disruption or damage to sensitive equipment.

6.2.1 DIT EHTM Attachment 7D Guidelines (vibration)

The Department for Infrastructure and Transport's (DIT) *Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities*, available as Attachment 7D to DIT's Environment and Heritage Technical Manual are typically adopted as part of the vibration management framework for infrastructure projects in South Australia.

For human comfort, the DIT guideline identifies vibration levels of 0.35–0.5 mm/s, above which vibration "might be felt to cause annoyance and concern," referencing *AS 2670.2 – Evaluation of human exposure to whole-body vibration in buildings (1–80 Hz).*

For limiting vibration levels such that the damage to structures or buried infrastructure is avoided, the DIT guideline references the requirements of German Standard DIN 4150-3 *Structural Vibration, Part 3 – Effects of Vibration on Structures.*

6.2.2 Australian Standard 2436

Australian Standard AS 2436 *Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites* provides broad guidance on the prediction, assessment and management of construction-related vibration. The standard outlines recommended practices for minimising vibration impacts on both site personnel and surrounding sensitive receivers, including guidance on equipment selection, work methods, separation distances, monitoring, and the application of feasible and reasonable vibration control measures.

The intent of AS 2436 is consistent with the principles embedded in DIT's *EHTM Attachment 7D*, with substantial overlap in recommended management and mitigation approaches for construction vibration. However, DIT *EHTM 7D* is specifically tailored to South Australian major public infrastructure works and provides clearer direction on vibration management within this jurisdiction. Accordingly, while AS 2436 offers valuable supporting guidance, DIT *EHTM 7D* is considered the more relevant primary reference for assessing and managing construction vibration impacts for this Project.

6.2.3 DIN 4150-3

German Standard DIN 4150-3 *Structural Vibration, Part 3 – Effects of Vibration on Structures* is a suitable reference for guideline vibration limits to avoid cosmetic and structural damage to buildings. The following DIN 4150-3 values are specified as PPV levels measured in any direction at or adjacent to the building foundation. The presented levels in Table 14 are the lowest applicable limit for each structure category.

Table 14: DIN 4150-3 Vibration guideline values

Reference: DIN 4150, Part 3, Table 1	**Vibration Velocity, mm/s (PPV)**			
	At foundation, at a frequency of:			**Plane of floor of uppermost storey**
Type of Structure	**<10Hz**	**10-50Hz**	**>50Hz**	**All frequencies**
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 - 40	40 - 50	40
Dwellings and buildings of similar design and/or use	5	5 - 15	15 - 20	15
Structures that because of their particular sensitivity to vibration do not correspond to those listed above and have intrinsic value	3	3 - 8	8 - 10	8

DIN 4150-3 states that exposing buildings to vibration levels higher than that recommended above would not necessarily result in damage. Rather it recommends these values as maximum levels of short-term construction vibration at which experience has shown that damage that reduces the serviceability of structures will not occur due to vibration effects. DIN 4150-3 is considered to be suitable for the assessment of both structural and cosmetic damage as the Standard considers a reduction in serviceability of the structure is deemed to have occurred if:

- Cracks form in plastered surfaces of walls
- Existing cracks in the building are enlarged
- Partitions become detached from loadbearing walls or floors.

Underground infrastructure

The DIN 4150 also provides guidelines for the short-term vibration exposure of buried pipelines. The guidelines provide peak particle velocity (PPV) vibration limits applicable at the pipe surface in any of the three orthogonal directions (i.e. x, y, z). These limits are provided in Table 15.

Table 15: Underground Pipework Vibration Limits

Pipe material	Peak Particle Velocity (PPV) limit, mm/s
Steel (including welded pipes)	100
Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	80
Masonry, plaster	50

It is noted that these limits are based on pipework built to modern construction standards. Where the integrity of the pipework is uncertain, further investigation may be required.

6.2.4 Electrical and communications infrastructure

If construction activities occur in close vicinity of existing electrical and communications infrastructure the vibration goals presented in the Australian Coal Industry's Research Program (ACARP) Report *Effect of Blasting on Infrastructure, ACARP Project No C14057*, dated 20 October 2008 will be utilised (presented in Table 16).

Table 16: Suggested vibration limits near electrical and communications infrastructure

Service	Peak Particle Velocity (PPV) limit, mm/s
Power lines – concrete and timber poles	100
Power lines – steel towers	100
Buried communication cables and pipelines	100

6.2.5 Summary of vibration noise criteria

The DIT EHTM Attachment 7D, which references DIN 4150 for structural vibration thresholds, will guide the implementation of mitigation measures, monitoring, and management of sensitive receivers, including human comfort.

Construction vibration associated with the Project will be assessed against DIN 4150-3, which provides limits to protect buildings, buried pipework, and other sensitive structures from structural and cosmetic damage.

Advisory levels of 0.35–0.5 mm/s (from AS 2670.2) are adopted to indicate vibration that may be perceptible and cause annoyance.

AS 2436:2010 will inform practical measures such as equipment selection, work sequencing, and operational techniques to minimise perceptible vibration. This combined framework ensures that vibration impacts are managed effectively, protecting both structures and occupants while supporting the efficient delivery of construction works.

7 Baseline noise monitoring

7.1 Details

Baseline noise monitoring was undertaken by Resonate Consultants at Mullaquana Station and Kootaberra over a period of 14 days between 15 May 2025 to 28 May 2025 to capture the existing ambient noise environment at adjacent land uses near the project. Additional baseline noise monitoring results from a campaign undertaken by Jacobs (Document no: IS449300-1-NW-RPT-007) at Lincoln Gap from 15 November 2023 to 23 November 2023 are also included in the summary below.

The monitoring results with respect to the subject site are presented in Appendix A—Daily measured noise levels.

7.2 Instrumentation

The noise measurements were taken with the equipment summarized in Table 17 below. The Rion NL-42 sound level meter is a Type 2 instrument suitable for field and laboratory use. The sound level meter was calibrated both before and after the measurements using a Type 1 Brüel & Kjær 4231 (Serial Number: 2528316) sound level calibrator, and the calibration was found to have not drifted. Both the sound level meters and calibrators carry current calibration certificates from a NATA accredited laboratory. Copies of the calibration certificates are available on request.

Table 17 Baseline noise monitoring equipment summary (Resonate Consultants)

Date	Location ID	Location Name	Equipment	Serial Number
15/05/2025 – 19/05/2025	NL1	Kootaberra (representative of Kalaya pump station)	Rion NL-42	00946976
15/05/2025 – 28/05/2025	NL2	Mullaquana Station	Rion NL-42	01000321

Table 18 Baseline noise monitoring equipment summary (Jacobs document no: IS449300-1-NW-RPT-007)

Date	Location ID	Location Name	Equipment	Serial Number
15/11/2023 – 23/11/2023	Lincoln Gap	Lincoln Gap	Svantek 307A	115294

Exclusions have been made based on periods where the measured noise levels may have been influenced by weather, namely where wind speed exceeded 5 m/s or rainfall exceeded 0.2 mm/hr in a given period, based on weather data recorded at the nearest BOM station (NL1 - Olympic Dam Aerodrome, Station 016089), (NL2 – WHYALLA (Mullaquana), Station 018058).

Figure 9 and Figure 10 details the respective logger locations conducted by Resonate Consultants. Note that the noise monitor near the Kalaya pump station was situated at a similar distance from the highway as the Ranges View Rest Area but on the opposite side of the road, where the noise levels would be similar. Figure 11 references the Lincoln Gap logger location conducted by Jacobs (document no: IS449300-1-NW-RPT-007).

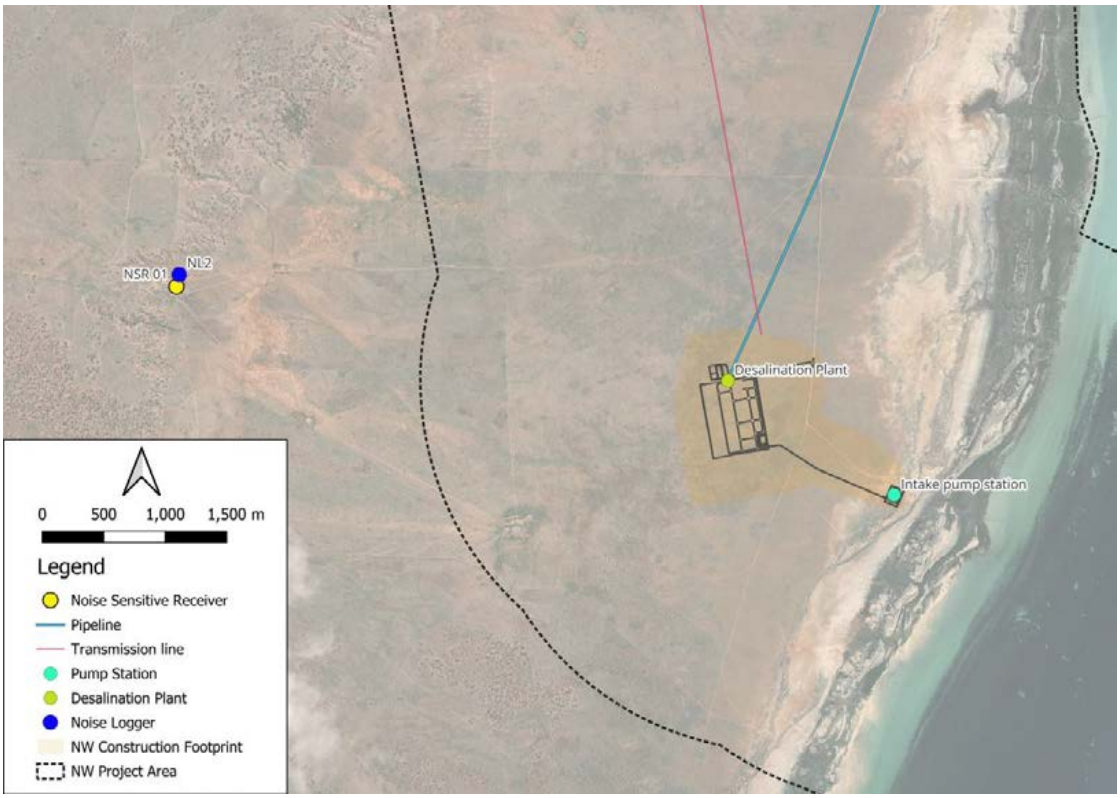


Figure 9 Mullaquana Station Logger location

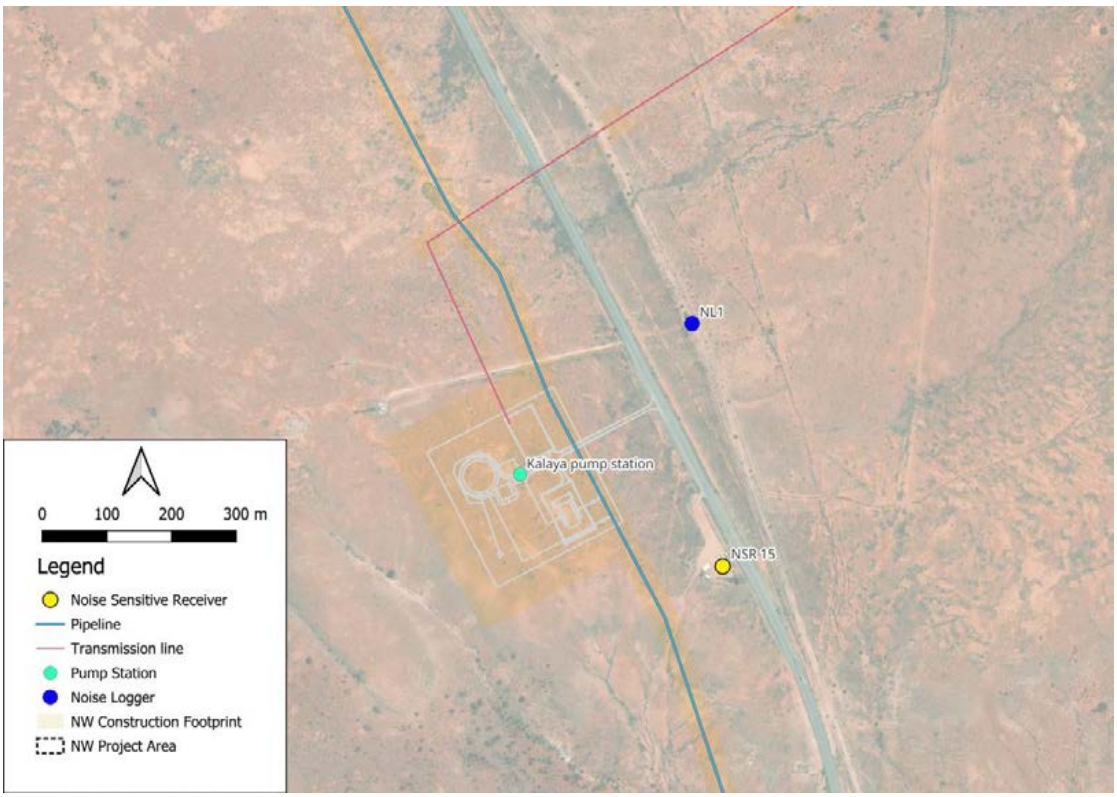


Figure 10 Kalaya logger location

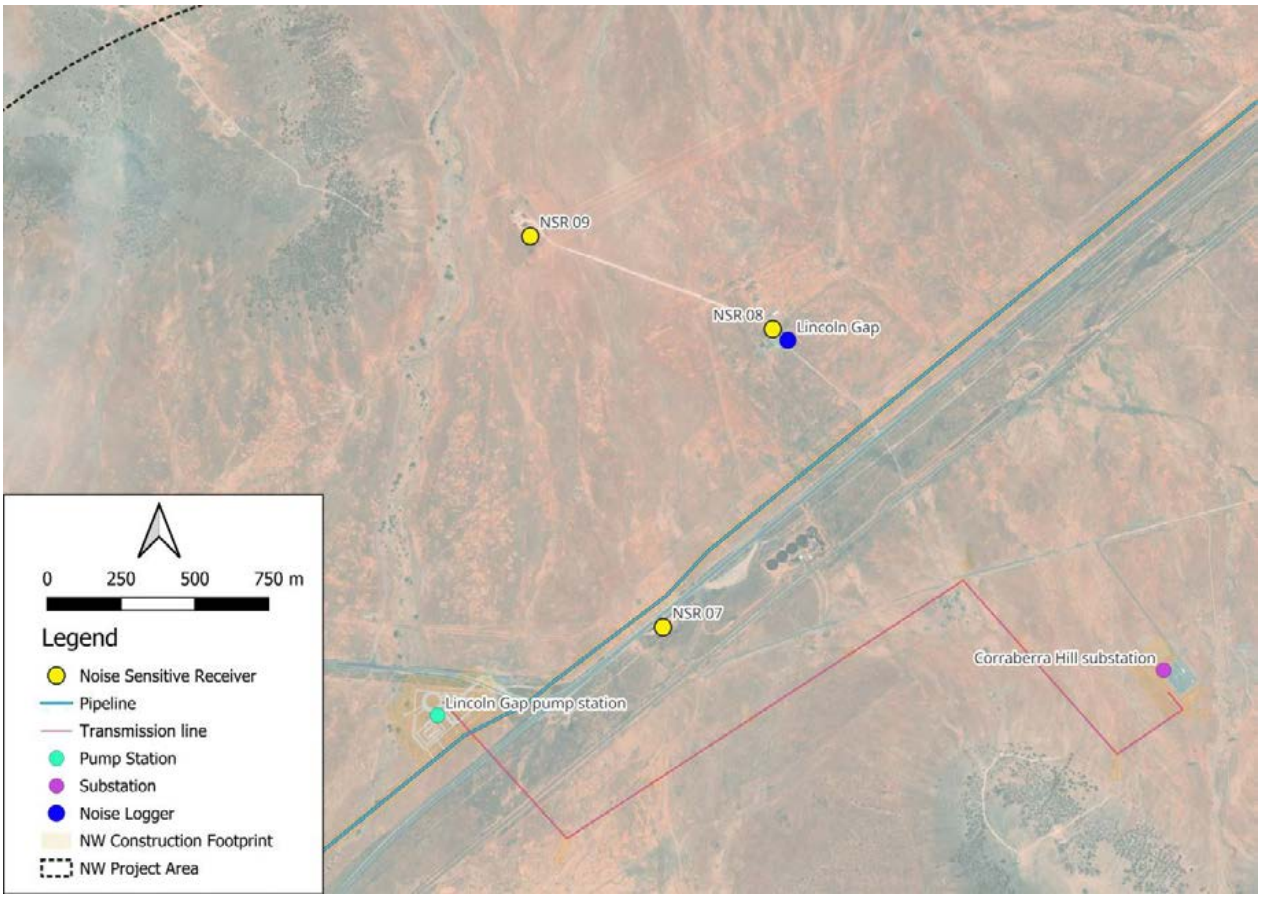


Figure 11. ***Baseline noise monitoring location - Lincoln Gap (Jacobs document no: IS449300-1-NW-RPT-007)***

7.3 Procedure

Noise measurements conducted by Resonate were undertaken in accordance with the following:

- The microphone of the sound level meter was at a height of approximately 1.2 metres above the ground and at least 3.5 metres away from any wall or facade.
- The axis of maximum sensitivity of the microphone of the sound level meter was directed towards the noise source.
- A wind shield was used during all measurements, and the measurements were undertaken during a calm, still night (for which the wind velocity did not exceed 5 m/s).
- Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration or electrical interference.
- Noise logging was undertaken in 15-minute intervals.

7.4 Results

A brief summary of the average measured noise levels during the monitoring period is presented in Table 19 and Table 20. Plots of the daily measured levels are attached to this report as Appendix A—Daily measured noise levels.

Table 19 Noise monitoring results summary - Day

Location	Type/SN	Date period	Range of measured noise level dB(A)		Maximum noise level dB(A)
			$L_{eq, 15min}$	Min $L_{90, 15\ min}$	L_{Fmax}
Kalaya	NL-42 00946976	15/05/2025 – 19/05/2025	51 - 53	15 - 25	79
Mullaquana	NL-42 01000321	15/05/2025 – 28/05/2025	39 - 59	15 – 16	107
Lincoln Gap	Svantek 307A 115294	15/11/2023 – 23/11/2023	50(1)	29(1)	-(2)

Table 20 Noise monitoring results summary - Night

Location	Type/SN	Date period	Average measured noise level dB(A)		Maximum noise level dB(A)
			$L_{eq, 15min}$	Min $L_{90, 15\ min}$	L_{Fmax}
Kalaya	NL-42 00946976	15/05/2025 – 19/05/2025	50 - 52	14 – 18	76
Mullaquana	NL-42 01000321	15/05/2025 – 28/05/2025	32 - 45	15 – 19	72
Lincoln Gap	Svantek 307A 115294	15/11/2023 – 23/11/2023	46(1)	27(1)	-(2)

(1) Nominated values have been reproduced from *Jacobs document no: IS449300-1-NW-RPT-007*

(2) *Jacobs document no: IS449300-1-NW-RPT-007* did not indicate L_{Fmax} data

8 Operational noise assessment

8.1 Operational noise sources

The noise emissions from the desalination plant, intake pump station and pump stations 1, 2, 3 and 4 have been modelled using Industrial Buildings in SoundPLAN. In general, noise emissions from industrial buildings are modelled as the breakout of the internal reverberant noise level through facades, including features such as the external wall construction, ceilings, louvres and doors. The indicative noise sources of the development (without additional noise mitigation) are based on the reference design report with additional details based on the information provided in the architectural drawings.

The modelled internal noise levels have been developed using the indicative noise-generating activities and locations presented in Table 21. As the Project remains in the concept design stage, detailed mechanical services selections have not yet been finalised. Accordingly, for the purposes of this EIS assessment, sound power levels (SWL) for certain mechanical plant have been assumed based on Resonate's database and experience from comparable projects. Refer to Appendix A—Daily measured noise levels, for the sound power levels used in this assessment.

Table 21 Proposed activity

Noise sources	Location	Period	
		Day—7 am to 10 pm	**Night—10 pm to 7 am**
Desalination Plant			
Plant operations	• RO pump – 8 x 2 MVA pumps (7 duty and 1 standby) • UF pump – 6 x 0.75 MVA pumps (5 duty and 1 standby) • Intake pump – 5 x 0.215 MVA pumps (4 duty and 1 standby) • 2 x 100 MVA, 132/33 kV transformers • Ventilation fans	All plant operating at 100% capacity	All plant operating at 100% capacity
Emergency equipment: • Portable diesel generator	• Ground mounted	Full operation as required during an emergency	Full operation as required in an emergency
Intake Pump Station – Mullaquana Station			
Plant operations	• Pump Station – 5 x 3.2 MVA pumps (4 duty and 1 standby) • Ventilation fans	All plant operating at 100% capacity	All plant operating at 100% capacity
Emergency equipment: • Portable diesel generator	• Ground mounted	Full operation as required during an emergency	Full operation as required in an emergency

Noise sources	Location	Period	
		Day—7 am to 10 pm	Night—10 pm to 7 am
Pump Station 2 – Lincoln Gap			
Plant operations	• Pump Station – 3 x 3.2 MVA pumps (2 duty and 1 standby) • Ventilation fans • 2 x 100 MVA, 275/6.6 kV transformers	All plant operating at 100% capacity	All plant operating at 100% capacity
Emergency equipment: • Portable diesel generator	• Ground mounted	Full operation as required in an emergency	Full operation as required in an emergency
Pump Station 3 – Kalaya			
Plant operations	• Pump Station – 3 x 2.6 MVA pumps (2 duty and 1 standby) • Ventilation fans • 2 x 100 MVA, 132/6.6 kV transformers	All plant operating at 100% capacity	All plant operating at 100% capacity
Emergency equipment: • Portable diesel generator	• Ground mounted	Full operation as required during an emergency	Full operation as required in an emergency
Pump Station 4 – Mangata			
Plant operations	• Pump Station – 3 x 2.6 MVA pumps (2 duty and 1 standby) • Ventilation fans • 2 x 10 MVA, 33/6.6 kV transformers	All plant operating at 100% capacity	All plant operating at 100% capacity
Emergency equipment: • Portable diesel generator	• Ground mounted	Full operation as required during an emergency	Full operation as required in an emergency

8.2 Operational Noise modelling

8.2.1 Modelling parameters

Noise emissions from site have been modelled in SoundPLAN Environmental Software v9.1 program, using the Conservation of Clean Air and Water in Europe (CONCAWE) algorithms. The model takes into consideration:

- attenuation of noise source due to distance
- barrier effects from buildings, topography and the like
- air absorption
- ground effects
- weather conditions (wind speed, wind direction, time of day, and cloud cover)

CONCAWE has six difference meteorological categories—CONCAWE meteorological category 1 represents weather conditions that are least conducive to noise propagation (best case situation with the lowest predicted noise levels), CONCAWE meteorological category 4 represents neutral weather conditions, and CONCAWE meteorological category 6 represents weather conditions that are the most conducive to noise propagation (the worst case situation with the highest predicted noise levels). In accordance with the *Guidelines for the use of the Environmental Protection (Commercial & Industrial Noise) Policy 2023*, CONCAWE meteorological category 5 has been used for daytime noise emissions and CONCAWE meteorological category 6 has been used for nighttime noise emissions.

8.2.2 Operational Modelling scenarios

Noise emissions from the proposed development have been assessed from the scenarios outlined in Table 22 for a 15-minute assessment period. For the purposes of this EIS, the modelling has been undertaken to satisfy the 'design' capacity requirement of 51 GL/year. The same design capacity assumption has been applied to all associated pump stations and desalination plant.

Table 22 Noise modelling scenarios

Scenarios	Activity
Scenario 1	Desalination plant + Mullaquana Station Intake Pump Station operation
Scenario 1a	Desalination plant + Mullaquana Station Intake Pump Station operation (with mitigation)
Scenario 2	Lincoln Gap Pump Station operation
Scenario 2a	Lincoln Gap Pump Station operation (with mitigation)
Scenario 3	Kalaya Pump Station operation
Scenario 4	Mangata Pump Station operation

8.2.3 Proposed construction

The indicative facade constructions of the development (without additional noise mitigation) are based on the reference design report with additional details based on the information provided in the architectural drawings, which are outlined in Table 23 and Table 24.

Table 23 Desalination Plant building facade construction (without additional noise mitigation)

Element	Construction
Intake Pump Station building	• Profiled metal cladding to the external walls and roof • Concrete wall for pipeline thrust loads, with steel wall cladding above • Roller doors remain shut when not required for access and egress • Louvres present for ventilation
R.O. Building	• Profiled metal cladding to the external walls and roof • Roller doors remain shut when not required for access and egress • Ventilation fans present
Administration building	• Hebel Concrete panels to external walls • Profile metal roof • Windows
U.F. Building	• Profiled metal cladding to the external walls and roof • Roller doors remain shut when not required for access and egress • Ventilation fans present
Cartridge Filters & RO Feed Pumps	• Profiled metal cladding to the external walls and roof • Roller doors remain shut when not required for access and egress • Ventilation fans present
Transfer Pump Station	• Profiled metal cladding to the external walls and roof • Concrete wall for pipeline thrust loads, with steel wall cladding above • Roller doors remain shut when not required for access and egress • Ventilation fans present

Table 24 Pump Station (general) building facade construction (without additional noise mitigation)

Element	Construction
Pump Stations (Mullaquana Station, Kalaya, Lincoln Gap, Mangata)	• Profiled metal cladding to the external walls and roof • Concrete up to 2,000 mm high for pipes • Roller doors remain shut when not required for access and egress • Ventilation fans present

The indicative acoustic performance of the different types of construction have been modelled with the overall Weighted Sound Reduction Index for each indicative construction are presented in Table 25. These inputs are indicative only and are subject to refinement as more detailed design information becomes available.

Table 25: Facade acoustic performance

Sound Reduction Category	R_W	Transmission Loss, dB						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Desalination plant, Intake pump station, pump stations								
0.48mm steel sheet	19	3	7	12	17	22	18	22
>100mm pre-cast concrete or equivalent)	>49	39	42	40	43	51	58	63
Roller doors(1)	13	4	7	9	11	13	14	18

(1) Accounted for leaks

8.3 Predicted noise levels

8.3.1 General activity

A summary of the predicted operational noise levels at noise-affected premises is provided in the following subsections. Noise predictions have been assessed against the night-time Noise EPP criteria, as these are more stringent than daytime criteria and represent the most conservative assessment scenario. This approach is appropriate given that the desalination plant and pump stations are expected to operate continuously, 24 hours per day, seven days a week.

8.3.2 Mullaquana Station Desalination plant + Intake Pump Station

Unmitigated operational noise levels have been predicted for all identified noise-sensitive receivers in the vicinity of the desalination plant and the intake pump station. The modelling adopts a conservative, worst-case scenario whereby both facilities are assumed to be operating concurrently. A noise contour plot, showing predicted noise levels in the vicinity of the plant is included in Figure 12. The predicted noise level at the most affected residential receptor for each scenario is presented in Table 26.

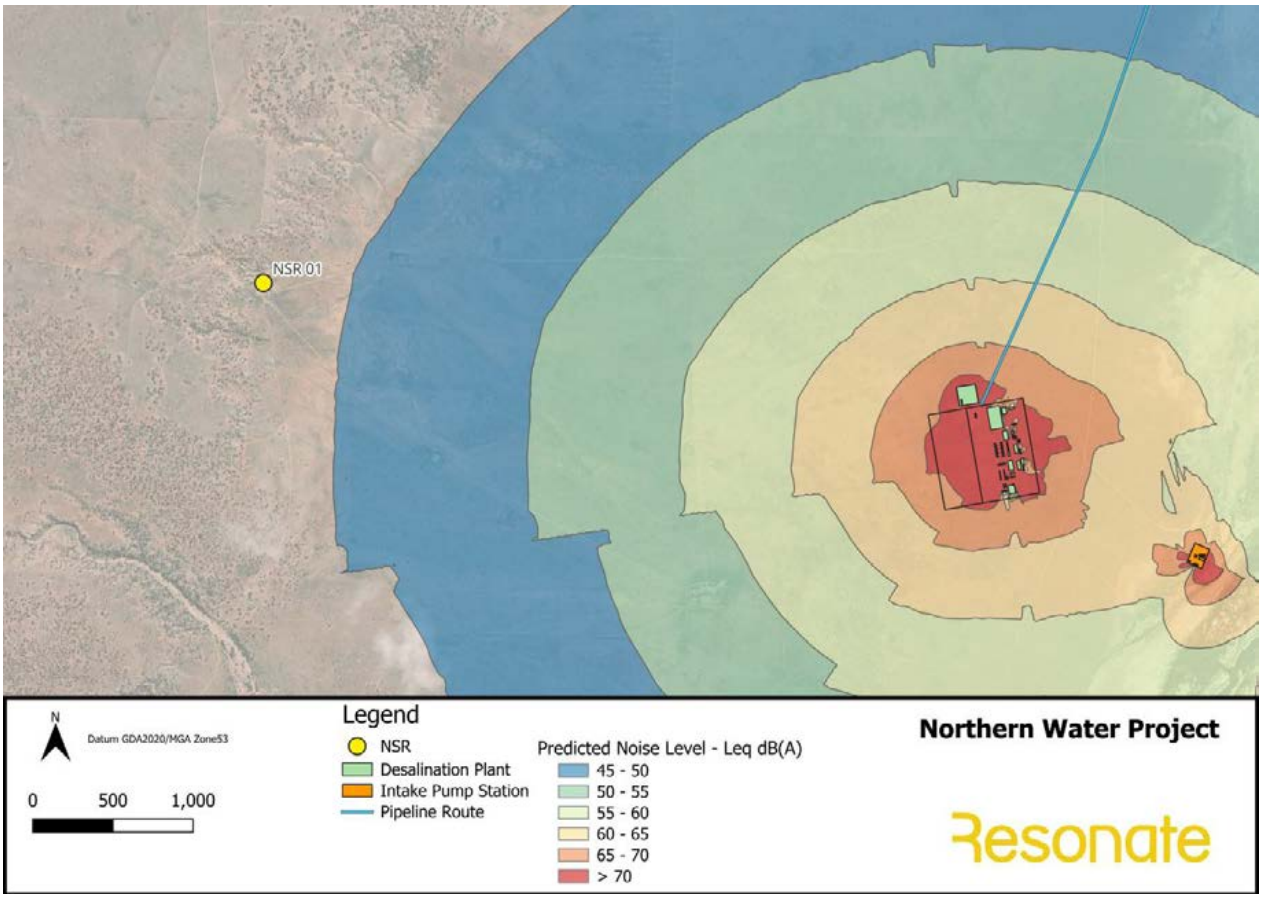


Figure 12 Desalination Plant and Intake pump station operational noise contours (without mitigation)

Table 26: Predicted L_{eq} noise levels at the most affected residential receivers for each model scenario

Prediction location	Relevant Criteria L_{eq} dB(A)	Predicted noise level L_{eq} dB(A)	Predicted to comply prior to mitigation
Scenario 1 (Night)			
Most affected residential receptor in the Remote Areas zone (NSR 01)	42	43	No

The predicted results generally indicate compliance with the daytime Noise EPP criteria. For night-time operation, there may be a marginal exceedance of L_{Aeq} 1 dB(A) with no mitigation applied to the plant. Predicted noise levels are lower than average ambient (L_{Aeq}) noise levels at this location but are higher than the minimum background (LA_{90}) levels. Noise from the Project may therefore be noticeable from time to time, particularly during periods of low background noise.

Due to the predicted non-compliance under the unmitigated scenario, a mitigated model scenario was developed incorporating reasonable and practicable acoustic treatments. Table 27 outlines the potential noise mitigation treatments required for the desalination plant to achieve compliance, while Table 28 presents the predicted noise levels at the most affected receivers following implementation of these mitigation measures and a noise contour of the mitigated scenario plot showing noise levels in the vicinity of the site is provided in Figure 13.

Table 27 Indicative acoustic treatments required for building services

Plant and/or location	Noise mitigation
R.O. Building	• Absorptive treatment to internal plant room walls and ceiling • Acoustic louvres (300 – 600 mm deep), such as Fantech Sound Bar Louvres SBL2
U.F. Building	• Absorptive treatment to internal plant room walls and ceiling • Acoustic louvres (300 – 600 mm deep), such as Fantech Sound Bar Louvres SBL2
Cartridge Filters & RO Feed Pumps	• Acoustic enclosure Or • Solid barrier of height 500 mm higher than the pumps
Transfer Pump Station	• Absorptive treatment to internal plant room walls and ceiling • Acoustic louvres (300 – 600 mm deep), such as Fantech Sound Bar Louvres SBL2

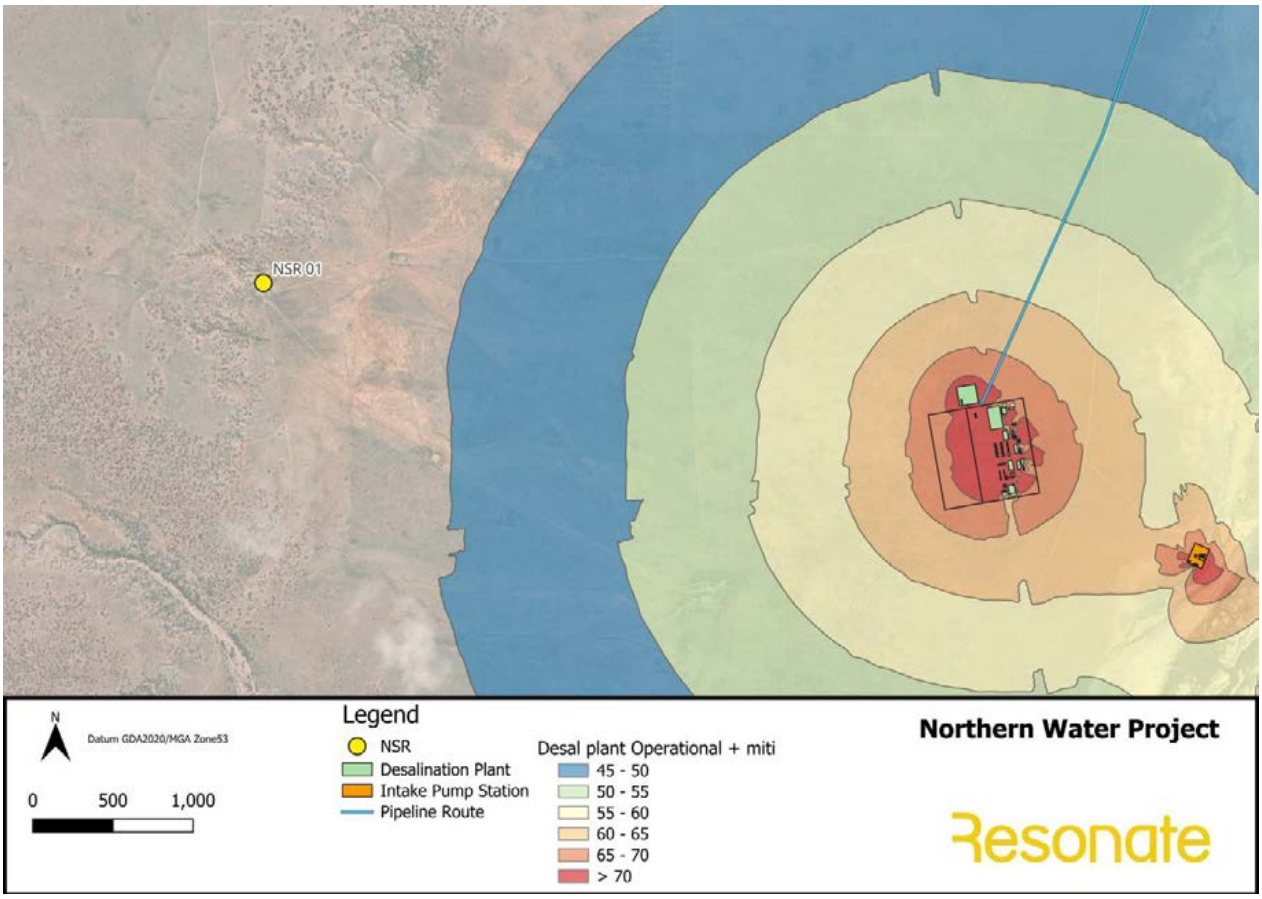


Figure 13 Desalination Plant and Intake pump station operational noise contours (with mitigation)

Table 28: Predicted L_{eq} noise levels at the most affected residential receivers for each model scenario (with indicative acoustic treatment)

Prediction location	Relevant Criteria L_{eq} dB(A)	Predicted noise level L_{eq} dB(A)	Predicted to comply
Scenario 1a (Night)			
Most affected residential receptor in the Remote Areas zone (NSR 01)	42	41	Yes

With the incorporation of the above acoustic treatments into the model, the predicted operational noise level at the most affected residential receiver (NSR 01) is 41 dB(A), which is below the applicable night-time Noise EPP criterion of 42 dB(A).

On this basis, and subject to the implementation of the identified mitigation measures and confirmation of final plant sound power levels during detailed design, the Project is predicted to achieve compliance with the relevant operational noise criteria. Verification of plant noise emissions and treatment performance should be undertaken prior to operation to confirm compliance. Refer to section 8.3.6 for mitigation recommendations.

8.3.3 Lincoln Gap Pump Station

The Lincoln Gap Pump Station is located adjacent to Eyre Hwy Parking and The Tanks Rest Area, which is outlined in Table 29.

Table 29 Rest area

Name	Image	Description
Eyre Hwy Parking and The Tanks rest area (NSR 07)		Rest/stop area

Unmitigated operational noise levels have been predicted for all identified noise-sensitive receivers in the vicinity of the Lincoln Gap pump station, and a noise contour plot showing noise levels in the vicinity of the site is provided in Figure 14. The predicted noise level at the most affected residential receptor for each scenario is presented in Table 30.

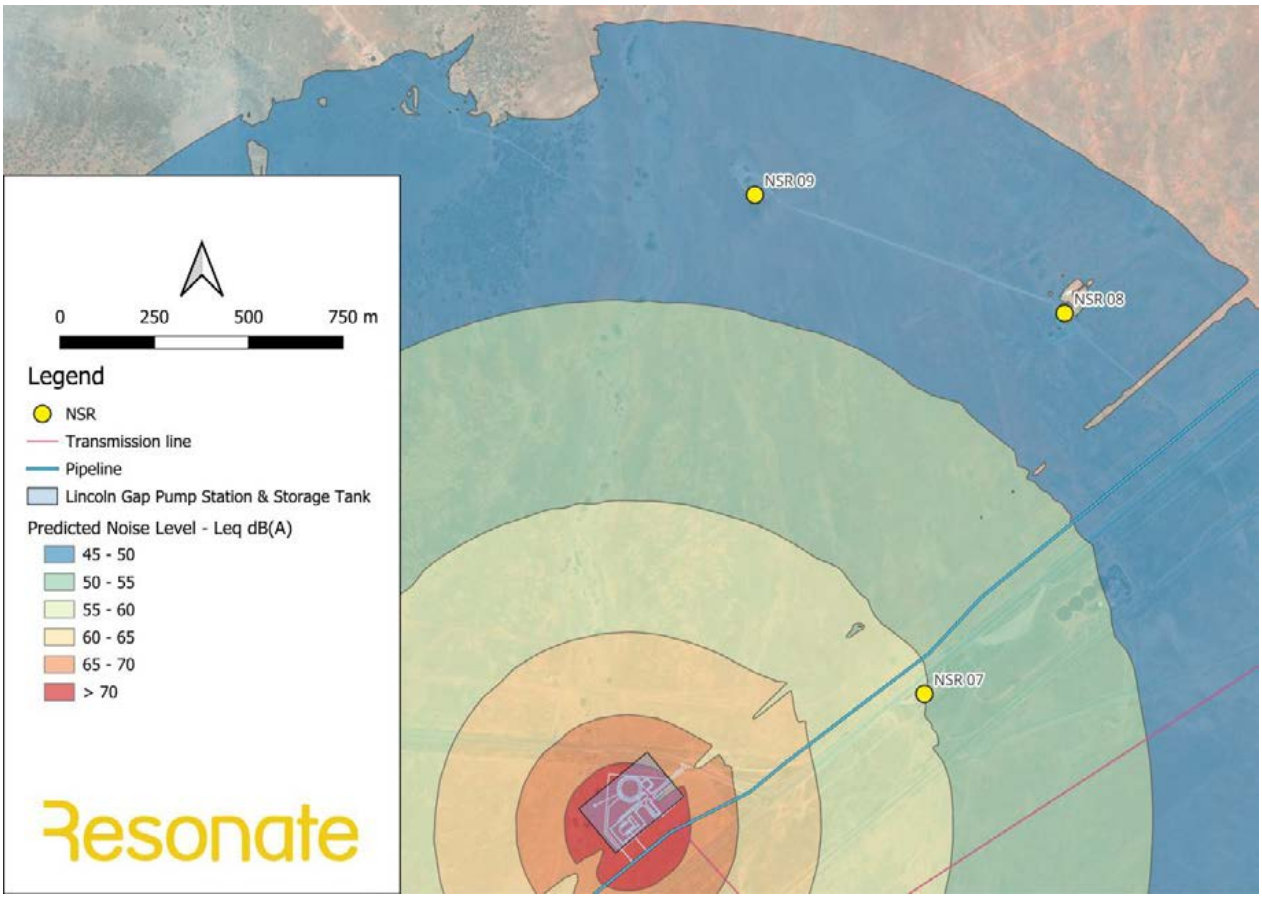


Figure 14 Lincoln Gap Pump Station operational noise contours (without mitigation)

Table 30: Predicted L_{eq} noise levels at the most affected residential receivers for each model scenario

Prediction location	Relevant Criteria L_{eq} dB(A)	Predicted noise level L_{eq} dB(A)	Predicted to comply prior to mitigation
Scenario 2 (Night)			
Most affected residential receptor (NSR 08 & NSR 09) in the Remote Areas zone	44	47	No
Eyre Hwy Parking and The Tanks Rest area (NSR 07)	N/A	55	N/A

In summary, the predicted results indicate that there may be an exceedance of the L_{eq} criterion of approximately 3 dB(A) with night-time Noise EPP criteria at all known residential receptors (NSR 08 & NSR 09). It is noted, however, that the Eyre Hwy Parking and The Tanks Rest Area (NSR 07) is a designated short-term stopping location for rest and relaxation of travellers and may occasionally be used for sleep. As it is not intended for long-term residential occupation, exceedances predicted at this location are not considered to represent impacts on a permanent noise-sensitive receptor. Notwithstanding this additional mitigation measures could be explored during detailed design to reduce operational noise levels. Refer to section 8.3.6 for mitigation recommendations.

Due to the predicted non-compliance under the unmitigated scenario, a mitigated model scenario was developed incorporating reasonable and practicable acoustic treatments. Table 31 outlines the potential noise mitigation

treatment required for the Pump Station to achieve compliance, while Table 32 presents the predicted noise levels at the most affected receivers following implementation of these mitigation measures and a noise contour of the mitigated scenario plot showing noise levels in the vicinity of the site is provided in Figure 15.

Table 31 Indicative acoustic treatments required for building services

Plant and/or location	Noise mitigation
Lincoln Gap Pump Station	Roof • 0.48 BMT cladding • 64 mm Purlins • 10 mm Plasterboard • 55HP Anticon Wall • 0.48 BMT cladding • 64 mm steel studs • 9 mm Fibre cement • 50 mm of 14 kg/m^3 glasswool insulation Ventilation • Absorptive treatment to internal plant room walls and ceiling • Acoustic louvres (300 – 600 mm deep), such as Fantech Sound Bar Louvres SBL2

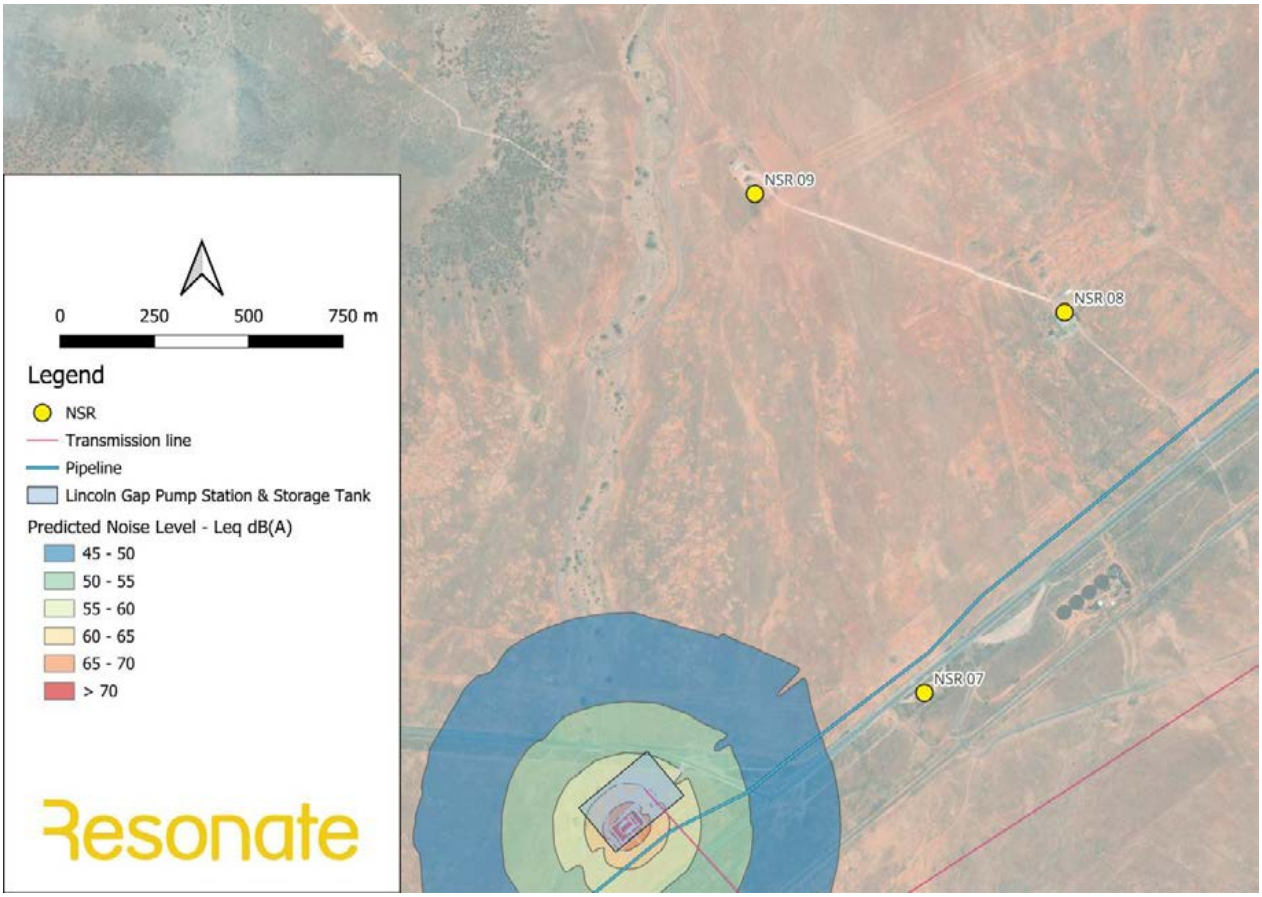


Figure 15 Lincoln Gap Pump Station operational noise contours (with all mitigation measures listed in Table 31)

Table 32: Predicted L_{eq} noise levels at the most affected residential receivers for each model scenario (with indicative acoustic treatment)

Prediction location	Relevant Criteria L_{eq} dB(A)	Predicted noise level L_{eq} dB(A)	Predicted to comply
Scenario 2a (Night)			
Most affected residential receptor (NSR 08 & NSR 09) in the Remote Areas zone	44	36	Yes

With the incorporation of the above acoustic treatments into the model, the predicted operational noise level at the most affected residential receiver is 36 dB(A), which achieves compliance with the applicable night-time Noise EPP criterion of 44 dB(A).

Accordingly, subject to the implementation of the identified mitigation measures and confirmation of final plant sound power levels during detailed design, the Project is predicted to achieve compliance with the relevant operational noise criteria. Verification of plant noise emissions and treatment performance should be undertaken prior to operation to confirm compliance.

Given the proximity of existing noise-sensitive receivers and the nearby Lincoln Gap Wind Farm, consideration of cumulative noise impacts is required. Additional upgrades to wall and roof constructions may therefore be necessary to manage cumulative noise contributions (refer to Section 12).

8.3.4 Kalaya Pump Station (located at Kootaberra)

The Kalaya Pump Station is located adjacent to the Ranges View Rest Area, which is outlined in Table 33.

Table 33 Ranges view rest area

Name	Image	Description
Ranges view rest area (NSR 15)		Rest/stop area

Unmitigated operational noise levels have been predicted for all identified noise-sensitive receivers in the vicinity of the Kalaya pump station, with the noise contour plot included as Figure 16. The predicted noise level at the most affected residential receptor for each scenario is presented in Table 34.

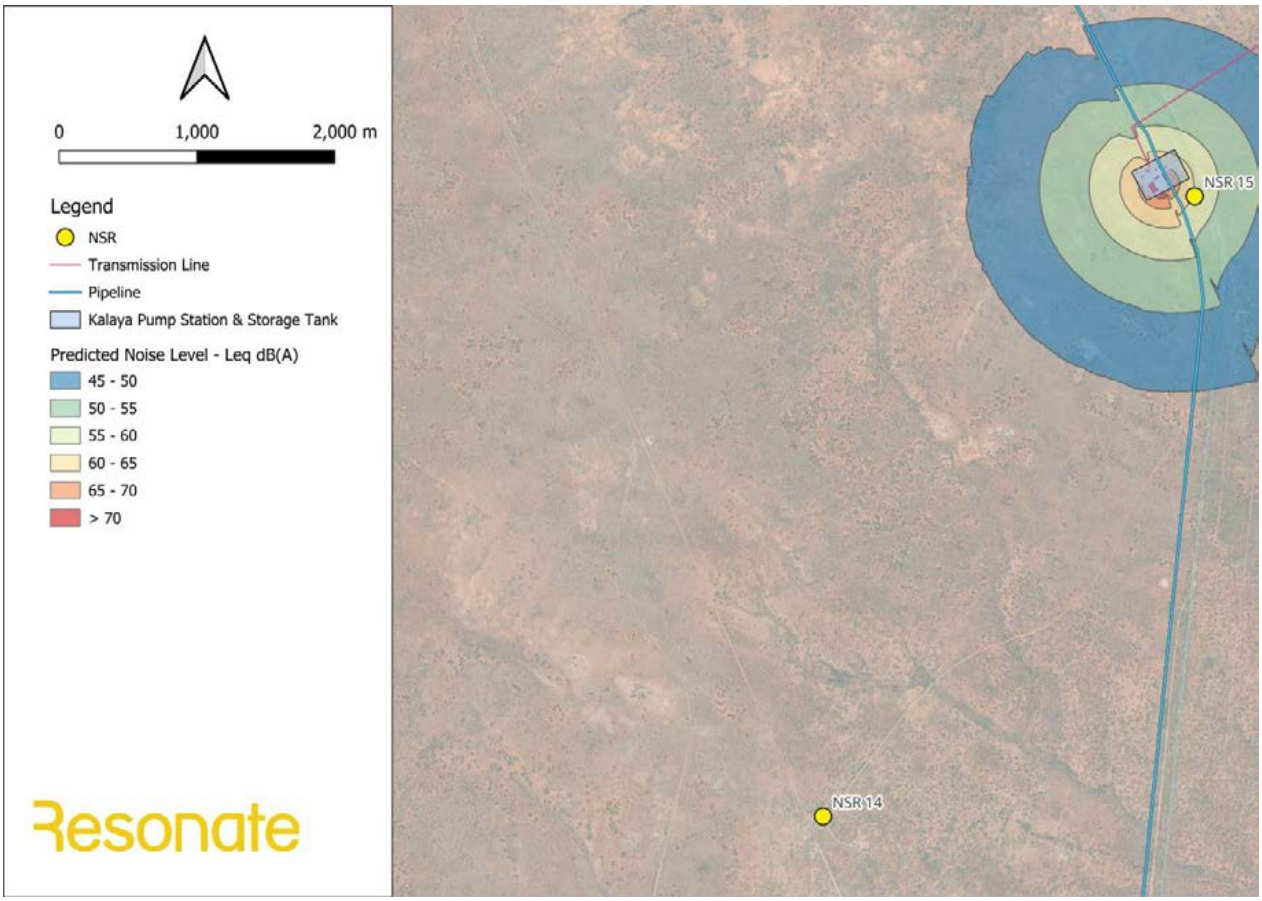


Figure 16 Kalaya pump station operational noise contours

Table 34: Predicted L_{eq} noise levels at the most affected residential receivers for each model scenario

Prediction location	Relevant Criteria L_{eq} dB(A)	Predicted noise level L_{eq} dB(A)	Predicted to Comply
Scenario 3 (Night)			
Most affected residential receptor in the Remote Areas zone (NSR 14)	44	26	Yes
Ranges view rest area (NSR 15)	N/A	66	N/A

In summary, the predicted results indicate compliance with night-time Noise EPP criteria at the most affected residential receptors (NSR 14). It is noted, however, that the Ranges View Rest Area (NSR 15) is a designated short-term stopping location for rest and relaxation of travellers and may occasionally be used for sleep. As it is not intended for long-term residential occupation, exceedances predicted at this location are not considered to represent impacts on a permanent noise-sensitive receptor. Notwithstanding this additional mitigation measures could be explored during detailed design to reduce operational noise levels. Refer to section 8.3.6 for mitigation recommendations.

8.3.5 Mangata Pump Station (located at Oakden Hills)

Unmitigated operational noise levels have been predicted for all identified noise-sensitive receivers in the vicinity of the Mangata pump station. Desktop assessment indicated that no noise-sensitive receptors are located within a 5 km radius of the pump station; therefore, a receptor-based assessment has not been undertaken. Notwithstanding this, a grid-based noise contour model has been prepared to illustrate the predicted unmitigated operational noise levels in the vicinity of the site for completeness, with results included in Figure 17.

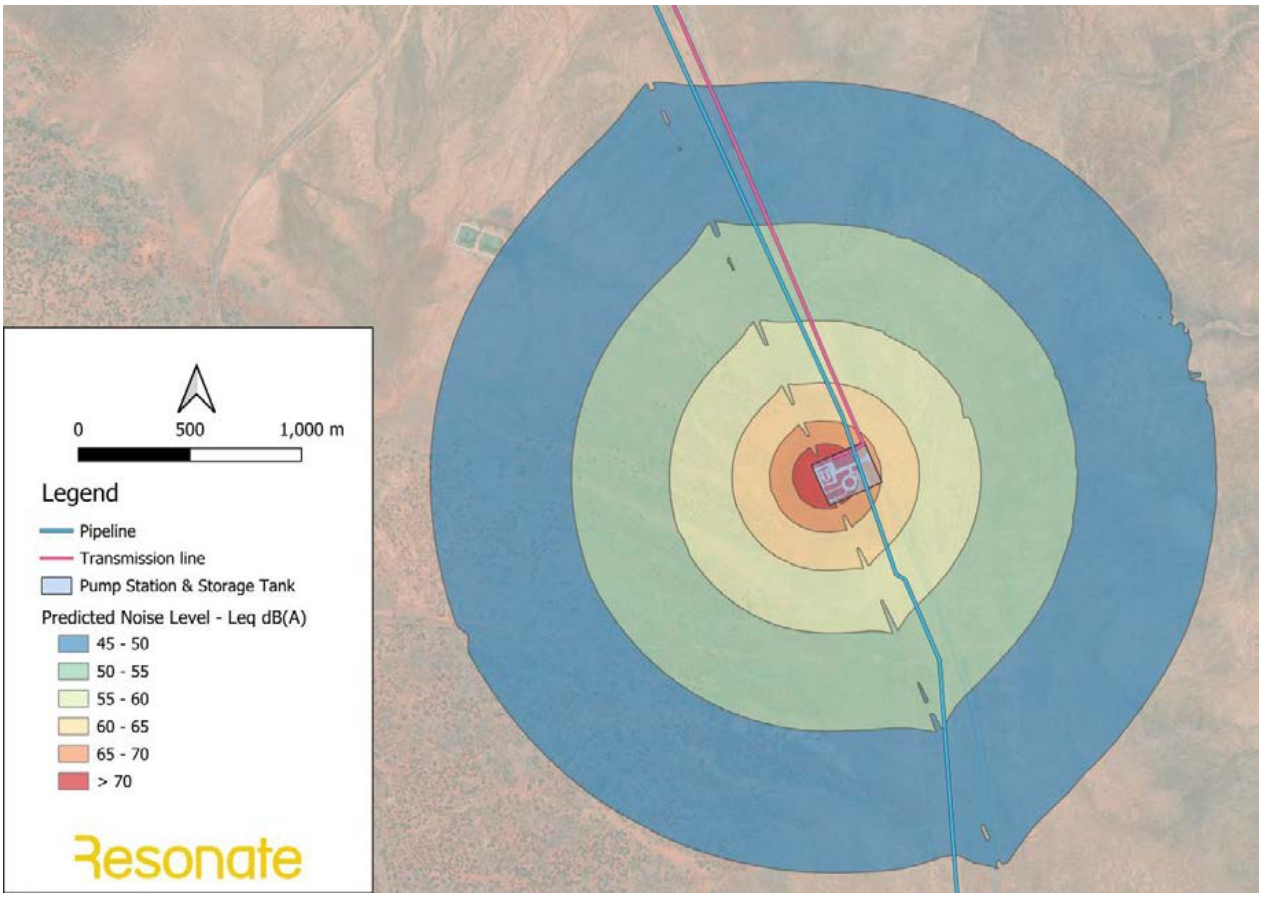


Figure 17 Mangata Pump Station operational noise contours

8.3.6 Mitigation

Based on the current indicative plant selections and layouts, it is considered feasible that compliance with the applicable noise criteria can be achieved for all of the sites during the detailed design phase, subject to the implementation of appropriate acoustic treatments. Plant types, capacities and locations remain subject to refinement as the design develops.

It is noted that without any specific acoustic treatment in place, noise levels were predicted to exceed the applicable noise criteria at several nearby noise-sensitive receivers. Accordingly, mitigation measures are likely to be required as part of the detailed design to achieve compliance.

The assessment modelling has incorporated reasonable and achievable acoustic mitigation measures, including acoustic louvres and absorptive linings, and selection of lower-noise plant. The modelled scenario indicates compliance with the relevant noise criteria; however, final compliance will be confirmed during detailed design once plant selections and architectural details are finalised.

Static insertion loss values for acoustic louvres are outlined in Table 35.

Table 35 Static insertion loss for acoustic louvres

Acoustic louvres	Static Insertion Loss, centre band frequency (Hz)						
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Fantech SBL2	5	10	14	22	27	25	21

Acoustically suitable absorption products for different plant areas are provided in Table 36.

Table 36 Recommended absorptive treatments

NRC	Panel
Internal plant rooms	
0.95	Martini Absorb HD 50
	Bradford Supertel 75 Acoustituff
1.0	Megasorber FM50 – 50 mm
	Martini Absorb HD 75
	Bradford Supertel 75 HD Perf / Unfaced
External plant areas	
0.9	Pyrotek 50 mm Reapor
1.0	Megasorber 50 mm FM-DS (thermoset acoustic foam with water-repellent Soundmesh G8)
	Stratocell Whisper

8.4 Transmission lines

To support the seawater desalination process and the distribution of product water, a large and reliable power supply is essential. An estimate of the project's power demand has been provided, with Table 37 detailing the overhead transmission line configuration and its connection to the associated stations.

Table 37 Transmission line details

Location	Details
Desalination plant NSP Voltage and substation	Desalination Plant Power supply native voltage is 132 kV. NSP Tie in Substation – ElectraNet, Yadnarie Switching Station (TBC). Switching Station to be constructed.
Pump station 2 NSP Voltage and substation	Pump station 2 power supply native voltage is 275 kV. NSP Tie in Substation – ElectraNet, Corraberrra Hill Substation. Existing substation.
Pump station 3 NSP Voltage and substation	Pump station 3 power supply native voltage is 132 kV. NSP Tie in Substation – ElectraNet, Bulkarow Substation. Substation to be constructed.
Pump station 4 NSP Voltage and substation	Pump station 4 power supply native voltage is 33 kV. NSP Tie in Substation – SA Power Networks, Mount Gunson South Substation. Existing substation.

8.4.1 Corona noise

Transmission lines are subject to corona discharge, a potential source of environmental noise that occurs when the electric field around a conductor ionises the surrounding air. This process can produce a faint crackling or hissing sound, particularly under humid or wet conditions. Although typically low in level, corona noise may become perceptible near high-voltage infrastructure and should therefore be assessment through predictive modelling and comparison with similar systems. The assessment is based on the nearest residential dwelling being located approximately 1 km from the closest transmission line and a sound pressure level of 43 dB(A) at 30m from a similar project with a power output of 134 kV.

The predicted night-time noise levels, representing the worst-case scenario, indicate that corona noise is expected to remain below the most stringent night-time criteria established in Section 5.3.1. Nonetheless, implementation of the general mitigation measures such as installing corona rings along locations where transmission lines pass near sensitive receptors to minimise corona noise generating is recommended for consideration during the detailed design phase.

8.4.2 Aeolian noise

Aeolian noise refers to the tonal sound generated by airflow-induced vibration of cylindrical or tensioned structures, such as overhead power lines, conductors, or insulator structures. When wind flows across these structures, vortex shedding can occur at discrete frequencies, exciting resonant modes that radiate as narrowband acoustic tones. The resulting sound is typically low-frequency, tonal, and steady in character, and it is influenced by factors including wind speed, span tension, conductor diameter, and ambient turbulence.

Unlike corona discharge, which produces broadband and impulsive noise, aeolian noise is typically dominated by a single tonal frequency (the fundamental), with minimal harmonic or broadband content. It is most prominent during moderate to high wind conditions, especially when wind speeds are sufficient to trigger sustained structural vibration.

It is expected that, even with the inclusion of characteristic penalties associated with aeolian noise, the predicted night-time noise levels at the nearest noise-sensitive receiver, located approximately 1 km from the transmission lines, will remain below the most stringent night-time criteria established in Section 5.3.1.

Nonetheless, implementation of the general mitigation measures such as installing dampers or spiral vibration control devices to reduce wind-induced singing or humming along locations where transmission lines pass near sensitive receptors to minimise aeolian noise, is recommended for consideration during the detailed design phase.

8.5 Summary

Preliminary operational noise modelling has been undertaken for the desalination plant, intake pump station, pump stations and transmission lines under conservative, unmitigated operating conditions. Predicted noise levels are generally comparable to the existing rural environment.

At the desalination plant/intake pump station and Lincoln Gap Pump Station, night-time criteria are marginally to moderately exceeded with no mitigation in place; noise may be noticeable at times of low background sound. But with the indicative mitigation measures proposed, it is predicted that compliance will be achieved. At Kalaya Pump Station, all known residential receptors comply, with exceedances limited to the Ranges View Rest Area, which is used for short-term stops rather than permanent residence. No noise-sensitive receptors were identified within 5 km of the Mangata Pump Station.

Transmission-line corona and aeolian noise are predicted to remain below the most stringent night-time criteria at the nearest dwelling and are considered compatible with surrounding land uses, noting that further targeted mitigation can be incorporated during detailed design if required.

9 Construction noise assessment

9.1 Construction noise

The construction works primarily comprise the desalination plant, intake pump station, pump stations 2, 3 and 4, storage tanks, the transfer system (pipeline) and transmission lines. The constructability of the various phases of the listed systems has been considered; a desktop analysis of each phase has been modelled to assess potential construction noise impacts at the nearest noise-sensitive receivers. The details of each construction phase are as detailed in Section 2.3.

9.1.1 Construction activities

Table 38 presents the assessment of construction noise impacts at the identified noise-sensitive receivers. The predictions reflect the nominal worst-case construction activity for each location and therefore represent a conservative estimate of potential impacts.

Refer to Appendix C—Construction noise source data for a detailed list of noise levels for each construction phase, activity and predicted noise levels of combined activity sound pressure levels (SPL) at different distances.

Table 38 Noise from construction activities

Project element	Nearest noise sensitive receiver(s)	Distance (m)	Worst-case construction activity	Activity sound power level	Predicted noise level, L_{eq} dB(A)
Desalination Plant & Intake Pump Station – Mullaquanna Station	NSR 01	4,100	TBM Launch box - Secant piling	124	44
PS2 - Lincoln Gap Pump station	NSR 07	580	Excavation	121	58
	NSR 08	1,500	Excavation	121	49
	NSR 09	1,500	Excavation	121	49
PS3 - Kalaya Pump station	NSR 15	130	Excavation	121	71
	NSR 16	5,200	Excavation	121	39
	NSR 17	6,600	Excavation	121	37
PS4 - Mangata Pump station	N/A		0	0	0
Bookaloo 132kV Transmission Line	NSR 15	400	Foundation	121	61
	NSR 16	3,800	Foundation	121	41
	NSR 17	6,000	Foundation	121	37
PS3 Substation - Kootaberra	NSR 15	3,300	Excavation	121	43
	NSR 16	4,000	Excavation	121	41
	NSR 17	6,400	Excavation	121	37
PS4 Substation - Mount Gunson	NSR 19	4,600	Excavation	121	40
Pandurra 275kV Transmission Line	NSR 07	400	Foundation	121	61
	NSR 08	1,000	Foundation	121	53

Project element	Nearest noise sensitive receiver(s)	Distance (m)	Worst-case construction activity	Activity sound power level	Predicted noise level, L_{eq} dB(A)
	NSR 09	1,700	Foundation	121	48
Oakden Hills 33kV Transmission Line	N/A		0	0	0
Mullaquana 132kV Transmission Line	NSR 02	2,250	Foundation	121	46
	NSR 01	4,600	Foundation	121	40
Pipeline – PS1 to PS2	NSR 01	4,500	Excavation	121	40
	NSR 04	4,100	Excavation	121	41
	NSR 03	1,100	Excavation	121	52
	NSR 06	850	Excavation	121	54
Pipeline – PS2 to PS3	NSR 07	60	Excavation	121	77
	NSR 08	420	Excavation	121	61
	NSR 09	1,200	Excavation	121	51
	NSR 10	1,700	Excavation	121	48
	NSR 11	1,200	Excavation	121	51
	NSR 12	80	Excavation	121	75
	NSR 13	1,900	Excavation	121	47
	NSR 14	2,350	Excavation	121	46
	NSR 15	95	Excavation	121	73
Pipeline – PS3 to PS4	NSR 16	3,000	Excavation	121	43
	NSR 17	1,500	Excavation	121	49
	NSR 18	450	Excavation	121	60
Pipeline – PS4 to Olympic Dam & Carrapatena	NSR 19	900	Excavation	121	54
	NSR 20	1,400	Excavation	121	50
	NSR 23	1,850	Excavation	121	48
	NSR 24	1,000	Excavation	121	53
	NSR 25	300	Excavation	121	63
	NSR 22	1,600	Excavation	121	49
	NSR 21	500	Excavation	121	59

9.1.2 Laydown areas

Information relating to the proposed laydown areas was obtained from the Systra Final Reference Design Constructability Report. Laydown areas would be established along the pipeline alignment to support construction activities associated with the transfer system. Based on the current constructability assumptions, six laydown areas are proposed at approximate chainages CH325, CH255, CH185, CH105, CH40 and CH20 (Carrapateena Offtake).

At the time of assessment, the final locations, extents and operational arrangements of the laydown areas had not been confirmed. Indicative laydown locations are shown schematically in Figure 18 and are generally understood to correspond with, or be located near, existing disturbed or previously surveyed laydown areas identified during the constructability assessment.

As the laydown areas would support the progressive construction of the pipeline, noise emissions associated with these areas are expected to be temporary in nature and generally consistent with the broader construction activities assessed as part of this TNVIA. Detailed quantitative assessment of individual laydown areas has not been undertaken at this stage because the information to support such an assessment has not been finalised at the time of writing. However, indicative construction noise source levels and representative sound pressure level attenuation over distance for typical laydown area activities are provided in Appendix C—Construction noise source data. Noise impacts associated with laydown area operation would be managed through implementation of the Construction Noise and Vibration Management Plan (CNVMP), including application of reasonable and practicable mitigation measures where required.

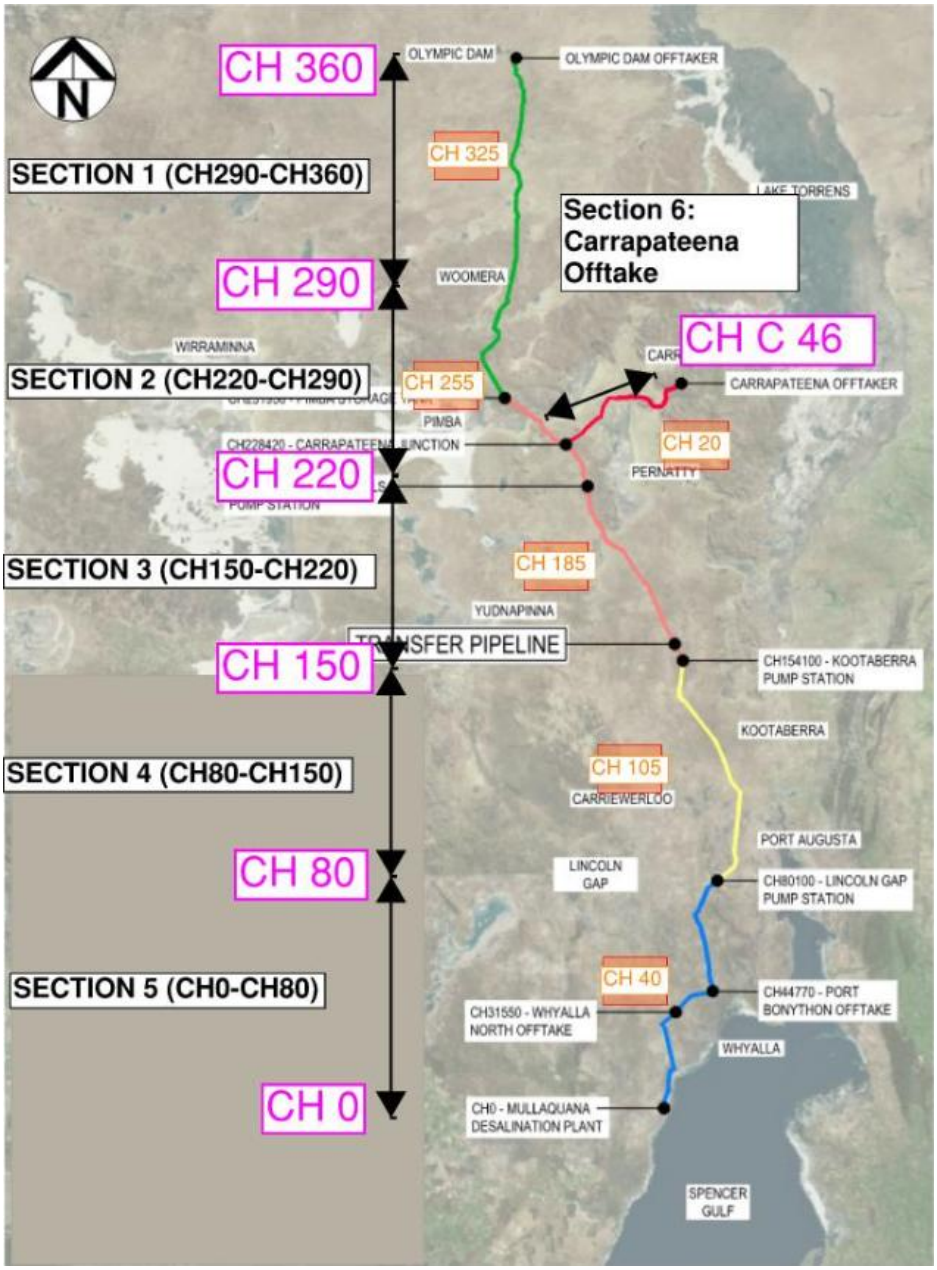


Figure 18 Proposed laydown locations (ref. SYSTRA Final Reference Design Constructability Report SYS-R-NWSP-006-R3)

9.1.3 Impacts

Construction activities are expected to occur primarily during standard daytime hours, consistent with the DIT *EHTM Attachment 7D* guidance, which defines daytime construction periods as 7:00 am to 7:00 pm on weekdays and Saturdays (and 9:00 am to 7:00 pm on Sundays and public holidays). Working within these periods aligns with community expectations and reduces the likelihood of adverse noise impacts, as background noise levels are generally higher and residential sensitivity is lower.

The predicted noise levels reflect a conservative worst-case scenario, with all equipment assumed to operate continuously, which is unlikely in practice. Most works are expected to occur during standard construction hours; if works are required outside these times, the contractor must assess and manage noise in accordance with the relevant DIT guideline and in consultation with the council and/or EPA.

Night-time works are not expected to be routine; however, where they are required for safety, productivity, or engineering reasons, they have a greater potential to adversely affect residential amenity due to lower ambient noise levels and increased sensitivity of nearby receivers. In such cases, mitigation for construction noise will need to be considered, refer to Section 9.2 for more details.

9.2 Construction noise mitigation

Construction activities would generally be undertaken during the hours of 7 am to 7 pm Monday to Saturday, consistent with the Local Nuisance and Litter Control Act 2016 (LNLC Act), EPA Information Sheet 425/23 – *Noise from Construction Activities*, and DIT *EHTM Attachment 7D* guidance.

Construction works outside of these hours, or on Sundays and public holidays, may require approval from the relevant authority depending on the nature of the activity, applicable development approval conditions, and project-specific regulatory requirements.

Accordingly, it is recommended that the contractor prepare a Construction Noise and Vibration Management Plan (CNVMP) prior to the commencement of main Project works. The CNVMP should specifically address the management of any proposed out-of-hours works, including mitigation measures, community notification procedures, complaint management processes, and relevant approval requirements.

Table 39 summarises general noise mitigation and management measures, including who is typically accountable, to be considered during the development of the CNVMP.

Table 39: Typical noise mitigation and management measures

Control Measure	Accountability
The site induction shall cover noise (and vibration) management and complaints, which will be reiterated through on-site training, such as toolbox talks or pre-starts.	Site Manager/Site Supervisor
Effective communication with the potentially affected community is a key mitigation measure.	Community Team
The potential shielding provided by site topography shall be considered in locating equipment.	Site Manager/Site Supervisors
Equipment that emits noise predominantly in a particular direction shall be sited such that noise is directed away from occupied premises where feasible.	Site Manager/Site Supervisor
Works planning shall consider preventing vehicles and equipment queuing, idling or reversing near occupied premises where practicable.	Site Manager/Site Supervisor

Control Measure	Accountability
Truck movements on local roads shall be limited as much as is practicable.	Site Manager/Site Supervisor
Truck operators shall ensure tailgates are cleared and locked at the designated points.	Site Manager/Site Supervisor
Truck movements along uneven surfaces shall be restricted to minimum speed near sensitive receivers.	Site Manager/Site Supervisor
Equipment that is used intermittently shall be shut down or throttled down to a minimum during periods where it is not in use.	Site Manager/Site Supervisor
Equipment shall be well maintained and have mufflers and silencers installed that meet the manufacturer's specifications where relevant.	Site Manager/Site Supervisor
Where a noisy plant is to be fixed in a stationary location, such that it may impact sensitive receivers for a significant length of time, an acoustic enclosure shall be installed where reasonable or practical, or an appropriately silenced generator or lighting tower used.	Site Manager/Site Supervisor
Acoustic screening shall be considered and implemented around noisy above ground equipment where noise levels are predicted to exceed the relevant noise level targets at sensitive land uses, where safe and practical.	Site Manager/Site Supervisor
Two-way radio chatter and volume settings shall be kept to the minimum practical.	Operators
The beeping of horns shall not used as a communication method, except for safety reasons in an emergency.	Operators
Where practical, all reversing plants used at night will be fitted with broadband reversing alarms, noting that it may not be possible to do so where the plant is called in at short notice to replace other plant requiring maintenance. All broadband reversing alarms shall be installed and operating in accordance with all relevant Occupational Health and Safety requirements.	Project Engineer
Where it cannot be guaranteed that plant will not be fitted with broadband reversing alarms (e.g., trucks that only attend the site on occasion), the site shall be set up as far as practicable so that those vehicles do not need to reverse.	Project Engineer
Materials shall not be dropped from a height, causing a loud noise wherever possible.	Operators
Where materials are to be dropped into an empty truck tray or disposal bin and may cause a loud noise, the tray/bin shall be lined with soil or an equivalent material to reduce impact noise where feasible.	Operators
Consideration should be given to minimising impact piling and instead adopting alternative lower noise options, such as bored or CFA piling, where possible from an engineering perspective.	Project Engineer and Piling Contractor

10 Construction vibration assessment

10.1 Vibration generating plant and equipment

Typical conservative vibration levels versus distance for various plant and equipment that are likely to be used or comparable to the equipment to be used are presented Table 40. Vibratory and impact piling predictions are detailed in Sections 10.1 and 10.3. The presented vibration levels are representative of vibration energy propagating through the ground. The predicted levels are based upon various measurements undertaken by Resonate over the Adelaide Metropolitan region.

Table 40 Typical distance to achieve predicted vibration level

Equipment	Predicted Vibration Level		
	5 mm/s	3 mm/s	0.4 mm/s
	Distance to Achieve Predicted Vibration Level (m)		
12T Vibratory Roller	15	20	77
12T Oscillating Roller	6	9	33
18T Vibratory Pad Foot Roller	16	22	85
32T Excavators with Hydraulic Rockbreaker	9	13	51
20T Excavators with Hydraulic Rockbreaker	7	10	39
12-15T Excavators with Hydraulic Rockbreaker	6	8	31
Bored Piling	3	4	14
Continuous Flight Auger (CFA) Piling	3	4	17
Bulldozer	5	6	24
Jackhammer	2	3	13

Other plant and equipment not listed above, such as excavation or backhoe dredging plant, comparatively produce negligible vibration to that listed above under normal operation.

10.2 Vibratory piling

Vibration generated by vibratory hammer piling is explained as follows:

- Vibratory drivers produce a steady-state vibration, forcing the ground particles to vibrate in a certain mode, regardless of the ground characteristic frequency. The vibration typically consists of several frequencies, but the dominant frequency is that of the vibratory driver itself. Resonance can also occur when the vibration frequency coincides with the characteristic pile/ground frequency.
- When sheet piles connect, friction between them increases vibration (3-5 times) especially with worn piles or misaligned driving. New piles and precise driving reduce this effect (Deckner et al., 2010).
- Clamping the piles off-centre also creates an uneven bending force, causing larger lateral vibrations (2-3 times) compared to vertical ones (Deckner et al., 2010).
- Vibration propagates away from the pile in the form of different wave types depending on whether the waves are emitted along the pile shaft and/or from the pile toe. At the toe (bottom of the pile), compression waves (P-waves) and shear waves (S-waves) occur, which both extend as spherical waves in all directions. When the waves reach the surface, they are reflected and refracted. The refracted waves are spread as surface waves (R-waves), which propagate with lower attenuation than body waves (e.g. P or S-waves) along the ground surface.

10.2.1 Vibratory piling predictions

Vibratory sheet piling vibration predictions have been undertaken utilising the approach described by Attwell et al. 1992, which uses an empirically derived quadratic regression model.

Modelling assumptions:

- Sheet pile = AZ 24-700
- Pile length = 14m
- Vibratory driver = 1000 kN centrifugal force, 250 kW hydraulic power
- Driving frequency = 27 Hz

Table 41 provides a summary of the predicted sheet piling vibration levels (mm/s PPV) from the pile with distance.

Table 41: Predicted vibration levels (mm/s PPV) in accordance with Attwell et al. 1992 – sheet vibratory piling

Distance (m)	Best Fit, mm/s PPV	Half Standard Deviation, mm/s PPV	One Standard Deviation, mm/s PPV
10m	6.7	11.9	21.2
20m	3.2	5.6	10.0
50m	0.9	1.7	3.0
100m	0.3	0.6	1.0
200m	0.1	0.2	0.3

10.3 Impact piling

Vibration generated by impact piling is explained as follows:

- The impact of the pile hammer on the pile helmet generates a stress wave that propagates through the pile.
- Dynamic forces develop along the interface between the pile and the surrounding soil, which causes vibration. The magnitude of the vibration generated varies with respect to the dynamic soil resistance.
- Vibration propagates in the form of different wave types depending on whether the waves are emitted along the pile shaft and/or from the pile toe. At the toe (bottom of the pile), compression waves (P-waves) and shear waves (S-waves) occur, which both extend as spherical waves in all directions. When the waves reach the surface, they are reflected and refracted. The refracted waves are spread as surface waves (R-waves), which propagate with lower attenuation than body waves (e.g. P or S-waves) along the ground surface.
- Vibrations attenuate with increasing distance from the pile, although in some soil layers and buildings, they may become amplified due to resonance effects.

10.3.1 Impact piling predictions

Impact piling vibration predictions have been undertaken utilising the Attwell et al. 1992 (quadratic regression model).

Modelling assumptions:

- Impact hammer = IHC S-150 Hydrohammer (7500 kg hammer, 150 kJ maximum energy)
- Hammer efficiency = 95% (conservative, typically we would expect the hammer to be less efficient than this)
- Pile diameter = 610 mm
- Pile length = 22 m
- Pile material = Steel

Table 42 provides a summary of the predicted impact piling vibration levels (mm/s PPV) from the pile with distance.

Table 42: Predicted vibration levels (mm/s PPV) in accordance with Attwell et al. 1992 – impact piling

Distance (m)	Best Fit, mm/s PPV	Half Standard Deviation, mm/s PPV	One Standard Deviation, mm/s PPV
10m	11.9	19.9	33.2
20m	7.3	12.1	20.3
50m	3.3	5.4	9.1
100m	1.6	2.6	4.4
200m	0.7	1.1	2.0

10.4 Assessment of vibration impacts

Note that in relation to the above predictions, it is typical to expect a reduction in vibration level as the vibration energy transfers from the ground to the building foundation or structure (e.g. Jurevicius et al. 2015). Therefore, the predictions are conservative in nature and a general guideline for the potential vibration impacts.

10.4.1 Potential impact to humans

The vibration targets for human comfort are unlikely to be exceeded at residential premises given the distance from the works, being at least 150 metres from the proposed works. We note that the maximum baseline vibration levels resulting from construction activities on the Project are generally above the adopted criteria.

10.4.2 Potential impact to heritage structures

The nearest heritage structure to the proposed works is the *Phillips Ponds Homestead ruins* and *graveyard*, a non-Aboriginal heritage site, located approximately 50 metres southwest of the proposed pipeline alignment. While the Phillips Ponds ruins are not formally protected under heritage legislation nor recorded on any heritage register, they remain a notable local landmark familiar to remote area travellers. Refer to for further details.

Based on the predicted vibrational levels outlined in Section 10.1 above, it can be concluded that potential vibration impacts on heritage structures are not expected.

10.5 Construction vibration mitigation and management

Similarly to construction noise as detailed in Section 9.2, the mitigation and management of vibration generated from construction activities may be assessed and documented in a Construction Noise and Vibration Management Plan (CNVMP) developed by the contractor responsible for managing the construction works. The CNVMP should consider the potential impact of vibration on human comfort to any occupied building as well as any damage to nearby structures and heritage assets.

11 Noise and vibration from commissioning and closure phases

11.1 Noise Impacts during Commissioning

The noise impacts associated with the commissioning phase of the project are anticipated to be comparable to, or less than, those experienced during the operational phase. The noise impacts during commissioning can be managed in the same manner as those during normal operation. Standard mitigation measures, such as scheduling noisy activities during less sensitive hours, using noise barriers or enclosures, and implementing equipment maintenance protocols to minimize excessive noise emissions, will be employed. These mitigation strategies will be outlined in a Noise and Vibration Management Plan (NVMP), which will be developed in accordance with applicable local noise regulations.

11.2 Noise Impacts during Decommissioning and Demolition

While specific details regarding the decommissioning and demolition methods are not yet available, it is expected that the noise impacts during these phases will be similar to those typically associated with construction activities. The primary sources of noise during decommissioning are likely to include machinery used for dismantling structures, demolition activities, and site clearance. These activities can generate significant noise, but the impacts can be effectively managed through appropriate noise control measures.

The specific methods and activities to be employed during decommissioning will be clarified in the future as part of the detailed planning process. At that time, a more precise assessment of the potential noise impacts will be conducted, and a detailed NVMP will be developed to address any identified risks. This plan will outline measures such as the use of quieter equipment, temporary noise barriers, and restrictions on working hours to reduce noise exposure to surrounding areas. Additionally, all decommissioning activities will be subject to the noise regulations and guidelines in effect at the time, ensuring compliance with local standards.

In conclusion, while the specific details of decommissioning are not yet fully defined, noise impacts from this phase are anticipated to be similar to those of construction and can be managed effectively through adherence to relevant noise regulations and the implementation of targeted mitigation strategies. Further refinement of the NVMP will ensure that noise impacts are minimized during the closure and decommissioning process.

12 Cumulative impacts

An assessment of potential cumulative noise impacts has also been undertaken. There are no other known significant or continuous noise-generating activities in the vicinity of the desalination plant or the inland pump stations that would meaningfully contribute to combined operational noise levels, with the exception of Lincoln Gap Pump Station, which is approximately 2,700 m from the nearest residential noise sensitive receiver (NSR 08 and NSR 09). This receiver is also exposed to noise from Lincoln Gap wind farm, with the nearest wind turbine generator (WTG) approximately 1,600 m to the north-west. As a result, there is potential for cumulative noise impacts at this location during both construction and operational phases of the pump station. Previous baseline noise monitoring was undertaken by Jacobs (Section 7); however, it has not been confirmed whether the Lincoln Gap Wind Farm was operational at the time of the measurements.

Although the Noise EPP (The Policy) excludes wind farm noise from assessment under the industrial noise framework, this EIS Project Specific Assessment Requirements (AEQ.2) considers cumulative amenity impacts from existing and approved developments. Accordingly, operational noise from the Lincoln Gap Wind Farm has been reviewed using publicly available planning approval documentation prepared by WSP (Department for Infrastructure and Transport (DIT) *Agenda Item 3.2.1 – DA 010-V070-19 Web*.) for the approved Stage 3 expansion.

The planning approval assessment predicts maximum operational noise levels of up to 41 dB(A) $L_{Aeq,10min}$ at NSR 08 and 43 dB(A) $L_{Aeq,10min}$ at NSR 09 under cumulative Stage 1, 2 and 3 wind farm operating conditions. With mitigation applied to the Lincoln Gap Pump Station, predicted noise levels from the pump station at the noise sensitive receivers are 36 dB(A). The combined cumulative noise level from both the wind farm and pump station is approximately 43 dB(A), which is within the EPA night-time criterion of 44 dB(A). Accordingly, cumulative operational noise levels are predicted to comply with the applicable amenity criteria.

Given the separation distances involved and the predicted operational noise levels from the proposed pump station, cumulative operational noise impacts are expected to remain within acceptable limits. Construction-related cumulative noise impacts may occur temporarily where construction activities coincide with wind farm operation; however, these impacts will be short-term and managed through implementation of standard construction noise and vibration management measures.

Cumulative operational impacts on other locations are expected to be minimal, and overall noise levels are unlikely to differ materially from those generated by the Project alone.

The Noise Policy inherently manages cumulative impacts by applying more stringent criteria to new noise sources. By adopting the Part 5 criteria for this Project, the assessment ensures that cumulative noise, comprising emissions from the Project alongside any future or unforeseen noise sources remains within the reasonable and acceptable limits established for existing environments under Part 4 of the Noise Policy. This approach provides confidence that the Project will not contribute to long-term cumulative exceedances.

Along the pipeline alignment, there is potential for temporary cumulative noise impacts during construction, particularly where works occur close to existing operational sites such as Olympic Dam Village, Carapateena, and other industrial or mining facilities. In these areas, construction noise may combine with existing operational noise, potentially increasing localised noise levels during active works. However, because pipeline construction progresses linearly and work fronts move rapidly, the duration of cumulative noise exposure at any given location is expected to be short (as indicated in the *Systra reference design constructability report*).

Any temporary cumulative impacts will be managed through the CNVMP, which outlines measures such as restricting work to standard daytime hours, implementing feasible and reasonable noise controls, using quieter equipment where practicable, and engaging with affected stakeholders when elevated noise levels are expected. These controls will help ensure cumulative impacts are minimised and remain short-term, manageable, and consistent with policy expectations.

13 Ecological impacts on fauna

13.1 Introduction

Desktop assessments for the Northern Water Project included vegetation mapping and species distribution data to inform potential fauna impacts. These assessments focused on threatened and sensitive fauna within areas adjacent to the pipeline, pump stations, substations and plant. The desktop review provides baseline information to guide impact assessment and management measures.

13.2 Recommended fauna guidelines

The potential impact of noise on fauna has been described as including physiological and behavioural responses, permanent and temporary damage to hearing organs, interference with breeding, and the masking of vital communication (Patricelli, 2006; Dooling, 2007; Parris, 2009; Ortega, 2012). The noise impact on fauna can be classified as one of four categories:

- **Permanent threshold shift (PTS)** is defined as a noise-induced threshold shift that persists after a recovery period subsequent to exposure (Ryan, 2016). It results in a permanent loss of hearing in fauna and may occur during to impulsive noise, or continuous exposure to high intensity noise. This impairs their ability to detect predators, and communicate with other fauna. As birds rely on vocal stimuli and the transmission of vocal signals for predator detection, the loss of hearing will lead to higher risks of predation (Ramírez-Santos, 2018).
- **Temporary threshold shift (TTS)** is similar to PTS, however the hearing loss is only temporary. The length of time at which hearing is lost will depend on the properties of the noise, and the species of fauna.
- **Masking** is the interference with the detection of one (biologically relevant) sound by another (Dooling, 2007). It impairs the ability to communicate effectively, and detect predators. This will only occur during the time at which the noise is present, and will not cause any damage to the hearing ability of fauna. Some birds have been known to alter the frequency of their communication to avoid masking by other noise (Francis, 2011).
- **Physiological and/or behavioural response** is defined as noise that causes any kind of response in fauna. The most common behavioural response for birds is flight as they perceive the noise as a threat, it is noted that the visual stimuli of humans also influences their response (Wright, 2010).

The level of impact on fauna depends on the type of noise produced, including frequency, loudness, consistency, and duration (Ortega, 2012), the species of animal and other physical and environmental factors, such as age, season, weather, ambient noise level and degree of previous exposure (Cayford, 1993; Yasue et. al, 2003; Yasue, 2006).

Currently there is limited knowledge on the specific hearing sensitivity of fauna native to the area of interest. As such there is no current government or other widely accepted guidelines. Interim guidelines for potential effects from different noise sources were recommended previously for the average bird (Dooling, 2007) and later adopted within the *Technical Guidance for Assessment and Mitigation of the Effects of Traffic Noise and Road Construction Noise on Birds* (2016 California Department of Transportation). These guidelines are outlined in Table 43.

Table 43: Recommended Interim Guidelines for Potential Effects from Different Noise Sources

Noise Source Type	Permanent threshold shift (PTS)	Temporary threshold shift (TTS)	Masking	Behavioural or Physiological Effects
Single Impulse (e.g. blast)	140 dB(A)[1]	NA[3]	NA[5]	Any audible component of traffic and construction noise has the potential of causing behavioural and/or physiological effects
Multiple Impulse (e.g. jackhammer, pile driver)	**125 dB(A)[1]**	**NA[3]**	**ambient dB(A)[6]**	

Noise Source Type	Permanent threshold shift (PTS)	Temporary threshold shift (TTS)	Masking	Behavioural or Physiological Effects
Non-Strike Continuous (e.g. construction noise)	**None[2]**	**93 dB(A)[4]**	**ambient dB(A)[6]**	independent of any direct effects on the auditory system of PTS, TTS, or masking
Traffic and Construction Noise	None[2]	93 dB(A)[4]	ambient dB(A)[6]	
Alarms (97 dB/100 ft)	None[2]	NA[2]	NA[6]	

(1) Estimates based on bird data Hashino et al. 1988 and other impulse noise exposure studies in small mammals.

(2) Noise levels from these sources do not reach levels capable of causing auditory damage and/or permanent threshold shift based on empirical data on hearing loss in birds from the laboratory.

(3) No data available on TTS in birds caused by impulse sounds.

(4) Estimates based on study of TTS by continuous noise in the budgerigar and similar studies in small mammals.

(5) Cannot have masking to a single impulse.

(6) A conservative estimate based on the combination of two independent noise sources. Using critical ratio data from 14 bird species, known short-term behavioural adaptations of birds to noise, and background noise levels typical of a quiet suburban environment, masking effects may begin to occur when noise levels reach approximately 50–60 dB(A).

There is limited information on the hearing sensitivity of reptiles and mammals, however some reptile species tested under laboratory conditions have shown to experience a TTS when exposed to 95 dB(A) for several minutes (Defour, 1980). A study into the effect of dune buggy noise on the mammalian kangaroo rat reported that a TTS was present when subjecting the rat to 95 dB(A) for 500s (Brattstrom, 1983). From this information, it is inferred that birds are the most noise sensitive fauna in the study area and will form the basis of the criteria. Common species that were identified within the subject site, most of which are birds, are not further discussed as these species are highly mobile and are likely to move away from noise. The noise impact on common species is considered negligible.

Compliance with this criterion will be achieved if noise from the Project is below the following levels at the expected location of noise-sensitive fauna receptors:

- 93 dB(A) for non-strike continuous noise sources
- 125 dB(A) for impulsive sources (such as impact pile driving).

13.3 Protected species under the *EPBC Act* / *NPW Act*

Three key threatened species of interest have been identified as known or likely to occur in the Project Area, of which 2 are listed as Vulnerable under the *EPBC Act* and/or the *NPW Act*. The remaining one species is listed as Vulnerable under the *EPBC Act.*

Table 44: Key species of interest listed under the *EPBC Act* and/or *NPW Act* that are relevant to the development

Species	EPBC Act	NPW Act	Likelihood in Project Area
Western Grasswren (*Amytornis textilis myall*)	Vulnerable	Vulnerable	Known (present in the southern areas of alignment)
Plains Mouse (*Pseudomys australis*)	Vulnerable	Vulnerable	Likely (in the northern areas of the alignment)
Southern Whiteface (*Aphelocephala leucopsis*)	Vulnerable	-	Known throughout the alignment

13.3.1 Western Grasswren (Amytornis textilis myall)

The Western Grasswren (*Amytornis textilis myall*) is listed as Vulnerable under the EPBC Act and Vulnerable under the NPW Act. It is endemic to the Gawler Ranges in South Australia. Its distribution is naturally fragmented, reflecting reliance on dense chenopod shrublands in semi-arid habitats (DCCEEW, 2023c). The population is generally considered a single subpopulation within South Australia (Garnett & Baker, 2020).

The impact on fauna from construction and operation of the Project has been determined for the major noise sources. Given the current detail on construction or operational activities, a conservative (worst-case) scenario has been modelled (Table 45).

To assess the impact in this case, the distance at which the noise generating activity will exceed the recommended fauna noise criteria has been determined.

Table 45: Fauna criteria exceedance distances for expected typical worst-case noise sources

Noise source	Fauna criteria	Lw, dB(A)	Exceedance distance[1], m
Vibratory Hammer Piling	93 dB(A)[2]	125	16
Compaction		109	3
Concrete pump		106	2
Impact piling	125 dB(A)[3]	128	1

(1) Exceedance distance has been determined as an absolute distance between the source and receptor, as the receptor height is unknown and is likely to change unexpectedly.

(2) Non-strike continuous TTS

(3) Impulsive PTS

Permanent threshold shift (permanent hearing loss) and **temporary threshold shift (temporary hearing loss)** are considered to be unlikely for the Western Grasswren, as the bird species have the ability to relocate themselves away from sources of noise. Furthermore, extensive laboratory data show that birds are much more resistant to hearing loss, auditory damage, and decline in vocal quality from acoustic overexposure than are humans and other mammals (e.g., Ryals et al., 1999; Saunders and Dooling, 2018). This is in part because birds can regenerate the auditory hair cells of the inner ear that are responsible for hearing even after they have been damaged by intense noise exposure. Birds, unlike mammals (including humans; e.g., Lewis et al., 2016), with damaged auditory hair cells subsequently recover a good deal of their hearing and vocal precision when the damaged hair cells are naturally replaced with new hair cells (Dooling et al., 2008).

Nevertheless, the potential of noise to cause masking and physiological and/or behavioural responses in threatened fauna was also assessed. Noises can interrupt or prevent feeding during time-limited periods of foraging, roosting, resting, and breeding. Activities such as vibratory hammer piling, compaction, dredging and impact piling have the potential to impact terrestrial fauna in two main ways, by masking and by physiological and/or behavioural responses.

Masking is the interference with the detection of a biologically relevant sound by another, usually anthropogenic, sound (Dooling, 2007). It impairs an organism's ability to communicate effectively and detect predators. Masking occurs during the production of the noise is present and does not cause damage to the hearing ability of fauna. Some birds alter the frequency of their communications to avoid masking by other noise (Francis, 2011). Additionally, like humans, birds also exhibit the Lombard effect, which means that they increase vocalisation levels in the presence of background noise (Lane and Tranel, 1971). The Lombard effect has been demonstrated in the field in various bird species (Brumm and Todt, 2002; Brumm and Zollinger, 2011) where it has been shown that birds can raise the level of their vocalisations in response to noise by as much as 10 dB (Manabe et al., 1998). Both laboratory and field data

show that birds use remarkably similar[2] strategies for maximising communication in noisy environments to humans (California Department of Transportation, 2016; Dooling and Leek, 2018).

Masking is most likely to occur in the following ways:

- Noise may impact the ability to of birds that prey on fish, molluscs, or insects to detect prey.
- Noise from the Development may impact Western Grasswrens' ability to detect predators such as foxes and feral cats.
- Noise may interfere with breeding calls, songs and displays of bird species that depend on communication in order to detect or attract mates, and breed.

Physiological and/or behavioural responses are defined as the changes in animal physiology or behaviour that result from noises. Noise, particularly from activities that create impulsive noise, can disrupt bird foraging, roosting, and breeding behaviour and physiology, while also making them more susceptible to predators, thereby impacting their overall health, survival, and reproductive success. The most common behavioural response for birds is flight, as they perceive the noise as a threat. It is noted that the visual stimuli of humans also influence their responses (Wright, 2010). Physiological and behavioural responses are most likely to arise in the following situations:

- Species may startle or take flight away from sources of impulsive noise. This may result in disruption to feeding, roosting, or breeding.
- Non-impulsive construction noises may interfere with the breeding and nesting of resident bird species, if they occur within or adjacent to the subject site.

13.3.2 Plains Mouse (Pseudomys australis)

The Plains Mouse (*Pseudomys australis*) is listed as Vulnerable under the EPBC Act and Vulnerable under the NPW Act, and may occur in the northern sections of the project alignment in open chenopod shrublands, grasslands, and cracking clay flats. While laboratory studies on rodents indicate that exposure to high-intensity or prolonged noise can cause temporary or permanent hearing damage (Borg et al., 1995; Chen & Fechter, 2003; Hu et al., 2000; Feng et al., 2020), there are no species-specific noise criteria established for the Plains Mouse. Given the species' nocturnal and burrowing habits, as well as its likely avoidance of noisy areas, permanent threshold shift (permanent hearing loss) and temporary threshold shift (temporary hearing loss) are considered to be unlikely. In addition, noise impacts are expected to be minor due to mobility and habitat distribution.

Due to burrowing habits, this species may also be sensitive to vibration, although no species-specific quantitative criteria are established in the available literature. Some construction activities, particularly compaction, rock-breaking and piling, are expected to generate vibration above typical baseline levels at distances in the order of hundreds of metres from works, albeit on a temporary basis. Operation of the project is unlikely to generate significant vibration outside of the immediate vicinity of pump stations and desalination plant. Similarly to noise, vibration impacts are expected to be minor due to habitat distribution.

13.3.3 Southern Whiteface (Aphelocephala leucopsis)

Desktop data indicate that the Southern Whiteface is abundant throughout the study area and occurs in a variety of habitats, including those likely to be impacted by the Project. The species is highly adaptable and tolerant of habitat disturbance, showing resilience to moderate levels of vegetation clearing and anthropogenic noise. Its mobility allows it to avoid temporary disturbances, including construction noise, and its broad distribution reduces the likelihood of any population-level impacts.

[2] Humans adopt a variety of strategies to hear better in a noisy environment (Roy and Siebein, 2019). This includes speaking louder, turning the head, moving closer, changing location, or only vocalising during pauses in the noise.

Consistent the Western Grasswren, potential for construction noise to result in hearing injury is limited to within < 20m of major construction works and is not expected to occur due to operational noise.

13.3.4 Summary of noise impact on terrestrial fauna

Noise emissions from the Development are unavoidable and will occur in areas that include preferred habitat for a range of threatened terrestrial fauna. Permanent threshold shift (i.e., permanent hearing loss) and temporary threshold shift (i.e., temporary hearing loss) are considered unlikely, as these species are capable of relocating away from sources of noise.

Potential noise impacts to threatened fauna may occur through masking of acoustic cues or eliciting physiological or behavioural responses, potentially leading to avoidance of foraging or roosting areas within the site. However, noise impacts on terrestrial fauna are not expected to be significant for the following reasons:

- Threatened species are unlikely to remain in areas of the site once habitats have been cleared.
- Noise impacts in most areas will be limited to periods of construction activity and will return to baseline levels following completion.
- Direct noise effects will primarily affect individual animals within the immediate vicinity of noise exceedances, rather than entire populations.
- Species are mobile and able to relocate to nearby suitable habitat if disturbed.

14 Conclusion

The Terrestrial Noise and Vibration Impact Assessment (TNVIA) undertaken for the Northern Water Project (the Project) provides a quantitative evaluation of construction and operational noise and vibration emissions from the desalination plant, intake pump station, pump stations, transmission infrastructure and pipeline alignment. Assessments were carried out in accordance with the *Environment Protection (Commercial and Industrial Noise) Policy 2023 (Noise EPP), the Environment Protection Act 1993, the Local Nuisance and Litter Control Act 2016 (LNLC Act),* DIT EHTM Attachment 7D, AS 2436:2010, AS 2670.2 and DIN 4150-3.

Predictive modelling used conservative assumptions, including worst-case meteorological propagation (CONCAWE Category 6), full concurrent operation of major plant items, and a 15-minute integration period for operational sources. Construction predictions assumed simultaneous operation of plant within each activity grouping. As such, the predicted noise levels represent upper-bound estimates of potential impacts.

The technical assessment confirms that:

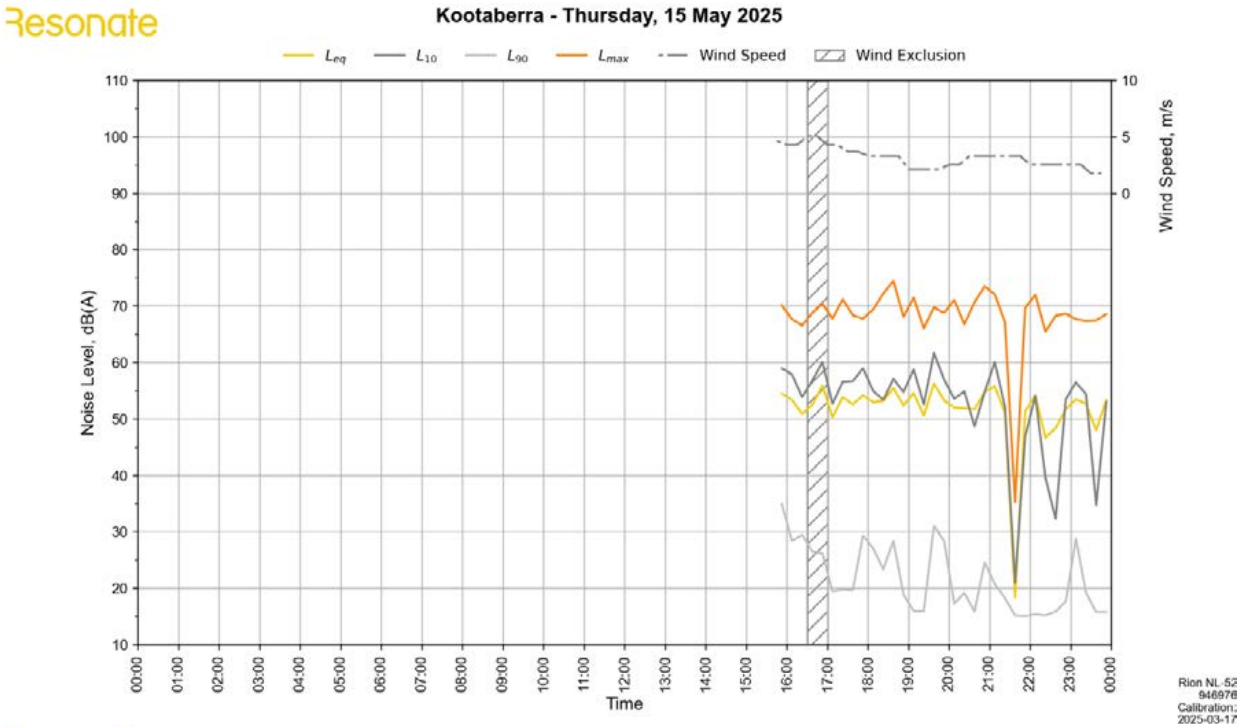
- Operational airborne noise
  - Prior to the inclusion of noise mitigation, minor exceedances of night-time Noise EPP Leq criteria (≤1–3 dB(A)) are expected at several residential receptors located near key infrastructure.
  - Higher exceedances are predicted at short-term rest areas (e.g., Ranges View, The Tanks, Eyre Highway stops), which are not classified as permanent noise-sensitive receivers.
  - With incorporation of recommended design-phase noise controls (e.g., acoustic louvres, high-performance cladding), operational noise is expected to achieve noise criteria at all residential locations.
- Construction airborne noise
  - Short-term exceedances of DIT EHTM 7D long-term construction noise targets are predicted at several receivers along the pipeline alignment due to close proximity to transient work fronts.
  - Exceedances are temporary and spatially limited given the linear, progressive construction methodology.
  - These impacts will be managed through the Construction Noise and Vibration Management Plan (CNVMP), including scheduling, plant selection, temporary shielding and stakeholder engagement in accordance with EHTM 7D.
- Ground vibration
  - Predicted vibration levels from piling, compaction and heavy plant comply with DIN 4150-3 structural damage limits for residential, industrial and heritage structures.
  - Vibration levels are also expected to remain below AS 2670.2 human comfort thresholds, except for short duration perceptible events during close-proximity activities, which are not expected to result in exceedance of acceptable limits.
  - Assessment indicates low risk to heritage assets such as the Phillips Ponds ruins.
  - Vibration impacts on terrestrial fauna are expected to be temporary and minor.
- Ecological receptors
  - Permanent or temporary hearing threshold shift (PTS/TTS) for terrestrial fauna, including EPBC and NPW Act–listed species (e.g., Western Grasswren, Plains Mouse), is unlikely due to their mobility and biological resilience.
  - Potential effects relate to masking and behavioural disturbance within defined exceedance radii, which are limited to tens of metres for typical construction equipment.
  - These impacts are manageable through fauna-sensitive work practices and maintaining spatial separation from identified habitat areas.
- Cumulative noise and vibration

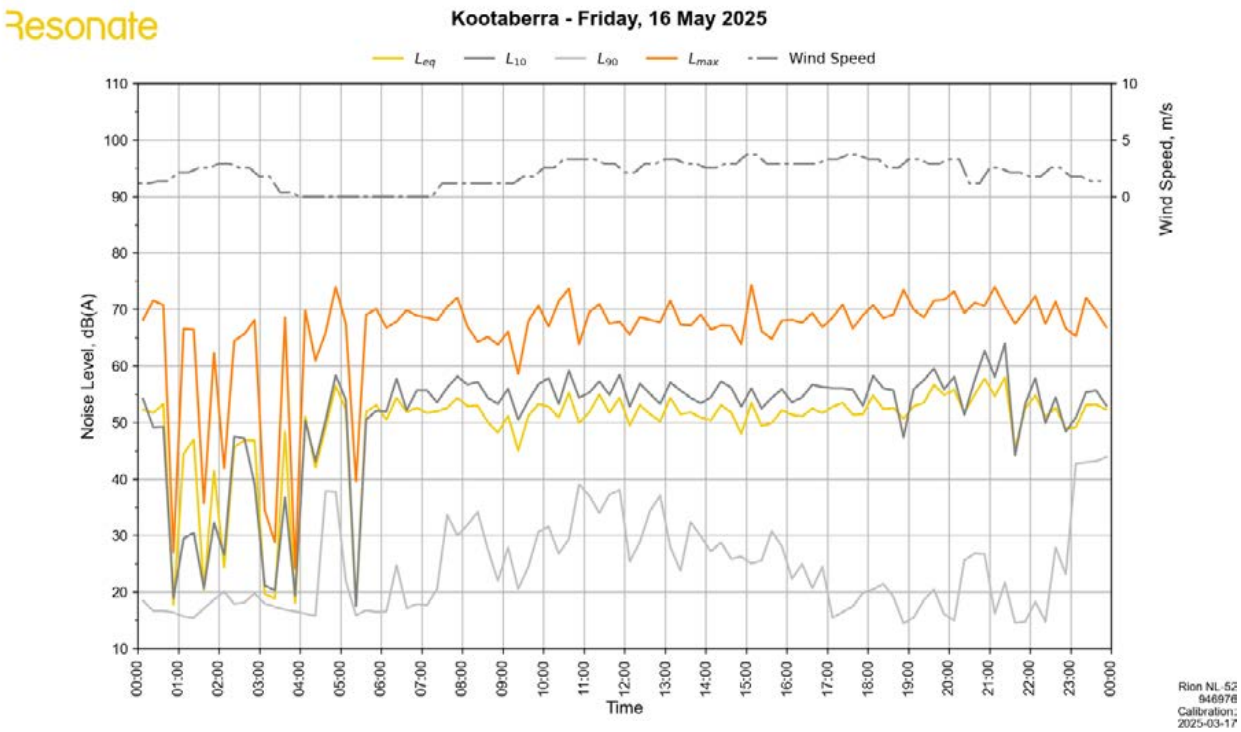
- With the exception of the Lincoln Gap wind farm, no significant existing or concurrent industrial noise sources occur near the desalination plant, pump stations or transmission infrastructure; therefore, operational cumulative noise is not expected to materially exceed Project-only levels.
- Publicly available planning approval documentation for the Lincoln Gap Wind Farm indicates that operational noise levels at the nearest receivers comply with the applicable amenity criteria. Based on this information and with mitigation incorporated into the pump station design, cumulative operational noise levels from both sources achieve compliance with all relevant noise criteria.
- Temporary cumulative construction noise may occur near operational sites (e.g., Olympic Dam, Carrapateena) where pipeline works coincide with existing industrial activity; these will be controlled through the CNVMP.

Overall, the modelling demonstrates that the Project is capable of achieving compliance with relevant operational noise and vibration criteria, as with mitigation in place the predicted exceedances limited to roadside rest areas. Construction exceedances are temporary, predictable and controllable through standard mitigation consistent with DIT EHTM 7D and AS 2436.

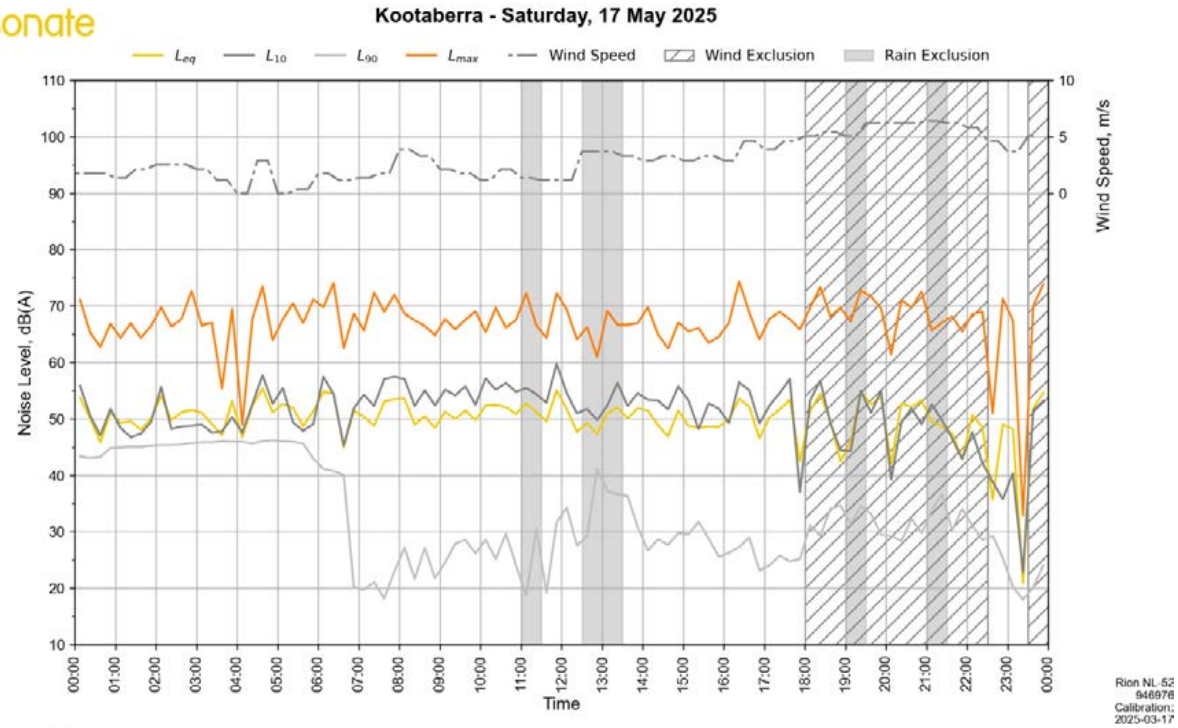
Accordingly, the Project is assessed as having manageable and acceptable noise and vibration impacts, with no predicted long-term risks to community amenity, structural assets or terrestrial fauna once recommended mitigation measures are implemented.

Appendix A—Daily measured noise levels

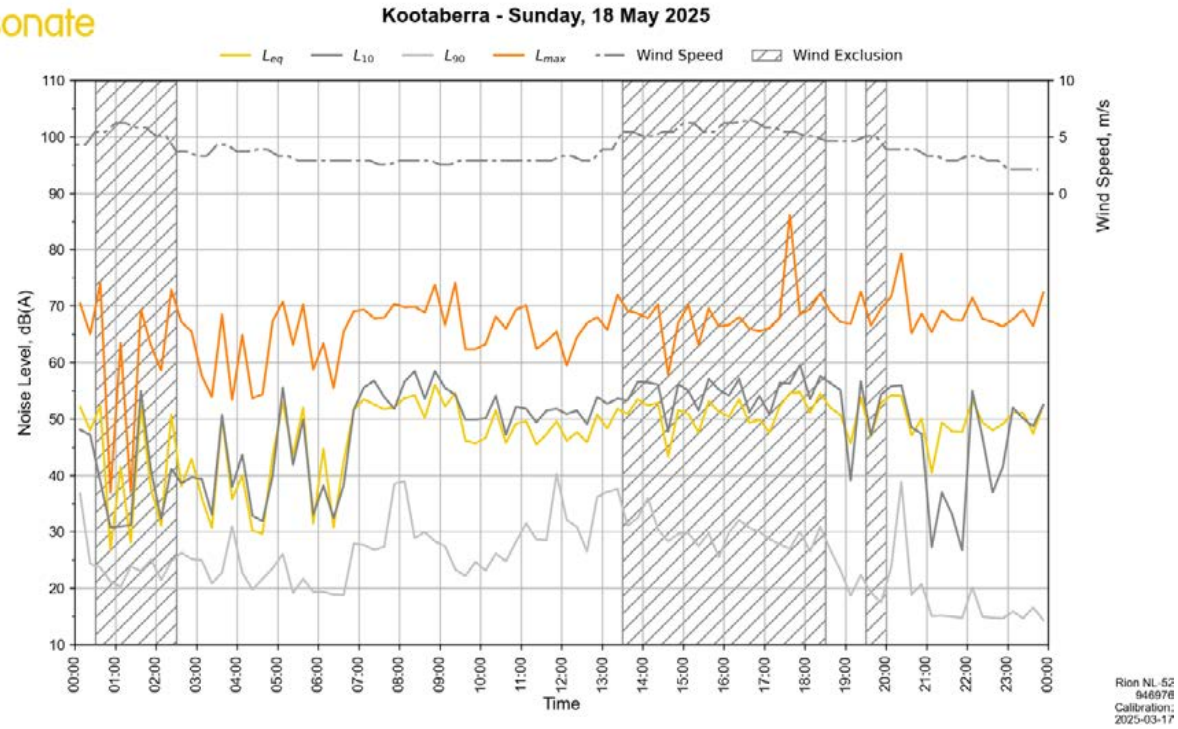


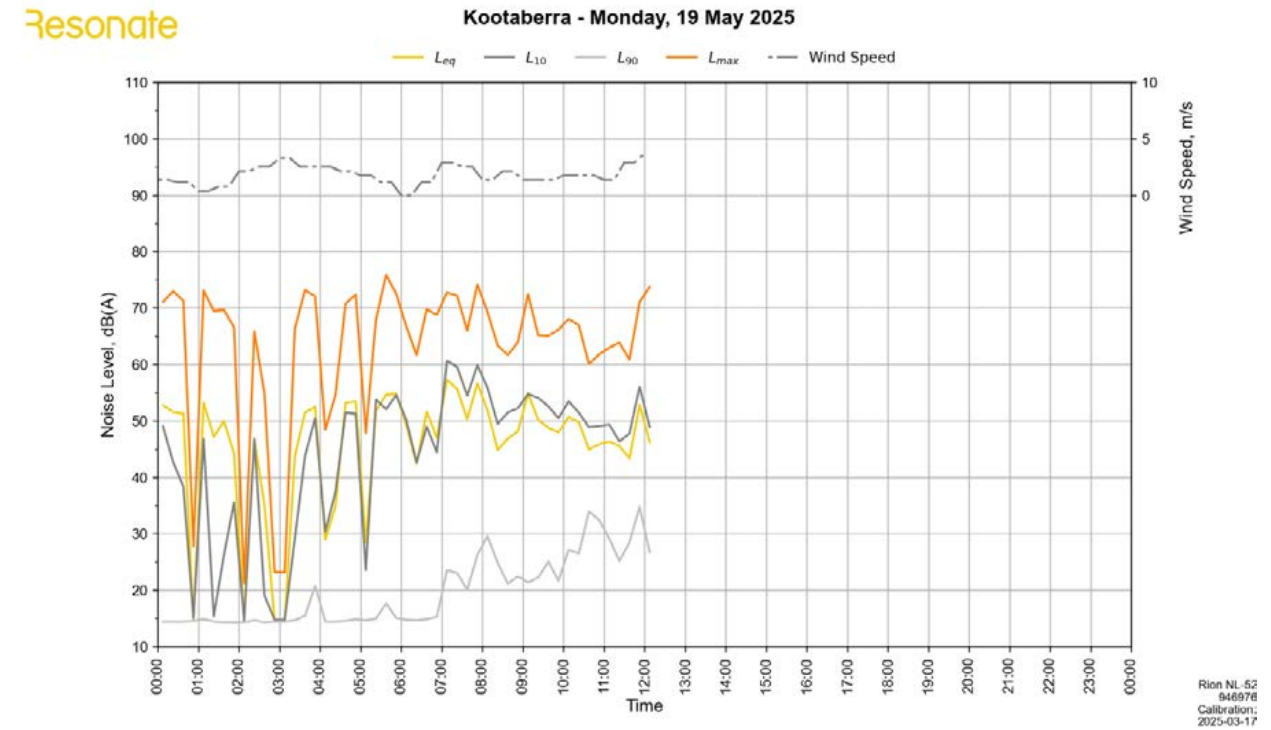


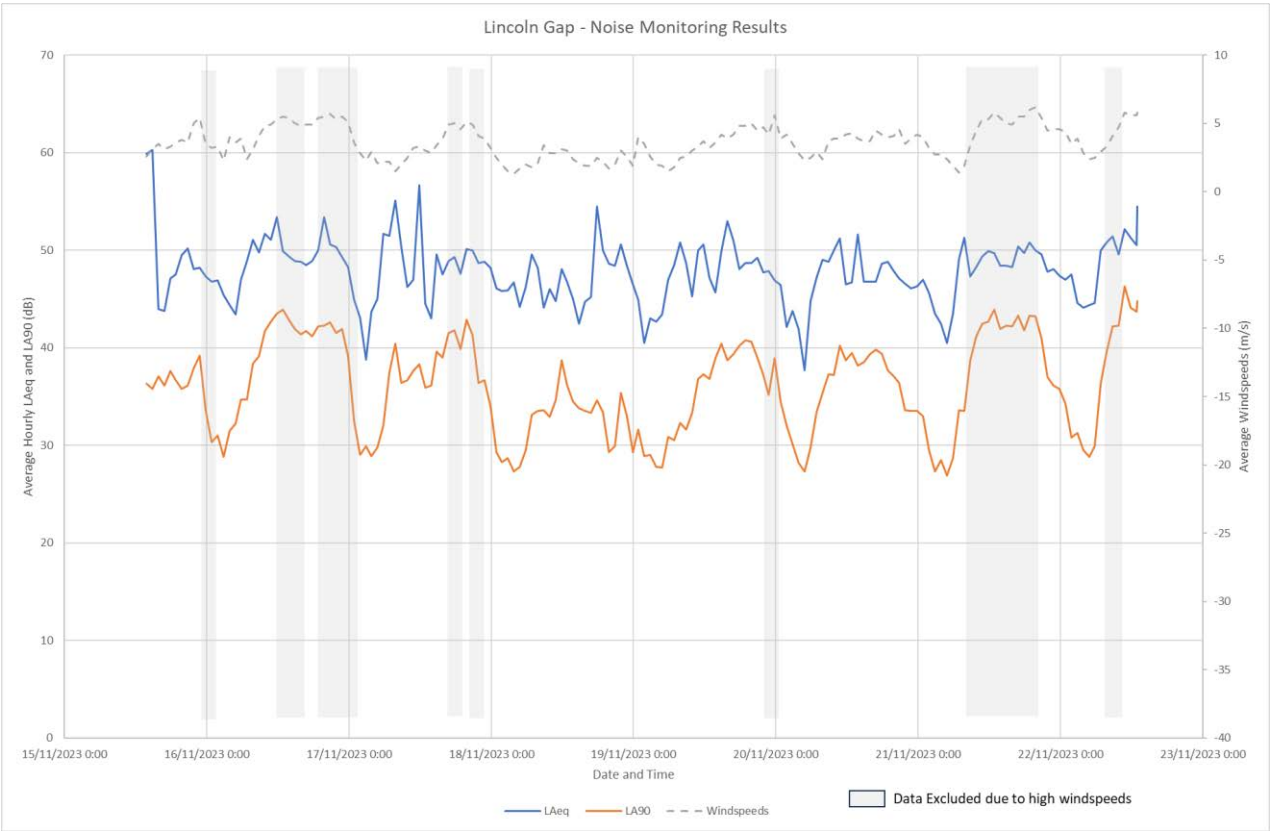
Resonate



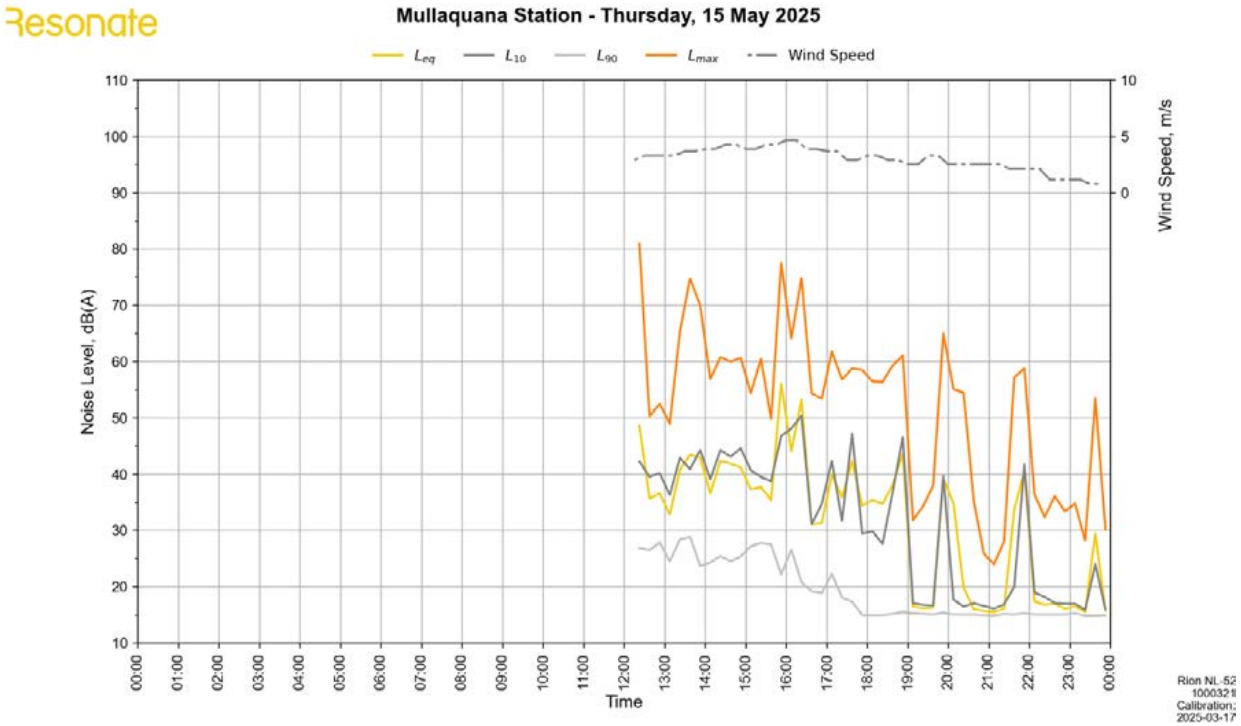
Resonate

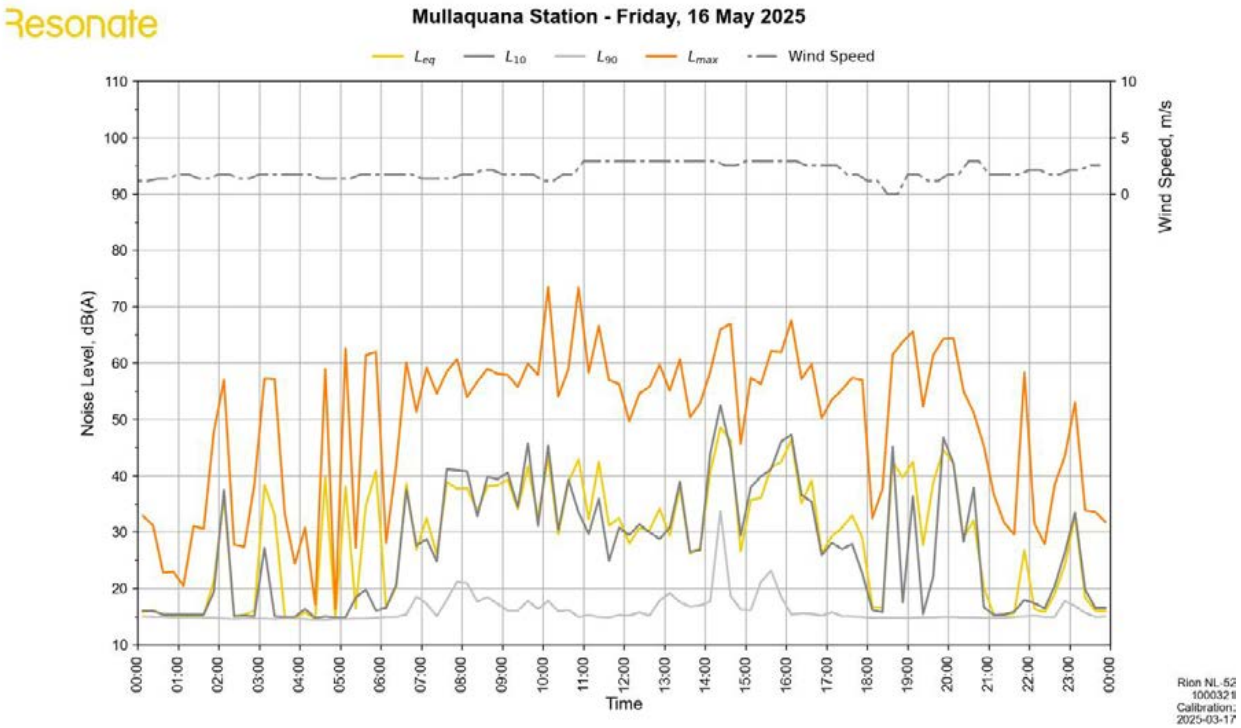


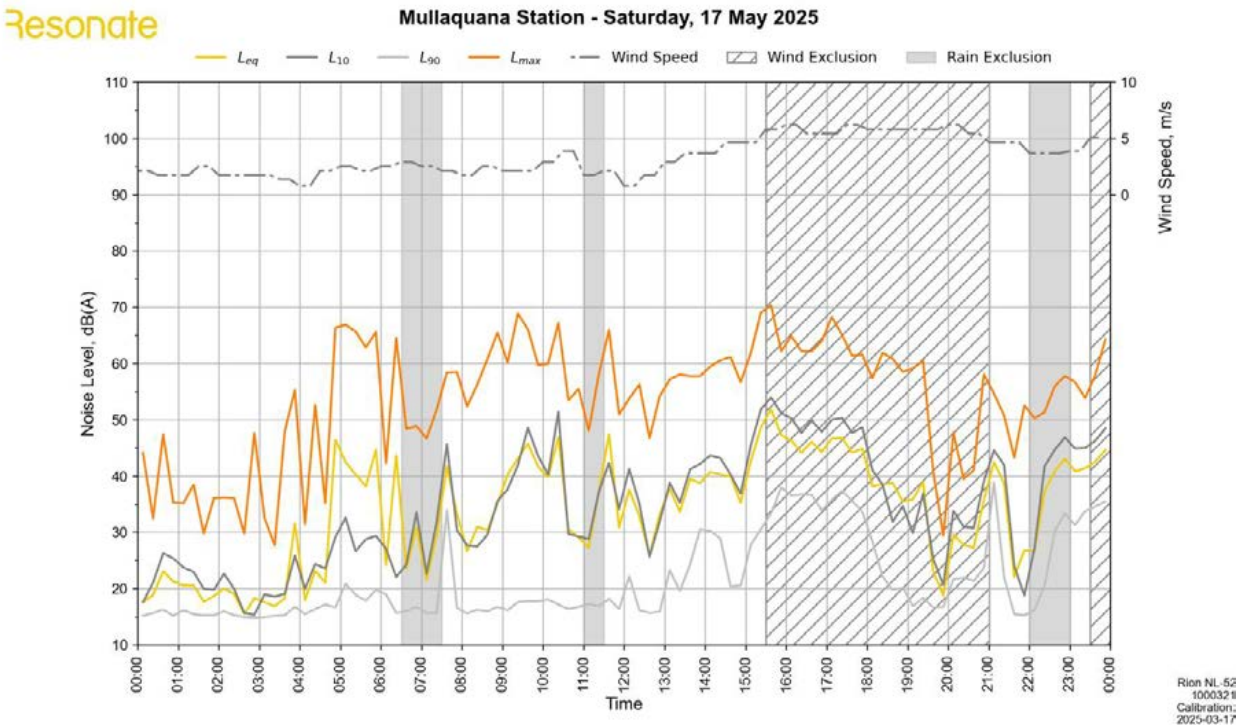


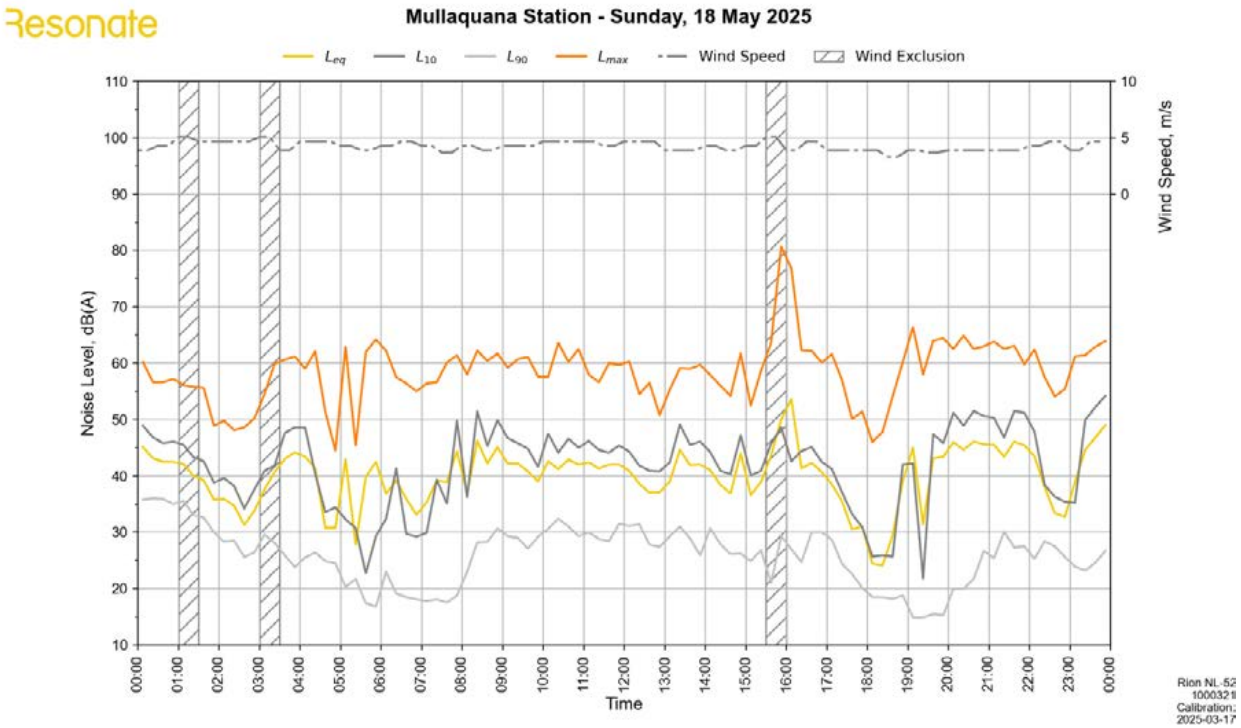


Jacobs doc no. IS449300-1-NW-RPT-001_NVIA_Rev C

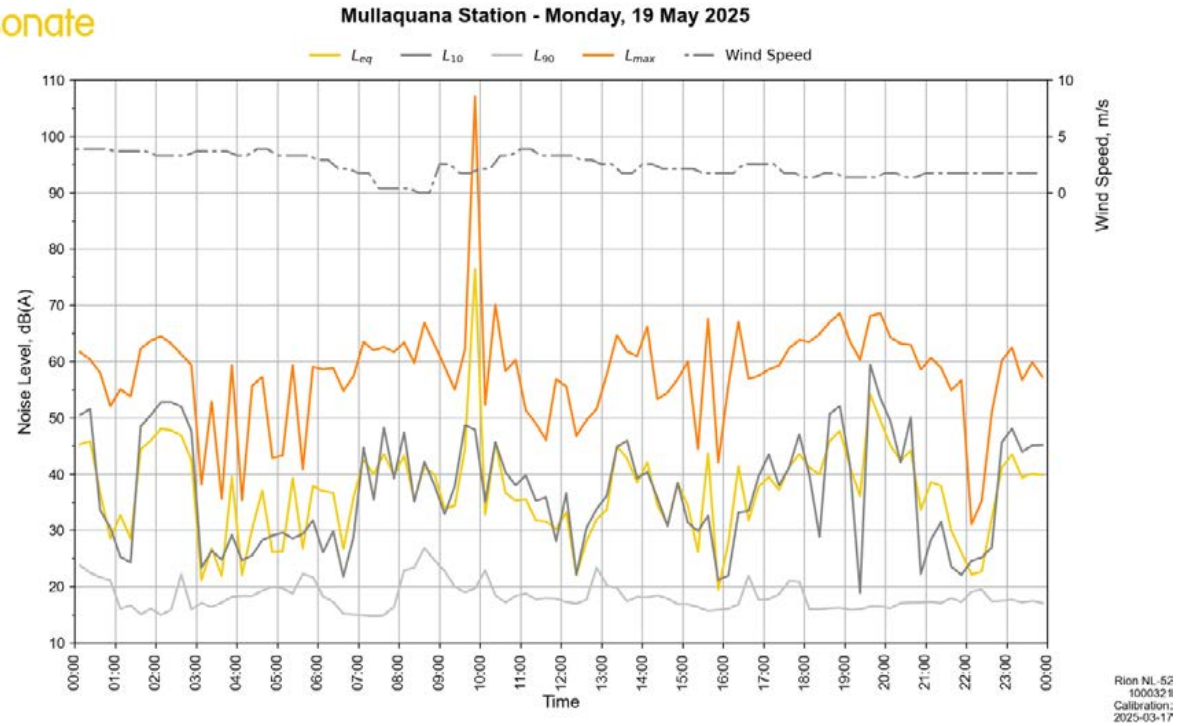

Resonate
Mullaquana Station - Thursday, 15 May 2025
L_{eq} L_{10} L_{90} L_{max} Wind Speed
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17


Resonate
Mullaquana Station - Friday, 16 May 2025
L_{eq} L_{10} L_{90} L_{max} Wind Speed
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17

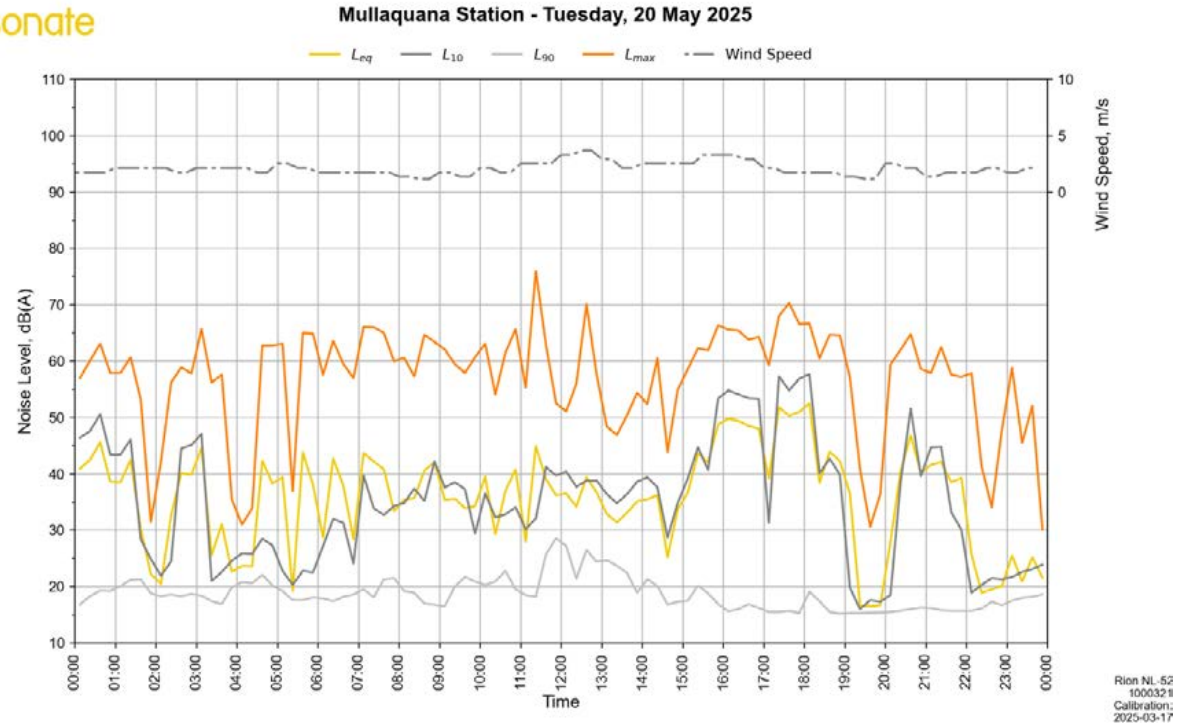

Resonate
Mullaquana Station - Saturday, 17 May 2025
L_{eq} L_{10} L_{90} L_{max} Wind Speed Wind Exclusion Rain Exclusion
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17


Resonate
Mullaquana Station - Sunday, 18 May 2025
L_{eq} L_{10} L_{90} L_{max} Wind Speed Wind Exclusion
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17

Resonate

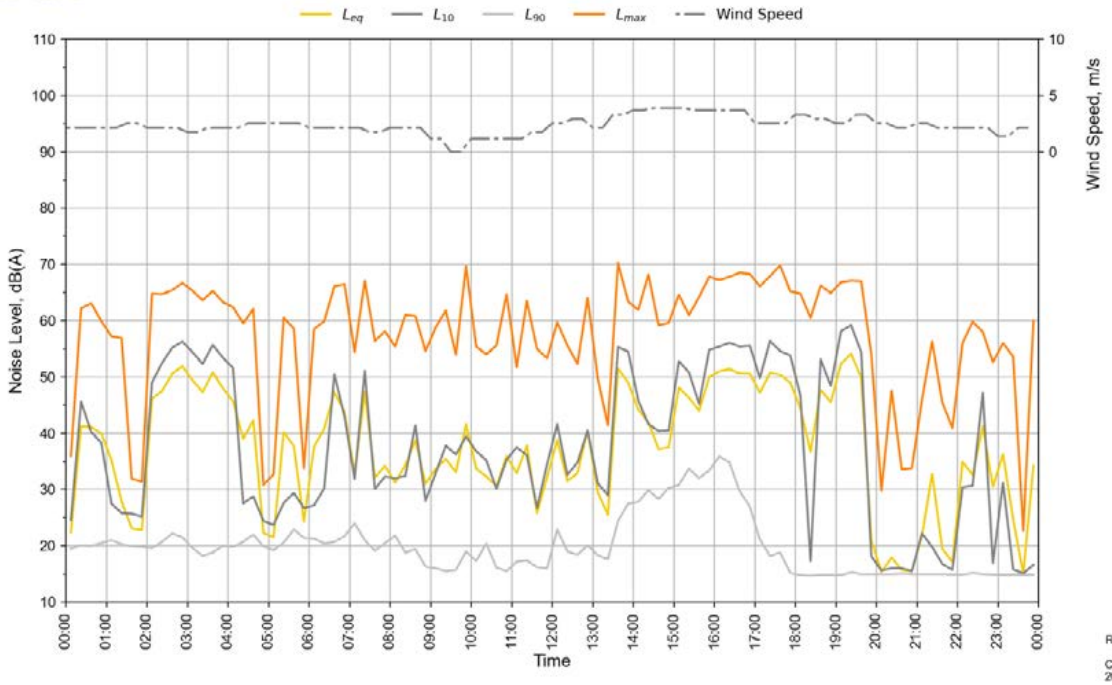


Resonate



Resonate

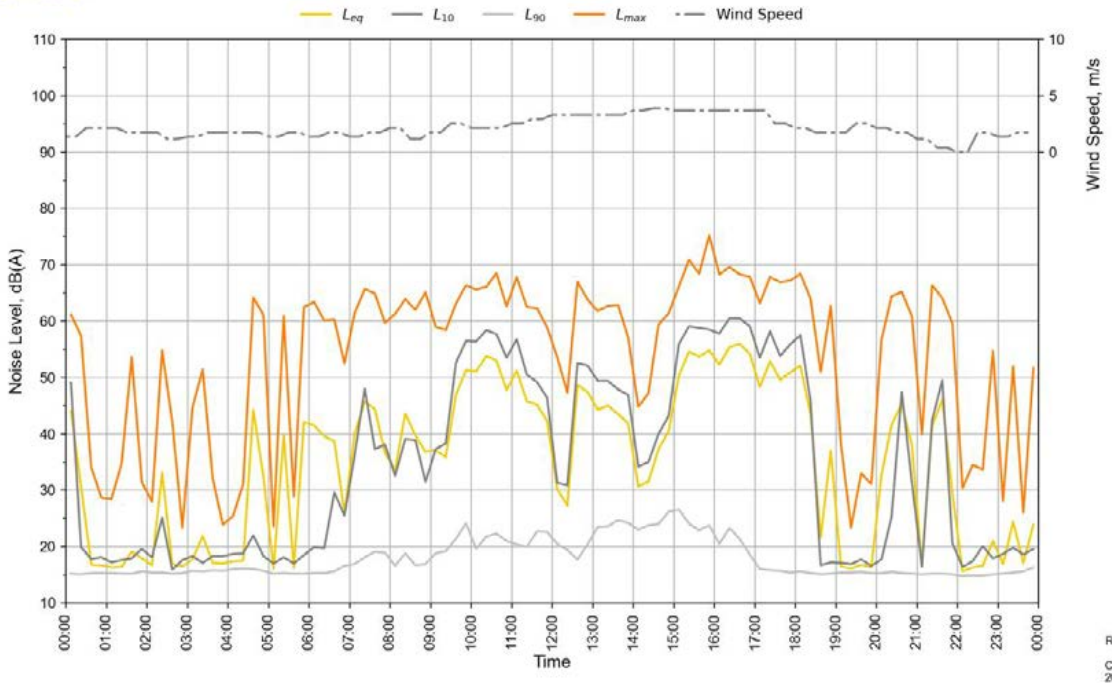
Mullaquana Station - Wednesday, 21 May 2025



Rion NL-52
1000321
Calibration:
2025-03-17

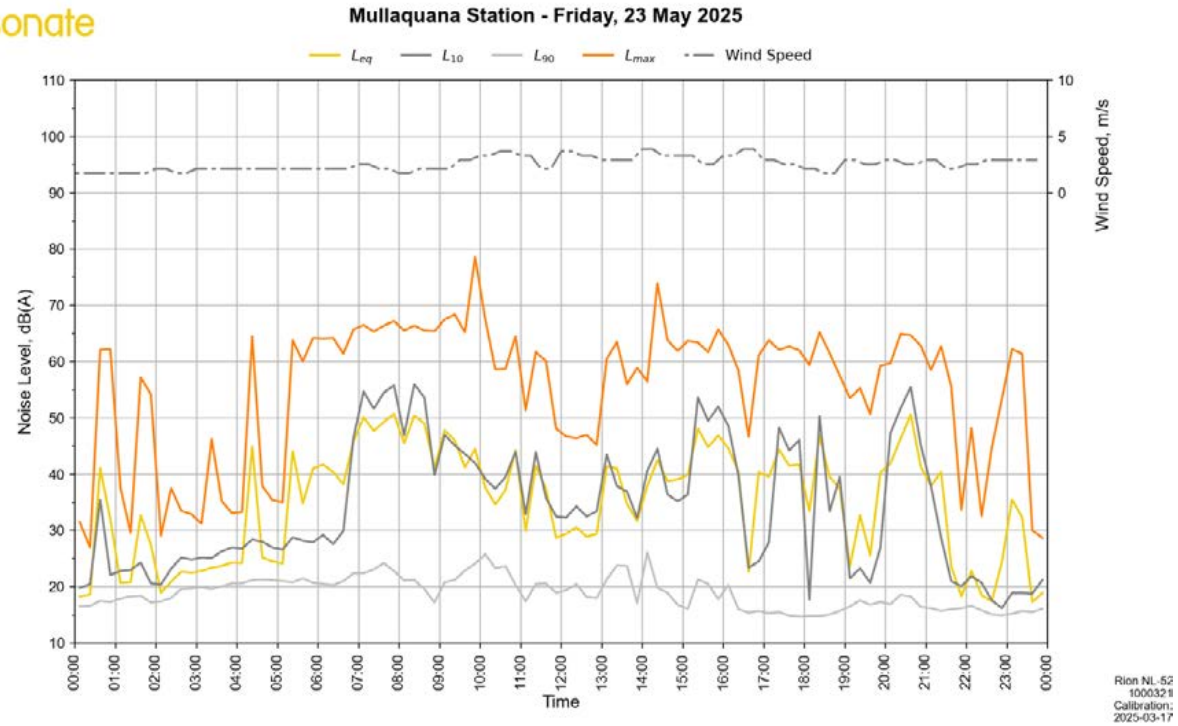
Resonate

Mullaquana Station - Thursday, 22 May 2025

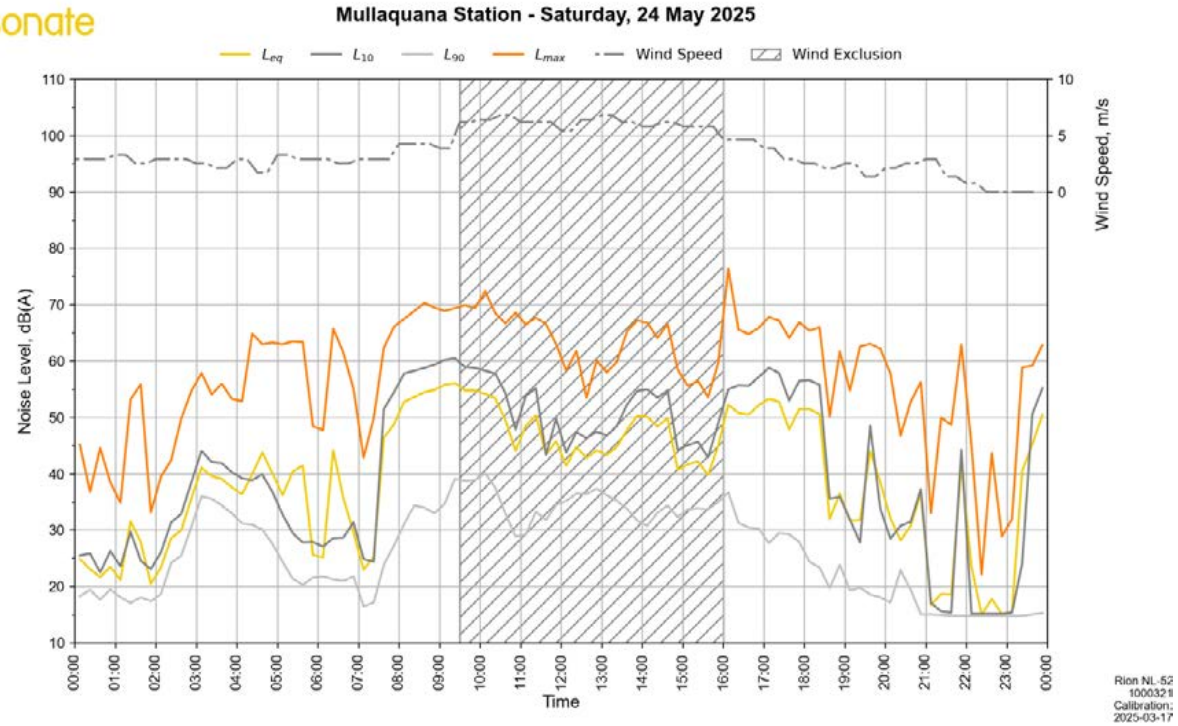


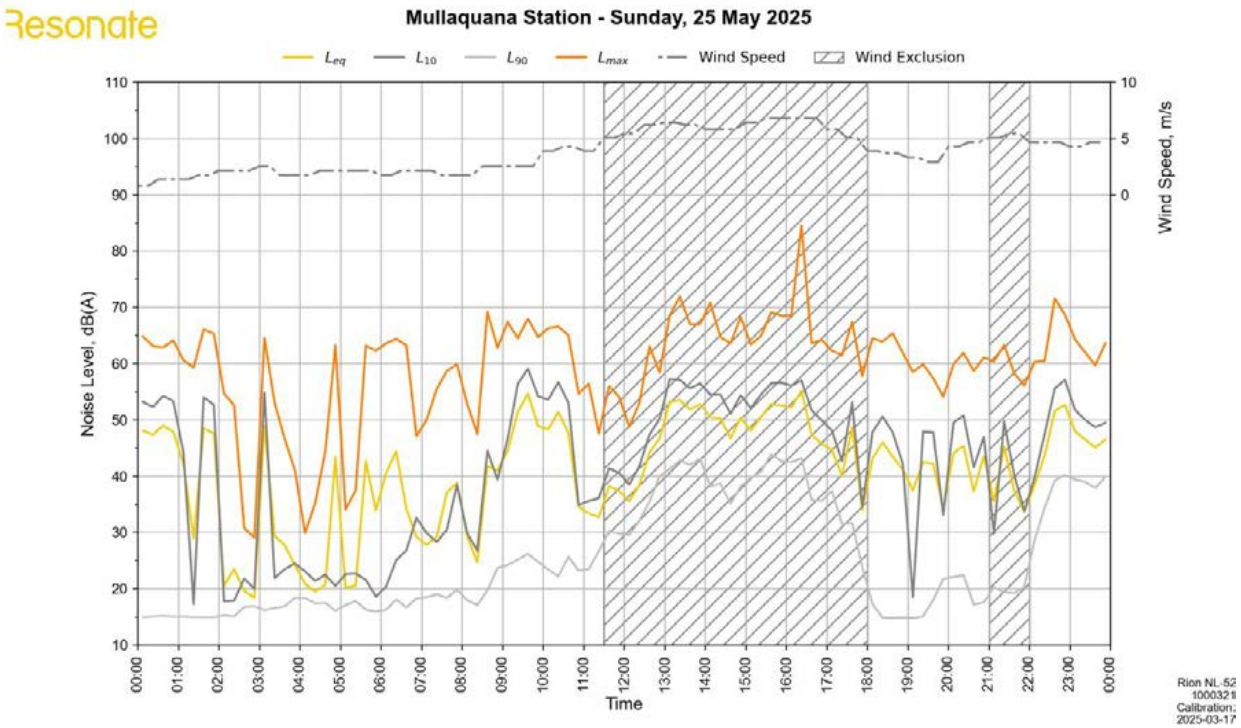
Rion NL-52
1000321
Calibration:
2025-03-17

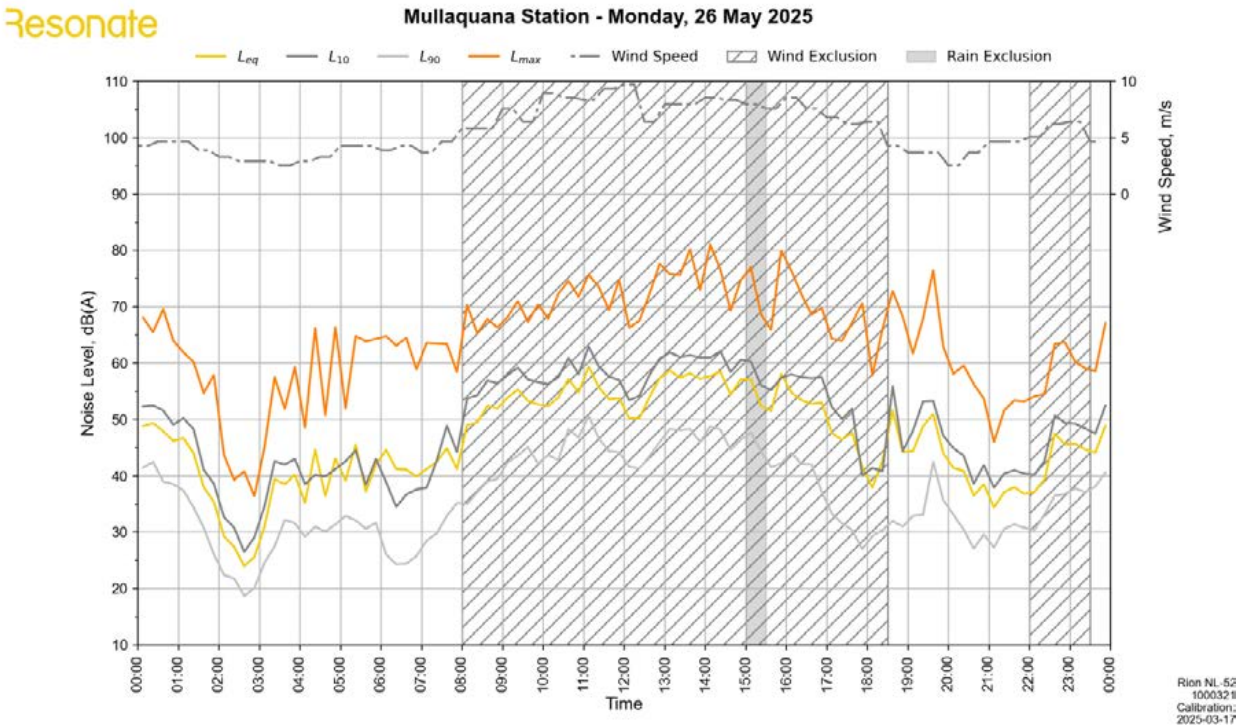
Resonate

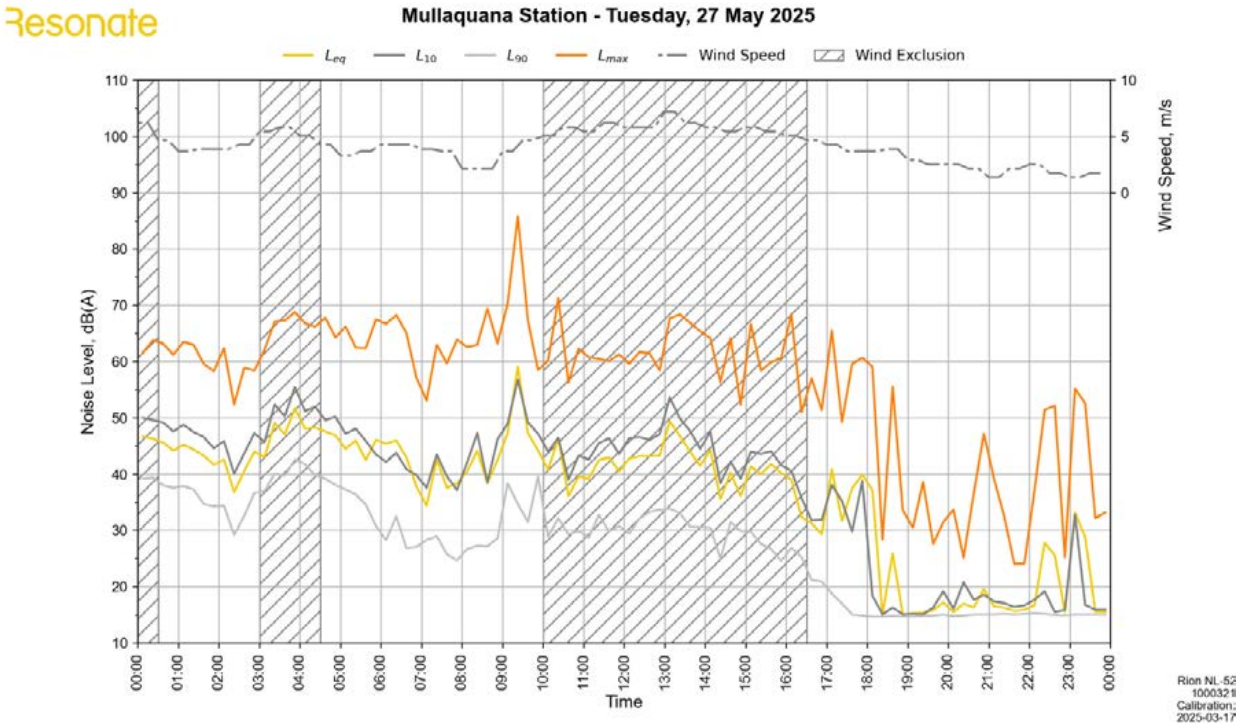


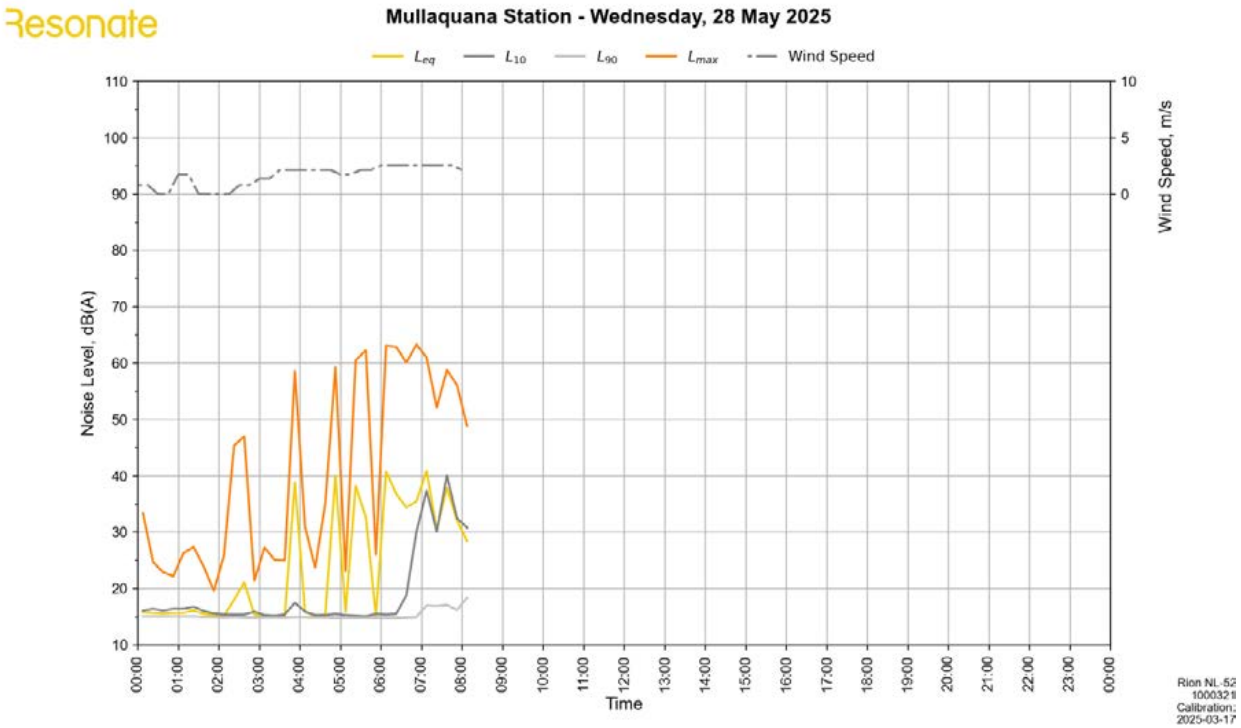
Resonate




Resonate
Mullaquana Station - Sunday, 25 May 2025
L_{eq}
L_{10}
L_{90}
L_{max}
Wind Speed
Wind Exclusion
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17


Resonate
Mullaquana Station - Monday, 26 May 2025
L_{eq}
L_{10}
L_{90}
L_{max}
Wind Speed
Wind Exclusion
Rain Exclusion
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17


Resonate
Mullaquana Station - Tuesday, 27 May 2025
L_{eq} L_{10} L_{90} L_{max} Wind Speed Wind Exclusion
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17


Resonate
Mullaquana Station - Wednesday, 28 May 2025
L_{eq} L_{10} L_{90} L_{max} Wind Speed
Noise Level, dB(A)
Wind Speed, m/s
Time
Rion NL-52
1000321
Calibration:
2025-03-17

Appendix B—Operational noise source data

Project Element	Noise source	Number	SWL	Total SWL
Intake pump station	Pump	4+1	108	115
Desalination Plant				
UF Feed pumps	Pump	5+1	109	116
	Ventilation fans	4	94	100
RO building	2 MVA Pumps	7+1	113	121
	Ventilation fans	4	94	100
Pump station 1 - Mullaquana Station	3.2 MW Pumps	4	113	118
	Ventilation fans	10	94	104
Pump station 2- Lincoln Gap	3.2 MW Pumps	2	113	119
	Ventilation fans	8	94	103
Pump station 3 - Kalaya	2.6 MW Pumps	2	113	116
	Ventilation fans	8	94	103
Pump station 4 - Oakden Hills	2.6 MW Pumps	2	113	116
	Ventilation fans	8	94	103
Portable Generator	Generator	1	100	100
Substations				
Desalination Plant	100 MVA Transformer	2	94	97
Mullaquana Station	90 MVA Transformer	1	93	93
Pandurra	10 MVA Transformer	2	80	83
Bookaloo	10 MVA Transformer	2	80	83
Oakden Hills	10 MVA Transformer	2	80	83

Appendix C—Construction noise source data

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
Indicative Activities and Resources for Pipeline Construction (>900mm)	Establish access, survey, clear the alignment	Grader	1	100	119	91	77	71
		D9	1	119				
		30t excavator	1	109				
	Excavation	1600 mm wide bucket wheel excavator	1	114	121	93	79	73
		45t excavators (widening and battering trench)	2	117				
	Mark out valve locations	30t excavator	1	109	109	81	67	61
	Stringing	45t excavator with vacuum lifter	1	117	118	90	76	70
		Front end loader (creating pipe supports)	1	109				
	Bedding sand	Front end loader	1	109	110	82	68	62
		20t excavator	1	104				
	Pipe laying	3t truck (rubber rings, lubricant, chain pullers, slings)	1	98	117	89	75	69
		45t excavator with vacuum lifter	1	117				
		Welding equipment	1	100				
		Front end loader	1	109	120	92	78	72

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	Backfill with select imported material (to 300 mm above pipe)	30t excavator	1	109				
		Excavator with needle vibrators	1	119				
		Water truck	1	100				
		Padder (if available)	1	0				
	Backfill to ground level using excavated material	30t excavator	1	109	113	85	71	65
		Grader	1	100				
		8t sheep foot roller	1	111				
	Tidy up / rehabilitation	-	-	0	0	0	0	0
	Support	Fuel truck	1	100	100	72	58	52
		Water and waste removal	1	0				
Indicative Activities and Resources for Pipeline Construction (<900mm)	Establish access, survey, clear the alignment	Grader	1	100	119	91	77	71
		D9	1	119				
		30t excavator	1	109				
	Excavation	1000 mm wide bucket wheel excavator	1	114	115	87	73	67
		30t excavator (widening and battering trench)	1	109				
	Mark out valve locations	30t excavator (to locally widen trench)	1	109	109	81	67	61
	Stringing	30t excavator with vacuum lifter	1	109	112	84	70	64

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
		Front end loader (creating pipe supports)	1	109				
	Bedding sand	Front end loader	1	109	110	82	68	62
		20t excavator	1	104				
	Pipe laying	3t truck (rubber rings, lubricant, chain pullers, slings)	1	98	110	82	68	62
		30t excavator with vacuum lifter	1	109				
		LH pipe layer and offsider	1	0				
		Welder and welding TA	1	100				
	Backfilling with select imported material (to 300 mm above pipe)	Front end loader	1	109	120	92	78	72
		30t excavator	1	109				
		Excavator with needle vibrators	1	119				
		Water truck	1	100				
		Padder (if available)	1	0				
	Backfill to ground level using excavated material	30t excavator	1	109	113	85	71	65
		Grader	1	100				
		8t sheep foot roller	1	111				
	Tidy up / rehabilitation	-	-	0	0	0	0	0
	Support	Fuel truck	1	100	100	72	58	52

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
		Water and waste removal	1	0				
Microtunnelling Resources	Typical Microtunnel Spread (used for crossings longer than 60 m and in saturated ground)	40t excavator (for lifting, incl. buckets, hammer, lifting chains)	1	114	115	87	73	67
		Microtunnelling machine	1	0				
		800 kVA generator	1	94				
		Welder	1	100				
		Pumps	2	94				
		Crew cab ute	2	85				
		6t tipper	1	98				
		Grout/bentonite mixer	1	97				
		Concrete kibble and vibrators	1	100				
Auger Boring Resources	Typical Auger Bore Spread (used for crossings in dry ground up to 60 m long)	30t excavator (for lifting, incl. buckets, hammer, lifting chains)	1	109	119	91	77	71
		Auger bore machine (complete with rails)	1	118				
		300 mm vent fan and ducting	1	85				
		200 kVA generator	1	94				
		Welder	1	100				
		Pumps	2	94				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
		Crew cab ute	1	85				
		6t tipper	1	98				
		Grout mixer	1	97				
Pump Station Details Complete with Sub-Crews	Prepare site area and construct building pad	Grader	1	100	119	91	77	71
		D9	1	119				
		30t excavator	1	109				
	Construct raft slab and FRP building walls	pump operator (static line pump)	1	80	103	75	61	55
		10t Dieci/telehandler	1	100				
		Concrete agitator truck	1	99				
	Erect structural steel	45ft knuckle boom EWPs	2	89	101	73	59	53
		100t slew crane	1	100				
	Install overhead crane	45ft knuckle boom EWP	1	89	103	75	61	55
		Crane	1	100				
		100t slew crane	1	100				
	Erect roof and wall sheeting	Crane	1	100	101	73	59	53
		45ft knuckle boom EWPs	2	89				
	Install pumps and internal pipework	-	-	0	0	0	0	0
	Install external pipeline and	-	-	0	0	0	0	0

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	connection to main line							
	Ancillary works (fencing, solar installation, substation construction, landscaping, access roads including spray seal)	Grader	1	100	109	81	67	61
		Roller	1	108				
		Water truck	1	100				
	Dry commissioning	-	-		0	0	0	0
Storage Tank Crew Details	Earthworks (access, tank/crane pad, pipework)	30t excavator	1	109	115	87	73	67
		Loader	1	109				
		Water truck	1	100				
		Body truck	1	100				
		Padfoot roller	1	108				
		Smooth roller	1	108				
		Pumps	1	94				
		Settlement tanks	1	80				
	Footing (ring beam, concrete base slab)	30t excavator (with lifting capability)	1	109	111	83	69	63
		Concrete pump	1	106				
		Concrete trowelling machine and vibrators	1	100				
		20 kVA generator	1	93				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
		3t tipper	1	98				
		Dual cab utes	3	85				
	Structure/Erection (precast walls and post-tension)	100t mobile crane	1	100	101	73	59	53
		Lifting equipment	-					
		20 kVA generator	1	93				
		Dual cab utes	2	85				
	Roof structure, roof and access steelwork	30t Franna	1	98	100	72	58	52
		20 kVA generator	1	93				
		Dual cab utes	3	85				
Proposed TBM Launch Box Resources	Prepare site area	Grader	1	100	119	91	77	71
		D9	1	119				
		30t excavator	1	109				
	Guidewall-Excavate trench / Place void former / Backfill with concrete	15t excavators	2	103	110	82	68	62
		30t moxy	1	108				
		concrete agitator	1	99				
	Secant piling (pre-bore the pile hole to support temporary casing 2–3m), install temp steel casing, excavate pile, concrete pile, extract steel casing	piling machines (e.g., Bauer BG 36)	4	112	124	96	82	76
		80t crawler cranes	2	99				
		15t excavators	4	103				
		vibro hammers	4	116				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	Capping beam – breakout guidewall, crop piles, blinding concrete, formwork install, reinforcement install, pour	15t excavators	4	103	116	88	74	68
		30t moxy	1	108				
		10t telehandlers	2	100				
		concrete agitator	1	99				
		CFA pile cropper	1	111				
		concrete pump	2	106				
	Excavation box	30-ton moxy dump trucks	3	108	123	95	81	75
		50-ton load-out excavator	1	117				
		30-ton excavators	2	109				
		drill rigs for anchors	2	118				
		10-ton telehandlers	2	100				
		shotcrete machines (e.g., Jacon Midjet)	2	106				
		concrete agitator	1	99				
	Base slab – tension piles, blinding, reinforcement, pour	10tn telehandlers	1	100	113	85	71	65
		concrete agitator	1	99				
		Concrete pump	1	106				
		tension pile install machine	1	111				
Plant Resources for Desalination	Clear and Grubbing	30t Excavators	4	109	117	89	75	69
		Water truck	1	100				
		Dump Trucks (30t)	2	108				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
Plant Bulk Earthworks	Cut and Fill Earthworks	CAT 621 Push Pull Scrapers	4	109	121	93	79	73
		CAT G14 Grader	1	100				
		13t Pad Foot Roller	1	108				
		13t Smooth Drum Roller	1	108				
		D8 Dozer	1	117				
		30t Excavator	2	109				
		D30T Dump Truck	2	108				
		Water truck	1	100				
UF Building Personnel Resources	Install UF train skids	Crane	1	99	99	71	57	51
	Install pipework / manifold / valves / instrumentation etc.	Crane	1	99	103	75	61	55
		2 x EWPs	2	89				
		100t crane	1	100				
	E&I cabling & terminations for process works	excavator	1	105	105	77	63	57
	E&I cabling & terminations for building works	excavator	1	105	105	77	63	57
		EWPs	1	89				
Cartridge Building Personnel Resources	Install RO LP & ERD Feed Pumps and Cartridge Filters	Crane	1	100	100	72	58	52
		Crane	1	100	103	75	61	55

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	Install pipework / manifold / valves / instrumentation etc.	EWPs	1	89				
		Crane	1	100				
	E&I cabling & terminations for process works	excavator	1	105	105	77	63	57
	E&I cabling & terminations for building works	excavator	1	105	105	77	63	57
		EWPs	1	89				
UF Feed Pumps Personnel Resources	Install UF Feed Pumps	Crane	1	100	100	72	58	52
	Install pipework / manifold / valves / instrumentation etc.	2 x EWPs	2	89	101	73	59	53
		100t crane	1	100				
	Install Sampling Pumps, valves, & pipework from UF Feed Tank to Laboratory. (assumed pipe laid in trench)	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
Autostrainer Personnel Resources	Install Auto-strainers	Crane	1	100	100	72	58	52
		2 x EWPs	2	89	101	73	59	53

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	Install pipework / manifold / valves / instrumentation etc.	100t crane	1	100				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
Blower Room Resources	Install Blowers	Crane	1	100	100	72	58	52
	Install pipework / manifold / valves / instrumentation etc.	Crane	1	100	100	72	58	52
	E&I cabling & terminations for Blowers and Blower Room	Excavator	1	105	105	77	63	57
UF CIP Personnel Resources	Install UF CIP Tanks	Crane	1	100	100	72	58	52
	Install pipework / manifold / valves / instrumentation etc.	Forklift	1	100	103	75	61	55
		Crane	1	100				
		EWP	1	89				
	E&I cabling & terminations for Blowers and Blower Room	Excavator	1	105	105	77	63	57
	Install preassembled RO racks with	Crane	1	100	100	72	58	52

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
RO Building Personnel Resources	empty pressure vessels							
	Install RO membranes	Forklift	1	100	100	72	58	52
		EWPs	1	89				
	Install RO HP & ERD Booster Pumps	Crane	1	100	100	72	58	52
	Install RO ERD Devices	crane	1	100	100	72	58	52
	Install pipework / manifold / valves / instrumentation etc.	EWPs	2	89	101	73	59	53
		100t crane	1	100				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for process works	EWPs	1	89	89	61	47	41
	E&I cabling & terminations for building works	Excavator	1	105	105	77	63	57
		EWPs	1	89				
RO Feed Tanks Personnel Resources	Install pipework / manifold / valves / instrumentation etc.	EWP	1	89	100	72	58	52
		Crane	1	100				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
RO CIP Personnel Resources	Install RO CIP Tanks	Crane	1	100	100	72	58	52
	Install pipework / manifold / valves / instrumentation etc.	Excavator	1	105	105	77	63	57
	Install pipework / manifold / valves / instrumentation etc.	EWP	1	89	89	61	47	41
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
RO Permeate Tanks Personnel Resources	Install Flushing Pumps	Crane	1	99	99	71	57	51
	Install pipework / manifold / valves / instrumentation etc.	EWP	1	89	100	72	58	52
		Crane	1	100				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	Install Lime Dewatering System equipment	Excavator	1	105	106	78	64	58
		Crane	1	100				
		EWPs	1	89				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	Install pipework / manifold / valves / instrumentation etc.	Excavator	1	105	106	78	64	58
		Crane	1	100				
		EWPs	1	89				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for Lime Centrifuge Building works	Excavator	1	105	105	77	63	57
Lime Dosing and Storage Personnel Resources	Install Lime Storage Silos	Crane	1	100	100	72	58	52
		EWPs	1	89				
	Install Lime Slurry Tanks	Crane	1	100	100	72	58	52
	Install Lime Saturators	Crane	1	100	103	75	61	55
		EWPs	1	89				
		Forklift	1	100				
	Install Lime Water Storage Tank and Dosing Skid, pump, etc., and Lime Sludge Tank	-	-	0	0	0	0	0
	Install pipework / manifold / valves / instrumentation etc.	Crane	1	100	103	75	61	55
		EWPs	1	89				
		Forklift	1	100				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for Lime Storage/Dosing Area works	Excavator	1	105	105	77	63	57
C02 Dilution and Injection Personnel Resources	Install pressure vessels, pumps, equipment	forklift	1	100	103	75	61	55
		Crane	1	100				
		EWP	1	89				
	Install pipework / manifold / valves / instrumentation etc.	excavator	1	105	106	78	64	58
		EWP	1	89				
		Crane	1	99				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
UF Chemical Storage Personnel Resources	Install pump skids, pumps, tanks, equipment	forklift	1	100	103	75	61	55
		Crane	1	100				
	Install pipework / manifold / valves / instrumentation etc.	Crane	1	100	107	79	65	59
		Excavator	1	105				
		EWP	1	89				
		Crane	1	100				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for building works	Excavator	1	105	105	77	63	57
		EWPs	1	89				
UF Chlorine Building Personnel Resources	Install pump skids, pumps, tanks, equipment	Crane	1	100	100	72	58	52
		forklift	1	100				
	Install pipework / manifold / valves / instrumentation etc.	Excavator	1	105	107	79	65	59
		Crane	1	100				
		forklift	1	100				
		EWP	1	89				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for building works	Excavator	1	105	105	77	63	57
		EWPs	1	89				
RO Chemical Personnel Resources	Install pump skids, pumps, tanks, equipment	Crane	1	100	103	75	61	55
		forklift	1	100				
	Install pipework / manifold / valves / instrumentation etc.	Excavator	1	105	106	78	64	58
		EWP	1	89				
		Crane	1	100				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for building works	Excavator	1	105	105	77	63	57
		EWPs	1	89				
Pump Station Personnel Resources	Install Product Water Pumps	Crane	1	100	100	72	58	52
	Install pipework / manifold / valves / instrumentation etc.	100t crane	1	100	100	72	58	52
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
	E&I cabling & terminations for Pump Station building works	Excavator	1	105	105	77	63	57
Product Water Tank Personnel Resources	Install Sampling Pumps, valves, & pipework from Product Water Tanks to Laboratory. (assumed pipe laid in trench)	Excavator	1	105	105	77	63	57
	Install pipework / manifold / valves /	Excavator	1	105	106	78	64	58
		EWP	1	89				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	instrumentation etc.	Crane	1	100				
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57
Intake Shaft Structure M&E Personnel Resources	Install Band Screens	Crane	1	100	100	72	58	52
	Install Spray Pumps / pipework / valves / instrumentation	-	-	0	0	0	0	0
	Penstock & Stop Logboards install	Crane	1	100	103	75	61	55
		EWP-scissor	1	89				
		80t Crane	1	99				
	E&I cabling & terminations for process works	forklift	1	100	106	78	64	58
		25t excavator	1	105				
Intake Pump Station M&E Personnel Resources	Install Intake Pumps & vertical pipework	Crane	1	100	100	72	58	52
	Install pipework / valves / instrumentation etc.	Crane	1	100	100	72	58	52
	E&I cabling & terminations for process works	Excavator	1	105	105	77	63	57

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
	E&I cabling & terminations for Intake building		-		0	0	0	0
Outlet Structure M&E Personnel Resources	Install Outlet Pumps & vertical pipework	Crane	1	100	100	72	58	52
	Install pipework / valves / instrumentation etc.	Crane	1	100	100	72	58	52
	E&I cabling & terminations for process works	-	1	0	0	0	0	0
Laydown Areas		220T Mobile Crane	1	101	109	81	67	61
		25T Franna	1	98				
		Pozi Track	1	104				
		4T Telehandler	1	95				
		70T Rough Terrain Crane	1	95				
		90T Mobile Crane	1	95				
		Semi-Truck	1	103				
		Handtools	1	85				
		Watercart	1	100				
	Access	Grader	1	100	109	81	67	61
		Bulldozer	1	96				
		Roller	1	108				

Project Element	Activity	Resources	Number	SWL (dB)	Activity combined SWL	Activity combined SPL @ 10m	Activity combined SPL @ 50m	Activity combined SPL @ 100m
Transmission line		Truck	1	98				
	Foundations	Drill rig	1	112	121	93	79	73
		Excavator	1	109				
		Augers	1	118				
		Vibration hammers	1	116				
		Bobcats	1	109				
		Frannas	1	98				
		Trucks	1	98				
	Tower assembly	Cranes	1	100	102	74	60	54
		Frannas	1	98				
	Optional	Helicopter	1	130	130	102	88	82
	Line Stringing	Cranes	1	100	102	74	60	54
		Frannas	1	98				

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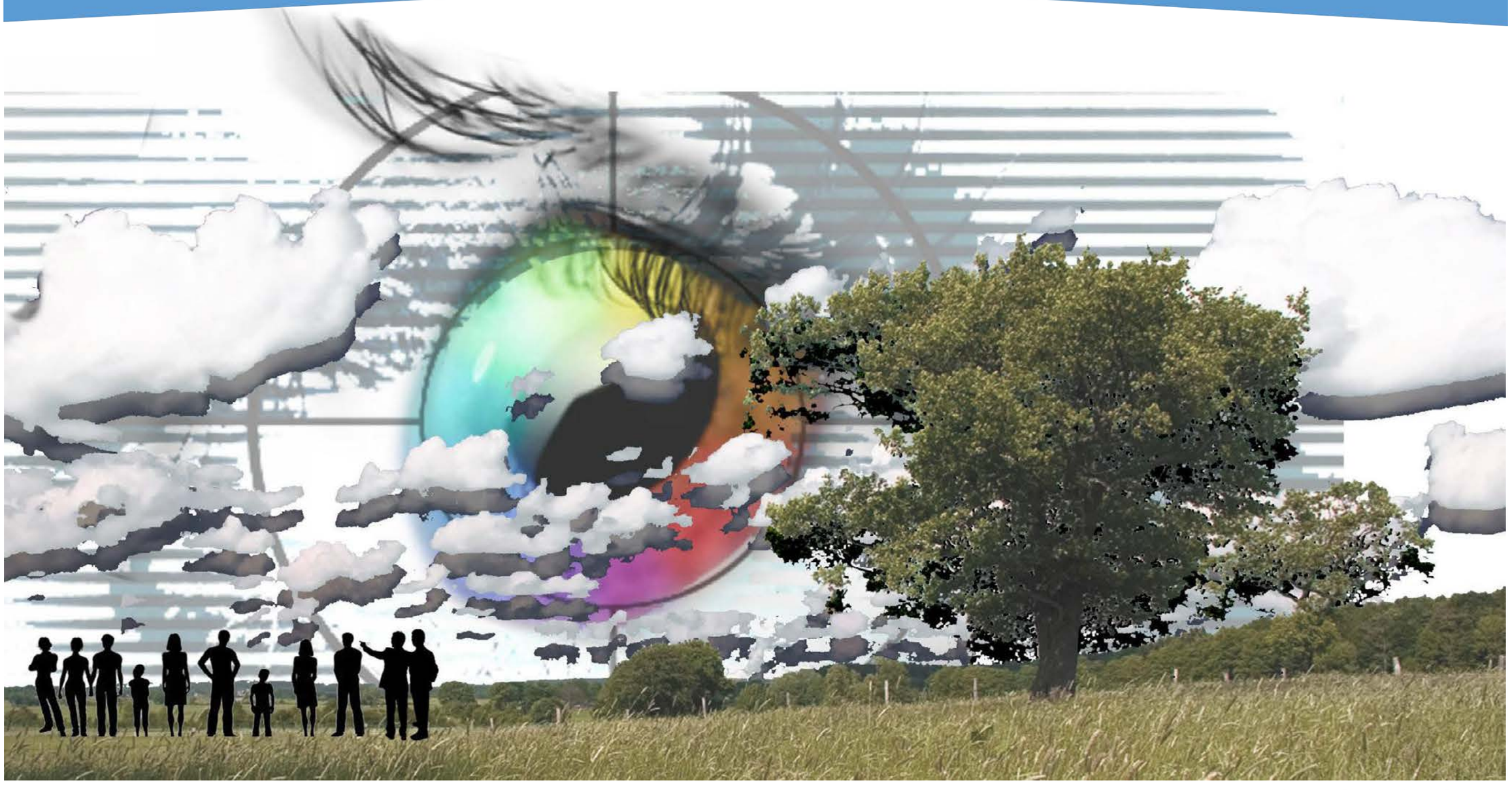
Appendix J-3:

Landscape Character and Visual Amenity Impact Assessment

Northern Water Project

Landscape Character and Visual Impact Assessment

July 2026



Hemisphere Design (Aust) Pty Ltd

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About the author

Stuart Heseltine, Principal, Hemisphere Design (Aust) Pty Ltd. Stuart is acknowledged as a leading practitioner in the area of landscape character and visual impact assessment. In considering each visual impact assessment exercise Stuart undertakes a qualitative landscape character assessment consistent with best practice as prescribed by the Guidelines for Landscape and Visual Impact Assessment (third edition), the Landscape Institute (UK) and Institute of Environmental Management and Assessment (NSW) 2013.

Stuart has successfully applied this methodology to major projects across South Australia, the Northern Territory, New South Wales, Victoria and Western Australia. Stuart has prepared assessments for the Adelaide, Kangaroo Island and Port Lincoln Desalination Plants (SA), the Lincoln Gap (Stage 3) and Barn Hill Wind Farm Developments (SA), the Chaff Mill (SA), Tailem Bend Stage Two (SA), Frasers Solar Farm (Glengarry North, Victoria), Mid Murray and Berri Solar Farm developments (SA), the Clements Gap BESS (SA), Tyabb BESS (Mornington Peninsula, Victoria) and the Torrens Island Gas Power Station Expansion (SA). In addition, Stuart has recently undertaken a visual impact assessment for a Crown Development Application to support the Whyalla Hydrogen Jobs Plan.

Stuart provides regular advice on the likely visual impact pertaining to Development Applications lodged in numerous Adelaide metropolitan and regional council areas.

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Glossary of terms

Term	Description
CL	Contextual Landscape
CVI	Cumulative Visual Impact
DIT	Department for Infrastructure and Transport, South Australia
EIA	Environmental Impact Assessment
HD	Hemisphere Design
kV	kiloVolts
Landscape Assessment	An assessment of the elements that collectively make up the landscape, such as landform, vegetation, land-use and cultural influences
LCVIA	Landscape Character and Visual Impact Assessment
Location(s) / Locality	The position or site of something
NW	Northern Water Project
PDC	PlanSA. Planning and Design Code
Receptor(s)	A place, route, viewer audience or interest group which may receive an effect and require assessment.
Sensitive Receptor (SR)	A Viewpoint or Viewpoint Locality where the observer is more susceptible to the visual impact of the development
Sensitive Receptor Locality (SRL)	An area where there are a number of collocated Sensitive Receptors
Viewpoint (VP)	A position providing a view of the proposed development from where an assessment is made to consider landscape character and the likely potential for visual impacts which may result as a consequence of the development.
Viewpoint Locality (VPL)	An area where there are a number of collocated viewpoints
Visibility shadow	Areas within the likely ZTVI where it is predicted that the proposed development will not be visible because there are a combination of ridgelines and depressions, specific blocks of vegetation and built form between the viewer and the proposed site that potentially blocks all views
Visual Exposure	A measure of the degree to which an observer at a location can see or potentially see the area to be affected by the proposed development. The visual exposure is subjectively classified as either none, low, moderate or high.
Zone of Theoretical Visual Influence (ZTVI)	The Zone of Theoretical Visual Influence (ZTVI) is the defined area within which modification to the contextual landscape as a result of the proposed development could be discernible to the naked eye. A nominated radius (e.g. 5km, 10km, 20km etc) from the centre of the proposed site is adopted as the likely furthest extent of the likely ZTVI.

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Executive summary

This Landscape Character and Visual Impact Assessment (LCVIA) is one of a number of studies to support an Environmental Impact Assessment on behalf of the South Australian government for the Northern Water Project (NW) (herein referred to as The Project).

It has been prepared in two parts: Part A: The Desalination Plant and associated infrastructure and Part B: The Transfer System including pipelines, pumping stations and storage. This assessment determines the likely visual impact of the Northern Water Project.

The Northern Water Project aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 gigalitre per year (GL/year) seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, product water storages) and electricity infrastructure.

This report assesses the likely visual impact of the proposed desalination plant at Mullaquana Station, south of Whyalla, South Australia.

This report does not consider Aboriginal cultural values in relation to Visual Amenity.

Part A: Desalination Plant

The visual impact that is likely to be experienced by the introduction of the desalination plant at Mullaquana Station and associated infrastructure in a landscape of **low scenic quality** to **moderate scenic quality** and **low sensitivity to change** to **medium sensitivity to change** will be:

- **No change** at two Sensitive Receptor Localities: SRL 01 and SRL 05;
- **Slight adverse impact** at four Sensitive Receptors/Sensitive Receptor Localities: SR 02, SR 03, SRL 04 and SR06.

Outside both the 5km and 10km Zone of Theoretical Visual Impact, the desalination plant and associated infrastructure and the north-south alignment of the kV transmission line and monopoles will have no discernible impact on the wider landscape and be a largely inconsequential feature within the panoramic vistas obtained from publicly accessible vantage spots.

Part B: The Transfer System:

The Transfer System passes through a varied landscape that ranges from a **low scenic quality** to **moderate scenic quality** with a **low sensitivity to change** to **medium sensitivity to change**. Of three representative locations assessed in this report, the visual impact that is likely to be experienced by the introduction of the transfer system pipeline and associated infrastructure will be **slight adverse impact** at two locations and **slight adverse impact** to **moderate adverse impact** at one location. At locations where the pipeline may be buried there is unlikely to be any permanent visual impact arising from the introduction of the pipeline if vegetation disturbance is minimised and managed.

When the infrastructure to be installed as part of The Project's transfer system is assessed in areas where other infrastructural elements already exist, the cumulative visual impact of the Project is likely to be **no change**.

Regulatory and Best Practice Compliance

The assessment demonstrated that neither the desalination plant nor the transfer system were at variance with the Provisions of the SA Government's Planning and Design Code (PDC) (assessments were made against previous versions; however, Assessment Provisions have not altered since the time of assessment and are still current as per *PDC Version 2026.12. 02 July 2026*). The assessment complied with best practice as prescribed by the Assessment Requirements Library: Impact Assessed Development: Visual Amenity, Landscape and Open Space both Standard and Detailed Assessment Requirements and the Guidelines for Landscape and Visual Impact Assessment (Third Edition).

Where practicable The Project is not at variance with the provisions of the PDC and the broader objectives of the regional and sub-regional land management plans within which it is located.

Key Observations and Considerations

- Mitigation strategies to ameliorate the visual impact both during construction and on completion of The Project works at Mullaquana Station are considered to be unnecessary due to the relative remoteness of the locality and the largely publicly inaccessible location which precludes close quarter views towards the built form.
- The transfer system alignment runs through a variety of diverse and unique landscapes, ranging from expansive arid plains north to Roxby Downs to pastural land juxtaposed against a contiguous scenic coastal landscape along the northern Eyre Peninsula.
- Each of the contextual landscapes assessed for the transfer system were highly modified landscapes and thus the siting of above ground infrastructure which includes pumping stations, storage wells and telecommunication towers at strategic locations will likely be notable but largely incidental features of the chosen locations and more immediate locality.
- Whilst considered unnecessary from a visual impact perspective, consideration can be given to a number of landscape and built form initiatives, for example landscape screening, which may assist in minimising likely visual impacts of both the desalination plant and transfer system and address potential community concerns which may arise.
- Avoiding the use of highly reflective finishes which emit glare over considerable distance for the proposed built form, monopoles and other infrastructure elements will accord with what is

generally regarded as visual mitigation best practice, demonstrating an amenity ‘duty of care’ by the project proponent.

- All future potential lighting (afterhours/night-time maintenance and security) is unlikely to have a significant influence on either the locality or contextual landscape and as such an assessment is considered unnecessary; however, all lighting requires designing to avoid excessive overspill beyond each site.

- During the construction phase, temporary changes to visual amenity will occur; however, the impact is considered to be slight and the need for visual mitigation unnecessary from a visual impact perspective.

It is the author’s opinion that the Northern Water Project will be a visually insignificant feature across the contextual landscapes within which the project is constructed.

1. Introduction

This Landscape Character and Visual Impact Assessment (LCVIA) has been prepared to support an Environmental Impact Assessment on behalf of the South Australian government for the Northern Water project (NW) (herein referred to as The Project).

The Project is a priority initiative for South Australia. The Project aims to provide a new sustainable water supply to the state's far north through the delivery of 51GL/year of water from a seawater reverse osmosis desalination plant, located at Mullaquana Station in the Spencer Gulf, and associated water transfer system (including pipeline, water pump stations and water storages), and power infrastructure.

This LCVIA provides an analysis of:

- the existing landscape character and visual amenity of the contextual landscape and locality for the proposed location of the desalination plant and separately, and more broadly, for that of the alignment chosen for the proposed Transfer System's pipeline and associated infrastructure;
- the sensitivity of the landscape to change; and
- the likely degree of visual impact as a result of the introduction of The Project.

This assessment determines the likely visual impact of The Project.

For the purpose of this report, the Project can be considered in two parts with respect to the consideration of likely visual impact:

- Part A: The Desalination Plant and associated infrastructure, including transmission lines;
- Part B: The Transfer System including pipelines, pumping stations and storage, and electrical infrastructure including transmission lines and substations.

In accordance with the original project brief and with reference to the PlanSA Assessment Requirements Library Guide,[1] the methodology for the landscape character and visual impact assessment undertaken and accompanying recommendations in this report in relation to the Desalination Plant meet the assessment requirements as described at AEQ4: Visual Amenity, Landscape and Open Space, Detailed Impact Assessment Requirements. The Transfer System has been assessed in accordance with the AEQ4: Visual Amenity, Landscape and Open Space, Standard Impact Assessment Requirements.

2. Project description

Northern Water (The Project) aims to provide a new, climate independent water source for industry in South Australia's Far North, Upper Spencer Gulf, and Eastern Eyre Peninsula. This would enable the growth in the region crucial for supporting global net-zero targets, including mining and exploration, and new and expanding industries.

The Project involves construction and operation of a large-scale seawater desalination plant in the Spencer Gulf, connected to northern South Australia via several hundred kilometres of pipeline, on the traditional lands of the Barngarla and Kokatha peoples.

Northern Water would support South Australia's current and future growth in the region, offering an alternative water source to industry reliant on climate dependent water sources.

The Project would service a range of industrial users including mining operations, other industrial customers in the region.

The desalination plant and main water supply pipeline would run north from the desalination plant to Olympic Dam passing Whyalla, Port Augusta, Woomera and Roxby Downs, and an offtake pipeline to Carrapateena is also under consideration.

The built form would include:

- a scaleable seawater reverse osmosis desalination plant;
- water intake pipes extending into Spencer Gulf and associated intake pumps;
- outlet pipes with diffuser structures for discharge of return water into the Spencer Gulf;
- a water supply pipeline from the desalination plant to Olympic Dam via appropriate storage including:
  - lateral connections
  - pump stations and associated water storage areas
  - stand-alone water storage areas not requiring pump stations
- electrical transmission line and network connection points;
- new transformer and substation (to be supplied by the energy network provider);
- communications towers at water delivery infrastructure sites;

[1] PlanSA. (2022) *PlanSA Assessment Requirements Library. Impact Assessed Development. s108 (1)(b)(c) of the PDI Act 2016.* Version 1.0. December 2022. Government of South Australia. Department for Trade and Investment. pp. 24-26. https://plan.sa.gov.au/__data/assets/pdf_file/0008/1186586/Assessment-Requirements-Library-Impact-Assessed-Development.pdf

- ancillary infrastructure and services (roads, access tracks, stormwater, water supply, power supply, telecommunications, wastewater treatment or disposal).

Temporary facilities during construction phase would likely include:

- laydown areas; and
- temporary worker accommodation

2.1 Site location

The Project is located at Mullaquana Station on the Upper Spencer Gulf, approximately 25km southwest of Whyalla, South Australia.

3. Assessment inputs

The following inputs have been considered in the preparation of this assessment:

- Location drawings and indicative layout/construction plans provided by JBS&G and others on behalf of the Department for Infrastructure and Transport, South Australia (DIT):
  - Desalination Plant, revised assessment process, May 2025
  - Transfer System, upon commencement of initial assessment process, 15 September 2023
- Aerial photography of the desalination plant site and associated infrastructure of both the locality and wider contextual landscape provided by the client;
- On-site photography of The Project site's wider locality and contextual landscape, undertaken by Hemisphere Design in September 2023 and June 2025 and Convergen in October 2023 and July 2025.

4. LCVIA assumptions

The assessment was undertaken based on the descriptions of infrastructure elements in the Design Report and associated design drawings as provided by JBS&G.

Assessments have been made on the basis of information provided by JBS&G that indicate:

- Built form at the desalination plant will likely include buildings (likely comprising an onsite administration building including control room, laboratory and offices, a workshop building), treated water storage tanks, detention basin and ancillary infrastructure such as security fencing, lighting and permanent access roads and car parking.
- Building height at the desalination plant will be 17m tall.

At the time of the assessment, a decision had not been made with regard the use of monopoles or towers to support transmission lines. The assessment undertaken in 2025 was on the assumption at that time that monopoles at 35m height would be used to support transmission lines and images have thus been prepared on that basis. The subsequent assessment of Sensitive Receptor 06 undertaken in July 2026, has been undertaken to provide the likely visual impact of the 'worst-case scenario', i.e. on the assumption that latticed towers at 60m height would be used to support transmission lines.

5. Methodology for LCVIAs

The methodology employed for the LCVIA involves consideration of best practice guidelines in qualitatively considering the landscape character and the likely visual impact of a proposal. Relevant statutory policies and/or guidelines are also considered and assessed as part of the LCVIA process. The qualitative landscape character assessment is undertaken in a rigorous manner consistent with best practice, as prescribed by the *Guidelines for Landscape and Visual Impact Assessment* (Third Edition).[2]

Further to the visual impact assessment a cumulative visual impact assessment is also made. Cumulative visual impacts result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. Several developments with insignificant impacts individually may together have a cumulative effect. In order to assess the cumulative visual impact of a development, the process outlined by NatureScot[3] which has been developed in relation to assessing the cumulative landscape and visual impact of onshore wind energy developments is adopted.

Whilst the NatureScot guidance has been developed for assessment of cumulative visual impact of Wind Farms, the principles and considerations can be applied similarly to other developments where infrastructure elements such as battery energy storage systems, solar farms, transmission powerlines, desalination plants and other renewable energy developments are introduced into the landscape.

5.1. Desktop analysis

A preliminary desktop study is undertaken using 'Google Earth' to remotely analyse the geographical area within which the proposed project is located. During this phase, the Zone of Theoretical Visual Influence (ZTVI), Viewpoints and, where relevant, a Visibility Shadow are determined.

[2] Landscape Institute and Institute of Environmental Management and Assessment. *Guidelines for landscape and visual impact assessment (3rd ed.).* (2013). Routledge. https://doi.org/10.4324/9780203436295.
[3] NatureScot. (2021) *Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy developments.* https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments

The ZTVI is the defined geographical area within which modification to the contextual landscape as a result of the proposal could be potentially discernible or visible.

Within the determined ZTVI, Viewpoints, being positions (and usually publicly accessible locations) providing a view of the proposed development from where an assessment is made, are identified to enable the character assessment of the contextual landscape and locality to be fully considered during the subsequent on-site visit. Viewpoints are selected where the assessor considers notable views of the development may, or are likely, to be received. Factors such as frequency or duration of visitation, whether a private dwelling/property or a publicly accessible location and other site-specific factors are taken into consideration when selecting the Viewpoint. The likely potential for visual impacts which may result as a consequence of the development are also assessed from each Viewpoint to prepare for the on-site visit.

Areas within the likely ZTVI where it is predicted that the proposed development will not be visible enable a Visibility Shadow to be determined within the ZTVI. The reasons that may result in the proposed development not being visible may include the presence of a combination of ridgelines and depressions, and/or specific blocks of vegetation and built form between the viewer and the proposed site that potentially block all views.

The footprint of the Visibility Shadow, identified as relative percentage of the ZTVI, is validated through the on-site assessment.

5.2. On-site analysis

Following the desk-top analysis, one or more on-site visits are made to substantiate, corroborate and refine the assessments made remotely. Viewpoints and other general locations are visited with regard to the ZTVI, and the Visibility Shadow and also to underpin the visual impact assessment.

The on-site assessment identifies areas within the likely ZTVI where it is predicted that the proposed development will not be visible, for reasons that may include the presence of a combination of ridgelines and depressions, and/or specific blocks of vegetation and built form between the viewer and the proposed site that potentially blocks all views.

The on-site assessments also enable identification of Viewpoints that are considered to be Sensitive Receptors (SRs) or Sensitive Receptor Localities (SRLs) to be confirmed; that is, Viewpoints where the observer is more susceptible to the visual impact of the proposed development.

A qualitative assessment of the likely visual impact of the proposal is undertaken from the identified SRs/SRLs and the subsequent degree of likely visual impact of the proposal overall is determined.

Photographs are taken on-site from relevant Viewpoints and other general locations to facilitate graphic presentation of the likely development and are taken using a lens setting that most closely reflects the view as seen by the 'naked eye' (such that there are no changes to the apparent size or distance of the proposal site). The assessment is supported by photomontage imagery to enable visualisation of the proposed development upon the site and Linewire/Photo-negative 'x-ray images' are also included for reference which depict the presence of proposed infrastructure in each photomontage without in-situ and contextual rendering.

5.3. Landscape assessment

Landscape assessment, in contrast to visual assessment, deals with the fabric, character and quality of the countryside. The landscape fabric consists of the elements that make up the landscape, such as landform, land-use and cultural influences. The way these elements fit together in terms of proportion, pattern, scale, etc., gives rise to a particular landscape character. Changes to the fabric and character of a particular landscape may affect the perceived value of that landscape, giving rise to changes in its quality.

The landscape character assessment encompasses both the wider contextual landscape and the locality, which is visually more difficult to define and within which the proposed development is located.

This characterisation process establishes a 'baseline' upon which judgments about the potential effects of the proposed development can be made. The following guiding definitions are applied to determine the landscape assessment:

Table 1: Landscape character definitions

High scenic quality	Areas and localities which exhibit an exceptionally strong positive character with valued features which combine to give an experience of unity, richness and harmony. Within this definition 'exceptional' could apply where an area is also deemed to be worthy of a legislative designation, e.g. a National Park.
Moderate scenic quality	Areas which exhibit a strong positive character with valued features with evidence of a visually acceptable level of alteration/degradation/erosion resulting in a location of more mixed character.
Low scenic quality	Areas with a generally positive character with fewer valued features with evidence of a visually acceptable level of alteration/degradation/erosion resulting in a location of more mixed character.
No scenic quality	Areas with a little or no positive character with few or no valued features with evidence of a visually unacceptable level of alteration/degradation/ erosion resulting in a highly modified location of little character.

5.4. Landscape sensitivity to change

The landscape characterisation process also enables an assessment of the landscape 'sensitivity to change', that is the ability of the landscape to accommodate the visual change associated with the proposed infrastructure, for both the wider contextual landscape and the locality.

"Landscape sensitivity may be regarded as a measure of the resilience, or robustness, of a landscape to withstand specified change arising from development types or land management practices, without undue negative effects on the landscape and visual baseline and their value."[4]

For example, a landscape that displays a high 'sensitivity to change' would not be able to absorb a development of the nature proposed by the development without irreparable consequences and impacts on the inherent character and visual amenity.

The following definitions are applied to determine the landscape's sensitivity to change:

Table 2: Landscape sensitivity to change definitions

High sensitivity to change	Key characteristics and qualities of the landscape are highly sensitive to change from the development type. Development would significantly conflict with several of the assessment criteria with severe adverse impacts likely to arise.
Medium sensitivity to change	Some of the key landscape characteristics or qualities of the landscape are sensitive to change from the development type. There is some ability to accommodate development in some situations without widespread or severe changes to the landscape; the development type relates to some aspects of landscape character.
Low sensitivity to change	Fewer of the key characteristics and qualities of the landscape are sensitive to change from the development type. There are opportunities to accommodate the development type in most locations without widespread or severe effects on the assessment criteria; the development type relates to many aspects of landscape character.
Negligible sensitivity to change	Key characteristics and qualities of the landscape are unlikely to be adversely affected by the introduction of the development type. The development type relates well to the assessment criteria and change may be accommodated without widespread significant adverse impacts on the landscape.

The factors used to determine the landscape sensitivity include:

- Pattern and scale of the landscape;
- Existing land use;
- Visual enclosure and openness of views;
- Scope for mitigation which would be in character with the existing landscape; and
- Value of the modified or natural visual landscape and 'sense of place'.

In general landscape sensitivity:

- Decreases when the viewing time is infrequent and becomes shorter; however, repetitive viewing even if of a short duration will increase sensitivity;
- Decreases as distance from the viewer to the development increases;
- Varies depending on the activity of the viewer, for example a resident within the confines of their dwelling at rest as compared to a rural hiker;
- Increases where a view is enjoyed and highly valued by the immediate community;
- Increases where a view is seen by many viewers;
- Increases if the view is seen from residences; and
- Increases if the visual landscape plays a part in tourist or recreational activities.

5.5. Likely visual impact assessment

Determining the likely visual impact of a development proposal in most regional locations presents obvious challenges where properties are often located some distance off major roads on private land away from publicly accessible locations. Where access is not sought to enter private land to obtain a view(s) that will best represent a potential visual impact, assumptions have to be drawn from views obtained from public locations that best typify the view and consequent visual impact that would likely be received from within the curtilage of the dwelling located on such 'remote' properties.

The following factors are considered when assessing the likely visual impact of the visual features of a proposed development on the SRs and SRLs:

- The visual qualities of the view and the duration and angle of the view in relation to the main activity of the viewer;
- The distance of the viewpoint from proposed visible infrastructure;
- The extent of the area over which the changes would be visible and the scale of the change in the view (loss or addition of features, changes in composition, proportion of view affected);
- The degree of contrast in form, scale, mass, line, height, colour and texture introduced into the view by the development where existing development is conspicuous;
- The duration and nature of the effect (temporary, permanent, intermittent);
- The numbers and types of viewers affected; and
- The potential for variety of infrastructure elements, their design or their layout close to each other, particularly when sited in an undulating landscape which has the potential to cause visual conflict, confusion and/or complexity.

The likely visual impact is determined before any potential mitigation is considered. The following criteria are applied to describe the likely visual impact of a proposed development at the SRs and SRLs:

Table 3: Likely visual impact definitions

Substantial adverse impact	where the scheme would cause a significant deterioration in the existing view

[4] Landscape Institute and Institute of Environmental Management and Assessment. *Guidelines for landscape and visual impact assessment (3rd ed.)*. (2013). Routledge. https://doi.org/10.4324/9780203436295.

Moderate adverse impact	where the scheme would cause a noticeable deterioration in the existing view
Slight adverse impact	where the scheme would cause a barely perceptible deterioration in the existing view
No change	no discernible deterioration or improvement in the existing view
Slight beneficial impact	where the scheme would cause a barely perceptible improvement in the existing view
Moderate beneficial impact	where the scheme would cause a noticeable improvement in the existing view
Substantial beneficial impact	where the scheme would cause a significant improvement in the existing view

These criteria are also applied to the consideration of the cumulative visual impact.

5.6. Consideration of likely Cumulative Visual Impacts

The following widely accepted definition of cumulative impacts, presented by NatureScot,[5] is adopted for the purpose of assessment of likely cumulative visual impact:

> *[An assessment of] 'the additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments, taken together.'*

Factors that contribute to the cumulative impact of development on landscape and visual amenity include:

- the distance between individual developments;
- the distance and area over which they are 'intervisible';
- the overall character of landscape and its sensitivity to development;
- the siting and design of the elements and the development themselves;
- the way in which landscape is experienced.

"The magnitude of cumulative change may be different from the magnitude of change brought about by the development when considered on its own. The aim of the cumulative assessment is to identify the magnitude of additional cumulative change which would be brought about by the proposed development when considered in conjunction with other wind farms in the wider contextual landscape."[6]

The cumulative visual impact assessment process advocates that the purpose of such an assessment is to identify the significant cumulative impacts arising from the proposed development and suggests the following parameters should be considered in assessing likely cumulative visual impact.

> *"Cumulative impacts on visual amenity can be caused by 'combined visibility' and/or 'sequential impacts':*
>
> *Combined visibility occurs where the observer is able to see two or more developments from one viewpoint. Assessments should consider the combined effect of all [developments] which are (or would be) visible from relevant viewpoints. Combined visibility may either be in combination (where several [developments] are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the various [developments]).*
>
> *Sequential impacts occur when the observer has to move to another viewpoint to see different developments. Sequential impacts should be assessed for travel along regularly-used routes like major roads, railway lines, ferry routes, popular paths, etc. The magnitude of sequential effects will be affected by speed of travel and distance between viewpoints.*
>
> *Two [developments] need not be intervisible – or even visible from a common viewpoint – to have impacts on the landscape experience for those travelling through, or living in an area. For example, it may be necessary to consider the cumulative impacts of [developments] on users of scenic road routes, or routes for walkers, cyclists and other recreational users, along their full length within the agreed study area."*[7]

The likely cumulative visual impact assessment also considers the magnitude of the cumulative change, which depends on "the scale, nature, duration and frequency of combined and sequential views (glimpses or more prolonged views; oblique, filtered or more direct views; time separation between sequential views)". This requires assessment of:

- the number of other developments which would be visible in the landscape in each of the different scenarios (existing, consented or application stage);
- direction of view to each of the developments;
- distance to each of the developments;
- the number and height of infrastructure elements at each of the developments – which may also be expressed as the horizontal and vertical angle occupied by elements – and any access tracks and grid connections;
- identification of key routes and journey scenarios, including impacts on key recreation resources such as long-distance routes, coastal paths and core paths;

[5] NatureScot. (2021) *Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy developments.* https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments
[6] NatureScot. (2021)
[7] NatureScot. (2021)

- duration of the change (i.e. age of constructed developments and the planning status of the other development projects).

In summary, Cumulative Visual Impact Assessments should be carried out where a proposed development may be seen in conjunction with other developments, to determine whether the introduction of additional infrastructure elements significantly alters the prevailing character of the contextual landscape and or the locality within which the development will be constructed.

Part A. Desalination Plant

A.1. Landscape Character Assessment of The Project

The proposed desalination plant, accompanying pipeline and kV transmission line are to be built on private unoccupied samphire mudflats at Mullaquana Station, south of Cowleds Landing on the western shore of the Spencer Gulf. The site is approximately 25km southwest of Whyalla and is contained within an area of 960,000m^2 (96ha). The proposed project site comprises of private land within the Remote Areas Zone of the South Australian *Planning, Development and Infrastructure Act 2016.*[8]

The desalination plant will be serviced with a 132kV power supply taken from the regional 275kV transmission line approximately 20km to the northwest of the proposed site. The 132kV power line and monopoles will follow a north-south alignment across private land to the desalination plant.

The Project is located adjacent the proposed site for the Nonowie Wind Farm which is currently seeking approval and subject to a separate Landscape Character and Visual Impact Assessment. As such cumulative visual impacts of The Project have not been considered as part of this study.

Prior to commencing the on-site assessment, a desktop study was undertaken to determine the likely Zone of Theoretical Influence (ZTVI) of The Project and areas from within the ZTVI where proposed infrastructure will likely fall within the visibility shadow. Across a predominantly planar landscape, a 5km radius from the centre of The Project was identified as the likely extent of the ZTVI for both the desalination plant and associated infrastructure and the north-south alignment of the kV transmission line and monopoles. The 5km ZTVI was also identified to notionally represent what could be subjectively described as the 'locality'.

Viewpoints with potential for distant views towards The Project were identified for on-site assessment, acknowledging nonetheless that the likelihood of views being received at these distant locations would be remote. The two distant locations identified were the regionally significant tourist attraction vantage point of Hummock Hill Lookout, some 26km to the north of the proposed site and the coastal settlement of Murninnie Beach some 10.5km to the south of the project.

The viewpoints within both the ZTVIs and further afield were identified for on-site consideration and assessment made to both define the landscape character of the contextual landscape and locality and to determine the likely presence of sensitive receptors within the ZTVI. The desk-top study identified a total of eight viewpoints for consideration and assessment.

A site visit was undertaken by staff of Hemisphere Design in July 2025 and by Convergen in July 2025 for image photography. The weather on both occasions was fine, with clear sky and a high degree of visibility. Photographs were taken at selected viewpoints to underpin the landscape character and visual impact assessment. Photographs have been taken using a 35mm Single Lens Reflex (SLR) camera with an approximate lens setting of 43mm. A second site visit was undertaken by Convergen in July 2026 for additional image photography for Sensitive Receptor 06.

The site visit determined that the majority of the ZTVI fell across mostly private, publicly inaccessible land. Consequently, given the inaccessible nature of land within the 5km ZTVI, the ZTVI was extended further to a 10km radius to include areas that are publicly accessible for consideration of the likely impact of the desalination plant and associated infrastructure as well as the north-south alignment of the kV transmission line and towers/monopoles. It is acknowledged that given the relatively low height, size and massing of the desalination plant and built form the likelihood of The Project being visible from distances at and beyond 10km is extremely unlikely.

At this point it was also determined that access to Murninnie Beach is not available to the occasional visitor due to the unmade roads and tracks off Lincoln Highway that travel east towards the foreshore affording access to private property only. As no readily available alternate public access routes to Murninnie Beach were obvious at the time of the site visit, a new publicly accessible viewpoint was identified immediately adjacent the Lincoln Highway some 16.5km southwest of The Project.

From the Viewpoints visited, the landscape character of the locality was reaffirmed, and preliminary consideration given to the potential visual impacts which may result as a result of The Project.

Five Viewpoints were subsequently each identified as a Sensitive Receptor (SR) or Sensitive Receptor Locality (SRL), being locations where potential views of the more visually prominent infrastructure elements of The Project are likely to be obtained from publicly accessible and more readily frequented locations.

Consideration of Nonowie Homestead as a potential Viewpoint was made, although access onto the property was not sought or obtained. Further, given the inaccessibility to the foreshore and immediate coastal waters adjacent The Project, offshore Viewpoints were also not considered.

[8] *Planning, Development and infrastructure Act 2016*. (South Australia) Version 19.9.2024. https://www.legislation.sa.gov.au/__legislation/lz/c/a/planning%20development%20and%20infrastructure%20act%202016/current/2016.14.auth.pdf

The remaining Viewpoints considered in the desk-top study and visited during the on-site visit were locations from which the presence and likely visual impact of The Project will be either largely indiscernible or have low frequency of visitation and were hence not assessed in any further detail.

A.1.1. Contextual landscape

Located at the intersection of the pastural landscape of the Eyre Peninsula to the southwest and the arid ochre sands and rocky outcrops of the far north, Whyalla is approximately 385km north of Adelaide. From elevated vantage points within and around the landscape, panoramic vistas extend across the Middleback Range, Arcoona Plateau and the distant Mount Remarkable and southern Flinders Ranges which capture the eye, enclosing the expansive horizon. The landscape is acknowledged as Barngarla Country, a cultural and environmentally important landscape.

The Project is located approximately 25km southwest of the Whyalla CBD in a broad contextual landscape across flat open country within the western coastal lowlands of the Spencer Gulf.



Image 1: The view from Hummock Hill Lookout, Whyalla

From the elevated viewpoint at Hummock Hill Lookout in Whyalla, the eye is drawn languidly across the iridescent greens and turquoise of the gulf waters. The eye of the observer is then orientated inland beyond the iconic Whyalla Jetty and across a dramatic and breathtaking panorama comprising of a myriad of colours and tonal hues including dark grey-greens, iridescent yellows and ochre browns delivering a landscape that is an inspiring visual kaleidoscope, both stimulating and imposing in equal parts.

The vantage point of Hummock Hill also allows the eye of the observer to be drawn west to and along the sinuous alignment of the Lincoln Highway (B100), the principal road linking Whyalla and the northeastern Adelaide Plains to the lower eastern Eyre Peninsula. The prosaic east-west movement of vehicles animates the satisfying vista; however, the alignment of high voltage kV power transmission towers further west that run parallel to the Lincoln Highway are conspicuous and somewhat intrusive columnar features.

Heading south out of Whyalla towards The Project, the absence of taller trees and the relative low level of the residential and more utilitarian built form in the suburb of Mullaquana accentuate the apparent height and appearance of the few columnar features within the contextual landscape, which includes two very tall telecommunication towers located south of The Project area. Within these vistas the mid-ground's abrupt angular form and sharply contrasting, foreboding colour of the Mount Young outcrop capture the eye, its striking colour and form visually connecting to the more contiguous forms of the Middleback Range further to the west and southwest.

The travellers' processional journey along the Lincoln Highway is one where the eye of the observer is drawn along in a forward motion through a southwest or northeast vista framed with tall dense evergreen shrubs on either side of the carriageway. Occasional glimpses are afforded to the distant hills ranges to the northwest and southeast over the coastal horizon where the foreshore is anonymous and not a feature of the travelling narrative. The journey north and northeast through the contextual landscape heralds the impending arrival at Whyalla where the residential, commercial and industrial pioneering built form is sharply juxtaposed against the distant Flinders Ranges.

In sharp contrast to the manicured township beaches, the more naturally appearing wide, sweeping foreshore of the Cowleds Landing Sanctuary Zone, which runs south from Eight Mile Creek Beach to the distant Cowleds Landing, is dotted with mangroves whose canopies feather the shallows along the water's edge – a most satisfying visual narrative that draws the eye to the hazy form of the distant ranges silhouetting the horizon. A tranquil landscape where the gulf setting delivers calming waters which lap the foreshore fringes as opposed to the more dynamic effervescent and louder 'wavescapes' of locations further south along the peninsula's coastline.

Within the fore- and mid-ground, views over the largely undeveloped planar ochre landform of the green-grey vegetation of saltmarsh and mangrove habitats, the sinuous weave of sand tracks, meandering ephemeral oxbow riverbeds and small rivulets of seawater evoke perceptions of how the pre-settlement landscape would have appeared; a majestic landscape where the planar expanse of a sweeping myriad of colours juxtaposed against the enveloping skyline creates breathtaking 270-degree vistas. In the absence of copses of tall trees casting patterned shadows, the fast-moving cloudscape delivers mottled patterns of hues and shades over the subtle crests and falls shrouding the homogenous tracts of saltbush, visually sharp sands and ochre earth tones of the immersive landscape.



Image 2: The planar landscape around Eight Mile Creek Beach looking towards Mount Young



Image 3: Offshore aerial view across the proposed desalination plant site [Source: Client]

A.1.2. Locality

The journey to The Project site commences along Mullaquana Road from the southern edge of Whyalla. On departing the residential settlement, the Whyalla Car Club and Dirt Circuit Racing track and the Steel City Raceway underpin a more underwhelming and utilitarian urban fringe character. Eight Mile Creek Road, the continuation south from Mullaquana Road, is a road surface of unmade compacted quarry rubble which is in a state of disrepair for long sections along its length; it affords access to Eight Mile Creek Beach, a popular location for day visitors, and finally terminates at Cowleds Landing. The frequency of travellers beyond Mullaquana along Eight Mile Creek Road over the duration of the site assessment was negligible save frequent passing of large commercial tucks accessing a commercial depot area near Cowleds Landing. The absence of travellers can likely be attributed to the condition of the road pavement coupled with the absence of adjoining land use activities. Beyond the Eight Mile Creek Beach turn-off, it is not a location where the casual road user or tourist would likely venture on a day out exploring.

Movement within the locality is restricted by the lack of public access along the coastal foreshore between Cowleds Landing and Murninnie Beach, a distance of approximately 18km along the coastal foreshore.

A.1.3. Immediate setting

For the purpose of this assessment both a 5km and 10km radius ZTVI from the centre of The Project site across both publicly accessible and private land has been identified from which the character of locality landscape has been determined through the use of aerial photography, Google earth information and client supplied drone photography.

The Project is located on an open ‘mudflat’ landscape where the topography is carpeted by native samphire and occasional mangroves at the immediate foreshore and copses of larger coastal shrubs further inland. A remote and likely windswept setting devoid of taller trees. The subtle interplay between vegetation, creek lines and prostrate landform establishes a pleasing visual mosaic.

The visual mosaic extends north and south beyond the publicly inaccessible locality in a north-south direction to the wider contextual landscape beyond the immediate ZTVI where public access is more readily afforded. Over the extensive flat landscape without discernible vantage points, the mosaic is largely appreciated *in situ* and within a vista where the distant horizon of the skyscape and seascape harmoniously meld, drawing the eye to extend beyond the immediate where these quintessential features of the endemic landscape can be more readily appreciated.

Based on this assessment, it is the author's opinion that the character of the contextual landscape and locality is one of a **low scenic quality** to **moderate scenic quality** and with **low sensitivity to change** to **medium sensitivity to change.**

A.1.4. Beyond the immediate contextual landscape

The Project will be inconspicuous at most ground level locations which fall outside the 5km ZTVI. The desalination plant will not be a feature of the journey north-south along the Lincoln Highway.

The assessment indicates that 35m tall monopoles to support the kV transmission lines may be faintly discernible from greater distances, but such views will be largely inconsequential within the panoramic vista and at such distances the likely visual impact of The Project is considered to be one of **no change**.

A.2. Likely Visual Impact Assessment

Access was not sought to enter private land to obtain a view(s) that will best represent a potential visual impact from a private dwelling, thus assumptions are drawn from views obtained from public locations that best typify the likely view experienced by property occupants. As highlighted in the methodology, this presents assessment challenges, however, it is the author's opinion this LCVIA assessment is an accurate and fair presentation of the potential likely impacts given these obvious constraints.

The Project is located on Mullaquana Station which is in a publicly inaccessible location. Views east from the property to and across the coastal horizon will likely be adversely affected by The Project built form and proposed transmission line alignment. As The Project is located on Mullaquana Station land and the property owner is considered a project 'stakeholder', the homestead dwelling is not considered to be a Viewpoint. Further, views from the coastal waters adjacent Mullaquana Station were also not assessed as it is a highly inaccessible location infrequently visited by a small number of passing recreational boat users who are likely to obtain fleeting views only.

A2.1. Assessment of likely visual impact from selected Viewpoints

The assessment of character and likely visual impact at Viewpoints made on-site determined that:

VP 01 Eight Mile Creek Beach Trail: views southwest, south.

- This viewpoint is a Sensitive Receptor Locality and considered further in the following section.

VP 02 Cowleds Landing: views southwest, south.

- This viewpoint is a Sensitive Receptor and considered further in the following section.

VP 03 Nonowie Homestead: views 180-degree northeast, south.

- Nonowie Homestead was identified as a likely Sensitive Receptor albeit for the purposes of this assessment access onto the property was not sought or obtained and assumptions on likely impacts are drawn from adjacent viewpoints along the Lincoln Highway. This viewpoint is a Sensitive Receptor and considered further in the following section.

VP 04 and VP 05 Lincoln Highway: views 180-degree views northeast east, southeast.

- These viewpoints collectively are a Sensitive Receptor Locality and considered further in the following section.

VP 06 Hummock Hill southern aspect: views southwest, south.

- This viewpoint is a Sensitive Receptor and considered further in the following section.

VP 07 Nearest publicly accessible location for representative views from Murninnie Beach: views northeast.

- Murninnie Beach is a location just over 10km to the south of The Project accessed via unmade gravel roads travelled by property owners accessing seaside properties and holiday rentals. A remote location which due to poor road conditions caused by inclement weather was inaccessible at the time of the site assessment. Views of The Project are precluded by a foreground and visibility shadow comprising of subtly undulating land overlain with small to medium coastal shrubs. Given the low-lying nature of the locality and the relatively low height of The Project built form and transmission line monopoles The Project will be indiscernible.

A photomontage x-ray image (refer Image 5 below) is shown from a location immediately adjacent Lincoln Highway to the west of Murninnie Beach and some 15km southwest of The Project. At the time of the site visit it became apparent that this location was the nearest publicly accessible location from which consideration of likely views northeast across the contextual landscape and locality and towards The Project could be obtained. The image presented demonstrates that over such an extensive distance the relatively prostrate and lower built form of The Project and transmission line will be wholly concealed and as such the viewpoint is not considered to be a Sensitive Receptor. This view is considered to be representative of the views likely to be experienced at publicly accessible locations at Murninnie Beach.



Image 4: View northeast towards The Project and eastward to Murninnie Beach from the gravel roadway adjacent Lincoln Highway - the nearest publicly accessible location for representative views from Murninnie Beach



Image 5: X-ray image view northeast showing The Project is indiscernible

VP 08 Eight Mile Creek Road, south of the Whyalla suburb of Mullaquana: view southwest.



Image 6: View from Eight Mile Creek Road southwest towards The Project

- An unkempt single track gravel road where the likely observer would be mostly limited to holiday homeowners accessing properties further south at Cowleds Landing. A road less travelled by the casual observer. Views southwest and west across the fore- and mid-ground to the distant project site and horizon of enveloping mountain ranges. The Project will be concealed from the single residential dwelling located on the lower northeastern aspect of Mount Young. The Project will be indiscernible and as such the viewpoint is not considered to be a Sensitive Receptor.

Viewpoint 07 and Viewpoint 08 were subsequently identified as locations from which the presence and likely visual impact of The Project will be indiscernible due to factors which include:

- the distance from the proposed site combined with the maximum height of the built form infrastructure when viewed across a planar landscape;
- the viewpoint falling within or adjacent a visibility shadow that contains and effectively 'screens' views to the proposed site;
- being in a locality that is publicly inaccessible that experiences a low frequency of visitation.

Consequently, these two viewpoints were not assessed in any further detail.

Mullaquana Station Homestead.

This location is private land and was thus not considered as a Viewpoint. However, it has been assessed as a Sensitive Receptor (SR 06).

Table 4: Viewpoints identified as Sensitive Receptors

Viewpoint 01 – Eight Mile Creek Beach Trail	Sensitive Receptor Locality 01 (SRL 01)
Viewpoint 02– Cowleds Landing	Sensitive Receptor 02 (SR 02)
Viewpoint 03 – Nonowie Homestead	Sensitive Receptor 03 (SR 03)
Viewpoint 04 and Viewpoint 05 – Lincoln Highway	Sensitive Receptor Locality 04 (SRL 04)
Viewpoint 06 – Hummock Hill Lookout	Sensitive Receptor Locality 05 (SRL 05)
Mullaquana Station Homestead	Sensitive Receptor 06 (SR 06)

The Viewpoints identified as Sensitive Receptors and Sensitive Receptor Localities were further assessed in detail to consider the likely visual impact on each viewpoint.

These Sensitive Receptors and Sensitive Receptor Localities are illustrated in Figure 1.

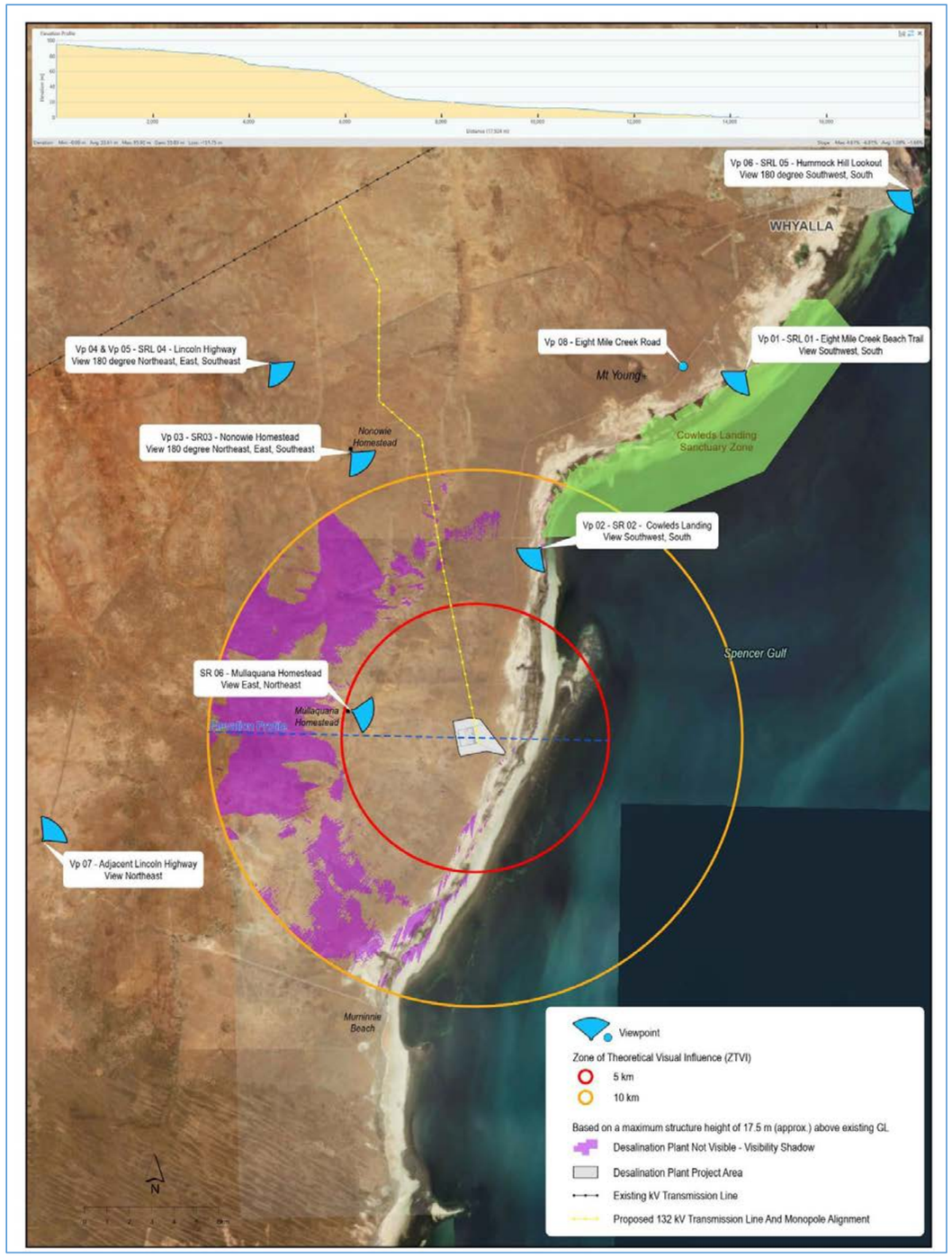


Figure 1: Viewpoints and Sensitive Receptors/Sensitive Receptor Localities with Zone of Visual Influence and Visibility Shadow

A2.2. Assessment of likely visual impact from Sensitive Receptors/Sensitive Receptor Localities

Sensitive Receptor Locality 01 (SRL 01) – Eight Mile Creek Beach



Image 7: View from Eight Mile Creek Beach looking southwest across The Project and Spencer Gulf

Viewpoint(s)	Location	View Direction	Distance from Project Site(s)
Viewpoint 01	Eight Mile Creek Beach and Saltmarsh Trail 'Trailhead'	Views southwest, south	17km to desalination plant 12km to nearest point of the kV transmission line

Landscape and setting

A journey along the non-bituminised Eight Mile Creek Road and a sandy access track brings the traveller to the popular Eight Mile Creek Beach and the trail head that introduces the Eight Mile Creek Beach Saltmarsh Trail. Located within the Cowleds Landing Sanctuary Zone the beach and immediate setting affords the visitor opportunities to meander along a tranquil and sandy benign foreshore whilst being immersed in a notable mangrove and saltmarsh habitat. A managed and rehabilitated ecosystem, the location is one of the region's quintessential pre-settlement landscapes, with an abundance of native fauna and flora.

A contiguous, 180-degree visual plane without piercing columnar built forms or structures where the eye of the observer meanders over a subtly undulating patchwork of green greys and yellow and ochre hues set against the majestic enveloping blue coastal horizon. The fore- and mid-ground is seamlessly juxtaposed against the distant mountainous landforms and expansive skyscape. Within a limited zone of visual influence, the prominent and visibly abrupt form of Mount Young further to the west, catches the eye, acting as a focal reference within a panorama where the undulating vegetated fore- and mid-ground consists of mangroves, native coastal shrubs and ground covers.

Sensitive Receptor Locality 01 (SRL 01) – Eight Mile Creek Beach
Visual exposure at receptor
Moderate to high across an open coastal foreshore and coastal expanse.



Image 8: Photo-montage showing likely appearance of The Project from Eight Mile Creek Beach

Predicted visual impact
The assessment was made on the assumption that monopoles at 35m height would be used to support transmission lines. The undulating vegetated fore- and mid-ground of mangroves, native coastal shrubs and ground covers will conceal views of the desalination plant and monopoles and as such The Project will be inconspicuous. The proposed desalination plant is in a contextual landscape of **low scenic quality** to **moderate scenic quality** with a **low sensitivity to change** to **medium sensitivity to change** and will be accommodated without any visual impact. Within a less travelled locality the visual impact of the desalination plant, associated infrastructure and transmission line and monopoles will be one of **no change**.
Mitigation
Mitigation strategies are considered unnecessary.

Sensitive Receptor Locality 01 (SRL 01) – Eight Mile Creek Beach



Image 9: X-ray image showing likely appearance of The Project from Eight Mile Creek Beach

Sensitive Receptor 02 (SR 02) – Cowleds Landing



Image 10: View from the southern edge of Cowleds Landing properties

Viewpoint(s)	Location	View Direction	Distance from Project Site(s)
Viewpoint 02	Cowleds Landing south (at the end of the access road for the properties south of Eight Mile Creek Road)	Views southwest, south	7.5km to desalination plant 3.6km to nearest point of kV transmission line

Landscape and setting

Public access along Eight Mile Creek Road terminates at Cowleds Landing. An historic location commemorating the legacy of one of the region's early pioneers and pastoralists, Humphrey Cowled. A sheltered and more enclosed foreshore locality accessed by the gravelled, unkempt single lane Eight Mile Creek Road, beyond which The Project and surrounding landscape and foreshore are publicly inaccessible. A coastal hamlet comprising of a collection of more traditional single storey holiday 'shacks' and more recently erected two storey residences which appear to be for holiday accommodation.

Along the publicly accessible short foreshore the built form enclosure to the west and larger coastal shrubs and mangroves that feather the foreshore to the north and south contain the eye of the observer, directing views east over the gulf and coastal horizon.

Sensitive Receptor 02 (SR 02) – Cowleds Landing

Publicly accessible views southwest are restricted to adjacent the most southerly two-storey dwelling and from a viewpoint where the eye draws over a low lying partially inundated foreground comprising of sinuous creek lines within mud flats of coastal groundcovers, a mid-ground of pastural land and the horizon of the Middleback Range and further afield the distant Minbrie Range. The occasional larger native shrub and *ad hoc* alignment of unkempt boundary post and wire fencing fleetingly holds the attention of the viewer across the largely uninspiring vista.

Visual exposure at receptor

Low to medium where built form excludes views south from the foreshore.



Image 11: Photo-montage showing likely appearance of The Project from the southern edge of Cowleds Landing properties

Predicted visual impact

The assessment was made on the assumption that monopoles at 35m height would be used to support transmission lines.

Within the vista the low lying and prostrate built form of the desalination plant will likely be faintly discernible on days with exceptionally high visibility, appearing as a grey 'pencil line' form sitting below and without interrupting the expansive horizon. Whilst punctuating the skyline, the distant columnar form of the telecommunications tower and the north-south aligned transmission line and slender monopoles will for the most part be imperceptible.

In a landscape of **low scenic quality** to **moderate scenic quality** and a **low sensitivity to change** to **medium sensitivity to change**, the likely visual impact will be one of **slight adverse impact**.

Sensitive Receptor 02 (SR 02) – Cowleds Landing
Mitigation
Visual mitigation is considered unnecessary. Notwithstanding, avoiding the use of highly reflective finishes for the proposed desalination plant's built form and monopoles will accord with what is generally regarded as visual mitigation best practice, demonstrating an amenity 'duty of care' by the project proponent.
 *Image 12: X-ray image showing likely appearance of The Project from the southern edge of Cowleds Landing properties*

Sensitive Receptor Locality 04 (SRL 04) – Lincoln Highway (B100) and Sensitive Receptor 03 (SR 03) – Nonowie Homestead



Image 13: View from Lincoln Highway at SRL04, looking northeast towards Mount Young and east towards The Project

Viewpoint(s)	Location	View Direction	Distance from Project Site(s)Approximate
Viewpoint 04 and Viewpoint 05 and representing likely visual impact from Viewpoint 03	Lincoln Highway (B100) approximately 18km west of Mullaquana Station	180-degree views northeast, east, southeast	15.5km to desalination plant 4km to nearest point of kV transmission line Nonowie Homestead: 11km to the desalination plant Approximately 2km to nearest point of kV transmission line

Landscape and setting

The Lincoln Highway (B100) is the principal road connecting the township of Whyalla and northern Adelaide Plains to the western coastal region of South Australia and beyond to the Nullarbor Plains. A single lane carriageway in either direction on a road with a posted maximum speed of 110kmph.

A linear Sensitive Receptor locality focussed on a subtly elevated crest which extends along the carriageway in an easterly direction notionally up to three kilometres from Viewpoints 04 and 05.

The locality affords elevated views northeast towards the west-east expanse of the Whyalla township, which sits below the horizon of the distant and highly prominent Arcoona Plateau and Southern Flinders Ranges. The visually abrupt appearance of Mount Young is an obvious focal point within a west-east panorama of vivid blue hues and a myriad of green, greys and ochres comprising of open native scrub and grassland, where large tracts are used extensively for sheep grazing.

Sensitive Receptor Locality 04 (SRL 04) – Lincoln Highway (B100) and Sensitive Receptor 03 (SR 03) – Nonowie Homestead
To the west of the Lincoln Highway, glimpsed views through intermittent copses of native roadside vegetation reveal the latticed towers of a 275kV transmission line that are somewhat inconspicuous within the open tracts of native scrub despite being the only nearby columnar features of note. At speeds of up to 110kmph the observer reads the landscape in broad sweeping vistas and as such singular detailed features of 'incident' are less conspicuous than the more enveloping context containing repetitive themes. As such, elongated vistas along the road corridor draws the eye of the observer to the visually abrupt Mount Young and distant Whyalla township juxtaposed against the mountainous horizon that silhouettes the enveloping skyline.
Visual exposure at receptor
High across the fore- and mid-ground in a sweeping 180-degree panorama.
 *Image 14: Photo-montage showing likely appearance of The Project from Lincoln Highway, looking northeast - east*
Predicted visual impact
The assessment was made on the assumption that monopoles at 35m height would be used to support transmission lines. In views to the east, the north-south alignment of the proposed 132kV transmission lines and columnar repetition of monopoles will be an obvious new addition to the visual landscape. However, within the 180-degree panorama where the power lines and monopoles sit below the horizon their presence will be notable but largely incidental where the vastness of the planar landform, abruptness of Mount Young and enveloping qualities of the vivid blue skyscape and mountainous horizon dominate and direct and capture the eye of the traveller. In a landscape of **low scenic quality** to **moderate scenic quality** and with a **low sensitivity to change** to **medium sensitivity to change** the impact on views northeast will be one of **slight adverse impact.** In views southeast from a viewpoint 80m (approximately) above the proposed ground level height of The Project the undulating vegetated foreground conceals both the proposed desalination infrastructure and Nonowie Homestead, located a further 3km to the southeast.

Sensitive Receptor Locality 04 (SRL 04) – Lincoln Highway (B100) and Sensitive Receptor 03 (SR 03) – Nonowie Homestead
At locations within the curtilage of Nonowie Homestead, the proposed desalination infrastructure will likely be concealed by the visibility shadow created by large shrubs overlain across a minor north-south ridge falling between the property and The Project. The proposed 132kV transmission lines and monopoles located 2km to the east will likely be conspicuous and somewhat incongruous visual features from the homestead and dwelling curtilage. Where the physical characteristics and quality of views north and northeast across the contextual landscape are likely to be similar to the views from Lincoln Highway (SRL 04) and in a landscape of **low scenic quality** to **moderate scenic quality** and with a **low sensitivity to change** to **medium sensitivity to change** the impact on views northeast from SR 03 is likely to be one of **slight adverse impact.**
Mitigation
Visual mitigation is considered impractical and unnecessary. Notwithstanding, avoiding the use of highly reflective finishes for the proposed monopoles will accord with what is generally regarded as visual mitigation best practice, demonstrating an amenity 'duty of care' by the project proponent.
 *Image 15: X-ray image showing likely appearance of The Project from Lincoln Highway, looking northeast – east*

Sensitive Receptor Locality 04 (SRL 04) – Lincoln Highway (B100) and Sensitive Receptor 03 (SR 03) – Nonowie Homestead



Image 16: 'Zoom in' of Photo-montage view of monopoles crossing Lincoln Highway looking northeast



Image 17: 'Zoom in' of x-ray view of monopoles crossing Lincoln Highway looking northeast

Sensitive Receptor Locality 05 (SRL 05) – Hummock Hill



Image 18: View southwest from Hummock Hill Lookout, Whyalla

Viewpoint(s)	Location	View Direction	Distance from Project Site(s)Approximate
Viewpoint 06	Hummock Hill Lookout (southern aspect)	View southwest, south	26km to both the desalination plant and nearest point of the kV transmission line

Landscape and setting

Located at the eastern edge of the city adjacent the expansive coastal foreshore, Hummock Hill has a rich history as the site of first settlement and later a strategic gun battery and signals post during WWII. Today Hummock Hill is a scenic vantage point that offers a breathtaking 360-degree panorama from a vantage point lookout and interpretive station frequented by both locals and visitors from intra and interstate and overseas.

A viewpoint where the eye of the observer is mesmerized by the expansive views over the iridescent greens and turquoise of the gulf waters which expand across the eastern and southern horizon in a dramatic and breathtaking panorama centering on the already iconic Whyalla Jetty.

The panorama reveals a foreground where a tended beach, manicured and irrigated lawns, exotic vegetation, whimsical parade of palm trees and bright and vividly coloured sunshades covering a children's playground are a reminder that Whyalla is an important and popular holiday destination, a place for escape and relaxation.

Sensitive Receptor Locality 05 (SRL 05) – Hummock Hill

In sharp contrast to the visually vibrant foreground and holiday foreshore the evolving view southwest across a planar midground devoid of large and obtrusive man-made features reveals a 'natural' landscape where native coastal vegetation blankets the gently undulating iridescent yellow sand dunes and green, grey and ochre mudflats. The vista across the turquoise blue ocean juxtaposed against the visually abrupt shadowy like appearance of Mount Young and the dark greys of the distant Middleback and Minbrie Ranges is inspiring. The panorama is in sharp contrast to the view north and west over the 'robust' and utilitarian cityscape that affords the observer a window into the pioneering activities of early settlers and through their endeavours the expansion of the city into a preeminent centre of industrial activity.

It could be opined that it is an urban vantage point of equal significance and status to the Mount Lofty Scenic Lookout in the Adelaide Hills.

Visual exposure at receptor

High in a contextual landscape where a panoramic vista affords breathtaking views across a visually contrived foreground and more 'natural', midground and horizon.



Image 19: Photo-montage showing likely appearance of The Project from Hummock Hill Lookout, Whyalla

Predicted visual impact

The assessment was made on the assumption that monopoles at 35m height would be used to support transmission lines.

At Hummock Hill the eye of the observer is cast across an expansive visual landscape. The abrupt interjection of Mount Young and midground of grey-green hues of native vegetation, yellow sands and ochre mudflats draw and direct the eye of the observer to the backdrop of the distant hills' ranges, as such at over 26km south of Hummock Hill, The Project will be indiscernible.

In a landscape of **low scenic quality** to **moderate scenic quality** and with a **low sensitivity to change** to **medium sensitivity to change** the likely visual impact of the Project will be one of **no change.**

Sensitive Receptor Locality 05 (SRL 05) – Hummock Hill
Mitigation
Considered unnecessary, however, the use of highly reflective material finishes which emit glare over considerable distances should, where practicable, be avoided.



Image 20: X-ray image showing likely appearance of The Project from Hummock Hill Lookout, Whyalla

Sensitive Receptor 06 (SR 06) – Mullaquana Station Homestead



Image 21: View eastward from Mullaquana Station Homestead Dwelling

Sensitive Receptor 06 (SR 06) – Mullaquana Station Homestead



Image 22: Aerial view indicating direction of view from Mullaquana Station Homestead dwelling towards the Project.

Sensitive Receptor 06 (SR 06) – Mullaquana Station Homestead			
Viewpoint(s)	Location	View Direction	Distance from Project Site(s)Approximate
	Mullaquana Station Homestead Dwelling, adjacent the eastern façade and curtilage boundary	East	Approximately 5km to the western edge of the site

Landscape and setting

A remote residential dwelling on a large pastural allotment which extends up to 5km north and south beyond the immediate locality of the dwelling curtilage and to the east to the coastal foreshore, also a distance of some 5km. The dwelling is located on subtly rising inaccessible land 10km to the east of Lincoln Highway and is concealed from view when travelling along the highway in either direction.

A single storey detached brick dwelling of modest size, an outdoor dining area, owner's carport and irrigated and lawned recreational area are located along the eastern façade affording glimpsed views to the eastern horizon and coastal foreshore.

To the immediate east and within close proximity to the dwelling an ad hoc collection of both ageing and newer single storey storage sheds and water tanks, portacabin and caravan within close proximity to the dwelling are obtrusive, dominating the view over the immediate foreground where small to medium sized native trees and evergreen ground covers provide some visual interest.

In the absence of tall trees and prominent vertical elements the eye of the observer is captured and drawn to the prominent, southern cross windmill, telecommunication mast and power pole within the foreground which briefly hold the viewer's attention across the largely uninspiring vista.

To the northeast a man-made earth bund approximately 2m high laced with post and wire fencing has been constructed; it is assumed this is to provide protection and shelter from inclement weather. The bund precludes views northeast beyond the dwelling across rising land to the distant horizon. Within this contained vista glimpsed views only are afforded out and beyond in an easterly direction only across the planar landscape of browns and ochres to the foreshore horizon.

Views across the open expansive coastal plain are restricted to glimpsed views only where the foreground of taller utilitarian sheds and buildings, post and wire fencing and man-made earth bund dominate the foreground view. The ad hoc alignment of the boundary post and wire fencing fleetingly holds the attention of the viewer.

Visual exposure at receptor

Low, given the distance from the site and the foreground-built form, vegetation and earth bund.

Sensitive Receptor 06 (SR 06) – Mullaquana Station Homestead



Image 23: Photo-montage showing likely appearance of The Project from Mullaquana Station Homestead Dwelling

Predicted visual impact

The assessment was made on the assumption that latticed towers at 60m height would be used to support transmission lines.

Within the enclosed vista defined by the earth bund to the northeast and ad hoc built form to the east, the eye of the observer is directed through glimpsed views over the grey green coastal vegetation to The Project's proposed desalination plant and on-site substation.

Within the perspective view the proposed built form and surrounding security fencing of The Project will appear as a prostrate linear form silhouetted against the seascape horizon. From this location adjacent the Homestead dwelling, the relative height of The Project taller built form will appear much lower in height and smaller in size and form than the single storey storage sheds in the immediate foreground. As such, when viewed within a vista where the foreground built form of sheds and barns are prominent, the proposed desalination plant will be largely indiscernible as a feature of a visual 'collective massing' of built form and likely only obvious on days with exceptionally high visibility.

The proposed catenary of power lines from the proposed desalination plant run along the horizon and expansive skyscapes in a north-south axis. In the absence of a more detailed design and for the purposes of this assessment a 'worst-case scenario' been assumed that the transmission lines will be strung along 60m tall latticed transmission towers at 40m/50m centres.

At a distance of 5km, the proposed transmission line and towers will likely appear as faint lines and vertical skeletal forms where they interface with the proposed desalination plant, notable but not overly obtrusive to the eye of the observer. As the proposed transmission line and towers proceed northward away from the desalination plant, their faint appearance will be concealed by the man-made earth bund and rising midground to the northeast of the dwelling.

Sensitive Receptor 06 (SR 06) – Mullaquana Station Homestead
Within the slightly elevated intermittent vista and at a viewing distance of approximately 5km the low lying and prostrate built form of the proposed desalination plant and distant columnar form of the north-south aligned transmission line and tower will for the most part be imperceptible. At a location and within a locality of **low scenic quality** to **moderate scenic quality** and **low sensitivity to change** to **medium sensitivity to change**, the likely visual impact will be one of **slight adverse impact**.
Mitigation
Avoiding the use of highly reflective finishes for the proposed desalination-built form and transmission towers and using colours and finishes that are neutral in colour and complement the colours and hues of the contextual landscape will accord with what is generally regarded as visual mitigation best practice, demonstrating an amenity 'duty of care' by the project proponent.



Image 24: X-ray image showing likely appearance of The Project from Mullaquana Station Homestead Dwelling

A.3. Likely visual impact during construction phase

During the construction phase temporary changes to visual amenity will occur. Construction works at the site *per se* are not anticipated to affect visual amenity apart from the potential short-term presence of a crane structure. These changes will be due mainly but not limited to the presence of temporary construction related infrastructure (e.g. construction camps, site offices and amenities, yards, storages and laydown areas), construction equipment, earthworks activities and an overall increase in the number of people and large vehicles at each site and at roadside locations. Dust clouds created by earth moving activities during construction will require appropriate management by the contractor to mitigate all likely visual impacts.

Given the inability to predict the timing and programming of construction until a contractor has been appointed and commences work on site and the degree of temporary change in the visual environment that will likely occur, but which cannot thus be determined, the visual impact during construction phase is not considered in detail in this assessment.

The changing visual environment and activity during construction will be temporary and as the number of individuals impacted will likely be low, is not considered further in the visual impact assessment.

A.4. Light pollution

The perception of landscape character and all special qualities experienced at night may be different from the day, and clearly the sensitivity of visual receptors may be different at night than during the day. Where required a night-time assessment should focus on the characteristics and qualities which are readily perceived at night and thus are more susceptible to effects from lighting. Any night-time assessment will require the recording of night-time conditions for landscape and visual receptors which may be informed by a lighting engineer's lighting assessment report baseline.

Night-time assessments are usually required where lighting will have a potential significant influence on landscape character and/or visual amenity, as a result of the combination of the sensitivity of the receiving night-time environment and the nature of the proposed lighting.

All future potential lighting (maintenance and security) is unlikely to have a significant influence on either the locality or contextual landscape and as such an assessment is considered unnecessary.

A.5. Mitigation considerations

Whilst unnecessary, where considered desirable mitigation strategies may include the use of complementary colourbond finishes for rooves and facades that both reflect the more natural colours of the locality and the juxtaposed hues of the gulf waters and horizon. Consideration should be given to the finish of taller, columnar structures which may include a telecommunication tower using non-reflective materials and muted colours that complement the hues of the horizon.

A.6. Consideration of the Planning and Design Code

The SA Government Planning and Design Code,[9] (PDC) contains a number of Assessment Provisions which refer to Desired Outcomes (DO) and Performance Outcomes (PO) which apply to the Project site and hence are considered relevant where they pertain to issues of visual amenity of the Project site.

[Note the initial assessment was made against *PDC Version 2025.15. 14 August 2025*. The Assessment Provisions have not altered since that time and are still current as per *PDC Version 2026.12. 02 July 2026.*]

Infrastructure and Renewable Energy Facilities

DO 1 *(requires the)* Efficient provision of infrastructure networks and services, renewable energy facilities and ancillary development in a manner that minimises hazard, is environmentally and culturally sensitive and manages adverse visual impacts on natural and rural landscapes and residential amenity.

General

PO 1.1 Development is located and designed to minimise hazard or nuisance to adjacent development and land uses.

Visual Amenity

PO 2.1 The visual impact of above-ground infrastructure networks and services (excluding high voltage transmission lines), renewable energy facilities (excluding wind farms), energy storage facilities and ancillary development is minimised from townships, scenic routes and public roads by:

a) utilising features of the natural landscape to obscure views where practicable
b) siting development below ridgelines where practicable
c) avoiding visually sensitive and significant landscapes
d) using materials and finishes with low-reflectivity and colours that complement the surroundings

[9] Department for Housing and Urban Development. PlanSA. (2023). *Planning and Design Code Version 2025.15. 14 August 2025.* Department for Housing and Urban Development, South Australia, Australia.

e) using existing vegetation to screen buildings
f) incorporating landscaping or landscaped mounding around the perimeter of a site and between adjacent allotments accommodating or zoned to primarily accommodate sensitive receivers.

PO: 2.2 Pumping stations, battery storage facilities, maintenance sheds and other ancillary structures incorporate vegetation buffers to reduce adverse visual impacts on adjacent land.

PO 2.3 Surfaces exposed by earthworks associated with the installation of storage facilities, pipework, penstock, substations and other ancillary plant are reinstated and revegetated to reduce adverse visual impacts on adjacent land.

Electricity Infrastructure and Battery Storage Facilities

PO: 5.1 Electricity infrastructure is located to minimise visual impacts through techniques including:

a) siting utilities and services:
   i. on areas already cleared of native vegetation
   ii. where there is minimal interference or disturbance to existing native vegetation or biodiversity
b) grouping utility buildings and structures with non-residential development, where practicable.

Telecommunication Facilities

PO 6.1 The proliferation of telecommunications facilities in the form of towers/monopoles in any one locality is managed, where technically feasible, by co-locating a facility with other communications facilities to mitigate impacts from clutter on visual amenity.

PO 6.2 Telecommunications antennae are located as close as practicable to support structures to manage overall bulk and mitigate impacts on visual amenity.

PO 6.3 Telecommunications facilities, particularly towers/monopoles, are located and sized to mitigate visual impacts by the following methods:

a) where technically feasible, incorporating the facility within an existing structure that may serve another purpose
   or all of the following:
b) using existing buildings and landscape features to obscure or interrupt views of a facility from nearby public roads, residential areas and places of high public amenity to the extent practical without unduly hindering the effective provision of telecommunications services
c) using materials and finishes that complement the environment
d) screening using landscaping and vegetation, particularly for equipment shelters and huts.

Renewable Energy Facilities

PO 7.1 Renewable energy facilities are located as close as practicable to existing transmission infrastructure to facilitate connections and minimise environmental impacts as a result of extending transmission infrastructure.

Temporary Facilities

PO 13.2 Temporary facilities to support the establishment of renewable energy facilities (including borrow pits, concrete batching plants, laydown, storage, access roads and worker amenity areas) are sited and operated to minimise environmental impact.

Part B. Transfer System

B.1. Landscape Character Assessment of The Project

The transfer system delivery pipeline will run approximately 360km north from the desalination plant at Mullaquana Station to Olympic Dam via Whyalla, Port Augusta, Woomera and Roxby Downs, with ancillary infrastructure such as transmission lines and substations, offtakes from the pipeline, water storage tanks and pump stations along the pipeline route. The pump station and water storage facility at Mullaquana Station are part of the desalination plant footprint and are not being assessed separately in this section of the report.

The transfer system traverses across a vast study area, where the overall character of the regional landscape transitions from the arid plains north of the contextual landscape surrounding Bimba to the beautiful scenery and safe, sandy beaches of the Spencer subregion of the Eyre Peninsula.

In consideration of the distances involved in travelling along a 360km corridor and the requirements of a Standard Assessment[10] the exercise has been conducted as a desk-top study only, supplemented with aerial photographs and relevant information contained in the project design report which includes maps and design drawings.

Reference has been made to the descriptions provided in the regional and subregional zones identified by the relevant South Australian Landscape Management Boards, local Council sources, anecdotal features and articles researched through the internet and observations drawn from aerial photographs using 'street view'. The author has also drawn on landscape character assessments undertaken for previous studies for other developments in some of the subregions.

The assessment of likely visual impact has been determined through the selection of three locations – Lincoln Gap, Kalaya (near Kootaberra) and Bimba (near Pimba) – along the length of the pipeline corridor being representative of the subregion and contextual landscape within which they are located. The locations are broadly representative of the infrastructure layout and appearance at other locations within the designated sub regional zones.

Aerial photographs have been used to develop indicative photomontages for the pumping station and associated infrastructure at each of the four selected locations.

The methodology adopted herein meets the requirements for a LCVIA undertaken in accordance with the AEQ4: Visual Amenity, Landscape and Open Space, Standard Impact Assessment Requirements.[11]

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[10] PlanSA. (2022) *PlanSA Assessment Requirements Library. Impact Assessed Development. s108 (1)(b)(c) of the PDI Act 2016.* Version 1.0. December 2022. Government of South Australia. Department for Trade and Investment. p. 25. https://plan.sa.gov.au/__data/assets/pdf_file/0008/1186586/Assessment-Requirements-Library-Impact-Assessed-Development.pdf : accessed 10 September 2023.

[11] PlanSA. (2022) pp. 24-26.

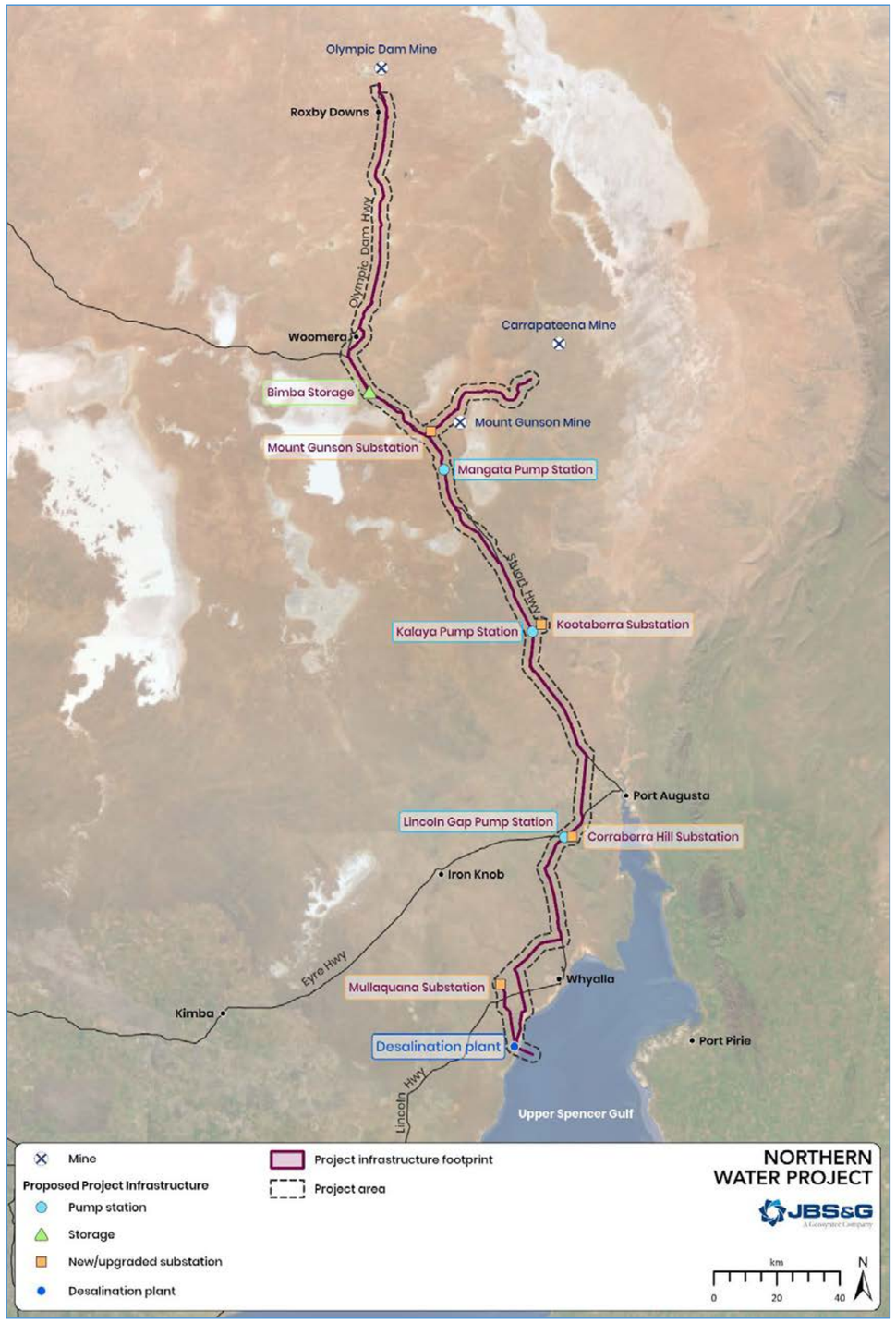


Figure 2: Pipeline alignment from Mullaquana Station to Olympic Dam

B.1.1. Contextual landscape

The proposed pipeline travels through:

- The northern region of the South Australian Eyre Peninsula; and
- The southwest of the South Australian Arid Lands region.

These regions are subdivided into the following subregional areas which have been adopted to assist in describing the landscape character through which the pipeline corridor travels.

- Eyre Peninsula – Spencer subregion
- Far North – Gawler Ranges subregion
- Far North – Kingoonya subregion

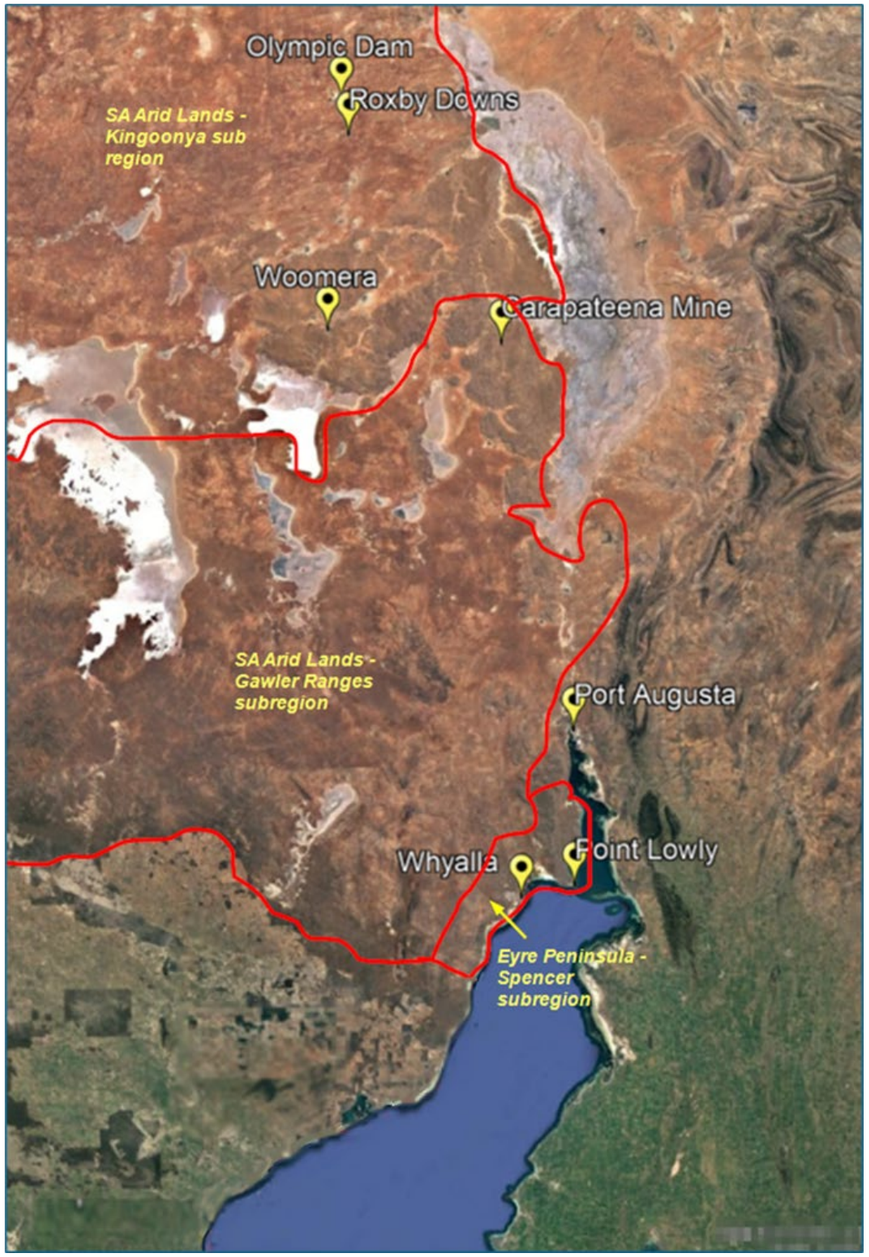


Figure 3: Landscape regions. Source: Hemisphere Design.

B.1.2. Far North: The Kingoonya Subregional Landscape Character

The Kingoonya district of the southwestern area of the SA Arid Lands region is generally flat to undulating with a mixture of sand dune and sand plain country and salt lake environments. It is a vast region with a hot, dry climate.

Agricultural productivity is low, the region is remote from large towns and there are areas of extreme inaccessibility and wilderness. Although pastoralism is the most extensive land use, the main influences on settlement in the area have been transport routes, changes in transport technology, the fluctuating economic fortunes in mining, tourism, modern weapons research and the traditional areas of Aboriginal population highlighted by the presence of many culturally significant sites around lakes and mound springs.[12]

The regional landscape centred on Roxby Downs is set against some of the most beautiful sweeping scenery in Australia. The red earth and the always-blue sky coupled with the stark native tree silhouettes is simply breath taking. The landscape is typified by extensive vistas over rolling red sand dune ridges connected through a dendritic arrangement of corridors and swales carpeted with the vivid contrasts of the silver saltbush undergrowth and grey greens hues of stunted native trees.[13]

In a landscape where the arid terrain underpins a sense of remoteness, based on anecdotal and factual references and assumptions drawn from aerial photographs it is the author's observation that the regional landscape is predominately of **moderate scenic quality** where more specific, localised areas of high scenic value can be identified. The landscape is one of a **low sensitivity to change** to **medium sensitivity to change**.

B.1.3. Far North: The Gawler Ranges Subregional Landscape Character

The district is characterised by a flat, planar landscape of dune-fields and weathered rocky ranges that drain into terminal salt lakes. The Landscape Board indicates "the primary land uses of the district are pastoralism (predominantly sheep), mining and energy, military, tourism, conservation (public and private lands), recreation and a township (Iron Knob). It is an ancient landscape, with significant cultural values."[14]

At its eastern boundary sweeping vistas are afforded across the modified planar landscape comprising of open arid scrubland and intermittent grazing land. The vista draws the eye of the observer to the

[12] SA Arid Lands Landscape Board (2021). *Kingoonya District Plan 2021-2023*. https://cdn.environment.sa.gov.au/landscape/images/DistrictPlan_Kingoonya.pdf
[13] Roxby Council. *Living in Roxby Downs*. https://www.roxbydowns.sa.gov.au/lifestyleandsport/livinginroxbydowns
[14] SA Arid Lands Landscape Board. (2022) *Gawler Ranges District Plan 2021-2023*. https://cdn.environment.sa.gov.au/landscape/images/District_Plan_GawlerRanges.pdf

troughs and peaks of the faceted slopes of the plateau to the north which command the horizon view and envelop Lincoln Gap.

The quintessential gateway and starting point of the 'outback journey' for many travellers, the contextual landscape offers an invite to enter and be immersed in the overwhelming expansive panorama where the eye traces the horizon in search of 'incident' and 'expression'.[15]

Based on anecdotal and factual references and assumptions drawn from aerial photographs it is the author's observation that the regional landscape is one of a predominately **low scenic quality** to **moderate scenic quality** where more specific, localised areas of both low and high scenic value can be identified. The landscape is one of a **low sensitivity to change** to **medium sensitivity to change**.

B.1.4. Eyre Peninsula: The Spencer Subregion Landscape Character

The coast and the Upper Spencer Gulf are highly valued by the community, with the northern coastline valued for "its peace and tranquility, beautiful scenery and safe, sandy beaches." According to the Land Management Board, the "shingle stranded beach ridges that run along Fitzgerald Bay are particularly unique and valued for its cultural and geological significance".[16]

A significant feature of the Upper Spencer coast is the large extent of mangroves, along nearly half of the coastline. The mangroves and seagrass meadows provide important nursery areas for fish and crustaceans. Coastal wetlands exist along most of the coast south of Whyalla, vegetated with sparse samphire.

To the northwest of Whyalla the landscape is dominated by the stony tablelands of the Arcoona Plateau. The stony hills and arid plains which typify the area are covered with a sparse shrubland with drifts of woodland.

Further south of Whyalla the land is flatter, rising gradually from the coast. Across this area, shrubland is widespread and land is predominantly used for grazing on the saltbush plains. Nearly 85% of the subregion's area is covered by native vegetation.[17]

A landscape of notable coastal scenic value and large tracts of arid plains juxtaposed against areas of more intrusive industrial development focused in and north of Whyalla. Based on anecdotal and factual references and assumptions drawn from aerial photographs it is the author's observation that the regional landscape is predominately one of **low scenic quality** to **moderate scenic quality** where specific localised areas of low scenic value can be experienced. The landscape is one of a **low sensitivity to change** to **medium sensitivity to change.**

B.2. Likely Visual Impact Assessment

The likely visual impact has been determined by assessing the selected pump station, communication tower and associated infrastructure locations along the length of the pipeline corridor that are representative of the subregional and contextual landscape. One representative location has been selected in each sub-region across the length of the transfer system as a focus for visual impact assessment.

Table 5: Regional locations chosen for assessment, as representative of the sub-region

Eyre Peninsula: Spencer subregion	Pump Station and Storage Tanks – Lincoln Gap
Far North: Gawler Ranges subregion	Pump Station and Storage Tank – Kalaya
Far North: Kingoonya subregion	Storage Tanks – Bimba

The before and after photomontages prepared are for illustrative purposes only. They provide sufficient information to assess likely visual impacts to meet the requirements of a Standard Assessment which is provided with each montage.

B.2.1. Likely visual impact during construction phase

During the construction phase temporary changes to visual amenity will occur. Construction works at the site *per se* are not anticipated to affect visual amenity. These changes will be due mainly but not limited to the presence of construction equipment, earthworks activities and an overall increase in the number of people and large vehicles at each site and at roadside locations and through increased usage of unsealed roads during construction. Dust clouds created by earth moving activities during construction will require appropriate management by the contractor to mitigate all likely visual impacts.

The temporary change to the visual environment from native vegetation clearance over the length of the pipeline during construction will take some time to rehabilitate due to the arid environment and the slow growing nature of the vegetation. Thus, while these changes may be temporary, they will be visibly evident in the landscape for some time.

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15 Hemisphere Design (Aust) Pty Ltd. (2019) *Lincoln Gap Wind Farm Stage 3 LCVIA, June 2019*.
16 Landscape South Australia: Eyre Peninsula. (2021) *Spencer Subregional Description. Landscape Plan for Eyre Peninsula – Appendix A.* p.3. https://cdn.environment.sa.gov.au/landscape/docs/ep/2021-subregional_description_spencer.pdf
17 Landscape South Australia: Eyre Peninsula. (2021) p.5

Given the inability to predict the timing and programming of construction until a contractor has been appointed and commences work on site and the degree of temporary change in the visual environment that will likely occur, but which cannot thus be determined, the visual impact during construction phase is not considered in detail in this assessment.

The changing visual environment and activity during construction will be temporary and as the number of individuals impacted will likely be low, is not considered further in the visual impact assessment.

B.2.1.1. Location assessed: Lincoln Gap

Region: Eyre Peninsula: Spencer subregion

Infrastructure

- Pumping station, water storage tank, transmission tower, electrical substation, access road and perimeter chainmesh fencing.



Image 25: Proposed location of infrastructure at Lincoln Gap adjacent the Eyre Highway

Landscape and Setting

Located in the Eyre Peninsula Spencer subregion, the modified planar landscape comprises of open arid scrubland and intermittent grazing land largely devoid of large copses of mature trees and shrubs.

The vista draws the eye of the observer travelling northward along the Eyre Highway over the ochre and grey green sandier landform to the abrupt troughs and peaks of the faceted slopes of the undulating plateau to the northeast which command the horizon view and envelop Lincoln Gap. Orientating the view south the eye of the observer meanders over a much flatter foreground before pausing at the mid-ground of the gentler slopes of the lower plateau to the south of Lincoln Gap.

Within this vista the vertical forms of the Lincoln Gap Wind Farm turbines, pole poles and powerlines, substation latticed infrastructure and telecommunication towers 'trace' over the landform and horizon in a linear east to west progression.

It is the author's opinion that the landscape character is one of a more **moderate scenic quality** and has a **low sensitivity to change** to **medium sensitivity to change**.

Considered Likely Visual Impact

The single-storey built form and ancillary infrastructure will be a somewhat inconspicuous feature of the highly modified locality and wider contextual landscape where, to the east the imposing wind turbines of the Lincoln Gap Wind Farm placed along the ridgeline silhouette the skyline. An array of existing power lines and transmission towers traverse the locality connecting the wind farm to the nearby substation and distributing power further afield.

The proposed 275 kV transmission lines and towers run east and adjacent the Lincoln Highway, crossing the highway at a right angle at the intersection with the Eyre Highway. These new additions to the visual landscape will be no more conspicuous than the existing catenary of lines and towers, and as such will be somewhat incidental.

In a landscape of **moderate scenic quality** and of a **low sensitivity to change** to **medium sensitivity to change** the singular visual impact of the proposal will be **slight adverse impact** where open views will be prominent from further/longer distances when approaching from the southwest, northeast and west along the Eyre Highway. In a landscape where the wind farm is highly conspicuous, the cumulative visual impact of The Project will be one of **no change**.

Mitigation

The intermittent planting of native trees and shrubs around the perimeter fencing adjacent to the highway will soften, without concealing, the built form appearance and appearance of the security fencing.

The use of colourbond sheeting in the construction of built form using muted matte finishes such as Ochre, Sage Green and Notre Dame Grey will complement the more natural landscape colours and hues. The use of exposed galvanized steel which emits a distracting glare should be minimised where possible.

Afterhours lighting and security lighting requires designing to avoid excessive overspill beyond the site.



Image 26: View from east at approximately 250m from the Lincoln Gap location

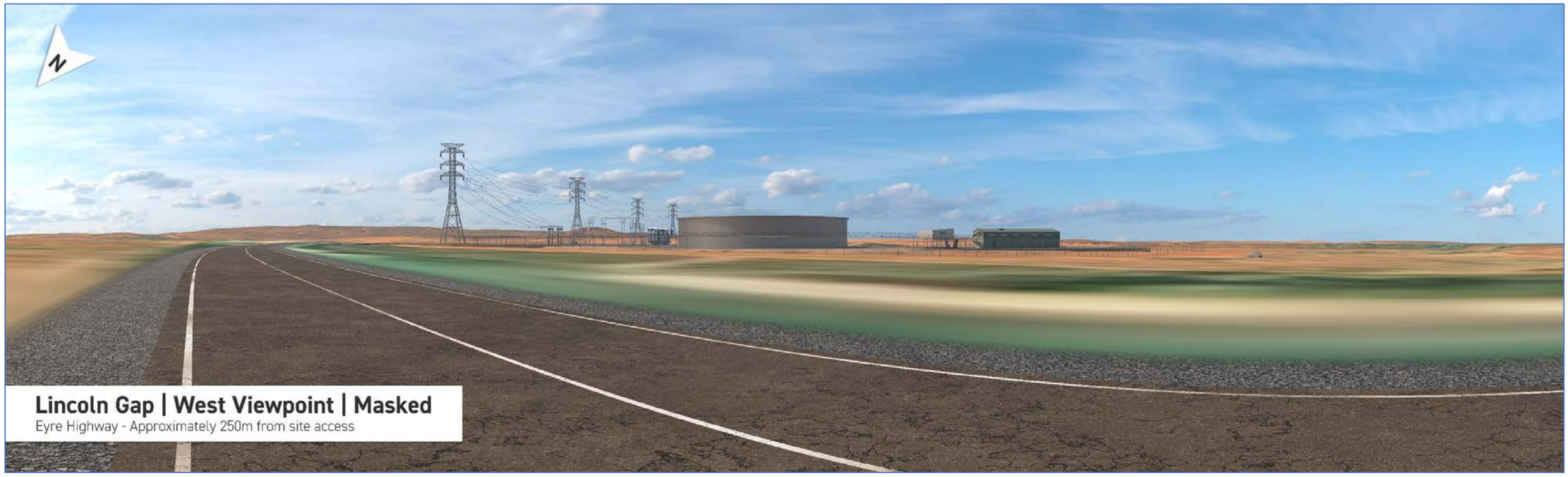


Image 27: View from west at approximately 250m from the Lincoln Gap location

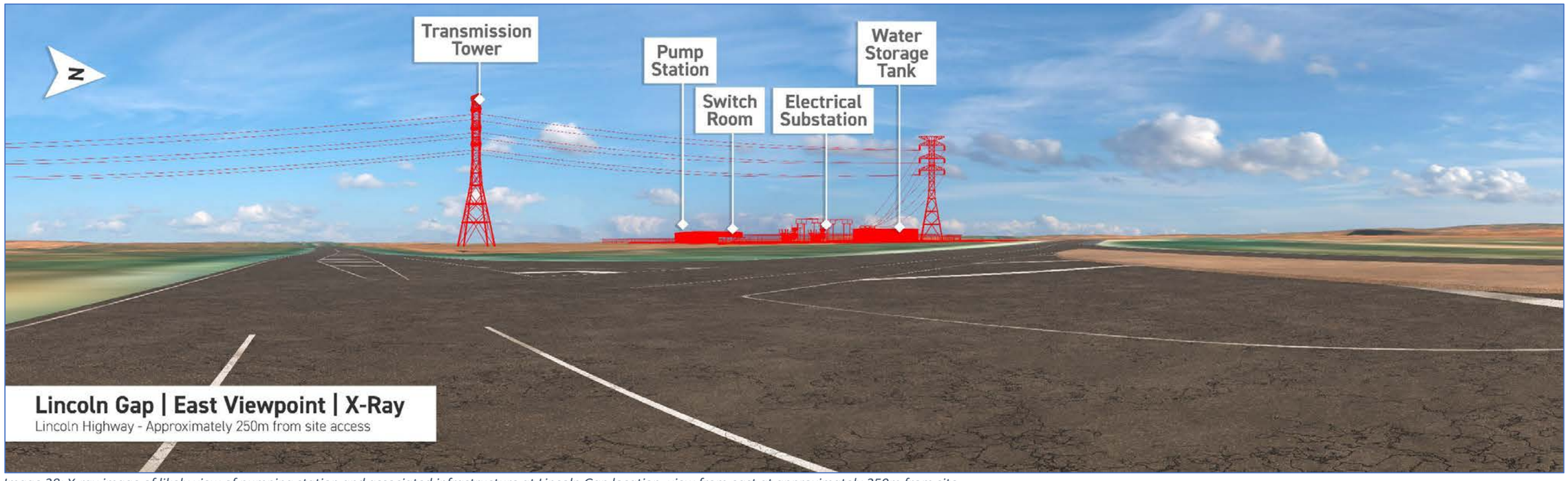


Image 28: X-ray image of likely view of pumping station and associated infrastructure at Lincoln Gap location, view from east at approximately 250m from site

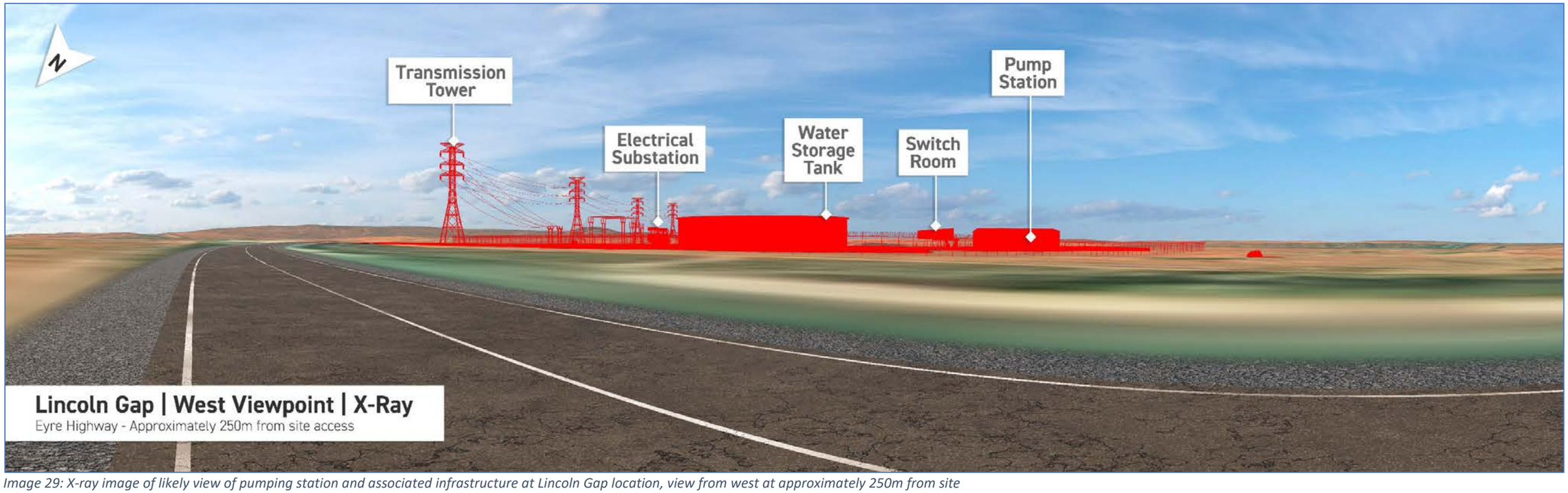


Image 29: X-ray image of likely view of pumping station and associated infrastructure at Lincoln Gap location, view from west at approximately 250m from site

B.2.1.2. Location assessed: Kalaya

Far North: Gawler Ranges subregion

Infrastructure

- Pumping station, water storage tank, telecommunications tower, access road and perimeter chainmesh fencing and transmission towers.

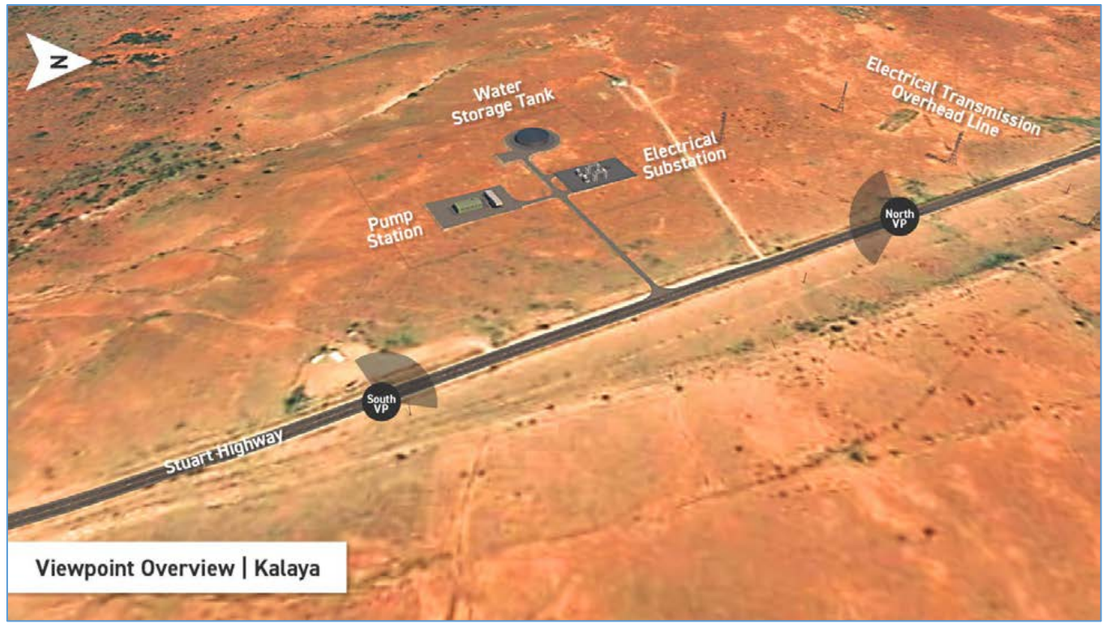


Image 30: Proposed location of infrastructure at Kalaya adjacent the Stuart Highway

Landscape and Setting

Located within the Far North Gawler Ranges subregion the landscape is typical of the open arid pastural plains that define the unique landscape qualities of the far north of South Australia.

A landscape where the eye of the observer travelling along the Stuart Highway is cast in all directions whilst being immersed in the dramatic panoramic vistas that fall upon the sculptural forms of the distant Southern Flinders Ranges to the east. A landscape devoid of canopy vegetation where native, more prostrate shrubs and groundcovers carpet the planar landform.

Man made focal references are limited to taller telecommunication towers, the occasional string of stobie poles and power lines and the frequent rest stops adjacent the highway.

It is the author's opinion that the landscape character is one of **low scenic quality** to **moderate scenic quality** and has a **low sensitivity to change** to **medium sensitivity to change.**

Considered Likely Visual Impact

The single story-built form and columnar communications tower will be conspicuous features of the locality and wider contextual landscape where the existing communication towers and rest stop shelters are notable man-made introductions.

The pumping station will be connected to the existing substation to the east, a power supply being facilitated through the installation of the new 3.6km 'Bookaloo' 275 kV transmission line from the new Kootaberra network substation crossing the Stuart Highway at a right angle to the north-south direction of travel. In a largely planar landscape where taller features are discernible over large distances the towers will be additional and highly conspicuous features of the journey along the Stuart Highway.

The ambient glow from the occasional use of after-hours maintenance lighting will be apparent.

In a landscape of **low scenic quality** to **moderate scenic quality** and of a **low sensitivity to change** to **medium sensitivity to change** the singular visual impact of the proposal will be **slight adverse impact** to **moderate adverse impact** where views of the pumping station and in particular the transmission towers will be prominent and from further/longer distances when approaching from the north and south.

Mitigation

The intermittent planting of native trees and shrubs around the perimeter fencing adjacent the Stuart Highway will soften, without concealing, the built form appearance and appearance of the security fencing.

The use of colourbond sheeting in the construction of built form using muted matte finishes such as ochre, Sage Green and Notre Dame Grey will complement the more natural landscape colours and hues. The use of exposed galvanized steel which emits a distracting glare should be minimised where possible.

Afterhours lighting and security lighting requires designing to avoid excessive overspill beyond the site.

View direction



Image 31: View from north at approximately 500m from the Kalaya location



Image 32: View from south at approximately 500m from the Kalaya location

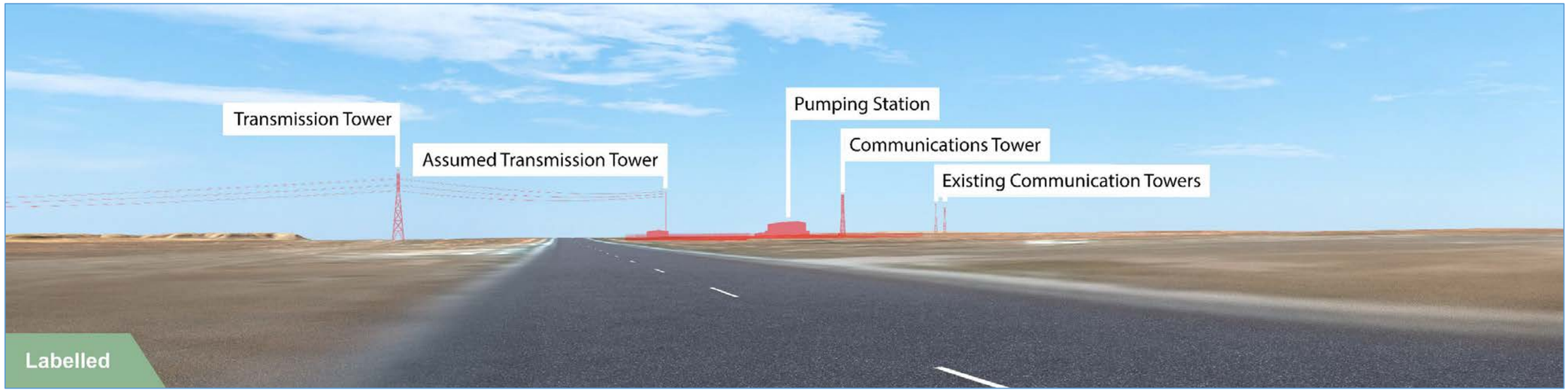


Image 33: X-ray image of likely view of pumping station and associated infrastructure at Kalaya location, view from north at approximately 500m from the site

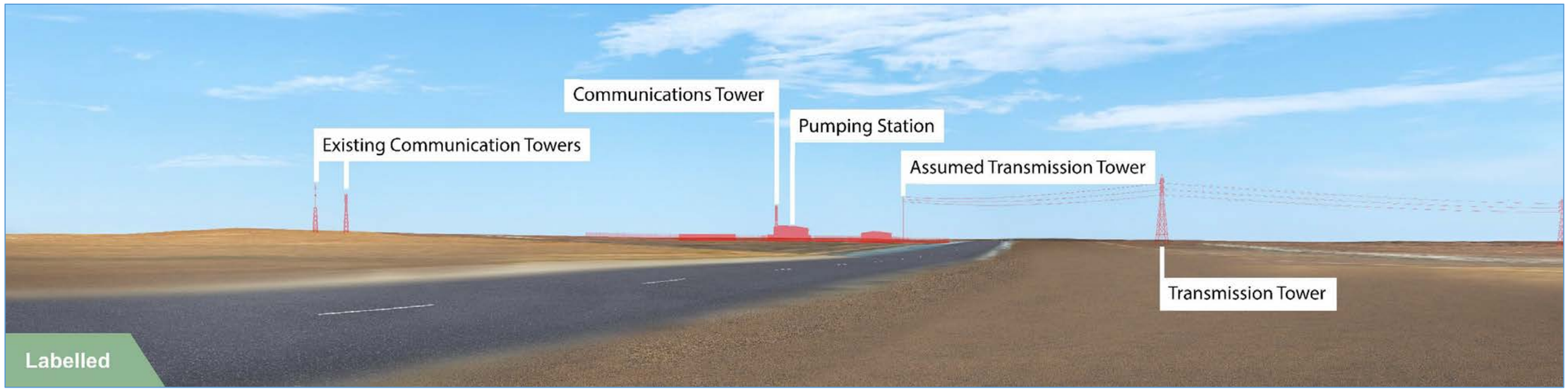


Image 34: X-ray image of likely view of pumping station and associated infrastructure at Kalaya location, view from south at approximately 500m from the site

B.2.1.3. Location: Bimba

Far North: Kingoonya subregion

Infrastructure

- Water storage tank, solar array.

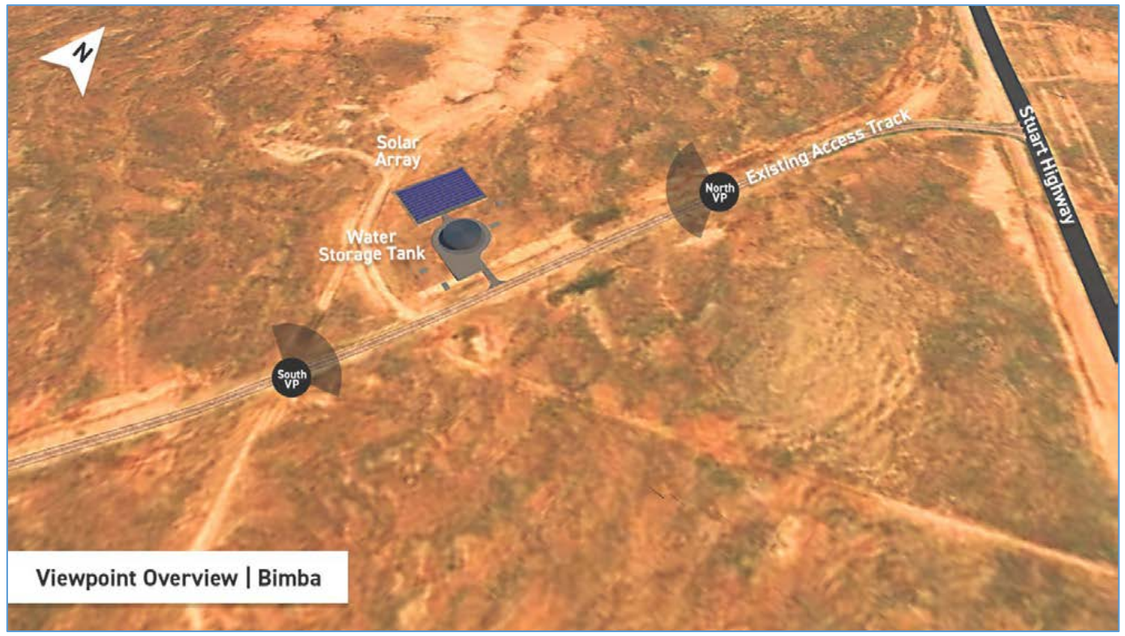


Image 35: The Project location at Bimba

Landscape and Setting

Located in the Far North, Kingoonya subregion, the modified planar landscape comprises of open arid scrubland and intermittent grazing land largely devoid of large copses of mature trees and shrubs.

Located some 13km southeast of the township of Pimba and approximately 500m to the west of the Stuart Highway (A87) the storage tank will be situated in a remote locality where the eye is drawn across an expansive landscape largely devoid of topographical features, notable trees and built form save a large telecommunications tower to the west which draws the eye of the observer in search of visual stimulation.

When viewed from the highway road corridor the ochre and mottled grey-green mosaic of bare earth and prostrate groundcovers blanket a fore- and mid-ground setting where the distant and vanishing thin slither of bitumen and ubiquitous traffic signs demarcating the northwards procession of the Stuart Highway dissect the planar view.

In search of visual interest the eye is lazily drawn to the distant hazy horizon where the abrupt juxtaposition of land with skyscape is abrupt and enveloping. It is a landscape where all visual features of note appear smaller within such a monumental open canvas.

Within the wider contextual landscape the township of Pimba to the northwest of the proposed site is a visual feature defined through an ad hoc arrangement of single storey dwellings and commercial premises and array of roofscapes and boundary fences of collected steel softened by intermittent plantings of medium to large evergreen native tress and smaller shrubs.

Whilst the township is notable on the journey north - south along the Stuart Highway it is however anonymous within the locality.

It is the author's opinion that the landscape character is one of a **low scenic quality** and has a **low sensitivity to change**.

Considered Likely Visual Impact

The Project is located some 500m to the west of the highway within a flat location comprising of intermittent ground cover clumps and patches. Whilst the Project's storage tank will be notable and conspicuous within westerly orientated vistas through its colour and form, the visual impact will be somewhat 'incidental' within the broader and enveloping panorama where the eye of the observer is drawn above and beyond to the distant horizon. Within the project footprint and at a distance of 500m from the highway the lower prostrate form of both the array of solar panels and the water storage tank will be anonymous. The surrounding security fencing will be largely transparent and inconsequential. A traveller north-south along the Stuart Highway will observe the project site as a fleeting moment of curiosity on a journey through the contextual landscape to a distant destination.

In a landscape of **low scenic quality** and **low sensitivity to change** the likely visual impact both singularly and cumulatively will be one of **slight adverse impact.**

Mitigation

The appearance of a likely grey concrete finish will be benign when viewed against the wider horizon and as such mitigation is not deemed necessary.

View direction



Image 36: View from north at approximately 250m from the Bimba location



Image 37: View from south at approximately 250m from the Bimba location

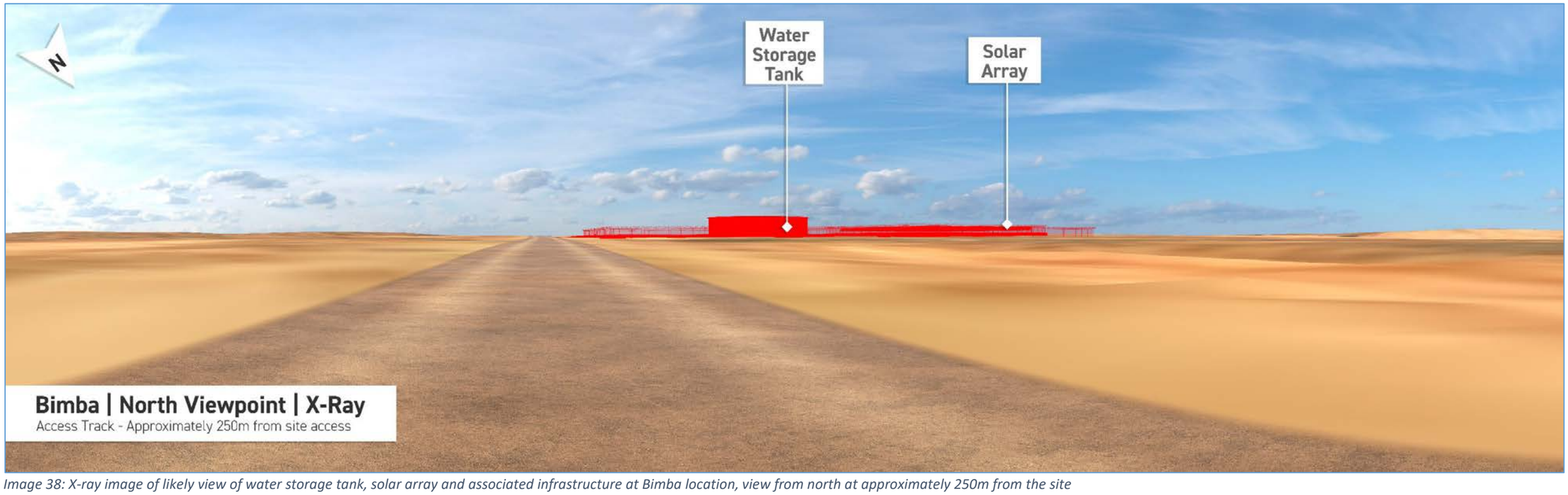


Image 38: X-ray image of likely view of water storage tank, solar array and associated infrastructure at Bimba location, view from north at approximately 250m from the site

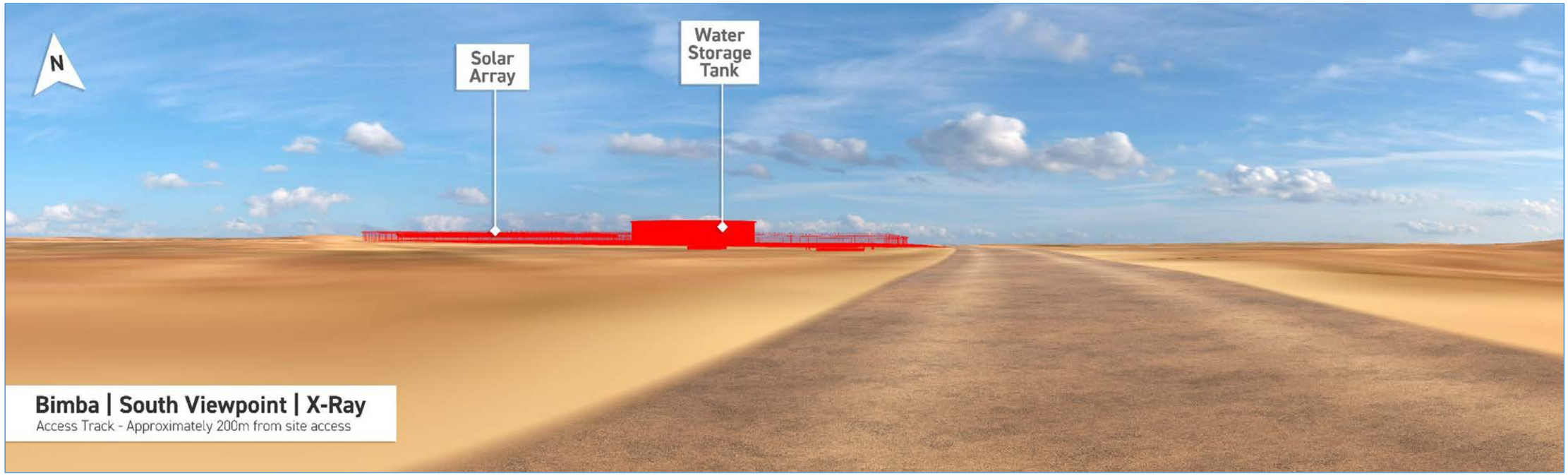


Image 39: X-ray image of likely view of water storage tank, solar array and associated infrastructure at Bimba location, view from south at approximately 250m from the site

B.3. Consideration of the Planning and Design Code

The following Assessment Provisions of the SA Government's Planning and Design Code (PDC),[18] which refer to Desired Outcomes (DO) and Performance Outcomes (PO) are considered relevant where they pertain to issues of visual amenity.

[Note the initial assessment was made against *PDC Version 2023.15. 26 October 2023*. The Assessment Provisions have not altered since that time and are still current as per *PDC Version 2026.12. 02 July 2026*.]

Infrastructure and Renewable Energy Facilities

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PO 1.1 Development is located and designed to minimise hazard or nuisance to adjacent development and land uses.

Visual Amenity

PO 2.1 The visual impact of above-ground infrastructure networks and services (excluding high voltage transmission lines), renewable energy facilities (excluding wind farms), energy storage facilities and ancillary development is minimised from townships, scenic routes and public roads by:

a) utilising features of the natural landscape to obscure views where practicable
b) siting development below ridgelines where practicable
c) avoiding visually sensitive and significant landscapes
d) using materials and finishes with low-reflectivity and colours that complement the surroundings
e) using existing vegetation to screen buildings
f) incorporating landscaping or landscaped mounding around the perimeter of a site and between adjacent allotments accommodating or zoned to primarily accommodate sensitive receivers.

PO: 2.2 Pumping stations, battery storage facilities, maintenance sheds and other ancillary structures incorporate vegetation buffers to reduce adverse visual impacts on adjacent land.

PO 2.3 Surfaces exposed by earthworks associated with the installation of storage facilities, pipework, penstock, substations and other ancillary plant are reinstated and revegetated to reduce adverse visual impacts on adjacent land.

Telecommunication Facilities

PO 6.1 The proliferation of telecommunications facilities in the form of towers/monopoles in any one locality is managed, where technically feasible, by co-locating a facility with other communications facilities to mitigate impacts from clutter on visual amenity.

PO 6.2 Telecommunications antennae are located as close as practicable to support structures to manage overall bulk and mitigate impacts on visual amenity.

PO 6.3 Telecommunications facilities, particularly towers/monopoles, are located and sized to mitigate visual impacts by the following methods:

a) where technically feasible, incorporating the facility within an existing structure that may serve another purpose
   or all of the following:
b) using existing buildings and landscape features to obscure or interrupt views of a facility from nearby public roads, residential areas and places of high public amenity to the extent practical without unduly hindering the effective provision of telecommunications services
c) using materials and finishes that complement the environment
d) screening using landscaping and vegetation, particularly for equipment shelters and huts.

Temporary Facilities

PO 13.2 Temporary facilities to support the establishment of renewable energy facilities (including borrow pits, concrete batching plants, laydown, storage, access roads and worker amenity areas) are sited and operated to minimise environmental impact.

[18] PlanSA (2023). *Planning and Design Code Version 2023.15. 26 October 2023*. Government of South Australia. pp. 4750-4754.

6. Summary and recommendations

As demonstrated through this LCVIA the visual impact that is likely to be experienced within both a 5km and 10km radius Zone of Theoretical Visual Influence (ZTVI) by the introduction of the desalination plant and associated infrastructure will be:

- **No change** at two Sensitive Receptor Localities: SRL 01 and SRL 05;
- **Slight adverse impact** at four Sensitive Receptors/ Sensitive Receptor Localities: SR 02, SR 03, SRL 04 and SR 06.

Outside the 10km ZTVI, the desalination plant will have no discernible impact on the wider landscape and be a largely inconsequential feature within the panoramic vistas obtained from publicly accessible vantage spots.

Mitigation strategies to ameliorate the visual impact both during construction and on completion of The Project works at Mullaquana Station are considered to be unnecessary due to the relative remoteness of the locality and the largely publicly inaccessible location which precludes close quarter views towards the built form. Noting that avoiding the use of highly reflective finishes which emit glare over considerable distance for the proposed desalination plant's built form and monopoles will accord with what is generally regarded as visual mitigation best practice, demonstrating an amenity 'duty of care' by the project proponent.

The visual impact that is likely to be experienced by the introduction of the Transfer System has been assessed based on three proposed locations across the three landscape sub-regions in which the transfer system will be constructed.

The scenic quality of these regions ranges from **low scenic quality** to **moderate scenic quality**, with a **low sensitivity to change** to **medium sensitivity to change**. As such the visual impact of The Project's transfer system will be) **slight adverse impact** at two locations (Lincoln Gap and Bimba) and **slight adverse impact** to **moderate adverse impact** at one location (Kalaya).

When the infrastructure to be installed as part of The Project's transfer system is assessed in areas where other infrastructural elements already exist, the cumulative visual impact of the Project is likely to be **no change**.

Mitigation strategies to ameliorate the visual impact of the locations of the transfer system infrastructure elements including intermittent planting of native trees and shrubs around perimeter fencing, the use of colourbond sheeting in the construction of built form using muted matte finishes such as ochre, Sage Green and Notre Dame Grey to complement the more natural landscape colours and hues and minimizing the use of exposed galvanized steel are recommended. In addition, afterhours lighting and security lighting requires designing to avoid excessive overspill beyond each site.

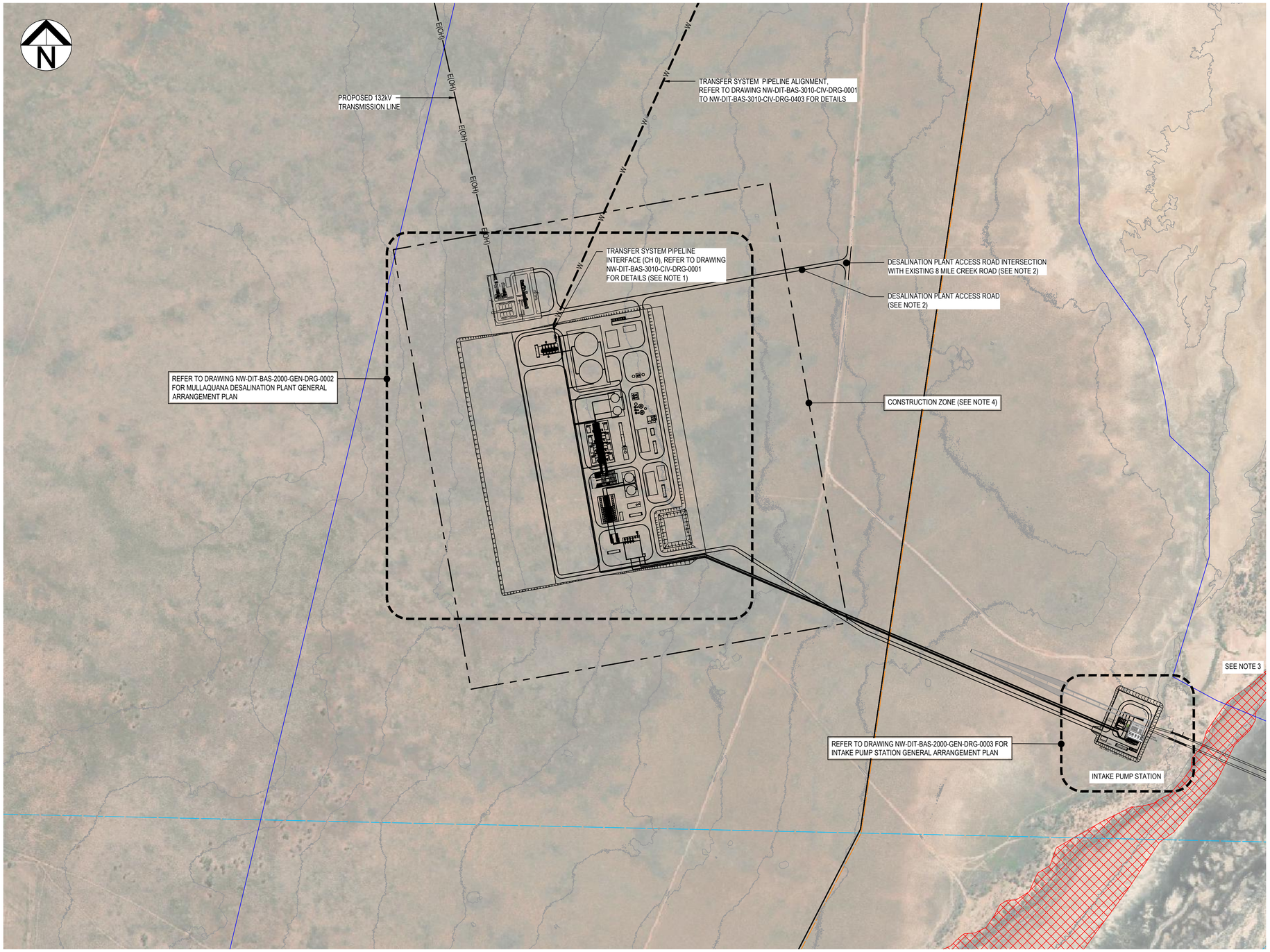
Where practicable The Project is not at variance with the provisions of the PDC and the broader objectives of the regional and sub-regional land management plans within which it is located.

The sense of place and place attachment values of the contextual landscape within which The Project is located will not be adversely impacted.

It is the author's opinion that the project will introduce a number of new infrastructure elements that, being of an acceptable design standard, will evoke curiosity and become prominent incidental infrastructure features of merit establishing best practice examples of progressive infrastructure delivery across the regions.

Appendix A

General Arrangement Drawing for Mullaquana Station Desalination Plant [Source: JBS&G]



NOTES:

1. LAYOUT SHOWN FOR FINAL DESALINATION PLANT AT DESIGN CAPACITY OF 140 MLD. FOR TRANSFER PIPELINE DETAILS REFER TO DRAWING SET NW-DIT-BAS-3010-CIV-DRG-001 TO 0403 AND FOR MARINE AND TUNNELING DETAILS, REFER TO DRAWING SET NWP-GHD-DBO-1000-CIV-DRG-1001 TO 1002.
2. INDICATIVE ACCESS ROAD ALIGNMENT SHOWN. TO BE CONFIRMED BY DIT.
3. EXTENT OF NO GO ZONE EXTRACTED FROM NORTHERN WATER GIS ON 9 MAY 2025. TO BE CONFIRMED BY DIT.
4. CONSTRUCTION ZONE SHOWN IS INDICATIVE ONLY FOR PLANNING PURPOSES. FINAL EXTENT TO BE CONFIRMED IN THE NEXT PROJECT PHASE.

LEGEND:

- CADASTRAL BOUNDARY
- BDAC EXTENT OF SURVEY
- COASTAL CONSERVATION ZONE
- NO GO ZONE

OVERALL SITE PLAN

SCALE 1:5000

FOR INFORMATION ONLY

NOT FOR CONSTRUCTION

SCALES: 100 0 50 100 150 200

No.	AMENDMENT DESCRIPTION	BY	DATE
C	RE-ISSUE FOR INFORMATION ONLY	AC	26.09.25
B	FOR INFORMATION ONLY	AC	30.06.25
A	DRAFT FOR COMMENT	PE	16.05.25

Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

REFERENCE DESIGN
NORTHERN WATER
OVERALL SITE PLAN
MULLAQUANA DESALATION PLANT
OVERALL SITE PLAN

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
DR	LR	CL	24C347	NW-DIT-BAS-2000-GEN-DRG-0001	C

CAD FILE NAME: NW-DIT-BAS-2000-GEN-DRG-0001.dwg

Appendix B

Convergen Metadata Documentation

Convergen Project Metadata Document

Hemisphere – Mullaquana

Delivery: Final
Date: 14/10/2025

Contents

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Kalaya: 16

Bimba: 21

Key Assets

Lincoln Gap Site	**Layout:** • NW-DIT-BAS-3160-CIV-DRG-2002-AMD B.pdf – Email from Stuart Heseltine, Downloaded - 22/09/25 **Infrastructure Asset:** Convergen library assets used for Site infrastructure – 1. Substation (Layout per "NW-DIT-BAS-3160-ELE-DRG-0101-AMD C.pdf") 2. Pump station 3. Switchroom (Dimensions used from "NW-DIT-BAS-3160-ELE-DRG-0111-AMD C.pdf") 4. Transmission Tower 5. Water Storage Tank 6. Security Chain Mesh Fence
Kalaya Site	**Layout:** • NW-DIT-BAS-3150-CIV-DRG-2012-AMD B.pdf – Email from Stuart Heseltine, Downloaded - 22/09/25 **Infrastructure Asset:** Convergen library assets used for Site infrastructure – 1. Substation (Layout per "NW-DIT-BAS-3150-ELE-DRG-0102-AMD C.pdf") 2. Pump station 3. Switchroom (Dimensions used from "NW-DIT-BAS-3150-ELE-DRG-0112-AMD C.pdf") 4. Transmission Tower 5. Water Storage Tank 6. Security Chain Mesh Fence
Bimba Site	**Layout:** • NW-DIT-BAS-3220-CIV-DRG-2032-AMD B.pdf – Email from Stuart Heseltine, Downloaded - 22/09/25 **Infrastructure Asset:** Convergen library assets used for Site infrastructure – 1. Water Storage Tank 2. Solar panels (Convergen has assumed layout position/orientation) 3. Security Chain Mesh Fence
Satellite Data	Maptiler download – 08/10/25
Terrain Data	High resolution terrain data downloaded from NEXTMap 6 – 10/10/2025, Elvis terrain data download (1 Second) - 08/10/2025

Limitations / Assumptions

- **Terrain Data and Alignment:**

The terrain data used is accurate to 5 metres around the sites and 1 second for further terrain. Camera placements are 1.57 metres above this terrain level and thus may affect accuracy of the depicted sight level.

- **Alignment Methodology:**

Visual Centre based alignment: Each viewpoint has been aligned so that the site is located at the centre of the camera view.

- **Factors Affecting Accuracy:**

Satellite Imagery: The resolution of the satellite imagery available was limited, which reduced the quality of the contextual ground plane visuals.

- **Lighting conditions:**

All viewpoints are lit using a direct light (sun) and indirect light source (360 photo sphere) to help represent the lighting conditions. All viewpoints are lit with the assumption of 11:10 AM and clear sky.

- **Transmission Towers:**

Transmission towers are placed approximately 150 metres apart depending on terrain and tower corridor requirements (i.e ensuring towers are place at the changes in direction).
The Transmission wire used has a diameter of 45 mm.

- **Water Storage Tank:**

The Water Storage Tank dimensions have been assumed based on the listed capacity of 6ML. Based on this capacity Convergen has calculated the rough required size for a tank to accommodate this capacity being 35.7 metres in diameter and 6 meters high.

- **Earthworks Assumptions:**

The access tracks were aligned to the terrain once completed the areas marked on the plans provided as level have been flattened accordingly. The access track was then lifted so that it was no clipping through the ground. The outside edge of the batter was then aligned to the terrain, and the inside edge of the batter was aligned to the access track and the gap between was filled to create the batter itself.

Infrastructure Reference Appendix

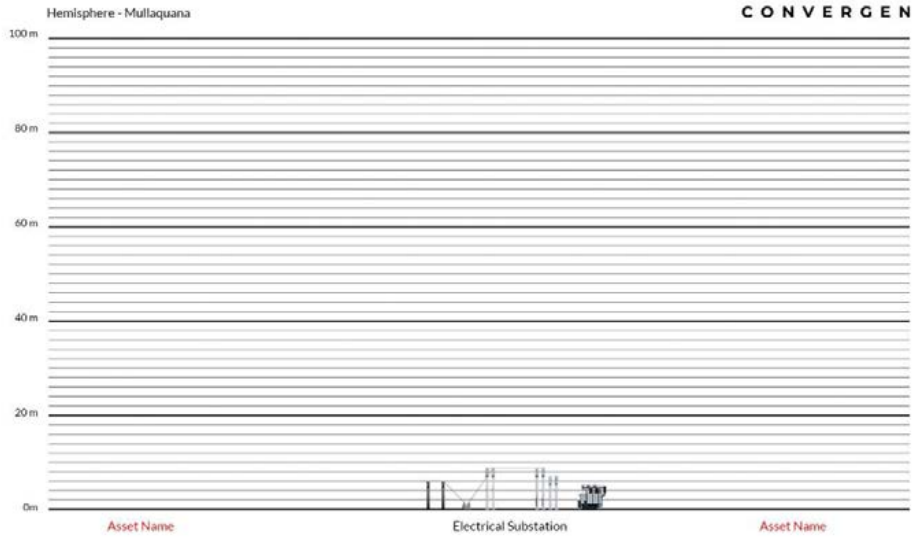
Component Specifications:

a. **Electrical Substation:**

Layout and rough positioning used from plans for the Lincoln Gap site (NW-DIT-BAS-3160-ELE-DRG-0111-AMD C.pdf) and Kalaya site (NW-DIT-BAS-3150-ELE-DRG-0112-AMD C.pdf)

i. Sites containing asset: Lincoln Gap & Kalaya

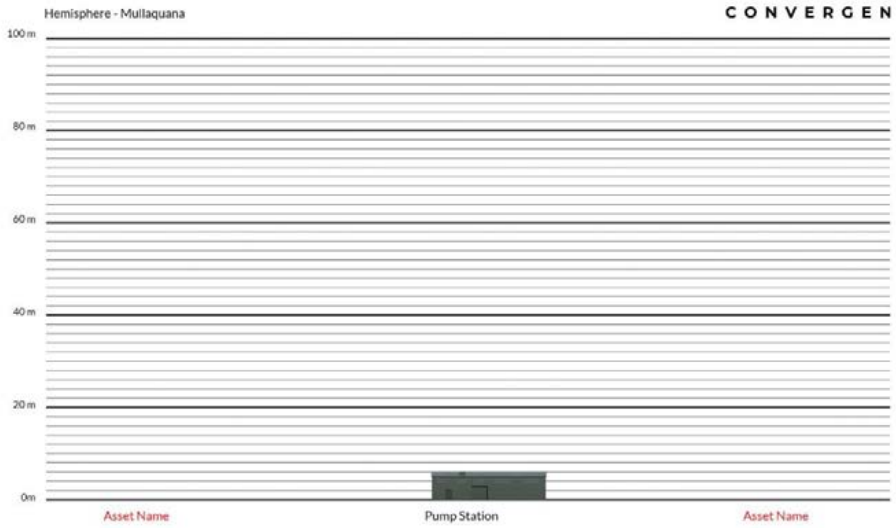
ii. Highest point: 9 metres





***b*. Pump Station:**

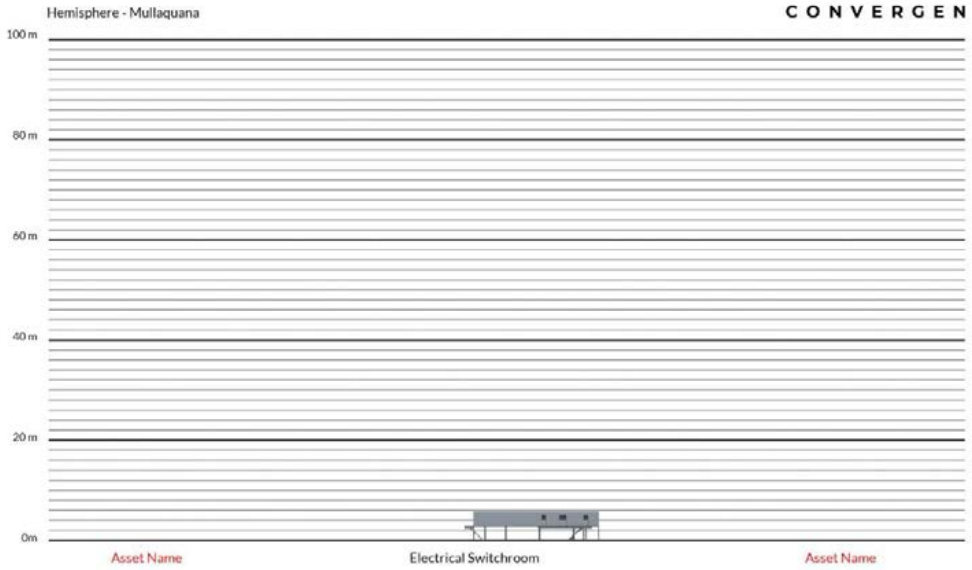
i. Sites containing asset: Lincoln Gap & Kalaya
ii. Height: 6 metres
iii. Length: 25 metres
iv. Width: 14.5 metres





c. **Switchroom:**

i. Sites containing asset: Lincoln Gap & Kalaya
ii. Highest point: 5.8 metres
iii. Width: 9.3 metres
iv. Height off the ground: 2.8 metres
v. Building height: 2.9 metres

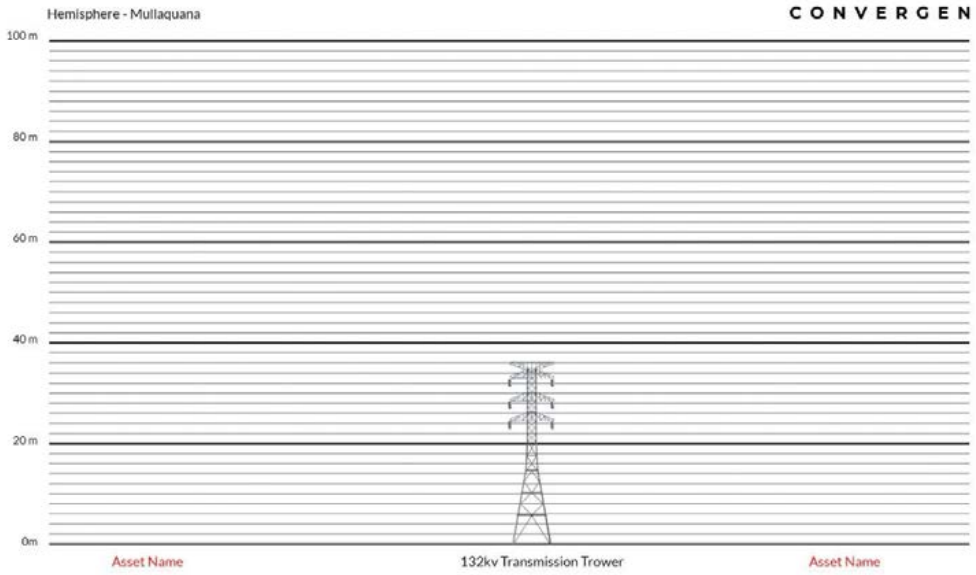




d. **Transmission Tower:**

Transmission tower number and spacing assumed, layout or locations not provided to Convergen.

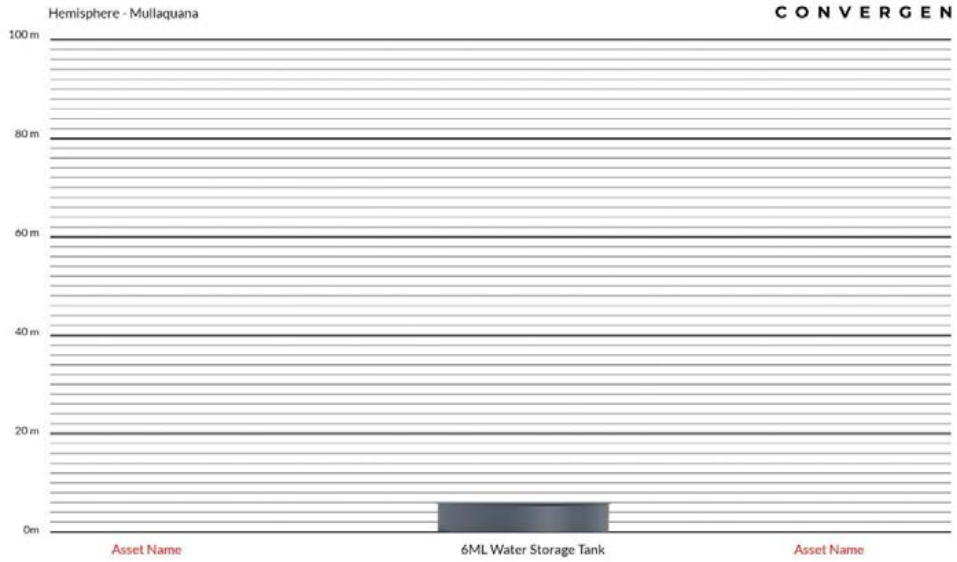
i. Sites containing asset: Lincoln Gap & Kalaya
ii. Height: 36.3 metres
iii. Transmission Tower spacing: 150 metres
iv. Transmission Tower Wire diameter: 45 millimetres

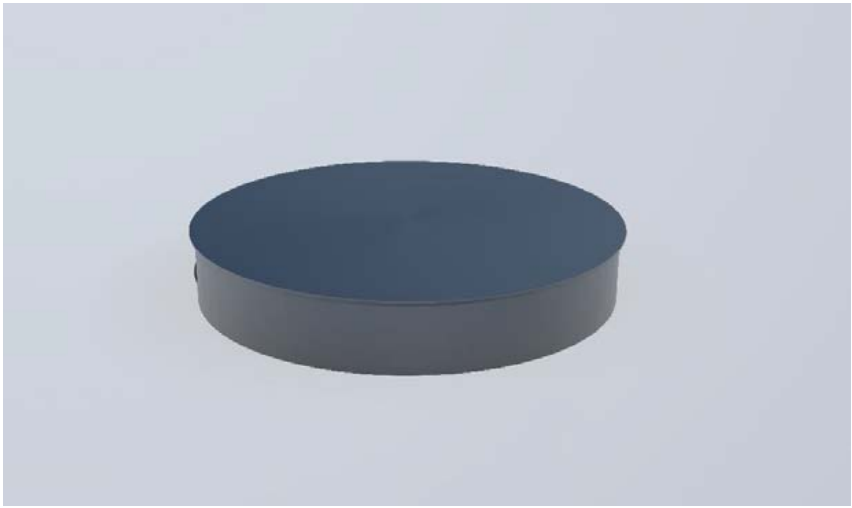




e. **Water Storage Tank:**

i. Sites containing asset: Lincoln Gap, Kalaya & Bimba
ii. Height: 6 metres
iii. Diameter: 35.7 metres
iv. Storage capacity: 6 million litres



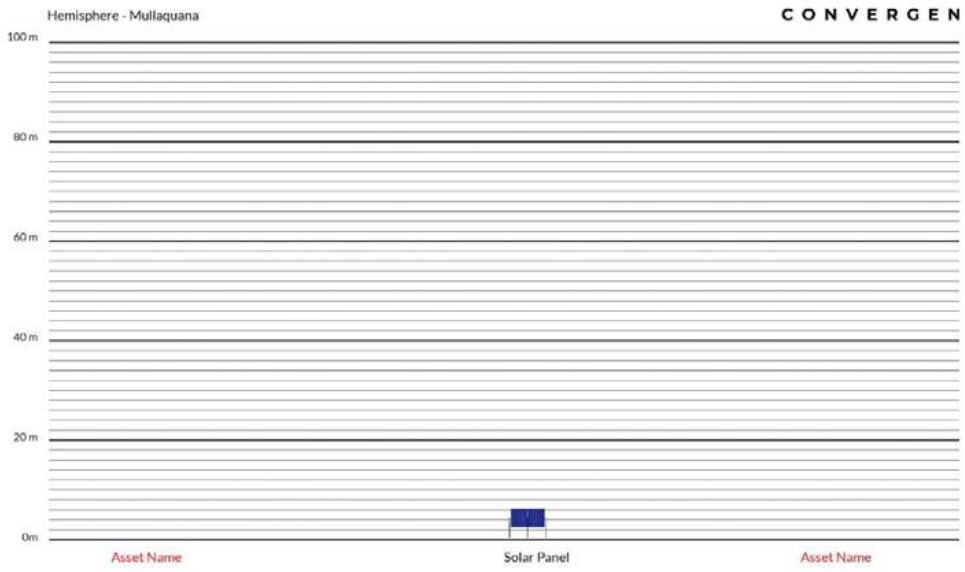


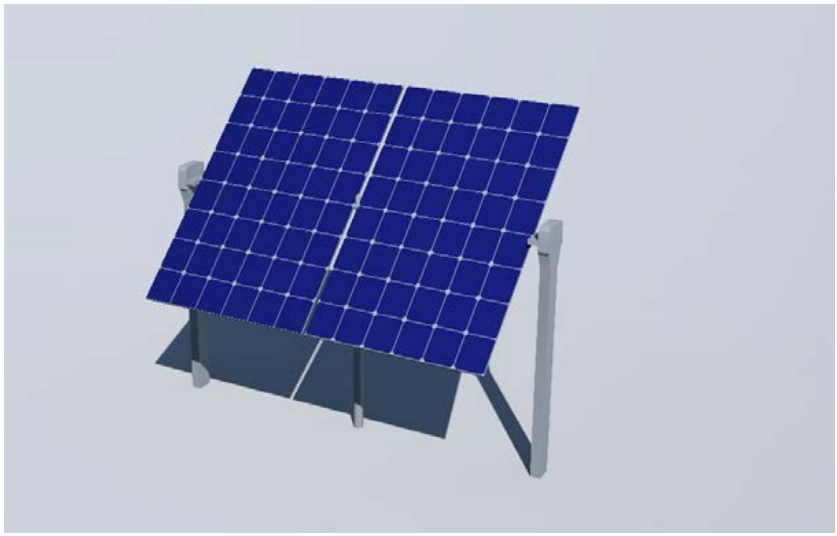
f. **Solar Panels:**

Solar panel asset used with assumed layout, position and orientations.

i. Sites containing asset: Bimba

ii. Height: 2.1 metres

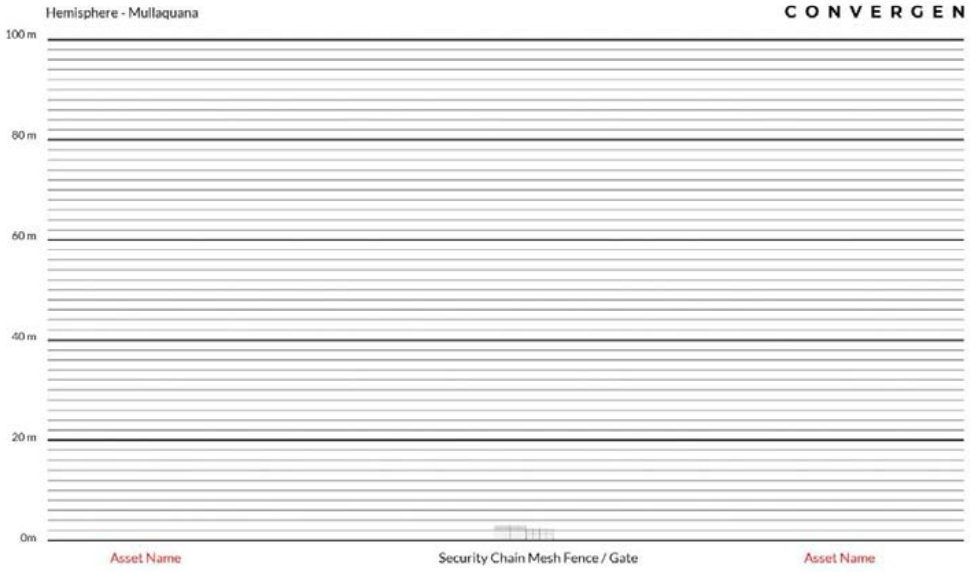




g. **Security Chain Mesh Fence / Gate:**

i. Sites containing asset: Lincoln Gap, Kalaya & Bimba

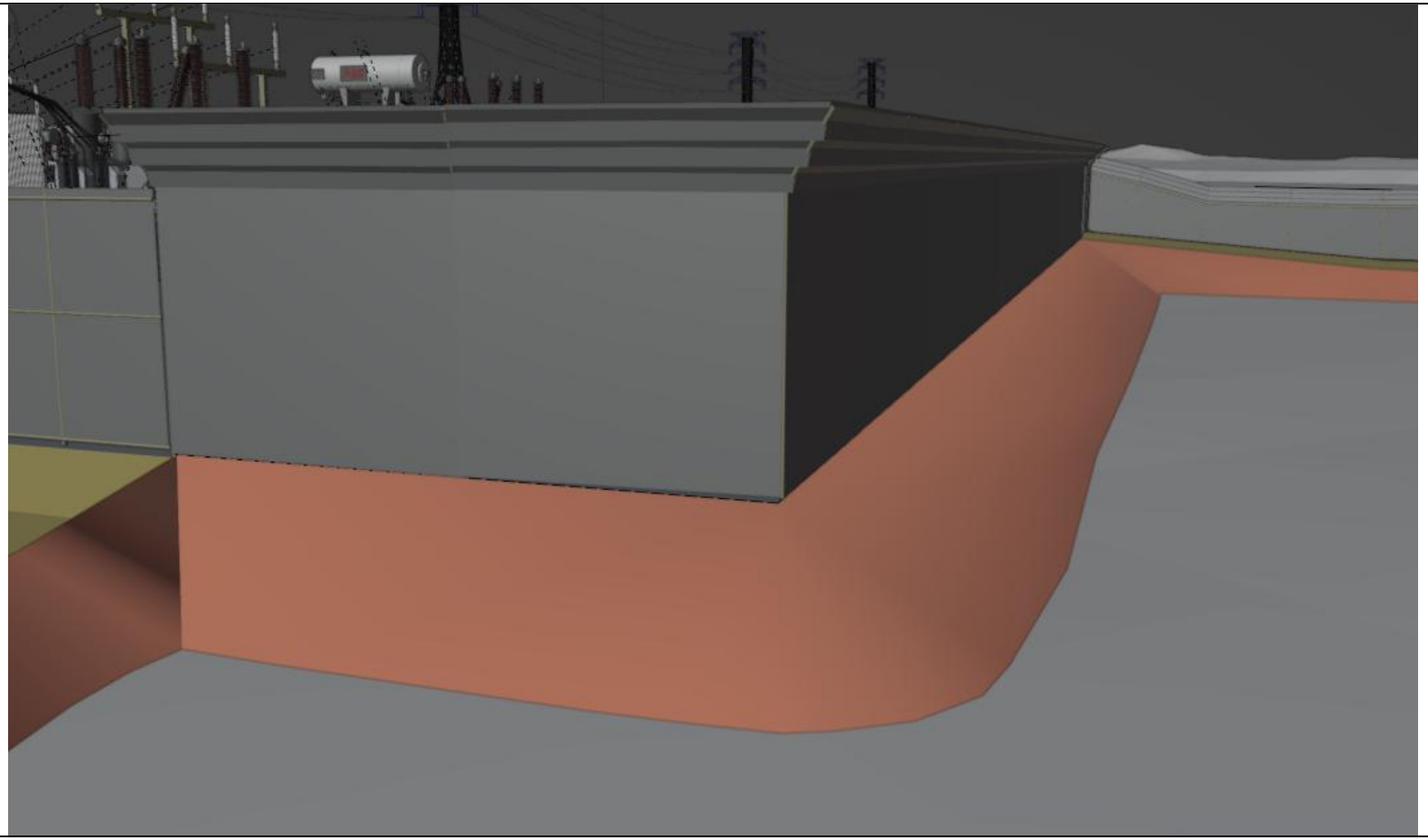
ii. Height: 3 metres





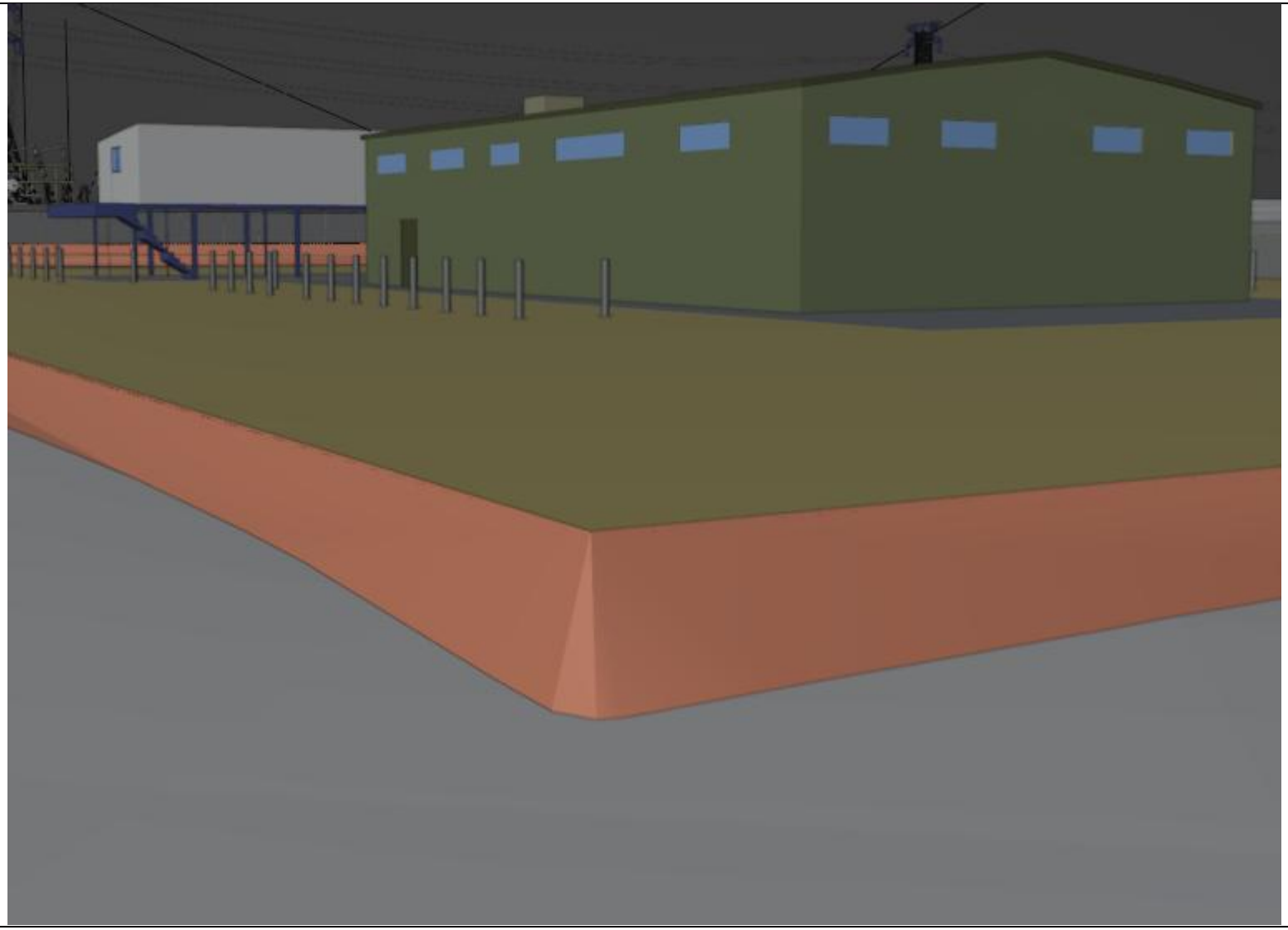
Infrastructure Earthworks appendix

Lincoln Gap:



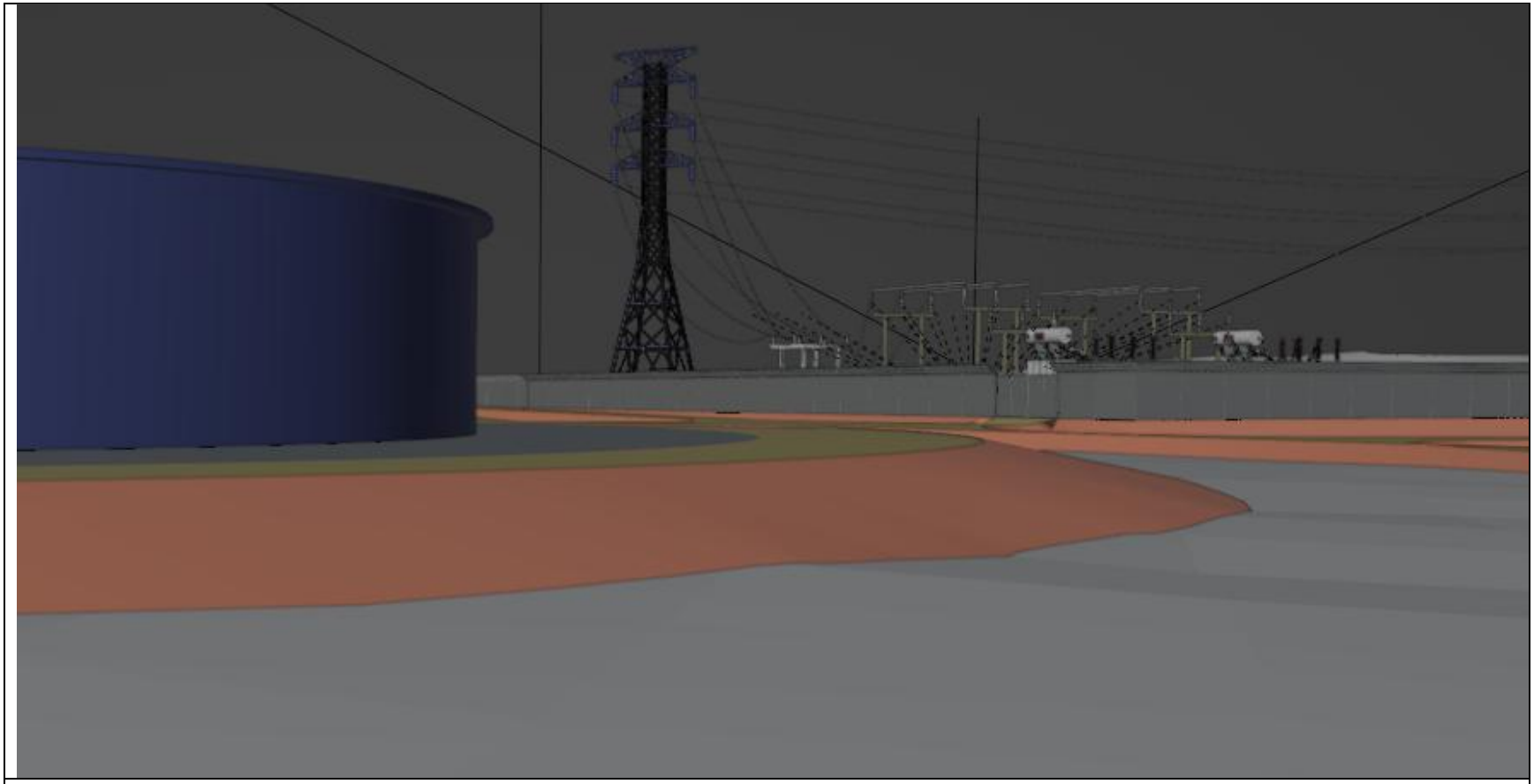
Description:

Screenshot taken of the north-eastern corner of the electrical substation section. The batters hight is 1.1 metres.



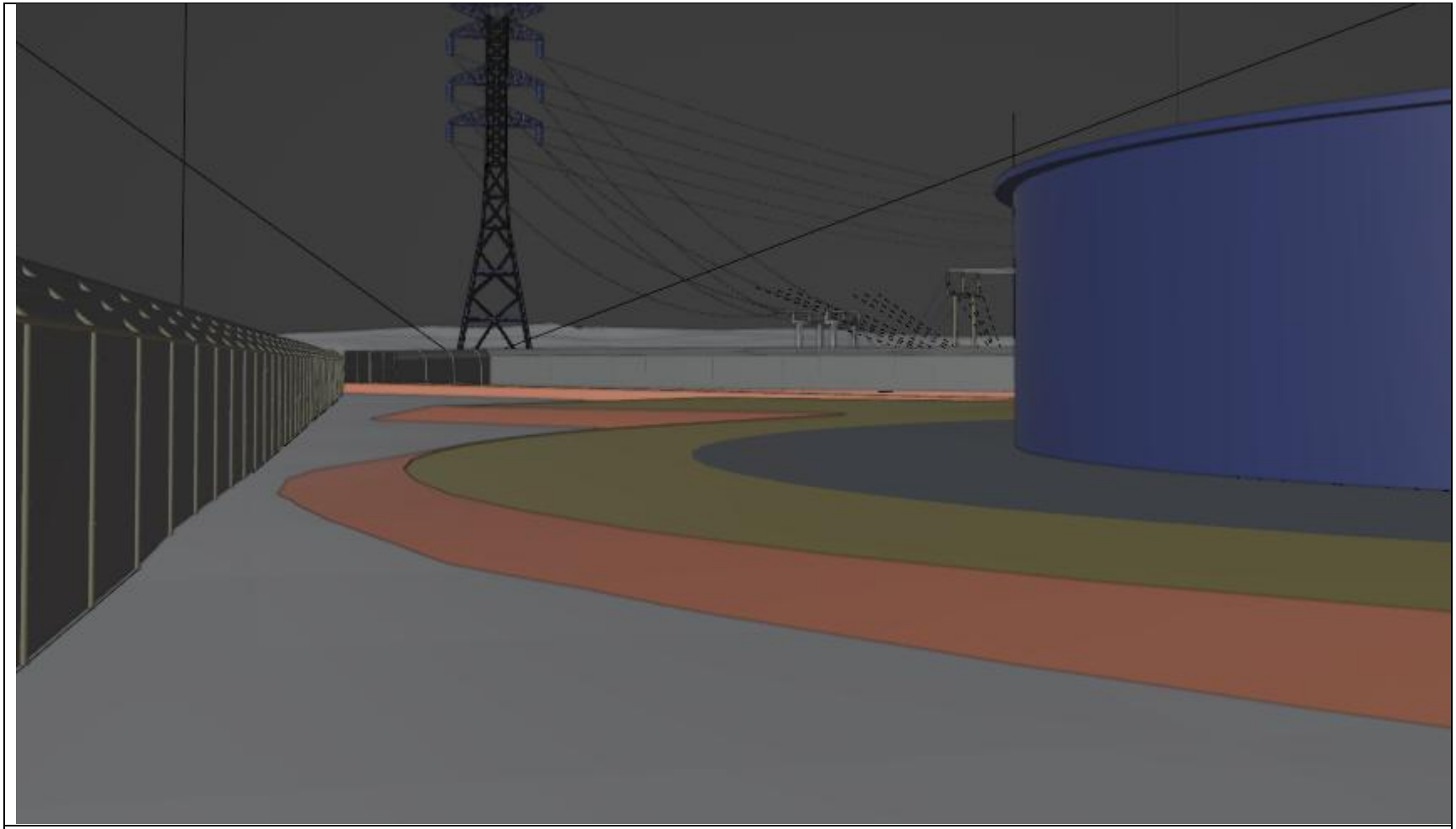
Description:

Screenshot taken of the north-western corner of the pump station and switchroom section. The batter hight is 1 metre.



Description:

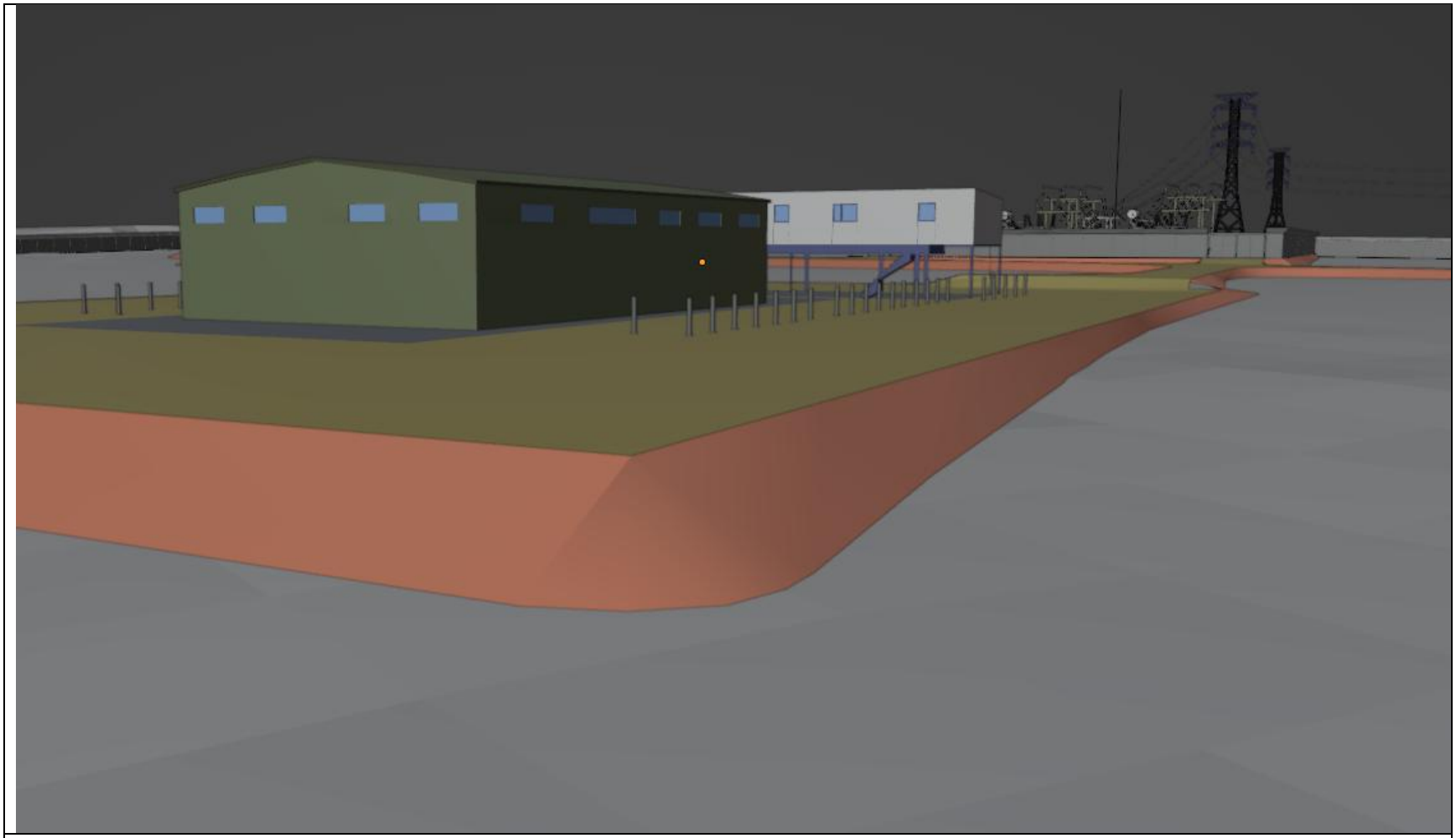
Screenshot taken of the south-western side of the water storage tank section. The batter hight is 0.8 metres.



Description:

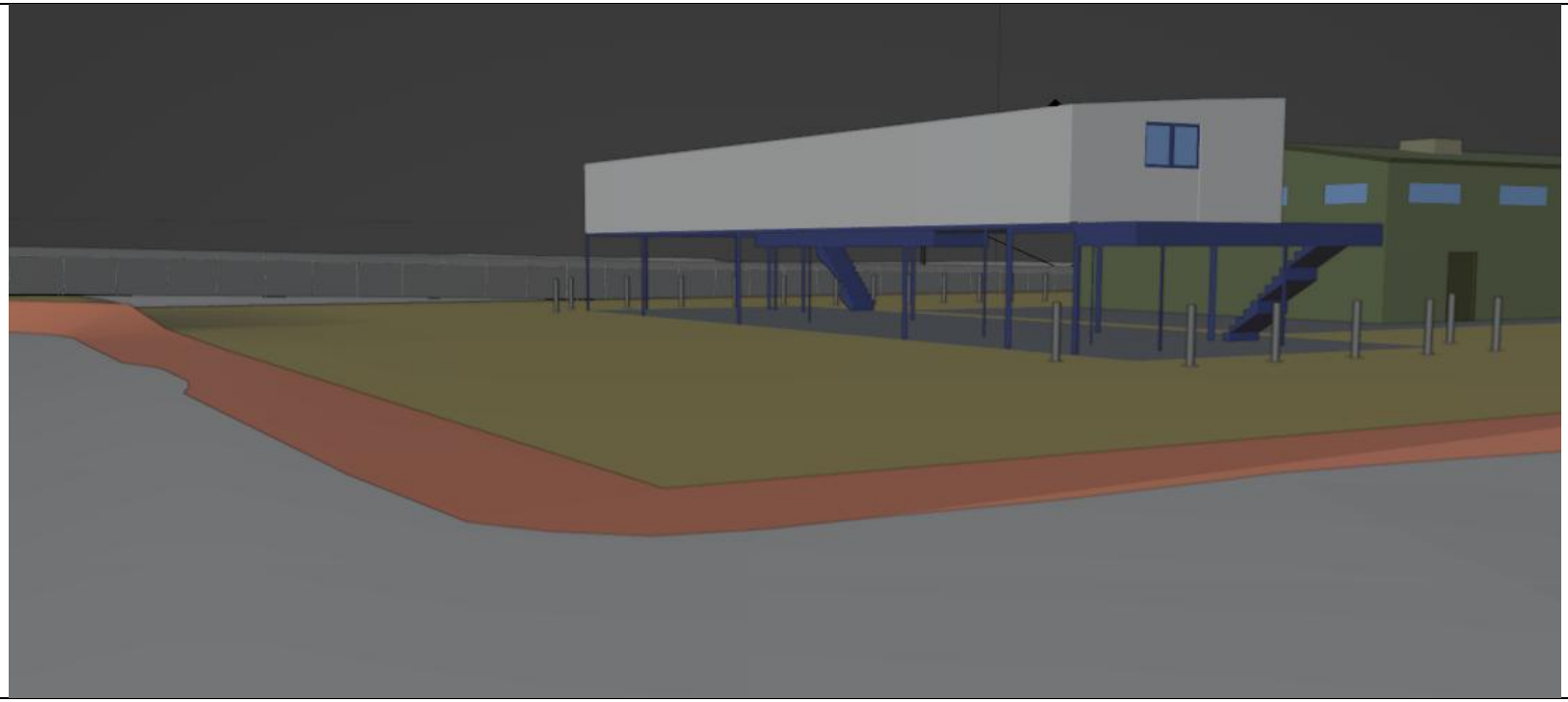
Screenshot taken of the northern side of the water storage tank section. The batter hight is 0.2 metres.

Kalaya:



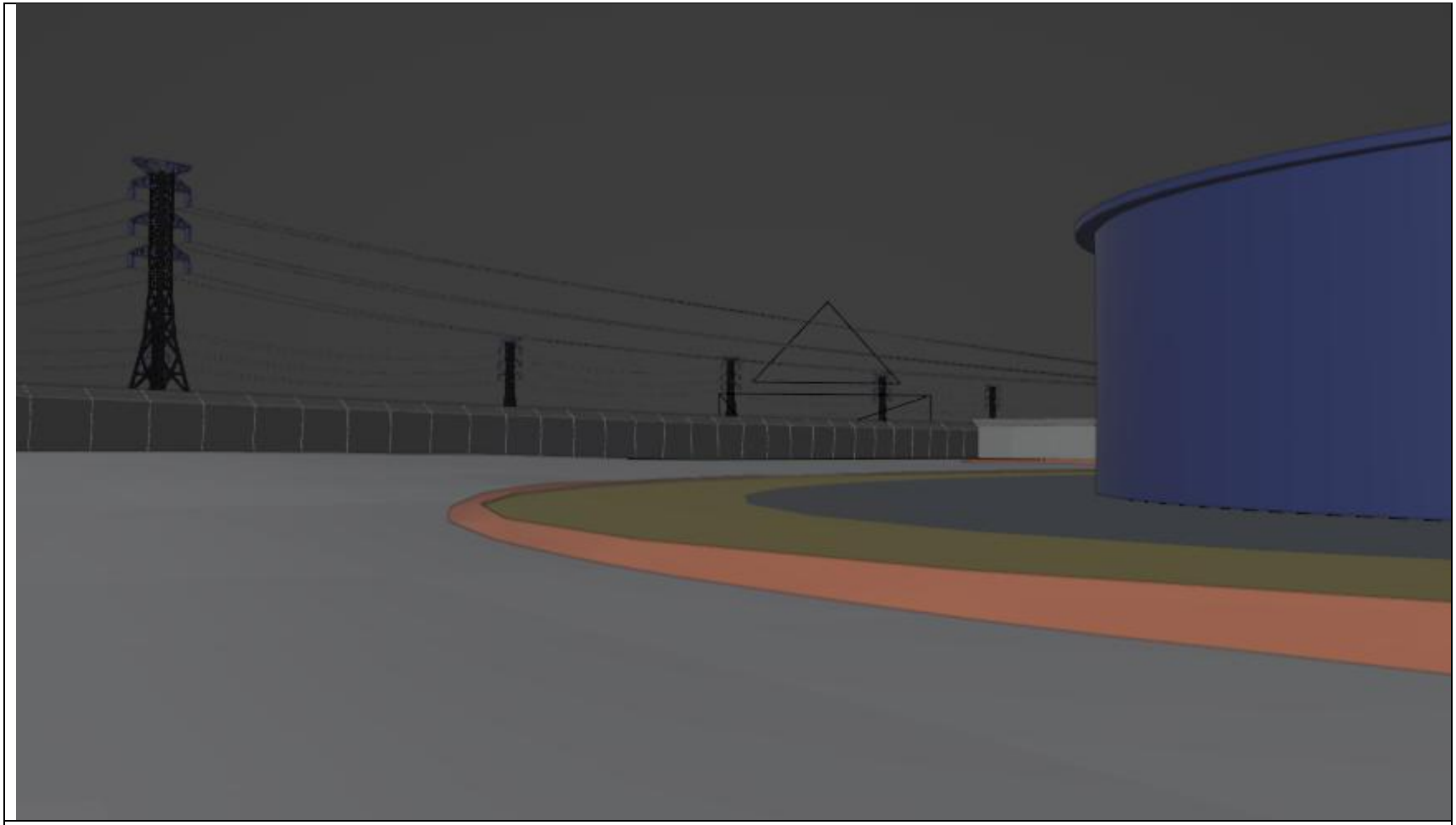
Description:

Screenshot taken of the south-eastern corner of the pump station and switchroom section. The batter hight is 1.4 metres.



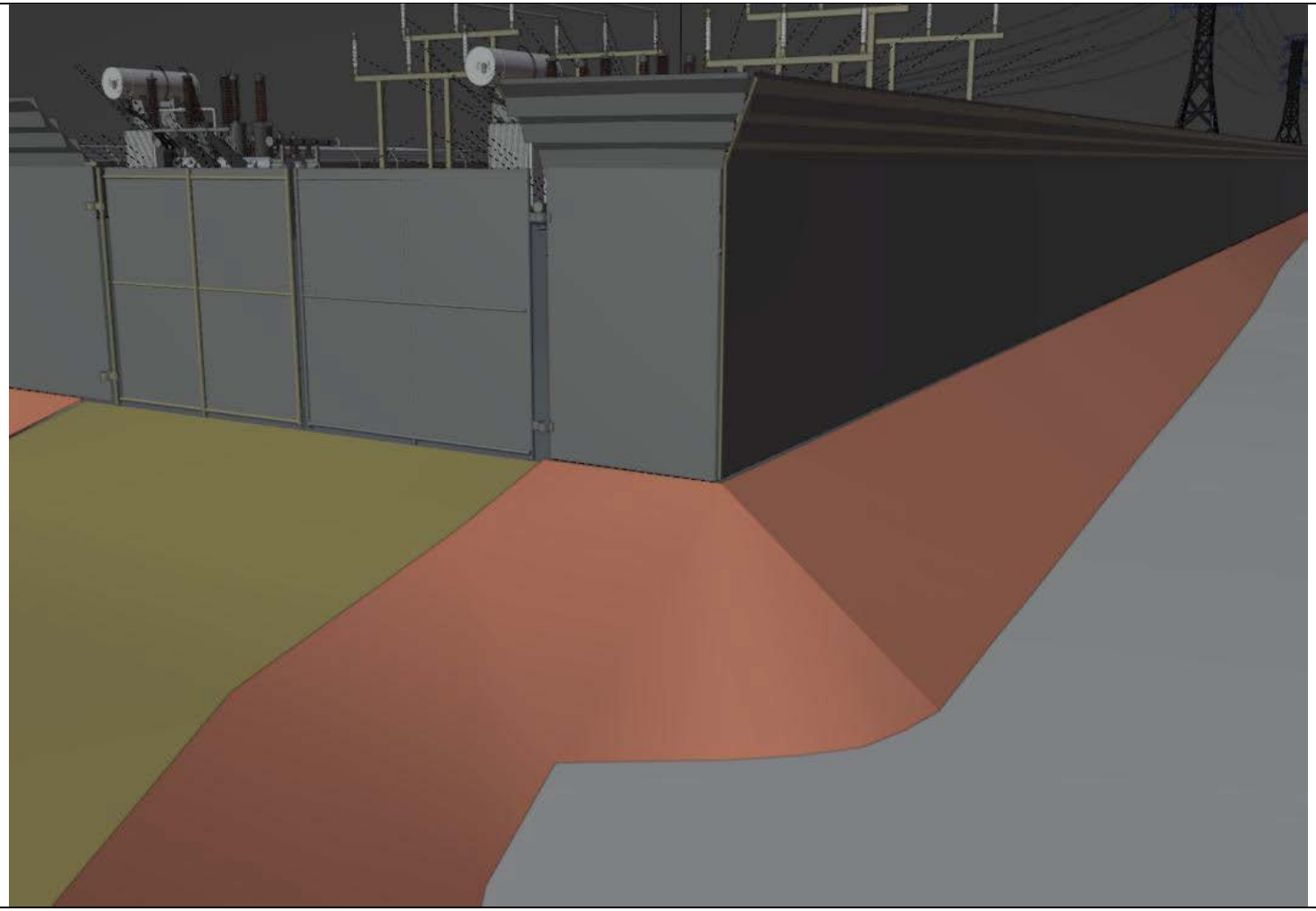
Description:

Screenshot taken of the north-western corner of the pump station and switchroom section. The batter hight is 0.05 metres.



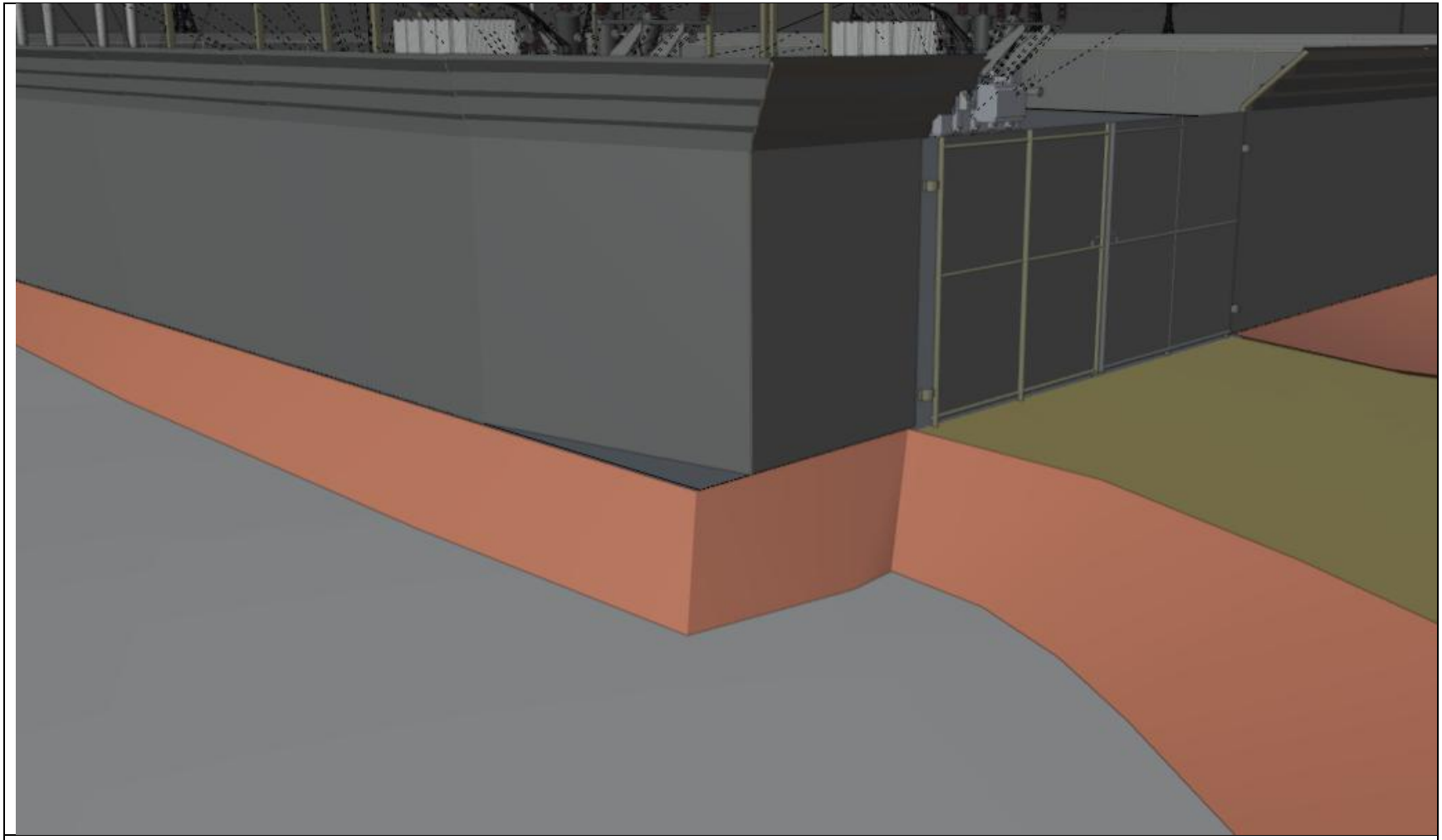
Description:

Screenshot taken of the north-western side of the water storage tank section. The batter hight is 0.2 metres.



Description:

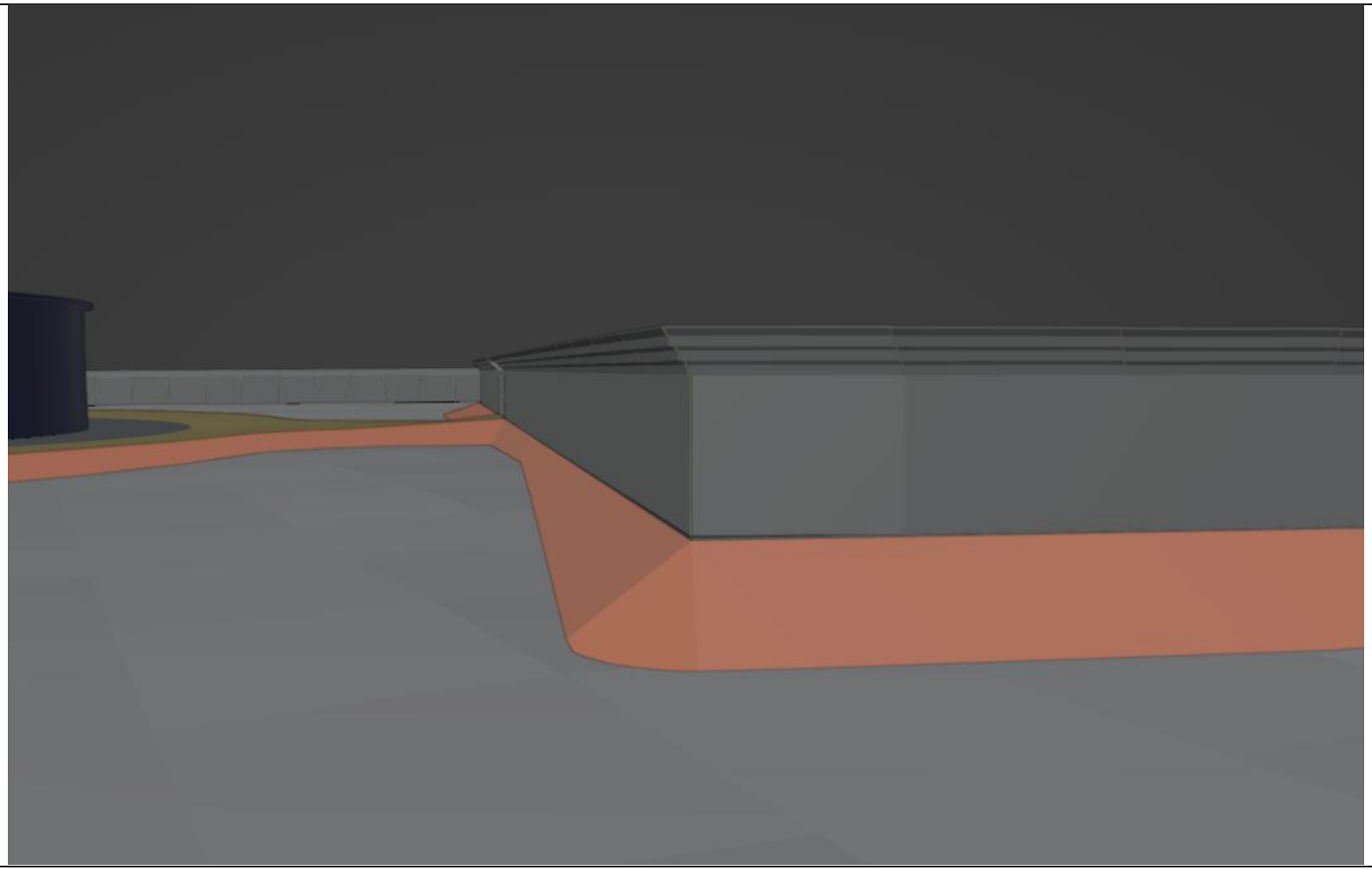
Screenshot taken of the south-eastern entrance of the electrical substation section. Batter hight is 1.4 metres.



Description:

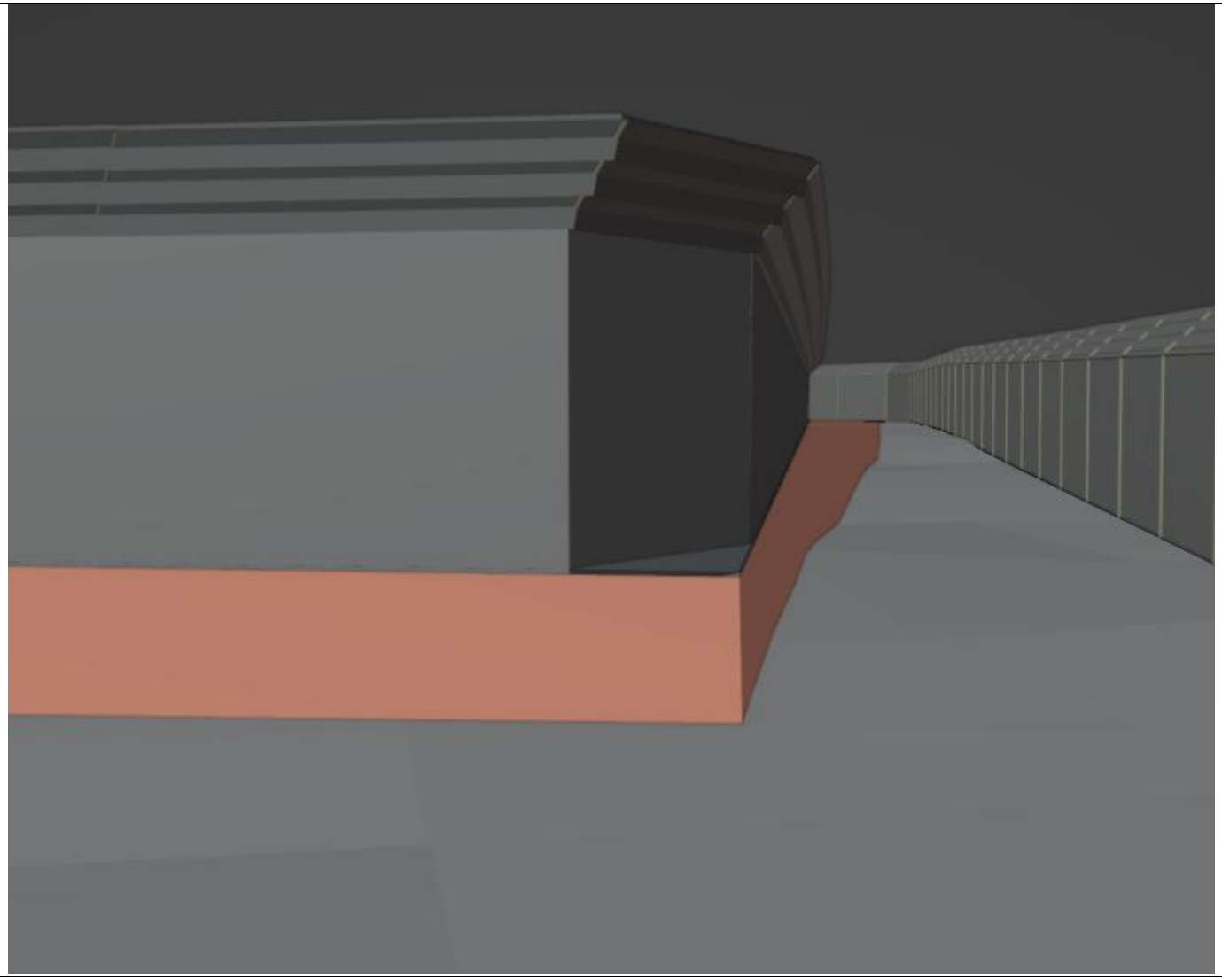
Screenshot taken of the south-western entrance of the electrical substation section. The batter hight is 0.8 metres.

Bimba:



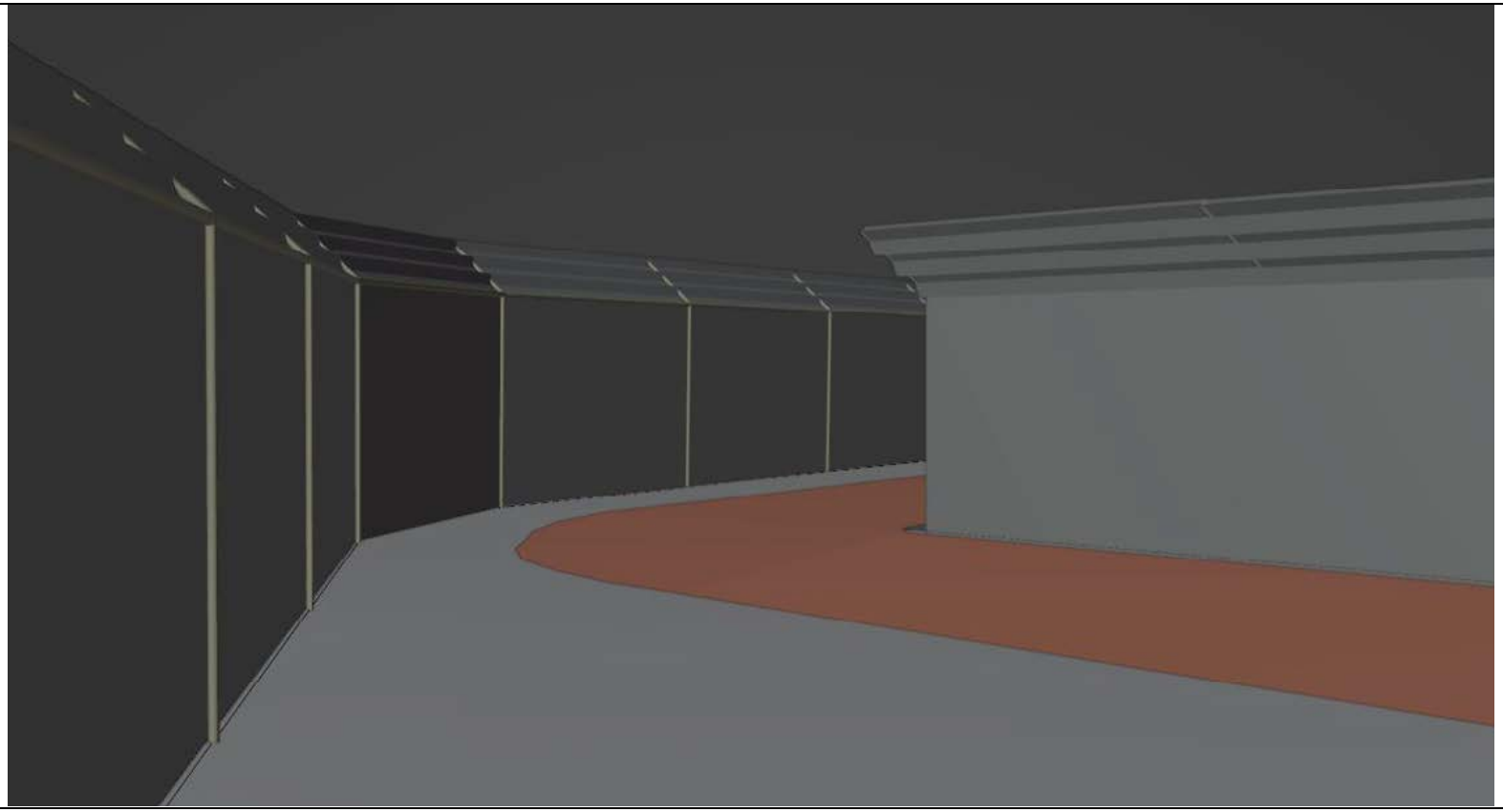
Description:

Screenshot taken of the north-eastern corner of the solar array section. The batter hight is 1.4 metres.



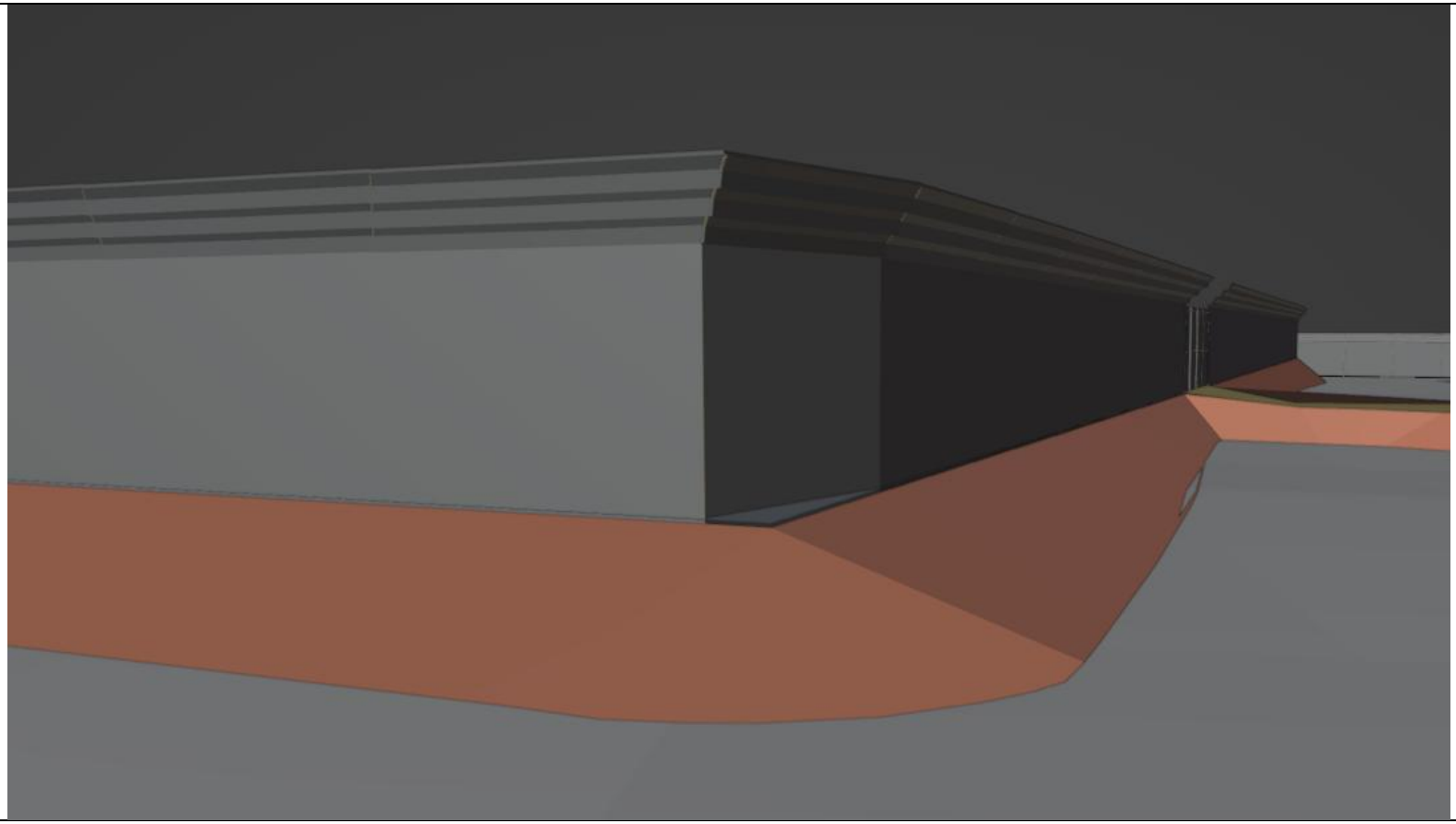
Description:

Screenshot taken of the north-western corner of the solar array section. The batter hight is 0.9 metres.



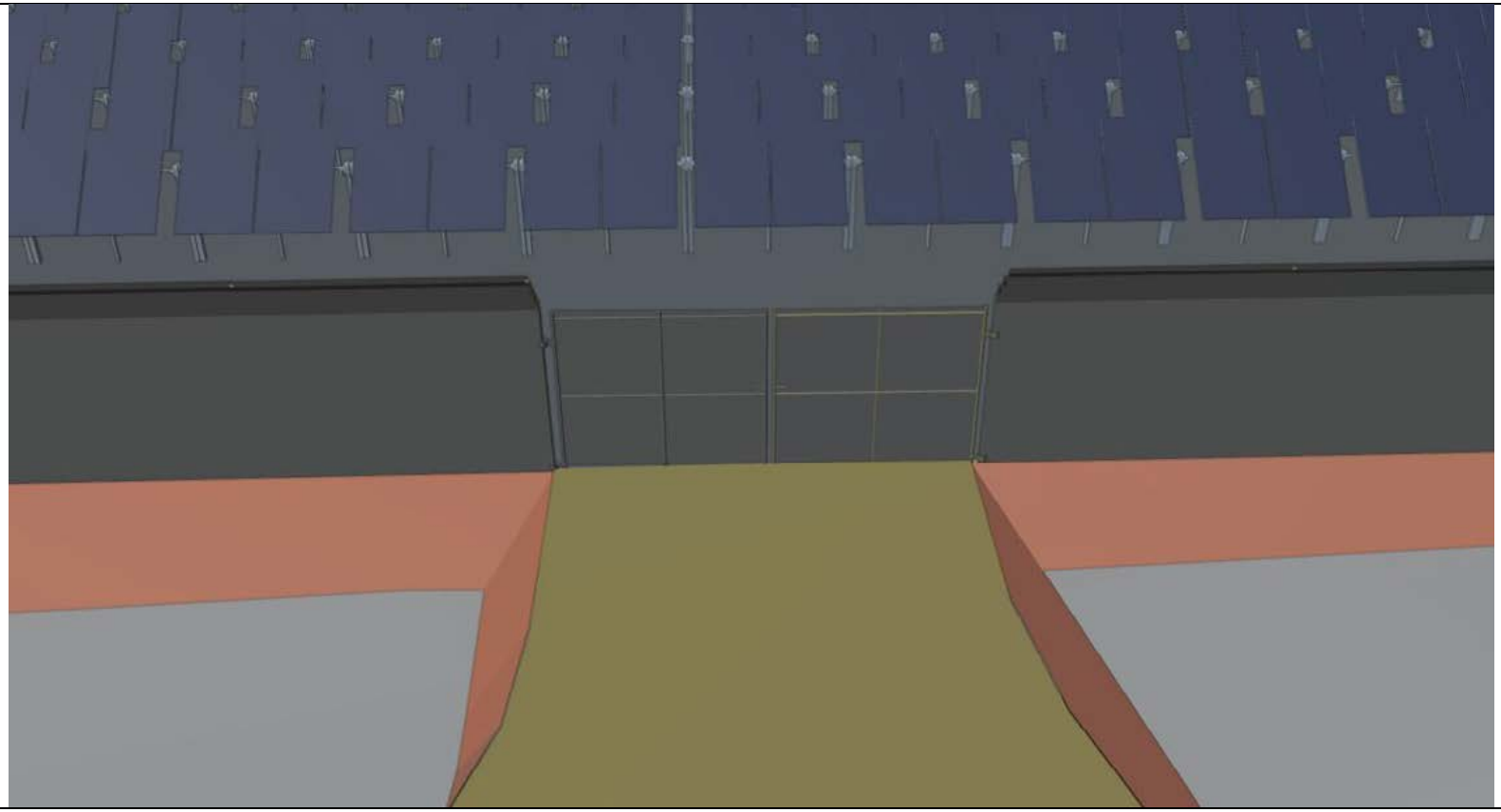
Description:

Screenshot taken of the south-western corner of the solar array section. The batter hight is .07 metres.



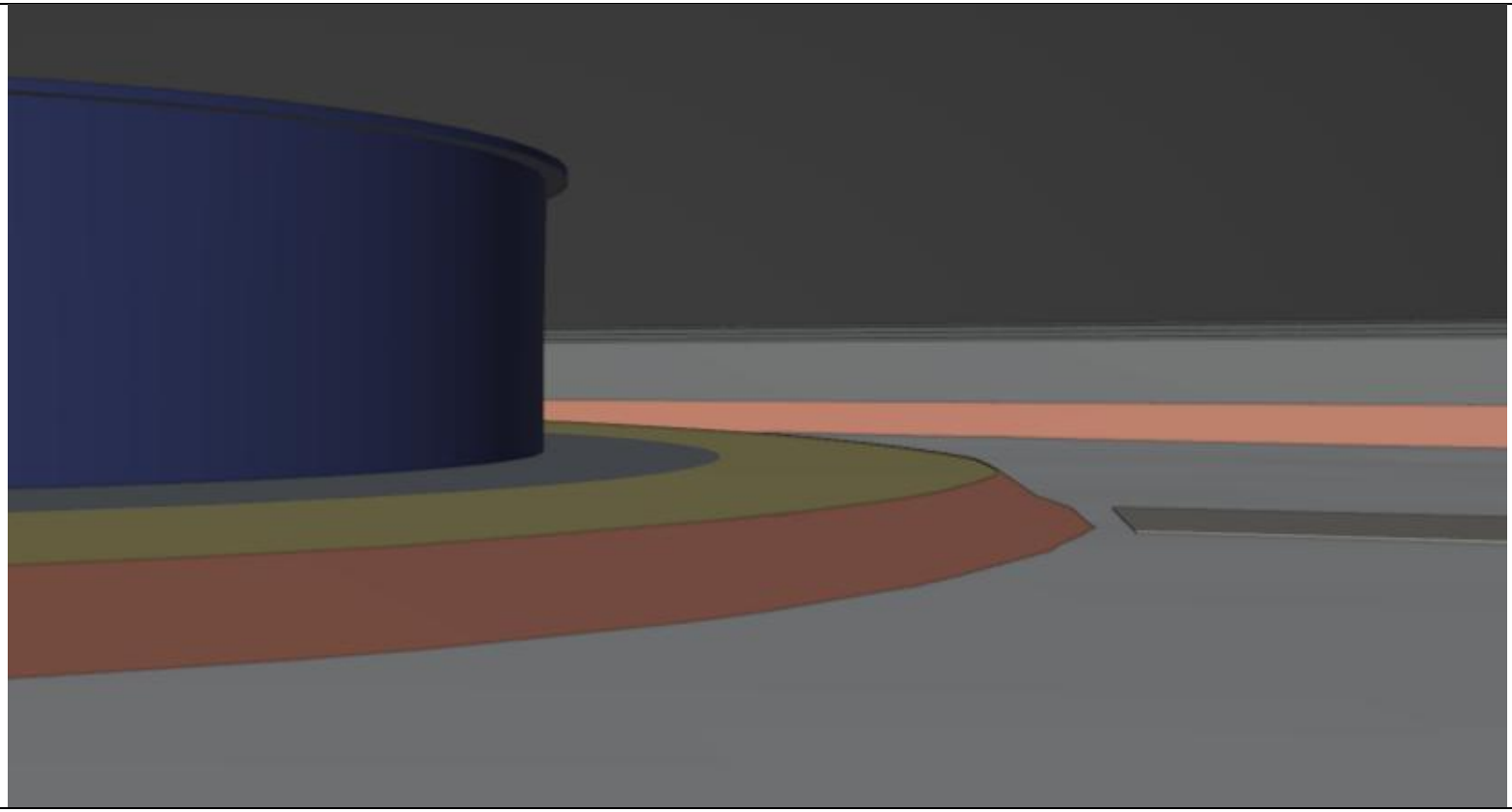
Description:

Screenshot taken of the south-eastern corner of the solar array section. The batter hight is 0.8 metres.



Description:

Screenshot taken of the entrance to the solar array section. On the right side of the gate the batter high is 1.2 metres. On the left side of the gate the batter hight is 1 metre.



Description:

Screenshot taken of the north-eastern side Water Storage Tank Area. The batter hight is .8 metres.

Convergen Project Metadata Document

Hemisphere – Mullaquana_Joyce Homestead

Delivery: Draft

Date: 10/07/2026

Contents

Convergen Project Metadata Document 1

Key Assets 3

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Rotation Alignment: 10

Key Assets

Layout	250624_JBSG_RTandon_ProjectFootprint_KML - 25/06/2025 Stuart Heseltine, email mullaquana_transmission_line_20250708.shp – 31/07/2025 Stuart Heseltine, email
Building specifications	NW-DIT-BAS-ARC-DRG_Desal-Plant_Combined-Architecturals.pdf - 24/06/2025 Stuart Heseltine, email *Note: RO Building height confirmed to be 17.1 meters and not 27.1 meters in height- 19/08/2025 Stuart Heseltine, email*
Tower specifications	Transmission Tower type - *275kV Lattice, 60m - Andrew Querzoli, JBSG 11/04/2026, Approved by Stuart 06/07/2026*
Satellite Data	Maptiler download - 01/05/25 Nearmaps download – 18/08/2025
Terrain Data	Elvis terrain data download(1 sec & 1 metre) - 30/04/2025, tinExisting(250624_JBSG_RTandon_ProjectFootprint_KML) - 24/06/2025 Stuart Heseltine email, NEXTMap elevation data(6 metre) – 26/06/2025, 14/08/2025, 15/08/2025, 02/07/2026
Layout	250624_JBSG_RTandon_ProjectFootprint_KML - 25/06/2025 Stuart Heseltine, email mullaquana_transmission_line_20250708.shp – 31/07/2025 Stuart Heseltine, email

Limitations / Assumptions

Terrain data is accurate to 6 metres surrounding site border, transmission towers and VP location. 1 sec terrain is used outside the site boundary. This may limit alignment accuracy.

- Imagery shown without earth curvature, no motion blur on turbines or atmospheric mist.
- All photomontages shown with 120º horizontal FOV, and 36º vertical FOV.

Photomontage Register

Photomontage Register - RVP								
Name	**Masks**	**Date**	**Time**	**Latitude**	**Longitude**	**Elevation (m)**	**Camera Height**	**Northing**
SRL06	Base, Masked & Red overlay	24/06/26	11:06 PM	-33.21171229	137.3627213	48.9671 m	50.5371 m	110°

Note: Camera height includes elevation with distance of photography capture from the ground (Convergen 1.57m standard), Northing is from North (0°).

Infrastructure Reference Appendix

Component Specifications:

1. **Layout:** 250624_JBSG_RTandon_ProjectFootprint_KML



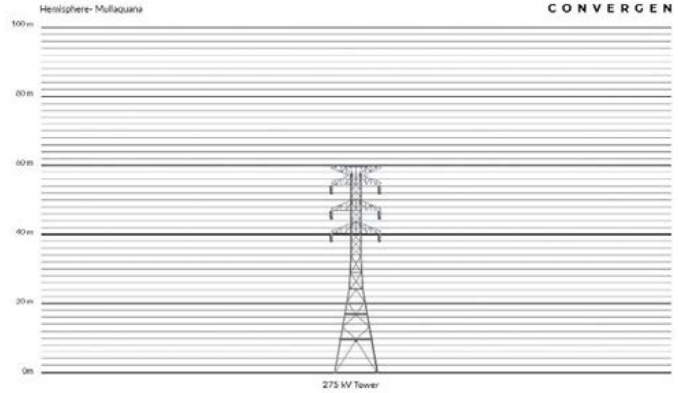




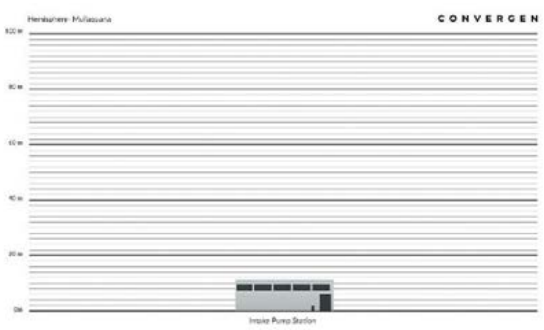
2. **Layout:** TransmissionLine-20250708
   Transmission Tower Type: 275kV Lattice Tower
   Transmission Tower Height: 60 m
   Transmission Towers: 208 total
   Transmission Tower spacing: Approx. 200 m apart
   Transmission Wire thickness: 5 cm diameter





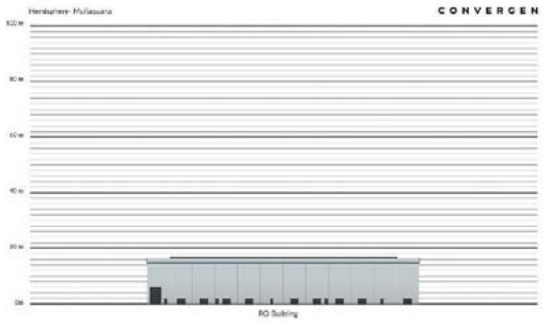


3. **Building Specifications:** Intake Pump Station
   Height: 11.171 m
   Building Base Elevation Height (RL): 4.8764 m
   Elevation Height (highest point): 16.0474 m





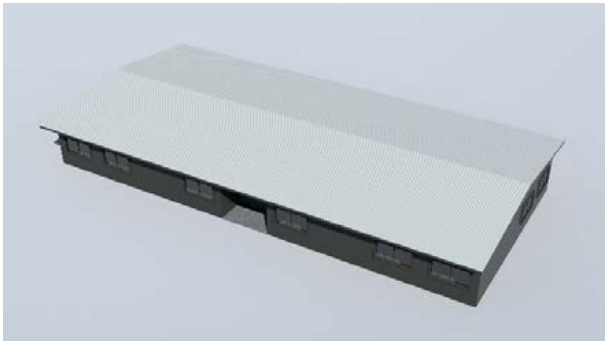
4. **Building Specifications:** RO Building
   Height: 17.1m
   Building Base Elevation Height (RL): 9.05702 m
   Elevation Height (highest point): 26.15 m



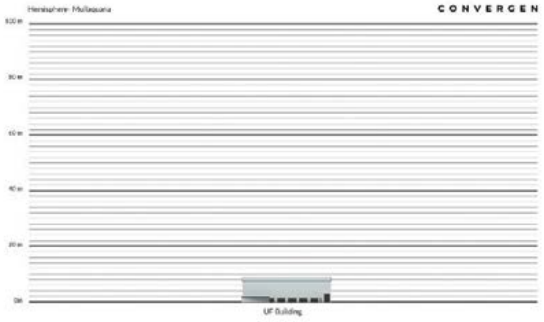


5. **Building Specifications:** Admin Building
   Height: 3.893 m
   Building Base Elevation Height (RL): 7.84081 m
   Building Elevation Height (highest point): 11.7338 m



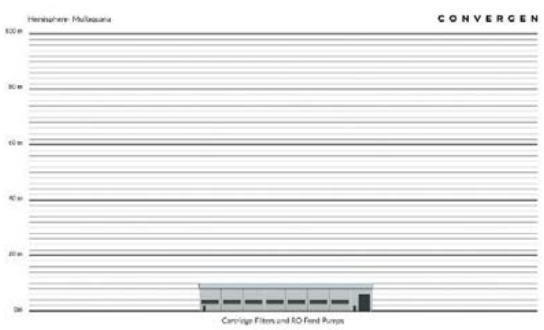


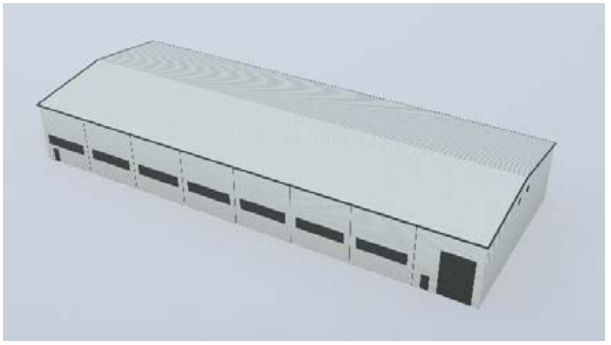
6. **Building Specifications:** UF Building
   Height: 17.805 m
   Building Base Elevation Height (RL): 9.03526 m
   Building Elevation Height (highest point): 26.789 m



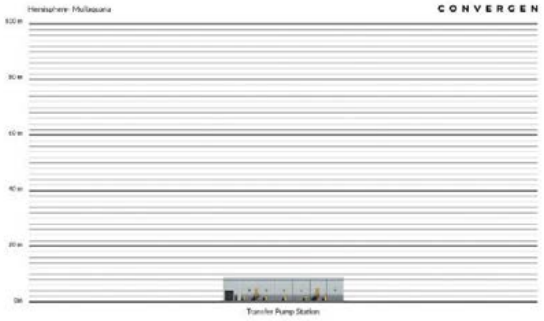


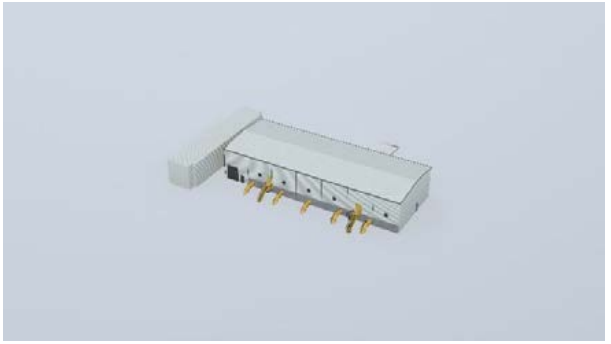
7. **Building Specifications:** Cartridge Filters and RO Feed Pumps
   Height: 9.988 m
   Building Base Elevation Height RL): 8.9642 m
   Building Elevation Height (highest point): 18.9472 m





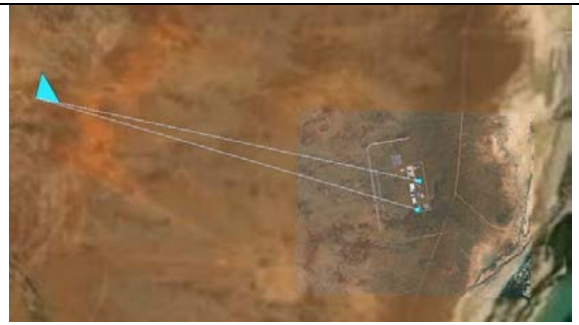
8. **Building Specifications:** Transfer Pump Station
   Height: 8.621m
   Building Base Elevation Height (RL): 9.22738 m
   Building Elevation Height (highest point): 17.7009 m





Rotation Alignment:

VP01 QGIS Rotational Bearing



Model input mark	Bearing from 0°
Left	100.94097°
Right	105.050023°



Appendix J-4:
Traffic Impact Assessment

Traffic Impact Assessment

Northern Water Project

Department for Infrastructure and Transport

9 September 2026

→ **The Power of Commitment**



Project name		Northern Water Project - Contract 25C014 Provision of Technical Services					
Document title		Traffic Impact Assessment | Northern Water Project					
Project number		12601676					
File name		12601676-GHD-00-00-TE-00001-S3-P03_25C014-V006 - Traffic Impact Assessment_R4.docx					
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S3	P02	R Green M Rasigatale H Jeon T Cooper	A Wescombe		N Tooley	*N Tooley	04.02.26
S4	P03	M Rasigatale S J Hamedani	T Cooper S Hosseini H Sandland	*T Cooper *S Hosseini *H Sandland	N Tooley	*N Tooley	23.04.26
S4	P04	S J Hamedani	M Rasigatale	*M Rasigatale	N Tooley	*N Tooley	09.09.26
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Executive Summary

GHD has been engaged by the Department for Infrastructure and Transport to undertake a Traffic Impact Assessment (TIA) of the Northern Water Project. The Northern Water Project (the Project) aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 gigalitre per year (GL/year) seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, product water storages) and electricity infrastructure.

The Project comprises the following key elements:

- a 51 GL/year seawater reverse osmosis desalination plant located at Mullaquana Station approximately 25 km south-west of Whyalla
- marine intake and outfall tunnels extending underneath the seabed and into Spencer Gulf
- diffuser structures for discharge of return water into Spencer Gulf
- a transfer system consisting of:
  - a ~360 km main transfer pipeline, largely constructed underground terminating at the delivery point at the Olympic Dam copper-gold mine
  - a ~46 km lateral branch to a delivery point at the Carrapateena copper-gold mine (which may be constructed above or below ground)
  - associated transfer pump stations and product water storage
- high voltage electricity supply including new transmission and distribution lines and new network and facility substations to provide power to the desalination plant and transfer pump stations
- associated temporary construction-related infrastructure (e.g. construction camps, site offices and amenities, yards, storages and laydown areas)
- access tracks including establishing new tracks and upgrading existing tracks
- enabling roadworks and road upgrades.

Alignment with Assessment Requirements (AEQ3)

Each of the requirements (summarised in Section 3) relating to this TIA have been addressed within this report, as outlined below.

- With the implementation of a Construction Traffic Management Plan (CTMP) and any recommendations contained within, including those which relate to temporary traffic management, disruptions for residents, businesses, and travellers during construction would be effectively mitigated.
- With the implementation of road safety treatments across the project area including signage, intersection turn treatments and construction traffic management the road safety impacts of this project can be suitably minimised.
- With the adoption of protective measures and monitoring protocols including engagement of a Road Quality Auditor who enforces a road rehabilitation program, the impact that road safety concerns along transport routes during construction as a result of damage to road surfaces has been addressed.
- With the recommendation for a Construction Traffic Management Plan, temporary traffic management and a traffic controller during construction, risks associated with changed traffic conditions during construction have been mitigated.
- With the engagement of a Road Quality Auditor, road condition assessments would be undertaken prior to and after construction, with a road rehabilitation regime implemented, this would minimise any adverse impacts on road infrastructure from project construction.
- There are expected to be minimal impacts for maritime and air operations.

Anticipated traffic volumes

As outlined within Section 7.1 of this report, the project is expected to generate significant additional traffic during the construction phase. This is expected to be in the order of 829,876 two-way vehicle trips across the full construction period, comprised of approximately 488,026 light vehicle and 341,850 heavy vehicle movements.

During the busiest construction period (Month 17), it is expected that there would be an additional 1,870 two-way vehicle trips per day across the project. During the AM and PM peak hour periods, the anticipated construction traffic volume is 217 vehicles per hour two-way. This includes 139 two-way light vehicle movements and 79 two-way heavy vehicle movements.

Key roads that would be subject to increased traffic volumes include:

– Lincoln Highway (south of Whyalla)
– Stuart Highway
– Horseshoe Road
– Mullaquana Road
– Eight Mile Creek Road (and associated access roads)

An alternative route to the Mullaquana Station Desalination Plant site has been proposed instead of using the existing local roads of Horseshoe Road and Mullaquana Road. The alternative route proposed is a new access road connecting between Lincoln Highway (south-west of Whyalla) and Eight Mile Creek Road parallel to the alignment of the Main Transfer Pipeline. This new road (referred to hereafter as “new Mullaquana Station access road” or “Option 2”) and its intersection with Lincoln Highway has been considered as the preferred route to Mullaquana Station Desalination Plant within this TIA on the basis that it will be completed and available for use during both the construction and operation phases.

During the operation phase, traffic volumes are expected to be low and easily absorbed into the road network. At the time of decommissioning further assessment should be undertaken to better estimate the traffic impacts. However, at a high level it is assumed traffic volumes would be comparable with the construction volumes.

Construction traffic impacts

Based on the anticipated traffic volumes and their distribution across the road network discussed in this report, the anticipated traffic impacts because of the project relate to:

– Road safety: Higher traffic volumes can introduce greater interaction between construction vehicles and the general public and increased loads on road surfaces. Road treatments and intersection upgrades may be required to maintain safety standards for both existing users and construction traffic as discussed.
– Insufficient vehicle parking: This can have an adverse effect on the surrounding road network which could lead to increased congestion, illegal parking and safety concerns. As such, all car parking would need to be provided off the road network and managed so that vehicles are not parked outside of the project locations.
– Community disruption: Project activities can temporarily affect the daily operations of residents and businesses. Disruptions may include temporary lane closures, detours, driveway access restriction due to construction zones and altered traffic patterns.
– Congestion: Expected traffic volumes are anticipated to be low, therefore impacts related to congestion are expected to be minimal and are unlikely to cause significant delays.
– Environment: Transport of any hazardous waste is likely to be very low and would be managed as part of the Environmental Management Plan (EMP). The proposed works could also result in spills and leaks from the construction vehicles, in the form of fuel, gear, waste spoil, raw quarry materials and more.
– Wildlife: Increased vehicle movements can elevate the risk of roadkill incidents especially in areas with high fauna activity near transport routes.
– Public disturbance: Project activities can lead to public disturbance through increased traffic volumes, dust emissions, noise, and vibration.
– Road condition: Frequent movement of heavy vehicles along the road network can accelerate the deterioration of existing road surfaces.

Recommended mitigation measures

To minimise the traffic impacts, the mitigations measures are proposed, including the following:

– Designated parking areas
– A Construction Traffic Management Plan (CTMP) and temporary traffic control
– Vehicle inspections & wash down areas
– Engagement of a Road Quality Auditor

– Road rehabilitation
– Turn lanes, localised road upgrades, signage and guidance for OSOM vehicles
– A dust management plan (DMP)
– A Construction Noise and Vibration Management Plan (CNVMP)
– Contingency measures for wildlife
– Marine exclusion zone and vessel coordination planning.

With the implementation of the mitigation measures recommended throughout this TIA, potential adverse impacts associated with traffic and transport would be significantly reduced, resulting in an overall low level of impact.

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Appendices

Appendix A Main Transfer Pipeline – existing access track conditions
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Appendix E Turn Warrant Assessment for New Mullaquana Station Access Road

1. Introduction

1.1 Background

The Northern Water Project (the Project) aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 gigalitre per year (GL/year) seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, product water storages) and electricity infrastructure.

The Project comprises the following key elements:

- a 51 GL/year seawater reverse osmosis desalination plant located at Mullaquana Station approximately 25 km south-west of Whyalla
- marine intake and outfall tunnels extending underneath the seabed and into Spencer Gulf
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- a transfer system consisting of:
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  - a ~46 km lateral branch to a delivery point at the Carrapateena copper-gold mine (which may be constructed above or below ground)
  - associated transfer pump stations and product water storage
- high voltage electricity supply including new transmission and distribution lines and new network and facility substations to provide power to the desalination plant and transfer pump stations
- associated temporary construction-related infrastructure (e.g. construction camps, site offices and amenities, yards, storages and laydown areas)
- access tracks including establishing new tracks and upgrading existing tracks
- enabling roadworks and road upgrades.

The Project extents are shown in Figure 1.

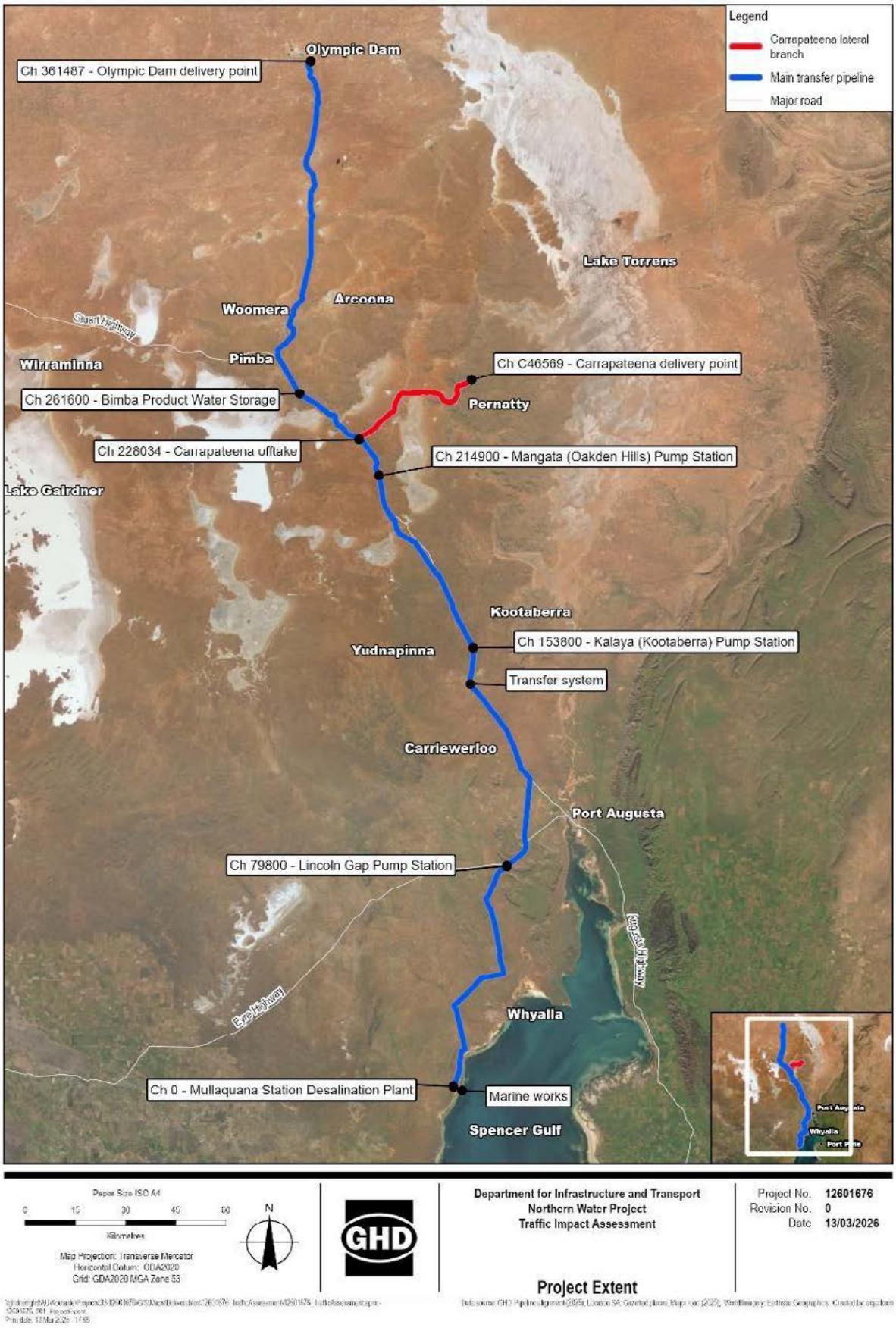


Figure 1 ***Project extent***

1.2 Purpose of this report

As part of the overall environmental impact assessments for the Northern Water Project, the Principal is seeking a Traffic Impact Assessment report. The purpose of this report is to assess the existing conditions of the transport network and the potential impact of the proposed development on the surrounding transport network, particularly with respect to traffic flow and safety.

In particular, this report aims to provide an understanding of what considerations need to be made to ensure impacts to the safety and efficiency of transport modes and the broader transport and traffic system and infrastructure are avoided or mitigated, in accordance with the relevant AEQ3 Assessment Requirements that apply to the Transport and Traffic elements of the Environmental Impact Statement for the Northern Water Project.

1.3 Scope and limitations

1.3.1 Scope

This Traffic Impact Assessment (TIA) aims to satisfy the Environmental Impact Statement (EIS) assessment requirements for the key transport and traffic considerations (AEQ3) relating to the Northern Water Project. Refer to Assessment requirements in Section 3 for a summary of these requirements and references to the sections of the TIA where they are addressed.

1.3.2 Limitations

This report: has been prepared by GHD for Department for Infrastructure and Transport and may only be used and relied on by Department for Infrastructure and Transport for the purpose agreed between GHD and Department for Infrastructure and Transport as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Department for Infrastructure and Transport arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Department for Infrastructure and Transport and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.4 Assumptions

The following assumptions have been made during the preparation of this TIA:

- The assumptions, limitations and parameters outlined in the NW TIA Design Basis Memo (GHD, 17 December 2025) shall apply to this TIA, as agreed upon with the Principal.
- The most current GHD Reference Design Report and Drawings (as listed in the Reference materials section) form the design basis for the Pump Station sites and the Mullaquana Station Desalination Plant site considered within this TIA.
- The Concept Design Sketches prepared by Project Delivery Partners (PDP), as listed in the Reference materials section, form the basis for the proposed intersection arrangements to be implemented at the new site entrances from the corresponding public roads.
- In addition to the route using existing local roads (Horseshoe Road and Mullaquana Road) to access Mullaquana Station Desalination Plant, an alternative route has been proposed via a new access road

connecting between Lincoln Highway (south-west of Whyalla) and Eight Mile Creek Road parallel to the alignment of the Main Transfer Pipeline. This new road (referred to hereafter as “new Mullaquana Station access road” or “Option 2”) and its intersection with Lincoln Highway has been considered as the preferred route to Mullaquana Station Desalination Plant within this TIA on the basis that it will be completed and available for use during both the construction and operation phases.

- A number of specific site options have been assumed within this TIA for temporary use during construction as laydown and stacking areas, accommodation camps, maritime operations, air transport, etc. These sites have been assessed based on what was identified at the time of writing this report and are subject to further assessment of viability. All sites considered within this TIA are subject to detailed design.
- Existing traffic data has been sourced from publicly available sources or from information supplied by the Principal and is assumed to provide a satisfactory representation of existing conditions of the road network around the subject sites. For roads where existing traffic data is unavailable (such as Horseshoe Road), a reasonable assumption has been derived based on the nearest road where traffic volume data is available or based on land use factors understood from a desktop assessment.
- Crash data has been sourced from Location SA and is assumed to provide a satisfactory representation of actual incidents in the existing road network over the last five years around the subject site suitable for the purpose of assessment in the TIA.
- Traffic generation rates and trip distribution of the proposed land uses are as per the assumptions detailed in the report and utilise estimates provided by the Constructability Advisor (Systra).
- Vehicle trips to the Mullaquana Station Desalination Plant are assumed to use Lincoln Highway (south of Whyalla) and then either the existing local roads of Horseshoe Road, Mullaquana Road and Eight Mile Creek Road or alternatively the proposed (Option 2) new Mullaquana Station access road and Eight Mile Creek Road (refer to section 6.2.1 for more details). The latter route utilising the proposed new Mullaquana Station access road is assumed to be the preferred route. For the purposes of this TIA, traffic volumes have been assumed to be identical for each of these routes as a worst case scenario.
- Month 17 (M17) within this document refers to 17 months into the construction period following Financial Investment Decision (FID) for the Project when peak construction traffic volumes are expected to occur.
- Vehicle movement numbers associated with the construction of new electrical transmission lines, distribution lines and substations are included in the total construction vehicle movement numbers for each of the respective pump station, product water storage and desalination plant sites, as provided by the Constructability Advisor (Systra Vehicle Movements Technical Note, 2026).
- The Fly in Fly Out (FIFO) worker numbers have been advised by the Constructability Advisor and are based on a 2-week on and 2-week off roster.
- Cumulative traffic impacts from other developments (e.g. Nonowie Wind Farm and Samphire Uranium Project) have not been assessed where development approval has not been granted or there is insufficient information.
- The assessment has not considered heavy vehicle movements for spoil removal from each site as it has been assumed that there will be no external spoil removal (other than spoil movements from Whyalla Port to Mullaquana Station), based on the assumed plan outlined within the Constructability Report (Systra, 2025).
- Internal site access and parking considerations for the Project sites are not considered part of the scope of this TIA. It is assumed for the purposes of this report that the Project sites would have adequate internal space for access, egress, parking and turning around, as required during Project construction and operation without impacting on other private or public roads and carparks.
- It is understood that no materials required to be transported as part of the Project would be of a hazardous nature requiring special management measures.
- Considerations for air transport operations are limited to how the workforce may use this mode for passenger transport and the feasibility of using existing flight services.

2. Definitions and reference materials

2.1 Definitions

Table 1 presents a list of key definitions used throughout this report.

Table 1 Definitions used in report

Term	Definition
AADT	Average Annual Daily Traffic
AEQ3	Amenity and Environmental Quality 3
ARTC	Australian Rail Track Corporation
AS	Australian Standard
ASD	Approach sight distance
ATS	Average Travel Speed
AGTM	Austroads Guide to Traffic Management
AGRD	Austroads Guide to Road Design
AUL	Auxiliary left turn
AUL(s)	Auxiliary left turn (short)
AUR	Auxiliary right turn
BAR	Basic right turn
BAL	Basic left turn
CEIP	Central Eyre Iron Project
CH	Chainage
CHL	Channelised left turn
CHR	Channelised right turn
CHR(s)	Channelised right turn (short)
CIP	Clean in Place
CNVMP	Construction Noise and Vibration Management Plan
CT	Certificate of Title
CTMP	Construction traffic management plan
DBOM	Design, build, operate and maintain
DIT	Department for Infrastructure and Transport – particularly in reference to their role as the Commissioner of Highways and maintainer of State Government owned roads.
DITRDCSA	Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
DIT Traffic	Department for Infrastructure and Transport – particularly in reference to the EIS referral agency.
DMP	Dust Management Plan
EIS	Environmental Impact Statement
EML	Extractive Minerals Leases
FIFO	Fly In Fly Out (workforce arrangement)
FTE	Full time equivalent
GML	General mass limits
HJP	Hydrogen Jobs Plan

Term	Definition
HCM	Highway Capacity Manual
HML	Higher mass limits
HV	Heavy vehicle
JUB	Offshore Jack-Up Barge
KAC	Kokatha Aboriginal Corporation
LOA	Length overall
LOS	Level of service
LV	Light vehicle
MGSD	Minimum gap sight distance
MSCL	Mild steel cement lined
NFDH	National Freight Data Hub
NHVR	National Heavy Vehicle Regulator
NW	Northern Water
OD	Outer diameter
OSOM	Over size and/or over mass
O&M	Operation and maintenance
PA	Port Augusta
PAWP	Port Augusta Woomera Pipeline
PBS	Performance based standard
PCE	Passenger car equivalent
PCU	Passenger car unit
PDP	Project Delivery Partners
PFFS	Percent of free-flow speed
Principal	Department for Infrastructure and Transport – particularly in reference to the body of the organisation involved with the Northern Water Project and responsible for the EIS application.
PTSF	Percent time-spent-following
RAV	Restricted Access Vehicle
RFDS	Royal Flying Doctor Service
RO	Reverse Osmosis
SA	South Australia
SAPN	South Australian Power Networks
SAPPA	South Australia Property and Planning Atlas
SISD	Safe intersection sight distance
TIA	Traffic Impact Assessment
TBM	Tunnel boring machine
VPD	Vehicles per day

2.2 Reference materials

The following references have been used in the preparation of this TIA:

- Concept Design Sketches SK000 – SK052: Mullaquana Road – Eight Mile Creek Road (PDP, 6 August 2025) – refer to Appendix B
- Concept Design Drawings: New Mullaquana Station Access Road (GHD, April 2026) - refer to Appendix D
- NW TIA Design Basis Memorandum (GHD, 17 December 2025)
- Guide to Road Design Part 3: Geometric Design (Austroads, 2021)
- Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads, 2021)
- Guide to Traffic Management Part 3: Transport Study and Analysis Methods (Austroads, 2020)
- Guide to Traffic Management Part 6: Intersection, Interchanges and Crossings Management (Austroads, 2020)
- Highway Capacity Manual (Transportation Research Board, 2016)
- Location SA Map Viewer
- Mullaquana Road Traffic Data (Whyalla City Council, 2017)
- Northern Water Web Map
- Reference Design Constructability Report (Systra, 20 November 2025)
- Reference Design Drawings (GHD, 26 September 2025)
- Reference Design Report (GHD, 3 October 2025)
- 'Olympic Dam Airport, small but busy, taking FIFO workers to BHP's growing province of South Australia mines', Adelaide AZ Article (Alliance Airlines, 2025)
- 'Becker on the ground in Whyalla', Whyalla City Council Article (Whyalla City Council, 2018)
- 'Rex touches down at Port Augusta', Australian Aviation Article (Australian Aviation, 2017)
- YPAG Airport Master Plan June 2016 (Port Augusta City Council, 2016)
- 'QantasLink adds Whyalla to its map', Qantas News Room Article (Qantas News Article, December 2024)
- 'myShip Tracking' Portal
- 'Flight Radar' Portal
- Whyalla Port Handbook, SIMEC (Flinders Port Holdings, 2023)
- Pimba Weekly Services Data (ARTC, 2025)
- Freight Train Interactive Maps – National Freight Data Hub (NFDH, 2023)
- ARTC Master Train Plan – Cook - Spencer Junction (ARTC, 29 December 2024)
- Nonowie Wind Farm Concept Design Layout (Tilt Renewables, 2025)
- 'Aurizon drives down emissions with rail-based logistics solution for BHP Copper South Australia', Aurizon News (Aurizon, 2025)
- 'Places to go Boating: South Australia' (Discover Boating, 2025)
- Northern Water – Project Wide Vehicle Movements Technical Note, 'SB-DIT-TN-SB000129-023-R1-Vehicle Movement' (Systra, 16 January 2026)
- Samphire Uranium Project, South Australia (Alligator Energy, 2023)
- Samphire Uranium project (Department for Energy and Mining, 2025)

3. Assessment requirements

3.1 Transport assessment requirements

The Assessment Requirements set out by the South Australian State Planning Commission for the Northern Water Project sets out the requirements for studies that are required to assess the environmental impacts of the Project.

Of relevance to this report is AEQ3: Traffic and Transport, which has the objective:

"To ensure impacts to the safety and efficiency of transport modes and the broader transport and traffic system and infrastructure are avoided or mitigated."

Table 2 presents the detailed requirements under AEQ3 and the sections within this report that respond to these requirements.

Table 2 AEQ3: Transport and Traffic Assessment Requirements

Impact Assessment Requirements		Response
1.	A Transport and Access Impact Assessment should be prepared by a suitable qualified traffic and access engineer, evaluating current and proposed access arrangements including the effect on the arterial road network and car parking, and vehicle interface with the local road network. Any assessment must address implications for the entire supply chain and the traffic and access impact for the construction, operations, maintenance and decommissioning phases.	Refer to all sections.
2.	The assessment should determine the transport system asset improvements, asset management / maintenance requirements, and operational management requirements to accommodate the increase in movements and/or vehicle sizes/mass for affected transport assets and services across all modes for the proposal's construction / implementation and operational phases. The assessment should provide where relevant:	Refer to Sections 9 and 10.
	A summary of the transport task for the development (including workforce and end-to-end supply chain (input and output)) during construction, operations and decommissioning phases of the development. This should address predicted traffic volumes, proposed vehicle types, number/frequencies, hours of activity and traffic peaks, any requirements that are outside of the current gazetted heavy vehicle networks, and any measures required to ensure compliance with the 'Heavy Vehicle National Law'.	Refer to Sections 6.6, 6.8, 7 and 8.
	A description of the existing transport and traffic environment (using traffic data, accident statistics) and include (where relevant) public transport networks, car parking, school bus routes, and public pedestrian, cycle pathways or trails.	Refer to Sections 5 and 6.
	Any operational management measures to minimise delays and ensure safety for other transport users (e.g. temporary road closures/detours), including transport of plant and equipment to/from the site.	Refer to Sections 8.2 and 10.
	Requirements for temporary or permanent modifications to roads or rail infrastructure (including rail crossings and bridges), upgrades to road surfaces, access on arterial and / or local roads and car parking as a result of the development including any increase (temporary or ongoing) in maintenance requirements of transport assets.	Refer to Sections 8 and 9.
	Any management measures for transport of hazardous materials.	Refer to Section 8.1.6.
	Describe how identified impacts to transport and access will be mitigated. Mitigation strategies may include works, contributions or other strategies that can be documented in a traffic management plan. Strategies must be prepared in close consultation with relevant transport authorities, including local government.	Refer to Sections 9.1 and 10.
Maritime operations (if relevant)		

3.	Describe expected marine traffic volumes to and from port / wharves, including expected boat/ship movements, timing and patterns.	Refer to Section 5.7, 7.1.2.3 and 7.2.2.2.
4.	Describe marine traffic impacts associated with these movements (e.g. interaction with other vessels, impacts to navigation aids) including to existing operators (e.g. commercial fisheries, aquaculture, tourist operators, ferry services, recreational users).	Refer to Section 8.1.14 and 8.2.
5.	Describe the impacts of any marine structures on maritime operations and management of these impacts.	Refer to Section 8.2 and 9.1
6.	Discuss the measures that will be undertaken to mitigate these impacts and any safety measures that will be implemented to ensure public safety and that enable compliance with relevant marine, navigation and ports legislation and operational arrangements.	Refer to Section 8.1.14, 8.2, 9.1 and 10.
Rail operations (if relevant)		
7.	Assess the potential impacts of any temporary or permanent disruption of existing freight and passenger rail services that would be due to either track works, increased rail traffic, or subsidence.	Refer to Section 5.8, 7.1.2.4 and 8.1.10.
8.	Discuss the measures that will be undertaken to mitigate these impacts.	Refer to Section 8.1.10 and 10.
Air operations (if relevant)		
9.	Assess the capacity of existing airports or airfields to handle the demand for air transport of people and/or freight. If existing facilities do not have sufficient capacity, describe and illustrate the requirements for any new or altered air transport facilities (e.g. runways, radar, lights and/or beacons).	Refer to Section 5.6 and 8.1.15.
10.	Describe the likely additional number of flights, size of aircraft, their frequency and timing, particularly noting any increase in night arrivals or take-offs. Describe and illustrate any air routes that would take new or increased air traffic.	Refer to Section 7.1.2.2 and 8.1.15.
11.	Describe any features of the project that could impact on air transport, such as the placement of waste dumps, stacks or flares beneath flight paths.	Refer to Section 8.1.15.
12.	Discuss the measures that will be undertaken to mitigate these impacts.	Refer to Section 8.1.15 and 10.

4. Methodology

This section describes the methodology used in this traffic impact assessment to evaluate the existing environment and potential impacts of the Project on traffic impact.

4.1 Assessment area

The assessment area is defined as the area surrounding the pipeline route and associated infrastructure, which extends broadly from Mullaquana Station to Olympic Dam.

4.2 Existing conditions assessment method

The existing conditions assessment was undertaken to establish an understanding of the various potential traffic impacts within and around the assessment area. The methodology applied is outlined in this section, and the detailed analysis is presented in Section 5.

The assessment methodology involved a combination of desktop research, review of planning and transport data and site-specific observations. Key components of the methodology included:

– Site location – identification of the assessment area and its connectivity to the surrounding road network through a desktop review.
– Planning zones – review of local planning maps to understand land use patterns.
– Transport network – identification of State and local government owned roads, existing road hierarchy and road conditions.
– Traffic volumes – collection and analysis of publicly available traffic count data.
– Crash history – analysis of crash history data for the past five years obtained from the Location SA website to identify crash trends and any other potential safety concerns.

It is noted that the assessment of existing conditions was undertaken as a desktop method only. It is strongly recommended that a site visit be conducted to confirm existing conditions. This would help inform and refine recommendations in this report.

4.3 Impact assessment method

A change to existing environment conditions caused by project activities in any of the project phases (construction, operation or decommissioning) may give rise to impacts.

The scoping requirements guided the TIA and development of environmental management measures to avoid and minimise impacts. Monitoring and contingency measures have also been proposed to demonstrate that predicted outcomes would be achieved.

This study assessed the impacts of construction, operation and decommissioning of the Project on traffic assets and values to be protected.

4.3.1 Construction

The construction phase assessment focuses on the potential impacts on road safety, traffic flow and congestion, road conditions, interaction between construction vehicles and road users, access and connectivity to the wider road network. Construction activities are expected to result in increased traffic volumes along local and regional roads due to the movement of heavy vehicles, OSOM loads, and workforce transport. The impact assessment methodology included:

– Identification of relevant construction activities that have the potential to affect traffic operations, road safety, road conditions, and access to the surrounding road network
– Assessment of construction activities, considering significance of impact
– Identification of mitigation measures (where required)

4.3.2 Operation

The operational phase impact assessment focuses on potential impacts associated with ongoing project activities such as routine inspections, periodic maintenance, and repairs. These activities may generate light to moderate traffic volumes. The operation impact assessment methodology included:

– Identification of relevant operational activities with the potential to affect traffic operations, road safety, road conditions, and access to the surrounding road network
– Assessment of operational activities, considering significance of impact
– Identification of mitigation measures (where required)

4.3.3 Decommissioning

The decommissioning phase impact assessment focuses on the potential impacts arising from the removal of decommissioned infrastructure and associated land rehabilitation. The impact assessment methodology included:

– Identification of relevant decommissioning activities with the potential to affect traffic operations, road safety, road conditions, and access to the surrounding road network
– Assessment of decommissioning activities, considering significance of impact
– Identification of mitigation measures (where required)

Decommissioning of the project would involve the same, or similar, issues as those associated with the construction of the project, however, the overall level of impact would be lower due to the nature of decommissioning activities.

5. Existing conditions

5.1 Project sites

The overall Project extends from the western side of the Upper Spencer Gulf and runs approximately 300 km north-west towards the Olympic Dam and Carrapateena mine sites, as shown in Figure 1.

The new and existing sites considered within the Project study extents are outlined in Table 3.

Table 3 Project sites

Project Sites	
New Sites (Permanent)	
1	Mullaquana Station Desalination Plant (including new transmission lines)
2	Lincoln Gap Pump Station (including new transmission lines)
3	Mangata Pump Station (including new transmission lines)
4	Kalaya Pump Station (including new transmission lines)
5	Bimba Product Water Storage
6	Mullaquana Station Substation
7	Kootaberra Substation
New Sites (Temporary)	
Main Transfer Pipeline	
8	x6 Laydown Areas as proposed in Table 6 and 7 of the Constructability Report (Systra, 2025) – Whyalla, Carriewerloo, Nutt, Mount Gunson, Pimba (KAC) & Purple Downs
9	x6 Stack Sites as proposed in Section 9.9.1 of the Constructability Report (Systra, 2025) – Carriewerloo, Nutt, Oakden Hills, Lake Windabout & Purple Downs
10	Pimba Proposed Accommodation Camp – within the KAC parcel laydown area as proposed in Section 9.3 of the Constructability Report (Systra, 2025)
Intake and Outfall Tunnels	
11	Whyalla Segment Yard
12	Offshore Jack-Up Barge (JUB) Workfront
Existing Sites	
Main Transfer Pipeline	
13	Coraberra Hill Substation (site upgrade)
14	Mount Gunson Substation (site upgrade)
15	Whyalla Proposed Accommodation Camp
16	Port Augusta Proposed Accommodation Camp
17	Roxby Downs Proposed Accommodation Camp
18	Whyalla Boral Quarries
19	Port Augusta Council Quarry
20	Mount Gunson Mines AMJ Musolino Quarry
21	Roxby Downs Holcim Quarry
22	Pimba Rail Line
Intake & Outfall Tunnels	
23	Whyalla Marine Port

The following construction workfronts have also been considered as origins and destinations for traffic movements:

– Transfer System: There would be 2 moving workfronts for the Transfer System works. The locations of these workfronts across the duration of the construction period have been derived from the Reference Design Constructability Report (Systra, 2025).
– Marine and Tunnelling: Offshore Jack-Up Barge (JUB) with onshore support.

The key sites can be seen in Figure 2, Figure 3 and Figure 4.

The full details of the proposed development are provided in the Reference Design Report (GHD, 2025) and the Reference Design Constructability Report (Systra, 2025).

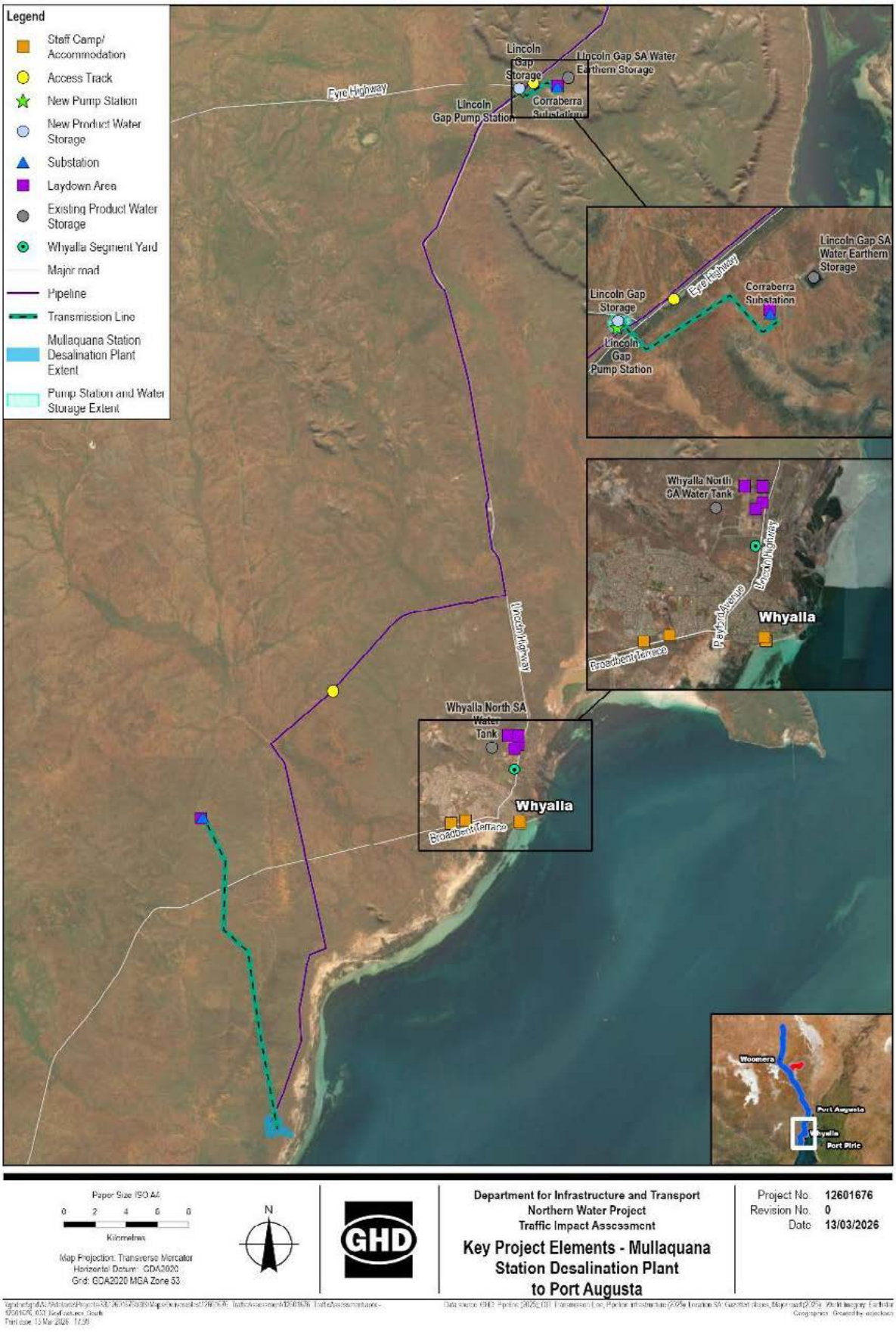


Figure 2 *Key Project Elements – Mullaquana Station Desalination Plant to Port Augusta*

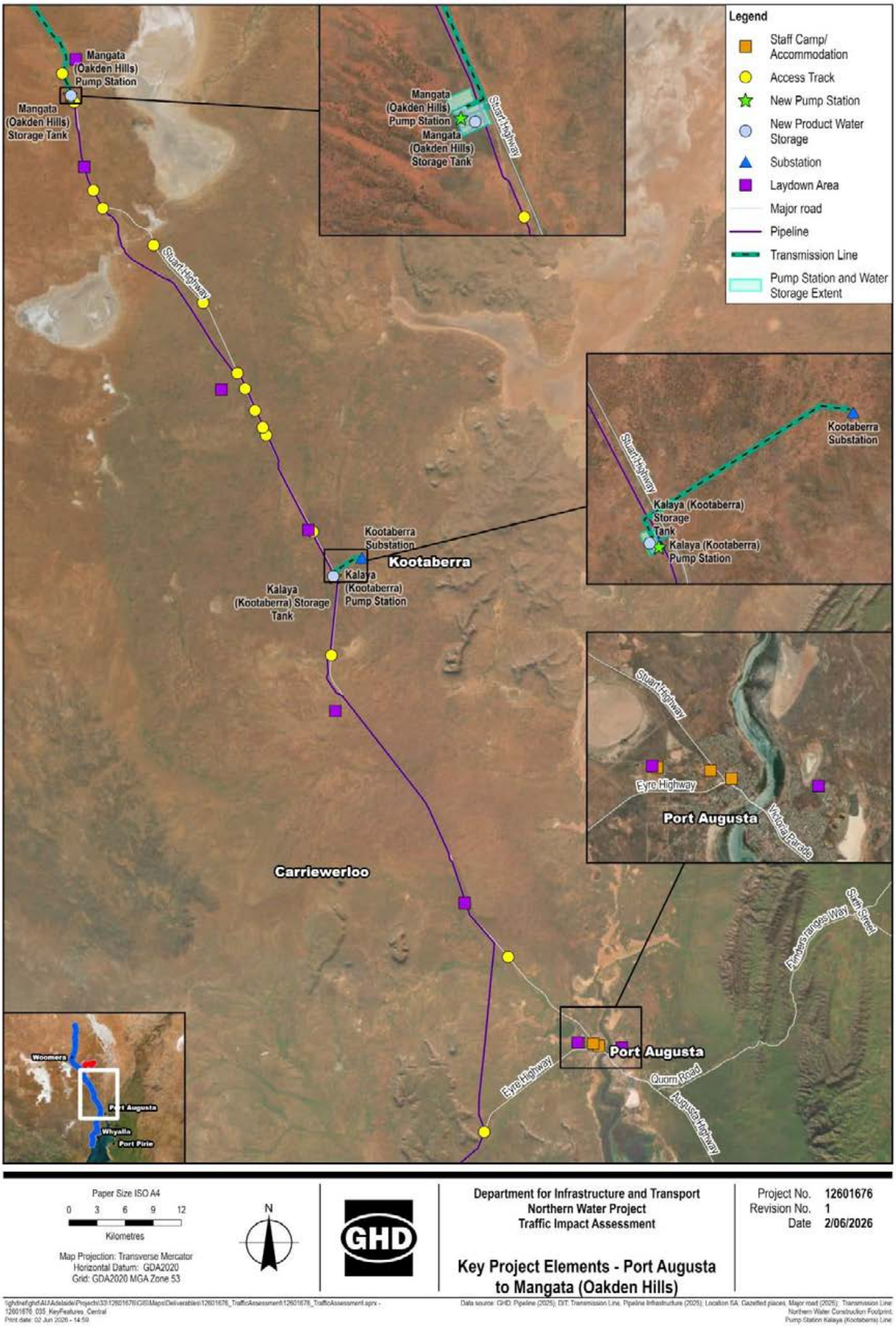


Figure 3 Key Project Elements – Port Augusta to Mangata (Oakden Hills)

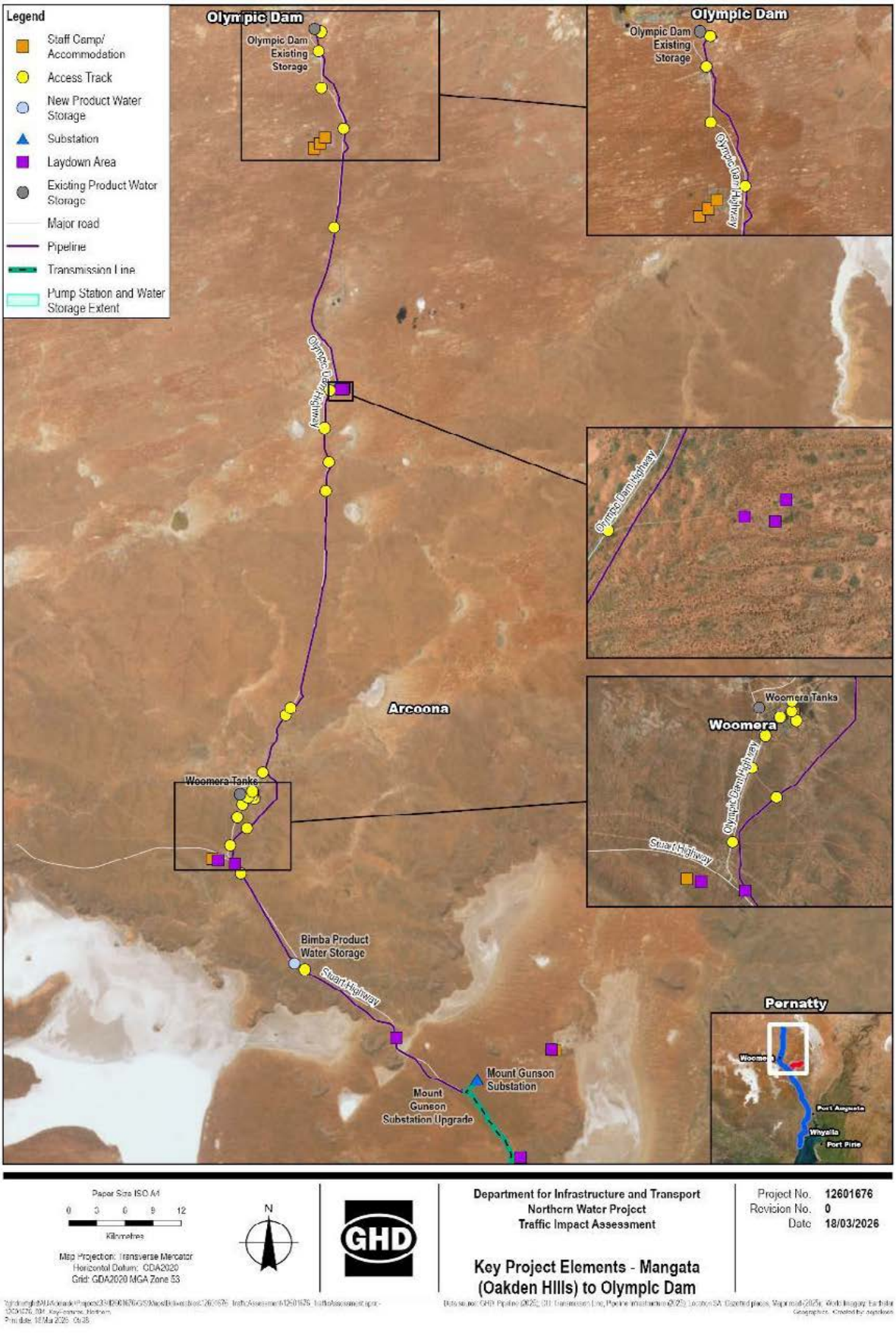


Figure 4 *Key Project Elements – Mangata (Oakden Hills) to Olympic Dam*

5.1.1 Mullaquana Station Desalination Plant

As shown in Figure 5, the proposed site location for the Mullaquana Station Desalination Plant is approximately 25 km south of Whyalla on the western coast of the Upper Spencer Gulf.

The nearest Department-owned road is Lincoln Highway, which does not provide direct access to the site. Based on GIS data and Location SA data (refer to Figure 6), the site is on a remote, undeveloped portion of land used primarily for livestock. It is currently only accessible via Eight Mile Creek Road (unsealed), which lies on the eastern side of the site, and unsealed private access tracks. The land on the eastern side, between the beach and Eight Mile Creek Road, is noted as a conservation zone, as shown in Figure 6.

The existing access route to the site from Lincoln Highway is via the Council-owned roads of Horseshoe Road, Mullaquana Road and Eight Mile Creek Road. An alternative route ("Option 2") has been proposed via a new Mullaquana Station access road connecting between Lincoln Highway (south-west of Whyalla) and Eight Mile Creek Road parallel to the alignment of the Main Transfer Pipeline. This new Mullaquana Station access road has been considered as the preferred route on the basis that it will be completed and available to use during both the construction and operation phases. However, both routes have been assessed within this TIA. The new access road is discussed in more detail in Section 6.2.1.

Existing traffic volumes to and from the site are not entirely known, however the existing infrastructure and largely undeveloped surrounding land use conditions indicate that there are currently not many attractions for travel to the area. Based on public records and data from 2018 and 2020, there appears to be a sand mine located just north-east of the Desalination Plant and Intake & Outfall Tunnels site with 2 Extractive Minerals Leases (EML) in place – 4101 (8.5 hectares) and 4102 (5.4 hectares). It is understood that the site is operated by the company 'Quality Sand - Landscape Supplies Whyalla' and it is assumed that it is still in use. Some minor traffic interactions from this site are likely to occur during Project construction and operation, but more information relating to traffic volumes and vehicle types for this site is required.

Near the proposed site, there are two other major projects in the planning phase. The Nonowie Wind Farm is planned to be situated approximately 10 km south-west of Whyalla and just north-west of Cowleds Landing, between Lincoln Highway and Eight Mile Creek Road. A concept design has been developed by Tilt Renewables in March 2025, as shown in Figure 7, although the project remains under assessment. It appears that primary access to this site would be from Lincoln Highway rather than Eight Mile Creek Road. Hence, any potential traffic interactions between projects are more likely to occur near the proposed Mullaquana Station Substation site.

The other nearby project is the Samphire Uranium Project, which is a proposed in-situ recovery field leach trial at the Blackbush uranium deposit. The location of this deposit can be seen in Figure 8, which appears to be a site of approximately 238 hectares located in direct vicinity of the proposed Desalination Plant and Intake & Outfall Tunnels. A retention lease of 5 years has recently been granted to Alligator Energy for this project in August 2025 (Department for Energy and Mining, 2025). Hence, it is anticipated that some traffic interactions may occur during Project construction and operation.



Figure 5 *Proposed Mullaquana Station Desalination Plant site locality plan*

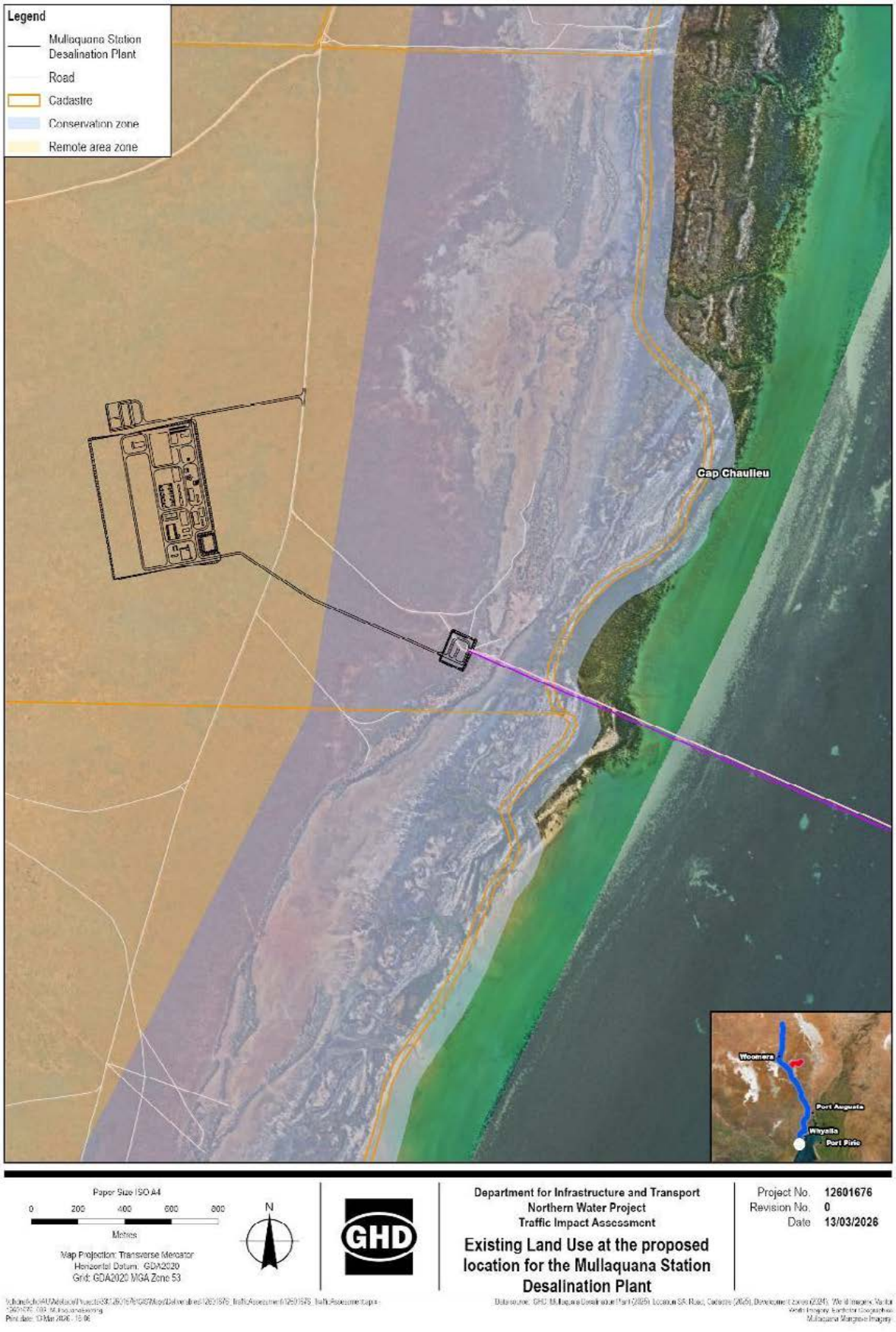


Figure 6 ***Existing land use at the proposed location for the Mullaquana Station Desalination Plant***

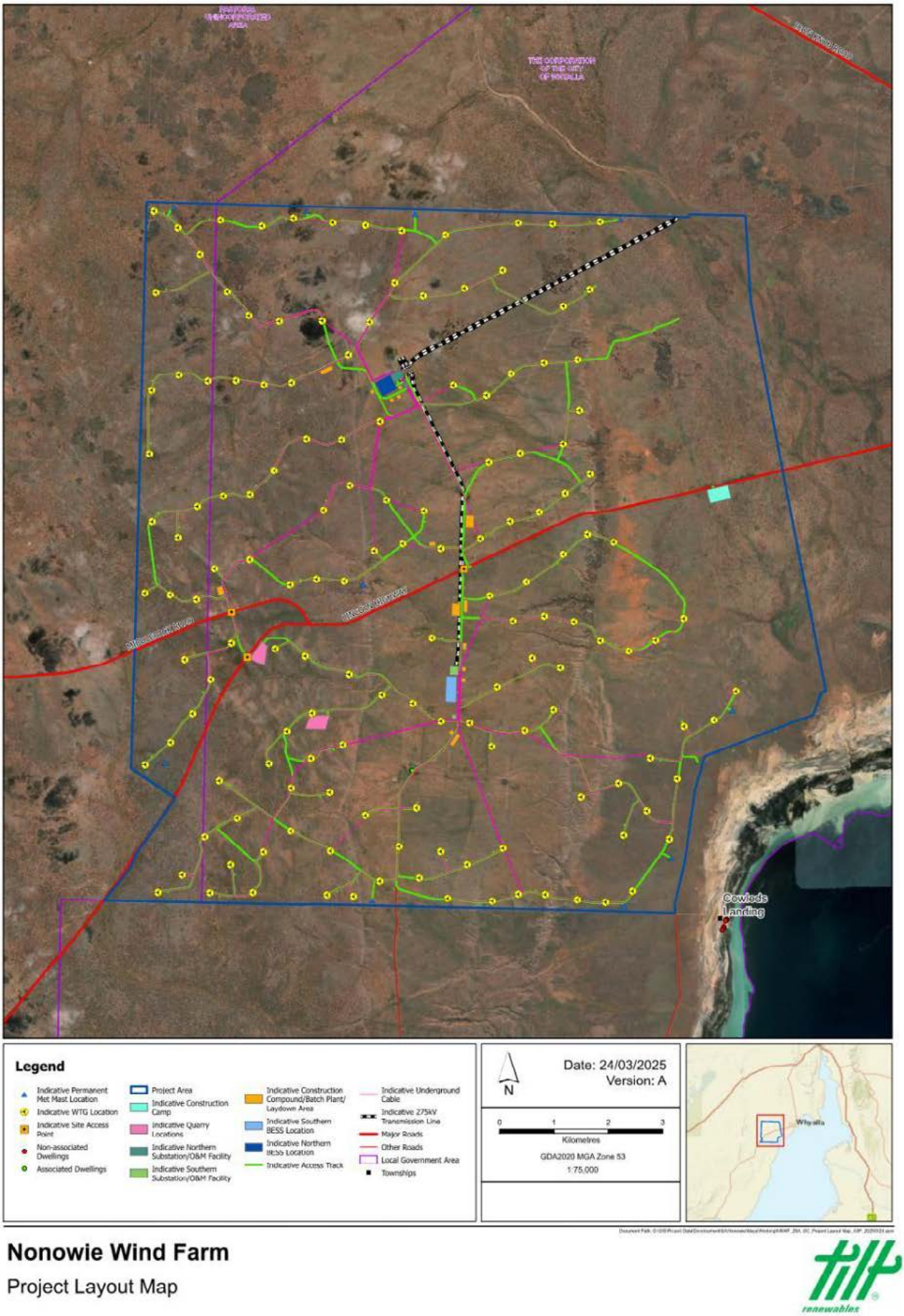


Figure 7 *Nonowie Wind Farm Concept Design Layout (Tilt Renewables, 2025).*

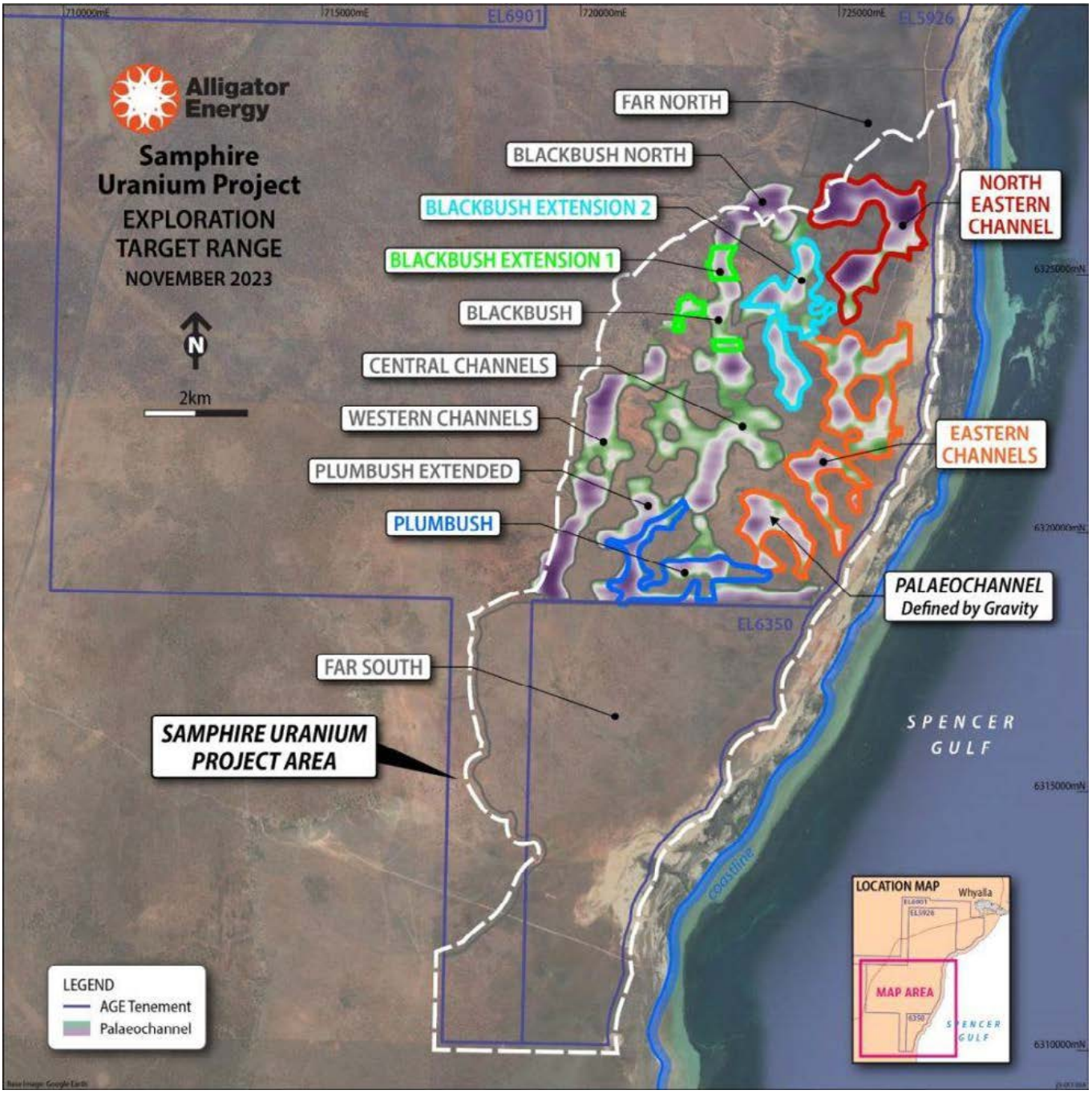


Figure 8 *Proposed location for the Samphire Uranium Project (Alligator Energy, 2023)*

5.1.2 Lincoln Gap Pump Station

The site proposed to be used for Lincoln Gap Pump Station is located approximately 24 km south-west of Port Augusta, as shown in Figure 9. The pump station is proposed to be located immediately south-west of the intersection between Eyre Highway and Lincoln Highway. The land surrounding the road corridor at this intersection is undeveloped and identified by Location SA 2024 data to be used predominantly for Livestock, as shown in Figure 10. There are rest stops and parking for drivers approximately 700 metres northeast of the site on Eyre Highway.

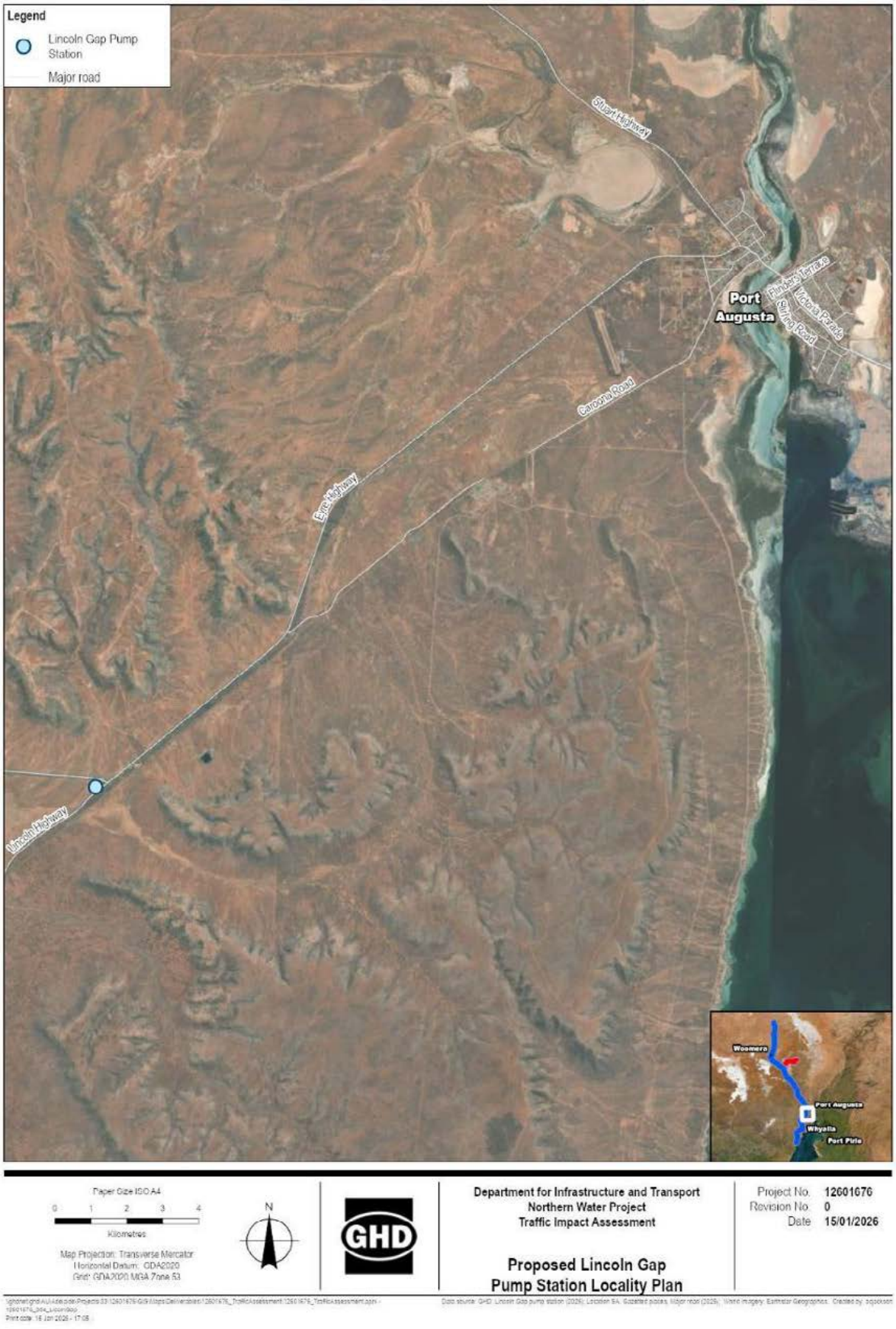


Figure 9 ***Proposed Lincoln Gap Pump Station locality plan***

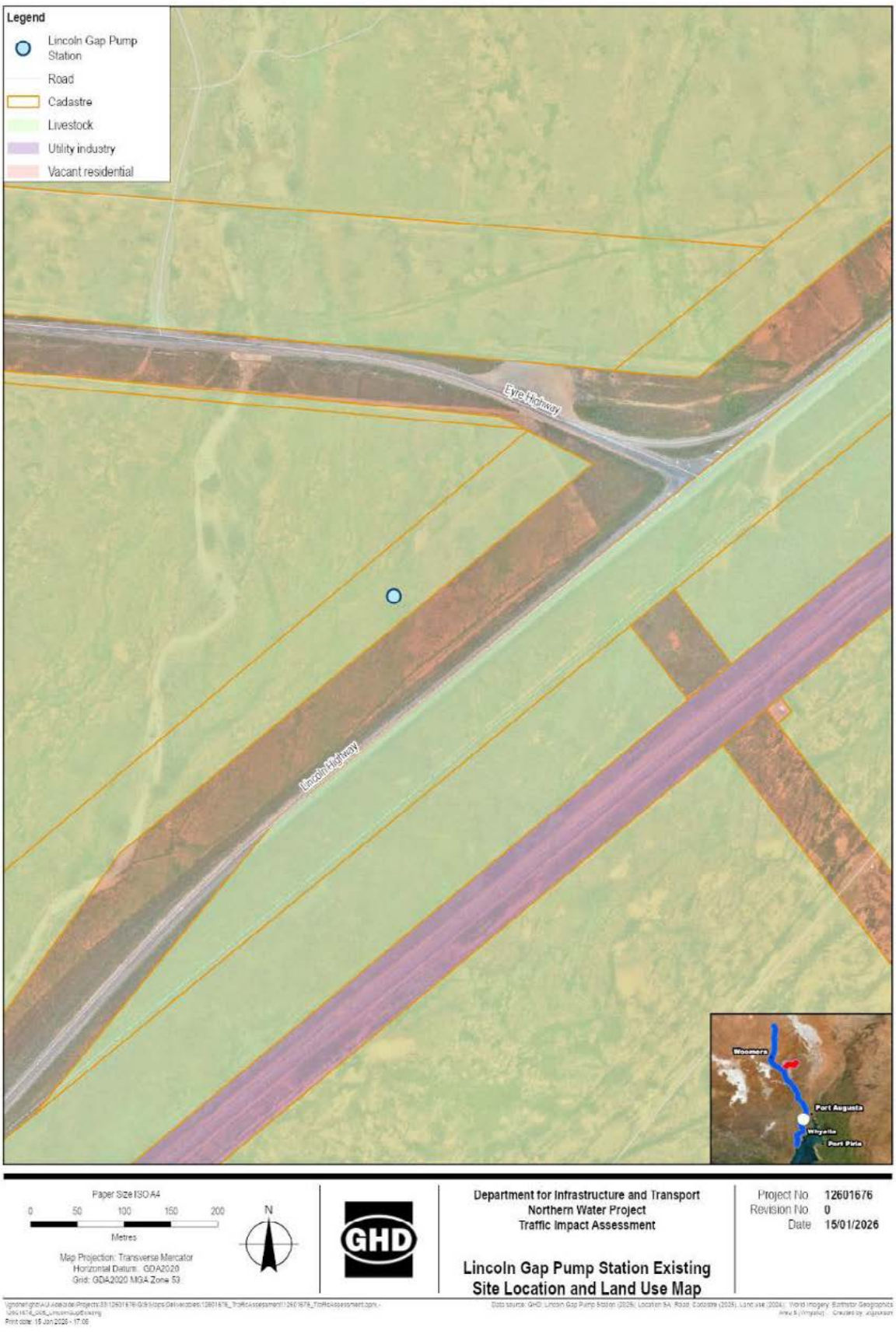


Figure 10 Lincoln Gap Pump Station existing site location and land use map

5.1.3 Kalaya Pump Station

The proposed site for Kalaya Pump Station is located approximately 62 km north-west of Port Augusta on the western side of the Stuart Highway, as shown in Figure 11. The proposed site is currently undeveloped and identified as land used for Livestock on Location SA, as shown in Figure 12. It is situated within a remote area between an existing communications tower (north of the site) and the Ranges View Rest Area (south of the site). There are rest areas and public toilets located immediately southeast of the site.

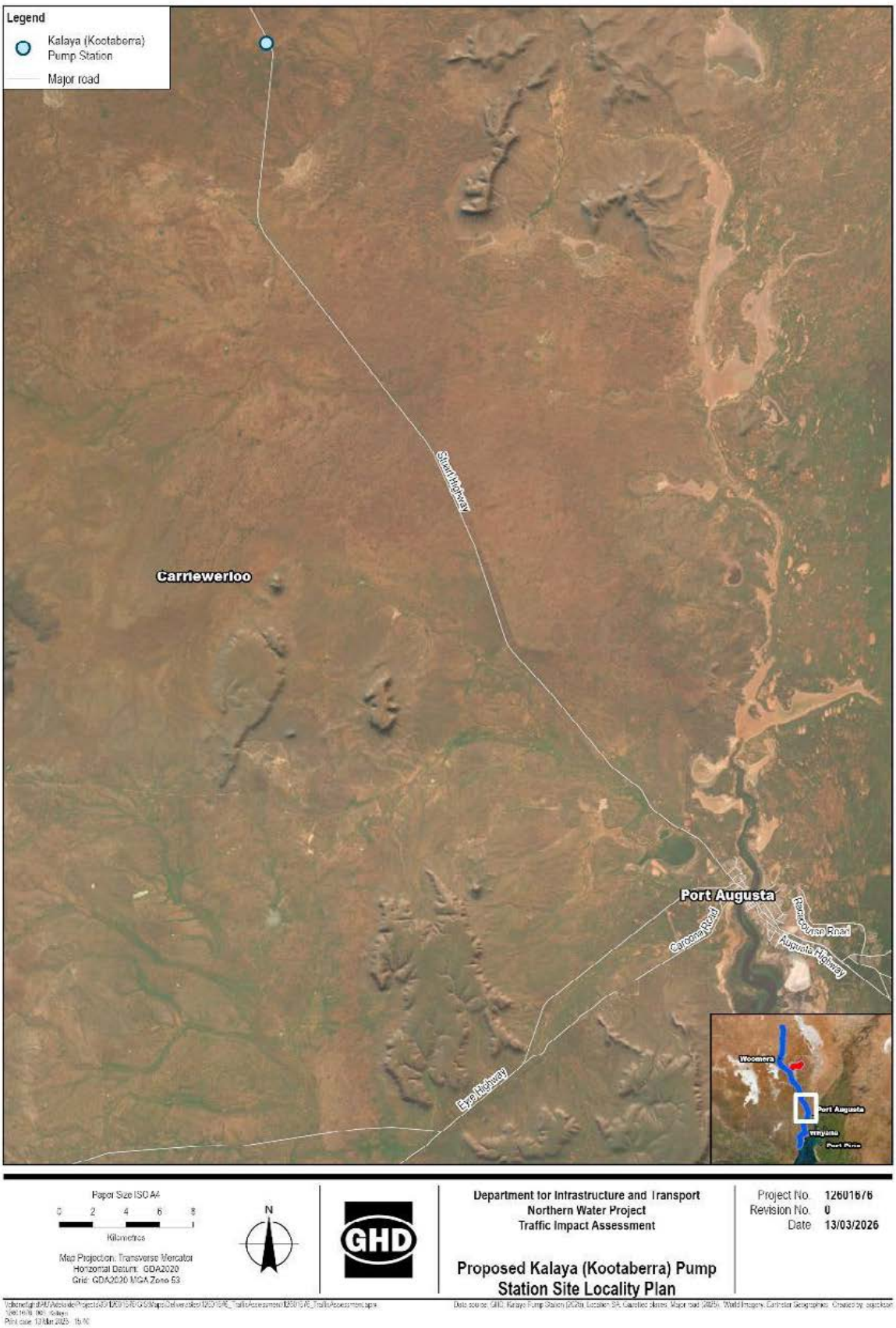


Figure 11 Proposed Kalaya (Kootaberra) Pump Station site locality

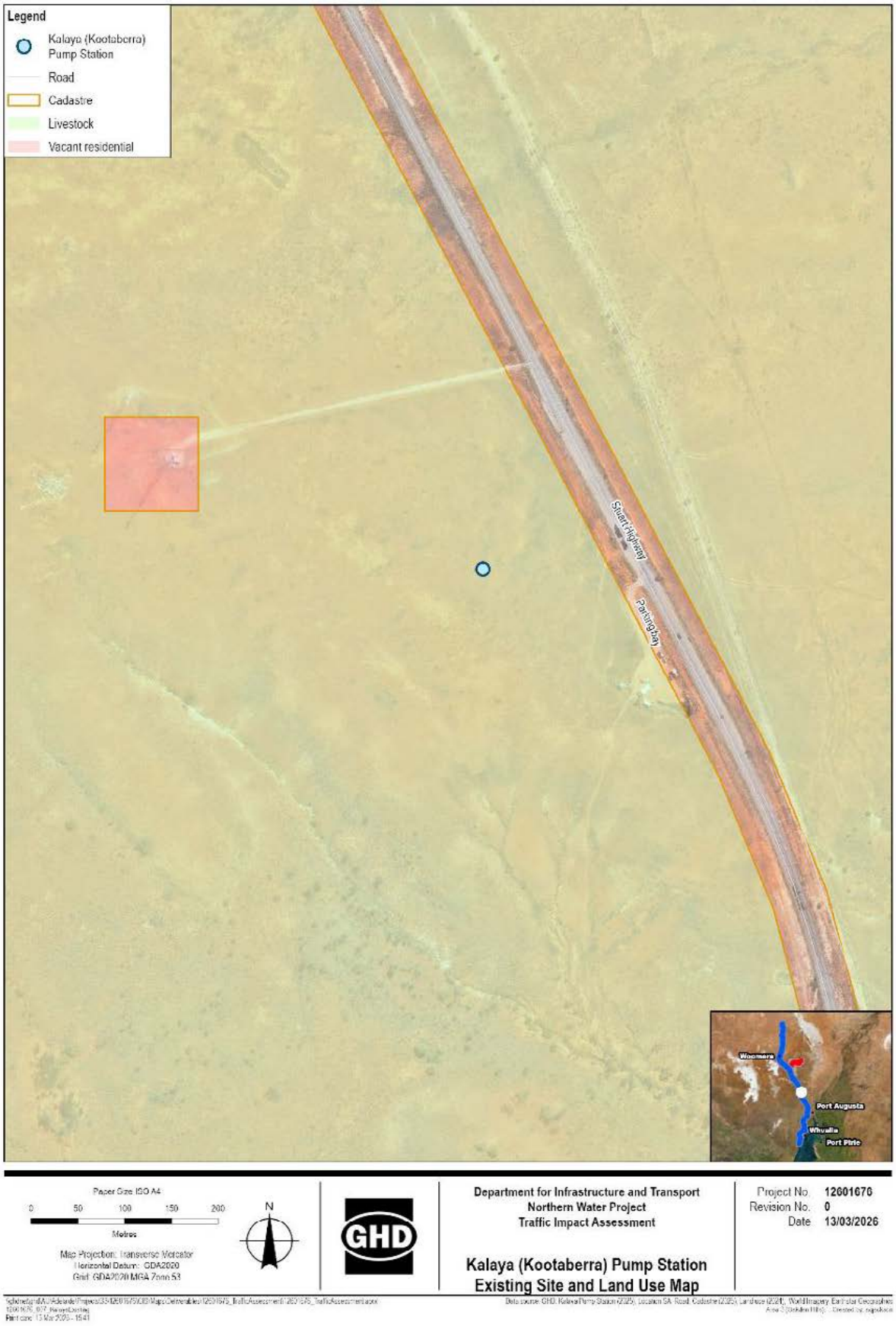


Figure 12 Kalaya (Kootaberra) Pump Station existing site and land use map

5.1.4 Mangata Pump Station

The site location for the proposed Mangata Pump Station is approximately 50 km south-east of Pimba, as shown in Figure 13. The existing site lies on an undeveloped portion of remote land, situated on the western side of Stuart Highway. The surrounding area is designated for livestock use, as shown in Figure 14.



Figure 13 *Proposed Mangata (Oakden Hills) Pump Station site locality*



Figure 14 Mangata (Oakden Hills) Pump Station existing site and land use map

5.1.5 Bimba Product Water Storage

The Bimba Product Water Storage is located off the Stuart Highway approximately 1 km to the southeast of the Pimba Township, as shown in Figure 15. The existing site lies on an undeveloped portion of remote land on the western side of the Stuart Highway designated for livestock use, as shown in Figure 16.



Figure 15 Proposed Bimba Product Water Storage site locality

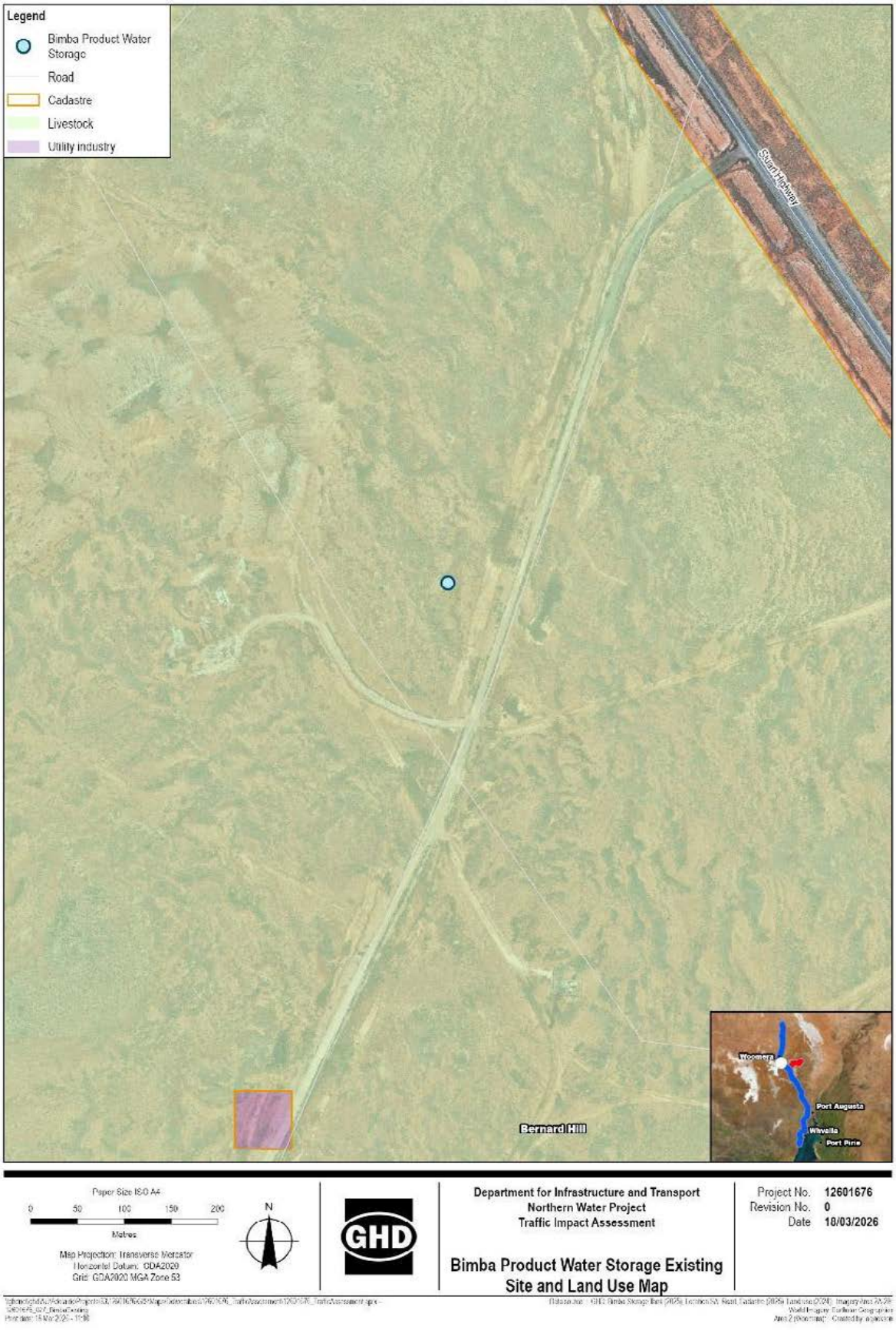


Figure 16 *Bimba Product Water Storage existing site and land use map*

5.1.6 Mullaquana Station Substation

The proposed Mullaquana Station Substation is located approximately 5 km to the northeast of the Lincoln Highway near Middleback Range, as shown in Figure 17. The existing site is a portion of remote land, as shown in Figure 18. As mentioned previously in Section 5.1.1, there are proposed developments for the Nonowie Wind Farm within the vicinity of the Substation site. Although this project is still under assessment, there is potential for shared access routes connecting to Lincoln Highway.

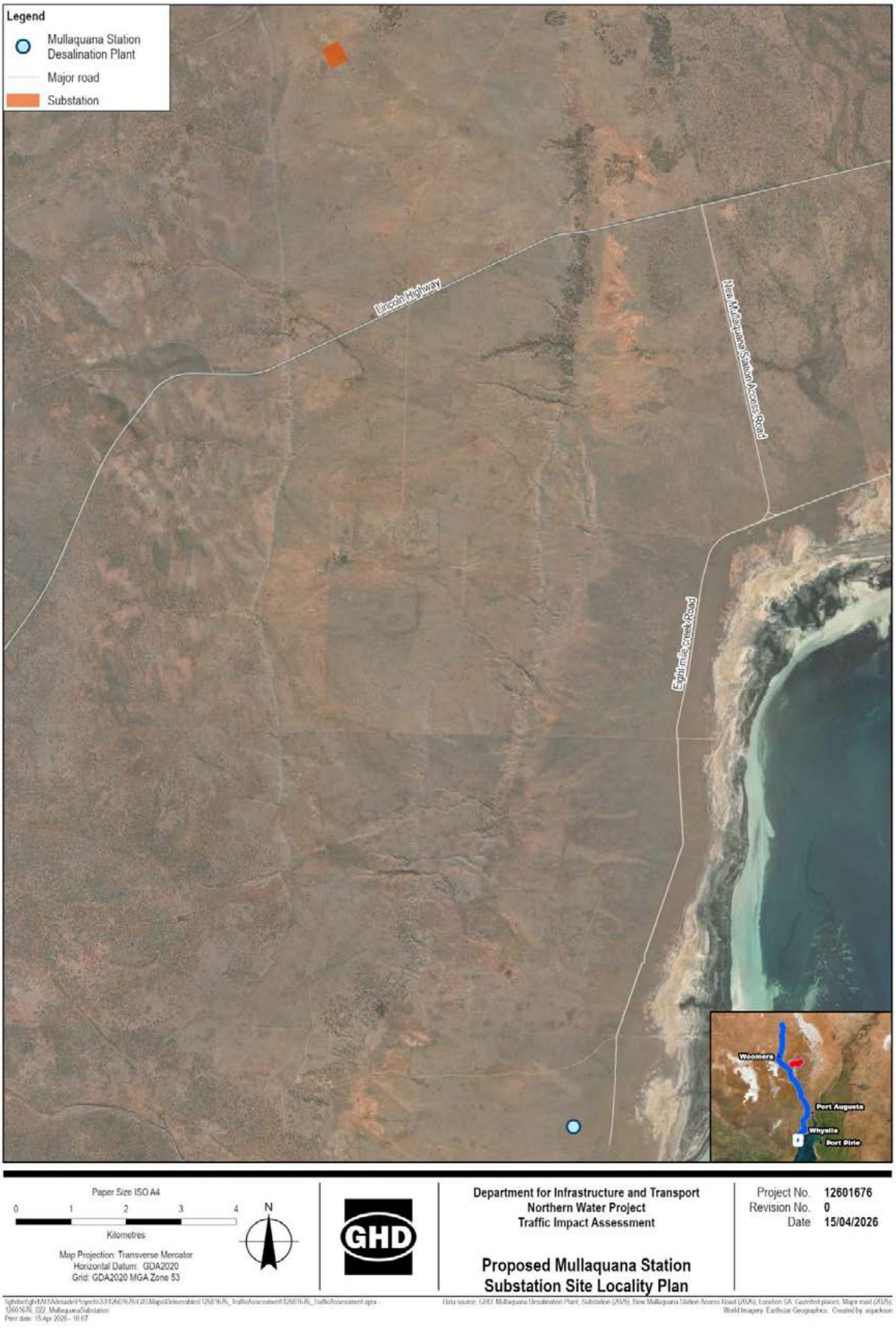


Figure 17 Proposed Mullaquana Station Substation site locality plan

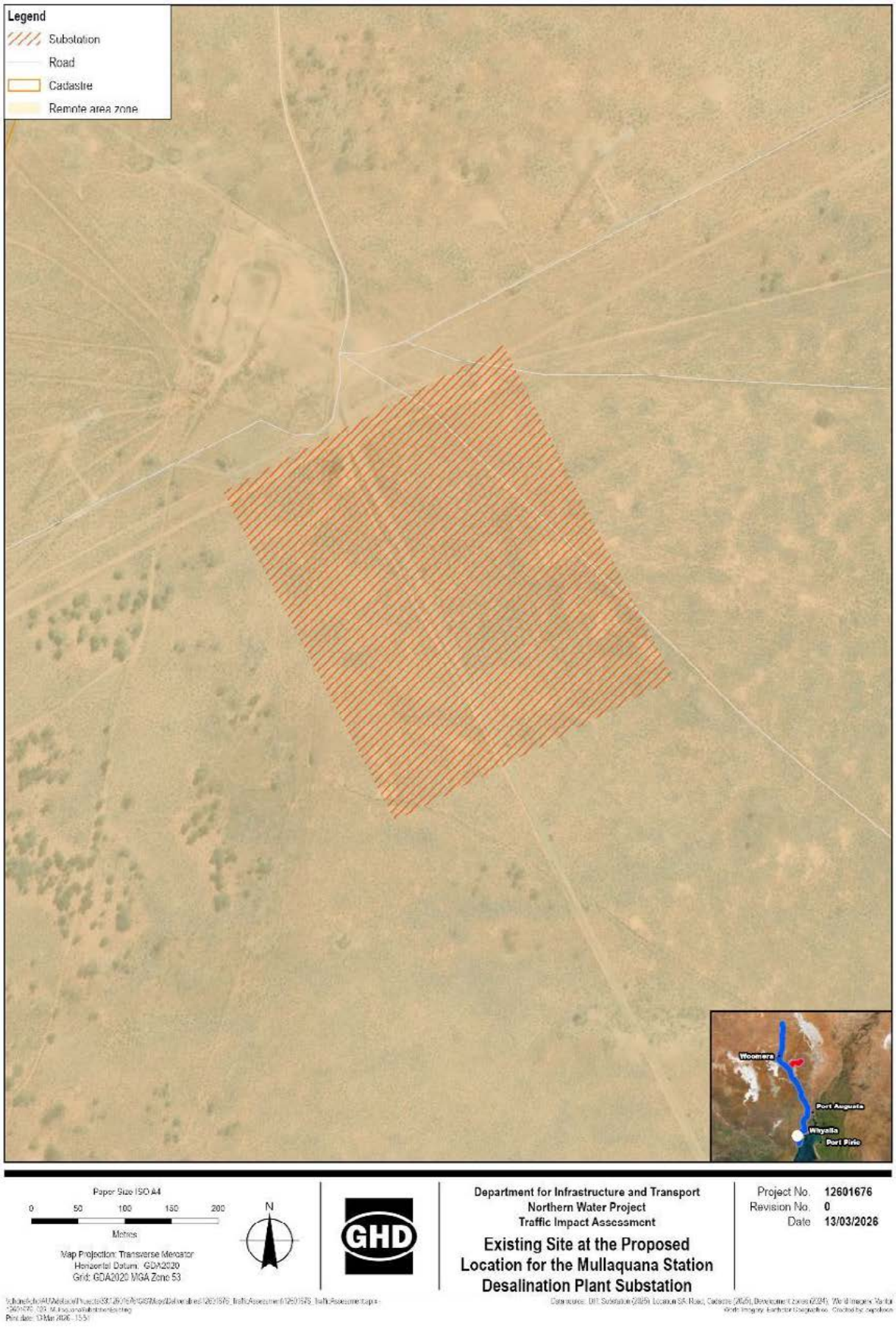


Figure 18 Existing site at the proposed location for the Mullaquana Station Substation

5.1.7 Kootaberra Substation

The Kootaberra Substation is located east of Stuart Highway on a portion of remote land approximately 120 km to the southeast of Pimba, and 75 km to the northwest of Port Augusta, as shown in Figure 19. The area surrounding the site is designated for livestock and utility use, as seen in Figure 20.

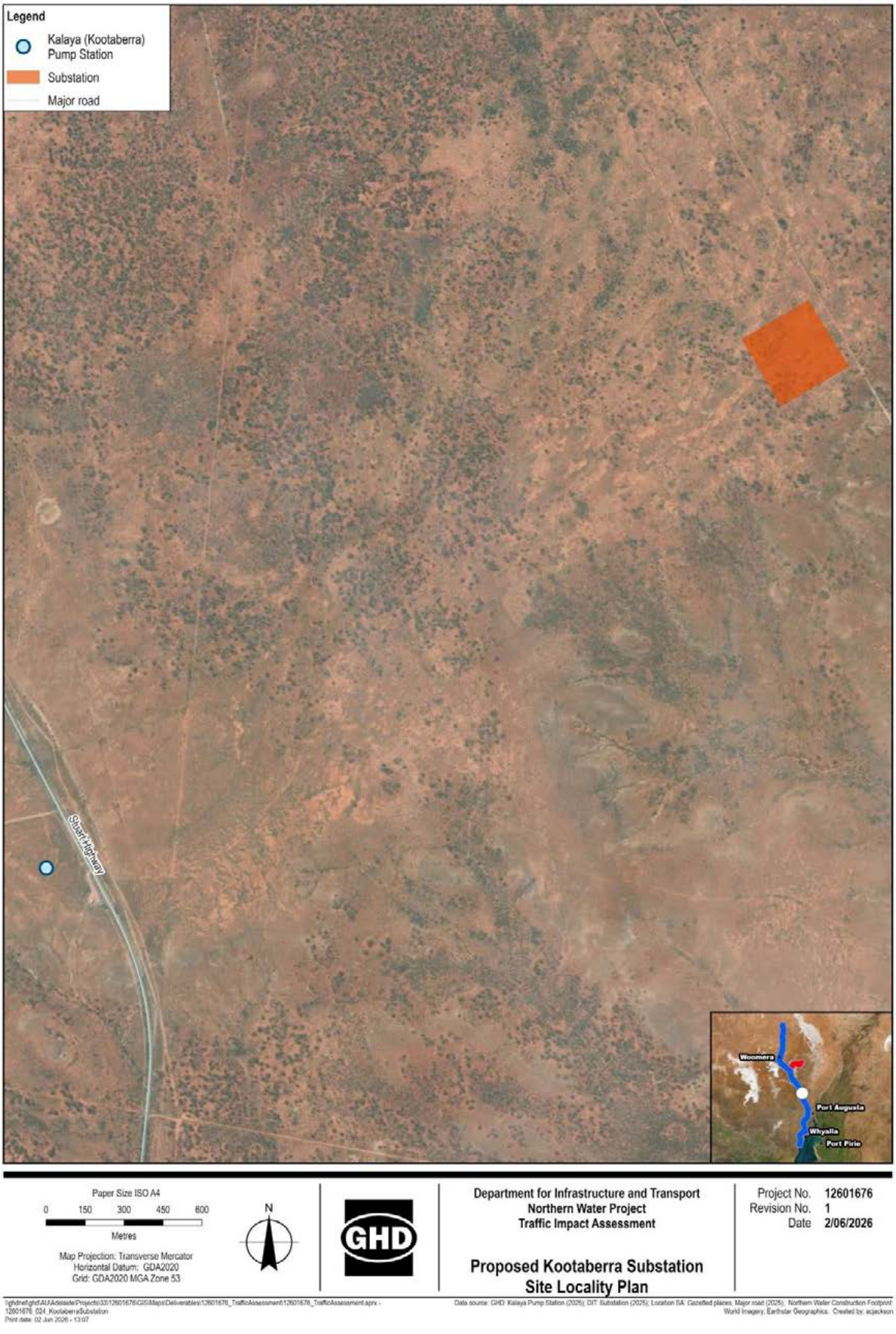


Figure 19 Proposed Kootaberra Substation Site Locality Plan



Figure 20 *Kootaberra Substation Existing Site and Land Use Map*

5.1.8 Main Transfer Pipeline

The following sub-sections describe the proposed sites that would be used either during the construction of the Main Transfer Pipeline, or to support it during operation.

5.1.8.1 Laydown Areas & Stack Sites

Laydown areas are primarily to be used for stocking pipe deliveries near the relevant sections of the Main Transfer Pipeline workfront. Stack sites are primarily to be used for stock piling imported bedding and backfill materials near the relevant sections of the Main Transfer Pipeline.

There are a number of Laydown and Stack sites proposed for use during construction of the Project, as shown in Figure 2, Figure 3 and Figure 4. However, it is likely that not all proposed sites would be used during project construction.

Based on recommendations by the Constructability Advisor (Systra, 2025), the laydown areas and stack sites considered for the purposes of this Traffic Impact Assessment report are at the locations below:

– Mt Gunson (Laydown)
– Whyalla Laydown (Laydown)
– Carriewerloo (Laydown & Stack Site)
– Nutt (Laydown & Stack Site)
– Pimba KAC (Laydown & Accommodation Camp)
– Purple Downs (Laydown & Stack Site)
– Oakden Hills (Stack Site)
– Lake Windabout (Stack Site)

5.1.8.2 Substations

Coraberra Hill Substation (site upgrade)

This site is currently an ElectraNet electricity substation which is to be upgraded as part of the proposed works. It is located near the Eyre Highway and Lincoln Highway intersection, 50 km north of Whyalla.

Mount Gunson Substation (site upgrade)

This substation is located approximately 1.5 km to the northeast of the Stuart Highway and approximately 40 km to the southeast of Pimba. Tracks from either the Carrapateena access road or Stuart Highway provide access to the site.

5.1.8.3 Accommodation Camps

There are a number of Accommodation Camp sites proposed for use during construction of the Project, as shown in Figure 2, Figure 3 and Figure 4. These are subject to further assessment of viability. However, the following sites have been assumed for the purposes of this TIA based on their size and proximity to the workfronts.

Whyalla Proposed Accommodation Camp

The proposed Whyalla Accommodation Camp adopted for the purposes of this TIA is located in the southern suburbs of Whyalla, at the corner of McDouall Stuart Avenue and Broadbent Terrace. The site is currently a plantation reserve.

Port Augusta Proposed Accommodation Camp

This proposed site adopted for the purposes of this TIA is situated on Press Road close to the Madland Street intersection in the northwestern part of Port Augusta. The land is currently undeveloped.

New Accommodation site - Pimba KAC parcel

The proposed accommodation site adopted for the purposes of this TIA in Pimba is located at the proposed KAC Laydown site. This site is on the southern side of Stuart Highway, just north-west of the intersection with Olympic Dam Highway. The land is currently undeveloped.

Roxby Downs Proposed Accommodation Camp

This proposed accommodation camp adopted for the purposes of this TIA is located at the existing Roxby Downs Racecourse, which is accessed from Olympic Highway immediately southwest of Roxby Downs. This site is assumed to be the preferred option among those presented on the Web Map, as it is the closest location to the workfront and has the largest available area.

Quarries

The proposed quarries proposed to be used during construction for sourcing project materials can be geographically seen in Figure 21.

Whyalla Boral Quarries

This commercial quarry and materials site is located off Iron Knob Road approximately 8km to the northwest of Whyalla.

Port Augusta Council Quarry

The Port Augusta Council Quarry is located 6 km to the west of Port Augusta (-32.490453, 137.721403), to the south of the Eyre Highway and near to Port Augusta Airport.

Mount Gunson Mines AMJ Musolino Quarry

This quarry is located approximately 12 km to the northeast of the Stuart Highway. Access to the site is via the Carrapateena entry point, which is 37 km to the southeast of Pimba.

Roxby Downs Holcim Quarry

The Roxby Downs Holcim Quarry is located to the west of Roxby Downs. Access is provided via the Olympic Way - Opal Road intersection, with the quarry situated approximately 4 km west of this point. The site is currently used as a commercial quarry and materials supply facility.

Pimba Rail Line

It is understood that the Pimba rail line may be utilised for pipe deliveries for the nearby sections of the Transfer System workfront, with deliveries expected to arrive from interstate. It is also anticipated that heavy vehicle transfers would be required to transport these materials from the rail line to the relevant laydown area, including Pimba KAC and Purple Downs sites.

According to Location SA data, an existing Pimba spur line is located just north of Pimba on the western side of Olympic Dam Highway. Although this spur line may currently be decommissioned, it is expected to be reinstated to support a new intermodal freight terminal being proposed in Pimba (Aurizon, 2025). If rail infrastructure is intended to be used during construction, this spur line may need to be reopened to allow trains to stop in Pimba.

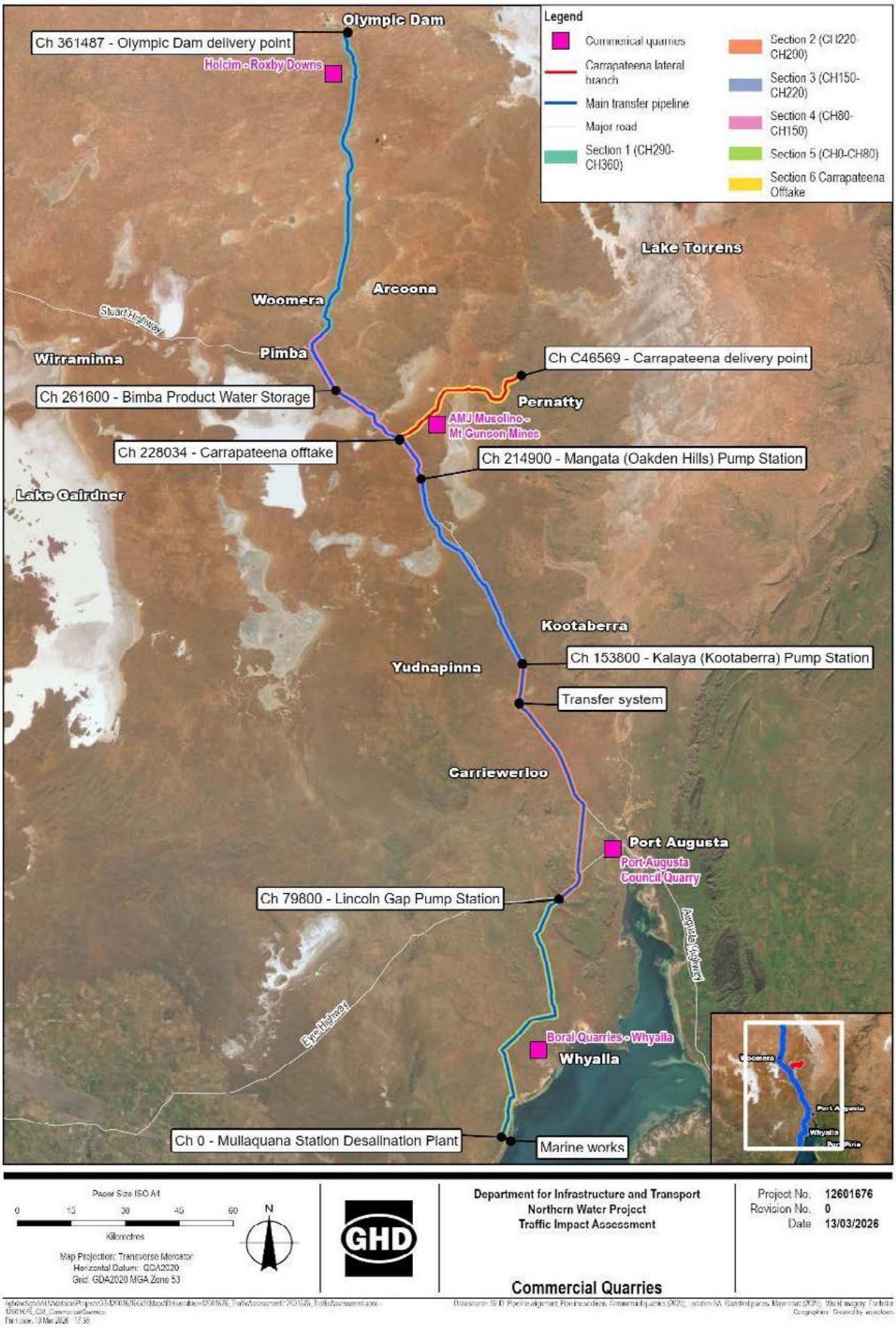


Figure 21 Commercial quarries proposed for use during construction

5.1.9 Intake and Outfall Tunnels

Whyalla Segment Yard

A segment yard is required for batching the concrete used to construct the tunnel rings for the marine and tunnelling works, as described by the Constructability Advisor. It is assumed that the segment yard would be located within the industrial area of the Whyalla Steelworks precinct, which is situated north of Whyalla along Lincoln Highway. The proposed location for the purpose of this report is the vacant land south-west of the intersection of Lincoln Highway and Arthur Glennie Drive.

Offshore Jack-Up Barge (JUB) Workfront

The JUB Workfront is to be located at the proposed location of the intake and outfall tunnels. There is currently limited information on the existing bathymetry levels, but it is assumed that there are adequate water depths for positioning and operating the JUB as required.

Whyalla Port

The nearest port to the JUB Workfront is Whyalla Port. It is assumed that the support vessels for the JUB Workfront would be able to use this port as required during construction.

It is proposed that the Inner Harbour be utilised during construction, as referred to in the Constructability Report (Systra, 2025).

According to SIMEC (Flinders Port Holdings, 2023), the maximum length (LOA) of vessels permitted in the Inner Harbour is 204 m. Whyalla Port is serviced by 4 tugboats and Liebherr 550 Mobile Harbour Cranes. There are 6 berths located within the Inner Harbour, including:

– Tar Berth
– Bulk Berth
– Products Berth
– Transhipment Berth
– Tug Berth
– Transhipment Maintenance Berth

The approach to the Inner Harbour is from the SSE and has the following channel information:

– Length: 2 nm
– Width: 120.0 m
– Depth: 10.0 m
– Direction: Main leads in line 306.6 degrees true

The Swing Basin has the following characteristics:

– Diameter: minimum 304 m
– Depth: 10.0 m

Whyalla Marina

Whyalla Marina is an existing public docking location for recreational vessels located in proximity to the overall Project. Further detail on this facility is provided in Section 5.7. The Whyalla Marina is expected to be used only infrequently during Project construction and operation, and any associated impacts on marina activities are anticipated to be minimal. Accordingly, it is only given a high-level consideration in this TIA to provide awareness of its use and to describe the anticipated boat trips to and from the marina.

5.2 Road network

The arterial road network that has been considered for the extents of this Project are shown in Figure 22, Figure 23, Figure 24 and Figure 25. This includes Lincoln Highway, Eyre Highway, Stuart Highway and Olympic Dam Highway. The existing conditions of these roads and the roads directly linking to the new permanent sites have been assessed in further detail below.

Access to the Project sites during construction would likely consist of the key roads outlined in Table 4. However, the bulk of the project-generated traffic would be concentrated on the arterial roads mentioned previously, particularly during operation. Hence, these arterial roads and roads accessing the new permanent sites have been the primary focus for this TIA.

Table 4 Project road network

Road	Access provided
Eight Mile Creek Road and associated access roads	– Mullaquana Station Desalination Plant (including Intake & Outfall Tunnels) – Main Transfer Pipeline (south of Lincoln Highway)
New Mullaquana Station access road (Option 2 route to the Desalination Plant)	– Mullaquana Station Desalination Plant (including Intake & Outfall Tunnels). This is not an existing road but is proposed to be in place prior to the construction phase. Refer to section 6.2.1.
Mullaquana Road	– Mullaquana Station Desalination Plant (including Intake & Outfall Tunnels)
Horseshoe Road	– Mullaquana Station Desalination Plant (including Intake & Outfall Tunnels)
Lincoln Highway (south of Whyalla)	– Mullaquana Station Desalination Plant (including Intake & Outfall Tunnels) – Main Transfer Pipeline south of Whyalla – Mullaquana Station Substation – Whyalla Airport
Kloeden Street	– Whyalla Accommodation Camp
Broadbent Terrace	– Whyalla North Laydown – Whyalla Accommodation Camp – Whyalla Port – Whyalla Segment Yard – Whyalla Boral Quarries
Playford Avenue	– Whyalla Port – Whyalla Segment Yard
Iron Knob Road	– Whyalla Boral Quarries – Main Transfer Pipeline between Lincoln Highway (south of Whyalla) and Cultana
Lincoln Highway (north of Whyalla)	– Whyalla Port – Whyalla Segment Yard – Main Transfer Pipeline from Cultana to Lincoln Gap
Shipyard Road (private access)	– Whyalla Port
Arthur Glennie Drive	– Whyalla Segment Yard – Whyalla North Laydown
Norrie Avenue	– Whyalla North Laydown – Whyalla Boral Quarries
Industry Drive	– Whyalla North Laydown
Eyre Highway (North)	– Lincoln Gap Pump Station – Main Transfer Pipeline from Lincoln Gap to Port Augusta – Coraberra Substation (just near Lincoln Gap Pump Station) – Port Augusta Laydown Area

Road	Access provided
Eyre Highway (West)	– Lincoln Gap Pump Station
Press Road	– Port Augusta Laydown Area
Madland Street	– Port Augusta Laydown Area
Addison Road & Caroona Road	– Port Augusta Airport
Stuart Highway	– Kalaya Pump Station – Mangata Pump Station – Bimba Product Water Storage – Carriewerloo Laydown Area – Nutt Laydown Area – Mount Gunson Laydown Area – KAC parcel Laydown & Accommodation – Oakden Hills Stack Site – Lake Windabout Stack Site – Main Transfer Pipeline from Port Augusta to Pimba and Carrapateena Lateral Pipeline – Mount Gunson Substation – Mount Gunson Mines Quarry – Olympic Dam Airport
Bimba Product Water Storage Existing Access Road	– Bimba Product Water Storage
Olympic Dam Highway	– Pimba Rail Line – Purple Downs Laydown Area & Stack Site – Main Transfer Pipeline from Pimba to Olympic Dam – Olympic Dam Airport
Olympic Way	– Roxby Downs Accommodation Camp – Main Transfer Pipeline north of Olympic Dam – Olympic Dam Airport
Blinman Road	– Olympic Dam Airport
Borefield Road	– Main Transfer Pipeline north of Olympic Dam
Carrapateena Access Road	– Carrapateena Lateral Pipeline – Mount Gunson Laydown Area (alternative access option) – Mount Gunson Substation (alternative access option) – Mount Gunson Mines Quarry (alternative access option)



Figure 22 *Lincoln Highway extents from Whyalla to Lincoln Gap*

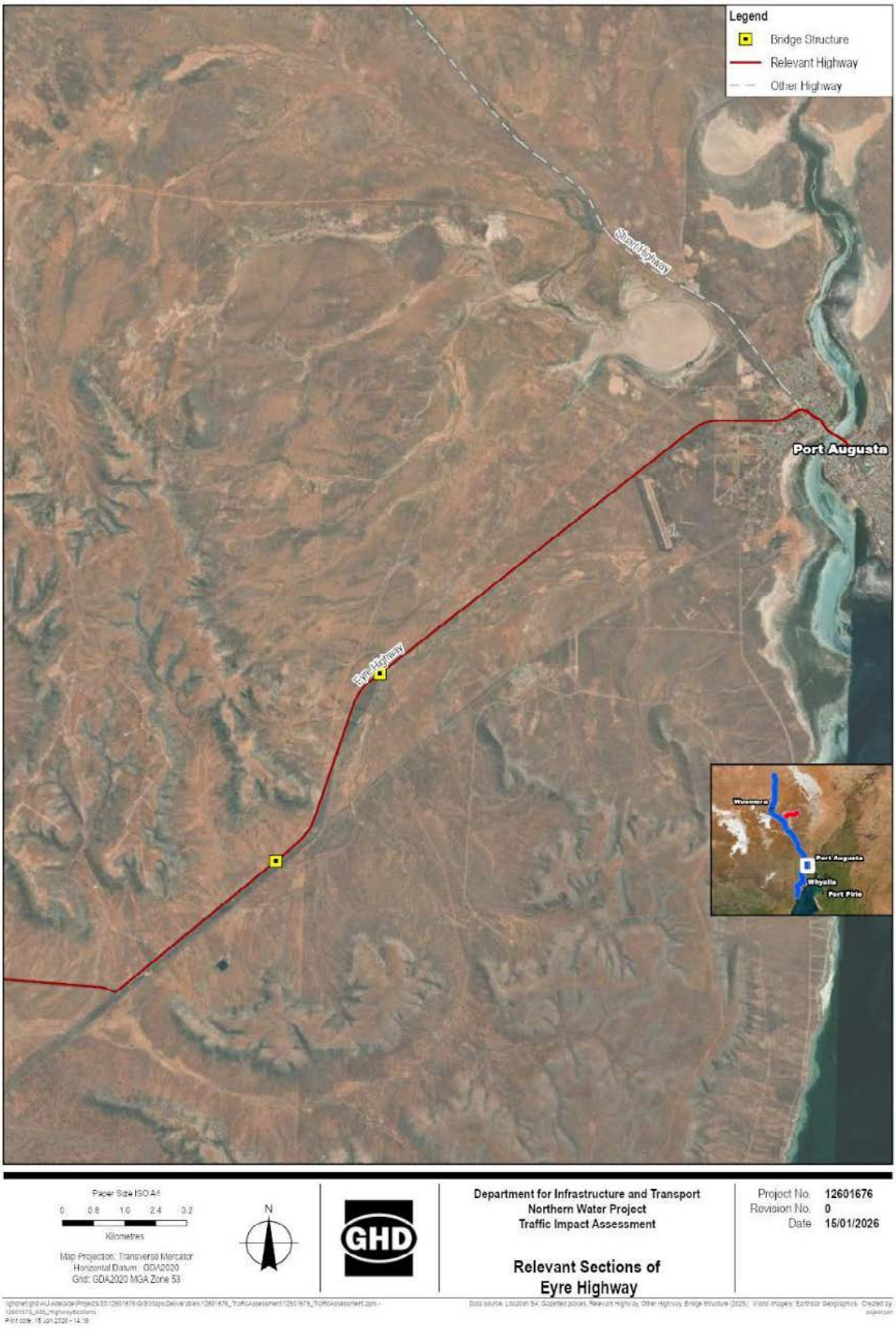


Figure 23 Eyre Highway extents from Lincoln Gap to Port Augusta

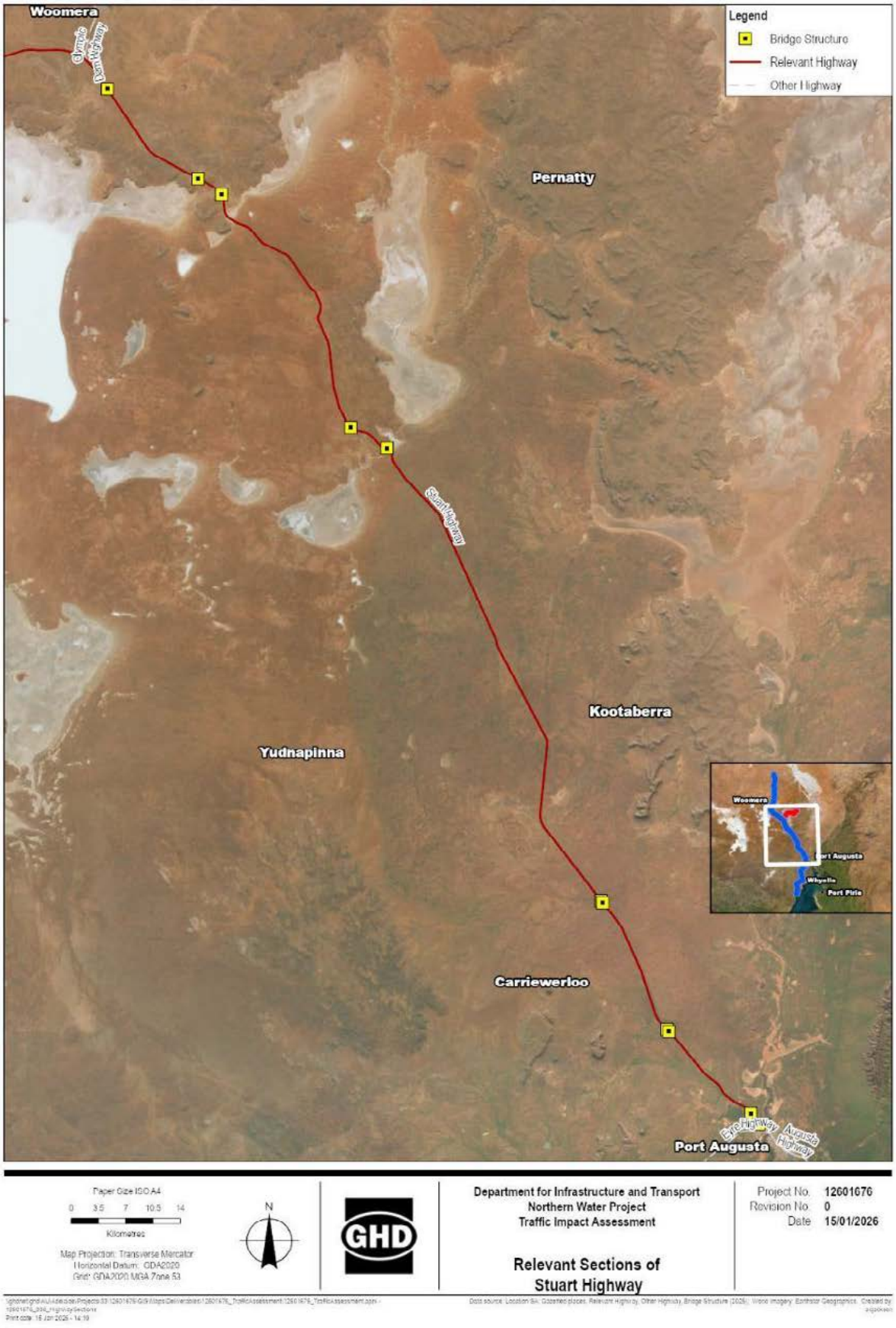


Figure 24 *Stuart Highway extents from Port Augusta to Pimba*



Figure 25 Olympic Dam Highway extents from Pimba to Olympic Dam

5.2.1 Traffic volumes - key roads

The traffic volumes for the key roads within the Project study extents have been obtained from Location SA, where available, and are presented in Figure 26, Figure 27 and Figure 28. Many local roads, as well as roads not owned by the Department, do not have recorded traffic volume data. For these roads, assumptions have been made for existing traffic volumes based on land use conditions and general attractions within the area.

Existing traffic volume data indicates that the highest light and heavy vehicle volumes along the key highway routes within the Project extents occur between Whyalla and Port Augusta. This section carries over 2000 total vehicle movements per day, with approximately 400 heavy vehicles per day on Lincoln Highway and 750 heavy vehicles per day on Eyre Highway (northern arm).

Broadbent Terrace and Playford Avenue also experience high traffic volumes, with almost 4000 vehicles per day travelling through Whyalla, including over 550 heavy vehicles. Just north of Whyalla, Arthur Glennie Drive and Lincoln Highway carry relatively high volumes of over 2000 vehicles per day, with approximately 20% constituting heavy vehicles. These roads are anticipated to be used during the Project construction for movements between the Desalination Plant, Marine Tunnel sites, proposed laydown area, segment yard and Whyalla Port.

The proportion of heavy vehicles along the highway network increases towards the northern end of the Project extents. This trend is expected given the remoteness of the northern areas and its proximity to the Olympic Dam Mine.



Figure 26 *Existing Traffic Volumes – Mullaquana Station to Lincoln Gap*

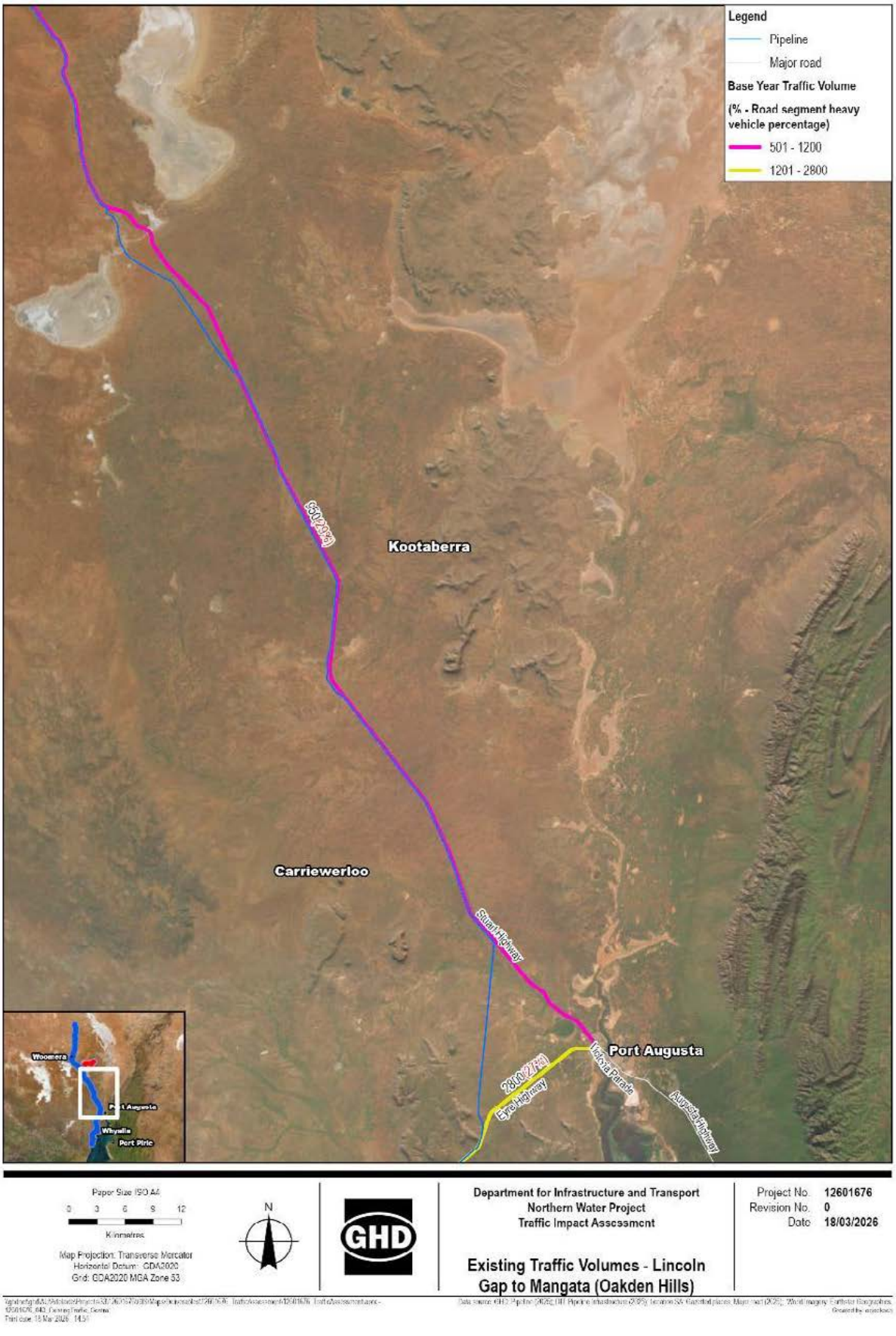


Figure 27 Existing Traffic Volumes – Lincoln Gap to Mangata (Oakden Hills)

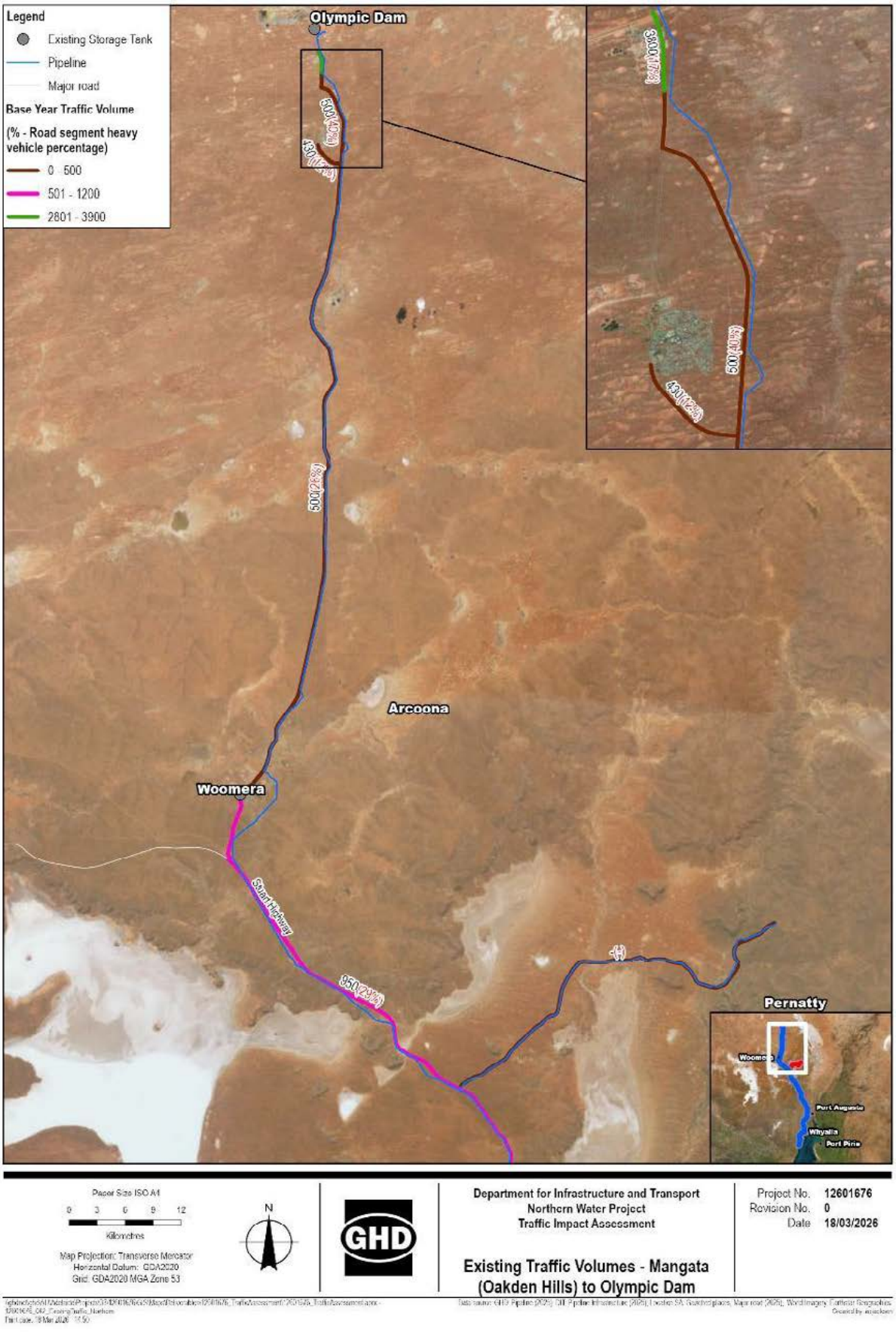


Figure 28 Existing Traffic Volumes – Mangata (Oakden Hills) to Olympic Dam

5.2.2 New sites - permanent

5.2.2.1 Mullaquana Station Desalination Plant and Intake & Outfall Tunnels

The Mullaquana Station Desalination Plant and Intake & Outfall Tunnels is expected to be a key site, particularly during construction, operation, and decommissioning. This site is anticipated to generate the most traffic out of the project sites. The existing conditions of the route from Whyalla to the proposed site has been assessed in detail below for both the arterial and local road networks.

5.2.2.1.1 Arterial Road Network

The arterial road network connecting to the proposed Mullaquana Station Desalination Plant site is presented in Table 5.

Table 5 Arterial road network surrounding Mullaquana Station Desalination Plant and intake/outfall tunnels

Road name	Description
Lincoln Highway (south of Whyalla)	– Study extents: South-west of Whyalla from the intersection with Horseshoe Road and approximately 16.5km further west to the proposed Mullaquana Station Substation access road. Details below are split into the **dual carriageway** extents and **single carriageway** extents. – Particular consideration has been given to the intersection with Horseshoe Road (within the dual carriageway extents) and the proposed intersection location for the new access road (approximately 12km west of Horseshoe Road within the single carriageway extents). These are the key intersections considered on Lincoln Highway corresponding to the 2 alternative proposed routes to Mullaquana Station Desalination Plant. – Classification and ownership: Sealed arterial road owned by the Department – NHVR (National Heavy Vehicle Regulator) PBS (Performance Based Standard) Route Level: 3B (up to 42 m long road trains) – Lincoln Highway transitions into Broadbent Terrace and connects to Whyalla when travelling east. Travelling south-west approximately 250 km, it provides a connection to Port Lincoln. **Dual Carriageway (from Horseshoe Road intersection to approximately 2km west)** – AADT Volumes: 7,900 vehicles (2021), 4% heavy vehicles – Posted speed limit: 80 km/h for extents of dual carriageway approximately 2km west from intersection with Horseshoe Road . – Two-way, dual carriageway with 3 m lane widths. – Left-turn treatment: CHL (channelised left turn) for turning movements onto Horseshoe Road – Right-turn treatment: CHR (channelised right turn) for turning movements onto Horseshoe Road – There is existing road lighting at the intersection with Horseshoe Road. **Single Carriageway (2km west of Horseshoe Road intersection to 16.5km further west)** – AADT Volumes: 1,200 vehicles (2019), 20% heavy vehicles – Posted speed limit: 110 km/h – Two-way, single carriageway with single 3.3m wide lanes in each direction and 1m sealed shoulders. – There is no existing turning treatment at the proposed new access road intersection (approximately 12km west of Horseshoe Road).

5.2.2.1.2 Local Road Network

The existing local road network considered includes roads connecting from Lincoln Highway to the proposed Mullaquana Station Desalination Plant site for both route options, via the existing local roads of Horseshoe Road and Mullaquana Road (Option 1) and via the proposed new Mullaquana Station access road (Option 2). Both these route options also include Eight Mile Creek Road. These routes are both shown in Figure 29. The new

Mullaquana Station access road will be discussed further in section 6.2.1. Table 6 provides a detailed summary of this road network.

Table 6 Local road network surrounding Mullaquana Station Desalination Plant and intake/outfall tunnels

Road name	Description
Eight Mile Creek Road	**Mullaquana Road (end of seal) to pipeline CH 7400** – Classification and ownership: Unsealed collector road owned by Whyalla City Council – AADT Volumes: N/A. Vehicle traffic data is currently not available for this road. A conservative average of 10 vehicles per day is assumed in this TIA. – Posted speed limit: Unknown from publicly available information. Assumed to be 80 km/h. – Two-way, single carriageway, approximately 9 m wide. – NHVR PBS Route Level: Nil (not cleared for any routes) **Pipeline CH 7400 to CH 1800** – Classification and ownership: Unsealed collector road owned by Whyalla City Council – AADT Volumes: N/A. A conservative average of 10 vehicles per day is assumed in this TIA. – Posted speed limit: Unknown from publicly available information. Assumed to be 80 km/h. – NHVR PBS Route Level: Nil (not cleared for any routes) – Vehicle tracks of approximately 4 m width in each direction are present. It should be noted that the track is irregular in alignment at some sections of this road. – **Study extents: pipeline CH 1800 to Mullaquana Desalination Plant & Intake/Outfall Tunnels** – At the desalination plant end of this road, two further access tracks connect to the coastline. These access tracks are also unsealed, private 2WD vehicle tracks. – Classification: Unsealed private 2WD vehicle track – AADT volumes not available. A conservative average of 10 vehicles per day is assumed in this TIA. – Posted speed limit: Unknown from publicly available information. Assumed to be 80 km/h. – NHVR PBS Route Level: Nil (not cleared for any routes) – Two-way single track approximately 4.2 m wide. – There are approximately 25 residential shacks at Murninnie Beach approximately 10.5 km south of the proposed Mullaquana Desalination Plant. However, it is not anticipated that vehicles would travel northward from Murninnie Beach on this access road as there is a more direct access road west of Murninnie Beach, towards the abandoned Murninnie Mine which connects to Lincoln Highway. Eight Mile Creek Road provides access to several informal beach tracks, conservation areas and rural property classified for livestock use on Location SA (2024). – Within the locality of Cowleds Landing, the land to the east of Eight Mile Creek Road (coastal side) comprises undeveloped reserve. The land to the west, bounded by Eight Mile Creek Road and Lincoln Highway, is predominantly agricultural, specifically utilised for wool production. South of Cowleds Landing, extending to the desalination plant site, the land is reserved for livestock use on both sides of Eight Mile Creek Road. – There are approximately 11 residential shacks near the coastline in Cowleds Landing. Murrippi Beach is connected to Eight Mile Creek Road via a 2.5 km-long unsealed public access road.
New Mullaquana Station access road (Option 2 route to the Desalination Plant)	*New road proposed – refer to Section 6.2.1.* – Study extents: Lincoln Highway to Eight Mile Creek Road parallel to and east of the Main Transfer Pipeline alignment. This is proposed as a preferred alternative route for access to the Mullaquana Station Desalination Plant instead of using the existing local roads of Horseshoe Road and Mullaquana Road. – Classification and ownership: Assumed to be a sealed rural collector road owned by the Department. Ownership may be handed over to Whyalla Council during the Operation Phase. – AADT Volumes: N/A. This is a new proposed road and hence has no existing traffic data. Refer to section 7 for estimated trip generation rates.

Road name	Description
	Road Design parameters adopted – refer to GHD Concept Design in Appendix D: – Design speed: 110 km/h (90 km/h for bend at Eight Mile Creek Road) – Posted speed limit: 100 km/h (advisory speed of 80 km/h for bend at Eight Mile Creek Road) – Two-way, single carriageway with 3.5m lane widths (3.8m for curve widening), 0.5m sealed shoulder widths, 1m unsealed shoulder width, 1m verge width. – Crossfall: 3% (crowned) on straight, desirable 5% (super) on curve – Design Vehicle: 26-m B-double
Mullaquana Road (Option 1 route to the Desalination Plant)	– Study extents: Horseshoe Road intersection to Eight Mile Creek Road (end of sealed road) – Classification and ownership: Sealed collector road owned by Whyalla City Council – AADT Volumes: N/A. Vehicle traffic data for Mullaquana Road collected in 2017 has been provided by Whyalla Council indicating an average of over 2,400 vehicles per day south-west of the caravan park entrance. Vehicle traffic data collected on the same day just north-east of Berkshire Road indicates that Mullaquana Road carries an average volume of 1,000 vehicles per day at this location. – Posted speed limit: 80 km/h – Two-way, single carriageway with 3.5 m lane widths – NHVR PBS Route Level: Nil (not cleared for any routes) – Provides access for a small number of residential streets within the suburb of Mullaquana with large semi-rural allotments set back from the road. It also provides access to Whyalla Caravan and Tourist Park, Eight Mile Creek Beach, Steel City Raceway, Whyalla Car Club & Dirt Circuit Racing Track and a secondary service route at the rear of Whyalla Airport. There is also a quarry with a storefront supplying landscape and construction materials. – Based on Google Street View, it appears that the airport reserve is also used for recreational use, including as an equestrian, pedestrian and dog exercise area.
Horseshoe Road (Option 1 route to the Desalination Plant)	– Study extents: Lincoln Highway intersection to Mullaquana Road intersection – Classification and ownership: Sealed collector road owned by Whyalla City Council – AADT Volumes: N/A. Vehicle traffic data is currently not available. Based on Mullaquana Road traffic data, this TIA assumes an average of 2,400 vehicles per day for Horseshoe Road. – Posted speed limit: 80 km/h – Two-way, single carriageway with 3.5 m lane widths – NHVR PBS Route Level: Nil (not cleared for any routes) – Horseshoe Road provides access for a small number of residential and industrial properties, including a wastewater treatment plant. – Approximately 35 m south of Lincoln Highway, Horseshoe Road traverses an open channel and culvert which runs parallel with Lincoln Highway. The culvert has a weight limit restriction of 10 tonnes per axle. The sealed road width over the channel appears to be 10 m wide. There is an existing safety barrier, but it appears to be non-compliant with current standards. – There is a private unsealed road leading to an archery club on the eastern side of Horseshoe Road just south of the bridge barrier. – There is a single existing road light at the intersection with Mullaquana Road, which is mounted to a stobie pole on the north-eastern corner of the intersection.



Figure 29 Road network to Mullaquana Station Desalination Plant site

5.2.2.2 Lincoln Gap Pump Station

5.2.2.2.1 Arterial Road Network

The proposed site for the Lincoln Gap Pump Station is at the intersection of Eyre Highway and Lincoln Highway, as shown in Figure 30. The intersection includes the southern arm of Lincoln Highway, the western arm of Eyre Highway (West) and the northern arm of Eyre Highway (North).

Lincoln Highway spans 315 km between Port Augusta and Port Lincoln on the east coast of Eyre Peninsula, with the main transfer pipeline running adjacent to Lincoln Highway for much of its section between Whyalla and Eyre Highway. Eyre Highway is approximately 950 km in length, extending south-west from Port Augusta towards Kimba and north-west through Ceduna and across the Nullarbor to the border of Western Australia. There does not appear to be any existing road lighting at the intersection of Eyre Highway and Lincoln Highway, though there are existing SA Power Networks (SAPN) overhead High Voltage lines running parallel with Eyre Highway (West) arm and crossing over Eyre Highway (North) arm. Table 7 summarises the key features for the existing roads within the vicinity of the proposed site.

Table 7 Lincoln Gap Pump Station surrounding Arterial road network

Road name	Description
Lincoln Highway (north of Whyalla at Lincoln Gap)	– Classification and ownership: Sealed arterial road owned by the Department – AADT volumes: 2,200 vehicles (2024), 21% heavy vehicles – Posted speed limit: 110 km/h – Two-way, single carriageway with 3 m lane widths – NHVR PBS Route Level: 4A (up to 53.5 m long road trains) – Left-turn treatment: CHL – The portion of Lincoln Highway within the study extents provides a key freight connection and highway corridor between Whyalla and Port Augusta.
Eyre Highway (West)	– Classification and ownership: Sealed highway road owned by the Department – AADT volumes: 950 vehicles (2024), 44% heavy vehicles – Posted speed limit: 110 km/h – Two-way, single carriageway with 3 m lane widths – NHVR PBS Route Level: 3B (up to 42 m long road trains) – Left-turn treatment: CHL low-angle with a 150 m acceleration lane – The portion of Eyre Highway within the study extents provides a key freight connection and highway corridor between Iron Knob and the intersection with Lincoln Highway.
Eyre Highway (North)	– Classification and ownership: Sealed highway owned by the Department – AADT Volumes: 2,800 vehicles (2019), 27% heavy vehicles – Posted speed limit: 110 km/h – Two-way, single carriageway with 3 m lane widths – NHVR PBS Route Level: 4A (up to 53.5 m long road trains) – Right-turn treatment: Auxiliary right turn – The section of Eyre Highway within the study extents provides a key freight connection and highway corridor between Port Augusta and the intersection with Lincoln Highway. – Key features: Minor Rest Area and Truck Parking Bays on the eastern side of the road just north of the intersection with Lincoln Highway.

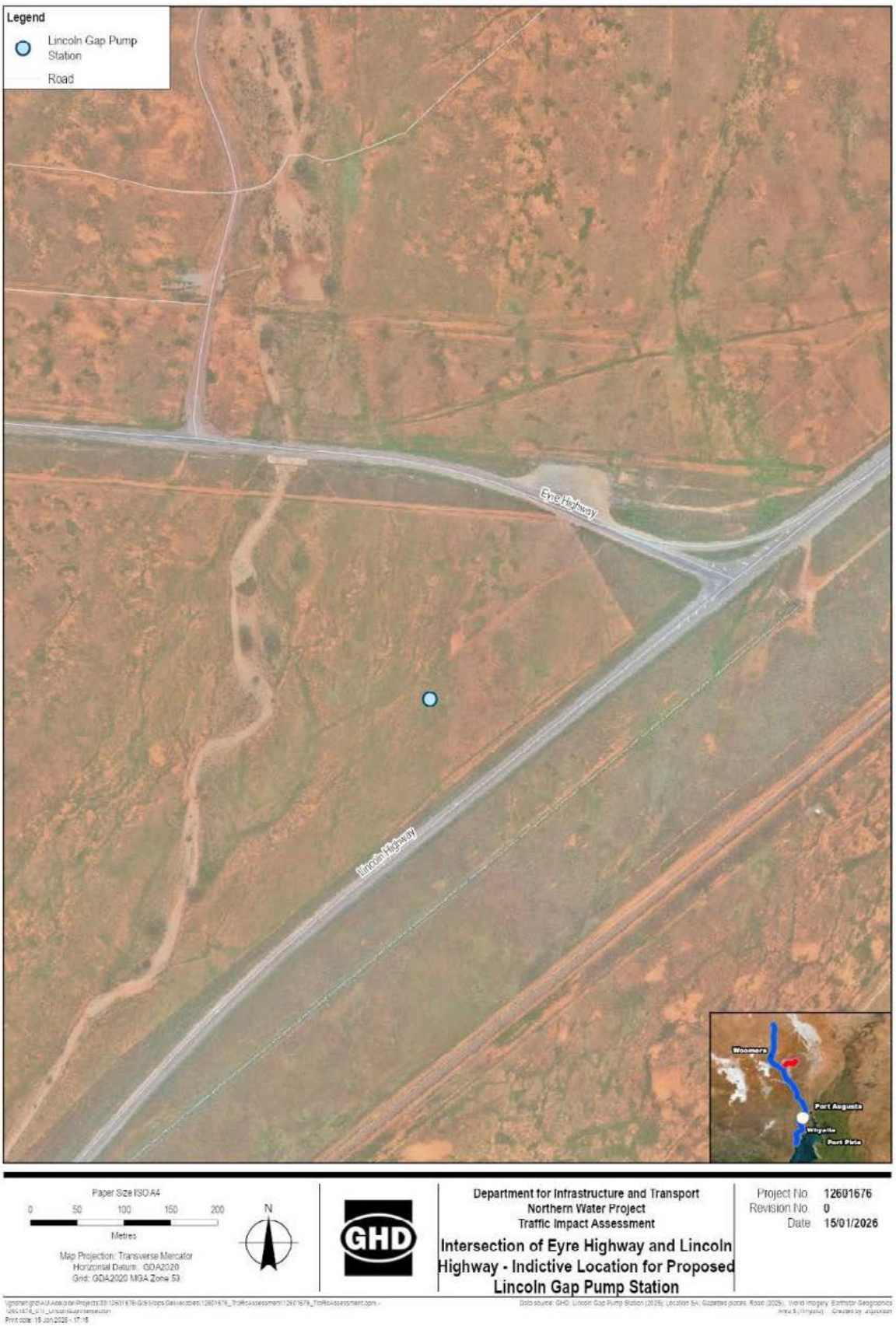


Figure 30 Intersection of Eyre Highway and Lincoln Highway - indicative location for proposed Lincoln Gap Pump Station

5.2.2.3 Kalaya and Mangata Pump Stations

5.2.2.3.1 Arterial Road Network

The proposed sites for the Kalaya Pump Station and Mangata Pump Station are both located on the western side of the Stuart Highway, as shown in Figure 31 and Figure 32. Stuart Highway covers a distance of 925 km from Port Augusta to the South Australian northern border. The two pump stations are proposed to be installed within the extents between Port Augusta and Pimba. Table 8 summarises the key existing features of Stuart Highway within the study extents.

Table 8 Kalaya and Mangata Pump Stations surrounding arterial road network

Road name	Description
Stuart Highway	– Classification and ownership: Sealed highway owned by the Department – AADT Volumes: 950 vehicles (2024), 33.5% heavy vehicles – Posted speed limit: 110 km/h – Two-way, single carriageway with 3 m lane widths – NHVR PBS Route Level: 4A (up to 53.5 m long road trains) – No access roads, road lighting or turning treatments currently exist at both of the site locations – The section of Stuart Highway included within the study extents provides a key freight connection and highway corridor between Port Augusta and Pimba. – There is a length of sealed shoulder approximately 200 m long and 4 m wide on the western side of Stuart Highway at the location of the proposed Kalaya Pump Station site. This sealed shoulder stretches between the access roads for the existing communications tower (north of the site) and the Ranges View Rest Area (south of the site).

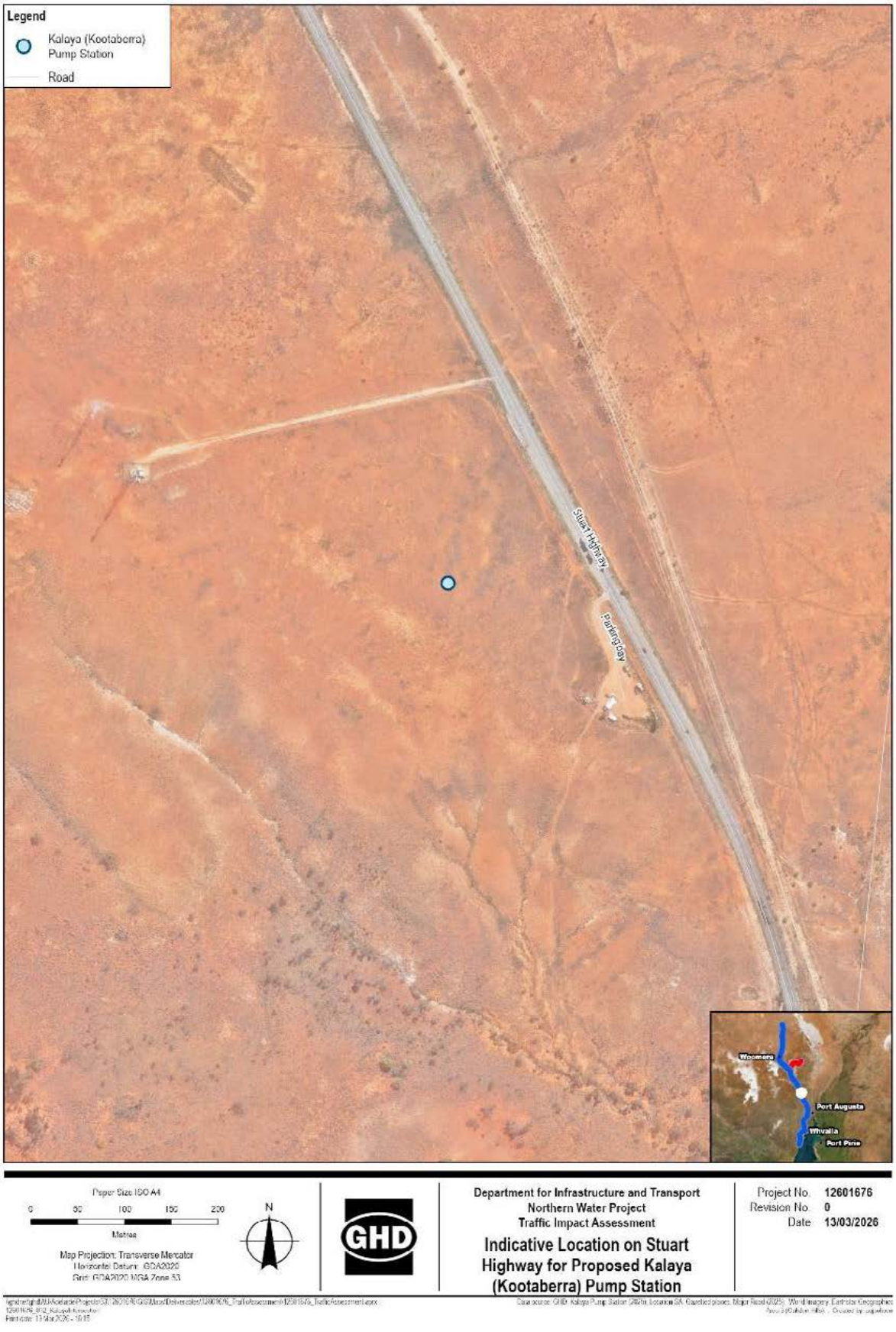


Figure 31 Indicative location on Stuart Highway for proposed Kalaya (Kootaberra) Pump Station

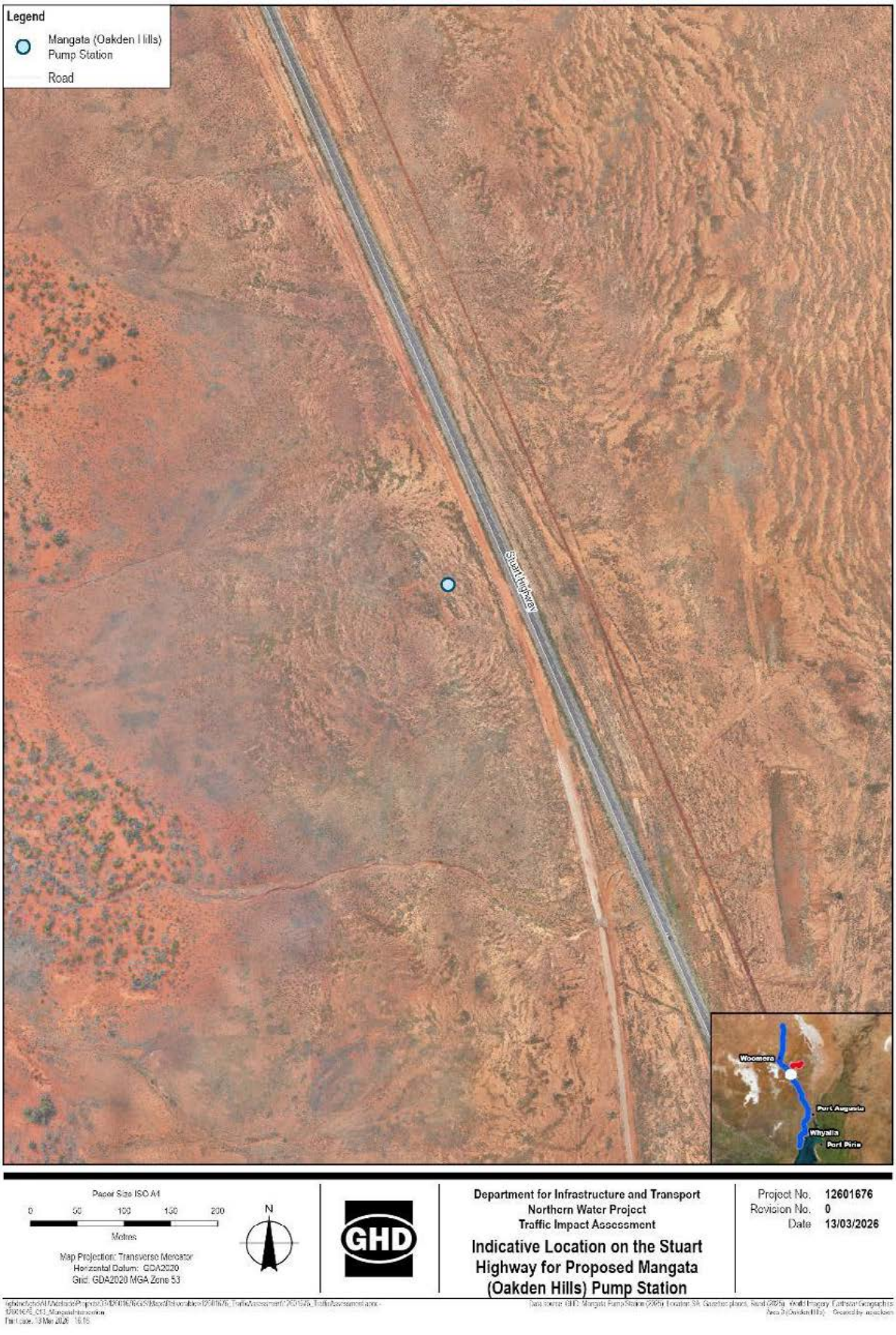


Figure 32 Indicative location on the Stuart Highway for proposed Mangata (Oakden Hills) Pump Station

5.2.2.4 Bimba Product Water Storage

Bimba Product Water Storage is also proposed to be located on the western side of Stuart Highway at an undeveloped site approximately 13 km south-east of Pimba. The proposed site is located on an existing unnamed access road that connects to Stuart Highway, as shown in Figure 51.

5.2.2.4.1 Arterial Road Network

Table 9 Bimba Product Water Storage surrounding arterial road network

Road name	Description
Stuart Highway	– Classification and ownership: Sealed highway owned by the Department – AADT Volumes: 950 vehicles (2024), 33.5% heavy vehicles – Posted speed limit: 110 km/h – Two-way, single carriageway with 3 m lane widths – NHVR PBS Route Level: 4A (up to 53.5 m long road trains) – Bimba Product Water Storage is accessed via an unnamed access road from Stuart Highway. A basic left turn treatment has been provided.

5.2.2.4.2 Local Road Network

Table 10 Bimba Product Water Storage surrounding local road network

Road name	Description
Unnamed Access Road	– Two-way, undivided, predominantly unsealed road with carriageway width of approximately 8 m. – Although Location SA classifies this access road as sealed, it is evident that the road is mostly unsealed from aerial and street view imagery. Only the first 55 m of the access road from Stuart Highway is sealed. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 5 vehicles per day has been taken. – No posted speed limit. – NHVR PBS Route Level: Nil (not cleared for any routes) – The unnamed access road provides access to the proposed Bimba Product Water Storage, which is located approximately 600 m from Stuart Highway. The road also provides access to a telecommunications tower approximately 1 km from the Stuart Highway. Island Lagoon is accessible from this road and is 6.5 km from Stuart Highway.

5.2.3 New sites – temporary

The new temporary sites are to be accessed primarily during construction. The roads that would be used to directly access these sites are described in Table 25 in Section 6.3 of this report. A majority of these sites are laydown areas or stack sites located along Stuart Highway. The existing conditions of this road has previously been discussed. Additionally, there are the new temporary sites of Whyalla Laydown on Industry Drive, Whyalla Segment Yard on Arthur Glennie Drive, the JUB workfront indirectly accessed via Whyalla Port on Shipyard Road, and Purple Downs Laydown area on Olympic Dam Highway.

5.2.3.1 Arterial Road Network

Table 11 Other arterial roads considered linking to new temporary sites

Road name	Description
Olympic Dam Highway (accessing Purple Downs Laydown)	– Classification and ownership: Sealed undivided highway owned by the Department – Posted speed limit of 110 km/h. – AADT Volumes: 500 vehicles (2019), 26% heavy vehicles – It is approximately 9 m wide at this location and extends over 900 km from Pimba (at the intersection with Stuart Highway) in the south, through Woomera and west of Roxby Downs to Olympic Dam in the north.

Road name	Description
	– NHVR PBS Route Level 4A (up to 53.5 m long road trains)

5.2.3.2 Local Road Network

Table 12 Other local roads considered linking to new temporary sites

Road name	Description
Broadbent Terrace (Whyalla)	– Classification and ownership: Sealed divided arterial road owned by the Department for the extents west of Playford Avenue and owned by Whyalla City Council for the extents east of Playford Avenue. – Posted speed limit of 80 km/h. – AADT Volumes: 8,800 vehicles (2021), 3% heavy vehicles (section west of Playford Avenue) – Two-way, 4-lane, dual carriageway with minimum 3 m lane widths. – Provides a key connection between Lincoln Highway (south) and Lincoln Highway (north) and also to Norrie Avenue through the centre of Whyalla township. – NHVR PBS Route Level 3B (up to 42 m long road trains)
Norrie Avenue (Whyalla)	– Classification and ownership: Sealed divided arterial road owned by the Department – Posted speed limit of 60 km/h. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 3,000 vehicles per day has been assumed. – Two-way, 4-lane, dual carriageway with 3.5 m lane widths and parking bays on the outside of both carriageways. – Provides a 2.7 km key connection through the centre of Whyalla township and between the signalised intersection of Arthur Glennie Drive / McBryde Terrace (north) and the unsignalised intersection with Broadbent Terrace (south). – Not cleared for any NHVR PBS Routes except for Level 3A (up to 36.5 m long road trains) for the 400 m long section south of Mills Street.
Playford Avenue (Whyalla)	– Classification and ownership: Sealed divided arterial road owned by the Department – Posted speed limit of 60 km/h. – AADT Volumes: 3,900 vehicles (2019), 9.5% heavy vehicles south of Elliott Street and 14.5% heavy vehicles north of Elliott Street – Two-way, 4-lane, dual carriageway with 3.5 m lane widths. – Provides an approximate 2 km key connection between Lincoln Highway (north) and Lincoln Highway (south). It cuts through the western area of Whyalla township between the signalised intersection with McBryde Terrace / Lincoln Highway (north) and the unsignalised intersection with Broadbent Terrace (south). – NHVR PBS Route Level 3B (up to 42 m long road trains)
Arthur Glennie Drive (Whyalla)	– Classification and ownership: Sealed sub-arterial road owned by the Department – The recorded AADT traffic volumes are 2,700 vehicles with 18.5% heavy vehicles (Location SA, 2019). – It is undivided with a posted speed limit of 100 km/h for the section running east-west from Lincoln Highway. For the portion running north-south, it is divided with a posted speed limit of 80 km/h in the north and reducing to 60 km/h in the south as it approaches Norrie Avenue / McBryde Terrace signalised intersection. – 4-lane, two-way sub-arterial road owned by DIT, of 14 m carriageway width. It is located just north of Whyalla township connecting from the signalised intersection with McBryde Terrace and Norrie Avenue and extending north-east to the signalised intersection with Lincoln Highway (north) and the main entrance road to the Whyalla Steelworks. – NHVR PBS Route Level: 3A (up to 36.5 m long road trains) – It passes through largely undeveloped land, but provides access to Iron Knob Road, Industry Drive (and the associated Industrial Estate), Whyalla Central Substation, and Whyalla Golf & Bowling Club.
Shipyard Road (Whyalla)	– Classification and ownership: Sealed local access road that is privately owned by Whyalla Steelworks. – It is a two-way undivided road that is approximately 7 m wide.

Road name	Description
	– Posted speed limit is unknown. It is assumed that the speed limit is 50 km/h. – It currently provides access from the unsealed intersection with Lincoln Highway to the Inner Harbour of Whyalla Port. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 50 vehicles per day has been assumed with a large percentage assumed to be heavy vehicles. – It appears to be cleared for up to a PBS Route Level 3A on the NHVR network (up to 36.5 m long road trains).
Industry Drive (Whyalla)	– Classification and ownership: Collector road owned by Whyalla City Council – AADT Volumes: N/A. Vehicle traffic data is currently not available. An estimate of 200 vehicles per day has been assumed with a large percentage assumed to be heavy vehicles. – It has a posted speed limit of 60 km/h and is approximately 16 m wide. – Sealed, no-through road that provides access to a number of businesses and small roads within the Industrial Estate north of Whyalla and terminates at a cul de sac. – NHVR PBS Route Level 3A (up to 36.5 m long road trains)
Press Road (Port Augusta)	– Classification and ownership: Sealed (south of Madland Street eastern arm) undivided local road owned by Port Augusta Council – Speed limit of 60 km/h. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 200 vehicles per day has been. – Two-way, single carriageway with 7 m sealed width. – Provides access to Department for Infrastructure and Transport office and other residential and industrial properties and roads. – Not cleared for any NHVR PBS Route Levels.
Madland Street (Port Augusta)	– Classification and ownership: Sealed (east of Press Road) undivided local road owned by Port Augusta Council. – Speed limit of 60 km/h. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 200 vehicles per day has been. – Two-way, single carriageway with approximately 9 m sealed width and no linemarking. – Provides access to residential and industrial properties and roads. – Not cleared for any NHVR PBS Route Levels.
Olympic Way (Roxby Downs)	– Classification and ownership: Sealed local road owned by the Department for the portion south of Roxby Downs and owned by Roxby Downs Council for the northern portion. – Posted speed limit of 110 km/h north and south of Roxby Downs reducing to 80 km/h approximately 400 m north of Roxby Downs Quarry and 500 m south of the Roxby Downs Racecourse. Reduces to 50 km/h south of Roxby Downs Quarry and north of Roxby Downs Racecourse. – AADT Volumes: 430 vehicles (2011), 11.5% heavy vehicles (section south of Roxby Downs). Vehicle traffic data is currently not available for the section through and north of Roxby Downs. – Two-way, single carriageway with minimum 7 m road width. – Provides a key connection to Roxby Downs township from Olympic Dam Highway with Axehead Road being the only other connecting road. – NHVR PBS Route Level 1A (up to 20 m long trucks) for full extent and up to Level 3B (42 m long road trains) for the extents north of Axe head Road, which includes the section accessing Roxby Downs Quarry (Opal Road).
Borefield Road (Olympic Dam)	– Classification and ownership: Unsealed local road understood to be owned by Roxby Downs Council for portion east of Olympic Dam. Owned by the Department for the portion further north. – Posted speed limit unknown – assumed to be 60 km/h for the portion just east of Olympic Dam. – AADT Volumes: 22 vehicles (2025), 13.5% heavy vehicles – Two-way, single carriageway approximately 7 m wide.

Road name	Description
	– Provides an approximate 110 km connection between Olympic Dam Highway and Oodnadatta Track. – NHVR PBS Route Level 4A (up to 53.5 m long road trains)

5.2.4 Existing sites

The existing sites that are proposed to be used for the Project are largely located on similar roads to the new sites proposed to be used, with the additional local and arterial roads below to be considered. Vehicle access arrangements for the existing sites to be used primarily during Project construction are outlined in Table 26.

5.2.4.1 Arterial Road Network

Table 13 Other arterial roads considered linking to new temporary sites

Road name	Description
Iron Knob Road (Whyalla)	– Classification and ownership: Sealed undivided sub-arterial road owned by the Department – Posted speed limit of 110 km/h – AADT Volumes: 650 vehicles (2021), 20% heavy vehicles – It is approximately 6 m wide and extends approximately 50 km from north of Whyalla (at the intersection with Arthur Glennie Drive) at the eastern end to Iron Knob at the western end. – NHVR PBS Route Level 3A (up to 36.5 m long road trains)
Lincoln Highway (Whyalla - accessing Whyalla Port)	– Classification and ownership: Sealed arterial road owned by the Department – AADT volumes: 2,200 vehicles (2024), 21% heavy vehicles – Posted speed limit: 80 km/h at this location – Two-way, 4-lane, dual carriageway with minimum 3.3 m lane widths – NHVR PBS Route Level 3B (up to 42 m long road trains) – Turn treatments: CHR(s) and BAL – The portion of Lincoln Highway provides a key freight connection and highway corridor between Whyalla and Port Augusta.
Olympic Dam Highway (Pimba - accessing Pimba Rail Line)	– Classification and ownership: Sealed undivided highway owned by the Department – Posted speed limit of 80 km/h at this location transitioning to 110 km/h approximately 150 m north of the rail line. – AADT Volumes: 650 vehicles (2004), 18.5% heavy vehicles – It is approximately 7 m wide at this location and extends over 900 km from Pimba (at the intersection with Stuart Highway) in the south, through Woomera and west of Roxby Downs to Olympic Dam in the north. – NHVR PBS Route Level 4A (up to 53.5 m long road trains)

5.2.4.2 Local Road Network

Table 14 Other local roads considered linking to existing sites to be used

Road name	Description
Kloeden Street (Whyalla)	– Classification and ownership: Sealed undivided local road owned by Whyalla City Council. – No posted speed limit. Assumed to be 50 km/h. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 500 vehicles per day has been assumed. – Two-lane, two-way road with a carriageway width of approximately 7 m. – NHVR PBS Route Level: Nil (not cleared for any routes) – Located in a predominantly residential area, Kloeden Street provides access to the proposed Whyalla Accommodation Camp, which is situated on the plantation reserve bounded by Kloeden Street, Lincoln Highway, Mcdouall Stuart Avenue and Heurich Terrace.
Caroona Road (Port Augusta)	– Classification and ownership: Sealed, undivided collector road owned by Port Augusta City Council. – Posted speed limit of 80 km/h changing to 100 km/h south of Shacks Road (north of Port Augusta Airport). – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 2,500 vehicles per day has been assumed. – Two-lane, two-way road with a carriageway width of approximately 8 m. – Only the 400 m segment from Addison Road to Baluch Road is rated for NHVR PBS Route Level 3A (up to 36.5 m long road trains). Other sections of Caroona Road are not cleared for any routes. – Caroona Road provides access to Port Augusta Airport, El Alamein Airfield and Cultana Training Area, which is operated by the Department of Defence. It also provides access to a number of residential properties and a free campground. It is an alternative route connecting between Augusta Highway (just west of the bridge) and Eyre Highway.
Addison Road (Port Augusta)	– Classification and ownership: Sealed, undivided collector road owned by Port Augusta City Council. – Posted speed limit of 50 km/h. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 2,500 vehicles per day have been assumed. – Two-lane, two-way road with a carriageway width of approximately 10 m. – NHVR PBS Route Level: Nil (not cleared for any routes) – Addison Road provides access to residential properties and streets between Eyre Highway and Caroona Road.near Eyre Highway, and Port Augusta Airport from Eyre Highway.
Opal Road (Roxby Downs)	– Classification and ownership: Unsealed, undivided local road owned by the Municipal Council of Roxby Downs. – No posted speed limit. – AADT Volumes: N/A. Vehicle traffic data is currently not available. A conservative estimate of 100 vehicles per day has been assumed. – Two-lane, two-way road with a carriageway width of approximately 12 m.

Road name	Description
	– NHVR PBS Route Level: Nil (not cleared for any routes). – Opal Road provides access to Holcim Roxby Downs, which is one of the proposed commercial quarries for construction materials. There is also a motorsport track between the quarry and Olympic Way.
Blinman Road (Olympic Dam)	– Classification and ownership: Unsealed, undivided local road owned by the Department. – Posted speed limit of 50 km/h. – AADT Volumes: 2,000 (2019), 13% heavy vehicles – NHVR PBS Route Level: Nil (not cleared for any routes) – Two-lane, two-way road with a carriageway width of approximately 7 m. – Blinman Road primarily provides access to Olympic Dam Accommodation Village and Olympic Dam Airport.

5.2.5 Main Transfer Pipeline

Lateral access tracks to the Main Transfer Pipeline are to be provided at 10 km intervals from public roads. These tracks would primarily provide access for light and heavy vehicles to the workfront during construction. Based on the 10km spacings, approximately 41 access tracks would be required. Table 15 below states the minimum number of access tracks required for each section of the Main Transfer Pipeline.

Table 15 Minimum number of access tracks required for each section of the Main Transfer Pipeline.

Section	Approximate Length (km)	Minimum no. access tracks required
Section A - Mullaquana Station to Lincoln Gap (CH 0 – 80100)	80	8
Section B - Lincoln Gap to Kalaya (CH 80100 – 154100)	74	7
Section C – Kalaya to Bimba (CH 154100 – 251950)	98	10
Section D - Bimba to Olympic Dam (CH 251950 – 361487)	110	11
Section E - Carrapateena Lateral Pipeline	47	5
TOTAL		**41**

Several access tracks have been proposed by the Principal as suitable for heavy vehicle access to the pipeline and key Project sites during construction. These consist of existing tracks, which may require road widening and upgrades, as well as new tracks. These access tracks are discussed in detail in Appendix A.

Additionally, a new Mullaquana Station access road has been proposed parallel with and east of the pipeline alignment between Lincoln Highway and Eight Mile Creek Road. This is proposed as a preferred alternative access route (Option 2) to the Mullaquana Station Desalination Plant instead of using the local roads of Horseshoe Road and Mullaquana Road (Option 1). It also provides a more direct access to the Main Transfer Pipeline between chainages 12300 and 18000. Refer to section 6.2.1 for more details.

5.3 Road safety performance

Existing road crash data for the intersections and roads included within the study extents has been assessed. This data is recorded on Location SA between the years of 2020 and 2024. Refer to Figure 33, Figure 34, Figure 35, and Figure 36 for visual localities of the recorded crash incidents within the study extents. A summary of crash data is presented in Table 16, highlighting crashes within close proximities to the key Project sites and along key routes within Whyalla and Port Augusta.

Table 16 Summary of crash data for the existing roads within close proximity to the key study areas (Source: Location SA, 2020 - 2024)

Location	Road	Total crashes	Crash type	Severity
Mullaquana Station Desalination Plant / Intake and Outfall Tunnels	Eight Mile Creek Road (9.3 km south from Mullaquana Road - end of sealed road)	1	Roll Over: 1	Property Damage Only: 1
	Eight Mile Creek Road (9.2 km south from Mullaquana Road - end of sealed road)	1	Roll Over: 1	Injury: 3 (1 incident)
	Eight Mile Creek Road (430 m south-west of Mullaquana Road - end of sealed road)	1	Roll Over: 1	Property Damage Only: 1
	Mullaquana Road (3.3 km south-west of Horseshoe Road)	1	Side Swipe: 1	Injury: 1
	Horseshoe Road / Mullaquana Road Intersection	1	Hit Fixed Object: 1	Injury: 1
	Lincoln Highway / Horseshoe Road Intersection	1	Right angle: 1	Property damage only: 1
Whyalla	Lincoln Highway / Broadbent Terrace (between McDouall Stuart Avenue and Playford Avenue)	8 (3 at Norrie Avenue intersection)	Hit Fixed Object: 8 Right angle: 2 (Norrie Ave)	Property damage only: 8
	Playford Avenue / Lincoln Highway (Broadbent Terrace to Arthur Glennie Drive)	31 (8 at night)	Hit Pedestrian: 1 Right Angle: 10 Hit Fixed Object: 3 Side swipe: 4 Hit Parked Vehicle: 3 Right Turn: 4 Rear End: 4 Left road out of control: 1	Property Damage Only: 20 Injury: 8 Serious Injury: 4
	Norrie Avenue	11 (1 at night)	Right Angle: 7 Right Turn: 1 Hit Fixed Object: 1 Hit Parked Vehicle: 1 Rear End: 1	Property Damage Only: 6 Injury: 5
	Arthur Glennie Drive	3	Right Turn: 1	Property Damage Only: 1

Location	Road	Total crashes	Crash type	Severity
		(1 at night)	Right Angle: 1 Hit Animal: 1	Injury: 2 Serious Injuries: 3 (one crash)
	Industry Drive	2 (1 at night)	Hit Fixed Object: 1 Roll Over: 1	Property Damage Only: 1 Injury: 1 Serious Injury: 1
	Iron Knob Road (Arthur Glennie Drive to proposed crossing location for Main Transfer Pipeline)	4 (1 at night)	Hit Fixed Object: 1 Roll Over: 1 Right Angle: 1 Hit Animal: 1	Property Damage Only: 4
Whyalla to Port Augusta	Lincoln Highway & Eyre Highway (northern arm)	51	Rear End: 7 Hit Fixed Object: 8 Side Swipe: 5 Right Angle Collision: 1 Head On: 6 Roll Over: 9 Right Turn: 1 Hit Animal: 11 Left road out of control: 1 Other: 2	Property Damage Only: 41 Injury: 8 Fatality: 2
Lincoln Gap Pump Station	Eyre Highway / Lincoln Highway Intersection	3 (2 at night)	Roll Over: 2 Left road out of control: 1	Property Damage Only: 3
Port Augusta	Press Road	0	None recorded	None recorded
	Madland Street	0	None recorded	None recorded
	Eyre Highway (within 500 m of Press Road intersection)	2 (1 at night)	Rear End: 1 Hit Animal: 1	Property Damage Only: 2
	Stuart Highway (within 500 m of Madland Street intersection)	2 (both at same location at intersection with The Australian Arid Lands Botanic Garden entrance)	Hit Fixed Object: 1 Side Swipe: 1	Property Damage Only: 2
Port Augusta to Pimba	Stuart Highway (Madland Street to Olympic Dam Highway)	36	Rear End: 3 Hit Fixed Object: 12 Side Swipe: 2 Head On: 1 Roll Over: 10 Right Turn: 1 Hit Animal: 3 Left road out of control: 4	Property Damage Only: 23 Injury: 12 Fatality: 1
Kalaya Pump Station	Stuart Highway (900 m south of the proposed Kalaya Pump Station site)	1	Head On: 1	Property Damage Only: 1

Location	Road	Total crashes	Crash type	Severity
Mangata Pump Station	Stuart Highway (2.9 km south of the proposed Mangata Pump Station site)	1	Hit Fixed Object: 1	Property Damage Only: 1
Bimba Product Water Storage	Stuart Highway (4 km northwest from proposed Bimba Product Water Storage site)	1	Side swipe: 1	Property Damage Only: 1
	Stuart Highway (5 km northwest from proposed Bimba Product Water Storage site)	2 (1 at night)	Roll over: 2	Property Damage Only: 2
	Stuart Highway (7 km southeast from proposed Bimba Product Water Storage site)	1	Roll over: 1	Serious injury: 1
Pimba to Olympic Dam	Olympic Dam Highway (Pimba to Olympic Dam)	10	Rear End: 1 Hit Fixed Object: 3 Right Angle: 1 Head On: Roll Over: 3 Hit Animal: 2	Property Damage Only: 7 Injury: 3
	Olympic Way	3 (1 at night)	Right Angle: 1 Roll Over: 1 Other: 1 Hit Parked Vehicle: 1	Property Damage Only: 1 Injury: 2 Serious Injury: 1

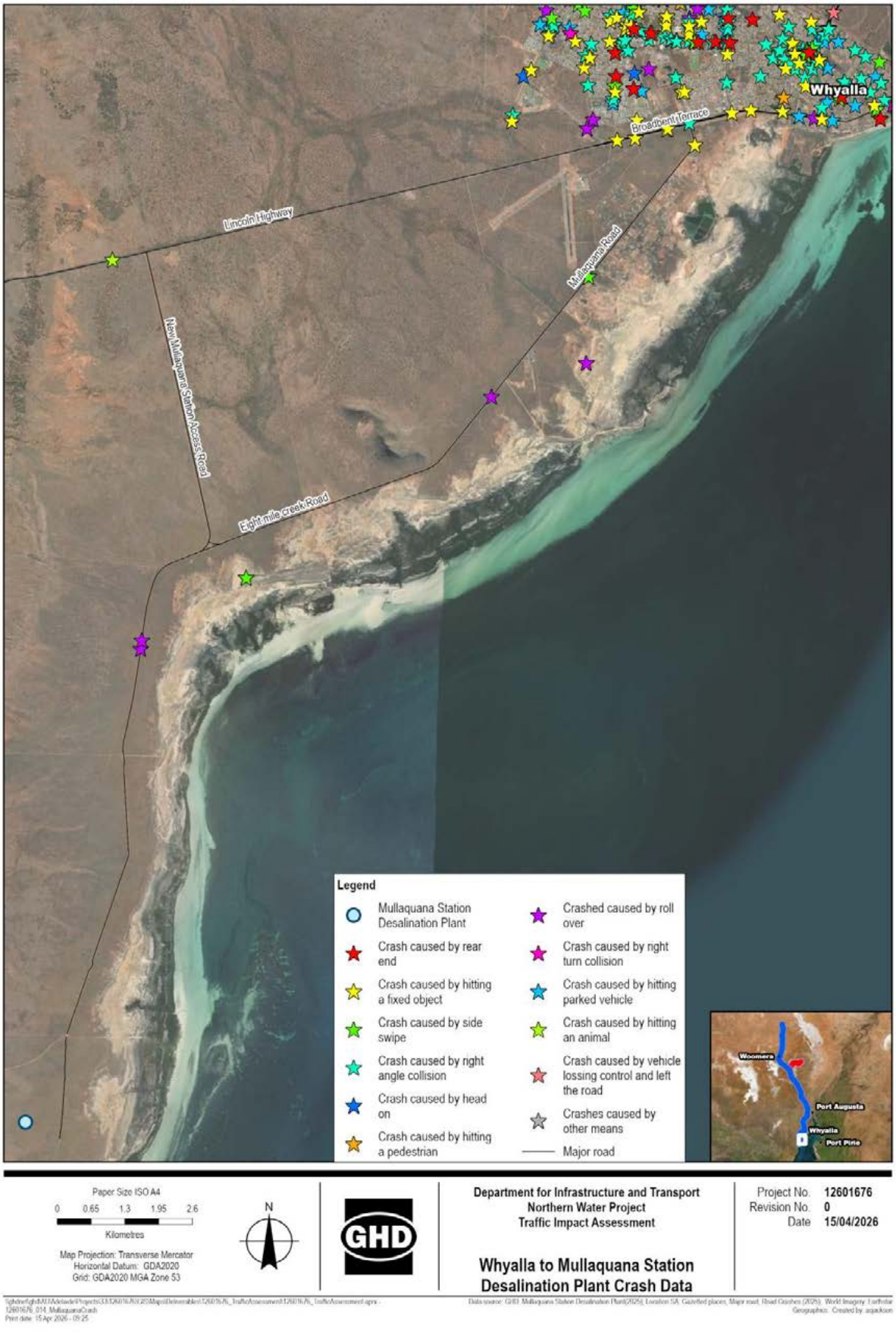


Figure 33 Whyalla to Mullaquana Station Desalination Plant Crash Data

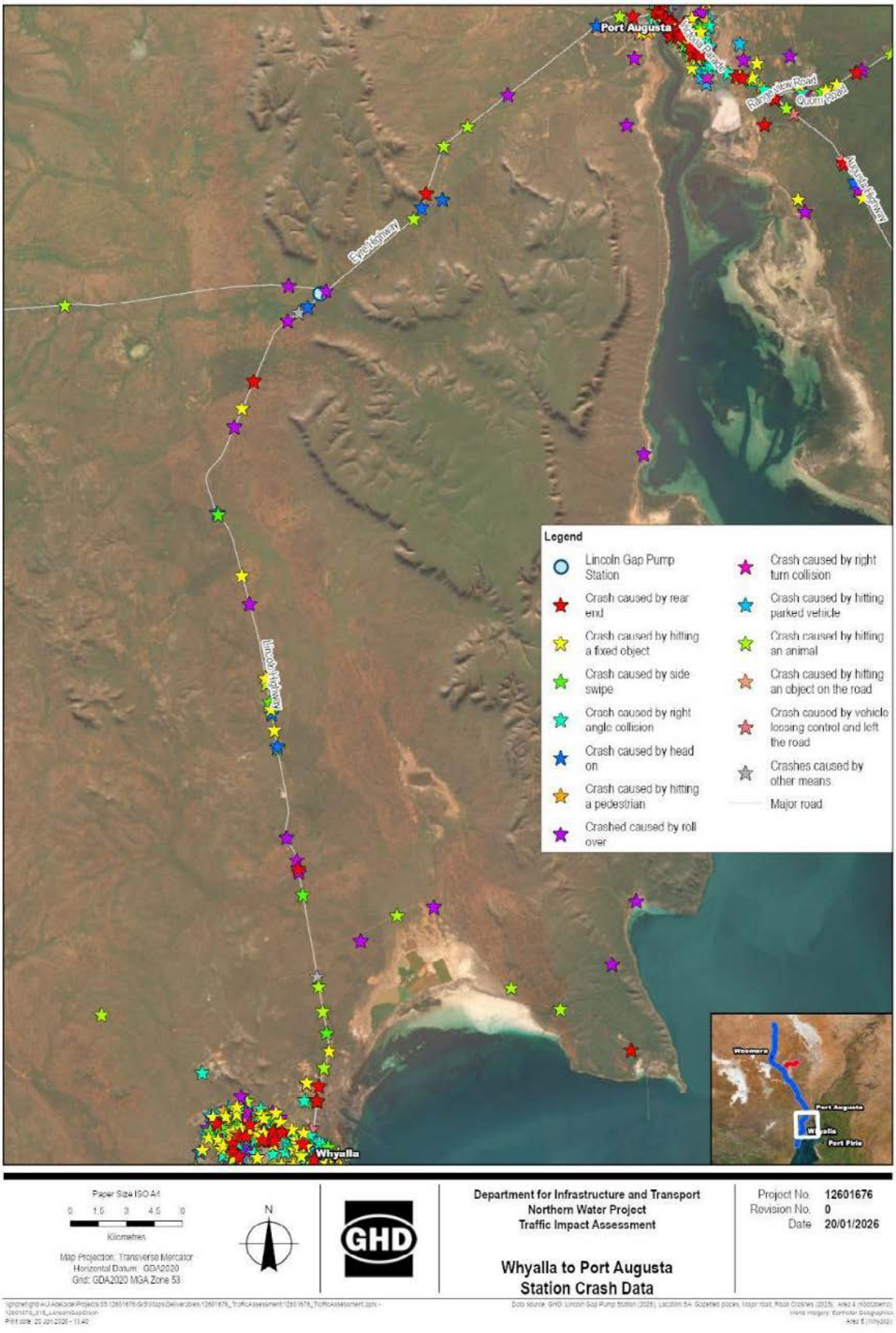


Figure 34 Whyalla to Port Augusta Crash Data

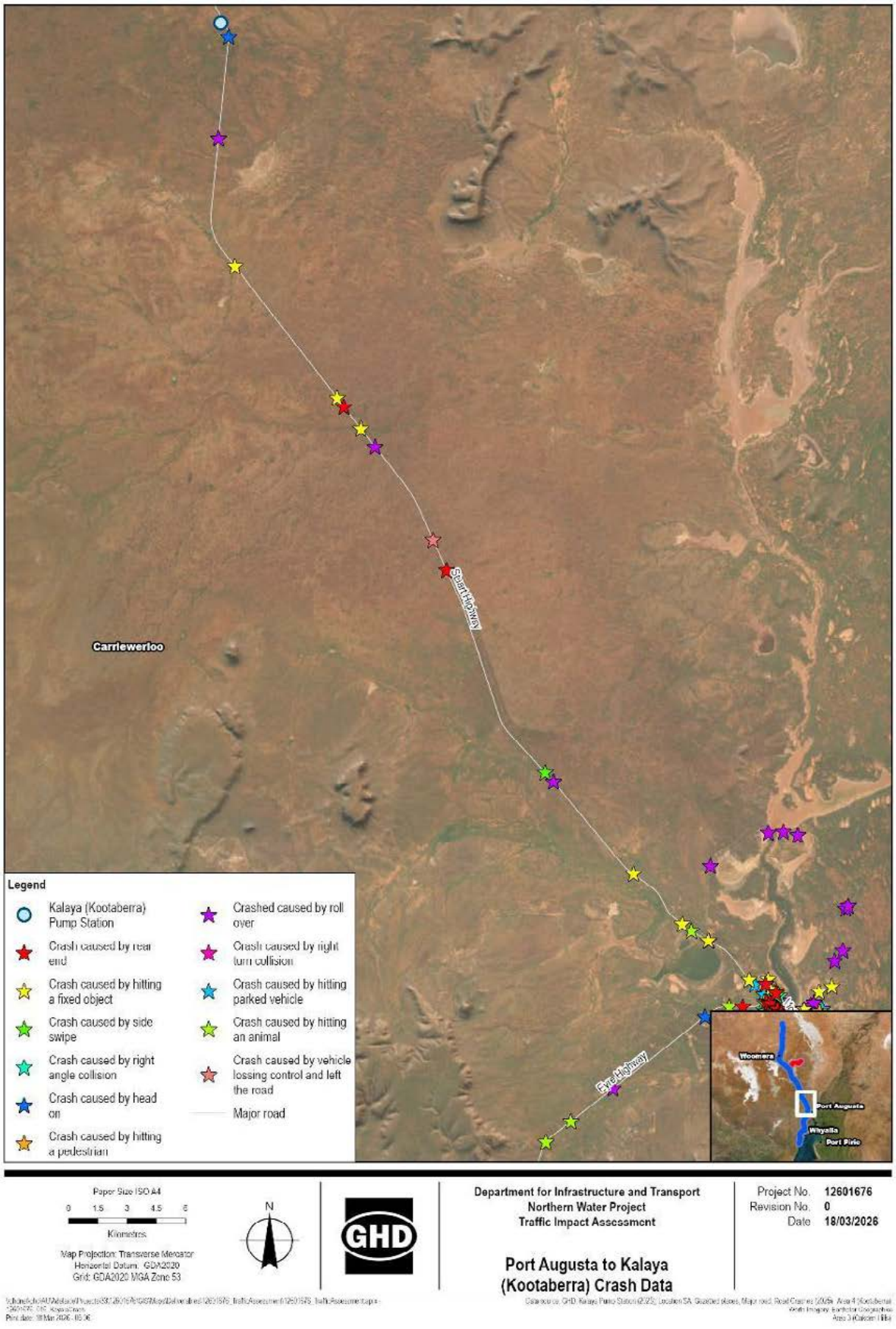


Figure 35 Port Augusta to Kalaya (Kootaberra) Crash Data

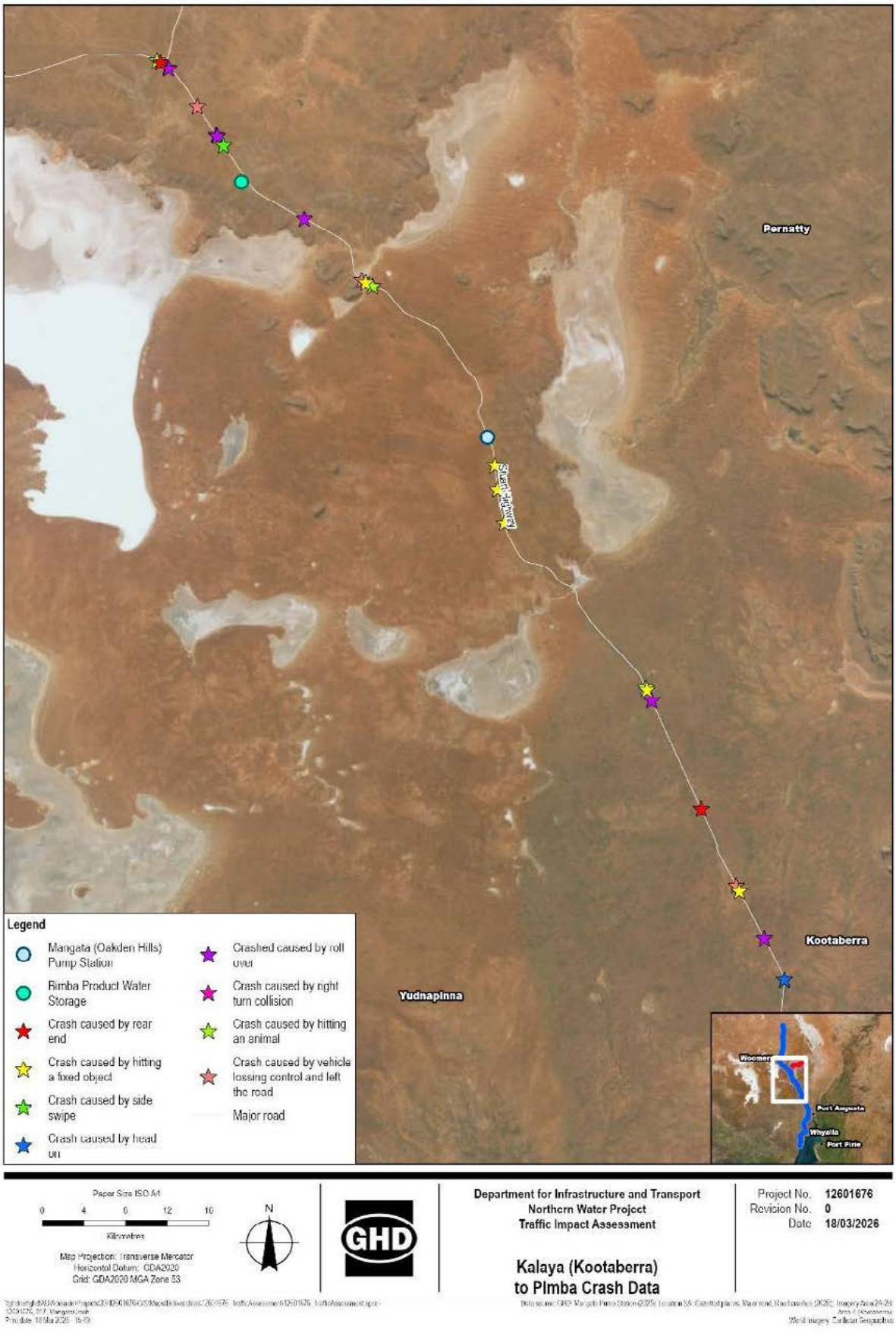


Figure 36 Kalaya (Kootaberra) to Pimba Crash Data

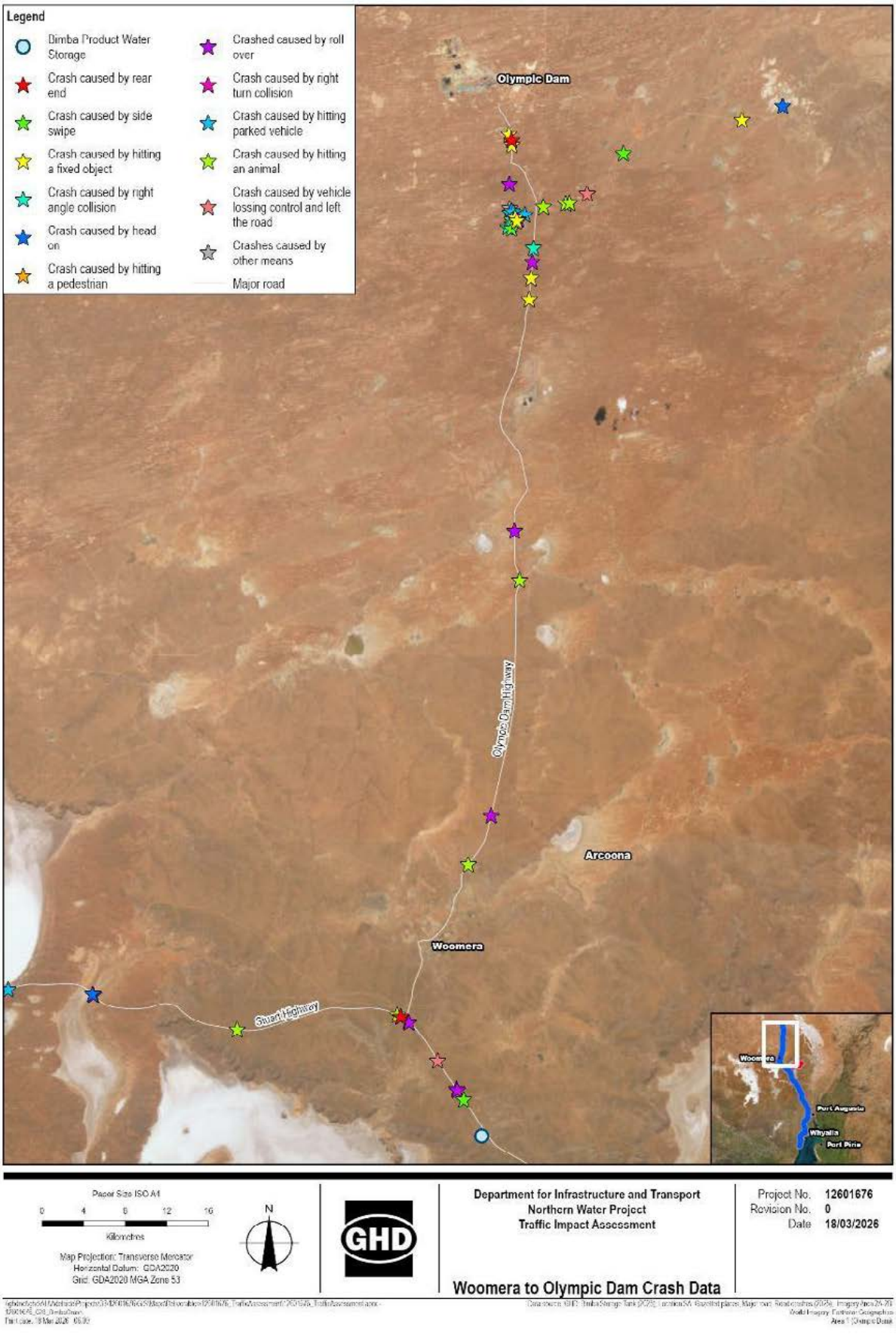


Figure 37 Pimba to Olympic Dam Crash Data

As expected, the crash occurrences are most densely seen within the towns (Whyalla, Port Augusta and Roxby Downs) as seen in the summary table and GIS maps above. Of the highway routes, the stretch of road between Whyalla and Port Augusta has the densest crash history.

5.3.1 Highway crash types

The percentages of crash types for each of the key highway segments can be seen in Figure 38, Figure 39 and Figure 40 below. There is a common theme for each of the segments, where the 3 most common crash types include 'Hit Fixed Object' (24% overall), 'Roll Over' (23% overall) and 'Hit Animal' (16% overall). These types of crashes are common for high-speed rural roads.

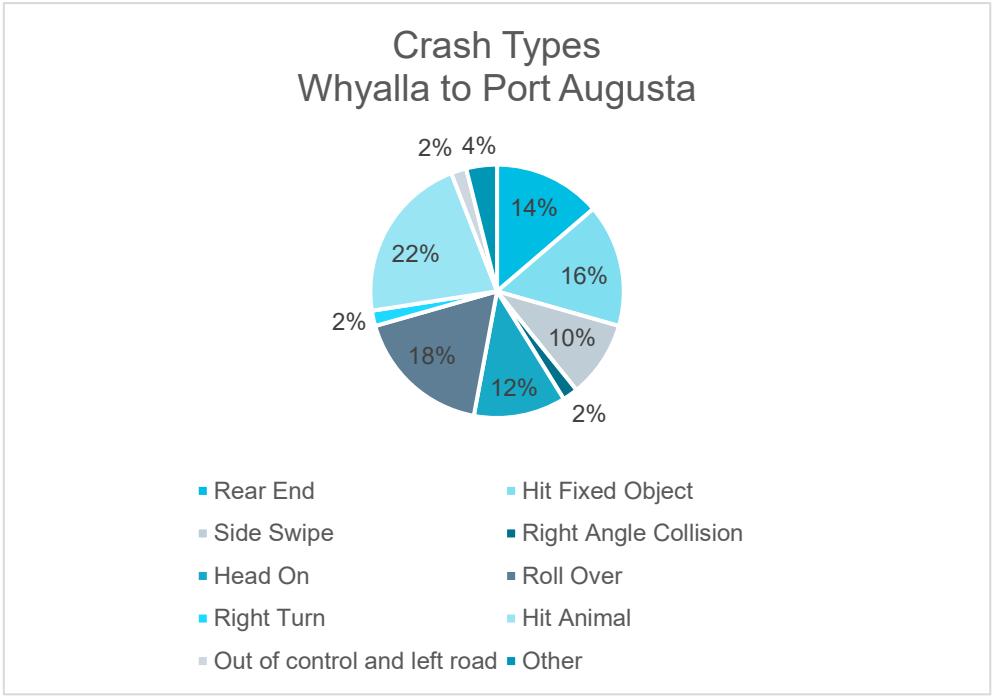


Figure 38 *Percentages of Crash Types between Whyalla and Port Augusta*

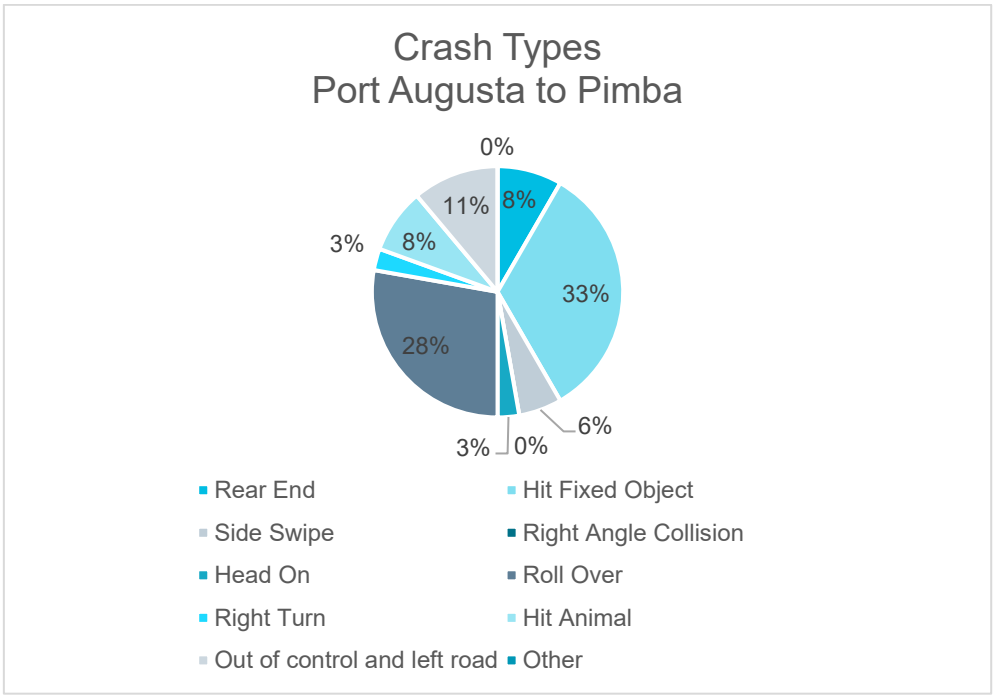


Figure 39 *Percentages of Crash Types between Port Augusta and Pimba*

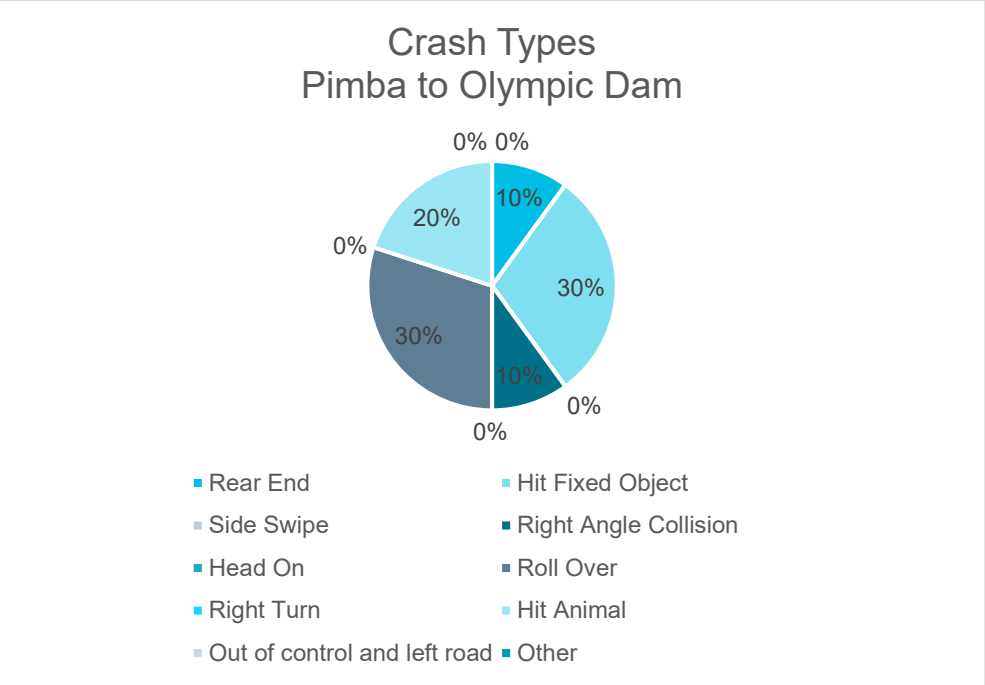


Figure 40 *Percentages of Crash Types between Pimba and Olympic Dam*

5.3.2 Highway crash severities

The percentage of crash severity types for each of the highway segments can be seen in Figure 41, Figure 42 and Figure 43. As seen in these figures, the highway crashes predominantly resulted in property damage only (73% overall). However, a reasonable proportion of crashes for all highway segments resulted in injuries (24% overall) and a small percentage (3% overall) resulted in fatality for the segment between Whyalla and Port Augusta and the segment between Port Augusta and Pimba. It appears that no crashes were recorded during 2020 to 2024 along these highways that resulted in a serious injury.

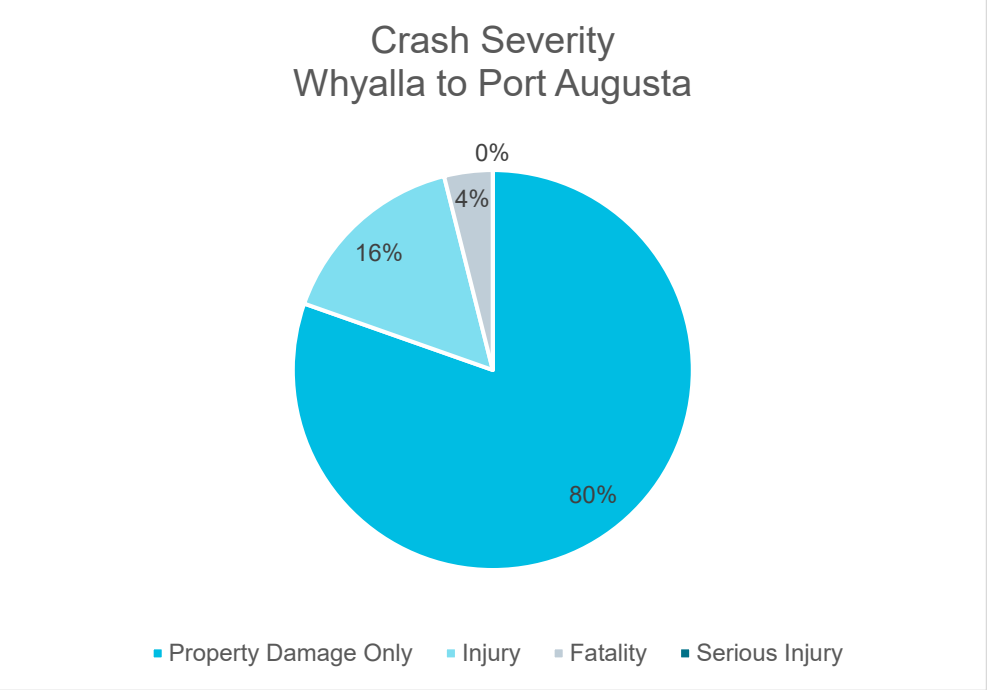


Figure 41 *Percentages of Crash Severities between Whyalla and Port Augusta*

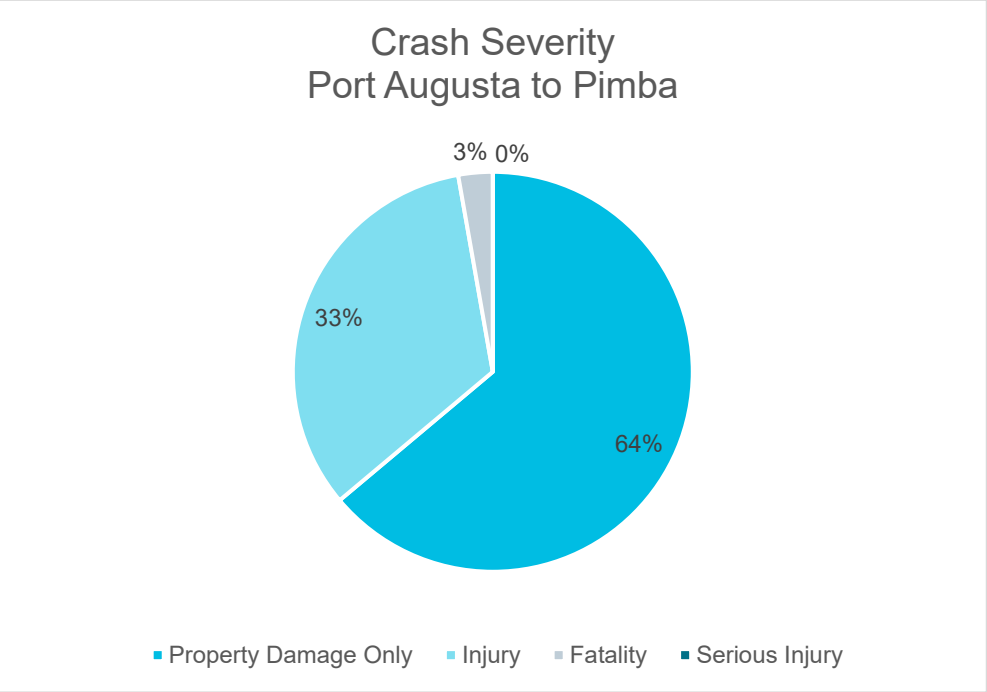


Figure 42 ***Percentages of Crash Severities between Port Augusta and Pimba***

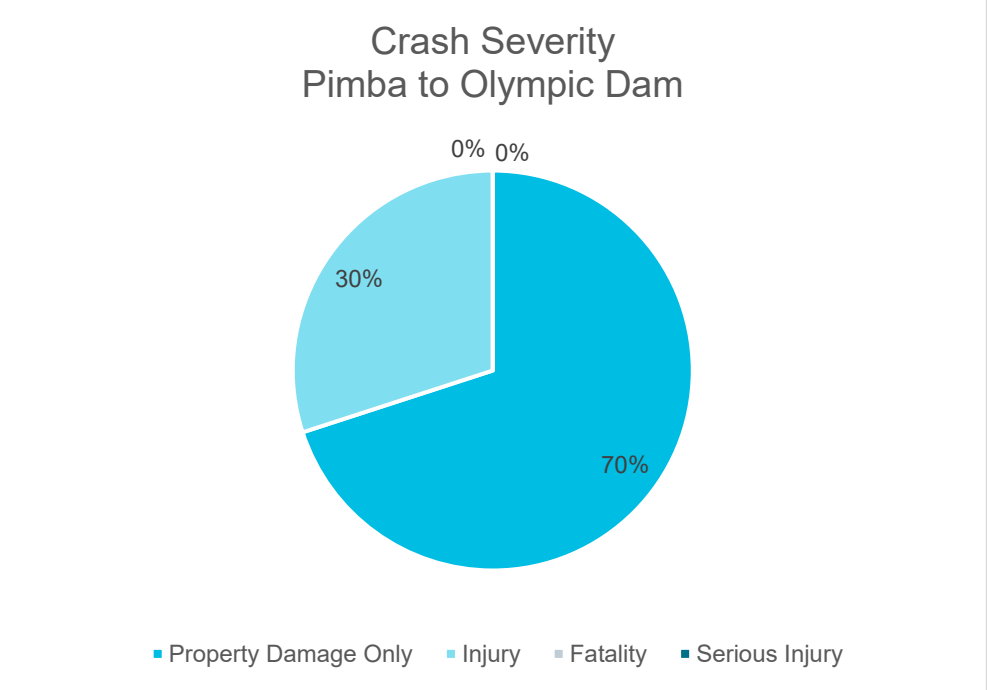


Figure 43 ***Percentages of Crash Severities between Pimba and Olympic Dam***

5.4 Public transport and bus routes

There are no existing public transport infrastructure or routes recorded on Location SA within the direct vicinity of the Project sites. However, Adelaide Metro records that there is currently a local bus service operated by Des's Transport that offers six key routes within the town of Whyalla, as shown in Figure 44. A few Whyalla school bus routes also operate on similar routes. There are also 2 public routes (map not available) and three dedicated school bus services offered in Port Augusta by Des's Transport, but these predominantly operate towards the east of the Project extents.

There are also regional bus services operated by Stateliner Premier Coach Services that offers passenger and small freight transport between Adelaide and a number of rural destinations in the region, including Port Augusta and Whyalla. The service timetable between Whyalla and Port Augusta is summarised below in Table 17.

Table 17 Stateliner bus timetables between Whyalla and Port Augusta

Origin	Operational days	Departure time from origin	Destination	Arrival time at destination
OTR Port Augusta East	Mon - Fri	1:27 pm (excluding Wed) 5:24 pm 8:58 pm	Whyalla Stateliner Terminal	2:34 pm (excluding Wed) 6:30 pm 10:05 pm
	Sat	1:27 pm 8:58 pm		2:34 pm 10:05 pm
	Sun	3:09 pm 8:58 pm		4:15 pm 10:05 pm
Whyalla Stateliner Terminal	Mon - Fri	6:00 am 9:00 am 11:55 am (Wed only) 12:00 pm (Mon only) 1:55 pm (Tue, Fri only)	OTR Port Augusta East	7:05 am 10:05 am 1:02 pm (Wed only) 1:05 pm (Mon only) 3:02 pm (Tue, Fri only)
	Sat, Sun	9:00 am 11:55 am		10:05 am 1:02 pm

Due to the relatively low frequency of public transport in the project vicinity and limited overlap with the project sites, it is assumed that interactions between project traffic and public/school bus routes would be negligible based on a review of publicly available information published for Whyalla and Port Augusta. Also, based on advice from the Constructability Advisor, it is assumed that the construction workers would have private light vehicle and minibus transport available for use as required. Hence, bus routes have not been considered in further detail within this TIA.



Figure 44 *Whyalla Bus Network Map (Source: Des's Transport, 2025)*

5.5 Active transport

Given the rural context, it is not anticipated that any trips to the proposed sites for construction or operation purposes would be made on foot or by bicycle. Hence, consideration for active transport has been limited to identification of existing footpaths, crossings and routes for pedestrians and cyclists within the direct vicinity of the proposed Project sites and route to the Desalination Plant.

There are no known pedestrian footpaths or formalised crossings on the public roads that provide direct access to the new permanent Project sites. There is also no dedicated cycling infrastructure currently providing direct access to any of the Project sites. Pedestrian and cycling infrastructure within the study extents are limited to within the nearby townships. Hence, vehicle interaction with pedestrians or cyclists is most likely to be experienced within townships (e.g. Whyalla, Port Augusta, Pimba, etc.) and internally within project sites. Active transport for the internal site movements is considered outside of the scope of this TIA.

Pedestrians are also likely to be encountered walking on Horseshoe Road or Mullaquana Road (Option 1 route to the Desalination Plant). These roads do not have any safety barriers or sealed footpaths but offer wide unsealed road verges, typically 3 m in width or more. Based on signage observed on Google Street View, it appears that the Whyalla Airport reserve off Mullaquana Road is also used as a recreational exercise area for pedestrians, dogs and horse riders. It appears that horse riders may travel along Mullaquana Road, with an informal crossing point just west of Saltbush Road. The number and frequency of users at this crossing is unknown. The alternative proposed access route (Option 2) to the Desalination Plant via the new Mullaquana Station access road would avoid this potential interaction between vehicles and pedestrians. Refer to section 6.2.1 for more details.

5.6 Air operations

Existing airports considered for Project use include Whyalla Airport, Port Augusta Airport and Olympic Dam Airport. The flight movements to and from these airports are summarised in Table 18, while the locations of these airports in relation to Adelaide can be seen in Figure 45.

Table 18 Details and movement data of the nearest airports to the project extents

Airport	Details	Flight Movements
Whyalla Airport	Whyalla Airport is a regional airport operated by Whyalla City Council and provides travel connections to and from Adelaide. The flight duration to or from Adelaide is approximately 45-50 minutes. Whyalla Airport is located between Mullaquana Road and Lincoln Highway, and the primary access to the airport is from Lincoln Highway. Whyalla Airport has the capacity for operating helicopters with Becker Helicopters offering services to support mining, agricultural and other industrial and commercial operations (Whyalla City Council, 2018). In 2025, a $30 million upgrade was delivered which allows larger, 74-seat Q400 aircrafts to operate. Runway dimensions: 1686 x 30 m Driving distance from Adelaide: 390 km (4.25 h)	– 15 DHD8 (Dash-8-400) flights per week between Whyalla and Adelaide each with a capacity of approximately 74 passengers. This comes to approximately **1,100 passengers per week between Adelaide and Whyalla**. Also 1 flight to Port Pirie per week with a capacity of approximately 5 passengers. (Flight Radar, 2026) – 21,837 outbound passengers per year on average from 760 aircraft movements and 21,578 inbound passengers from 762 aircraft movements (DITRDCSA, 2024)
Port Augusta Airport	Port Augusta Airport is owned and operated by the Port Augusta City Council. There are no regular passenger flights except charter services, predominantly for FIFO workers. Additionally, the airport is a major hub for the Royal Flying Doctor Service (RFDS) operations. Based on the Port Augusta City Council's 2016 Master Plan, the airport is capable of handling 190,000 - 200,000 aircraft movements per year.	– 3 DHD8 (Dash-8-400) flights per week from Port Augusta to Adelaide with a capacity of approximately 74 passengers. This comes to approximately **222 passengers per week from Port Augusta to Adelaide**. Also 1 flight with a capacity of approximately **74 passengers from Adelaide to Port Augusta per week**. (Flight Radar, 2026) – Approximately 16,000 passengers per year on average (Port Augusta City Council, 2016)

Airport	Details	Flight Movements
	Port Augusta Airport is located approximately 4 km south-west of Port Augusta, with primary access to the airport from Caroona Road. Runway dimensions: 1650 x 30 m Driving distance from Adelaide: 316 km (3.5 h)	
Olympic Dam Airport	Olympic Dam Airport is a privately owned regional airport operated by BHP and primarily serves the Olympic Dam mine and its surrounding community. Olympic Dam Airport is located approximately 8 km north of Roxby Downs, with primary access to the airport from Blinman Road via Olympic Dam Highway. Potential future expansion of the airport is also in planning. Runway dimensions: 1860 x 30 m Driving distance from Adelaide: 574 km (6.25 h)	– 27 E190 (Embraer 190) flights per week between Olympic Dam Airport and Adelaide with a capacity of approximately 84 passengers. This comes to approximately **2,200 passengers per week between Olympic Dam and Adelaide.** Also, 1 flight per week runs between Olympic Dam and Port Augusta with a capacity of approximately 12 passengers. (Flight Radar, 2026) – 54,083 outbound passengers per year on average from 677 aircraft movements and 47,701 inbound passengers from 626 aircraft movements (DITRDCSA, 2024)

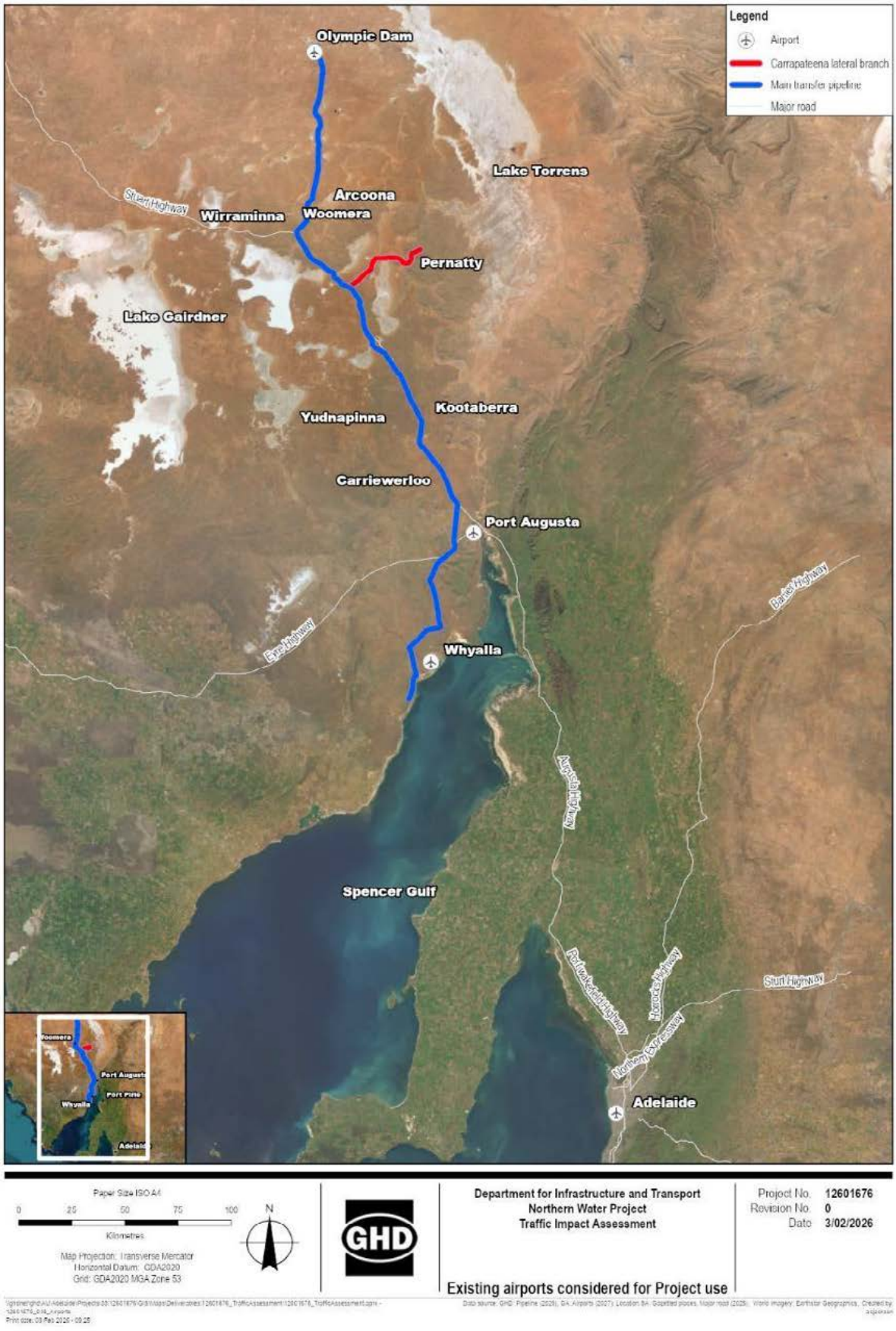


Figure 45 Existing airports considered for Project use

5.7 Maritime operations

Whyalla Port

Whyalla Port is owned and operated by OneSteel Manufacturing Pty Ltd (trading as SIMEC Mining) and primarily used for steelwork operations and associated mining activities (Whyalla Port Handbook, Flinders Port Holdings, 2023). Cargo handled through the port typically includes steel and mining materials. The port operator has previously leased the quay facilities to external operators, including recently to the Ares Group for offloading onshore windfarm components (Systra, 2025). Access to the port requires permission from OneSteel.

Whyalla Port is composed of three main areas, each with their own unique shipping operations.

Table 19 Summary of the main operational areas at Whyalla Port

Area	Dimensions	Description
Inner Harbour	**Length:** 1789 m (west to east) **Width:** 30.5 – 35 m **Channel depth:** 10.0 m **Berth depth:** 8.6 – 10.7 m	Used primarily for the loading and unloading of steelmaking bulk materials, finished steel products, iron ore products, coke byproducts and third-party cargo. Consists of the following: • Bulk Berth • Products Berth • Inner Harbour Transhipment Berth • Swing Basin The maximum permitted vessel length is 204 m.
Outer Harbour	**Length:** 274 m **Width:** 45.7 m **Depth:** 10.7 m	Used primarily for the loading of bulk iron ore products. Consists of the following: • Outer Harbour Transhipment Berth • Swing Basin The maximum permitted vessel length is 202 m.
Offshore Transhipment Points	Exclusion zone of 0.5 nautical miles (nm) in radius for each of the four locations. Vessels not involved in the transhipment operation must not enter during operations.	Consists of four fixed anchorages designated for offshore transhipment operations. The locations of the four points are as follows: • TP1: 33 06.12’ S 137 38.30’ E (approximately 5.0nm from Whyalla Port) • TP2: 33 09.12’ S 137 38.21’ E (approximately 7.5nm from Whyalla Port) • TP3: 33 10.12’ S 137 37.12’ E (approximately 9.0nm from Whyalla Port) • TP4: 33 07.36’ S 137 39.00’ E (approximately 5.0nm from Whyalla Port) The vessels used in the transhipment operations consist of the FOTB Spencer Gulf and two towed barges.

An approximation of yearly vessel calls in Whyalla Port has been made through a comparison of various port tracking portals including myShip Tracking, Vessel Finder, Flinders Ports and MagicPort. The data is presented below in Table 20. Data was collected from a desktop assessment of public information and represents time periods available at the time of inquiry. It is suitable for the purposes of gaining a high-level appreciation of current movements within Whyalla Port, but is not considered a future forecast, nor an accurate representation of average yearly vessel movements over long periods. Movements can fluctuate based on commodity demand.

Table 20 Vessel calls at Whyalla Port by type (2024-2025)

Vessel type	Vessel calls (2024-2025)
Tugs and harbour craft (home ported vessels)	4
Bulk carrier	55
General cargo ship	1
Pilot vessel	89

To supplement the desktop review of vessel calls at Whyalla Port, vessel activity within the broader Upper Spencer Gulf region was examined using Automatic Identification System (AIS) data obtained from the Australian Maritime Safety Authority (AMSA) Craft Tracking System (CTS). The dataset used was the Vessel Traffic Data Sub-areas – February 2026, which contains vessel traffic records derived from AIS data collected from terrestrial and satellite AIS sources (AMSA, 2026).

The AIS dataset was spatially filtered to capture vessel activity within the Upper Spencer Gulf region using a geographic bounding box, encompassing Whyalla Port, Port Bonython and surrounding waters. Vessel types recorded within the filtered dataset were summarised by aggregating AIS records by vessel type to provide an overview of vessel activity within the region.

Analysis of the filtered dataset identified approximately 132,578 AIS vessel activity records (interactions) by vessel type within the study area for the month of February 2026. The most frequently recorded vessel types included sailing vessels (45,406 records), cargo ships (27,265 records), pleasure craft (24,425 records), tug vessels (10,278 records) and pilot vessels (6,487 records). Fishing vessels accounted for approximately 3,903 AIS records within the dataset. The approximate number of active vessels during this period is provided in Table 21 below.

Table 21 Vessels recorded in February 2026

Type of vessels	No of vessels	Percent
Cargo ship	26	28.0%
Fishing	3	3.2%
Other - All	3	3.2%
Recreational	13	14.0%
Port tender, pilot vessels and tugs	14	15.1%
Sailing	27	29.0%
Search and Rescue	3	3.2%
Tankers	4	4.3%
Grand Total	93	100.0%

These results indicate that maritime activity in the Upper Spencer Gulf consists of a mix of:

– commercial shipping associated with port operations, which form about a third of vessel movements
– harbour support vessels such as tugs and pilot vessels, which form approximately 15% of the vessel movements
– commercial fishing vessels, which form only 3% of the recorded data
– recreational vessels including sailing and pleasure craft, which form about 43% of the recorded data.

Note that most ocean going commercial and recreational vessels are required to carry AIS under international maritime regulations and Australian navigation requirements, however the data may not capture all smaller fishing or recreational vessels operating within the region. In addition, the dataset represents vessel activity for a single month (February 2026) and therefore provides an indicative snapshot of vessel activity rather than a long-term annual average.

Commercial fishing is an established marine activity within Spencer Gulf. The region supports several managed fisheries including the Spencer Gulf Prawn Fishery and the South Australian Marine Scalefish Fishery, which operate throughout the gulf targeting species such as Western King Prawns (Melicertus latisulcatus), snapper and

other scalefish species (PIRSA, 2020). These fisheries operate across defined management areas within Spencer Gulf in accordance with fishery-specific management plans.

Whyalla Marina

The Whyalla Marina is accessed by vehicle via Buttlingarra Way. The marina has an existing carpark and multi-lane boat ramp and is also home to the Whyalla Yacht Club. There are over 30 mooring points on the mooring jetty and a number of mooring points located adjacent to the Yacht Club. Permission from Whyalla Council would be required to use the marina and boat ramp.

The Whyalla Marina is reported to be used by over a thousand recreational vessels each year for fishing, sailing, and cruising (Discover Boating, 2025). Users include members of the public, the Whyalla Yacht Club, Whyalla Sea Rescue, Whyalla Sportfishing Club, Spencer Gulf Adventures tour groups, and other boating groups and companies. The Whyalla Foreshore Jetty is used primarily for recreational fishing and public access. It does not support commercial vessel operations and is therefore not relevant to Project marine logistics. This marina is not considered in detail in this TIA given its recreational nature, combined with the relatively infrequent use (maximum 1 return trip per day expected) and low impact that is anticipated to be presented by the Project (1 vessel expected).

5.8 Rail operations

There are no passenger rail services currently within the study area, only freight rail. The current rail network within the study extents that is recorded on Location SA can be seen in Figure 46. The railway lines noted to be open and in operation include the following freight lines:

Whyalla Railway Lines

– Whyalla – Iron Duke Track: connecting west to the rural towns of Iron Knob, Iron Baron and Iron Duke.
  - This track and land are wholly owned by OneSteel.
– Whyalla Branch: connecting north to Port Augusta via Whyalla Port.
  - Australian Rail Track Corporation (ARTC) owns the track and land for most of this section, although a combination of OneSteel, Aurizon Bulk Central and private ownership are seen for tracks at the Whyalla Port and its immediate surroundings.

Port Augusta Lines

– Whyalla Branch: connecting south to Whyalla (as previously mentioned).
– Port Augusta – WA Border: connecting north-west to Pimba.
– Coonamia – Port Augusta: connecting south to Port Pirie.

Pimba Lines

– Port Augusta – WA Border: connecting west to Tarcoola (and WA beyond) and south-east to Port Augusta (as previously mentioned). Existing spur line at Pimba noted to be open and in use (Location SA, 2018).

Based on the Constructability Report, only the Pimba Line is feasible to use for delivery of pipes during construction. Location SA (2018) data indicates that the spur line at Pimba is open and in use, however this should be clarified as aerial imagery appears to show this spur line as partially closed and possibly overgrown in some locations. This spur line, if usable, would likely be used for the transfer of pipes from trains to heavy vehicles.

The National Freight Data Hub (NFDH) records a train count of over 2800 trains on the Pimba Line between December 2022 and November 2023. The primary commodity type transported on this line was recorded to be ‘Intermodal + Steel’, making up over 90% of the recorded trains. Other commodity types transported on this line during this period included minerals and general freight, but in much smaller quantities.

ARTC (2024) data indicates that the average train length passing through is approximately 1800 metres long. Based on 2025 data sourced from the Australian Rail Track Corporation (ARTC) for rail services into Pimba, the following train schedule movements in Table 22 were reported. This data indicates that train movements have

potentially increased through Pimba in more recent years, resulting in an estimate of nearly 100 trains passing through each week and almost 5000 trains per year.

Table 22 Pimba line weekly train services (ARTC, 2025)

Weekday	UP		DOWN		TOTAL DAY	TOTAL NIGHT
	Day (7am - 10pm)	Night (10pm - 7am)	Day (7am - 10pm)	Night (10pm - 7am)		
Mon	5	1	2	2	7	3
Tues	3	2	4	1	7	3
Wed	3	6	7	1	10	7
Thurs	4	2	4	4	8	6
Fri	2	3	4	2	6	5
Sat	4	1	7	3	11	4
Sun	3	5	6	3	9	8
Average					**9**	**6**
Weekly Total					**58**	**36**



Figure 46 Existing Railway Lines within the Study Area

6. Proposed project

6.1 General overview

The Project proposes to introduce several new permanent sites associated with the Desalination Plant and Transfer System infrastructure, as well as some new temporary sites during the construction phase. Many existing sites would also be upgraded, developed or utilised to either provide new permanent infrastructure (such as electrical substations), temporary facilities (such as accommodation camps or laydown areas), or construction resources (such as commercial quarries). A summary of the project sites is provided in Table 23.

The Main Transfer Pipeline would typically be considered in the following sections:

– Section A – Mullaquana Station to Lincoln Gap (CH 0 – 80100)
– Section B - Lincoln Gap to Kalaya (CH 80100 – 154100)
– Section C – Kalaya to Bimba (CH 154100 – 251950)
– Section D – Bimba to Olympic Dam (CH 251950 – 361487)
– Section E - Carrapateena Lateral Pipeline

Table 23 Project sites

Section of pipeline infrastructure	
New Sites (Permanent)	
1	Mullaquana Station Desalination Plant
2	Lincoln Gap Pump Station
3	Mangata Pump Station
4	Kalaya Pump Station
5	Bimba Product Water Storage
6	Mullaquana Station Substation
7	Kootaberra Substation
New Sites (Temporary)	
8	6 Laydown Areas – Whyalla, Carriewerloo, Nutt, Mount Gunson, Pimba & Purple Downs
9	6 Stack Sites – Carriewerloo, Nutt, Oakden Hills, Lake Windabout & Purple Downs
10	Pimba Proposed Accommodation Camp – within the KAC parcel laydown area as proposed in Section 9.3 of the Constructability Report (Systra, 2025)
11	Whyalla Segment Yard
12	Offshore Jack-Up Barge (JUB) Workfront
Existing Sites	
13	Coraberra Hill Substation (site upgrade)
14	Mount Gunson Substation (site upgrade)
15	Whyalla Proposed Accommodation Camp
16	Port Augusta Proposed Accommodation Camp
17	Roxby Downs Proposed Accommodation Camp
18	Whyalla Boral Quarries
19	Port Augusta Council Quarry
20	Mount Gunson Mines AMJ Musolino Quarry
21	Roxby Downs Holcim Quarry

Section of pipeline infrastructure	
22	Pimba Rail Line
23	Whyalla Marine Port

The full details of the proposed development are provided in the Reference Design Report (GHD, 2025). The nominated desalination plant site is near Mullaquana station, located approximately 25 km south of Whyalla, as identified by the Department. The site consists of the desalination plant, high voltage switchyard, intake and outlet pump station areas, TBM launch facility, construction activity and enabling/temporary works, stormwater management systems and future proofed land to support the potential development of additional treatment plant up to the Ultimate capacity. For the purposes of the reference design, the plant is to be located in the south-eastern corner of the identified parcel (H560400 Section 53), which is Crown land with a lease currently held by Joyce Pastoral Pty Ltd.

6.2 Access for new permanent sites

The following section describes the proposed access arrangements to the new permanent sites to be developed.

6.2.1 Mullaquana Station Desalination Plant

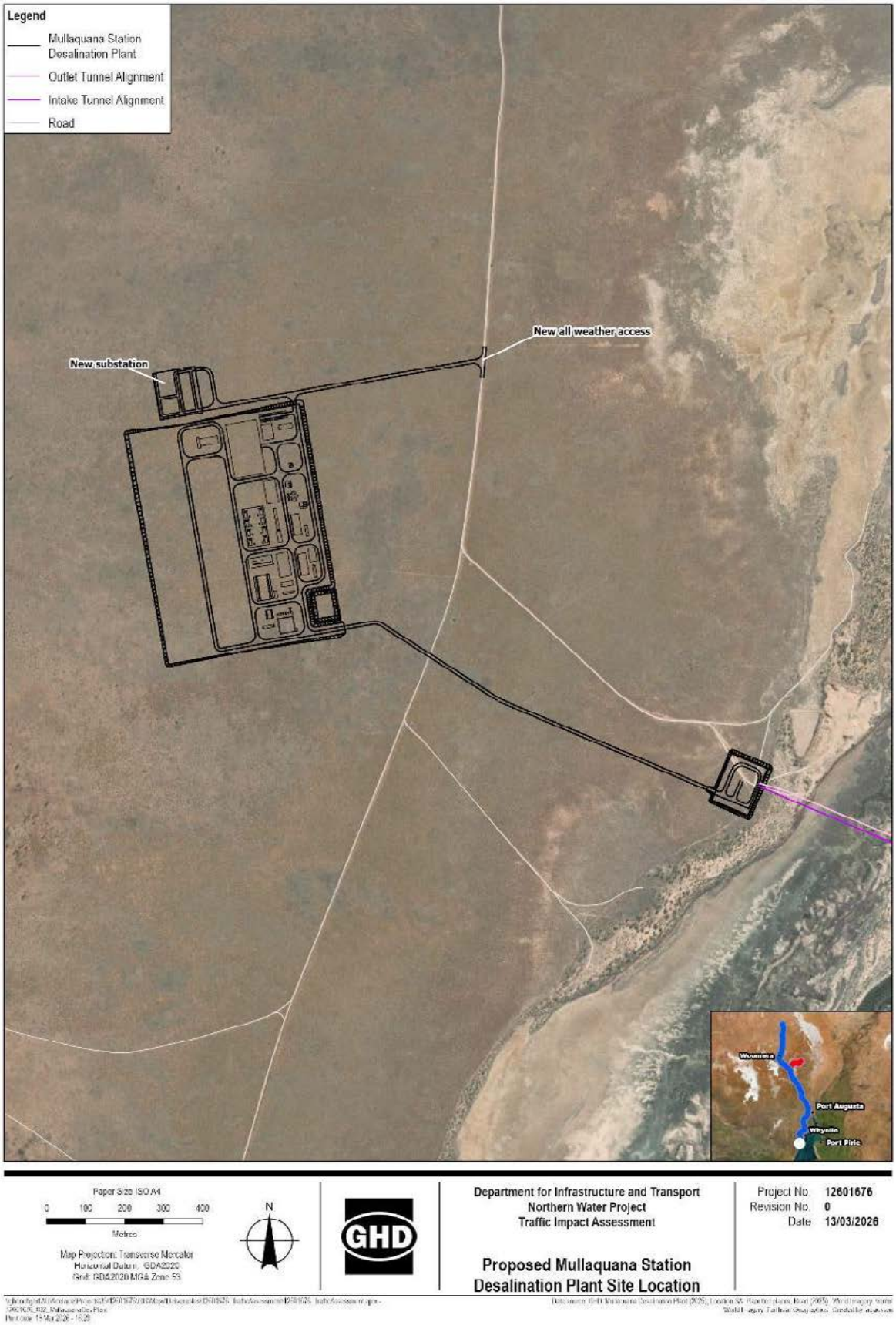
Vehicular access to the proposed Mullaquana Station Desalination Plant is anticipated to be from the town of Whyalla. Two routes have been identified and assessed within this TIA, as previously discussed in section 5.1.1.

These routes include the existing access route via Horseshoe Road and Mullaquana Road (Option 1) and the proposed alternative route via the new Mullaquana Station access road (Option 2). The new Mullaquana Station access road is considered the preferred route in this TIA, however both have been presented for consideration. These routes and their key access roads have been outlined in Table 24, as previously referred to in Section 5.2.

Table 24 Mullaquana Station Desalination Plant access roads

Access road	Approximate extents (km)	Start	End
Option 1 - Existing route via Horseshoe Road and Mullaquana Road			
Horseshoe Road	0.4	Lincoln Highway Intersection	Mullaquana Road Intersection
Mullaquana Road	5.8	Horseshoe Road Intersection	Eight Mile Creek Road (unsealed)
Eight Mile Creek Road (unsealed)	19	Mullaquana Road	Proposed Mullaquana Station Desalination Plant Site
Option 2 - Proposed alternative route via the New Mullaquana Station Access Road (preferred)			
Lincoln Highway	12	Whyalla	New Mullaquana Station Access Road Intersection
New Mullaquana Station Access Road	6	Lincoln Highway Intersection	Eight Mile Creek Road Intersection
Eight Mile Creek Road (unsealed)	12	New Mullaquana Station Access Road Intersection	Proposed Mullaquana Station Desalination Plant Site

Direct access to the site is proposed to be via a new all-weather access track from Eight Mile Creek Road, as shown in Figure 47.



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Figure 47 Proposed Mullaquana Station Desalination Plant Site Arrangement based on the Reference Design (GHD, 2025)

6.2.2 Lincoln Gap Pump Station

Vehicular access to the Lincoln Gap Pump Station is currently proposed to be on the southern side of the Eyre Highway (West) arm approximately 250 m west of the intersection between Eyre Highway and Lincoln Highway, as shown in Figure 48.

Given the proximity of the Coraberra Hill Substation site that is to be upgraded, the vehicle traffic volumes for these two sites during construction have been considered as a combined total.

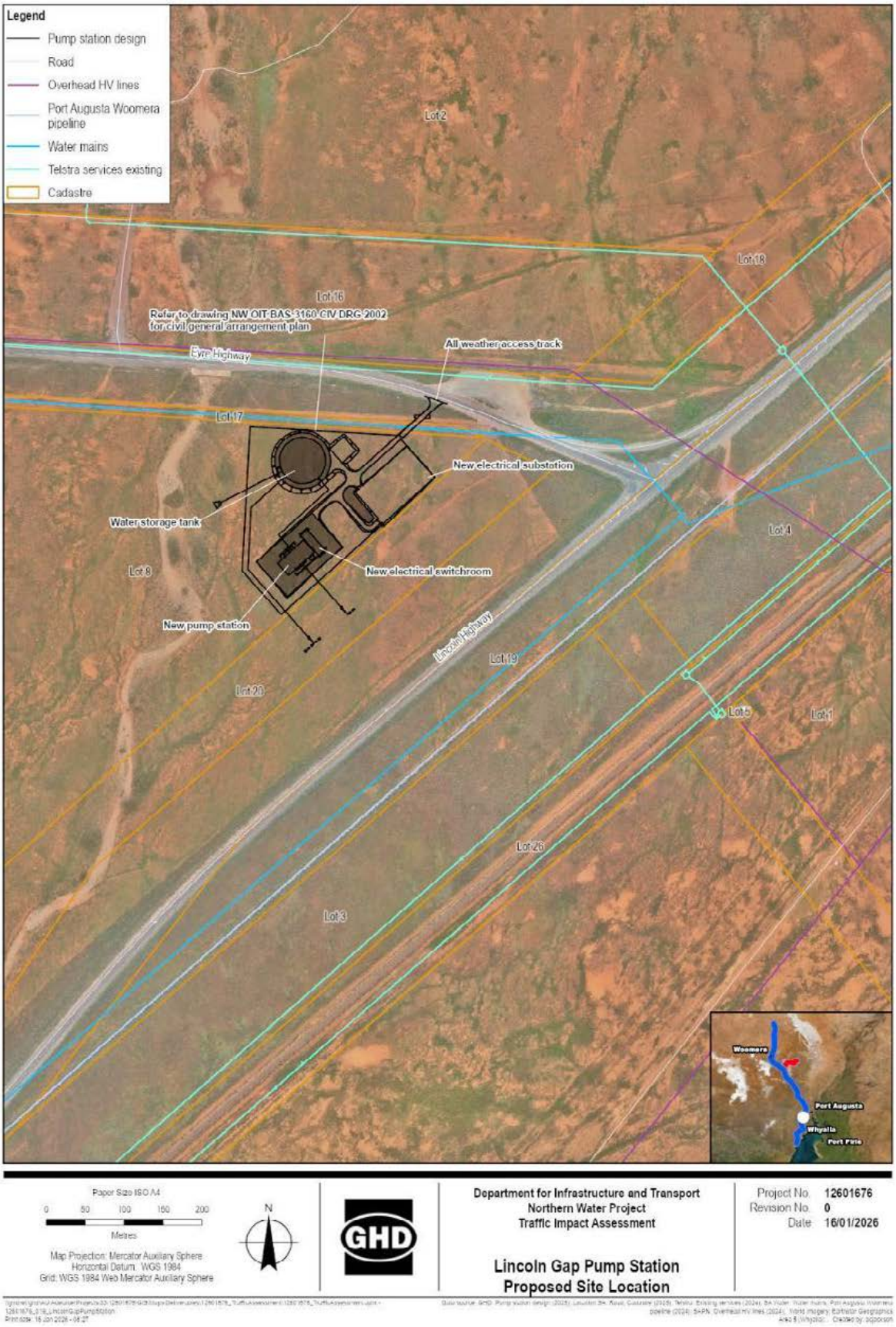


Figure 48 Lincoln Gap Pump Station proposed site

6.2.3 Kalaya Pump Station

Vehicular access to Kalaya Pump Station is currently proposed to be on the western side of Stuart Highway, as shown in Figure 49.



Figure 49 Kalaya (Kootaberra) Pump Station proposed site location

6.2.4 Mangata Pump Station

Vehicular access to Mangata Pump Station is currently proposed to be on the western side of Stuart Highway, as shown in Figure 50.

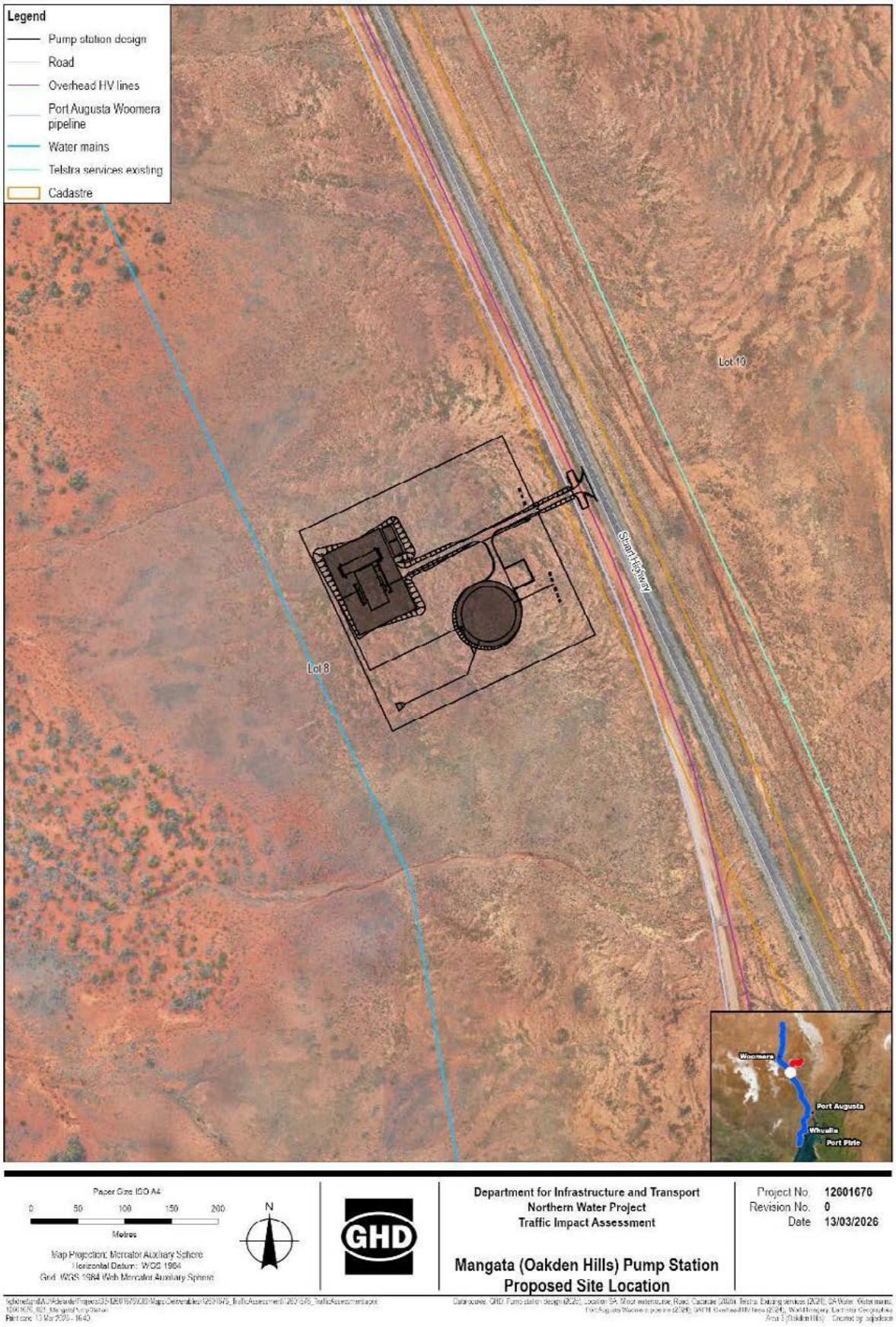


Figure 50 Mangata (Oakden Hills) Pump Station proposed site

6.2.5 Bimba Product Water Storage

Vehicle access to the Bimba Product Water Storage site is proposed to be on the western side of Stuart Highway via the existing unsealed access road approximately 14 km south-east of Pimba, as shown in Figure 51.

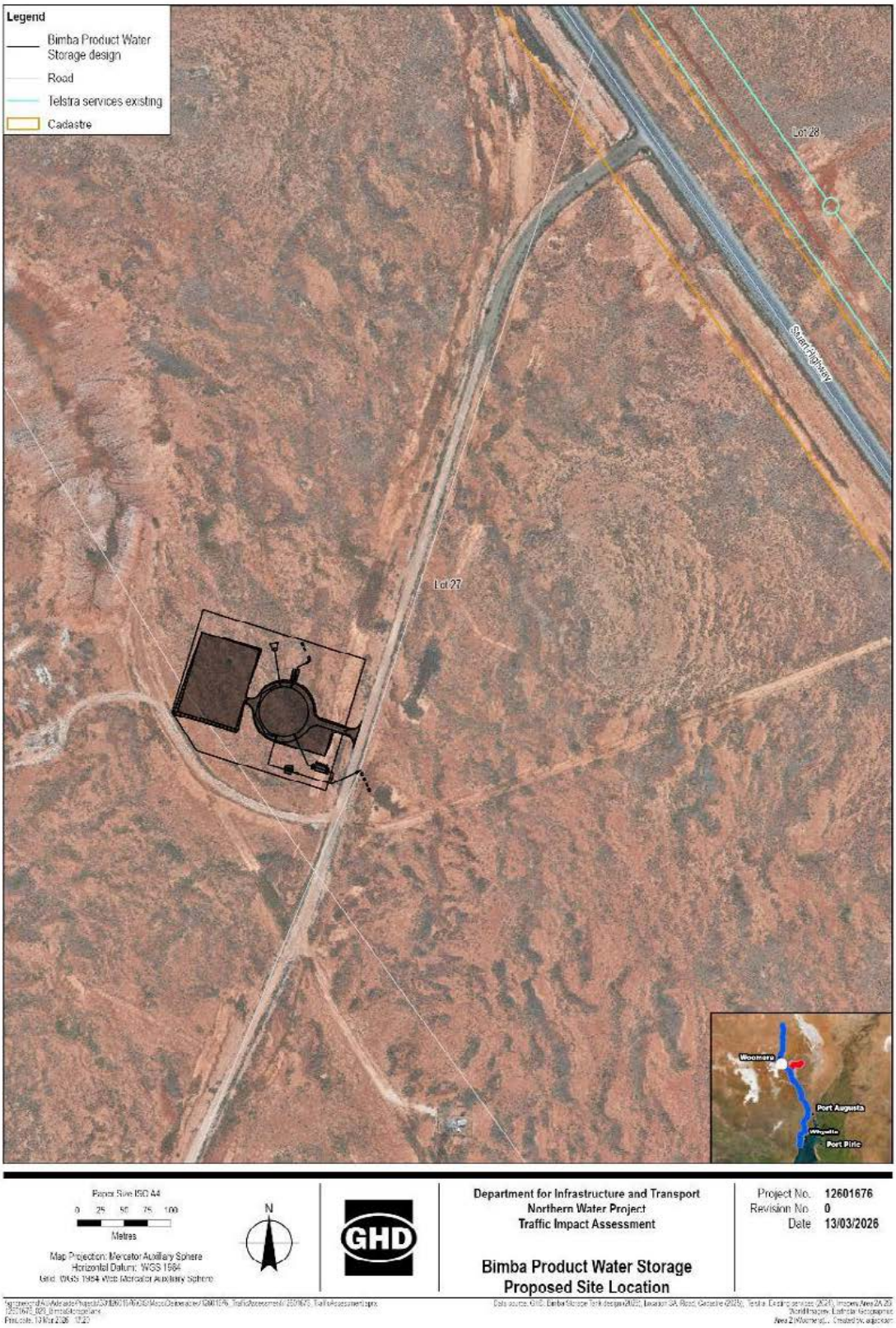


Figure 51 Bimba Product Water Storage Proposed Site Location

6.2.6 Mullaquana Station Substation

Vehicle access to the new Mullaquana Station Substation site is proposed to be on Lincoln Highway, as this is the closest public road. Figure 52 shows the proposed site location and access road. A new access road is required on the northern side of Lincoln Highway as there is currently no formal access in place.

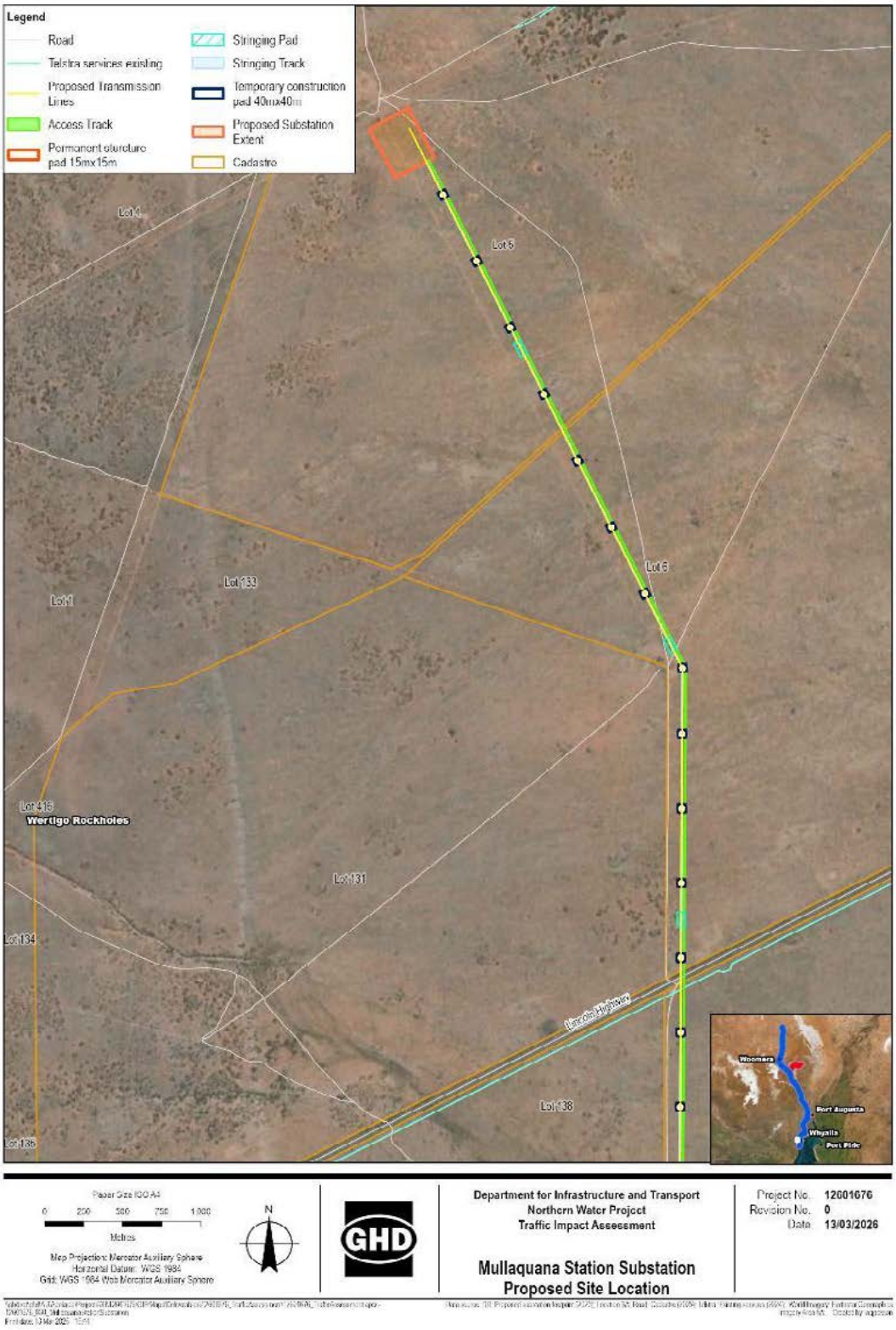


Figure 52 Mullaquana Station Substation Proposed Site Location

6.2.7 Kootaberra Substation

Vehicle access to the new Kootaberra Substation is proposed to be on Stuart Highway. A new access road is required for this new site on the eastern side of Stuart Highway, as shown in Figure 53. This would be located opposite the access road for Kalaya Pump Station on Stuart Highway, but slightly further north. Hence, the number of heavy vehicles accessing these pump station and substation sites during construction have been considered as a combined total.

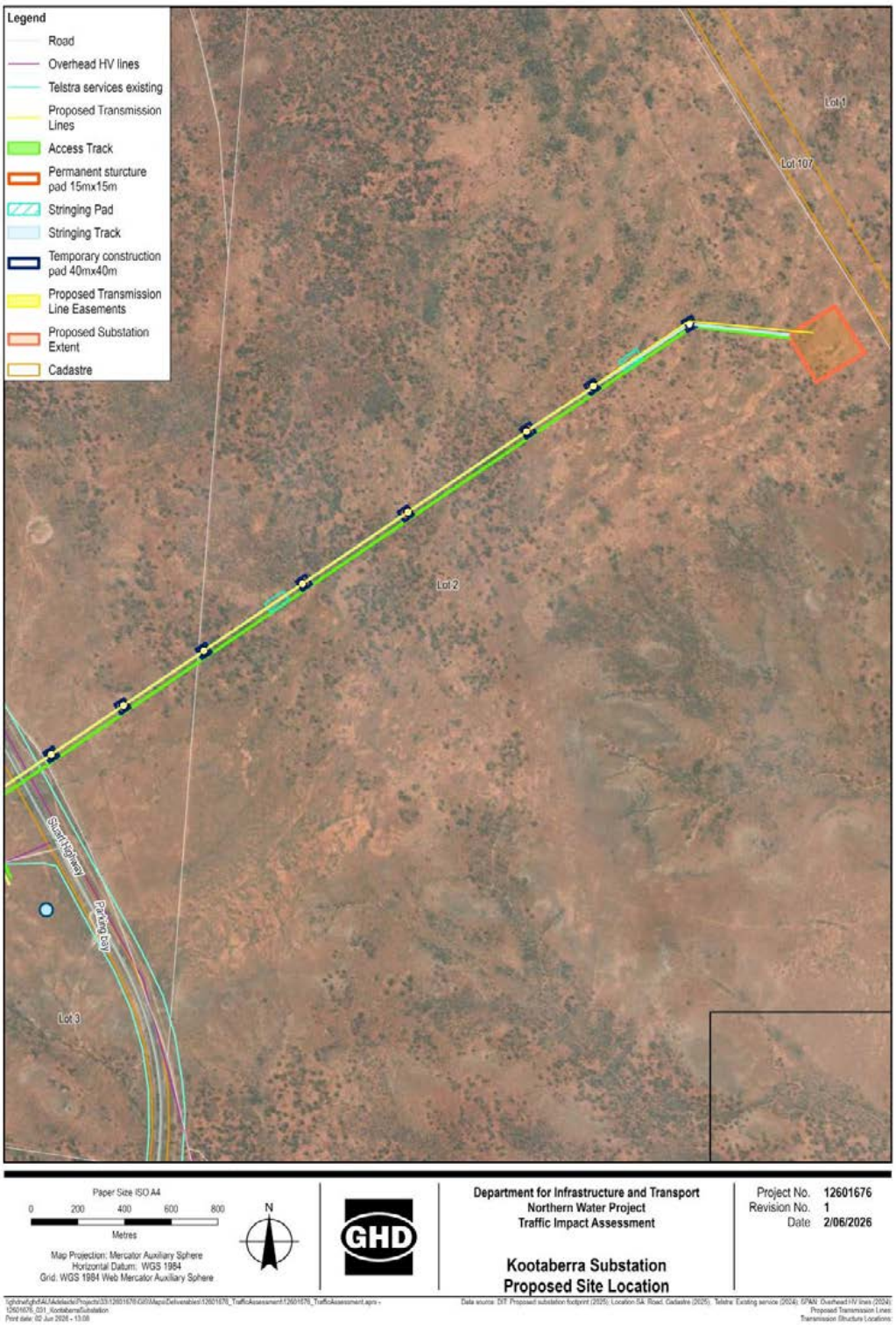


Figure 53 Kootaberra Substation Proposed Site Location

6.3 Access for new temporary sites

Vehicle access arrangements for the new temporary sites are outlined in Table 25.

Table 25 Access to New Temporary Sites

Site	Proposed Public Road(s) Access	Proposed Site Access Location
Jack-Up Barge (JUB) Workfront	– Shipyard Road (Whyalla Port)	– Access to the JUB workfront would be provided via sea from Whyalla Port. The route by sea is approximately 28 km from the port to the JUB workfront.
Whyalla Segment Yard	– Arthur Glennie Drive	– It is proposed that access to the site is from the southern side of Arthur Glennie Drive, west of the intersection with Lincoln Highway.
Whyalla Laydown	– Industry Drive / Mulconray Road	– There are multiple laydown site options at this location including on the eastern side of Industry Drive and at the end of the cul de sacs on both Industry Drive and Mulconray Road.
Carriewerloo Laydown & Stack Site	– Stuart Highway	– Existing unsealed access road on the western side of Stuart Highway noted to be in 'good' condition.
Nutt Laydown & Stack Site	– Stuart Highway	– Existing unsealed access road on eastern side of Stuart Highway. No condition rating has been noted for this access road.
Oakden Hills Stack Site	– Stuart Highway	– Existing unsealed access road on eastern side of Stuart Highway. No condition rating has been noted for this access road.
Mount Gunson Laydown	– Stuart Highway	– Existing unsealed access road on the western side of Stuart Highway noted to be in 'good' condition (same access road as Mount Gunson substation and quarry sites).
Lake Windabout Stack Site	– Stuart Highway	– Existing unsealed access road on eastern side of Stuart Highway. No condition rating has been noted for this access road.
Pimba (KAC) Laydown & Accommodation Camp	– Stuart Highway	– New access road on south-western side of Stuart Highway
Purple Downs Laydown & Stack Site	– Olympic Dam Highway	– Existing unsealed access road on eastern side of Olympic Dam Highway. Access road is approximately 1.5km long and noted to be in 'good' condition.

6.4 Access for existing sites to be used

Vehicular access for the existing sites would largely remain unchanged as per the current access arrangements, as described in Table 3.

Table 26 Access to Existing Sites to be used

Site	Public Road(s) Access	Site Access Location
Intake & Outfall Tunnels	– Eight Mile Creek Road (unsealed) via the same route as the Mullaquana Station Desalination Plant - refer to section 6.2.1.	– Existing unsealed access road on eastern side of Eight Mile Creek Road noted to be in 'good' condition
Whyalla Proposed Accommodation Camp	– Broadbent Terrace / McDouall Stuart Avenue / Kloeden Street	– No existing access road or driveway appears to exist for formalised vehicular access as the reserve is surrounded with raised kerbing.
Whyalla Boral Quarries	– Iron Knob Road	– Existing site access road (sealed) on the northern side of Iron Knob Road.
Whyalla Port	– Lincoln Highway	– Shipyard Road (private access road). – ***Access would need to be permitted for Project use.***
Coraberra Hill Substation (site upgrade)	– Eyre Highway	– Existing unsealed access road on the eastern side of Eyre Highway. No condition rating is noted for this access road, but it provides access to the existing Coraberra Hill Substation.
Port Augusta Council Quarry	– Eyre Highway	– Existing access road (unsealed) on the south-eastern side of Eyre Highway.
Port Augusta Proposed Accommodation Camp	– Madland Street / Press Road	– Existing access road (unsealed) with gate on western side of Press Road at the intersection with Madland Street (south).
Mount Gunson Substation (site upgrade)	– Stuart Highway	– Existing unsealed access road on the western side of Stuart Highway noted to be in 'good' condition (same access road as Mount Gunson Laydown and Quarry sites).
Mount Gunson Mines AMJ Musolino Quarry	– Stuart Highway	– Existing unsealed access road on the western side of Stuart Highway noted to be in 'good' condition (same access road as Mount Gunson Laydown and substation sites).
Pimba Rail Line	– Olympic Dam Highway	– Existing unsealed access road on western side of Olympic Dam Highway that accesses the existing Pimba Spur Line
Roxby Downs Proposed Accommodation Camp	– Olympic Way	– Existing access road (unsealed) on the western side of Olympic Dam Highway.
Roxby Downs Holcim Quarry	– Olympic Way / Opal Road (unsealed)	– Opal Road (unsealed) on western side of Olympic Dam Highway just north of Roxby Downs

Access for the Whyalla Accommodation Camp is not yet confirmed, but it is proposed to use Kloeden Street as it does not have a centre median unlike other roads surrounding the reserve. Access to Whyalla Marine Port requires access to private roads, with Shipyard Road proposed as the primary road to be utilised as it provides the most direct access to the port.

6.5 Access to Main Transfer Pipeline

As described in Section 5.2.3 of this report, access to the Main Transfer Pipeline during and after construction is proposed to be provided via access tracks at approximately 10 km intervals. The exact location and number of access tracks would be subject to the methodology employed by the construction Contractor. For the purposes of this report, it is assumed that the heavy vehicle access tracks proposed by the Principal would be used – refer to Appendix A for a summary of these access tracks and their assessed condition.

Additional access to the Main Transfer Pipeline will also be available for the portion of pipeline parallel with the new Mullaquana Station access road that has been proposed (refer to section 6.2.1).

6.6 Vehicle parking

6.6.1 Construction

Car parking allowance within the Constructability Report (Systra, 2025) has only been specifically provided for the Mullaquana Station Desalination Plant and Intake & Outfall Tunnels, as shown in Table 27.

Key assumptions include:

– Based on the area required for car spaces and access aisles as per Australian Standard AS 2890.4, approximately 20 m^2 of space is required per car.

Table 27 Construction allowance for car parking at the permanent sites (Systra, 2025)

Site	Car parking allowance (Reference Design Constructability Report - Systra)
Mullaquana Station Desalination Plant	Approximately 1000 carparks (20,000 m^2 as per Figure 162, page 190) based on the assumptions above.
Intake & Outfall Tunnels	25 car park spaces
Lincoln Gap Pump Station	Unspecified
Kalaya Pump Station	Unspecified
Mangata Pump Station	Unspecified
Bimba Product Water Storage	Unspecified

6.6.2 Operation

Car parking allowance within the Reference Design (GHD, 3 October 2025) for each of the permanent sites has been provided to the capacities shown in Table 28.

Key assumptions include:

– Carpark bay to be 2.5 m W x 5.4 m L and internal roads to be 5.8 m W (AS 2890.4)
– 20% of carpark areas to be assumed as access road

Table 28 Reference Design allowance for car parking at the permanent sites (GHD, 3 October 2025)

Site	Car parking allowance (Reference Design Report - GHD)
Mullaquana Station Desalination Plant	Carpark included within the site layout with 40 car spaces (Section 4.4.11) located close to the administration building (Table 32, Section 4.4.2.1).
Intake & Outfall Tunnels	Carpark included within the site layout with 7 car spaces located adjacent to the switchroom (refer to GHD Reference Design Drawing NW-DIT-BAS-2000-GEN-DRG-0003).
Lincoln Gap Pump Station	Unsealed hardstand located on all four sides of the pumping station buildings for access, parking and vehicle turnaround (Section 4.6.5.5).

Site	Car parking allowance (Reference Design Report - GHD)
Kalaya Pump Station	Unsealed hardstand located on all four sides of the pumping station buildings for access, parking and vehicle turnaround (Section 4.6.5.5).
Mangata Pump Station	Unsealed hardstand located on all four sides of the pumping station buildings for access, parking and vehicle turnaround (Section 4.6.5.5).
Bimba Product Water Storage	No dedicated space has been provided for car parking within the site, however there is a 20 m x 20 m crane pad area that is likely to be available during operation and a 5 m wide access track around the tank (refer to GHD Reference Design Drawing NW-DIT-BAS-3220-CIV-DRG-2032). Hence, approximately 20 car parking spaces are available based on the assumptions above.

6.6.3 Decommissioning

At time of decommissioning, it is expected that car parking requirements would be similar to that of the Construction phase. As such, it is anticipated that car parking supply would be identical to the Construction phase.

6.7 Construction phase

The construction phase considers both temporary and permanent sites that are planned to be constructed or upgraded as part of the Project, as described in Table 3.

As per advice from the Constructability Advisor, the total construction program is estimated to be approximately 51 months, with the workforce schedules and breakdown of timeframes outlined in Table 29 for the different overlapping construction phases.

Table 29 Construction Program & Schedules

Construction Element	Construction Timeframe	Construction Schedules
Transfer System	20 months (months 10 to 30) Carrapateena lateral pipeline to be 8 weeks	12h, 7 days/week
Marine and Tunnelling	30 months (months 9 to 39)	24h, 7 days/week
Desalination Plant	35 months (months 6 to 41)	12h, 7 days/week
Wet Commissioning	10 months (months 42 to 51)	12h, 7 days/week
Overall Construction	51 months	

The following workfronts have been considered for the construction phase:

1. Transfer System: 2 moving workfronts that would progressively construct the Main Transfer Pipeline, and the Pump Station and Product Water Storage sites
2. Marine and Tunnelling: Offshore Jack-Up Barge (JUB) with on-shore support
3. Mullaquana Station Desalination Plant

6.8 Operation phase

The operation phase only considers the new or upgraded permanent sites included within the Project, as described in Table 3.

Access to these sites would be provided by new or upgraded roads constructed in accordance with Austroads Guide to Road Design Part 3 and the Reference Design specifications (GHD, 2025). The key specifications for the access roads from the Reference Design are outlined below:

– Unsealed (all-weather), 5 m width.
– Minimum crossfall: 2% minimum crossfall each way (i.e., crowned).

– Minimum pavement thickness: Determined based on assumed CBR of 3.
– Design Vehicle – 12.5 m rigid truck.

6.9 Decommissioning phase

Decommissioning of the project would take place at some point in the future, which is still yet to be determined. Access to project sites would likely be through the new or upgraded sites.

7. Project Traffic

7.1 Construction phase

During the construction phase, the anticipated traffic would consist of vehicles and vessels associated with the movement of construction workers and the delivery of materials and equipment. The traffic volume estimates described in the Constructability Report are very conservative, particularly for heavy vehicle movements. There are a number of ways in which the potential traffic impacts posed by the Project can be reduced through the construction methodology, such as the reuse of backfill material on site.

7.1.1 Construction transport types

Based on the Constructability Report (Systra, 2025), the vehicles and vessels described in Table 30 are anticipated to make up the key traffic movements during construction. For the purposes of assessing trip generation and distribution, the vehicles classes have been simplified to Light Vehicles, Heavy Vehicles and Oversize Overmass (OSOM) Vehicles. A key assumption noted within the Constructability Report (Systra, 2025) is that the Project will have no external spoil removal (other than spoil movements from Whyalla Port to Mullaquana Station). Hence, the assessment has not considered truck movements for spoil removal from each site.

It is also anticipated that existing passenger flights to and from Whyalla Airport would be utilised and possibly also to and from Port Augusta Airport and Olympic Dam Airport.

Table 30 Construction Vehicle & Vessel Types

Vehicle Type	Purpose	Site(s)
Light Vehicles		
10-seater mini buses	Transport of workers to workfront from accommodation site	Main Transfer Pipeline Workfront
Dual cab utility vehicles	Transport of workers to workfront	Main Transfer Pipeline Workfront Marine and Tunnelling Workfront Mullaquana Station Desalination Plant
Heavy Vehicles		
20/30 kL water trucks (Assumed as semi-trailers)	Construction water deliveries and hydrotesting	Main Transfer Pipeline Workfront Marine and Tunnelling Workfront
Oversize Overmass (OSOM) vehicles	The deliveries anticipated to be via over size or overmass (OSOM) vehicles are heavily dependent on how much the Construction Contractor will elect to modularise or pre-assemble off site before bringing to Mullaquana Station. The OSOM deliveries anticipated are: – Preassembled Reverse Osmosis (RO) racks - over sized – Some pipework - over sized – Some pumps (i.e. intake pumps) - over size and over mass – Lime dosing material - over sized – TBM Shield – TBM Cutterhead – Crawler Cranes (250 t and 60 t)	Mullaquana Desalination Plant Marine and Tunnelling Workfront
B-Double Road Train	All other heavy vehicle deliveries, including:	Main Transfer Pipeline Workfront Marine and Tunnelling Workfront Mullaquana Station Desalination Plant

Vehicle Type	Purpose	Site(s)
	– Quarry (backfill and bedding) Materials – Pipes – Spoil (Marine & Tunnelling) – Tunnelling Segments & Supply Materials (grout, conditioning agents, etc.) – Desalination Plant materials and components (concrete, reinforcement, backfill / bedding, piping, cabling and pits, etc.)	
Maritime Vessels		
Jack-Up Barge (JUB) x1	Construction of Intake & Outfall Tunnel support piles	Marine and Tunnelling Workfront
Tugs x3	Support vessel for JUB	Marine and Tunnelling Workfront
Supply barge x1	Support vessel for JUB	Marine and Tunnelling Workfront
Spoil barge x2	Support vessel for JUB	Marine and Tunnelling Workfront
Support Vessel, Line Boat, Safety Boat (x2 total)	Support vessels for JUB	Marine and Tunnelling Workfront
Dive Boat x1	Support vessel for JUB	Marine and Tunnelling Workfront
Crane barge x1	Support vessel for JUB	Marine and Tunnelling Workfront
Air Support		
Helicopter x1	Support for JUB	Marine and Tunnelling Workfront

7.1.2 Trip generation – construction

7.1.2.1 Road

Estimated Light Vehicle (LV) and Heavy Vehicle (HV) movements have been provided by the Constructability Advisor (Systra, 16 January 2026). These have been adopted for the purposes of this TIA and summarised in Table 31, Figure 54 and Figure 55. Peak traffic generated by the Project occur during months 15 to 18, whilst construction activities are at the greatest. This occurs when all construction elements are underway.

The project is expected to generate significant additional traffic during the construction phase. This is expected to be in the order of 829,876 two-way vehicle trips across the full construction period, comprised of approximately 488,026 light vehicle and 341,850 heavy vehicle movements.

During the peak construction period (17th month of the four-year construction program), it is expected that there would be an additional 935 one-way (1,870 two-way) vehicle trips per day introduced into the network by the project.

During the AM and PM peak hour periods, the anticipated construction traffic volume is 217 vehicles per hour two-way. This includes:

– 139 two-way light vehicle movements
– 79 two-way heavy vehicle movements

Table 31 Estimated construction vehicle movements for each site

Project site	HV Total (1-way)	LV Total (1-way)	Average Daily HV (1-way)	Average Daily LV (1-way)	Total daily HV movements in M17 (1-way)	Total daily LV movements in M17 (1-way)
Main Transfer Pipeline Sections						
Mullaquana Station Desalination Plant to Whyalla North Delivery Point	3701	1530	31	13	0	0
Whyalla North Delivery Point to Port Bonython Delivery Point	1509	556	25	10	0	0
Port Bonython Delivery Point to Lincoln Gap Pump Station	3776	1432	31	12	15	12
Lincoln Gap Pump Station to Kalaya Pump Station	9212	3728	34	14	44	14
Kalaya Pump Station to Mangata Pump Station	6565	2636	36	15	0	0
Mangata Pump Station to Carrapateena Junction	1657	640	28	11	0	0
Carrapateena Junction to Bimba Product Water Storage	2494	1028	28	11	35	12
Bimba Product Water Storage to Woomera Delivery Point	2332	888	26	10	33	10
Woomera Delivery Point to Oak Dam Delivery Point	1529	536	25	9	0	0
Oak Dam Delivery Point to Olympic Dam Delivery Point	3144	3184	30	11	0	0
Carrapateena Junction to Carrapateena Lateral Branch	3553	1334	24	9	11	9
Project Sites						
Lincoln Gap Pump Station	1999	1806	7	7	4	7
Kalaya Pump Station	2100	1734	6	6	8	6
Mangata Pump Station	2542	1921	7	5	10	6
Bimba Product Water Storage	935	570	4	3	4	5
Mullaquana Station Pump Station	1504	1680	6	6	8	6
Whyalla Laydown	5187	960	22	4	15	4
Carriewerloo Laydown	4289	1200	13	4	19	4
Nutt Laydown	4368	512	18	2	13	3
Pimba KAC Laydown	4299	1424	13	4	19	4
Purple Downs Laydown	4012	840	19	4	0	0
Mount Gunson Laydown	1888	480	16	4	0	0
Whyalla Quarry	4570	0	22	0	22	0
Port Augusta Quarry	2841	0	14	0	14	0
Mount Gunson Quarry	6952	0	19	0	20	0
Roxby Downs Quarry	2841	0	24	0	0	0
Oakden Hills Stack Site	3088	384	17	2	0	0
Lake Windabout Stack Site	2665	328	18	2	30	3

Project site	HV Total (1-way)	LV Total (1-way)	Average Daily HV (1-way)	Average Daily LV (1-way)	Total daily HV movements in M17 (1-way)	Total daily LV movements in M17 (1-way)
Pipeline Access Roads	14024	1176	40	4	0	0
Whyalla Camp	1110	88732	1	67	1	122
Port Augusta Camp	226	6384	1	24	1	24
Pimba KAC Camp	1656	9120	5	25	4	26
Roxby Downs Camp	226	6864	1	25	1	26
Intake and Outfall Tunnels	11492	13144	12	13	27	6
Whyalla Segment Yard	11967	7920	15	10	18	11
Whyalla Port	1354	2400	2	4	3	4
Mullaquana Station Desalination Plant	18438	74846	20	76	40	138
Hydrotesting						
Mullaquana Station to Kalaya Pump Station	6280	0	26	0	27	0
Kalaya Pump Station to Olympic Dam	7850	0	26	0	27	0
Carrapateena Junction to Carrapateena Lateral Branch	650	0	11	0	0	0
Wet Commissioning						
Mullaquana Station Desalination Plant	100	2096	1	7	0	0

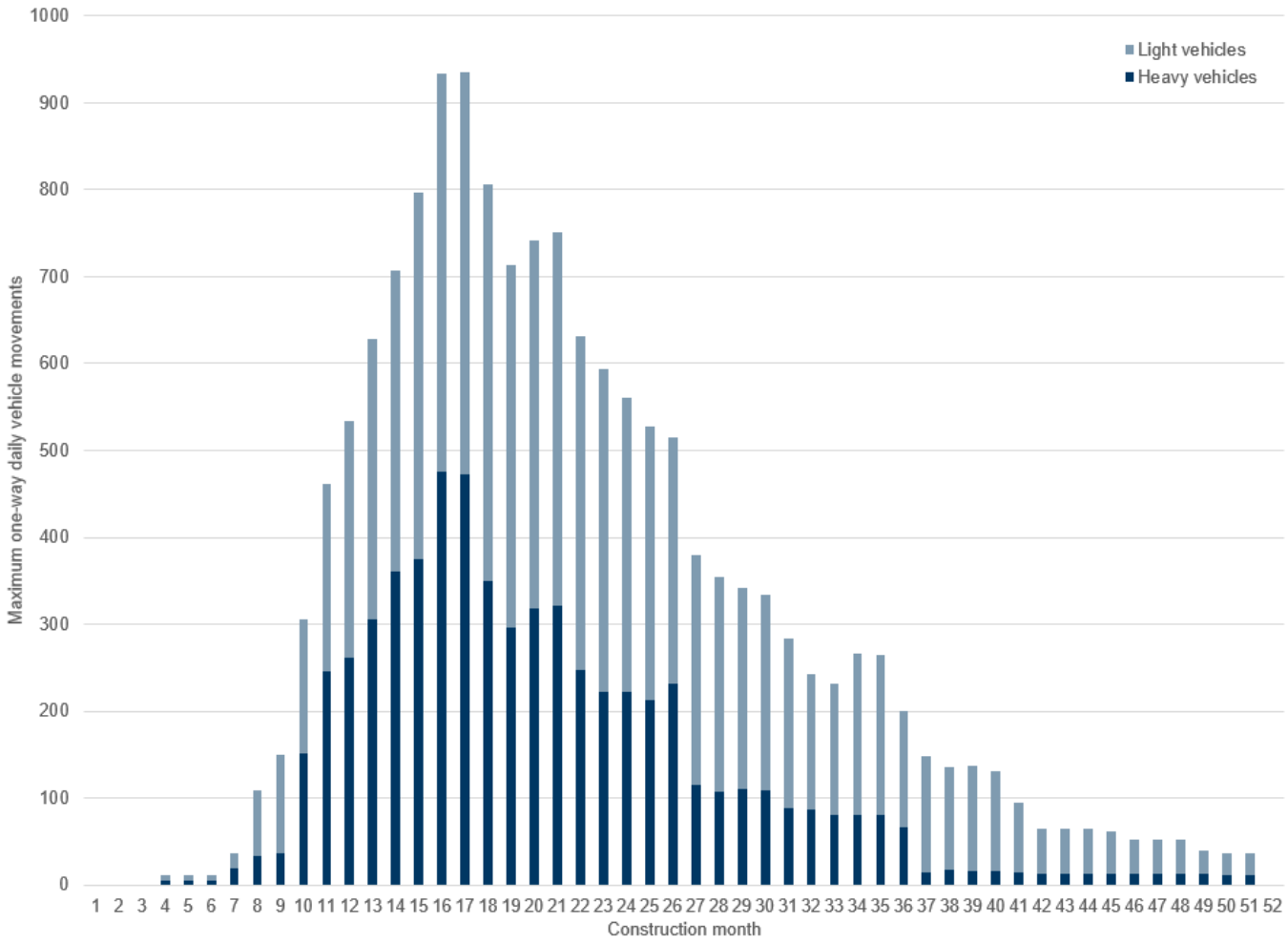


Figure 54 ***Maximum one-way daily vehicle movements by construction month and vehicle type***

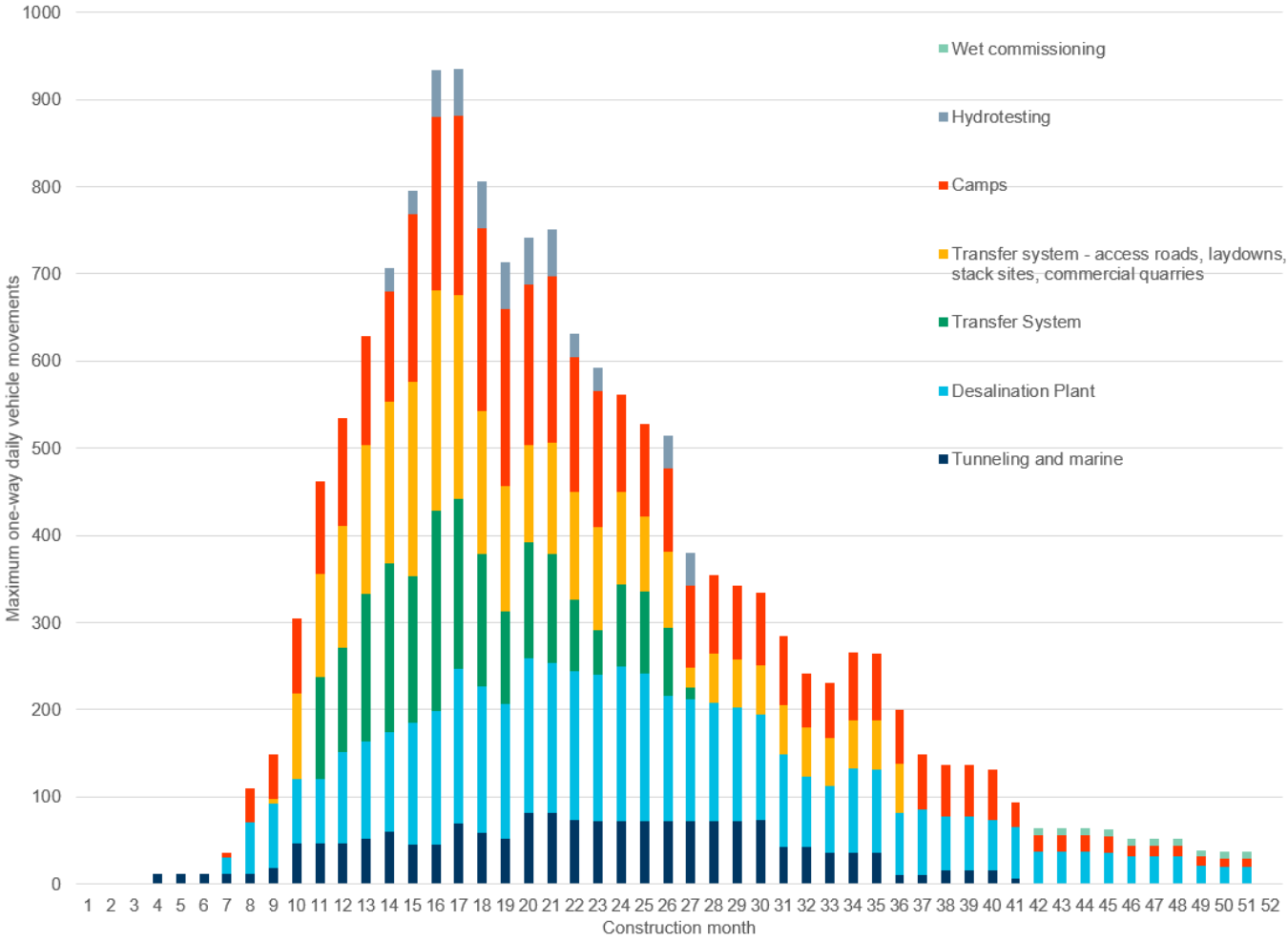


Figure 55 Maximum one-way daily vehicle movements by construction month and activity

7.1.2.1.1 Oversize and Overmass Vehicles

Based on advice from the Constructability Advisor, the OSOM deliveries outlined in Table 32 would occur during construction. It is assumed that each delivery would require 2 trips.

Table 32 Oversize and Overmass Vehicle deliveries (Systra, 2025)

Project Site	Items Delivered	Assumed Total Delivery Volumes
Intake and Outfall Tunnels	– TBM cutterhead and shield – Intake pump station pumps	– 4 OSOM Vehicles
Mullaquana Station Desalination Plant	– HV transformers – Generators – Pre assembled RO racks (Oversized only) – Some pipework (Oversized only) – Lime dosing material (Oversized only)	– 4 OSOM Vehicles – 6 Oversize (only) Vehicles
Lincoln Gap Pump Station	– HV transformers – Generators – Some pipework (Oversized only)	– 4 OSOM Vehicles – 2 Oversize (only) Vehicles
Kalaya Pump Station	– HV transformers – Generators – Some pipework (Oversized only)	– 4 OSOM Vehicles – 2 Oversize (only) Vehicles

Project Site	Items Delivered	Assumed Total Delivery Volumes
Mangata Pump Station	– HV transformers – Generators – Some pipework (Oversized only)	– 4 OSOM Vehicles – 2 Oversize (only) Vehicles
Bimba Product Water Storage	– HV transformers – Generators – Some pipework (Oversized only)	– 4 OSOM Vehicles – 2 Oversize (only) Vehicles
TOTAL		– **24 OSOM Vehicles** – **14 Oversize (only) Vehicles**

7.1.2.2 Air

The anticipated air transport related trips generated during construction are shown in Table 33. The Fly in Fly Out (FIFO) worker numbers have been advised by the Constructability Advisor and are based on a 2-week on and 2-week off roster. It is assumed that these would all be originating from Adelaide, with interstate resources connecting via Adelaide Airport to Whyalla, Port Augusta or Olympic Dam. The helicopter movement values have been adopted based on the assumption of 1 trip per 2 weeks from Whyalla Airport to the JUB Workfront.

Table 33 Air Transport trips generated during construction

Movement	Bi-weekly Peak Movements (1-way)
FIFO Workforce	
Transfer System (Adelaide to Whyalla, Port Augusta or Olympic Dam)	100 workers
Desalination Plant (Adelaide to Whyalla)	400 workers
Marine and Tunnelling (Adelaide to Whyalla)	120 workers
JUB Support	
Helicopter (Whyalla Airport to JUB Workfront)	1 trip

7.1.2.3 Maritime

Marine construction activities will be undertaken primarily from a jack-up barge (JUB), supported by tugs, barges and ancillary support vessels, which will mobilise from Whyalla Port to the offshore workfront. The expected marine traffic volumes during construction to and from Whyalla Port, Whyalla Marina are presented in Table 34, as extrapolated from the information in the Constructability Report (Systra, 2025). Only the dive boat is assumed to use Whyalla Marina. The other vessels are assumed to use Whyalla Port.

The JUB is expected to remain stationed at the workfront for extended periods, with supporting vessels undertaking routine transits to deliver materials, equipment and personnel. It has also been assumed that a given vessel would undertake one movement per week from the designated port to the workfront, except for the Spoil barges - which have a total of three movements each during the construction period.

Table 34 Marine traffic volumes generated during construction (total values)

Vessel Type	Jack-Up Barge (JUB) Workfront	Whyalla Marine Port	Whyalla Marina
Jack-Up Barge (JUB) x1 (Total movements)	1	0	0
Tugs x3 (Total movements)	387	387	0

Vessel Type	Jack-Up Barge (JUB) Workfront	Whyalla Marine Port	Whyalla Marina
Supply barge x1 (Total movements)	129	129	0
Spoil barge x2 (Total movements)	6	6	0
Support Vessel, Line Boat, Safety Boat (Total movements)	258	258	0
Dive Boat x1 (Total movements)	129	0	129
Crane barge x1 (Total movements)	129	129	0

Construction vessel movements will be concentrated along the transit corridor between Whyalla Port and the offshore workfront within Upper Spencer Gulf, consistent with the shore base logistics identified in the Reference Design Constructability Report (Systra, 2025). When compared with existing maritime activity within Upper Spencer Gulf described in Section 5.7, the additional construction vessel movements represent a noticeable increase relative to the vessel calls currently recorded at Whyalla Port, Table 20. However, Whyalla Port represents only one component of maritime activity within the Upper Spencer Gulf. AIS vessel traffic analysis undertaken using AMSA Craft Tracking System (CTS) data identified approximately 95 vessel movements during the sample month of February 2026.

This activity includes vessel movements associated with multiple regional ports and facilities, including Whyalla Port, Port Bonython and other maritime users such as commercial fishing vessels and recreational craft. In this broader regional context, the construction vessel movements associated with the Project represent a relatively small proportion of overall maritime activity within Upper Spencer Gulf. Construction vessel movements will also be concentrated along a short corridor between Whyalla Port and the offshore workfront and will be scheduled and coordinated with port operations to minimise disruption to existing maritime users. The construction-related vessel movements therefore represent a temporary and localised increase in marine activity during the construction period, associated solely with construction logistics and limited to the duration of marine construction activities. Additional maritime safety measures may include notification of marine works through appropriate communication channels, coordination of vessel movements with port operations, and implementation of temporary marine safety zones around construction activities where necessary.

7.1.2.4 Rail

As previously mentioned, Pimba rail line is the only rail line being considered within this TIA and it is assumed that the Pimba spur line is open and able to be used. This would be subject to suitability of the rail line, coordination with existing rail operations and approval from the rail authority. It should be noted that the vehicle movements previously presented in section 7.1.2.1 represent traffic volumes in the “worst case” scenario where the Pimba spur line is unable to be used, requiring more heavy vehicle traffic on the road network for pipe deliveries. This section describes rail specific impacts introduced by the potential use of the Pimba rail line.

It is anticipated that this rail line would be used for the transportation of pipes to the Main Transfer Pipeline Workfront once the works commence for the sections between Kootaberra and Olympic Dam. Based on information provided by the Constructability Advisor, the sections of pipeline between Kootaberra and Olympic Dam is estimated to be completed within approximately 24 months.

Based on the same heavy vehicle requirements for pipe delivery as specified by the Constructability Advisor, it is assumed that 2.5 km of pipe would be delivered to this section of the Main Transfer Pipeline Workfront every week by rail, if elected to be used by the Construction Contractor. It is assumed that a single rail car could carry the same number of pipe lengths as a single truck trailer (x4 12 m lengths).

Hence, it is anticipated that approximately 53 freight rail cars per week are required to transport pipes to the Main Transfer Pipeline workfront, coming to a total of approximately 5512 rail cars over the 24 months (104 weeks). Based on the average train length, it is assumed that 1 train a week could facilitate these deliveries while still allowing approximately half of the train to transport other freight. This is summarised in Table 35 below.

Table 35 Estimated Rail Freight Deliveries Generated

Rail Delivery Requirement	Value
Weekly pipe delivery requirements	2.5 km (for the respective workfront)
No. pipe lengths per rail car	4 pipes
No. rail cars per week	53 rail cars
Approximate no. train deliveries per week	1 train

7.1.3 Trip distribution – construction

The anticipated distribution of construction trips has been assessed in this section based on the estimated trips generated. Table 36 outlines the assumed key routes used for construction trips to each of the project sites. For maritime trips, vessels have been assumed to take the most direct route from Whyalla Port to the JUB workfront. For rail deliveries, it is assumed that trains would arrive at Pimba from interstate.

Table 36 Assumed routes for construction trips to each site

Project site	LV Origins / Destinations	HV Origins / Destinations	Primary routes
Mullaquana Station Desalination Plant	Whyalla Proposed Accommodation Camp	Whyalla Laydown Whyalla Boral Quarries	Industry Drive Arthur Glennie Drive Iron Knob Road Norrie Avenue Broadbent Terrace Lincoln Highway (South of Whyalla) **Option 1 - Existing Route from Whyalla:** Horseshoe Road Mullaquana Road Eight Mile Creek Road **Option 2 - Proposed Route from Whyalla (refer to section 6.2.1):** Lincoln Highway (South of Whyalla) New Mullaquana Station Access Road Eight Mile Creek Road
Lincoln Gap Pump Station	Port Augusta Proposed Accommodation Camp	Port Augusta Laydown	Eyre Highway (West and North arms) Press Road
Kalaya Pump Station	Port Augusta Proposed Accommodation Camp	Carriewerloo Laydown & Stack Site	Stuart Highway Press Road Madland Street
Mangata Pump Station	KAC parcel - Pimba Proposed Accommodation Camp	Oakden Hills Stack Site Nutt Laydown	Stuart Highway
Bimba Product Water Storage	KAC parcel - Pimba Proposed Accommodation Camp	KAC parcel Laydown	Stuart Highway

Project site	LV Origins / Destinations	HV Origins / Destinations	Primary routes
Mullaquana Station Substation	Whyalla Proposed Accommodation Camp	Whyalla Laydown Whyalla Boral Quarries	Industry Drive Arthur Glennie Drive Iron Knob Road Norrie Avenue Broadbent Terrace Lincoln Highway (South of Whyalla)
Kootaberra Substation	Port Augusta Proposed Accommodation Camp	Carriewerloo Laydown & Stack Site	Stuart Highway Press Road Madland Street
Main Transfer Pipeline (Section A - Mullaquana Station to Lincoln Gap)	Whyalla Proposed Accommodation Camp	Whyalla Laydown Whyalla Boral Quarries Port Augusta Laydown	Press Road Eyre Highway (West and North arms) Industry Drive Arthur Glennie Drive Iron Knob Road Norrie Avenue Broadbent Terrace **Option 1 - Existing Route from Whyalla:** Horseshoe Road Mullaquana Road Eight Mile Creek Road **Option 2 - Proposed Route from Whyalla (refer to section 6.2.1):** Lincoln Highway (South of Whyalla) New Mullaquana Station Access Road Eight Mile Creek Road
Main Transfer Pipeline (Section B - Lincoln Gap to Kalaya)	Port Augusta Proposed Accommodation Camp	Carriewerloo Laydown & Stack Site	Eyre Highway (West and North arms) Press Road Madland Street Stuart Highway
Main Transfer Pipeline (Section C - Kalaya to Bimba)	KAC parcel - Pimba Proposed Accommodation Camp	Nutt Laydown & Stack Site Oakden Hills Stack Site Lake Windabout Stack Site KAC parcel Laydown	Stuart Highway
Main Transfer Pipeline (Section D – Bimba to Olympic Dam)	KAC parcel - Pimba Proposed Accommodation Camp Roxby Downs Proposed Accommodation Camp	KAC parcel Laydown Purple Downs Laydown & Stack Site	Stuart Highway Olympic Dam Highway Olympic Way Borefield Road
Main Transfer Pipeline (Section E - Carrapateena Lateral Pipeline)	KAC parcel - Pimba Proposed Accommodation Camp	Mount Gunson Laydown Mount Gunson Mines Quarry	Stuart Highway Carrapateena Access Road Mount Gunson Mine Access Tracks

Project site	LV Origins / Destinations	HV Origins / Destinations	Primary routes
Intake and Outfall Tunnels	Whyalla Proposed Accommodation Camp	Whyalla Segment Yard	Lincoln Highway Playford Avenue Broadbent Terrace **Option 1 - Existing Route from Whyalla:** Horseshoe Road Mullaquana Road Eight Mile Creek Road **Option 2 - Proposed Route from Whyalla (refer to section 6.2.1):** Lincoln Highway (South of Whyalla) New Mullaquana Station Access Road Eight Mile Creek Road

7.1.3.1 Oversize and overmass vehicles

The majority of OSOM deliveries would be made to the Mullaquana Station Desalination Plant site and onshore Tunnelling workfront (TBM launch box). It is also anticipated that the HV transformers, generators and some pipework would be delivered to each Pump Station / substation site.

Hence, the following key routes are expected to be subject to OSOM vehicles:

– Stuart Highway
– Lincoln Highway (north and south of Whyalla)
– Eyre Highway
– One (or both) of the below access routes to the Mullaquana Station Desalination Plant and Intake and Outfall Tunnels sites:
  - Existing route:
    – Horseshoe Road
    – Mullaquana Road
    – Eight Mile Creek Road
  - Proposed route (refer to section 6.2.1):
    – Lincoln Highway (south of Whyalla)
    – New Mullaquana Station Access Road
    – Eight Mile Creek Road

7.2 Operations phase

7.2.1 Operations transport

During operation, it is assumed that light vehicles and heavy vehicles would access the Desalination Plant site and pump station sites for operational staff duties, deliveries and maintenance. Additionally, it is assumed that marine vessels would also be used to access the intake and outfall tunnels. Air and rail transport have not been considered in this section as it is assumed that local resources would be sourced during operation. The anticipated traffic movements during operation are much lower than during construction.

7.2.2 Trip generation – Operation

7.2.2.1 Road

The estimated trips generated for each of the new permanent sites is provided in Table 37. These numbers are based on advice from the Constructability Advisor in the Northern Water – Project Wide Vehicle Movements Technical Note (Systra, 16 January 2026). The light vehicle trips to all the other Pump Station and Tank sites have been assumed based on the trip numbers indicated within the Technical Note for the Transfer system pump stations. Heavy vehicles have been assumed to make the same number of annual trips except for leak repair works and deliveries of lubricants, oils, parts, small equipment and tools, as these are assumed to be LV trips only.

Table 37 Trips generated to the new permanent sites during operation

New Sites	HV Annual Trips (1-way)	LV Annual Trips (1-way)
Mullaquana Station Desalination Plant	117	3717
Lincoln Gap Pump Station	8	13
Mangata Pump Station	8	13
Kalaya Pump Station	8	13
Bimba Product Water Storage	8	13

7.2.2.2 Maritime

Based on discussions with the Constructability Advisor, it is also assumed that 15 marine vessel trips (one-way) would be made every year to the intake and outfall tunnels during operation. These trips would be associated with routine inspection, monitoring and maintenance activities. It is assumed that these trips would be undertaken via a small vessel that can be launched from Whyalla Marina, with vessel movements limited to short-duration transits between the marina and the offshore intake and outfall locations.

Operational marine vessel movements are expected to be infrequent, low-intensity and intermittent, and would occur within an existing maritime environment. Given the limited frequency and small vessel size, operational maritime activities are expected to result in negligible impacts on existing marine traffic conditions. This level of activity represents a very small addition to the existing maritime traffic within the Upper Spencer Gulf described in Section 5.7, which includes commercial shipping, commercial fishing vessels and recreational craft operating within the region.

7.2.3 Trip distribution – Operation

The anticipated distribution of operation trips has been assessed in this section based on the estimated trips generated. For the purposes of this TIA, it is assumed that vehicles associated with operational traffic would be arriving from and returning to the towns shown in Table 38. During the operation phase, these routes consider the towns where operational staff are mostly likely to travel from, based on the combination of the town's size and the fastest travel time to site. As an example, Pimba is not considered due to its size and lower likelihood of operational staff travelling from there, even though it is closer to Mangata Pump Station than Port Augusta.

Table 38 Assumed routes for trips to new permanent sites during operation

New Sites	LV Origins / Destinations	HV Origins / Destinations	Primary Routes
Mullaquana Station Desalination Plant	Whyalla	Whyalla	Broadbent Terrace Lincoln Highway (South of Whyalla) **Option 1 - Existing Route from Whyalla:** Horseshoe Road Mullaquana Road

New Sites	LV Origins / Destinations	HV Origins / Destinations	Primary Routes
			Eight Mile Creek Road **Option 2 - Proposed (preferred) Route from Whyalla (refer to section 6.2.1):** Lincoln Highway (South of Whyalla) New Mullaquana Station Access Road Eight Mile Creek Road
Lincoln Gap Pump Station	Port Augusta	Port Augusta	Eyre Highway (West and North arms)
Mangata Pump Station	Port Augusta	Port Augusta	Stuart Highway
Kalaya Pump Station	Port Augusta	Port Augusta	Stuart Highway
Bimba Product Water Storage	Port Augusta	Port Augusta	Stuart Highway

7.3 Decommissioning phase

At the time of decommissioning of the pipeline and associated infrastructure, it is anticipated that the traffic generated during these activities would be similar to the construction stage as the same access routes and road network would likely be utilised. Therefore, it is assumed that traffic generation and distribution of the construction stage is also representative of the decommissioning stage.

8. Traffic impacts

8.1 Construction phase

8.1.1 Road capacity

Based on the existing traffic volumes (refer to Section 6) and assumed trip generation and distribution (refer to Section 7), the roads in the study extents are expected to be subject to traffic volumes for the busiest construction period and operations, as shown in Table 39. It is expected that there would be modest increases in traffic on major highways such as Lincoln Highway and Eyre Highway. On minor roads, such as Eight Mile Creek Road and Bimba Product Water Storage Existing Access Road, the percentage increase in traffic volumes is expected to be much higher - noting that existing volumes are assumed to be very low. Both the existing route (Option 1) and proposed route (Option 2 - refer to section 6.2.1) to the Mullaquana Station Desalination Plant and Intake and Outfall Tunnel sites have been shown in *italics* with worst case scenario traffic volumes presented for both. In reality, it is likely that either only 1 of these routes will be used or that the traffic volumes will be split between the 2 routes, depending on the Contractor's methodology.

Table 39 Expected average daily traffic volumes (two-way)

Road	Existing conditions	During peak construction period (M17)	Increase from existing conditions	During operation period	Increase from existing conditions
Eight Mile Creek Road (and associated access roads)	10	460	4600%	22	120.0%
New Mullaquana Station Access Road (Option 2)	*N/A*	*450*	*N/A*	*12*	*N/A*
Mullaquana Road (Option 1)	*2400*	*2850*	*19%*	*2412*	*0.5%*
Horseshoe Road (Option 1)	*2400*	*2850*	*19%*	*2412*	*0.5%*
Lincoln Highway (south of Whyalla)	7900	8722	10%	7912	0.2%
Kloeden Street	500	746	49%	500	0.0%
Broadbent Terrace	8800	9200	5%	8800	0.0%
Playford Avenue	3900	3972	2%	3900	0.0%
Iron Knob Road	650	694	7%	650	0.0%
Arthur Glennie Drive	2700	2796	4%	2700	0.0%
Lincoln Highway (north of Whyalla)	2200	2380	8%	2200	0.0%
Shipyard Road (private access)	50	64	28%	50	0.0%
Norrie Avenue	3000	3082	3%	3000	0.0%
Industry Drive	200	238	19%	200	0.0%
Eyre Highway (west)	950	1026	8%	950	0.0%
Eyre Highway (north)	2800	2988	7%	2802	0.1%
Press Road	200	250	25%	200	0.0%
Madland Street	200	250	25%	200	0.0%

Addison Road & Caroona Road	2500	2500	0%	2500	0.0%
Stuart Highway	950	1802	90%	956	0.6%
Bimba Product Water Storage Existing Access Road	5	23	360%	5	0.0%
Olympic Dam Highway	500	632	26%	500	0.0%
Olympic Way	430	484	13%	430	0.0%
Blinman Road	1900	1900	0%	1900	0.0%
Borefield Road	200	200	0%	200	0.0%
Carrapateena Access Road	500	580	16%	500	0.0%

The increase in traffic anticipated on the study roads are overall relatively minor in most cases, except for Eight Mile Creek Road (4500%), Bimba Product Water Storage Existing Access Road (360%), Stuart Highway (90%), and Kloeden Street (49%). It is likely that Eight Mile Creek Road and Bimba Product Water Storage Existing Access Road would require significant upgrades to meet the required capacity during both construction and operation phases. The extents of the Eight Mile Creek Road upgrades would depend on the construction Contractor's selected access route to the Mullaquana Station Desalination Plant and Intake and Outfall Tunnel sites (refer to section 6.2.1).

According to the Austroads *Guide to Traffic Management Part 3: Transport Study and Analysis Methods* (AGTM03-20, 2020), the capacity of a single lane is affected by various factors and can be calculated as 1,800 pc/h (passenger cars per hour) multiplied by adjustment factors for heavy vehicles and narrow lanes and lateral clearances. This is relevant for Lincoln Highway in the vicinity of Whyalla, which has two lanes in each direction.

According to the Transportation Research Board's *Highway Capacity Manual* (2016), the typical lane capacity of two-lane two-way rural roads and highways is 1,700 passenger cars per hour per direction of travel. This is nearly independent of the directional distribution of traffic. That is, the capacity of two-lane two-way rural roads and highways per direction is almost unaffected by the proportion of vehicles travelling in each direction. This is relevant for the other impacted rural roads and highways in the study area.

As volumes on impacted roads are expected to be highest during the construction phase, volumes during construction have been considered for the purposes of assessing capacity. Currently no data is available on the peak proportion of daily volumes or the directional split of traffic on impacted roads, and therefore a peak proportion of AADT of 15% has conservatively been adopted for Light Vehicles and an even distribution for Heavy Vehicles across the 12-hour work shift. Direction splits of 60-40 have conservatively been adopted for the purposes of this assessment. The resultant one-lane peak volumes are shown in Table 40. For clarity, these volumes are the combined total of existing traffic volumes and forecasted peak construction traffic volumes.

Both the existing route (Option 1) and proposed route (Option 2 - refer to section 6.2.1) to the Mullaquana Station Desalination Plant and Intake and Outfall Tunnel sites have been shown in *italics* with worst case scenario traffic volumes presented for both. As previously mentioned, it is likely that either only 1 of these routes will be used in reality or that the traffic volumes will be split between the 2 routes, depending on the Contractor's methodology.

Table 40 Anticipated demand

Road	Anticipated two-way peak hourly volume during busiest construction period (M17)	Estimated maximum one-lane hourly peak volume
Eight Mile Creek Road	59	35
New Mullaquana Station Access Road (Option 2)	*418*	*251*
Mullaquana Road (Option 1)	*418*	*251*

Road	Anticipated two-way peak hourly volume during busiest construction period (M17)	Estimated maximum one-lane hourly peak volume
Horseshoe Road (Option 1)	*418*	*251*
Lincoln Highway (south of Whyalla)	1292	388
Kloeden Street	67	67
Broadbent Terrace	1372	823
Playford Avenue	593	356
Iron Knob Road	101	61
Arthur Glennie Drive	415	125
Lincoln Highway (north of Whyalla)	349	209
Shipyard Road (private access)	9	6
Norrie Avenue	9	274
Industry Drive	19	20
Eyre Highway (west)	150	90
Eyre Highway (north)	442	265
Press Road	37	22
Madland Street	37	22
Addison Road & Caroona Road	375	225
Stuart Highway	224	134
Bimba Product Water Storage Existing Access Road	3	2
Olympic Dam Highway	88	53
Olympic Way	72	43
Blinman Road	285	171
Borefield Road	30	18
Carrapateena Access Road	83	50

As shown in Table 40, the assumed maximum one-lane peak volumes during construction are expected to be well within the theoretical capacity of the impacted roads (i.e. below 1,700 passenger cars per hour per lane). It is therefore expected that there would be no significant impact on traffic efficiency as a result of the additional traffic volumes associated with the development.

The above increase in traffic has not been considered in conjunction with other known developments and construction projects, such as the previously mentioned Samphire Uranium Project and Nonowie Wind Farm Project which are near the proposed Mullaquana Station Desalination Plant and Substation sites. There is currently insufficient information on these projects to assess the combined traffic impacts posed within the network. It is recommended that further investigation is undertaken to determine how the Project may overlap with other planned developments and construction works and the associated traffic impacts.

8.1.2 Access for new permanent sites

8.1.2.1 Mullaquana Station Desalination Plant

Option 1 - Existing route

A turning path assessment at key intersection locations along the existing route (Option 1) was previously undertaken in August 2025 by PDP (Project Delivery Partners) using a B-double (26.0 m) for the design vehicle. Figure 56 and Figure 57 show the turning path assessments undertaken for the existing intersections of Lincoln Highway and Horseshoe Road and the intersection of Horseshoe Road and Mullaquana Road, respectively. The turning movements are shown over aerial imagery and indicate that the existing intersection treatments may require some adjustments to the horizontal geometry to cater for the design vehicle. For Lincoln Highway intersection, this may include widening of the lanes for the left-turn in and out of Horseshoe Road and removal or adjustment to the splitter island to compensate for turning movements onto Horseshoe Road. For Mullaquana Road intersection, this may include relocation of the power pole on the inside of the bend and road seal widening for the inside and outside of the bend. Road widening should be able to accommodate edge lines to highlight intersection constraints and to encourage vehicles to stay off edge of seal to maintain good traction and prevent edge breaks. Additional investigation is recommended particularly for checking the swept paths for any oversize vehicles that may be required once confirmed by the construction contractor.

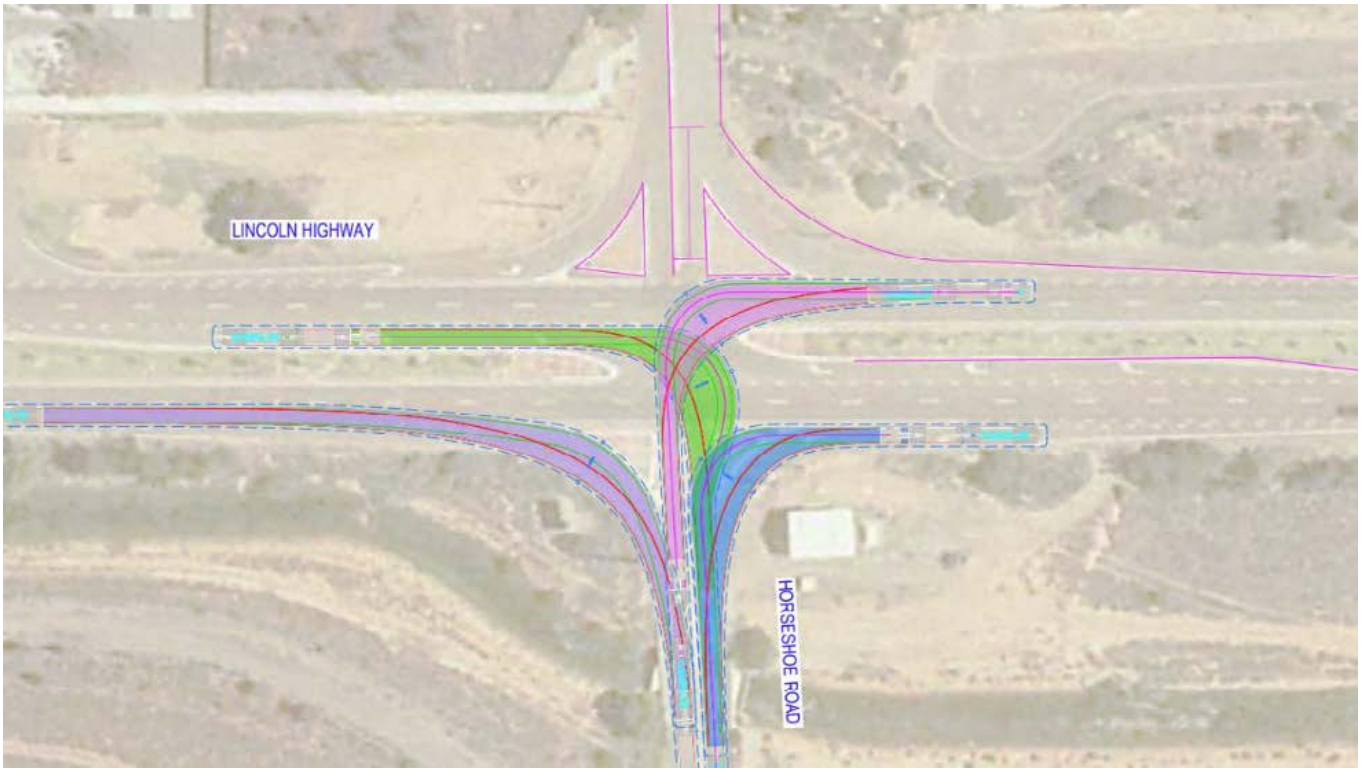


Figure 56 Turning path assessment at intersection of Lincoln Highway and Horseshoe Road (PDP, 2025)



Figure 57 Turning path assessment at intersection of Mullaquana Road and Horseshoe Road (PDP, 2025)

Option 2 - Proposed alternative route

The proposed route (Option 2) via the new Mullaquana Station access road requires a new intersection on Lincoln Highway and also a new intersection with Eight Mile Creek Road with a reconfiguration of the priority. A turn warrant assessment has been undertaken for the intersection on Lincoln Highway based on the worst case forecasted trip generation rates, which will be during the peak construction period (refer to Table 40). In discussion with DIT, the turn treatments adopted on Lincoln Highway for this new intersection are a basic right turn treatment (BAR) and a short auxiliary left turn lane treatment (AUL(s)) – refer to section 8.1.3.2 and Appendix E. The turn treatments for the intersection between the new Mullaquana Station access road and Eight Mile Creek Road will be basic left (BAL) and basic right (BAR) turn treatments, due to the very low traffic volumes anticipated to be turning onto the northern portion of Eight Mile Creek Road.

The proposed new Mullaquana Station access road and associated intersections on Lincoln Highway and Eight Mile Creek Road have been designed to a concept level by GHD – refer to Appendix D. A turning path assessment has been undertaken at the Lincoln Highway intersection using a B-double (26.0 m) for the design vehicle, as shown in Figure 58. The intersection arrangement proposed in the concept design (GHD, 2026) appears to have sufficient space for the design vehicle turning movement. Additional investigation is recommended particularly for checking the swept paths for any oversize vehicles that may be required once confirmed by the construction contractor.



Figure 58 Turning path assessment at intersection of Lincoln Highway and New Mullaquana Station Access Road (GHD, 2026)

8.1.2.2 Lincoln Gap Pump Station

The proposed intersection arrangement for site access from Eyre Highway is shown in Figure 59, including the previously conducted turning path assessment (PDP, 2025). The intersection arrangement proposed in the concept design (PDP, 2025) appears to have sufficient space for the design vehicle turning movement. The proposed arrangement is a priority-controlled T-junction on Eyre Highway. Additional investigation is recommended particularly for checking the swept paths for any oversize vehicles that may be required once confirmed by the construction contractor.

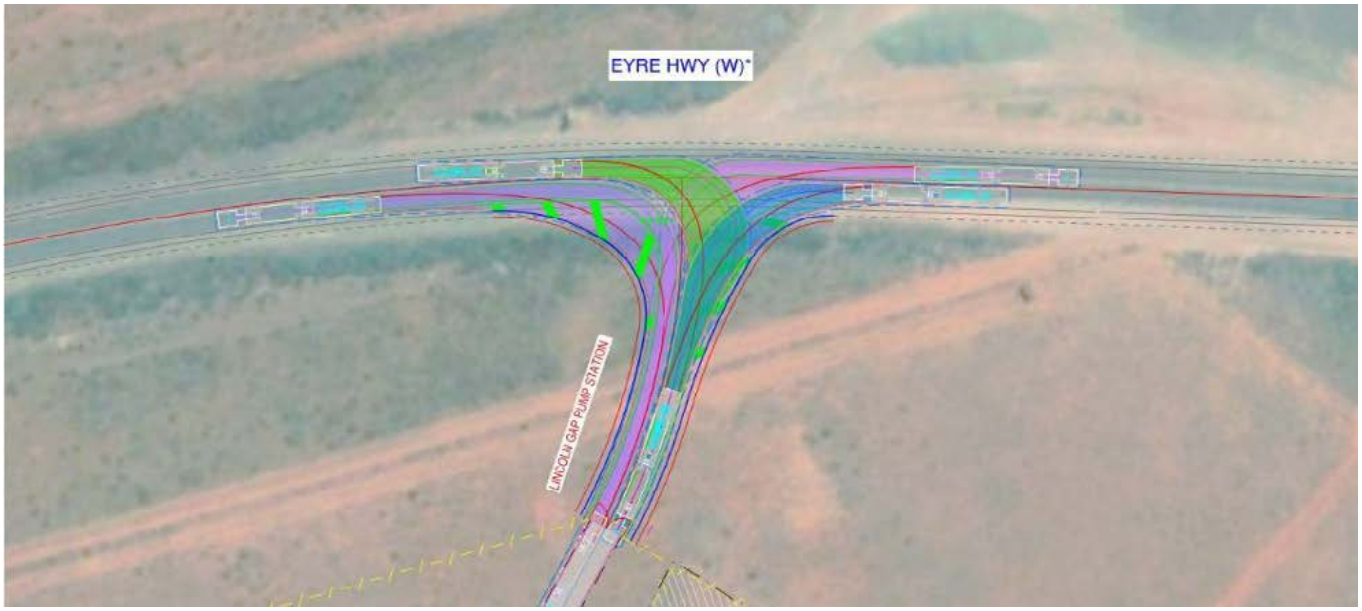


Figure 59 Lincoln Gap Pump Station proposed intersection arrangement at the access point from Eyre Highway (PDP, 2025)

8.1.2.3 Kalaya Pump Station

The proposed intersection arrangement for site access from Stuart Highway is shown in Figure 60, including the previously conducted turning path assessment (PDP, 2025). The intersection arrangement proposed in the concept design (PDP, 2025) appears to have sufficient space for the design vehicle turning movement. The proposed arrangement is a priority-controlled T-junction on Stuart Highway. Additional investigation is recommended particularly for checking the swept paths for any oversize vehicles that may be required once confirmed by the construction contractor.

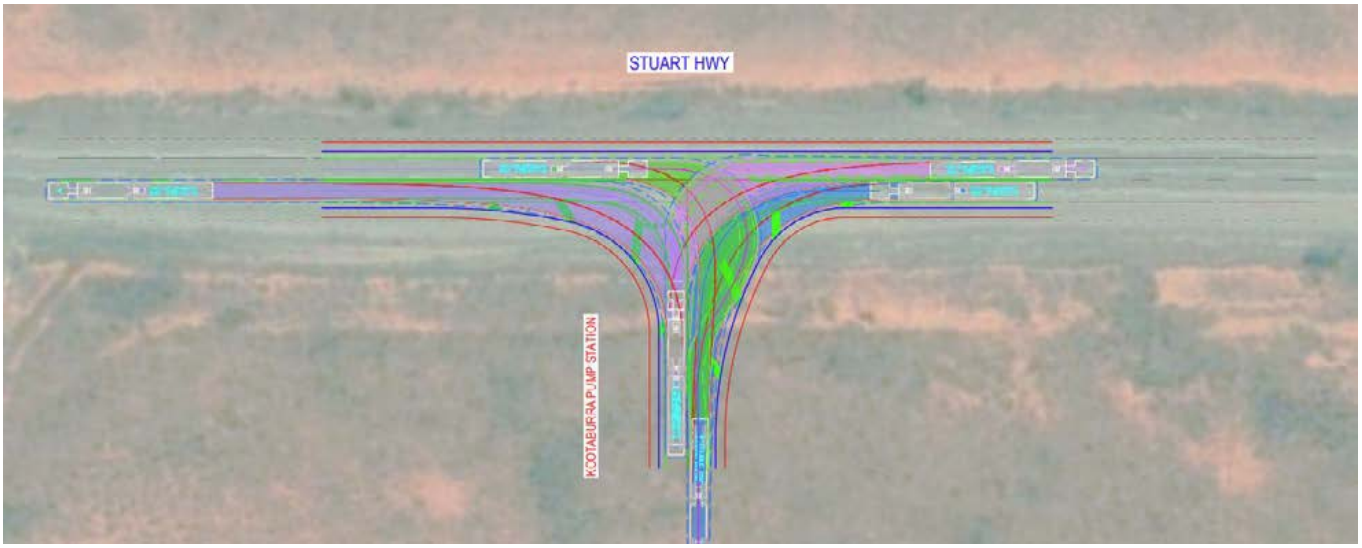


Figure 60 Kalaya Pump Station proposed intersection arrangement at the access point from Stuart Highway (PDP, 2025)

8.1.2.4 Mangata Pump Station

The proposed intersection arrangement for site access from Stuart Highway is shown in Figure 61, including the previously conducted turning path assessment (PDP, 2025). The intersection arrangement proposed in the concept design (PDP, 2025) appears to have sufficient space for the design vehicle turning movement. The proposed arrangement is a priority-controlled T-junction on Stuart Highway. Additional investigation is recommended particularly for checking the swept paths for any oversize vehicles that may be required once confirmed by the construction contractor.



Figure 61 Mangata Pump Station proposed intersection arrangement at the access point from Stuart Highway (PDP, 2025)

8.1.3 Road safety

The increase in vehicle movements during a project's construction, particularly heavy vehicles, can affect road safety. Higher traffic volumes can result in greater interaction between construction vehicles and the public and increase loads acting on road surfaces.

To help minimise road safety risks during construction, a comprehensive assessment of the road network across the assessment area has been undertaken. This review identified locations where treatments and upgrades may be required to maintain safety standards for both existing users and construction traffic.

The treatments considered include:

– Speed limit restrictions to reduce traffic speeds, improving safety
– Turn lanes at unsignalised intersections to improve traffic flow and reduce conflict points
– Localised pavement sealing and upgrades to enhance surface conditions and durability
– Tree trimming to maintain clear sightlines and reduce hazards
– Signage improvements to provide clear guidance and warnings for all road users
– OSOM vehicle guidance to ensure safe navigation of OSOM vehicles through constrained routes.

Refer to the following sections for a full breakdown of the road safety assessments and treatment recommendations at various road segments and intersections within the assessment area.

8.1.3.1 Sight distance requirements

Approach Sight Distance

Approach Sight Distance (ASD) for cars is the minimum sight distance that must be available on minor road approaches to all intersections. This distance is measured from the driver's eye height (1.1 m) to the pavement level at the holding line. ASD for trucks is the distance required for trucks approaching the intersection at 85th percentile operating speed to stop safely. It is measured from the driver's eye height (2.4 m) to the pavement level at the holding line and is numerically equal to truck stopping sight distance. Trucks require a longer distance to stop than light vehicles, therefore the minimum requirements are assessed for trucks.

The required ASD for trucks for each site access was calculated in accordance with Table 5.6 in the Austroads *Guide to Road Design Part 3: Geometric Design* (AGRD03-16, 2021), with adopted values and resulting ASD shown in Table 41.

Table 41 Approach sight distances for the access roads at each site

Intersection	Road	Operating speed*	Reaction time (s)	Grade^ (%)	ASD (m)
Eight Mile Creek Road (north) / New Mullaquana Station Access Road	Eight Mile Creek Road (north)	80 km/h	2.5	0	142
Lincoln Highway / New Mullaquana Station Access Road	New Mullaquana Station Access Road	100 km/h	2.5	0	205
Lincoln Highway / Horseshoe Road	Horseshoe Road	80 km/h	2.5	0	142
Eyre Highway / Site Access	Lincoln Gap Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Kalaya Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Mangata Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Bimba Product Water Storage Site Access	50 km/h	2.5	0	69
Lincoln Highway / Site Access	Mullaquana Station Substation Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Kootaberra Substation Site Access	50 km/h	2.5	0	69
Industry Drive / Site Access (Whyalla Laydown)	Whyalla Laydown Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Carriewerloo Laydown & Stack Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Nutt Laydown & Stack Site	50 km/h	2.5	0	69
Stuart Highway / Site Access	Oakden Hills Stack Site	50 km/h	2.5	0	69
Stuart Highway / Site Access	Mount Gunson Laydown Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Lake Windabout Stack Site	50 km/h	2.5	0	69
Stuart Highway / Site Access	Pimba (KAC) Laydown & Accommodation Camp Site Access	50 km/h	2.5	0	69
Olympic Dam Highway / Site Access	Purple Downs Laydown & Stack Site	50 km/h	2.5	0	69
Arthur Glennie Drive / Site Access	Whyalla Segment Yard Site Access	50 km/h	2.5	0	69

Iron Knob Road / Site Access	Coraberra Hill Substation (site upgrade) Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Mount Gunson Substation (site upgrade) Site Access	50 km/h	2.5	0	69
Kloeden Street / Site Access	Whyalla Proposed Accommodation Camp Site Access	50 km/h	2.5	0	69
Press Road / Site Access / Madland St	Port Augusta Proposed Accommodation Camp Site Access	50 km/h	2.5	0	69
Olympic Way / Site Access	Roxby Downs Proposed Accommodation Camp Site Access	25 km/h	2.5	0	26
Iron Knob Road / Site Access	Whyalla Boral Quarries Site Access	50 km/h	2.5	0	69
Eyre Highway / Site Access	Port Augusta Council Quarry Site Access	50 km/h	2.5	0	69
Stuart Highway / Site Access	Mount Gunson Mines AMJ Musolino Quarry Site Access	50 km/h	2.5	0	69
Olympic Way / Opal Road	Opal Road	50 km/h	2.5	0	69
Olympic Dam Highway / Site Access	Pimba Rail Line Site Access	50 km/h	2.5	0	69
Lincoln Highway / Ship Yard Road	Ship Yard Road	50 km/h	2.5	0	69

**Operating speed on site access roads assumed to be 50 kmh.*

^Assumed in the absence of surveyed grade information. To be confirmed by site inspection.

Based on aerial imagery and an understanding of the terrain from Google Street View, it is expected that the required ASD at these intersections can be met. It is recommended that this be confirmed on site, and to ensure that the alignment of the site access roads satisfies the ASD requirements during construction.

In particular, the ASD available for the Eight Mile Creek Road (north) approach to the proposed intersection with the new Mullaquana Station access road needs to be confirmed during the detailed design of this new road depending on the final grades and levels. The intersection approach grade for Eight Mile Creek Road (north) has been assumed in this TIA to have a 0% slope. However, it is more likely that there will be a slight grade upon approach and therefore the required ASD would differ to what has been noted above.

Safe Intersection Sight Distance

Safe Intersection Sight Distance (SISD) is the minimum sight distance that should be provided on major road approaches to all intersections. This distance is measured along the carriageway from the conflict point to the approaching vehicle. It is measured from the driver's eye height (1.1 m) to a point 1.25 m above the road (representing the driver seeing the upper part of a car), assuming the driver on the minor approach is 7 m from the conflict point, as per the Austroads *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* (AGRD04A-17, 2021).

The SISD for each site access road intersection was calculated in accordance with Equation 2 in the AGRD04A-17, with adopted values and resulting SISD shown in Table 42.

Table 42 Safe intersection sight distances for major road approaches at each site

Intersection	Approach	Operating speed	Reaction time (s)	Observation time (s)	Coefficient of Deceleration	Grade* (%)	SISD (m)
Lincoln Highway / New Mullaquana Station Access Road	Lincoln Highway eastbound	110 km/h	2.5	3.0	0.29	0	332
	Lincoln Highway westbound	110 km/h	2.5	3.0	0.29	0	332
New Mullaquana Station Access Road / Eight Mile Creek Road	New Mullaquana Station Access Road	100 km/h	2.5	3	0.29	0	289
	New Mullaquana Station Access Road	100 km/h	2.5	3	0.29	0	289
Lincoln Highway / Horseshoe Road	Lincoln Highway eastbound	80 km/h	2.5	3.0	0.29	0	209
	Lincoln Highway westbound	80 km/h	2.5	3.0	0.29	0	209
Eyre Highway / Lincoln Gap Site Access	Eyre Highway eastbound	110 km/h	2.5	3.0	0.29	0	332
	Eyre Highway westbound	110 km/h	2.5	3.0	0.29	0	332
Stuart Highway / Kalaya Site Access	Stuart Highway southbound	110 km/h	2.5	3.0	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3.0	0.29	0	332
Stuart Highway / Mangata Site Access	Stuart Highway southbound	110 km/h	2.5	3.0	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3.0	0.29	0	332
Stuart Highway / Bimba Product Water Storage Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Lincoln Highway / Mullaquana Station Substation Site Access	Lincoln Highway eastbound	110 km/h	2.5	3	0.29	0	332
	Lincoln Highway westbound	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Kootaberra Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Industry Drive / Site Access (Whyalla Laydown)	Industry Drive	60 km/h	2.5	3	0.29	0	141
	Industry Drive	60 km/h	2.5	3	0.29	0	141
Stuart Highway / Carriewerloo Laydown & Stack Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332

Intersection	Approach	Operating speed	Reaction time (s)	Observation time (s)	Coefficient of Deceleration	Grade* (%)	SISD (m)
Stuart Highway / Nutt Laydown & Stack Site Access	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Nutt Laydown & Stack Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Mount Gunson Laydown Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Lake Windabout Stack Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Pimba (KAC) Laydown & Accommodation Camp Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Olympic Dam Highway / Purple Downs Laydown & Stack Site Access	Olympic Dam Highway southbound	110 km/h	2.5	3	0.29	0	332
	Olympic Dam Highway northbound	110 km/h	2.5	3	0.29	0	332
Arthur Glennie Drive / Whyalla Segment Yard Site Access	Arthur Glennie Drive eastbound	100 km/h	2.5	3	0.29	0	289
	Arthur Glennie Drive westbound	100 km/h	2.5	3	0.29	0	289
Arthur Glennie Drive / Jack-Up Barge (JUB) Workfront Site Access	Buttlingarra Way eastbound	30 km/h	2.5	3	0.29	0	58
	Buttlingarra Way westbound	30 km/h	2.5	3	0.29	0	58
Eyre Highway / Coraberra Hill Substation Site Access	Eyre Highway	110 km/h	2.5	3	0.29	0	332
	Eyre Highway	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Mount Gunson Substation Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Kloeden Street / Whyalla Camp Site Access	Kloeden Street eastbound	50 km/h	2.5	3	0.29	0	110
	Kloeden Street westbound	50 km/h	2.5	3	0.29	0	110
Press Road / KAC Laydown and Camp Site	Press Road northbound	50 km/h	2.5	3	0.29	0	110
	Madland Street westbound	50 km/h	2.5	3	0.29	0	110

Intersection	Approach	Operating speed	Reaction time (s)	Observation time (s)	Coefficient of Deceleration	Grade* (%)	SISD (m)
Access / Madland St							
Olympic Way / Roxby Downs Camp Site Access	Olympic Way southbound	80 km/h	2.5	3	0.29	0	209
	Olympic Way northbound	80 km/h	2.5	3	0.29	0	209
Iron Knob Road / Whyalla Boral Quarries Site Access	Iron Knob Road Eastbound	110 km/h	2.5	3	0.29	0	332
	Iron Knob Road Westbound	110 km/h	2.5	3	0.29	0	332
Eyre Highway / Port Augusta Council Quarry Site Access	Eyre Highway southbound	110 km/h	2.5	3	0.29	0	332
	Eyre Highway northbound	110 km/h	2.5	3	0.29	0	332
Stuart Highway / Mount Gunson Mines AMJ Musolino Quarry Site Access	Stuart Highway southbound	110 km/h	2.5	3	0.29	0	332
	Stuart Highway northbound	110 km/h	2.5	3	0.29	0	332
Olympic Way / Opal Road	Olympic Way southbound	80 km/h	2.5	3	0.29	0	209
	Olympic Way northbound	80 km/h	2.5	3	0.29	0	209
Olympic Dam Highway / Pimba Rail Line Site Access	Olympic Dam Highway southbound	80 km/h	2.5	3	0.29	0	209
	Olympic Dam Highway northbound	80 km/h	2.5	3	0.29	0	209
Lincoln Highway / Ship Yard Road	Lincoln Highway southbound	80 km/h	2.5	3	0.29	0	209
	Lincoln Highway northbound	80 km/h	2.5	3	0.29	0	209

**Assumed in the absence of surveyed grade information.*

Based on aerial imagery and an understanding of the terrain from Google Street View, it is expected that the actual SISD at these intersections are in excess of the calculated SISD requirements, and therefore the intersection locations are considered appropriate in this respect. It is recommended that this be confirmed on site.

In particular, the SISD available for new Mullaquana Station access road approach to the proposed intersection with Eight Mile Creek Road (north) needs to be confirmed during the detailed design and construction of this new road to ensure there are no obstructions to visibility within the inside of the curve. Given the flat terrain and low-lying vegetation, this is considered unlikely.

At the Lincoln Highway / Horseshoe Road intersection it is recommended that vegetation planted in the Lincoln Highway median is regularly maintained to prevent growth obstructing sight lines from Horseshoe Road, particularly if Horseshoe Road is proposed to be used as an access route during construction.

The intersection of particular concern is the site access at Lincoln Gap Pump Station. The sight distances for right-turn movements exiting the proposed site may be restricted by the bend west of the site on Eyre Highway (West). Further investigation is recommended at this site to confirm sight distances can be achieved.

Additionally, based on Google Street View, Kalaya and Mangata Pump Station access roads are located along a stretch of Stuart Highway where there appears to be a minor crest in the road. Confirmation on site is recommended as to how this impacts sight distances.

The existing access tracks to the Main Transfer Pipeline have been assessed from a high-level perspective via aerial imagery based on the most stringent SISD requirement of 332 m, as noted above. Appendix A provides further details and locations of these tracks. In general, the access tracks appear to be in excess of the required SISD of 332 m, but it is recommended to verify this on site. The access track intersections of particular concern regarding SISD and requiring further investigation on site include:

– Access Track ID 8 (Iron Knob Road) approximately 200 m from a bend in the road with vegetation obstructing view around the bend
– Access Track ID 91 (Olympic Dam Highway) on the inside of a curve

8.1.3.2 Turn treatments

The Austroads *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management* (AGTM06-20, 2020) includes guidance on the selection of turn treatments on a major road at unsignalised intersections. Section 3.3.6 of the Austroads *Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management*, provides warrants for the provision of turn lanes at unsignalised intersections. Turn lane warrants assess whether the addition of a turn lane is required at an unsignalised intersection. The purpose is to improve safety and traffic flow by reducing conflicts between turning vehicles and through traffic. Turn lane warrants are determined based on:

– Design speed
– Traffic volumes
– The number of lanes in each direction
– The presence of a right-turn splitter island.

With consideration of the above criteria, turn lane warrants determine whether basic, auxiliary or channelised turn treatments are required. Based on the intersection arrangements, the projected traffic volumes during the peak month of construction and the respective design speeds, the turn lane treatments at each intersection throughout the project area were determined based on the turning warrant diagrams for turn treatments on major roads, as shown in Figure 62, Figure 63 and Figure 64. Based on this graph, Curve 1 represents the boundary between a basic right (BAR) and a short channelised right (CHR(s)) turn treatment and between a basic left (BAL) and a short auxiliary left (AUL(s)) turn treatment. Curve 2 represents the boundary between a CHR(s) and a channelised right (CHR) turn treatment and between an AUL(s) and an auxiliary (AUL) or channelised left (CHL) turn treatment. Example layouts for BAL, BAR and CHR(s) turn treatments are shown in Figure 65.

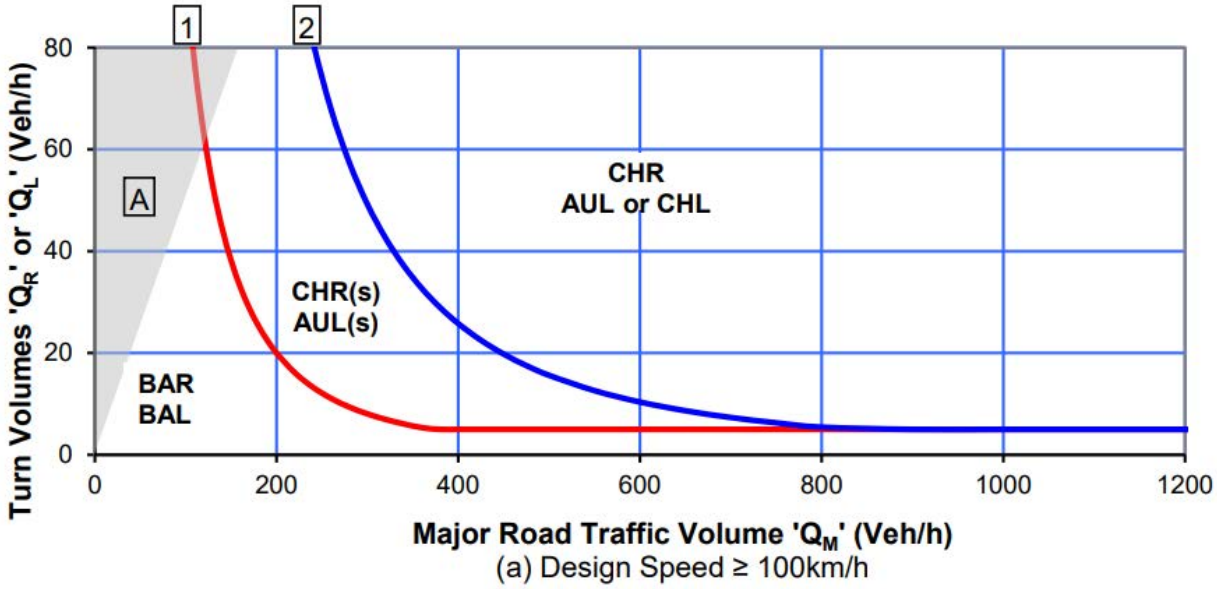


Figure 62 *Warrants for turn treatments on major roads at unsignalised intersections with design speed greater than 100km/h (AGTM06-20, 2020)*

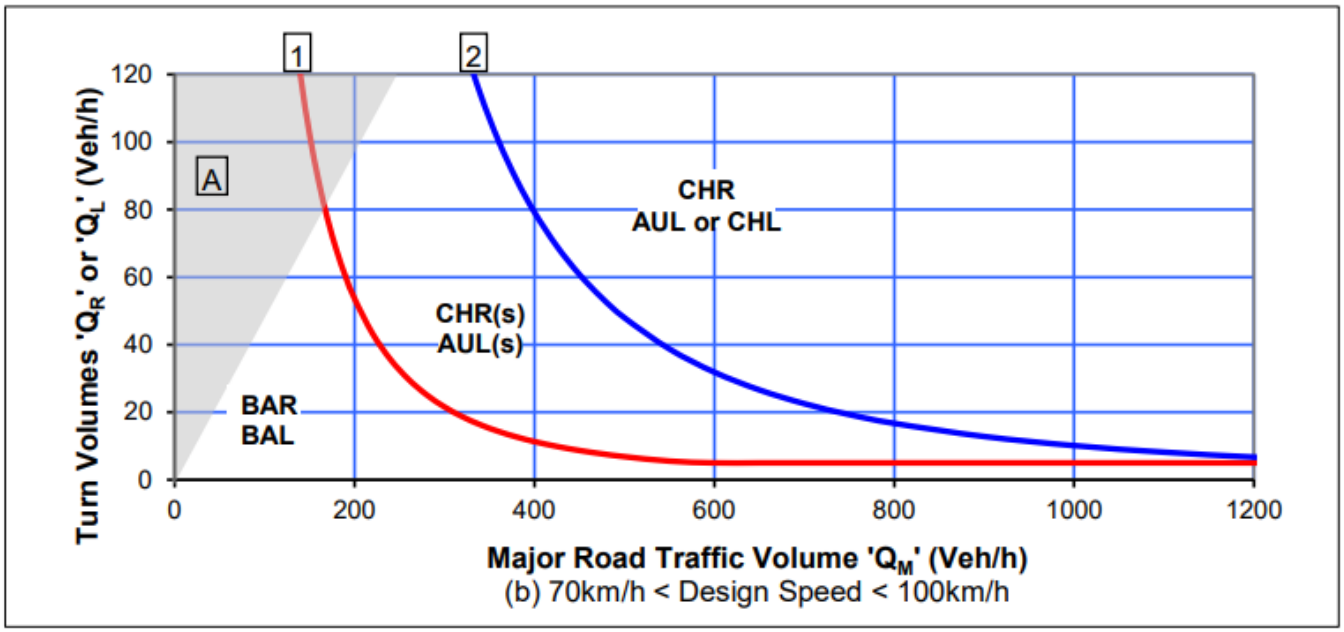


Figure 63 *Warrants for turn treatments on major roads at unsignalised intersections with design speed between 70km/h and 100km/h (AGTM06-20, 2020)*

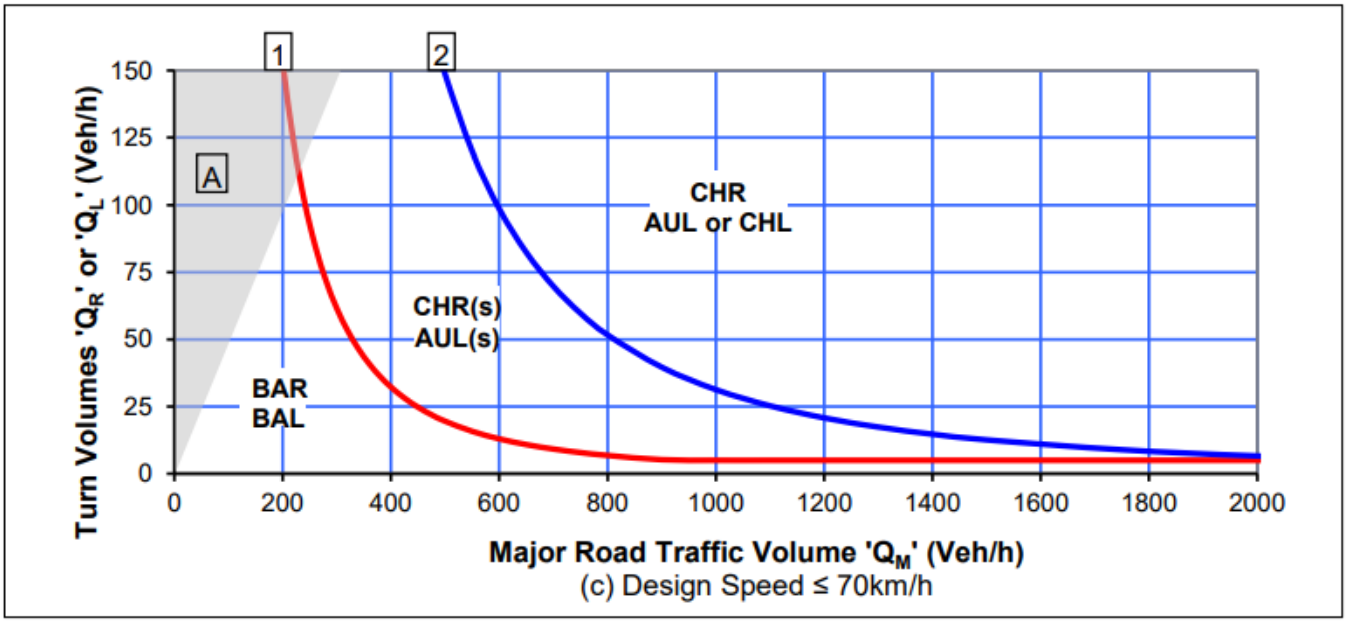
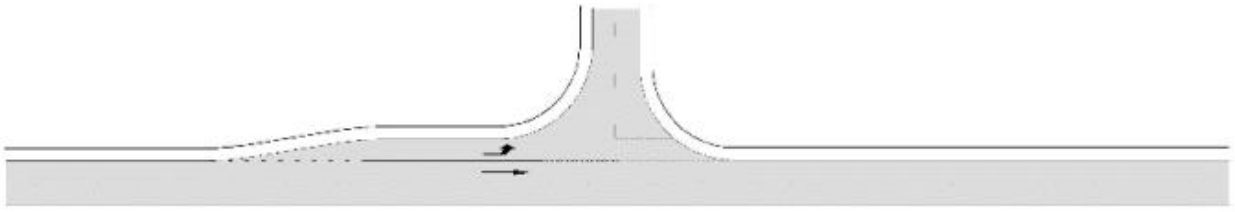
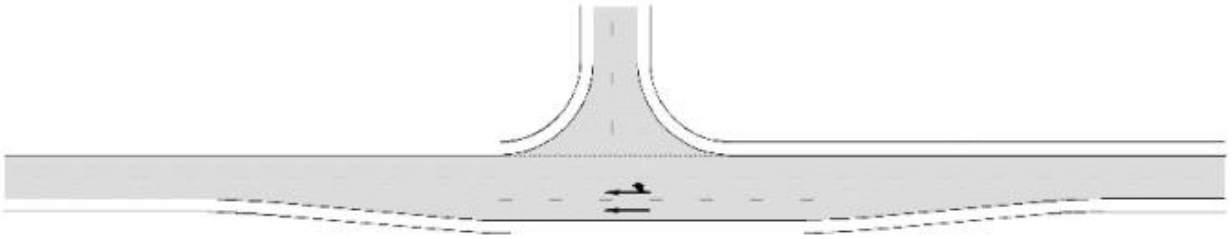


Figure 64 ***Warrants for turn treatments on major roads at unsignalised intersections with design speed less than 70km/h (AGTM06-20, 2020)***



Auxiliary Left Turn (AUL)
on the Major Road



Auxiliary Right Turn (AUR)
on the Major Road (Two-Lane, Two-Way Road)

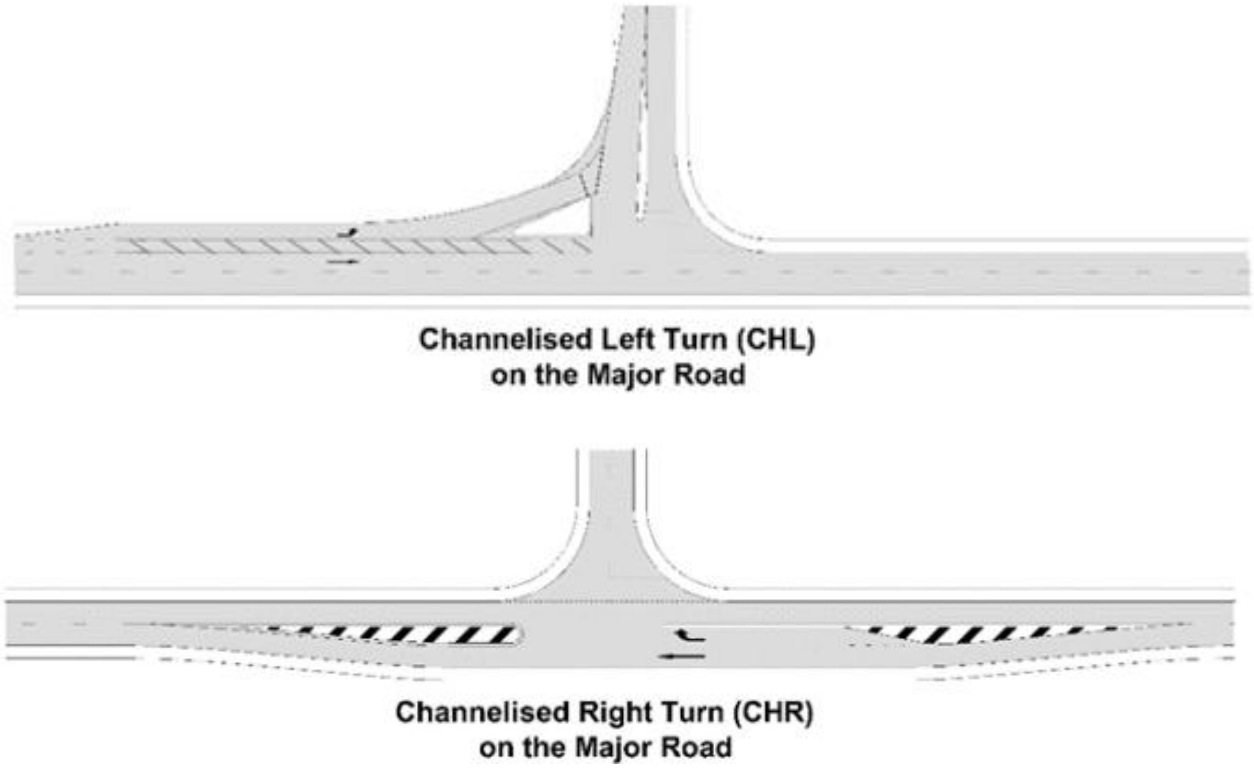


Figure 65 Example intersection treatment layouts (AGTM06-20, 2020)

Table 43 presents the key intersection locations for the study area, the existing turn treatments and the recommended turn treatments to be developed for the construction phase of the project. From this assessment, most intersections require upgrading in some capacity to accommodate the construction phase traffic. The worst case traffic volumes generated by the Project at Lincoln Highway and new Mullaquana Station access road intersection only warrant a BAL (refer to Appendix E and section 8.1.2.1). However, an AUL(s) has been designed to allow for variability in the estimated traffic volumes and improve the safety of the proposed intersection.

The access tracks to the Main Transfer Pipeline have been assessed from a high-level perspective to determine adequate turn treatments required. As a worst-case scenario during the construction peak period (Month 17), the traffic volumes are anticipated to be highest for the sections of pipeline primarily accessed via Stuart Highway. Similar volumes are observed during this peak period accessing Lake Windabout Stack Site, which is also on Stuart Highway. The access tracks are anticipated to be used on a temporary basis during construction and infrequently during operation. Due to the above, the turn treatments at the access track intersections would require BAL and BAR treatments only.

Figure 66 and Figure 67 show the intersections requiring turn treatments spatially.

Table 43 Intersection treatment recommendations

Location	Intersection	Current left turn treatment	Recommended left turn treatment	Current right turn treatment	Recommended right turn treatment
Mullaquana Station Desalination Plant	Lincoln Highway / New Mullaquana Station Access Road	None (new road)	AUL(s)	None (new road)	BAR
Mullaquana Station Desalination Plant	New Mullaquana Station Access Road / Eight Mile Creek Road	None (new road)	BAL	None (new road)	BAR
Mullaquana Station Desalination Plant	Lincoln Highway / Horseshoe Road	CHL	CHL(s)	CHR	CHR

Lincoln Gap Pump Station	Eyre Highway / Site Access	None	BAL	None	BAR
Kalaya Pump Station	Stuart Highway / Site Access	None	BAL	None	BAR
Mangata Pump Station	Stuart Highway / Site Access	None	BAL	None	BAR
Bimba Product Water Storage	Stuart Highway / Site Access	None	BAL	None	BAR
Mullaquana Station Substation	Lincoln Highway / Site Access	None	CHL(s)	None	BAR
Kootaberra Substation	Stuart Highway / Site Access	None	BAL	None	BAR
Whyalla Laydown	Industry Drive / Site Access	None	BAL	None	BAR
Carriewerloo Laydown	Stuart Highway / Site Access	None	BAL	None	BAR
Nutt Laydown	Stuart Highway / Site Access	None	BAL	None	BAR
Oakden Hills Stack Site	Stuart Highway / Site Access	None	BAL	None	BAR
Mount Gunson Laydown	Stuart Highway / Site Access	None	BAL	None	BAR
Lake Windabout Stack Site	Stuart Highway / Site Access	None	BAL	None	BAR
Pimba KAC Laydown	Stuart Highway / Site Access	None	BAL	None	BAR
Purple Downs Laydown	Olympic Dam Highway / Site Access	None	BAL	None	BAR
Whyalla Segment Yard	Arthur Glennie Drive / Site Access	None	BAL	None	BAR
Coraberra Hill Substation (site upgrade)	Eyre Highway / Site Access	None	BAL	None	BAR
Mount Gunson Substation	Stuart Highway / Site Access	None	BAL	None	BAR
Whyalla Camp	Kloeden Street / Site Access	None	BAL	None	BAR
Pimba KAC Camp	Stuart Highway / Site Access	None	BAL	None	BAR
Roxby Downs Camp	Olympic Way / Site Access	None	BAL	None	BAR
Whyalla Quarry	Iron Knob Road / Site Access	None	BAL	None	BAR
Port Augusta Quarry	Eyre Highway / Site Access	None	BAL	None	BAR
Mount Gunson Quarry	Stuart Highway / Site Access	None	BAL	None	BAR
Roxby Downs Quarry	Olympic Way / Opal Road	AUL	BAL	AUR	BAR
Pimba Rail Line	Olympic Dam Highway / Site Access	None	BAL	None	BAR
Whyalla Port	Lincoln Highway / Ship Yard Road	None	BAL	CHR(s)	BAR

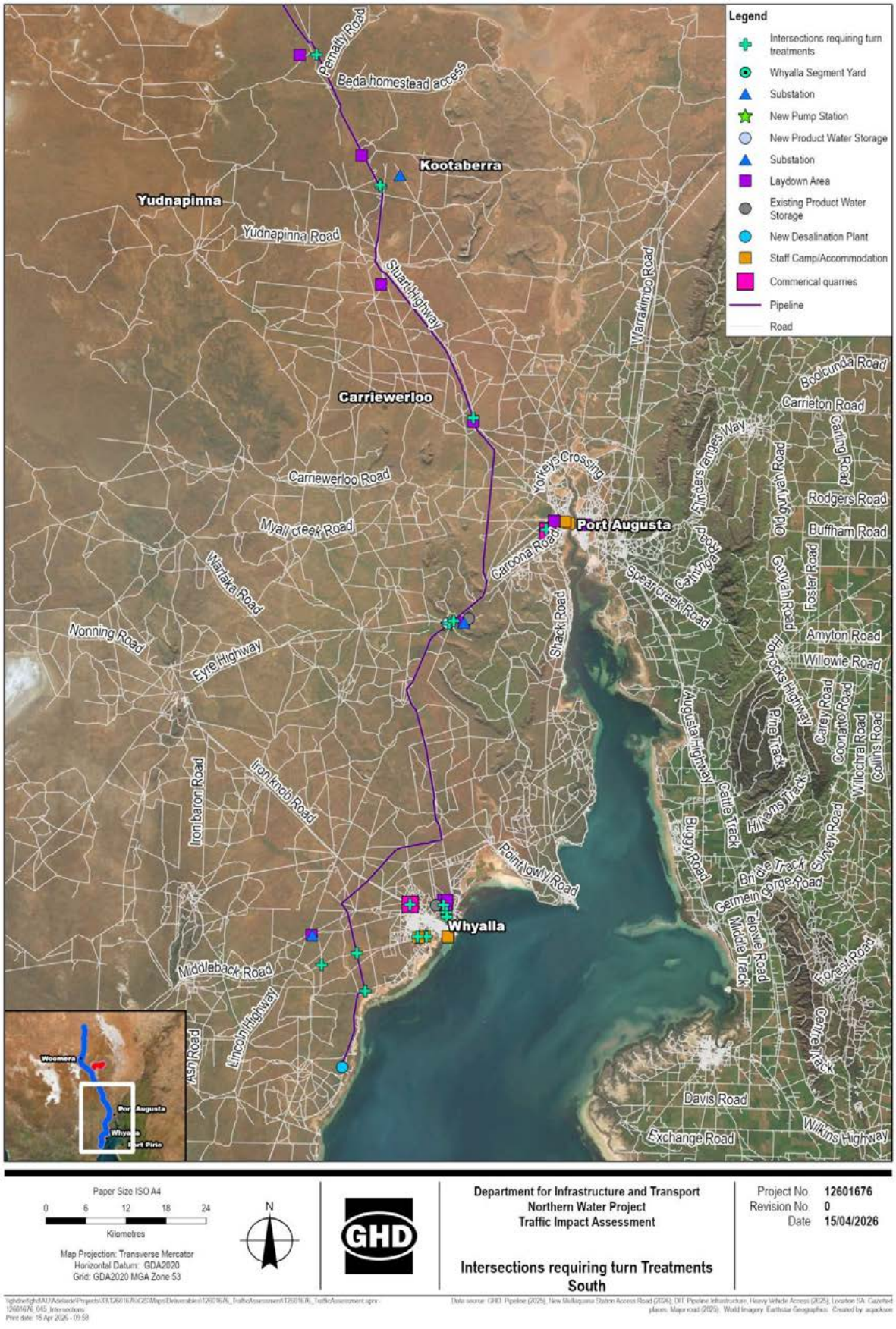


Figure 66 *Intersections requiring turn treatments – southern section*

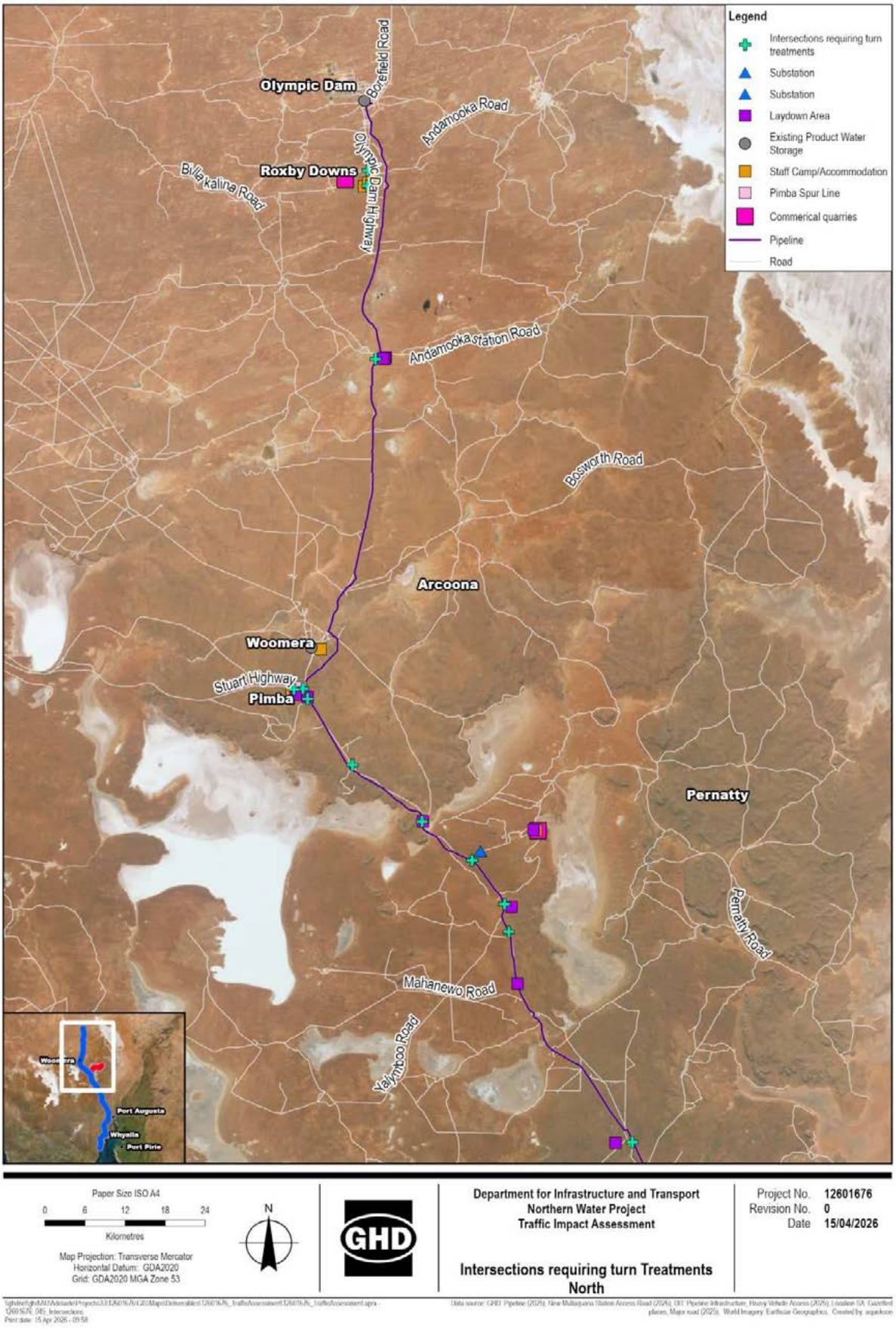


Figure 67 Intersections requiring turn treatments – northern section

8.1.3.3 Localised road upgrades

A high-level desktop assessment of impacted roads was undertaken to determine any likely required localised road upgrades based on current condition and expected traffic (including consideration of heavy vehicle requirements – refer to Section 8.1.13). In addition to the below recommendations, it is also recommended that a review of drive over structures including culverts (particularly in the proposed route of overmass vehicles such as on Horseshoe Road) is undertaken along with a review of power line locations and clearances as part of future route assessments. Table 4.5 in Austroads Guide to Road Design Part 3 Geometric Design (AGRD03-21) has been consulted for this assessment. This table sets out the minimum single carriageway rural road widths for different AADT values. A summary of road treatments, including existing road type, is provided in Appendix C.

Mullaquana Station Desalination Plant

– Lincoln Highway (south of Whyalla)
  - Daily traffic volumes on this section are expected to increase from 7,900 vehicles per day to 8,722 vehicles per day during the peak construction period. This equates to a 10% increase in traffic.
  - The desktop assessment of Lincoln Highway (south of Whyalla) indicates that it is in good condition as a two-way, dual carriageway with 3 m lane widths.
  - Therefore, no specific treatments are recommended.
– Horseshoe Road
  - Daily traffic volumes on this section are expected to increase from 2,400 vehicles per day to 2,850 vehicles per day during the peak construction period. This equates to an 19% increase in traffic.
  - A desktop assessment of Horseshoe Road shows that the carriageway is generally in good condition with a sealed carriageway of approximately 7 m, and unsealed shoulders.
  - For the expected changes in traffic volumes on this road, it is noted that sealed shoulders of 1 m may be provided in accordance with AGRD03-21 to appropriately cater for the expected traffic volumes, it is considered that, given the rural context, their provision would offer limited additional safety benefit and is therefore not required.
  - Therefore, no specific treatments are recommended.
– Mullaquana Road
  - Daily traffic volumes on this section are expected to increase from 2,400 vehicles per day to 2,850 vehicles per day during the peak construction period. This equates to an 19% increase in traffic.
  - A desktop assessment of Mullaquana Road shows that the carriageway is generally in good condition with a sealed carriageway width of approximately 7 m, and unsealed shoulders.
  - For the expected changes in traffic volumes on this road, it is noted that sealed shoulders of 1 m may be provided in accordance with AGRD03-21 to appropriately cater for the expected traffic volumes, it is considered that, given the rural context, their provision would offer limited additional safety benefit and is therefore not required.
  - Therefore, no specific treatments are recommended.
– Eight Mile Creek Road
  - Daily traffic volumes on this section are expected to increase from 10 vehicles per day to 460 vehicles per day during the peak construction period. This equates to an 4,500% increase in traffic.
  - Upgrades of Eight Mile Creek Road are required due to anticipated traffic volumes generated by construction activities. This includes localised road widening and sealing and could include pavement stabilisation. It is understood that a concept design for the upgrade of this road has already been completed (PDP, 2025). In light of increased traffic demand associated with the Project, consideration should be given to the long-term economic efficiency of sealing the road compared with ongoing unsealed maintenance throughout construction phase, including whole-of-life costs and the maintenance burden on the road authority.
– New Mullaquana Station Access Road (new road)
  - The new Mullaquana Station access road is proposed to provide an alternative access route (Option 2) to the Desalination Plant and Intake and Outfall Tunnel sites.

- It is proposed to provide access from Lincoln Highway (south of Whyalla) to Eight Mile Creek Road and thereby avoid the use of Horseshoe Road and Mullaquana Road (Option 1 route).
- The new Mullaquana Station access road (Option 2 route) is understood to be the preferred route to the Mullaquana Station Desalination Plant (refer to section 6.2.1) and hence may negate the need to upgrade the northern portion of Eight Mile Creek Road, depending on the construction Contractor's elected methodology and transport route selection.

Lincoln Gap Pump Station

– Eyre Highway (north)
  - Daily traffic volumes on this section are expected to increase from 2,800 vehicles per day to 2,988 vehicles per day during the peak construction period. This equates to an 7% increase in traffic.
  - A desktop assessment of Eyre Highway (north) indicates that it is in good condition with a sealed carriageway of approximately 6 m and a sealed shoulder of 1 m.
  - Therefore, no specific treatments are recommended. Localised road widening may be determined appropriate following a site inspection.
– Eyre Highway (west)
  - Daily traffic volumes on this section are expected to increase from 950 vehicles per day to 1,026 vehicles per day during the peak construction period. This equates to an 8% increase in traffic.
  - A desktop assessment of Eyre Highway (south) indicates that it is in good condition with a sealed carriageway of approximately 6 m and a sealed shoulder of 1 m.
  - Therefore, no specific treatments are recommended based on the desktop assessment. Localised road widening may be determined appropriate following a site inspection.
– Lincoln Highway (south)
  - Daily traffic volumes on this section are expected to increase from 2,200 vehicles per day to 2,380 vehicles per day during the peak construction period. This equates to an 8% increase in traffic.
  - A desktop assessment of Lincoln Highway indicates that it is in good condition with a sealed carriageway of approximately 7 m and a shoulder of approximately 0.5 m to 1 m.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.

Kalaya Pump Station & Mangata Pump Station

– Stuart Highway
  - Daily traffic volumes on this section are expected to increase from 950 vehicles per day to 1,762 vehicles per day during the peak construction period. This equates to an 85% increase in traffic.
  - A desktop assessment of Stuart Highway indicates that it is in average to good condition with a sealed carriageway of approximately 6 m with a 1 m paved shoulder along the length of the Stuart Highway.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.
  - It is recommended that consideration is given to the access roads for the existing communications tower and Ranges View Rest Area when designing intersection treatments at the pump station site entrance.
  - Also, based on Google Street View, the Kalaya Pump Station access road is located along a section of Stuart Highway where there appears to be a minor crest in the road. Confirmation on site is recommended as to how this impacts sight distances.

Bimba Product Water Storage

– Stuart Highway
  - Daily traffic volumes on this section are expected to increase from 950 vehicles per day to 1,762 vehicles per day during the peak construction period. This equates to an 85% increase in traffic.

- A desktop assessment of Stuart Highway indicates that it is in average to good condition with a sealed carriageway of approximately 6 m and a 1 m paved shoulder along the length of the Stuart Highway.
- Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.

– Unnamed Access Road
  - Daily traffic volumes on this section are expected to increase from 5 vehicles per day to 23 vehicles per day during the peak construction period. This equates to an 360% increase in traffic.
  - Based on site photos sourced from the Web Map, the existing access road appears to be an unsealed, informal track that requires upgrades prior to use for heavy vehicle access, including localised road widening, gravelling and potential pavement stabilisation (if determined necessary following a site inspection).

New sites – temporary

– Broadbent Terrace
  - Daily traffic volumes on this section are expected to increase from 8,800 vehicles per day to 9,200 vehicles per day during the peak construction period. This equates to an 5% increase in traffic.
  - A desktop assessment of Broadbent Terrace indicates that it is in good condition with sealed carriageways of approximately 6 m and a 1 m paved shoulder.
  - Therefore, no specific widening treatments are recommended.
– Norrie Avenue
  - Daily traffic volumes on this section are expected to increase from 3000 vehicles per day to 3082 vehicles per day during the peak construction period. This equates to a 3% increase in traffic.
  - A desktop assessment of Norrie Avenue indicates that it is in good condition with sealed carriageways of approximately 7 m and a 2 m paved shoulder.
  - Therefore, no specific widening treatments are recommended.
– Playford Avenue
  - Daily traffic volumes on this section are expected to increase from 3,900 vehicles per day to 3,972 vehicles per day during the peak construction period. This equates to an 2% increase in traffic.
  - A desktop assessment of Playford Avenue indicates that it is in good condition with sealed carriageways of approximately 7 m.
  - Therefore, no specific widening treatments are recommended.
– Arthur Glennie Drive
  - Daily traffic volumes on this section are expected to increase from 2,700 vehicles per day to 2,796 vehicles per day during the peak construction period. This equates to an 4% increase in traffic.
  - A desktop assessment of Arthur Glennie Drive indicates that it is in good condition with a sealed carriageway of approximately 14 m with a 1 m paved shoulder.
  - Therefore, no specific widening treatments are recommended.
– Industry Drive
  - Daily traffic volumes on this section are expected to increase from 200 vehicles per day to 238 vehicles per day during the peak construction period. This equates to an 19% increase in traffic.
  - A desktop assessment of Industry Drive indicates that it is in good condition with a sealed carriageway of approximately 16 m.
  - Therefore, no specific widening treatments are recommended.
– Shipyard Road
  - Daily traffic volumes on this section are expected to increase from 50 vehicles per day to 64 vehicles per day during the peak construction period. This equates to an 28% increase in traffic.
  - A desktop assessment of Shipyard Road indicates that it is in average to good condition with a sealed carriageway of approximately 7 m.

- Therefore, no specific widening treatments are recommended. Localised road widening and pavement upgrades may be determined appropriate following a site inspection.

– Madland Street
  - Daily traffic volumes on this section are expected to increase from 200 vehicles per day to 250 vehicles per day during the peak construction period. This equates to an 25% increase in traffic.
  - A desktop assessment of Madland Street indicates that it is in good condition with a sealed carriageway of approximately 9 m with unsealed shoulders.
  - Therefore, no specific widening treatments are recommended.
– Press Road
  - Daily traffic volumes on this section are expected to increase from 200 vehicles per day to 250 vehicles per day during the peak construction period. This equates to an 25% increase in traffic.
  - A desktop assessment of Press Road indicates that it is in good condition with a sealed carriageway of approximately 7 m with unsealed shoulders.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.
– Olympic Dam Highway (accessing Purple Downs Laydown)
  - Daily traffic volumes on this section are expected to increase from 500 vehicles per day to 632 vehicles per day during the peak construction period. This equates to an 26% increase in traffic.
  - A desktop assessment of Olympic Dam Highway (accessing Purple Downs Laydown) indicates that it is in good condition with a sealed carriageway of approximately 9 m with a 1 m paved shoulder.
  - Therefore, no specific widening treatments are recommended.
– Olympic Way
  - Daily traffic volumes on this section are expected to increase from 430 vehicles per day to 484 vehicles per day during the peak construction period. This equates to an 13% increase in traffic.
  - A desktop assessment of Olympic Way indicates that it is in good condition with a sealed carriageway of approximately 7 m and a shoulder.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.
– Borefield Road
  - Daily traffic volumes on this section are expected to remain unchanged at 200 vehicles per day during the peak construction period.
  - A desktop assessment of Borefield Road indicates that it is in poor to average condition with a sealed carriageway of approximately 7 m and unsealed shoulders.
  - Therefore, no specific widening treatments are recommended. Localised road widening and pavement upgrades may be determined appropriate following a site inspection.

Existing sites

– Kloeden Street
  - Daily traffic volumes on this section are expected to increase from 500 vehicles per day to 746 vehicles per day during the peak construction period. This equates to an 49% increase in traffic.
  - A desktop assessment of Kloeden Street indicates that it is in good condition with a sealed carriageway of approximately 7 m.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.
– Iron Knob Road
  - Daily traffic volumes on this section are expected to increase from 650 vehicles per day to 694 vehicles per day during the peak construction period. This equates to an 7% increase in traffic.

- A desktop assessment of Iron Knob Road indicates that it is in average to good condition with a sealed carriageway of approximately 6 m and unsealed shoulders.
- Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.

– Lincoln Highway (accessing Whyalla Port)
  - Daily traffic volumes on this section are expected to increase from 2200 vehicles per day to 2380 vehicles per day during the peak construction period. This equates to an 8% increase in traffic.
  - A desktop assessment of Lincoln Highway indicates that it is in good condition with sealed carriageways of approximately 7 m and unsealed shoulders.
  - Therefore, no specific widening treatments are recommended.
– Addison Road
  - Daily traffic volumes on this section are expected to remain unchanged at 2,500 vehicles per day during the peak construction period.
  - A desktop assessment of Addison Road indicates that it is in average to good condition with a sealed carriageway of approximately 10 m.
  - Therefore, no specific widening treatments are recommended. Localised pavement upgrades may be determined appropriate following a site inspection.
– Caroona Road
  - Daily traffic volumes on this section are expected to remain unchanged at 2,500 vehicles per day during the peak construction period.
  - A desktop assessment of Carrona Road indicates that it is in good condition with a sealed carriageway of approximately 8 m and unsealed shoulders.
  - Therefore, no specific widening treatments are recommended.
– Olympic Dam Highway (accessing Pimba Rail Line)
  - Daily traffic volumes on this section are expected to increase from 500 vehicles per day to 632 vehicles per day during the peak construction period. This equates to an 26% increase in traffic.
  - A desktop assessment of Olympic Dam Highway indicates that it is in good condition with a sealed carriageway of approximately 7 m and a 1 m paved shoulder.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.
– Opal Road
  - Daily traffic volumes on this section are expected to remain unchanged at 100 vehicles per day during the peak construction period.
  - A desktop assessment of Opal Road indicates that it is in average condition with a sealed carriageway of approximately 12 m.
  - Therefore, no specific widening treatments are recommended. Localised pavement upgrades may be determined appropriate following a site inspection.
– Blinman Road
  - Daily traffic volumes on this section are expected to remain unchanged at 1,900 vehicles per day during the peak construction period.
  - A desktop assessment of Blinman Road indicates that it is in average to good condition with a sealed carriageway of approximately 7 m and unsealed shoulders.
  - Therefore, no specific widening treatments are recommended. Localised road widening may be determined appropriate following a site inspection.

Main Transfer Pipeline

- A number of access tracks have been proposed by the Principal as suitable for heavy vehicle access to the pipeline and key Project sites during construction. Some of these are existing tracks which may require road widening and upgrades while some are new tracks.
- These are discussed in Appendix A.
- Additionally, the new Mullaquana Station access road is proposed to be constructed parallel to the Main Transfer Pipeline between Eight Mile Creek Road and Lincoln Highway and hence would provide more direct access to this portion of the pipeline.

8.1.4 Vehicle parking

Insufficient parking can have an adverse effect on the surrounding road network, leading to increased congestion, illegal parking and safety concerns. Vehicle parking supply would need to be determined and documented in the CTMP. A parking management plan would also be required to address vehicle parking demand and requirements.

Based on the proposed parking allowance described in Section 6.6 and the anticipated vehicle traffic generated during construction and operation as described in Section 7, there appears to be adequate light vehicle parking capacity for each of the permanent sites (excluding the Main Transfer Pipeline). There is currently insufficient information to assess the parking capacity for each of the temporary sites used during construction and whether some of the sites would have adequate space allowed for parking. Confirmation is required by the construction contractor that the space allocations described below can be provided for the sites lacking specific information on parking space allocations.

Based on existing understanding of traffic demand, the vehicle types outlined below would need to be considered when considering the requirement to provide sufficient parking and reduce the impacts of car parking.

8.1.4.1 Light Vehicles

8.1.4.1.1 Construction

- Based on construction traffic estimates the peak period is expected to generate a maximum of 4 light vehicles at laydown sites and 7 light vehicles at the pump station and tank storage sites (excluding the Mullaquana Station Desalination Plant).
- Mullaquana Station Desalination Plant site is expected to generate 138 light vehicles during the construction peak period.
- The Intake and Outfall Tunnels site is expected to generate an average of 13 light vehicles during the construction period.
- Whyalla Accommodation Camp will experience a maximum of 122 light vehicle movements during the construction peak period.
- Port Augusta Camp will experience a maximum of 24 light vehicle movements during the construction peak period.
- Pimba KAC Camp will experience a maximum of 26 light vehicle movements during the construction peak period.
- Roxby Downs Camp will experience a maximum of 26 light vehicle movements during the construction peak period.
- The Main Transfer Pipeline workfront is expected to generate a maximum of 15 light vehicles during the construction peak period, but approximately 15% (as per the Systra Constructability Report, 2025) of these are anticipated to be mini-bus vehicles that will drop workers off and not require parking. Hence, approximately 13 light vehicles will require parking space.

Based on the area required for car spaces and access aisles as per Australian Standard AS 2890.4, approximately 20 m^2 of space is required per car. Therefore, the sites would require minimum dedicated parking areas as follows:

- Laydown areas: 80 m^2

– Pump station and tank storage sites: 140 m^2
– Mullaquana Station Desalination Plant: 2760 m^2 – it is understood from the Constructability Report (Systra, 2025) that an area of 20000 m^2 has been allowed for in the proposed construction site arrangement, so ample space will be available.
– Intake & Outfall Tunnels: 260 m^2 – it is understood that 25 carpark spaces have been allowed for and hence adequate space on site is available during the construction period.
– Camps: 2440 m^2 for Whyalla, 520 m^2 for Pimba and Roxby Downs, and 480 m^2 for Port Augusta.
– Main Transfer Pipeline: varies with a maximum of 260 m^2. Due to the nature of the Main Transfer Pipeline workfront, it is understood that there will not be designated parking for the most part and so it should be verified that there is adequate off-road capacity to accommodate 13 light vehicles to park at any one time.

8.1.4.1.2 Operation

Based on the light vehicle traffic generated during operation (refer to Section 7.2.2.1) and the space allocated within the design at each of the permanent sites (refer to Section 6.6.2), there is ample provision for light vehicle parking.

8.1.4.2 Heavy Vehicles

8.1.4.2.1 Construction

While heavy vehicle numbers to each site during construction are expected to be relatively high, it is expected that they will be on a high turnover rate and will not all be on site simultaneously. Based on the assumption that heavy vehicles spend an average of 1 hr on site each and the arrivals are evenly distributed throughout the 12 hour work shift, the maximum space requirements for each of the sites are described below.

– For the laydown areas, peak demand may result in up to 30 heavy vehicles on site for one day. Therefore, sufficient space should be allocated for 3 truck bays and associated manoeuvring spaces.
– At the pump station and Product Water Storages sites, peak demand is up to 10 heavy vehicles, therefore requiring space for 1 truck arrival and associated manoeuvring space.
– At Mullaquana Station Desalination Plant, peak demand is up to 40 heavy vehicles, therefore requiring space for 4 truck arrivals and associated manoeuvring space. There is still almost 17000 m^2 space available on this site based on the 20000 m^2 space allowed for in the Constructability Report (Systra, 2025) and excluding the assumed area for light vehicle parking.
– The Intake and Outfall Tunnels site is expected to experience volumes of up to 27 heavy vehicles during the peak construction period. This requires space for a maximum of 3 heavy vehicles on site.
– For the camp sites, the peak demand is generally 1 heavy vehicle. Hence, each of the camps need to have adequate space for at least 1 heavy vehicle. Pimba KAC camp is the only exception with a maximum demand of 5 heavy vehicles in one day, resulting in the need for 1 heavy vehicle parking and manoeuvring space. It is anticipated that there will be adequate space for this due to it also being a laydown area.
– The Main Transfer Pipeline workfront is expected to generate a maximum daily traffic volume of 44 heavy vehicles during the construction peak period. Hence, approximately 4 heavy vehicles will require parking and associated manoeuvring space.

8.1.4.2.2 Operation

Based on the heavy vehicle traffic generated during operation (refer to Section 7.2.2.1) and the space allocated within the design at each of the permanent sites (refer to Section 6.6.2), there appears to be adequate provision for heavy vehicle parking. While designated heavy vehicle parking may not exist for each site, there is space within the internal boundaries of the sites ensuring no impacts to public roads.

8.1.5 Community disruption

Construction activities can temporarily affect the daily operations of residents and businesses. Disruption may include the following:

– Temporary lane closures, detours, or construction zones may restrict driveway access or require alternative routes for residents and service vehicles
– Altered traffic patterns can lead to longer travel times for local road users.

Disruptions to the community would be managed in a CTMP. The CTMP would outline key strategies to minimise impacts, such as scheduling activities during designated hours to avoid sensitive periods and liaising with residents and businesses regarding construction timelines and expected disruptions.

8.1.6 Environment

Transport of any hazardous waste generated by construction activities is likely to be low and would be managed as part of an Environmental Management Plan (EMP). The proposed works could also result in spills and leaks from the construction vehicles, in the form of fuel, gear, waste spoil, raw quarry materials and more.

Vehicles would be inspected before leaving the site. During this inspection, the vehicles would be checked to ensure any loads are well-secured to prevent spillage. Furthermore, it is recommended that vehicle washdown areas be installed at the site entrances. These can be used by vehicles prior to leaving the site, to ensure they are not spreading dust, mud or other debris across the road network and to ensure that biosecurity protocols are implemented to avoid spread of weeds, pathogens and other contaminants.

8.1.7 Wildlife

During the construction phase, increased vehicle movements can elevate the risk of roadkill incidents. These impacts are particularly concerning in areas with high fauna activity near transport routes. If monitoring indicates that roadkill volumes become significant, the project could implement targeted mitigation measures such as wildlife crossing signage, reduced speed zones, construction traffic bans during dawn and dusk, or temporary fencing to protect fauna and minimise further harm. These measures should be outlined in the CTMP.

8.1.8 Public disturbance

Construction activities can lead to public disturbance through increased traffic volumes, dust emissions, noise, and vibration. To mitigate these impacts, an EMP and CTMP would be implemented to minimise disruption. Key measures include regular watering of aggregate sections to suppress dust, particularly during dry conditions, and restricting the use of engine brakes near sensitive areas to reduce noise. Additionally, proactive engagement with local communities should be maintained, providing clear communication on construction timelines and anticipated disruptions.

8.1.9 Road condition

Construction activities would involve frequent movement of heavy vehicles along the road network over many months which can accelerate the deterioration of existing road surfaces. To manage this impact, a road condition audit should be undertaken prior to the commencement of construction works to understand the current condition of all roads expected to carry the construction traffic. The audit should also include other associated infrastructure such as culverts, bridges, and other critical assets. The findings of the audit would be used to determine whether any sections of the road network are not fit for the anticipated construction traffic and where deficiencies are identified, road upgrades would be implemented prior to construction to ensure the road network can safely accommodate the increased vehicle movements.

An inspection regime should be implemented throughout the construction phase to monitor road conditions and to identify any defects. Regular inspections would enable timely maintenance interventions, reduce safety hazards and minimise disruption to both construction and public traffic. It is the expectation that the proponent would conduct the road condition audit to reinstate all roads back to an appropriate condition once construction is complete.

8.1.10 Rail Operations

As previously discussed, only the Pimba rail line is anticipated to be used for the Project. The estimated number of rail deliveries generated by the Project is anticipated to be 53 rail cars per week over two years (24 months) during

construction. This is assumed to be facilitated by one train per week, which is expected to retain 50 percent capacity for other freight deliveries. Based on the existing train schedules previously discussed, these deliveries make up only 1 percent of trains passing through Pimba.

Given the low frequency and temporary nature of rail deliveries (only required during Project construction) and assuming the Pimba spur line is open and in use, the Project is understood to have a negligible impact on existing rail operations. No oversize or overmass deliveries are proposed to be by rail. Hence, it is assumed that existing freight rail infrastructure and services can accommodate the Project requirements without any major adjustments, as long as the Pimba spur line is able to be used. If higher frequencies or quantities of rail deliveries are required during Construction, then a reassessment may be required.

8.1.11 Public Transport & Bus Routes

Due to the rural context of the study sites and the minimal services that currently exist within the Project area, it is not anticipated that there will be any material impact on public transport infrastructure as a result of the proposed Project. The location and timing of Project operations is expected to pose minimal conflicts with public transport and school bus networks, if any.

There is a public bus stop located on Kloeden Street just north of the proposed Whyalla Accommodation Camp. However, based on the proposed working roster in the Constructability Report (Systra, 2025), the existing bus service on this road is not anticipated to be operating during the times when workers are leaving or arriving back at the Camp. Hence, it is assumed that this bus stop can remain operational during Project construction.

8.1.12 Active transport

Active transport options to the Project sites have not been considered due to the study sites being located in rural locations with minimal attractions for this mode, or adjacent to high-speed public highways, or in industrial locations. Additionally, internal site access infrastructure has not been considered for any of the study locations. Existing active transport infrastructure within the study areas is minimal as discussed in the existing conditions section of this report.

Hence, the primary consideration for active transport in this TIA relates to bicycle lanes at intersections that may require adjustments, such as the intersection of Lincoln Highway and Horseshoe Road. Any proposed adjustments to this intersection would need to maintain similar or increased Level of Service for cyclists.

8.1.13 Oversize and Overmass Vehicles

During construction, OSOM vehicles are expected to be required to transport construction materials to the various sites, as described in Table 30. At this stage the estimated OSOM traffic volumes are shown in Table 44. The exact number of OSOM vehicle movements would need to be confirmed by the appointed contractor for this project and documented in their traffic management plan. The safety of these movements for all of the study sites should be considered, and once the specific vehicle types and routes are confirmed, traffic route assessments and traffic management plans developed if required to ensure that the interaction between the oversize vehicles and general traffic does not cause unreasonable risk.

The final mass and dimensions of each load would determine the specific permit conditions, which may include the following:

– Pre-transport route assessment
– Warning signs and devices
– Pilot vehicles and escort vehicles
– Mass and dimension limits, including rear overhang
– Times of operation

In addition to State Government requirements, the use of oversize vehicles would require a permit from the NHVR. The existing study roads to the new permanent Project sites (except for the Desalination Plant site) satisfy varying levels of NHVR PBS route requirements as specified in Section 5.2. The existing study roads (Option 1 route) to the proposed Mullaquana Station Desalination Plant site from Lincoln Highway / Horseshoe Road intersection in

Whyalla are currently not cleared for any NHVR PBS routes. It is uncertain whether these existing roads can accommodate OSOM vehicle deliveries anticipated to the site in terms of road widths and structural capacity. Permits would need to be obtained from Council for the use of Horseshoe Road, Mullaquana Road and Eight Mile Creek Road (Option 1 route) if they are to be used for access to the Mullaquana Station Desalination Plant from Whyalla, as they are not approved OSOM routes. Alternatively, if only the new Mullaquana Station access road (Option 2 route) is proposed to be used for access to the Desalination Plant during construction, then permits would only be required for this road and the southern portion of Eight Mile Creek Road. It is recommended then that any OSOM vehicles accessing the Desalination Plant and Intake and Outfall Tunnel sites are only permitted to use the proposed route via Lincoln Highway and the new Mullaquana Station access road (Option 2 route).

To cater to 26-metre-long B-Double trucks, roads must be subject to at least a NHVR PBS Level 2 rating. According to Table 4 in NHVR's Network Classification Guidelines, an unsealed road must meet a minimum carriageway width of 7.2 m to achieve this rating. The unsealed access tracks to Mullaquana Station Desalination Plant have varying carriageway widths between 4.1 m and 11 m, making the route currently unsuitable for B-Double truck operations. It is understood (based on the full set of PDP concept sketches as shown in Appendix B and the GHD concept design in Appendix D) that this route is undergoing design separately to be upgraded to meet the new design requirements.

Table 44 Estimated OSOM traffic volumes

Project		Delivery	Total one-way trips
Tunnelling and Marine	Intake and Outfall Tunnels	TBM cutterhead and shield, Intake pump station pumps	6
Desalination Plant	Mullaquana Station Desalination Plant	HV transformers, Generators, Over sized only- pre assembled RO racks, Over sized only – some pipework, Over sized only – lime dosing material	8
Transfer System	Lincoln Gap Pump Station	HV transformers, Generators, Oversized only - some pipework	2
Transfer System	Kalaya Pump Station	HV transformers, Generators, Oversized only - some pipework	2
Transfer System	Mangata Pump Station	HV transformers, Generators, Oversized only - some pipework	2
Transfer System	Bimba Product Water Storage	HV transformers, Generators, Oversized only - some pipework	2

8.1.14 Maritime operations

The maximum number of movements at Whyalla Port by any one vessel is expected to be approximately 1 to 2 trips per day, based on the total trips being evenly distributed across the construction period. The vessels are anticipated to have staggered arrivals/departures at the port, which should be coordinated by the construction contractor based on their preferred methodology to pose minimal impact on port operations. Construction vessels are expected to spend the majority of time stationed at the jack-up barge (JUB) offshore workfront, with port calls primarily required for mobilisation, demobilisation, crew changes and the delivery or removal of materials and equipment. Given the limited number of vessel movements and the ability to coordinate port access with existing port users, impacts on port operations are expected to be minor. Additional mobile cranes or new port crane structures may be required to accommodate construction operations and transferal of spoil from barges to heavy vehicles.

The existing maritime operations that are likely to be most impacted by the Project are the Whyalla Steelworks (OneSteel Manufacturing Pty Ltd). Most of the vessels currently using the Whyalla Port are for the Steelworks' operations. It is recommended that the construction contractor engage with the Whyalla Steelworks and port operators to confirm there is adequate capacity at the port based on the preferred construction methodology and also to obtain access permits as required for the use of access roads (i.e. Shipyard Road) and the general port precinct.

Marine construction activities will occur within an existing maritime environment that includes commercial shipping associated with Whyalla Port, harbour support vessels (e.g. tugs and pilot vessels), commercial fishing vessels operating within Spencer Gulf fisheries, and recreational vessels operating from local marinas and boat ramps. Potential interactions between Project vessels and other marine users may occur during vessel transits between Whyalla Port and the offshore workfront. These interactions are expected to be limited and manageable through standard maritime navigation practices and coordination with port authorities and other marine users.

Currently, Whyalla Marina is primarily used by recreational users. The use of Whyalla Marina during Project construction and operation is relatively minor. Only a single dive boat is expected to require a mooring point and access at this Marina during construction. During operation, approximately 15 trips per year are estimated to be made from the Whyalla Marina to the Marine Tunnels. Hence, the Project impact to the Whyalla Marina and its associated infrastructure and operations is expected to be minimal.

Construction marine activities would be undertaken in accordance with applicable maritime safety requirements, including the Navigation Act 2012 (Cth), the International Regulations for Preventing Collisions at Sea (COLREGs), and relevant South Australian marine safety and port operational requirements.

8.1.15 Air operations

The use of air transport for the Project is limited to the transport of FIFO workers during construction and helicopter support for the JUB Workfront. The required movements for FIFO workers have been assessed against existing passenger flight movements between Adelaide Airport and the respective airports and are summarised in Table 45.

Table 45 FIFO transport level of impact

Airport	Bi-weekly FIFO movements (peak)	Existing weekly passenger movements (average)	Existing weekly flight capacities (approximate)	Days that flights typically occur per week	Increase in passengers	Within Capacity
Whyalla	620 workers	420 passengers	1100 passengers to/from Adelaide	7	148%	Yes
Port Augusta	100 workers	310 passengers	222 passengers to Adelaide, 74 passengers from Adelaide	5	32%	No
Olympic Dam	100 workers	1040 passengers	2200 passengers to/from Adelaide	7	10%	Yes

Based on the above, it can be seen that the number of air passengers during construction would be significantly increased into Whyalla Airport (148%) and Port Augusta Airport (32%). Olympic Dam Airport is only expected to experience an increase in passengers by 10%. It can be seen that the increase in passengers can be absorbed by existing flight capacities for Whyalla Airport and Olympic Dam Airport (especially with the potential Olympic Dam airport expansion being planned). However, the flights to and from Port Augusta Airport do not currently have adequate capacity to accommodate the Project movements, particularly for flights to Port Augusta, unless additional flights are added to the route, which can occur on the same day as per the current schedule, or on another day of the week.

It is recommended that an assessment is made by the construction contractor as to the preferred work rosters and methodology for transporting and accommodating workers. Given Whyalla is approximately a four hour drive from Adelaide, it may be feasible for some of the intended Adelaide-based FIFO workers to travel by vehicles instead of

by plane. However, fatigue management would need to be considered. Regardless, it is recommended that the construction contractor verify whether additional flights can be scheduled between Adelaide and Port Augusta during Project construction, as required to accommodate the FIFO workforce.

It is understood that only one helicopter approximately every 2 weeks is required on the Project during construction for crew transfers and medivac support at the JUB Workfront. Helicopter services currently exist within Whyalla and it is recommended that the construction contractor contact these services to see if they can facilitate these operations, if alternative methods are not available. Due to the low number of helicopter movements, it is not anticipated to pose any significant impact on existing air operations.

There are no Project elements that are anticipated to pose any physical impacts on air transport as the associated infrastructure and equipment proposed is largely low-lying or well outside of anticipated flight paths.

8.2 Operations phase

The traffic generated by the project for operational purposes is expected to be negligible, and the expected low frequency of maintenance traffic (maximum of 20 one-way trips in a day across the pipeline) would be readily accommodated by the existing local road network, which is considered adequate for the anticipated traffic volumes. The new Mullaquana Station access road proposed would further reduce impacts posed by operational traffic to the existing local roads, as it provides an alternative route (Option 2) to access the Desalination Plant with higher capacity and reduces interactions with local road traffic. It is assumed that it would be open to public traffic during the operations phase, but the impacts are anticipated to be very minor due to the low traffic volumes expected.

In the event that a major piece of infrastructure requires replacement during operation of the project, a permit would be sought from the NHVR (if required) for the delivery of any oversize or overmass plant and equipment to the site and the conditions of this permit implemented by the haulage contractor.

Operational marine activities associated with the Project are expected to be limited to the vessel trips described in Section 7.2.2.2 for inspection, monitoring and maintenance of the intake and outfall infrastructure. Following completion of construction, normal commercial and recreational maritime traffic within Upper Spencer Gulf would continue to operate under existing navigation arrangements. The intake and outfall infrastructure will remain on the seabed and will require protection from seabed-disturbing activities such as anchoring or trawling, which may pose a risk to the integrity of the infrastructure. An exclusion or restricted area may therefore be required around the seabed infrastructure to reduce the risk of damage to the Project infrastructure and associated risks to marine users. The need for, and extent of, any exclusion or restricted area should be determined through a navigation risk assessment and consultation with relevant stakeholders, including commercial fishery operators. Any restrictions would be implemented in accordance with the Harbors and Navigation Act 1993 (SA) and Harbors and Navigation Regulations 2023 (SA). Where required, updates to nautical charts, Notices to Mariners, or installation of navigational marking would be developed in consultation with the Department, the Australian Hydrographic Office (AHO), and the operator of Whyalla Port (SIMEC Mining). Given the intake and outfall structures are understood to project approximately 3–4 m above the seabed, their final location and elevation should also be assessed against applicable navigation routes and under-keel clearance requirements to confirm whether additional operational controls or marking measures are required. However, based on the current intake and outfall structure design, they are not anticipated to be located in any key vessel navigation routes, see Figure 68. The intake and outfall structures are assumed to fall away from the navigational channel. Navigational marking or chart updates may be required depending on the final design and location of the seabed infrastructure.



Figure 68 AIS aggregated vessel tracks in Spencer Gulf (2020).

8.3 Decommissioning phase

The desalination plant and pipeline have a long operational lifespan (up to 100 years). As a result, the decommissioning of these assets would occur at different times rather than being concentrated within a single period.

Given that the access routes and local road network used during the construction phase are assumed to also be utilised during decommissioning, the impacts would be the same as the construction impacts outlined above. Accordingly, the same mitigation, monitoring and contingency measures would apply.

9. Recommended mitigation and monitoring

9.1 Mitigation measures

Mitigation measures recommended to avoid, minimise and mitigate potential adverse effects on traffic are listed in Table 46.

Table 46 Mitigation measures relevant to traffic impact

Measure ID	Mitigation measure	Project phase
TT01 Community Disruption	**Construction Traffic Management Plan** A detailed CTMP should be prepared prior to construction. Amongst other items, the CTMP should include: – Detours around any overhead obstructions for vehicles which would not make the clearance – Swept path assessments for all bends in the haulage routes and all turns at intersections along the haulage routes – An assessment of the required pre-construction road upgrades – A plan for routine inspections and repairs of road infrastructure – Movement frequencies and volumes of construction vehicles – Delivery schedules and construction vehicle access routes – Designated haulage routes, timing restrictions and signage	Construction, Operation and Decommissioning
TT02 Vehicle Parking	**Off-road vehicle parking** All parking should occur within the construction areas in dedicated parking areas for cars, buses and trucks. All staff and drivers would be instructed not to park on public roads. All loading and unloading of materials would be limited to the No loading or unloading should occur on public roads. Adequate car parking provision at each construction laydown and worksite is to be confirmed by the appointed contractor.	Construction, Operation and Decommissioning
TT03 Congestion	**Temporary traffic control** Temporary traffic management measures would optimise vehicle flow and reduce bottlenecks around work zones, helping to minimise congestion and maintain safe, efficient travel for road users. If the new Mullaquana Station access road (Option 2 route) is proposed to be used as the primary route to the Desalination Plant site for construction vehicles, it is recommended that access for this road is restricted during construction to permitted vehicles only through signage and traffic controls. Additionally, it may be beneficial to temporarily restrict access to and from Eight Mile Creek Road during construction for the portion east of the new Mullaquana Station Access Road. This will minimise the potential interactions between construction and non-construction vehicles on the new Mullaquana Sation access road.	Construction, Operation and Decommissioning
TT04 Environment	**Vehicle inspections** Vehicle inspections would be undertaken before vehicles exit the construction and laydown areas to identify and address potential leaks or spills before they occur and to ensure any loads on vehicles are secured, helping to prevent contamination and protect the surrounding environment.	Construction, Operation and Decommissioning
TT05 Environment	**Vehicle wash down areas** Wash down areas should be provided within the laydown areas and tower assembly sites near the entrances to allow workers to clean construction vehicles on site, ensuring they are not spreading dust, mud or other debris across the road network and to ensure that biosecurity protocols are implemented.	Construction, Operation and Decommissioning
TT06 Public Disturbance	**Community engagement** Proactive engagement with the public would be implemented to provide clear communication around construction timelines and anticipated disruptions.	Construction, Operation and Decommissioning

Measure ID	Mitigation measure	Project phase
TT07 Road condition	**Road Quality Auditor** An independent Road Quality Auditor should be engaged for the duration of the project. The auditor would be responsible for: – Undertaking a pre-construction pavement condition survey of any roads which are to be used by the project – Undertake an assessment of all local road culverts along the proposed access routes and any other critical assets – Undertake inspections of each local access road – Inspect any road upgrade works to ensure that construction is in accordance with the approved engineering drawings to the appropriate standard – Report the results of all condition surveys and inspections to Northern Water, DIT or local councils as relevant.	Construction, Operation and Decommissioning
TT08 Road condition	**Road rehabilitation** Any roads damaged by the construction of the project should be repaired to an acceptable standard. A final road condition audit by the Road Quality Auditor would be undertaken to certify all roads have been either maintained or rehabilitated to an acceptable level at the completion of the project construction.	Construction, Operation and Decommissioning
TT09 Road Safety	**Turn lanes** Turn lane treatments at unsignalised intersections should be provided based on the proposed requirements outlined in Section 8.1.3 to improve safety and traffic flow by reducing conflicts between turning vehicles and through traffic. Intersections requiring a basic left turn treatment and either a basic right turn or short channelised right turn treatment is also provided in Section 8.1.3.2. Turn lane treatments are based on design speed, traffic volumes, the number of lanes in each direction and the presence of a right-turn splitter island.	Construction, Operation and Decommissioning
TT10 Road Safety	**Localised road upgrades** Roads which are planned to be utilised by the project during construction should be upgraded to a standard appropriate for the volume of traffic and the size of vehicles. These upgrades are detailed in Section 8.1.3.3 and could include: – Addition of aggregate – Grading of road – Widening of road pavement – Sealing of road Given that this report is a desktop based assessment only, a full site inspection and a route assessment is recommended to confirm these recommendations. The following roads should particularly be considered for road upgrades: – Eight Mile Creek Road – All site access roads – Access Roads to Main Transfer Pipeline (as required)	Construction, Operation and Decommissioning
TT11 Road Safety	**Signage** To increase awareness of the increased truck volumes and the presence of OSOM vehicles, truck warning signage should be installed at the following locations: – On approach to all site access points – Laydown areas – Key intersections identified in Section 8.1.3.2.	Construction, Operation and Decommissioning
TT12 Road Safety	**Assistance crews** Traffic management crews should drive ahead of OSOM vehicles during delivery. The assistance crews would assist by removing in roadside obstructions and holding traffic where required.	Construction, Operation and Decommissioning
TT13 Road Safety	**Traffic controllers** Traffic controllers would be present to hold up any traffic where over dimension vehicles are required to occupy more than one traffic lane, drive over the road centre line or turn across oncoming traffic.	Construction, Operation and Decommissioning

Measure ID	Mitigation measure	Project phase
TT14	**New access road(s)** New access roads, such as the new Mullaquana Station Access Road may be warranted to reduce the impacts of construction and operation traffic, particularly on local roads.	Construction, Operation and Decommissioning
MM01	**Marine exclusion zone and vessel coordination planning** An exclusion zone around the desalination plant infrastructure on the seabed will be required to prevent damage to seabed infrastructure from certain maritime activities (e.g. trawling or anchoring). The extent of the exclusion zone will be determined by the Marine Safety and Compliance team of the Department for Infrastructure and Transport through undertaking a risk assessment. Consultation will be undertaken with key stakeholders including commercial fishery groups around the design and implementation of an appropriately sized exclusion zone that reduces impacts to users of the adjacent marine waters while also providing protection to seafarers and the Project's marine-based infrastructure. Additional maritime safety measures during construction may include notification of marine works through appropriate communication channels, coordination of vessel movements with port operations, and implementation of temporary marine safety zones around construction activities where necessary.	Construction, Operation and Decommissioning

9.2 Monitoring and contingency measures

The monitoring and contingency measures that are proposed to assess traffic impacts associated with the project are summarised in Table 47.

Table 47 Monitoring and/or contingency measures relevant to traffic impact

Measure ID	Monitoring and/or contingency measure	Project phase
Monitoring measure MC-TT01 Community Disruption	**Construction Traffic Management Plan** A detailed CTMP should be prepared prior to construction. Amongst other items, the CTMP should include: – Detours around any overhead obstructions for vehicles which would not make the clearance – Swept path assessments for all bends in the haulage route and all turns at intersections along the haulage route – An assessment of the required pre-construction road upgrades – A plan for routine inspections and repairs of road infrastructure – Vehicle movement monitoring to ensure that the actual traffic volumes generated by the project do not exceed traffic volumes estimated – Movement frequencies and volumes of construction vehicles – Delivery schedules and construction vehicle access routes – Designated haulage routes, timing restrictions and signage	Construction and Decommissioning
Contingency measure MC-TT02 Wildlife	**Wildlife contingency measures** If roadkill volumes become high during construction, the following contingency measures should be considered: – Installation of temporary exclusion fencing – Implementation of speed restrictions – Adjusted work schedules to avoid peak wildlife activity times – Deployment of wildlife spotters to monitor high-risk areas The project would also review traffic routes and consider alternative access points to minimise interactions with sensitive habitats.	Construction, Operation and Decommissioning
Contingency measure MC-TT03 Road condition	**Road Quality Auditor** An independent Road Quality Auditor should be engaged for the duration of the project. The auditor would be responsible for:	Construction, Operation and Decommissioning

Measure ID	Monitoring and/or contingency measure	Project phase
	– Undertaking a pre-construction pavement condition survey of any roads which are to be used by the project – Undertaking an assessment of all local road culverts along the proposed access routes and any other critical assets – Undertaking inspections of each local access road – Inspecting any road upgrade works to ensure that construction is in accordance with the approved engineering drawings to the appropriate standard – Reporting the results of all condition surveys and inspections to Northern Water, DIT or local councils as relevant.	

10. Summary and conclusions

The purpose of this report is to assess the potential traffic impacts associated with the project to inform the preparation of the EIS required for the Northern Water Project. The Northern Water Project (the Project) aims to provide a secure climate resilient water source for industry in South Australia's Upper Spencer Gulf and Far North. Delivery of the Project will involve the construction and operation of a 51 gigalitre per year (GL/year) seawater reverse osmosis desalination plant located at Mullaquana Station on the Upper Spencer Gulf, and associated water transfer system (including pipelines, transfer pump stations, product water storages) and electricity infrastructure.

The Project comprises the following key elements:

- a 51 GL/year seawater reverse osmosis desalination plant located at Mullaquana Station approximately 25 km south-west of Whyalla
- marine intake and outfall tunnels extending underneath the seabed and into Spencer Gulf
- diffuser structures for discharge of return water into Spencer Gulf
- a transfer system consisting of:
  - a ~360 km main transfer pipeline, largely constructed underground terminating at the delivery point at the Olympic Dam copper-gold mine
  - a ~46 km lateral branch to a delivery point at the Carrapateena copper-gold mine (which may be constructed above or below ground)
  - associated transfer pump stations and product water storage
- high voltage electricity supply including new transmission and distribution lines and new network and facility substations to provide power to the desalination plant and transfer pump stations
- associated temporary construction-related infrastructure (e.g. construction camps, site offices and amenities, yards, storages and laydown areas)
- access tracks including establishing new tracks and upgrading existing tracks
- enabling roadworks and road upgrades.

The project would be constructed over a four year period and GHD's assessment has focussed on the peak period of the construction schedule, assumed to be Month 17.

Alignment with Assessment Requirements (AEQ3)

Each of the requirements (summarised in Section 3) relating to this TIA have been addressed within this report, as outlined below.

- With the implementation of a CTMP and any recommendations contained within, including those which relate to temporary traffic management, disruptions for residents, businesses, and travellers during construction would be effectively mitigated.
- With the implementation of road safety treatments across the project area including signage, intersection turn treatments and construction traffic management the road safety impacts of this project can be suitably minimised.
- With the adoption of protective measures and monitoring protocols including engagement of a Road Quality Auditor who enforces a road rehabilitation program, the impact that road safety concerns along transport routes during construction as a result of damage to road surfaces has been addressed.
- With the recommendation for a Construction Traffic Management Plan, temporary traffic management and a traffic controller during construction, risks associated with changed traffic conditions during construction have been mitigated.
- With the engagement of a Road Quality Auditor, road condition assessments would be undertaken prior to and after construction, with a road rehabilitation regime implemented, this would minimise any adverse impacts on road infrastructure from project construction.
- There are expected to be minimal impacts for rail, maritime and air operations.

Anticipated traffic volumes

As outlined within Section 7.1 of this report, the project is expected to generate significant additional traffic during the construction phase. This is expected to be in the order of 829,876 two-way vehicle trips across the full construction period, comprised of approximately 488,026 light vehicle and 341,850 heavy vehicle movements.

During the peak construction period (Month 17 of the four-year construction program), it is expected that there would be an additional 1,870 two-way vehicle trips per day across the project.

During the AM and PM peak hour periods, the anticipated two-way construction traffic volume is 217 vehicles per hour. This includes:

– 139 two-way light vehicle movements
– 79 two-way heavy vehicle movements

During the operation phase, traffic volumes are expected to be relatively low and easily absorbed into the road network. At the time of decommissioning, further assessment should be undertaken to better estimate the traffic impacts. However, at a high level, it is assumed traffic volumes would be comparable to the construction volumes.

Construction traffic impacts

Based on the anticipated traffic volumes and their distribution across the road network, the anticipated traffic impacts as a result of the project relate to:

– Road safety:
  - Higher traffic volumes can introduce greater interaction between construction vehicles and the general public and increased loads on road surfaces. Road treatments and upgrades may be required to maintain safety standards for both existing users and construction traffic as discussed.
– Insufficient vehicle parking:
  - This can have an adverse effect on the surrounding road network which could lead to increased congestion, illegal parking and safety concerns. As such, all car parking would need to be provided off the road network and managed so that vehicles are not parked outside of the project locations.
– Community disruption:
  - Project activities can temporarily affect the daily operations of residents and businesses. Disruptions may include temporary lane closures, detours, driveway access restriction due to construction zones and altered traffic patterns.
– Congestion:
  - Expected traffic volumes are anticipated to be low, therefore impacts related to congestion are expected to be minimal and are unlikely to cause significant delays.
– Environment:
  - Transport of any hazardous waste is likely to be very low and would be managed as part of the Environmental Management Plan (EMP). The proposed works could also result in spills and leaks from the construction vehicles, in the form of fuel, gear, waste spoil, raw quarry materials and more.
– Wildlife:
  - Increased vehicle movements can elevate the risk of roadkill incidents especially in areas with high fauna activity near transport routes.
– Public disturbance:
  - Project activities can lead to public disturbance through increased traffic volumes, dust emissions, noise, and vibration.
– Road condition:
  - Frequent movement of heavy vehicles along the road network can accelerate the deterioration of existing road surfaces.

Recommended mitigation measures

To minimise the traffic impacts, the proposed mitigations measures include the following:

– Designated parking areas
– A Construction Traffic Management Plan (CTMP)
– Temporary traffic control
– Vehicle inspections & wash down areas
– Engagement of a Road Quality Auditor
– Road rehabilitation
– Turn lanes, localised road upgrades, signage and guidance for OSOM vehicles
– Traffic controllers
– New access road(s)
– A dust management plan (DMP)
– A Construction Noise and Vibration Management Plan (CNVMP)
– Contingency measures for wildlife
– Marine exclusion zone and vessel coordination planning.

With the implementation of the mitigation measures recommended throughout this assessment, potential adverse impacts associated with traffic and transport would be significantly reduced, resulting in an overall low level of impact, therefore highlighting the effectiveness of these measures in managing traffic related impacts across all phases of the project.

Appendices

Appendix A

Main Transfer Pipeline – existing access track conditions

Table 48 Proposed existing access tracks to pipeline

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
1	Proposed Desalination Plant	Eight Mile Creek Road	0 - 12200	Good
2	Proposed Marine Tunnels	Eight Mile Creek Road	0	Good
3	Proposed Mullaquana Station Transmission Line (south of Lincoln Highway)	Lincoln Highway (south of Whyalla)	N/A	Good
4	Proposed Mullaquana Station Substation and Pipeline Access (north of Lincoln Highway)	Lincoln Highway (south of Whyalla)	N/A	Good. Great condition on the east side of the track.
5	Proposed Pipeline Access east of Mullaquana Station Substation (north of Lincoln Highway)	Lincoln Highway (south of Whyalla)	22500	Good
6	Proposed Pipeline Access east of Mullaquana Station Substation (north of Lincoln Highway)	Lincoln Highway (south of Whyalla)	24000	Good
7	Proposed Mullaquana Station Substation Access (north of Lincoln Highway)	Lincoln Highway (south of Whyalla)	N/A	Good
8	North-west of Whyalla (south of Iron Knob Road)	Iron Knob Road	26400	Not rated. No photo.
9	North-west of Whyalla (south of Iron Knob Road)	Iron Knob Road	31100	Not rated. Site photo indicates the track is in average condition but may require vegetation removal and corridor widening due to adjacent railway line and fenceline. 
10	Cultana (west of Lincoln Highway)	Lincoln Highway (north of Whyalla)	44500	Not rated. New track.
11	North of Tregalana (west of Lincoln Highway)	Lincoln Highway (north of Whyalla)	51900	Not rated. New track.
12	Non-existent			
13	North of Tregalana (west of Lincoln Highway)	Lincoln Highway (north of Whyalla)	61900	No condition rating. Based on site photo and comments, track appears in good condition. Comments: “New track. Minimal vegetation disturbance. 10km Double lane access track.”

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
				
14	Non-existent			
15	Non-existent			
16	South of Lincoln Gap (west of Lincoln Highway)	Lincoln Highway (north of Whyalla)	71100	Not rated. New track - significant vegetation clearing required.
17	Non-existent			
18	Proposed Lincoln Gap Pump Station (south of Eyre Highway West)	Eyre Highway (West)	80000	Not rated. No photo.
19	Access to Coraberra Substation at Lincoln Gap (east of Eyre Highway)	Eyre Highway (North)	N/A	Not rated. No photo.
20	Non-existent			
21	North of proposed Lincoln Gap Pump Station (east of Eyre Highway)	Eyre Highway (North)	88600	Good. Little vegetation clearance required.
22	This track is Carriewerloo Road North-west of Port Augusta (west of Stuart Highway)	Stuart Highway	103000	Average. Carriewerloo Road - cuts through a no go zone.
23	North of Carriewerloo Road	Carriewerloo Road	106000 (from the west from Carriewerloo Road)	No rating. Only photos indicate the access track is an informal farm track. Appears to cross a creek bed just west of pipeline. 
24	North of Carriewerloo Road	Stuart Highway	106000 (from the east from Stuart Highway)	No rating. Site photo indicates the track is in good condition with minimal vegetation clearing required.

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
				
25	Non-existent			
26	North-west of Carriewerloo (west of Stuart Highway)	Stuart Highway	112800	Average
27	North-west of Carriewerloo (east of Stuart Highway)	Stuart Highway	N/A	No rating. No photo. Comment - “water cart”.
28	Proposed Carriewerloo Laydown site (west of Stuart Highway)	Stuart Highway	114600	Good
29	North-west of Carriewerloo (west of Stuart Highway)	Stuart Highway	116400	Average
30	Non-existent			
31	Non-existent			
32	North-west of Carriewerloo (west of Stuart Highway)	Stuart Highway	126500	Average
33	Non-existent			
34	Non-existent			
35	Non-existent			
36	North-west of Carriewerloo (west of Stuart Highway)	Stuart Highway	136500	Average
37	Potential Kootaberra Laydown site south of Kootaberra (west of Stuart Highway)	Stuart Highway	139200	Good
38	Non-existent			
39	Non-existent			
40	South of Kootaberra (west of Stuart Highway)	Stuart Highway	145300	Minimal vegetation impact - significant road buildup required at highway entrance.
41	North of proposed Kalaya Pump Station (west of Stuart Highway)	Stuart Highway	154000	Good
42	Potential Kootaberra Laydown site north of Kootaberra (west of Stuart Highway)	Stuart Highway	159200	Good
43	Non-existent			

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
45	Non-existent			
46	Non-existent			
47	Non-existent			
48	North-west of Kootaberra (east of Stuart Highway)	Stuart Highway	169800	Poor (major upgrade)
49	Non-existent			
50	Non-existent			
51	Non-existent			
52	North-west of Kootaberra (west of Stuart Highway)	Stuart Highway	178500 - 178900	Entrance from main road in 'Good' condition. Access track crosses existing 'Port Augusta Woomera Pipeline' (PAWP) and 'Port Augusta WA Border' rail line. Comments note "Preferred for float access and SAPN under crossings" east of rail line and "overgrowth old highway" west of the rail line. Section west of the rail line rated as 'Poor (major upgrade)'.
53	Proposed Nutt Laydown Area A & B (east of Stuart Highway)	Stuart Highway	N/A	No condition rating. Based on site photo, access track appears to be in average condition. 
54	West of proposed Nutt Laydown Area A & B (west of Stuart Highway)	Stuart Highway	188200 - 188700	Average for section east of rail line. Poor (major upgrade) for section west of rail line. Upgrade for float over ARTC rail line may be required.
55	North-west of proposed Nutt Laydown Area A & B (west of Stuart Highway)	Stuart Highway	195400	Average condition east of Port Augusta Woomera Pipeline (PAWP). Poor (major upgrade) west of PAWP. ARTC Crossing may require upgrading. Steep crossing over PAWP would require upgrade.
56	South of proposed Oakden Hills Laydown Area C (west of Stuart Highway)	Stuart Highway	202100	Average
57	Non-existent			
58	Non-existent			

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
59	Proposed Oakden Hills Laydown Area C (west of Stuart Highway)	Stuart Highway	207100	Good
60	Non-existent			
61	South of the proposed Mangata Pump Station (west of Stuart Highway)	Stuart Highway	214000 - 214400	Average for entrance section connecting to Stuart Highway. Good for section running north-south along existing property fence line.
62	Non-existent			
63	Proposed Oakden Hills Laydown Area A (east of Stuart Highway)	Stuart Highway	N/A	No condition rating. No photos. Based on Google streetview, access track appears to be in average condition.
64	Non-existent			
65	South-east of Carrapateena Mine Access Road (west of Stuart Highway)	Stuart Highway	225000	Poor (major upgrade)
66	North-west of Carrapateena Mine Access Road (west of Stuart Highway)	Stuart Highway	230800 – 231400	Poor (major upgrade). Significant vegetation removal required to provide 8 m wide access road.
67	South-west of proposed Lake Windabout Laydown Area (south of Stuart Highway)	Stuart Highway	233800	Average
68	Proposed Lake Windabout Laydown Area (east of Stuart Highway)	Stuart Highway	N/A	No condition rating. No photos.
69	North of proposed Lake Windabout Laydown Area (west of Stuart Highway)	Stuart Highway	238200	No condition rating. No photos.
70	Non-existent			
71	Non-existent			
72	South-east of proposed Bimba Tank site (west of Stuart Highway)	Stuart Highway	246700	Good
73	Bimba Tank site access (west of Stuart Highway)	Stuart Highway	251500	Good
74	Non-existent			
75	Non-existent			
76	Non-existent			
77	Previously proposed South Pimba Laydown Area (east of Stuart Highway)	Stuart Highway	262900 - 264200	Poor (major upgrade). Initial access entrance from Stuart Highway is in good condition
78	Proposed KAC Pimba Laydown Area (south of Stuart Highway)	Stuart Highway	N/A	No condition rating. No photos.

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
79	East of Pimba and south of rail line (east of Olympic Dam Highway)	Olympic Dam Highway	265000	No condition rating. No photos.
80	East of Pimba and north of rail line (east of Olympic Dam Highway)	Olympic Dam Highway	265100	Average. Comments: “Moderate track. Needs grading. Close to rail in some areas. ARTC requirements”
81	South of Woomera (south of Coorilla Avenue)	Coorilla Avenue	270800	Good
82	North-east of Woomera (east of Olympic Dam Highway)	Olympic Dam Highway	276600	Average condition rating at entrance. No condition rating for majority of access track length. No photos.
83	Non-existent			
84	Non-existent			
85	Bosworth Road (east of Olympic Dam Highway)	Olympic Dam Highway	284300	Good
86	North-west of Lake Richardson (east of Olympic Dam Highway)	Olympic Dam Highway	290200	Average
87	Non-existent			
88	North-west of Lake Richardson (east of Olympic Dam Highway)	Olympic Dam Highway	300200	Good. Comments: “10km Double lane access track. Steep descent from highway, will need ramping”
89	South-west of Lake Mary (east of Olympic Dam Highway)	Olympic Dam Highway	311800	Poor (major upgrade). Comments: “Potential option. Minor vegetation clearance. Widening. Minimal sight distance. Needs to go under power line. Need to go through/modify gate”
90	Proposed Purple Downs Laydown Area A & B (east of Olympic Dam Highway)	Olympic Dam Highway	319900	Good
91	South-west of Coorlay Lagoon (east of Olympic Dam Highway)	Olympic Dam Highway	328000 - 32810	Good
92	West of Coorlay Lagoon (east of Olympic Dam Highway)	Olympic Dam Highway	330600 - 330700	No condition rating. No photos.
93	West of Coorlay Lagoon (east of Olympic Dam Highway)	Olympic Dam Highway	330700	Average. Comments: “Vegetation clearance required at the entrance from the highway. Steep descent from the highway may need work. Needs grading”
94	Non-existent			
95	Non-existent			
96	North-west of Coorlay Lagoon (east of Olympic Dam Highway)	Olympic Dam Highway	337100	Good

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
97	South-east of Roxby Downs (east of Olympic Dam Highway)	Olympic Dam Highway	345800	Poor (major upgrade). Comments: “Needs substantial vegetation clearance. Very steep descent needs grading. Need to go through existing fence as shown in picture”  
98	Non-existent			
99	Non-existent			
100	North-east of Roxby Downs (east of Olympic Dam Highway)	Olympic Dam Highway	35150	Good
101	Non-existent			
102	Non-existent			
103	Non-existent			
104	Non-existent			
105	Borefield Road (north of Olympic Dam)	Olympic Dam Highway / Borefield Road	358800	Good. Comments: “Borefield road. Excellent condition”
106	Non-existent			
107	Access road to proposed Mount Gunson Laydown site, Mount Gunson Substation and Mount Gunson Mine & Quarry (east of Stuart Highway)	Stuart Highway	N/A	Good
Carrapateena Lateral Offtake				
No ID	North of Mount Gunson Substation (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	2200 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track in good condition.

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
				
No ID	North-east of Mount Gunson Substation (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	3700 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track in average condition. 
No ID	East of proposed Mount Gunson Laydown site (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	7400 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track in good condition. 
No ID	North-west of proposed Mount Gunson Laydown site (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	11900 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track in average condition. Levels likely require lifting at entrance from main road.

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
				
No ID	North of proposed Mount Gunson Laydown site (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	13800 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track in good condition. 
No ID	North-east of proposed Mount Gunson Laydown site (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	23300 (Carrapateena Lateral Offtake)	No condition rating. No photos.
No ID	North-east of proposed Mount Gunson Laydown site (South of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	26000 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track in average condition. Levels likely require lifting at entrance from main road.

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
				
No ID	North-east of proposed Mount Gunson Laydown site (north of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	33800 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track condition as 'Poor (major upgrade)'. 
No ID	South-west of Carrapateena mine (north of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	35000 – 35300 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track condition as 'Poor (major upgrade)'. 
No ID	South-west of Carrapateena mine (north of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	36500 (Carrapateena Lateral Offtake)	No condition rating. Site photo is limited but appears to show access track condition to be average.

ID	Location	Connecting Road	Approximate Chainage	Condition Rating / Additional Comments / Photo
				
No ID	South-west of Carrapateena mine (west of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	39200 (Carrapateena Lateral Offtake)	No condition rating. No photos.
No ID	South-west of Carrapateena mine (north of Carrapateena Mine Access Road)	Carrapateena Mine Access Road	44500 (Carrapateena Lateral Offtake)	No condition rating. Based on site photo, access track appears to have a condition of 'Poor (major upgrade)'. Appropriate formation of the Access Road to accommodate heavy vehicle traffic is recommended. 

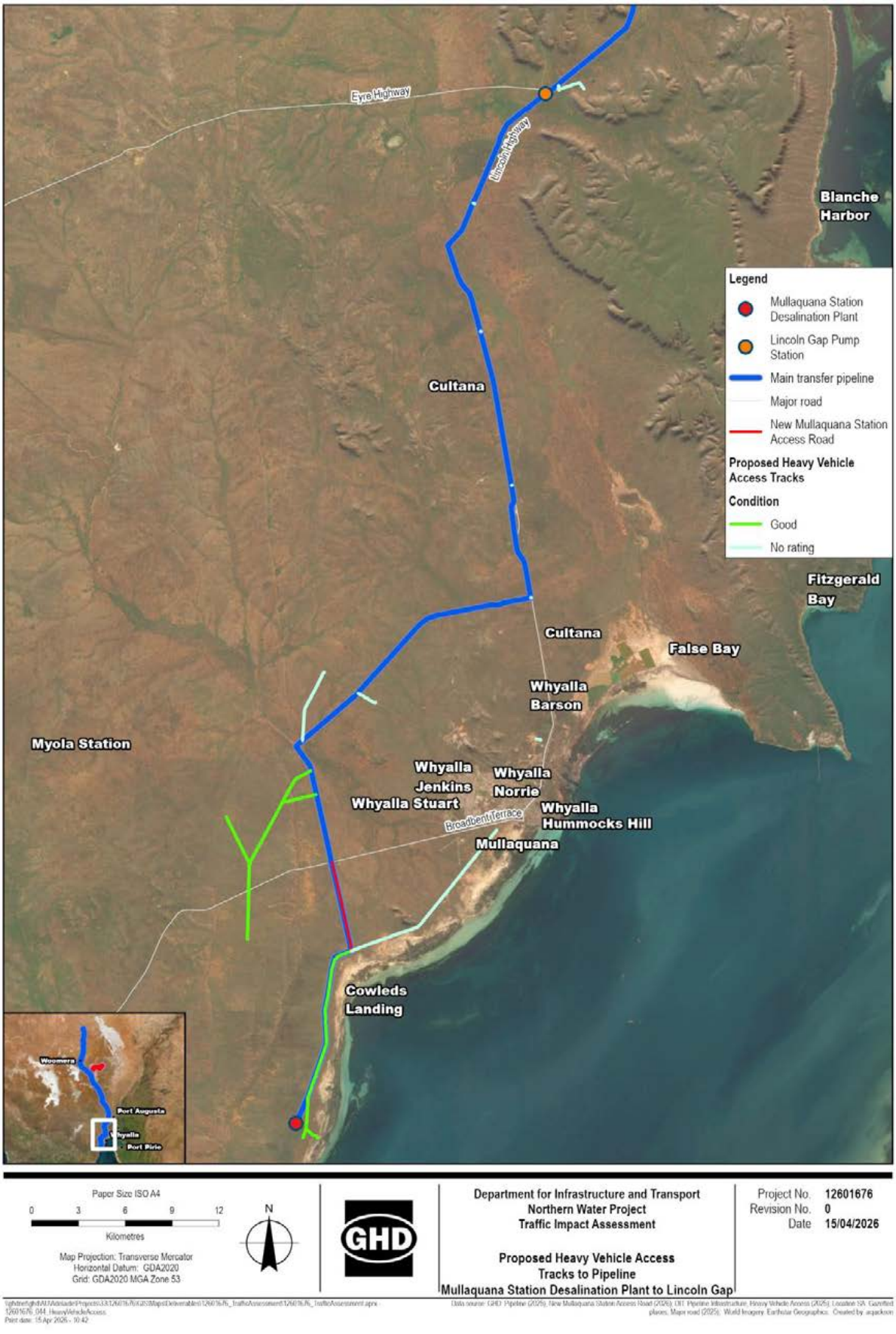


Figure 69 *Proposed Heavy Vehicle Access Tracks – Mullaquana Station Desalination Plant to Lincoln Gap*



Figure 70 *Proposed Heavy Vehicle Access Tracks – Lincoln Gap to Kalaya (Kootaberra)*

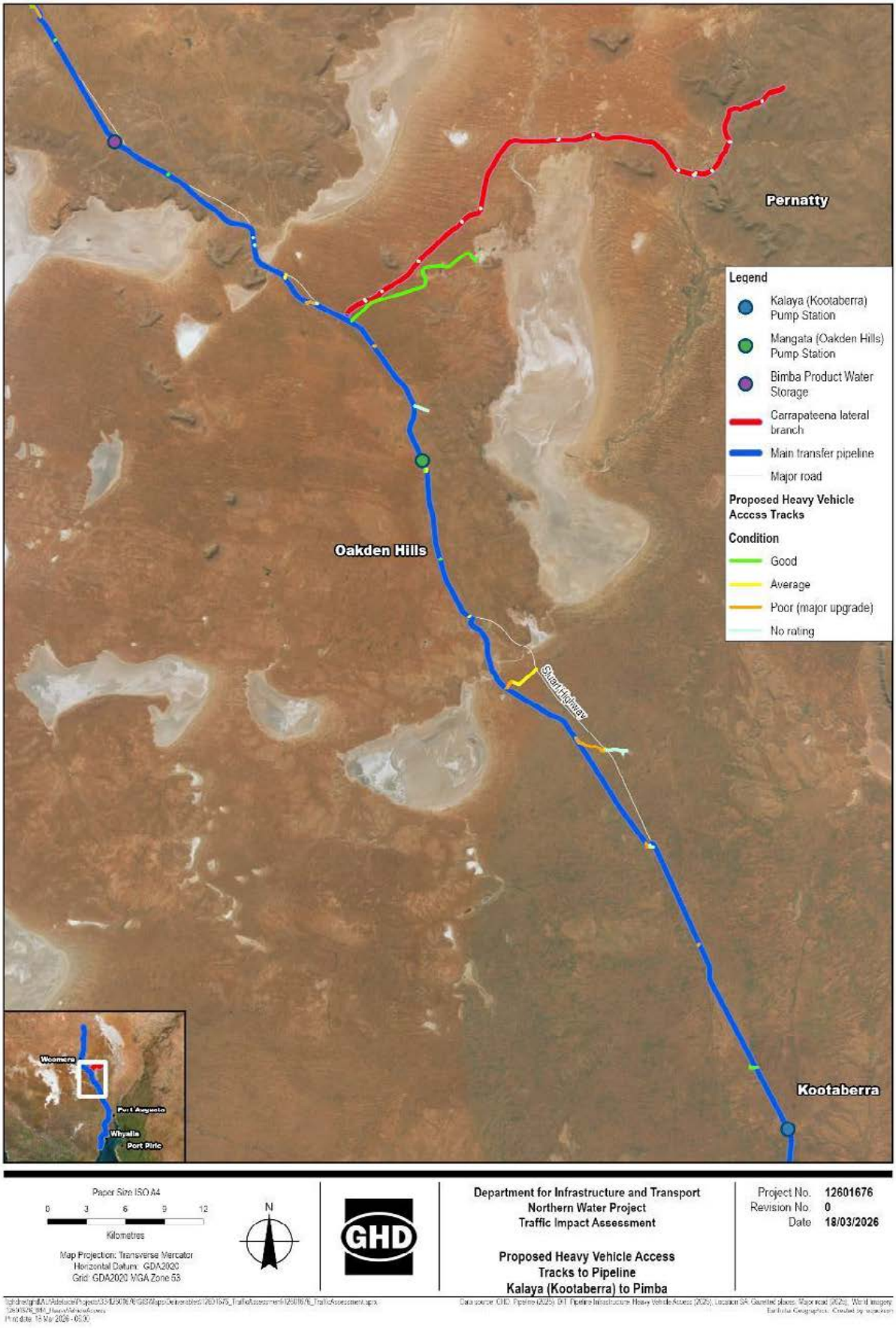


Figure 71 Proposed Heavy Vehicle Access Tracks – Kalaya (Kootaberra) to Pimba

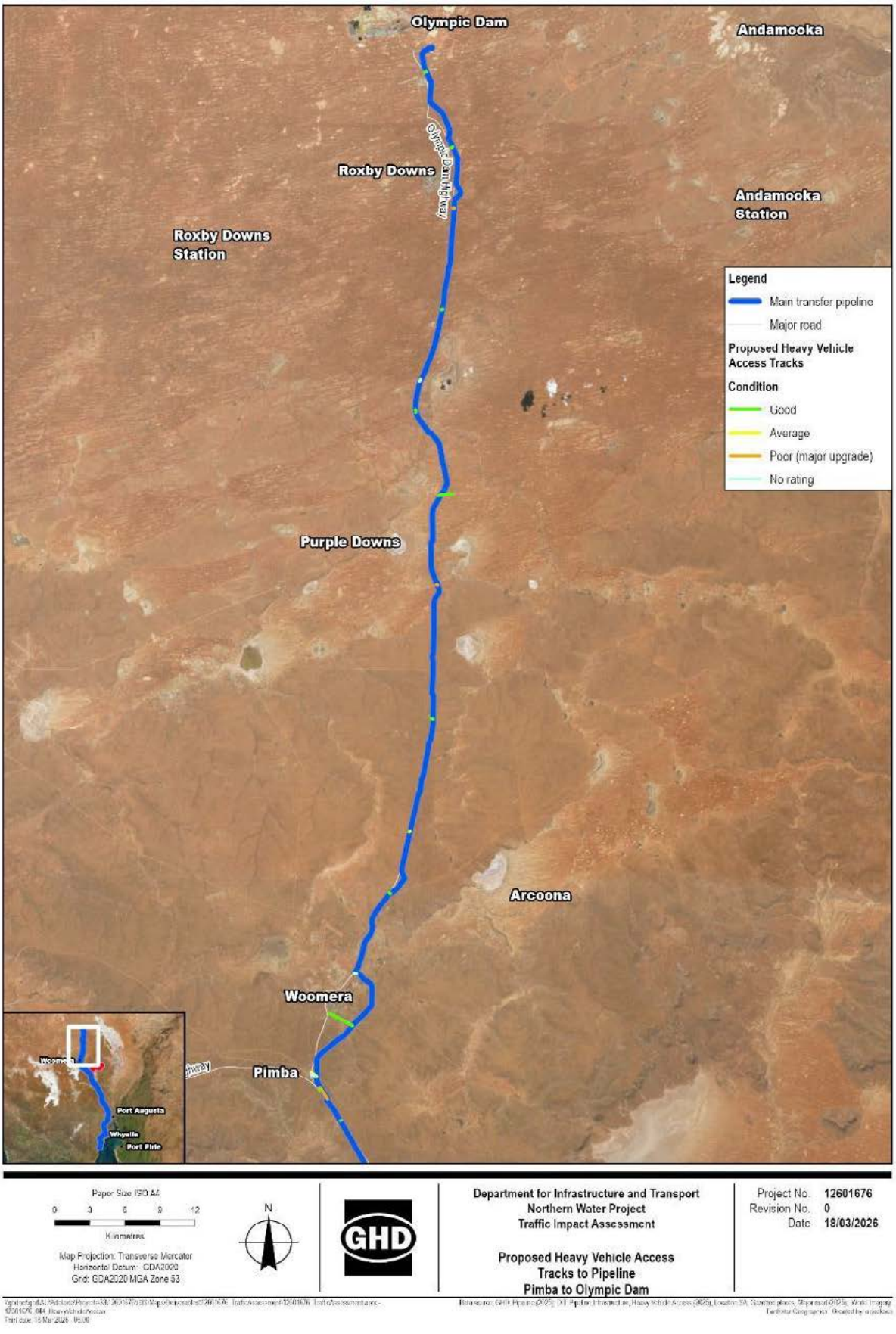


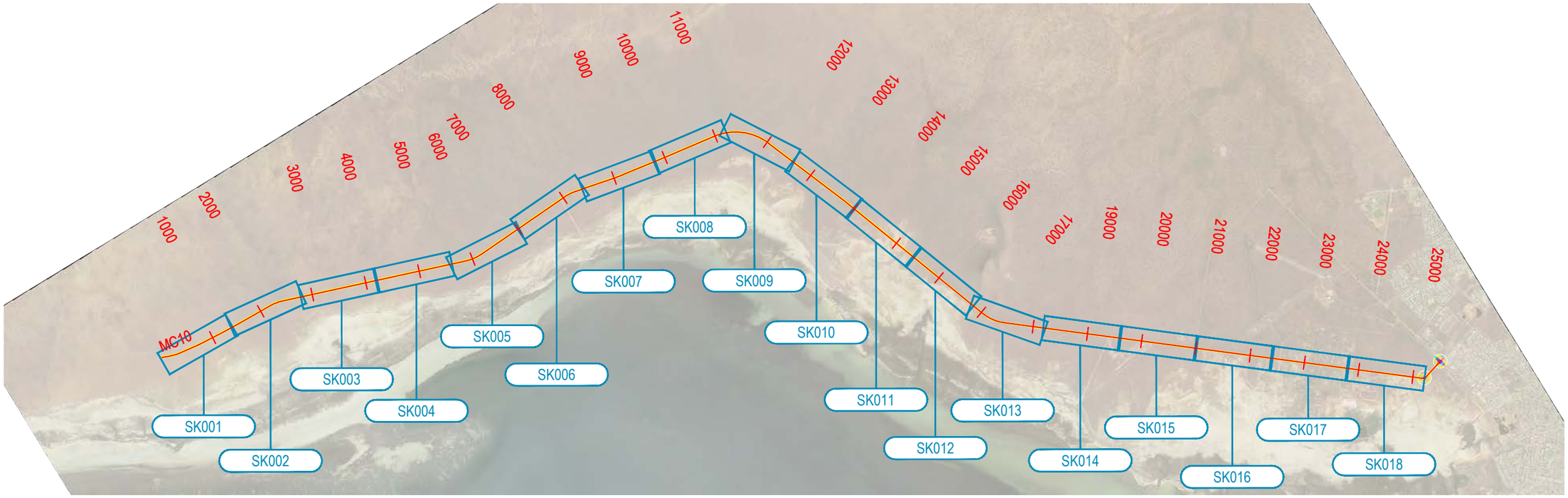
Figure 72 Proposed Heavy Vehicle Access Tracks – Pimba to Olympic Dam

Appendix B

PDP Sketches SK000 – SK052:
Mullaquana Road – Eight Mile Creek Road

MULLAQUANA ROAD - EIGHT MILE CREEK ROAD

NORTHERN WATER



TITLE AND INDEX

SHEET	LOCATION
SK000	MC10; CH 0 TO CH 25,000

PLAN AND PROFILE

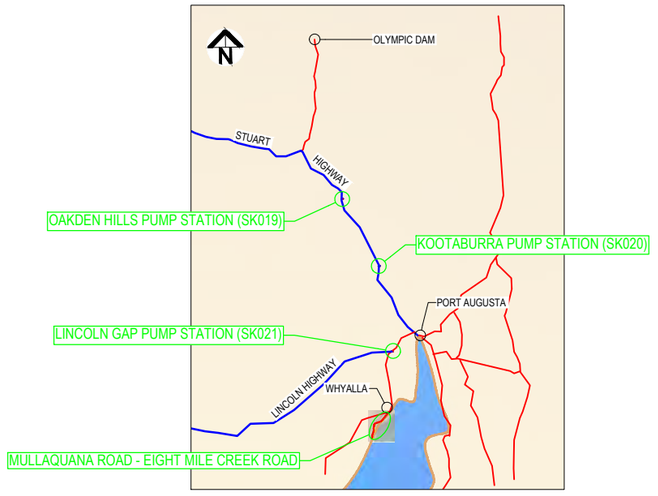
SHEET	LOCATION
SK001	MC10; CH 0 TO CH 1400
SK002	MC10; CH 1400 TO CH 2800
SK003	MC10; CH 2800 TO CH 4200
SK004	MC10; CH 4200 TO CH 5600
SK005	MC10; CH 5600 TO CH 7000
SK006	MC10; CH 7000 TO CH 8400
SK007	MC10; CH 8400 TO CH 9800
SK008	MC10; CH 9800 TO CH 11200
SK009	MC10; CH 11200 TO CH 12600
SK010	MC10; CH 12600 TO CH 14000
SK011	MC10; CH 14000 TO CH 15400
SK012	MC10; CH 15400 TO CH 16800
SK013	MC10; CH 16800 TO CH 18200
SK014	MC10; CH 18200 TO CH 19600
SK015	MC10; CH 19600 TO CH 21000
SK016	MC10; CH 21000 TO CH 22400
SK017	MC10; CH 22400 TO CH 23800
SK018	MC10; CH 23800 TO CH 25200

JUNCTIONS / PUMP STATIONS

SHEET	LOCATION
SK019	OAKDEN HILLS PUMP STATION
SK020	KOOTABURRA PUMP STATION
SK021	LINCOLN GAP PUMP STATION
SK022	LINCOLN HIGHWAY
SK023	HORSESHOE ROAD

CROSS SECTIONS

SHEET	LOCATION
SK024	MC10; CH 0 TO CH 800
SK025	MC10; CH 900 TO CH 1700
SK026	MC10; CH 1800 TO CH 2600
SK027	MC10; CH 2700 TO CH 3500
SK028	MC10; CH 3600 TO CH 4400
SK029	MC10; CH 4500 TO CH 5300
SK030	MC10; CH 5400 TO CH 6200
SK031	MC10; CH 6300 TO CH 7100
SK032	MC10; CH 7200 TO CH 8000
SK033	MC10; CH 8100 TO CH 8900
SK034	MC10; CH 9000 TO CH 9800
SK035	MC10; CH 9900 TO CH 10700
SK036	MC10; CH 10800 TO CH 11600
SK037	MC10; CH 11700 TO CH 12500
SK038	MC10; CH 12600 TO CH 13400
SK039	MC10; CH 13500 TO CH 14300
SK040	MC10; CH 14400 TO CH 15200
SK041	MC10; CH 15300 TO CH 16100
SK042	MC10; CH 16200 TO CH 17000
SK043	MC10; CH 17100 TO CH 17900
SK044	MC10; CH 18000 TO CH 18800
SK045	MC10; CH 18900 TO CH 19700
SK046	MC10; CH 19800 TO CH 20600
SK047	MC10; CH 20700 TO CH 21500
SK048	MC10; CH 21600 TO CH 22400
SK049	MC10; CH 22500 TO CH 23300
SK050	MC10; CH 23400 TO CH 24200
SK051	MC10; CH 24300 TO CH 25100
SK052	MC10; CH 25200 TO CH 26000



LOCALITY

SCALES:

DO NOT SCALE

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	NOT ISSUED AT AMENDMENT A	PDP	-

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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

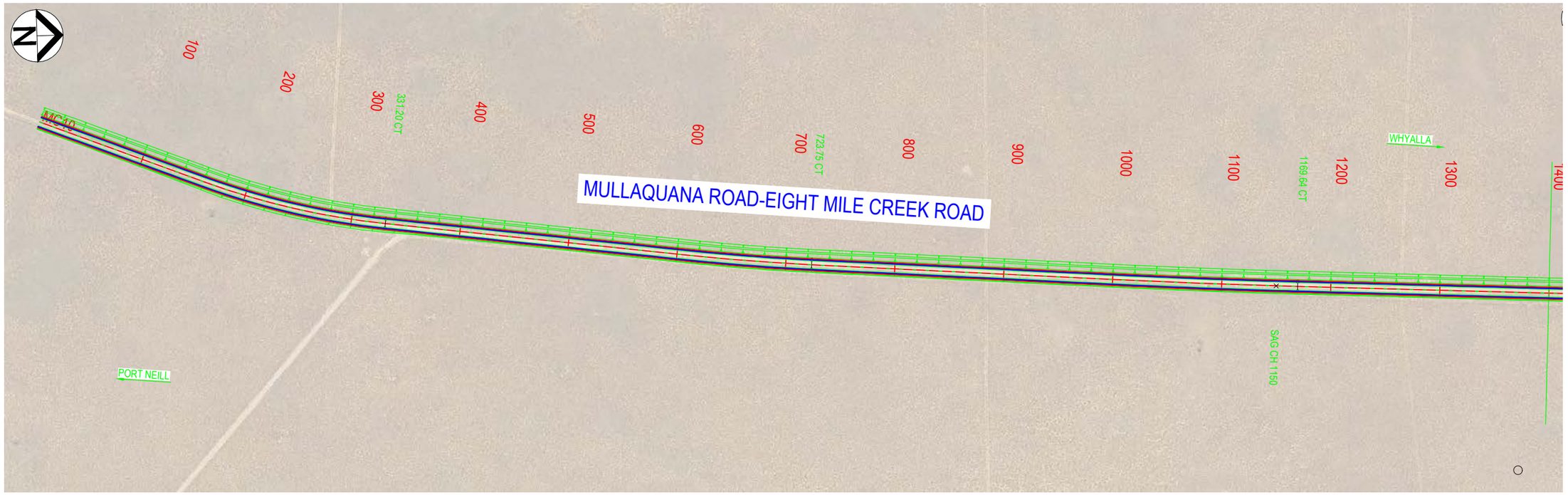
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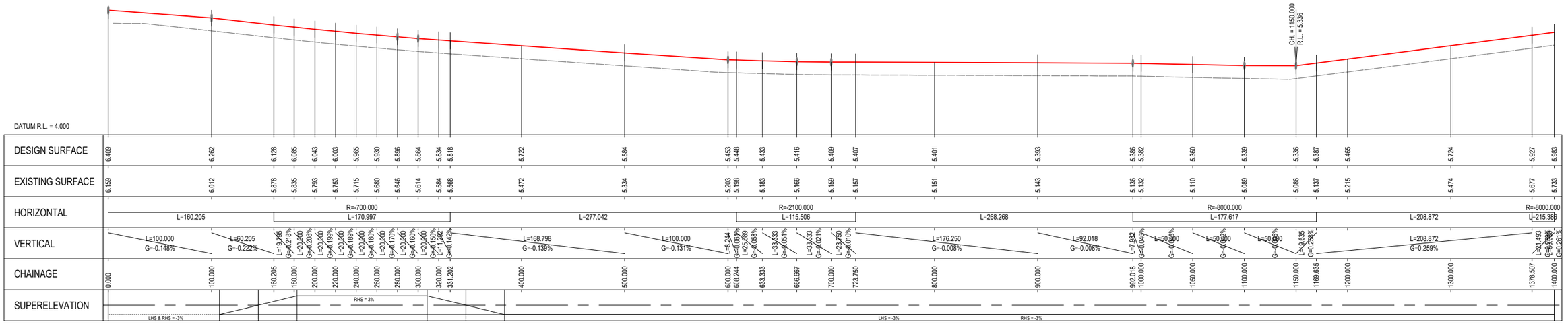
MC10; CH 0 TO CH 25,000

TITLE & INDEX

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK000	D

CAD FILE NAME: T – INDEX & LOCALITY DWG





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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
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B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

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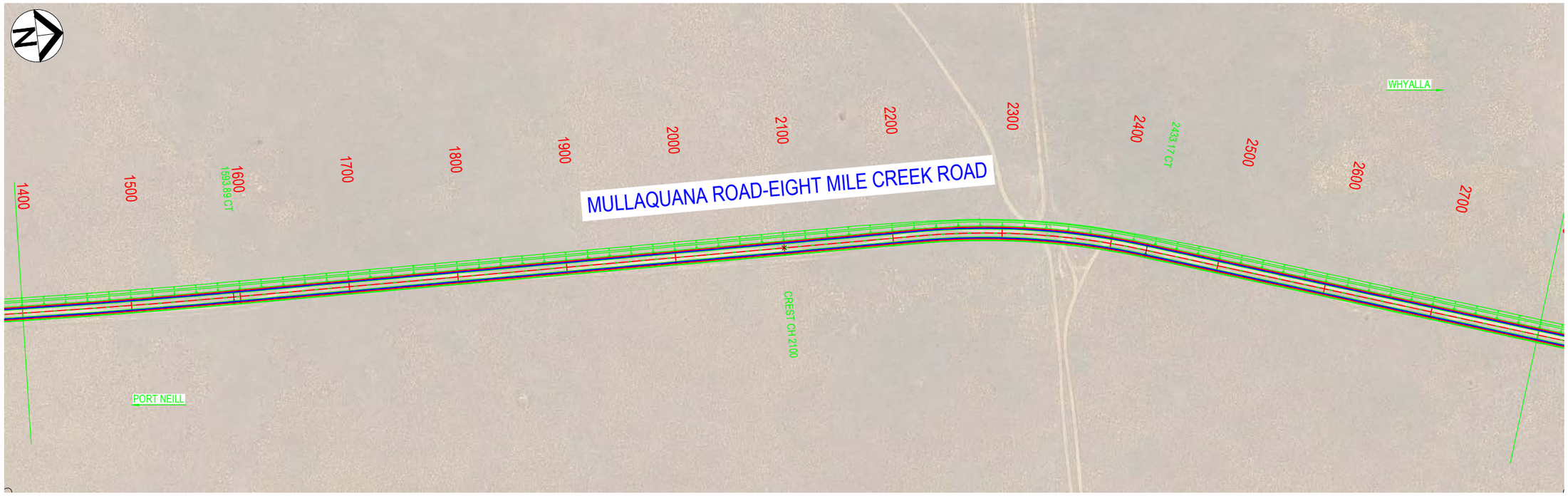
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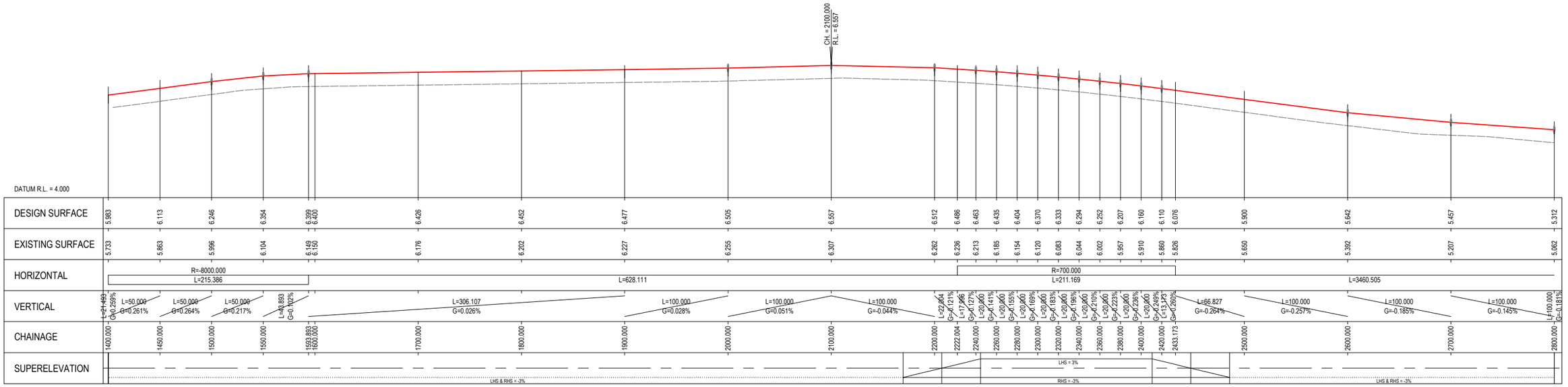
MC10; CH 0 TO CH 1400

PLAN & PROFILE

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

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ROAD No. NCRN

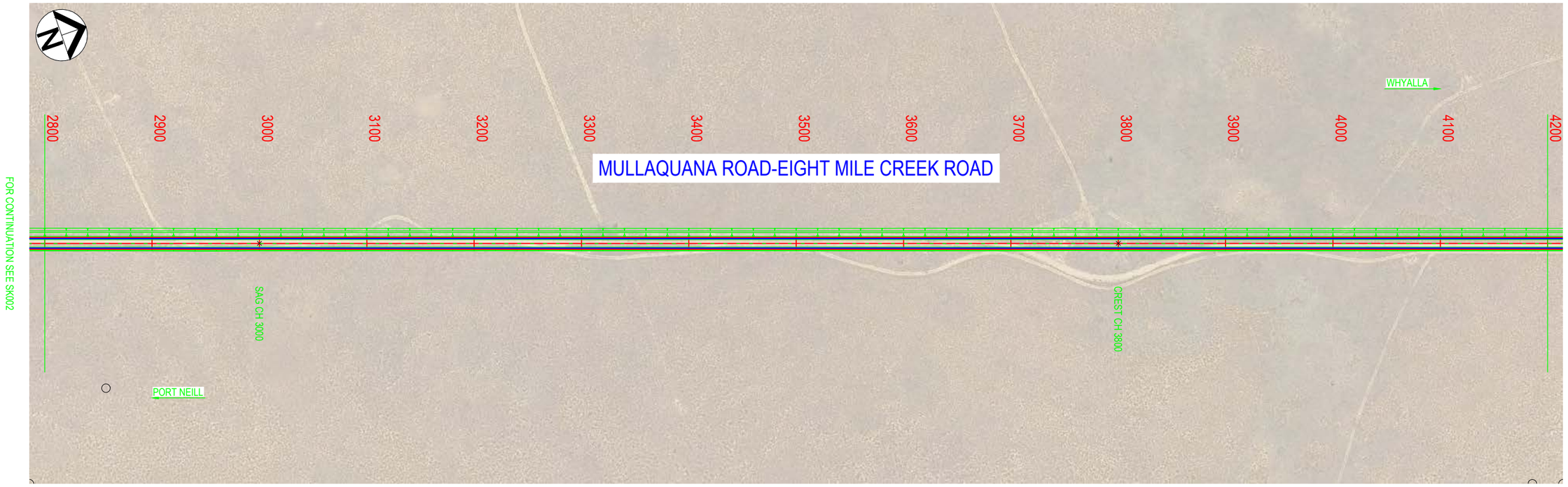
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

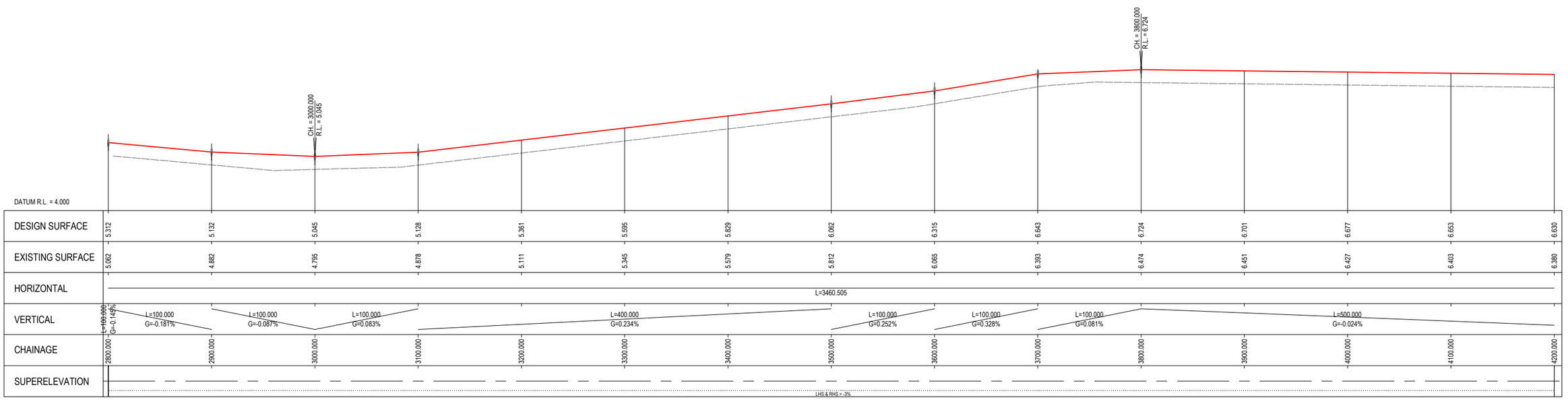
NORTHERN WATER
MC10; CH 1400 TO CH 2800
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

Government of South Australia

Department for Infrastructure and Transport

ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

NORTHERN WATER

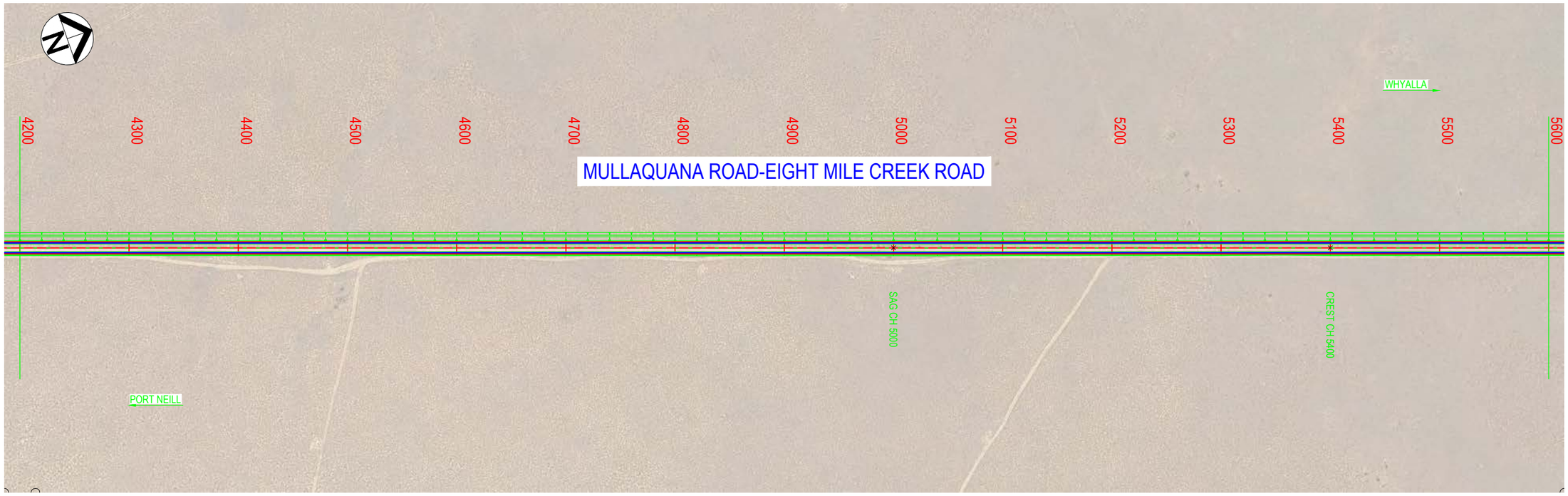
MC10; CH 2800 TO CH 4200

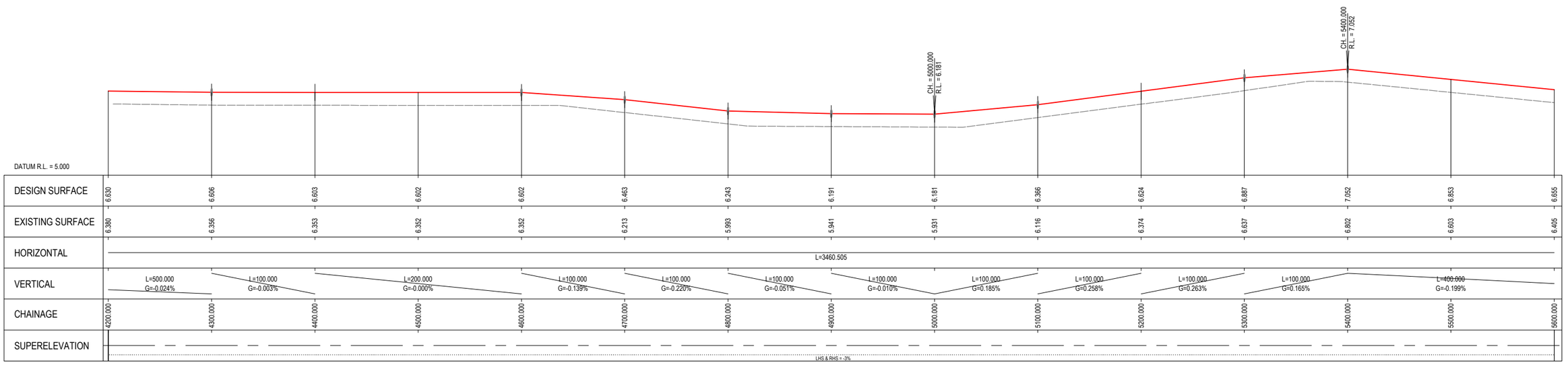
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK003	D

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

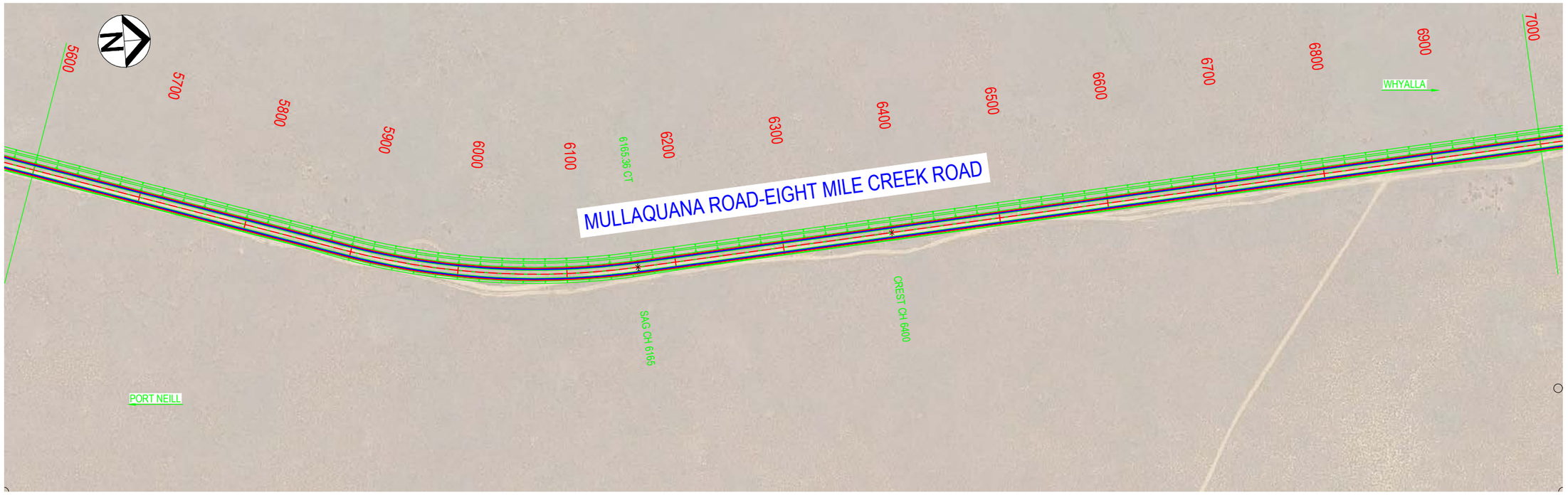
Government of South Australia
Department for Infrastructure and Transport

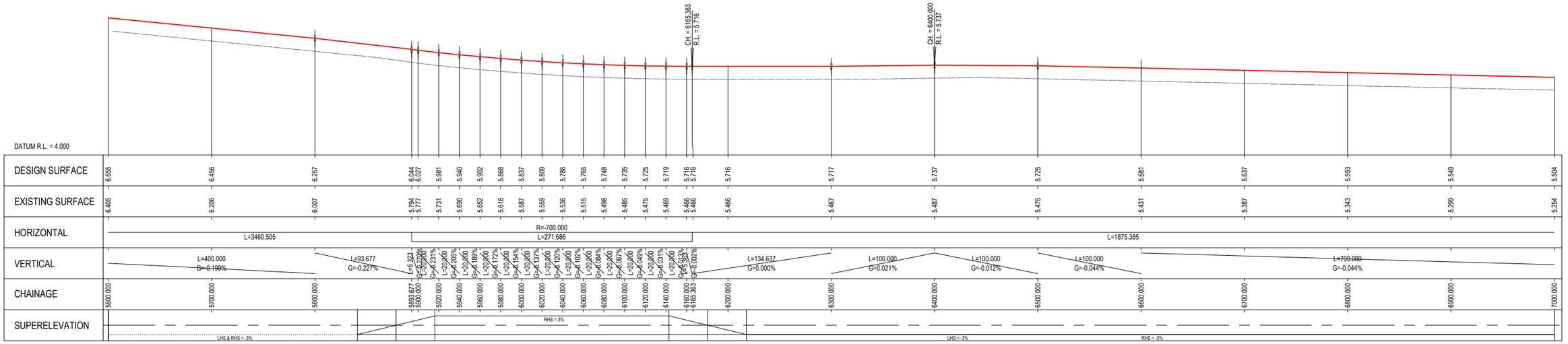
ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 4200 TO CH 5600
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK004	D

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
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B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

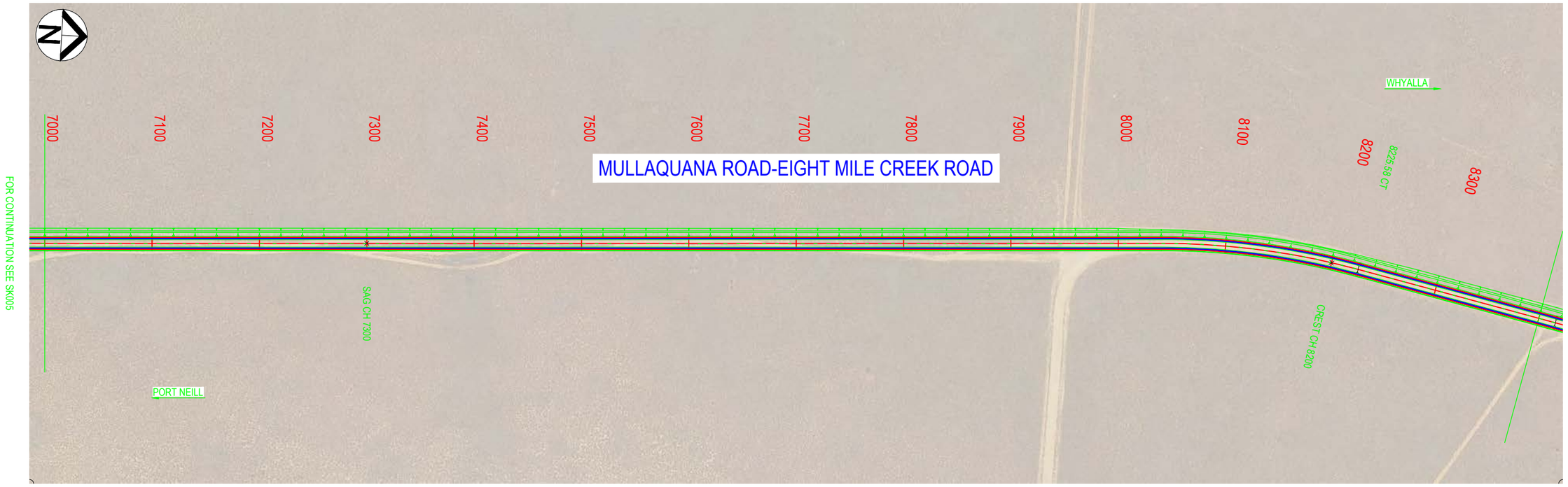
NORTHERN WATER

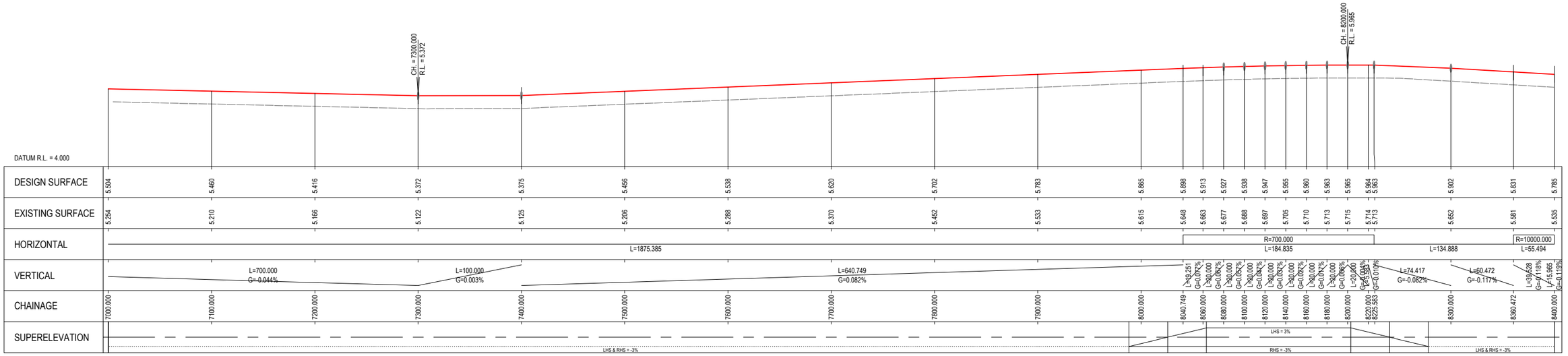
MC10; CH 5600 TO CH 7000

PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK005	D

CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
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A	CONCEPT	PDP	26.05.25

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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

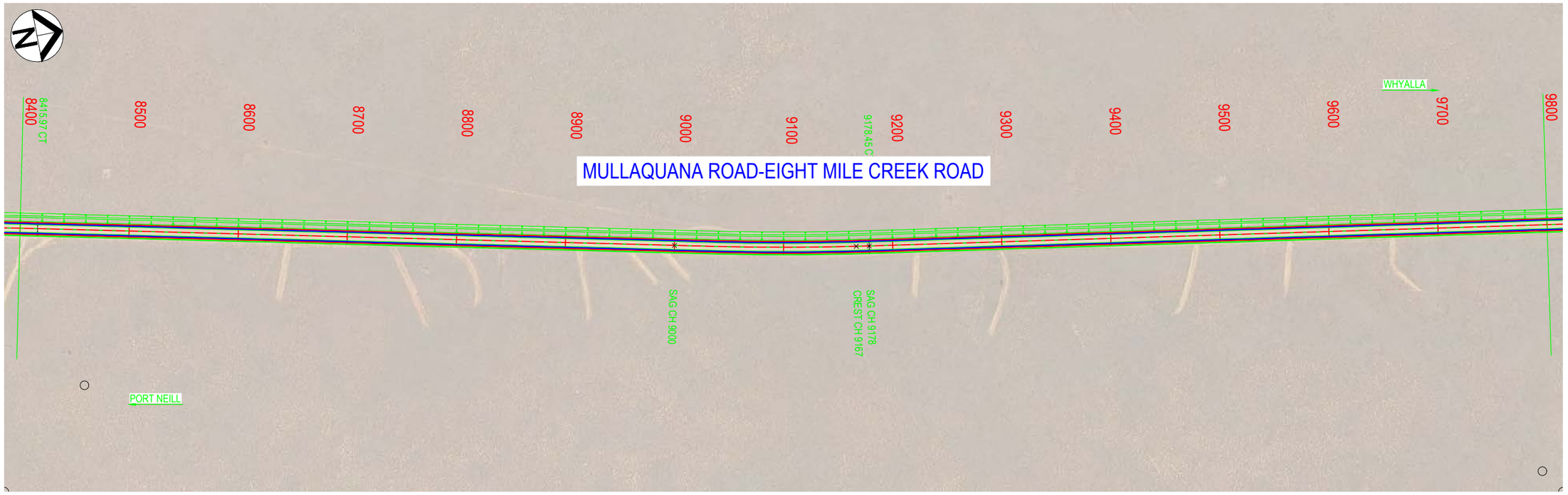
NORTHERN WATER

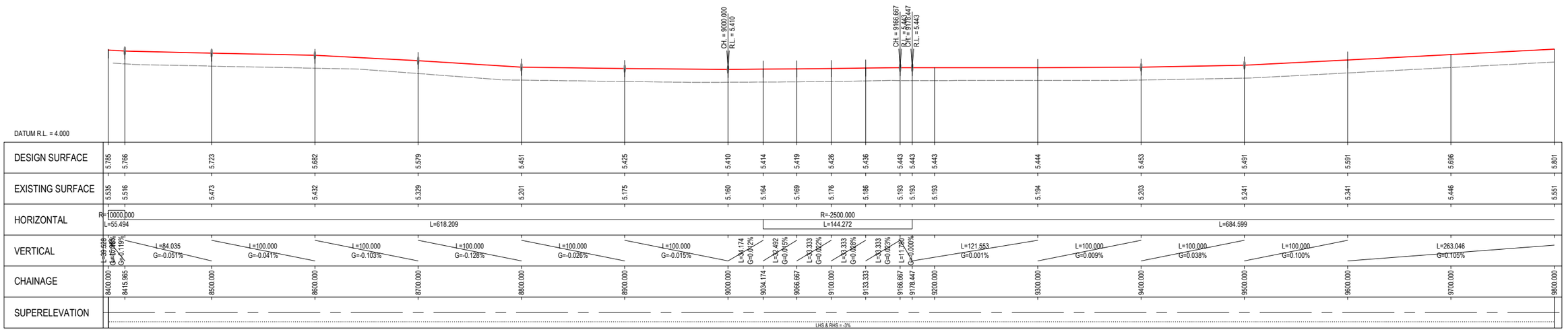
MC10; CH 7000 TO CH 8400

PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK006	D

CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
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A	CONCEPT	PDP	26.05.25

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Department for Infrastructure and Transport

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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

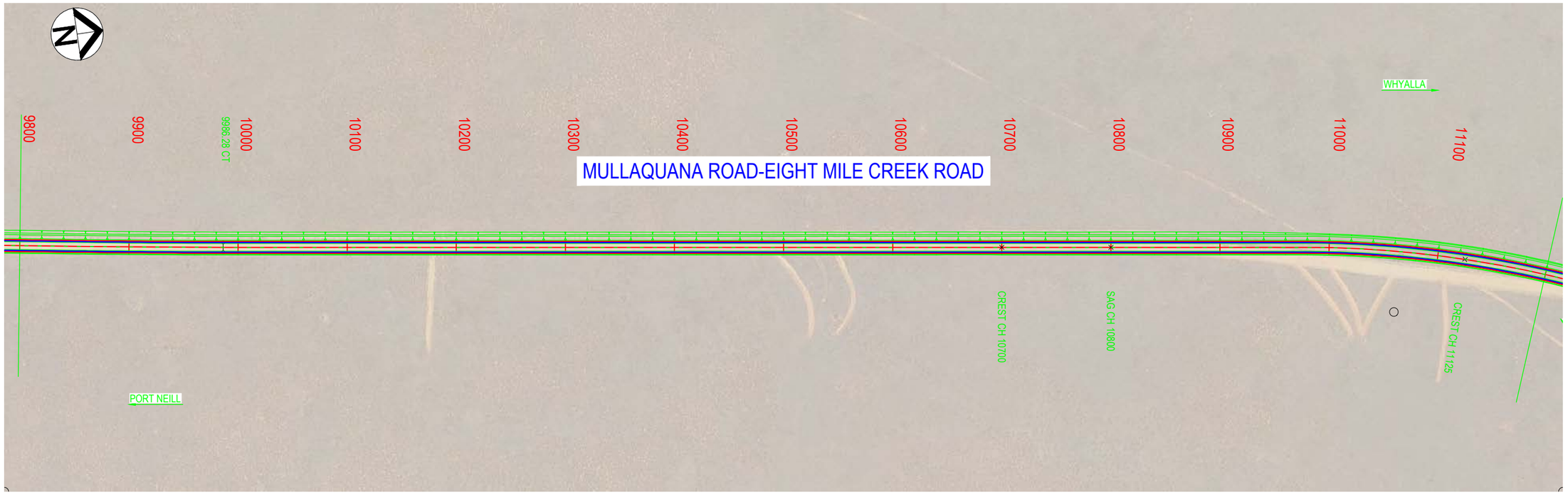
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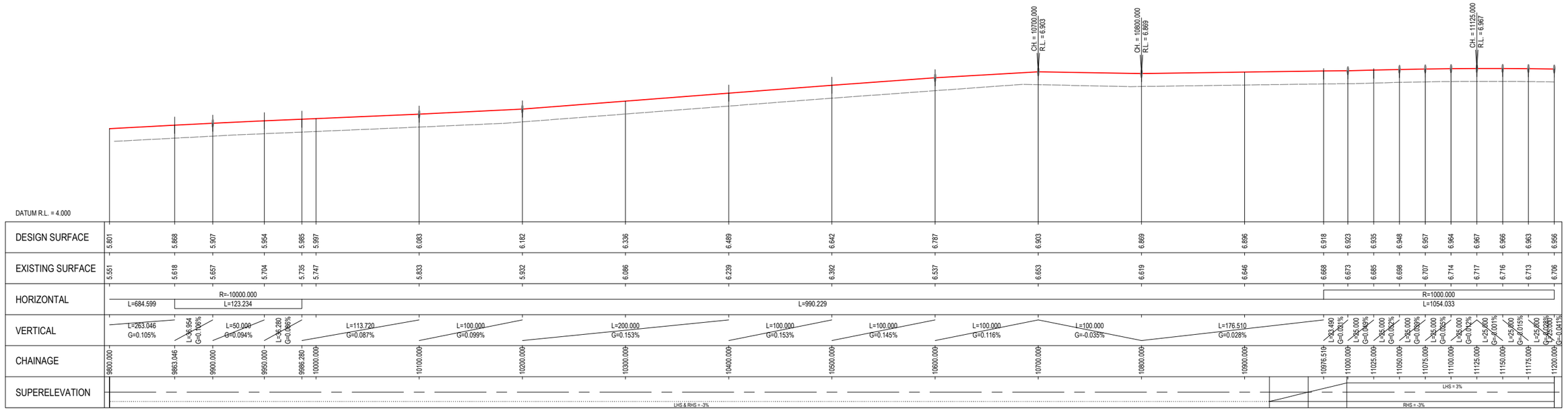
MC10; CH 8400 TO CH 9800

PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK007	D

CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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EXISTING SURFACE	5.551	5.618	5.657	5.704	5.735	5.747	5.833	5.932	6.086	6.239	6.392	6.537	6.653	6.619	6.646	6.668	6.673	6.685	6.698	6.707	6.714	6.717	6.716	6.713	6.706
CHAINAGE	9800.000	9863.046	9900.000	9950.000	9986.280	10000.000	10100.000	10200.000	10300.000	10400.000	10500.000	10600.000	10700.000	10800.000	10900.000	10976.510	11000.000	11025.000	11050.000	11075.000	11100.000	11125.000	11150.000	11175.000	11200.000

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SCALES: 40 0 20 40 60 80

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A	CONCEPT	PDP	26.05.25

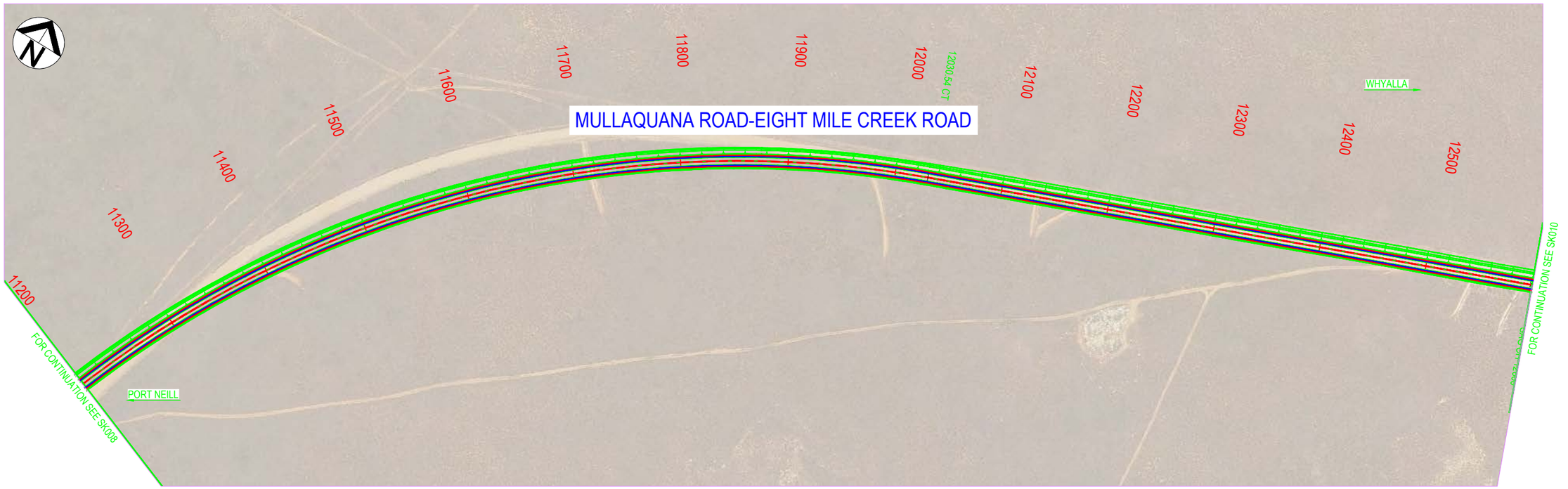
Government of South Australia
Department for Infrastructure and Transport

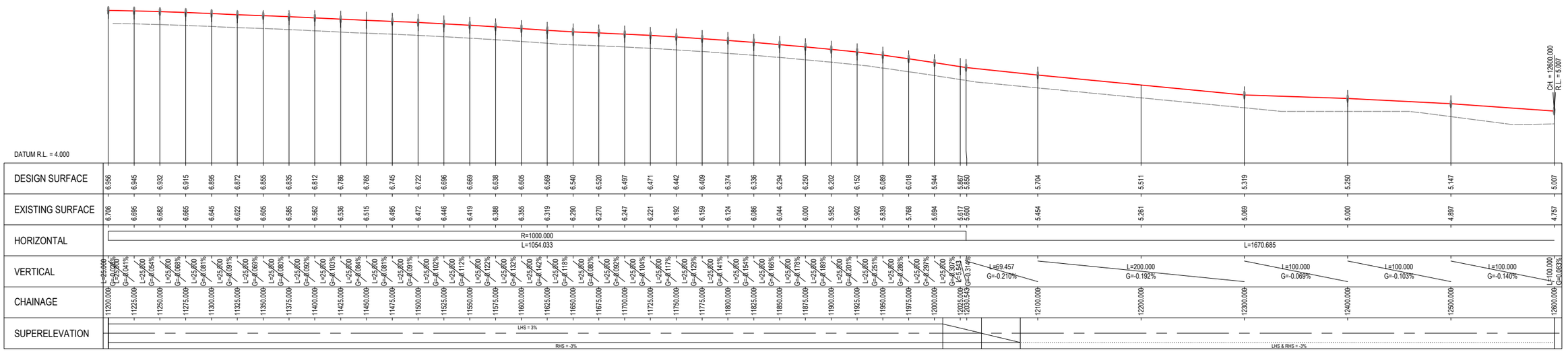
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ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 9800 TO CH 11200
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK008	D

CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
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B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

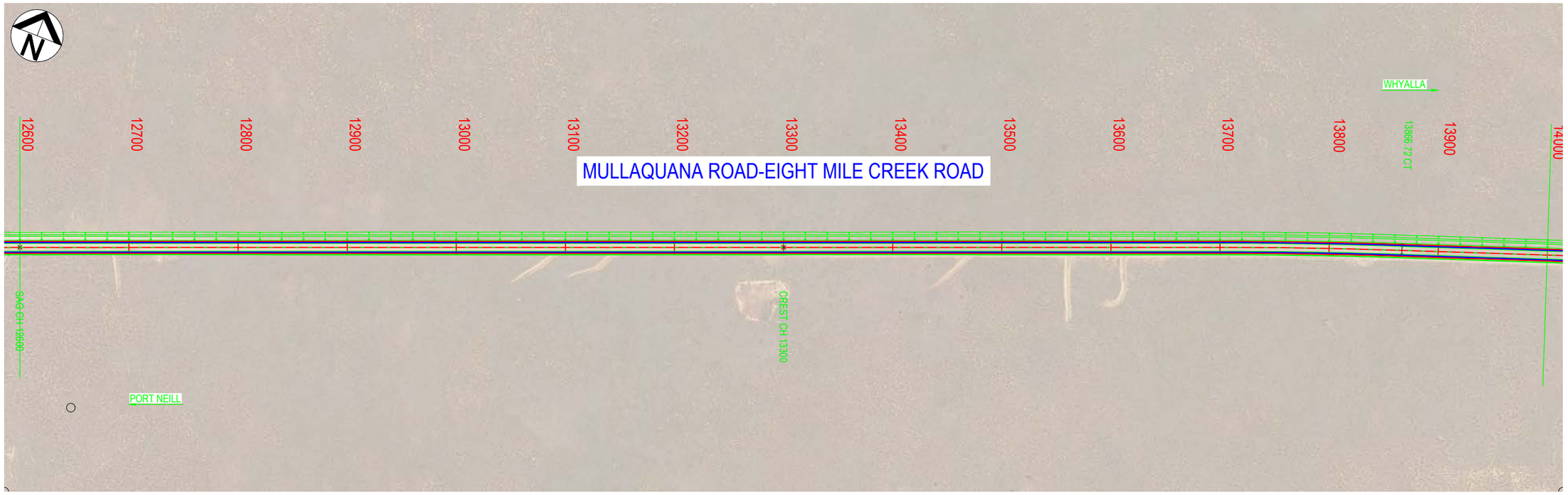
Government of South Australia
Department for Infrastructure and Transport

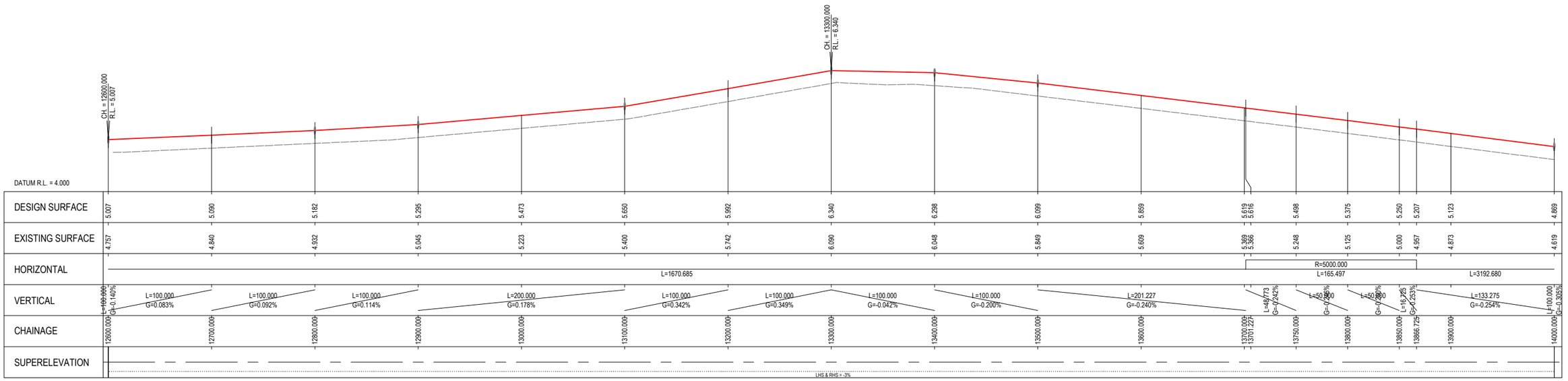
ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 11200 TO CH 12600
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK009	D

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
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Department for Infrastructure and Transport

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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

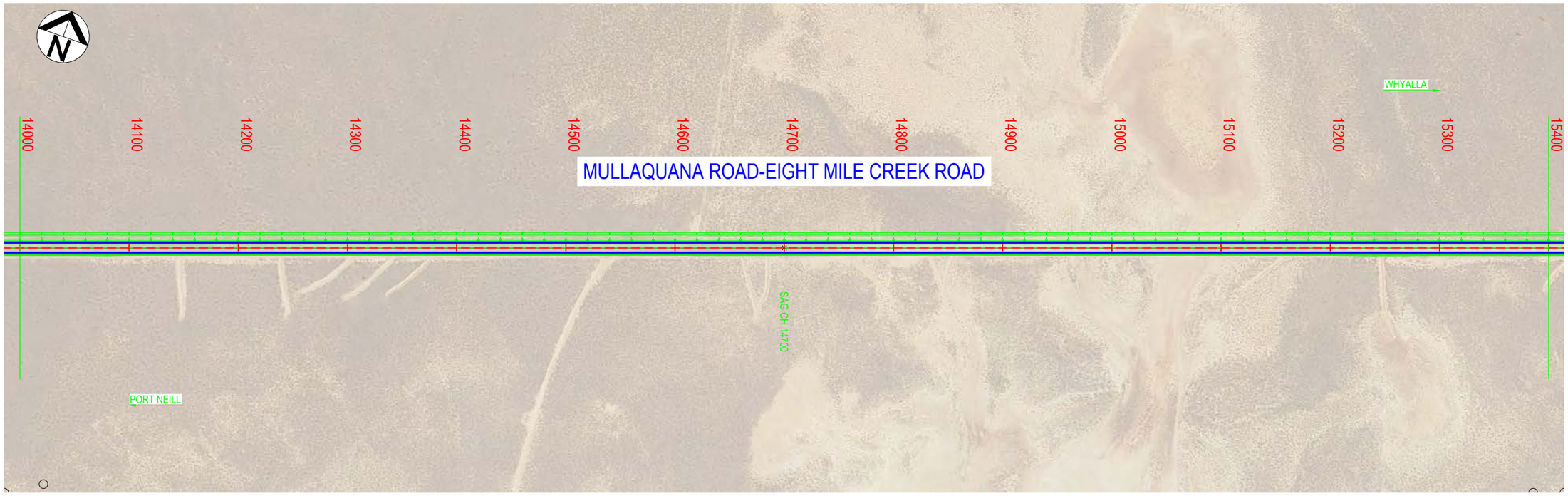
NORTHERN WATER

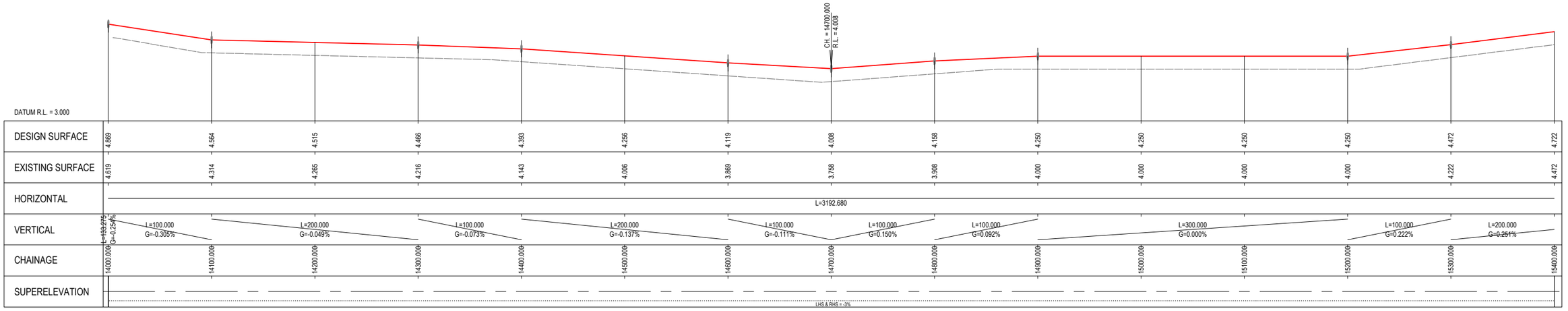
MC10; CH 12600 TO CH 14000

PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
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CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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SCALES: 40 0 20 40 60 80

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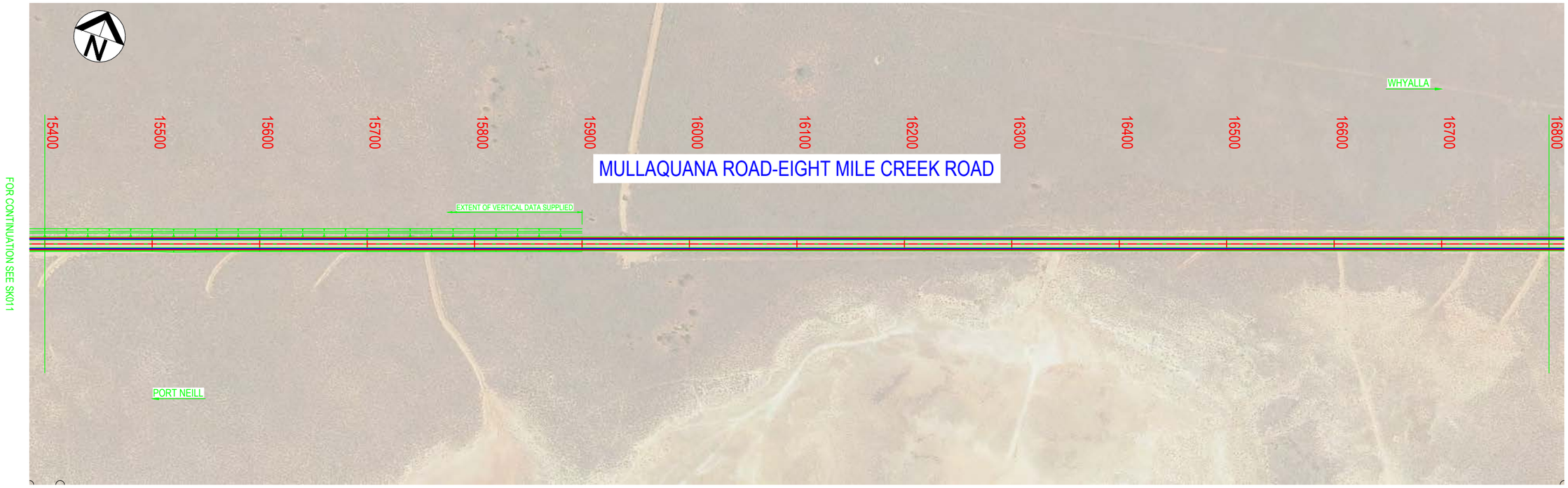
Government of South Australia
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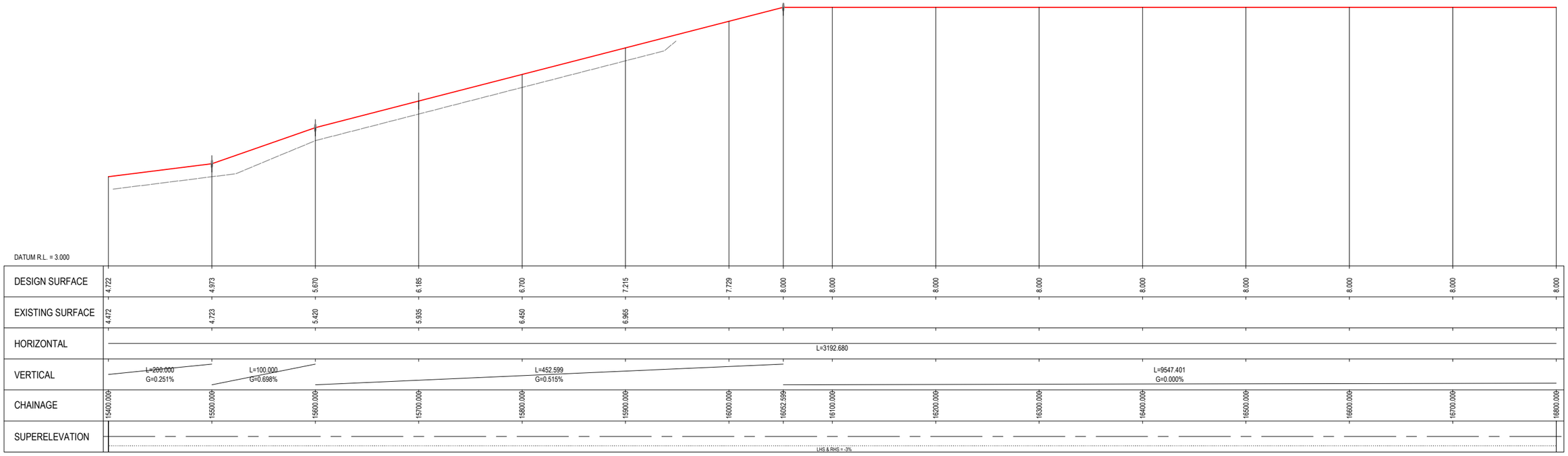
ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 14000 TO CH 15400
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
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SCALES: 40 0 20 40 60 80

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D	CONCEPT	PDP	06.08.25
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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

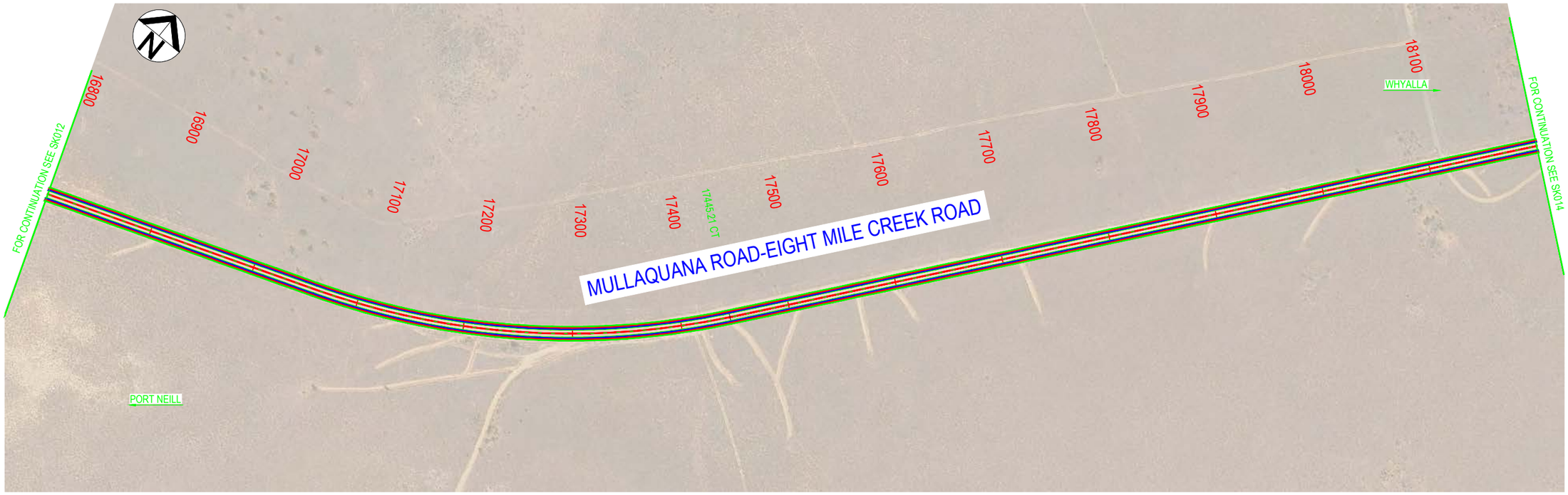
NORTHERN WATER

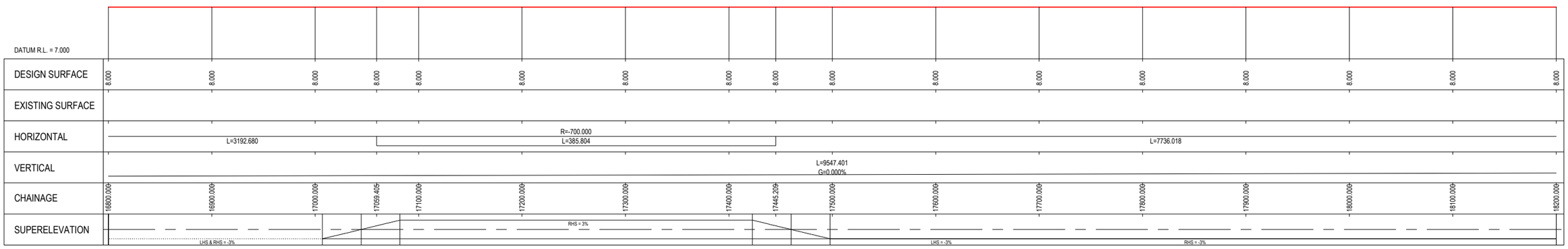
MC10; CH 15400 TO CH 16800

PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK012	D

CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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SCALES: 40 0 20 40 60 80

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Department for Infrastructure and Transport

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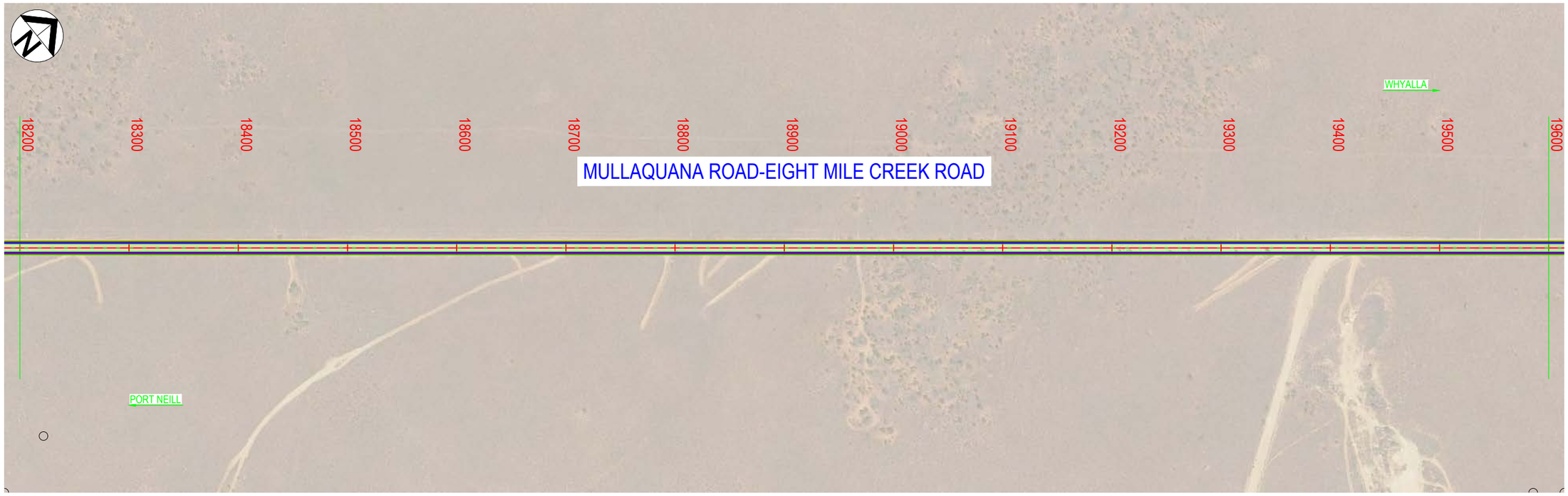
ROAD No. NCRN

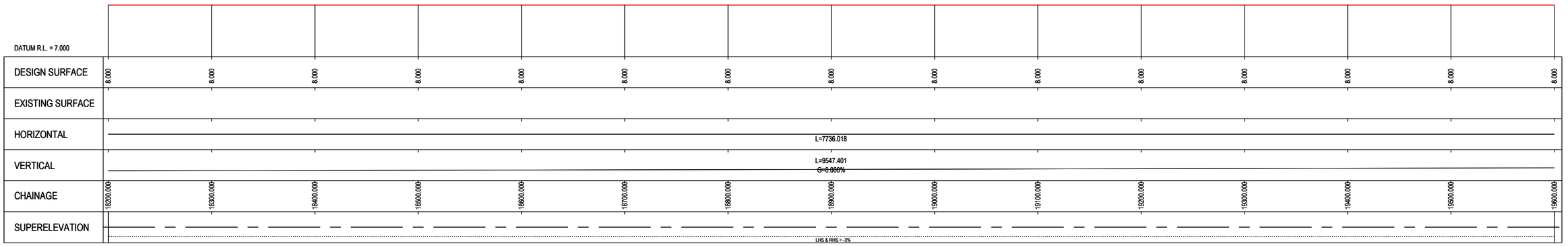
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

NORTHERN WATER
MC10; CH 16800 TO CH 18200
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK013	D

CAD FILE NAME: 2 - PLAN & PROFILE.DWG





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A	CONCEPT	PDP	26.05.25

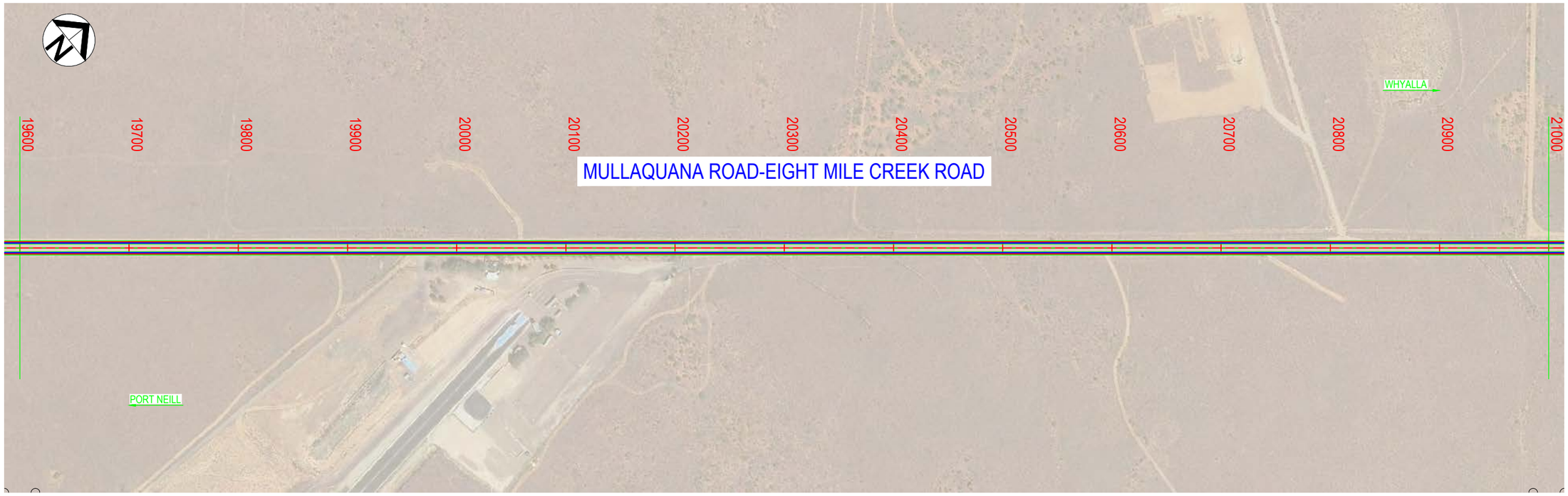
Government of South Australia
Department for Infrastructure and Transport

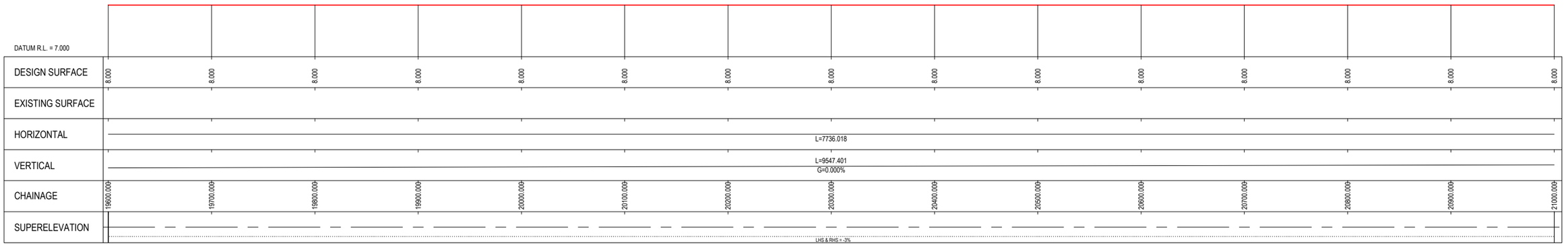
ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 18200 TO CH 19600
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK014	D

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SCALES: 40 0 20 40 60 80

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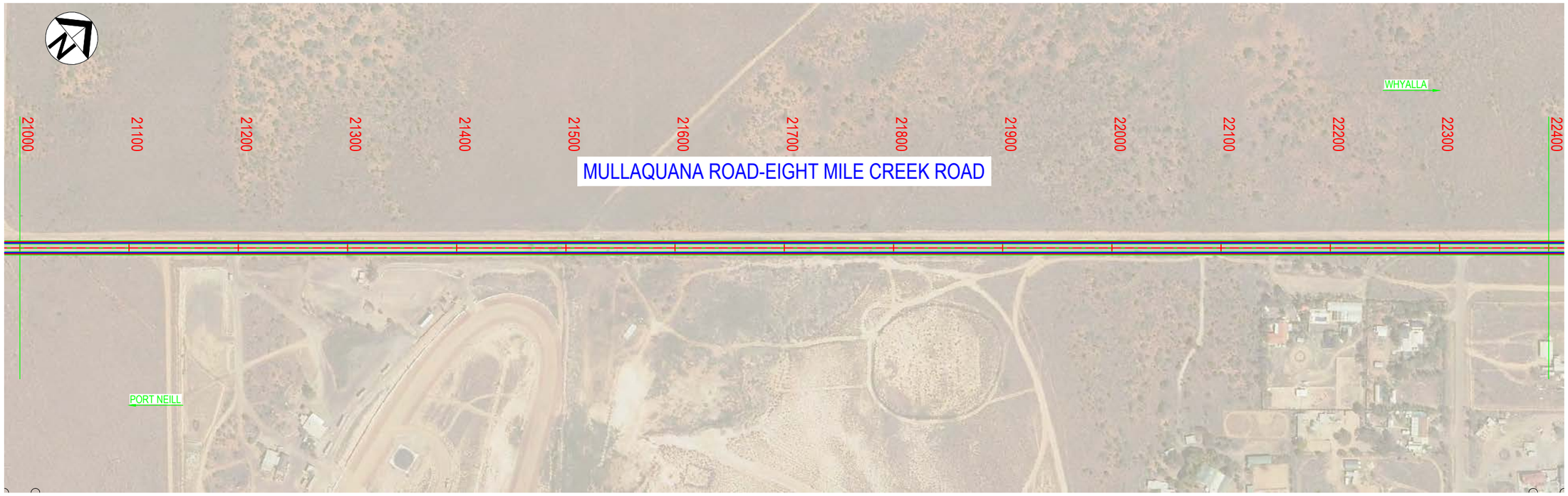
Government of South Australia
Department for Infrastructure and Transport

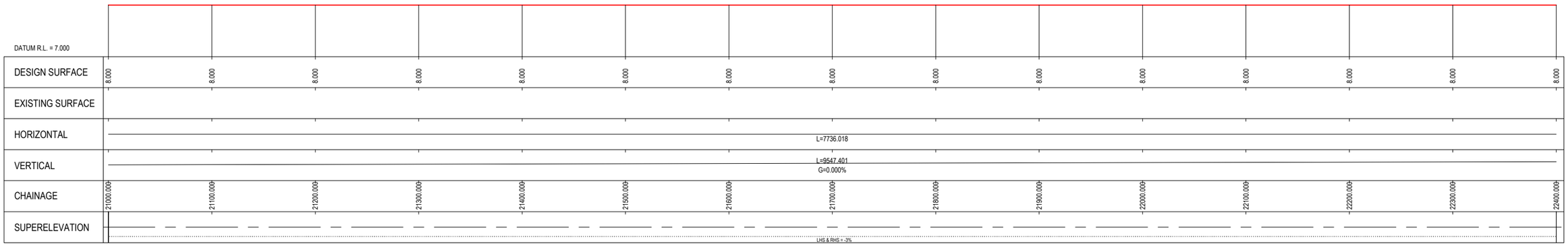
ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 19600 TO CH 21000
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK015	D

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CAD FILE NAME: 2 - PLAN & PROFILE.DWG





NOTES:

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN

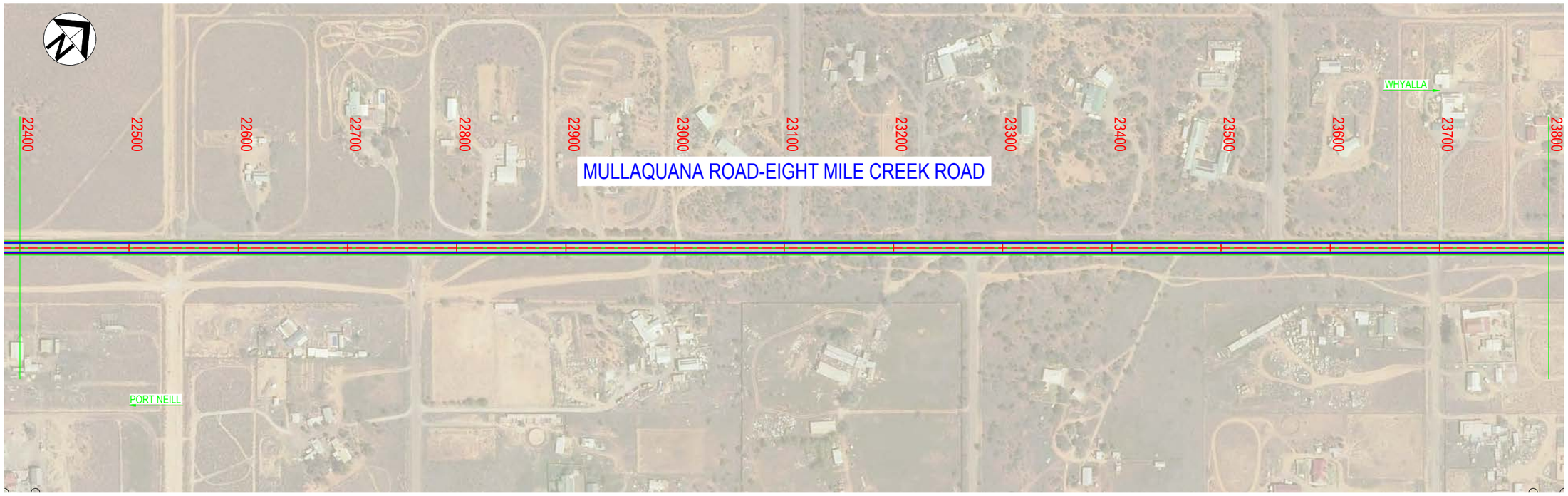
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

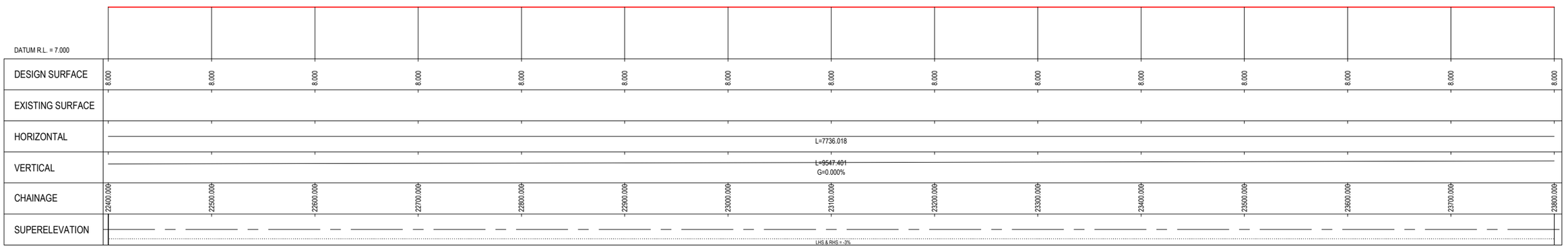
NORTHERN WATER
MC10; CH 21000 TO CH 22400
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK016	D

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN

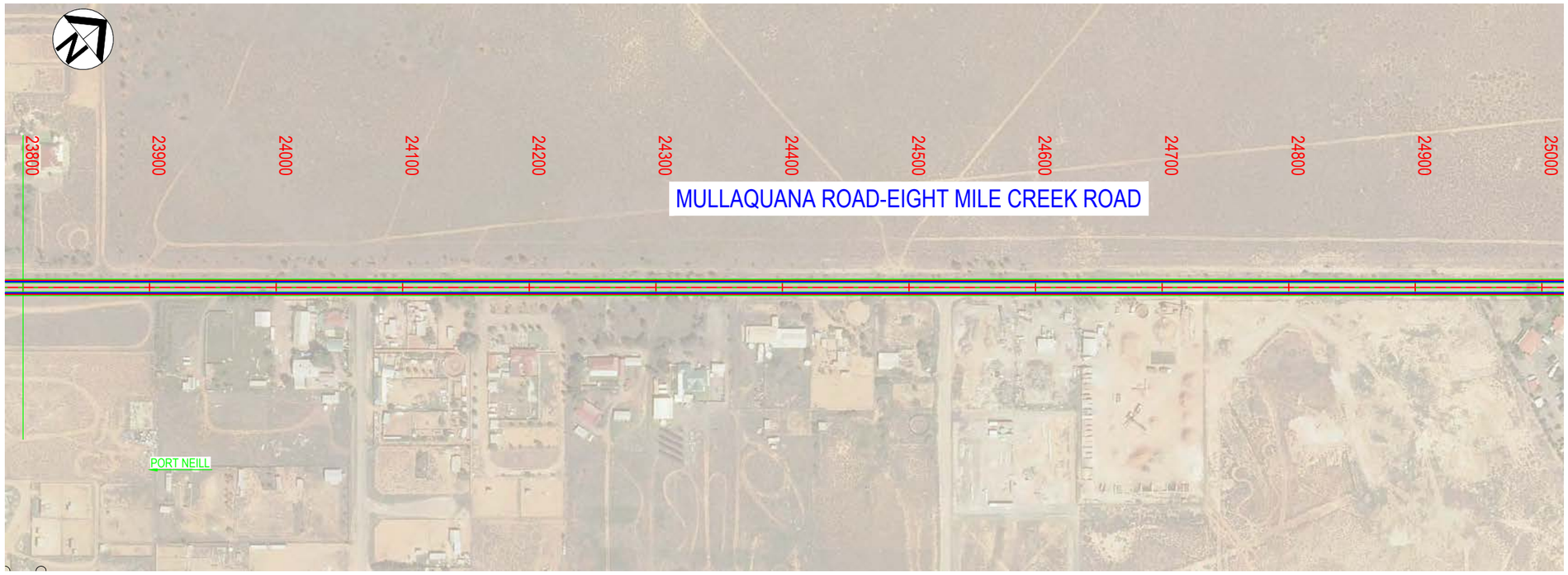
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

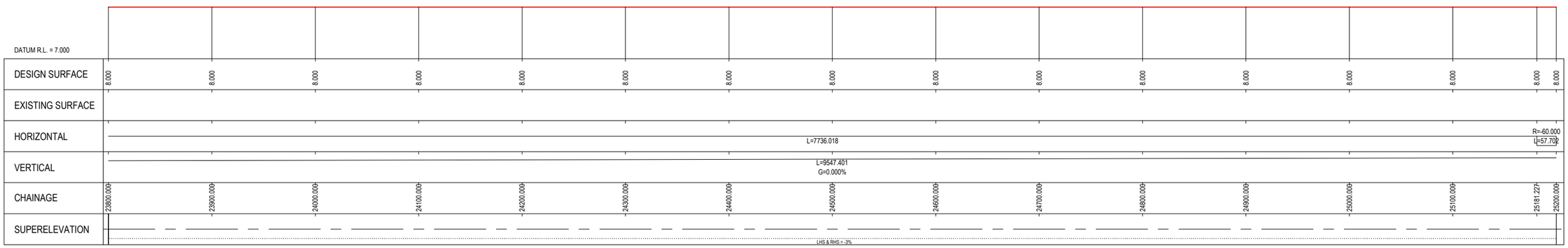
NORTHERN WATER
MC10; CH 22400 TO CH 23800
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK017	D

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SCALES: 40 0 20 40 60 80

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

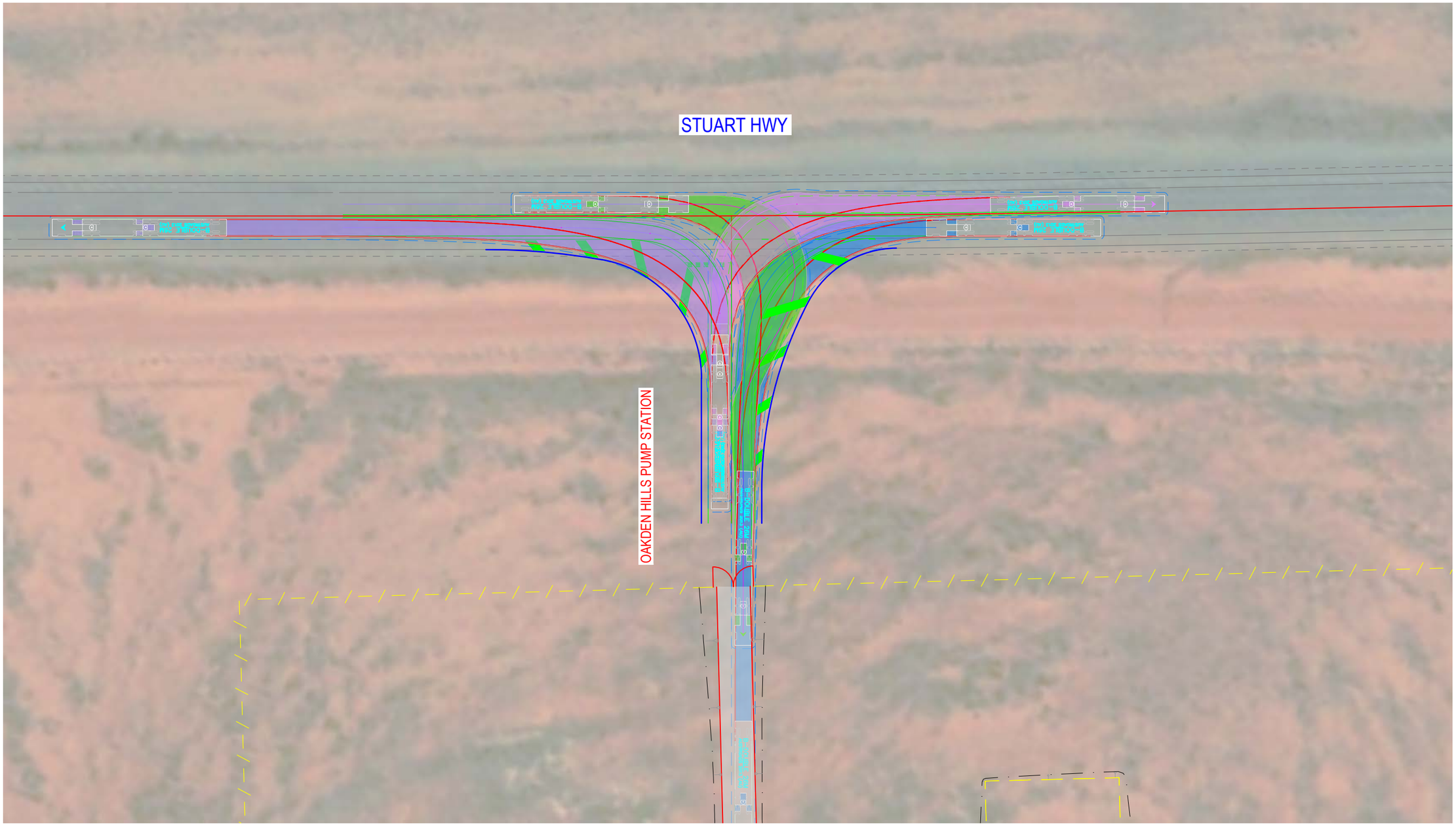
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 23800 TO CH 25200
PLAN & PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK018	D

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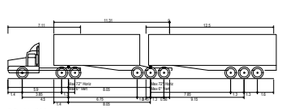
CAD FILE NAME: 2 - PLAN & PROFILE.DWG



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DESIGN VEHICLE:



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	NOT ISSUED AT AMENDMENT A	PDP	-

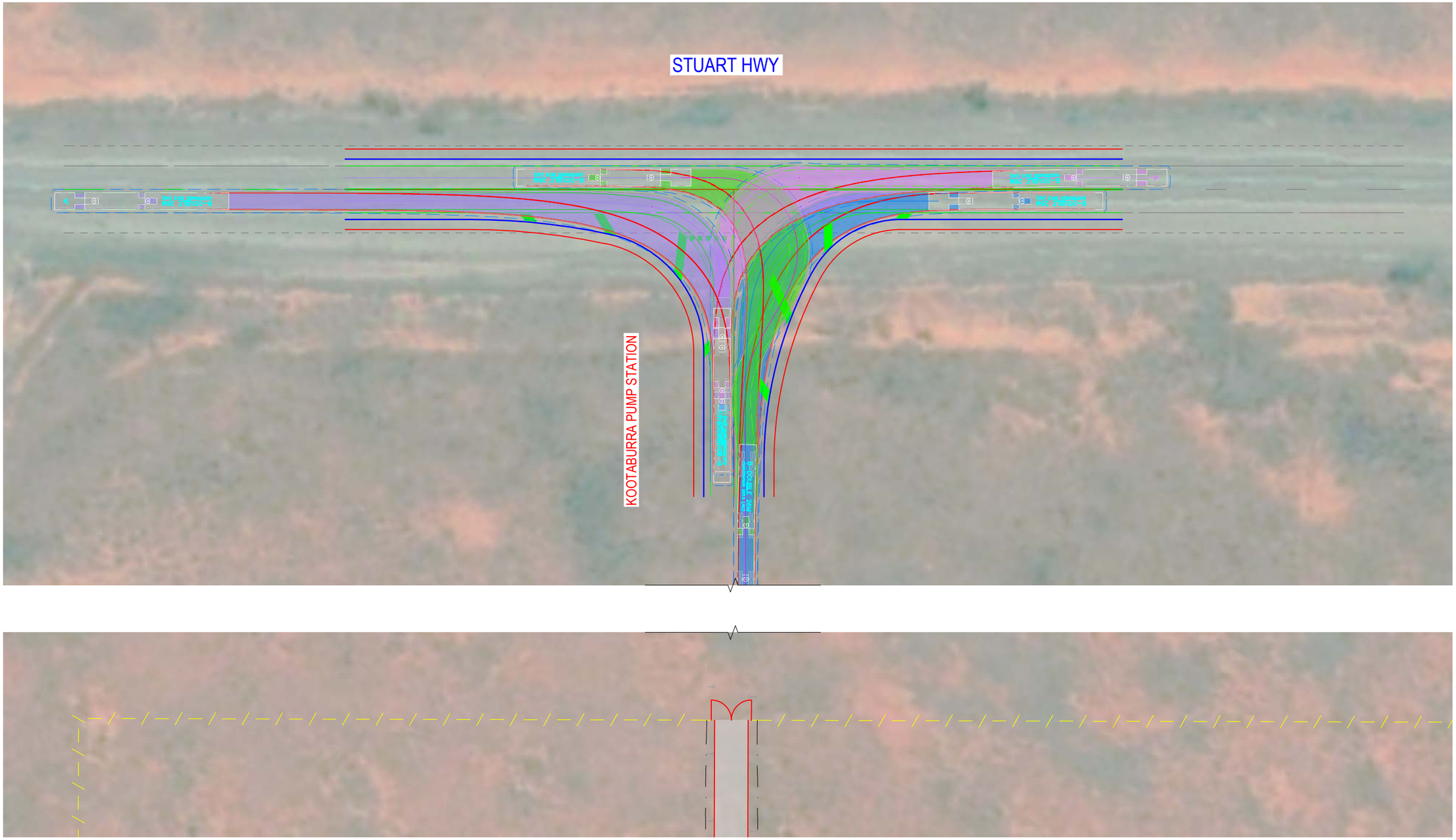
Government of South Australia
Department for Infrastructure and Transport

ROAD No. 01000
STUART HIGHWAY
NORTHERN WATER
OAKDEN HILLS PUMP STATION
VEHICLE TURNPATHS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK019	D

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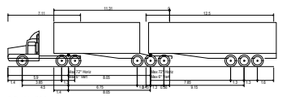
CAD FILE NAME: 3 - VEHICLE TURNPATHS.DWG



NOTES:

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DESIGN VEHICLE:



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	NOT ISSUED AT AMENDMENT A	PDP	

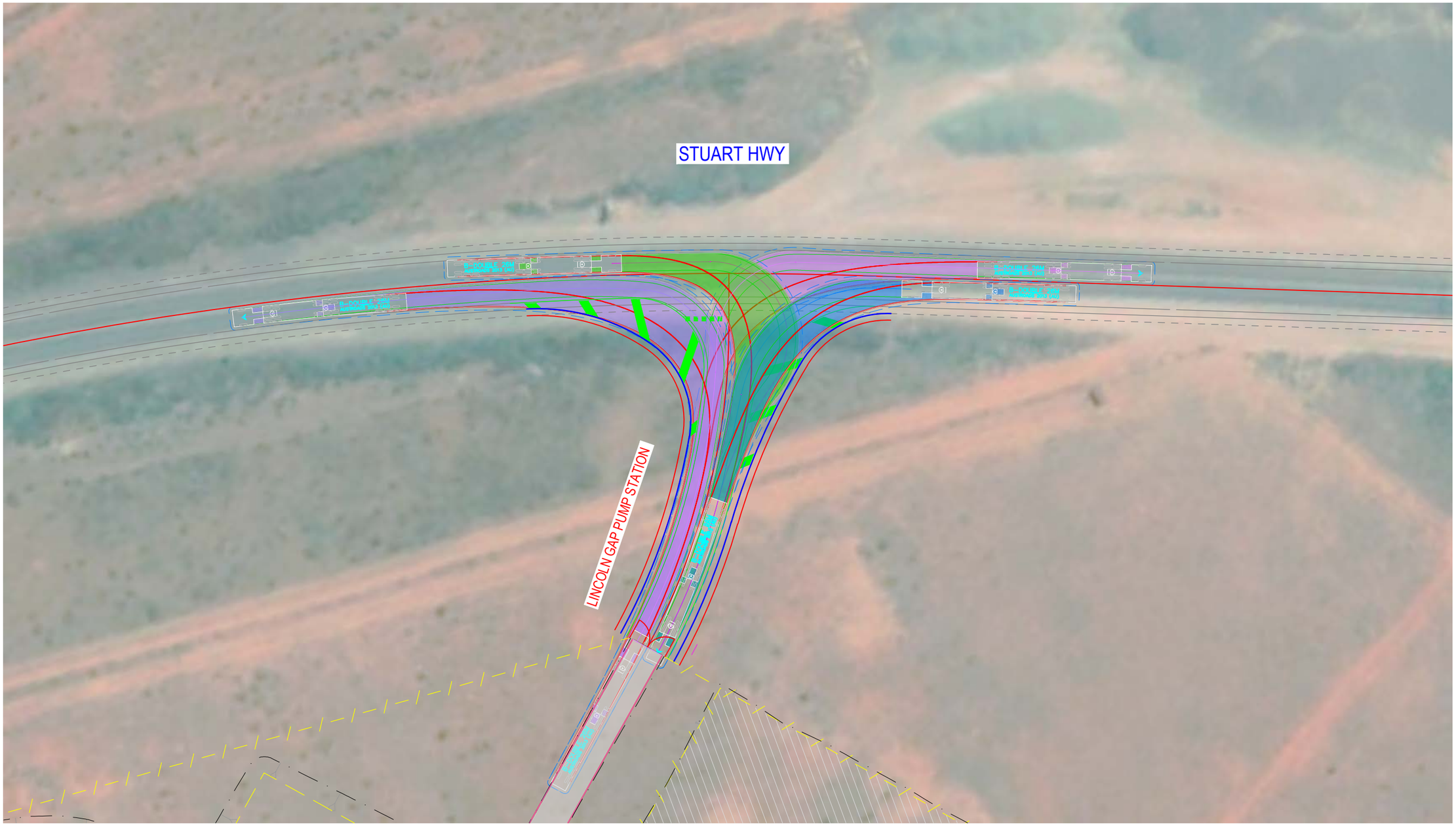
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. 01000
STUART HIGHWAY
NORTHERN WATER
KOOTABURRA PUMP STATION
VEHICLE TURNPATHS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK020	D

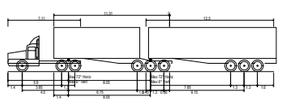
CAD FILE NAME: 3 - VEHICLE TURNPATHS.DWG



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DESIGN VEHICLE:



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	NOT ISSUED AT AMENDMENT A	PDP	-

Government of South Australia
Department for Infrastructure and Transport

ROAD No. 01000
STUART HIGHWAY
NORTHERN WATER
LINCOLN GAP PUMP STATION
VEHICLE TURNPATHS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK021	D

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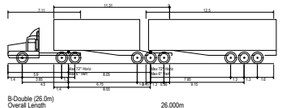
CAD FILE NAME: 3 - VEHICLE TURNPATHS.DWG



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DESIGN VEHICLE:



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	NOT ISSUED AT AMENDMENT A	PDP	-

Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN

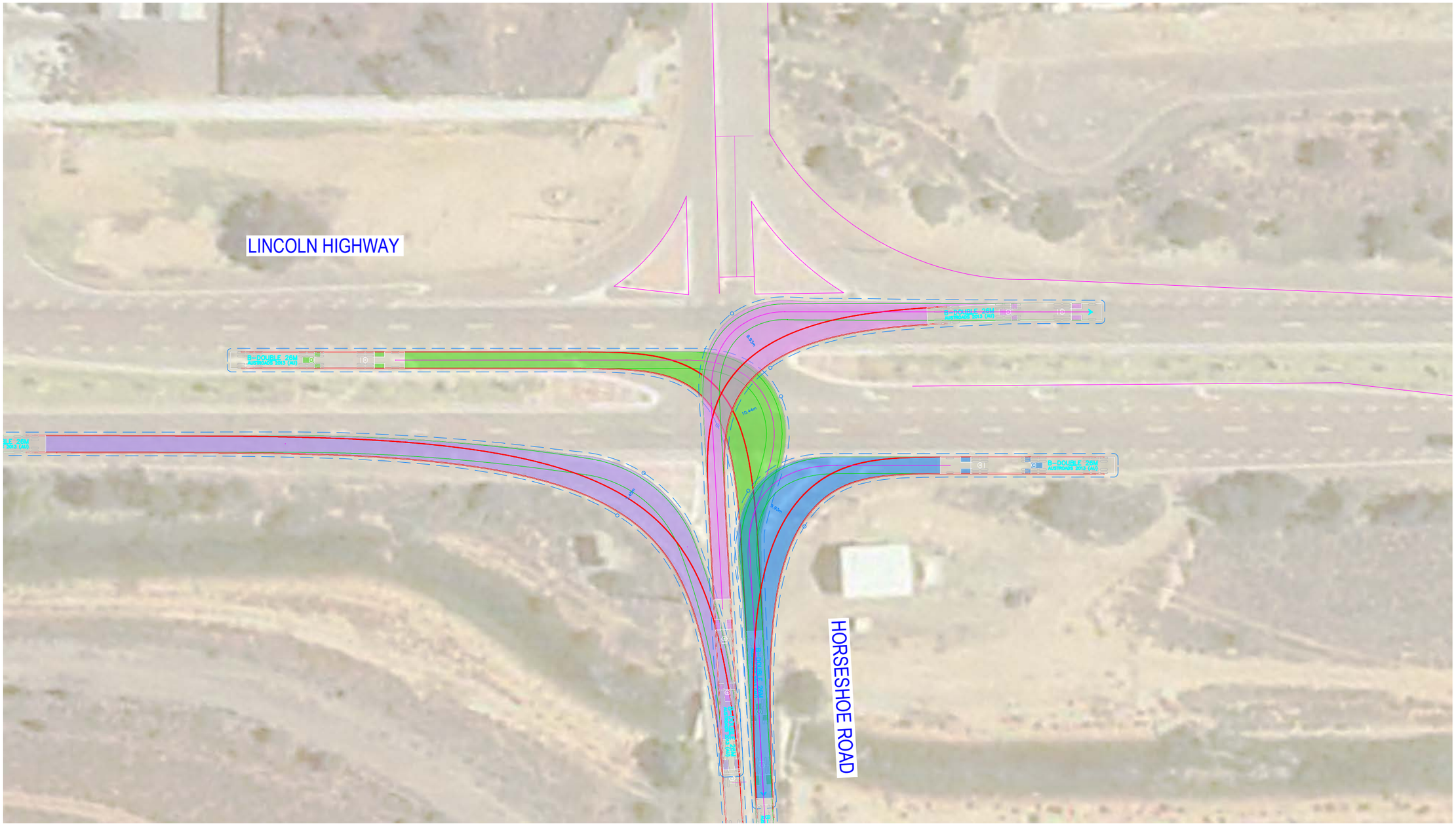
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

NORTHERN WATER
LINCOLN HIGHWAY
VEHICLE TURNPATHS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK022	D

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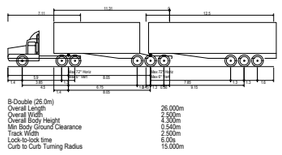
CAD FILE NAME 3 - VEHICLE TURNPATHS.DWG



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DESIGN VEHICLE:



B-Double (26.0m)	
Overall Length	26.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	NOT ISSUED AT AMENDMENT A	PDP	-

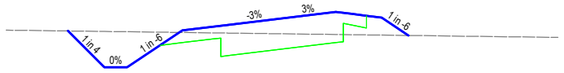
Government of South Australia
Department for Infrastructure and Transport

ROAD No. 02600
LINCOLN HIGHWAY
NORTHERN WATER
HORSESHOE ROAD
VEHICLE TURNPATHS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK023	D

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CAD FILE NAME: 3 – VEHICLE TURNPATHS.DWG

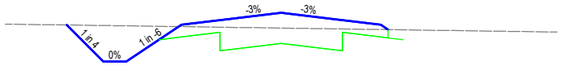


REF. STRING MC10
X = 725398.598
Y = 6321426.704

DATUM R.L. 3.9

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.839	5.248	5.248		5.848	5.878	5.908	5.938		6.043		6.148	6.118	6.088	6.058	5.766
LEVEL DIFF.		0.000	-0.583	-0.578		0.034	0.067	0.100	0.133		0.250		0.367	0.340	0.313	0.286	0.000
HORIZ. OFFSET	-13.964	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	8.263	

CHAINAGE 200

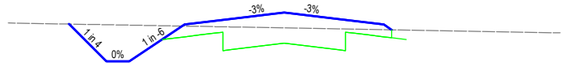


REF. STRING MC10
X = 725450.971
Y = 6321721.573

DATUM R.L. 3.5

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.384	4.789	4.789		5.389	5.419	5.449	5.479		5.584		5.479	5.449	5.419	5.389	5.308
LEVEL DIFF.		0.000	-0.587	-0.582		0.031	0.065	0.099	0.132		0.250		0.158	0.131	0.105	0.079	0.000
HORIZ. OFFSET	-13.982	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	6.982	

CHAINAGE 500



REF. STRING MC10
X = 725483.975
Y = 6322019.669

DATUM R.L. 3.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.214	4.606	4.606		5.206	5.236	5.266	5.296		5.401		5.296	5.266	5.236	5.206	5.119
LEVEL DIFF.		0.000	-0.597	-0.591		0.026	0.060	0.095	0.129		0.250		0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.033	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.020	

CHAINAGE 800



REF. STRING MC10
X = 725362.647
Y = 6321333.406

DATUM R.L. 4.2

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		6.056	5.467	5.467		6.067	6.097	6.127	6.157		6.262		6.157	6.127	6.097	6.067	5.990
LEVEL DIFF.		0.000	-0.582	-0.577		0.034	0.068	0.101	0.134		0.250		0.156	0.129	0.102	0.076	0.000
HORIZ. OFFSET	-13.957	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	6.963	

CHAINAGE 100



REF. STRING MC10
X = 725437.529
Y = 6321622.481

DATUM R.L. 3.6

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.523	4.927	4.927		5.527	5.557	5.587	5.617		5.722		5.617	5.587	5.557	5.527	5.447
LEVEL DIFF.		0.000	-0.587	-0.582		0.031	0.065	0.099	0.132		0.250		0.158	0.131	0.105	0.079	0.000
HORIZ. OFFSET	-13.982	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	6.982	

CHAINAGE 400

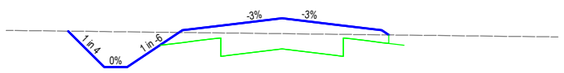


REF. STRING MC10
X = 725475.866
Y = 6321919.999

DATUM R.L. 3.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.223	4.614	4.614		5.214	5.244	5.274	5.304		5.409		5.304	5.274	5.244	5.214	5.128
LEVEL DIFF.		0.000	-0.597	-0.591		0.026	0.060	0.095	0.129		0.250		0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.033	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.020	

CHAINAGE 700

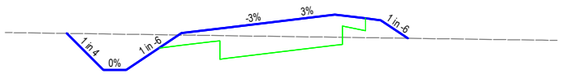


REF. STRING MC10
X = 725325.637
Y = 6321240.507

DATUM R.L. 4.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		6.201	5.614	5.614		6.214	6.244	6.274	6.304		6.409		6.304	6.274	6.244	6.214	6.139
LEVEL DIFF.		0.000	-0.579	-0.575		0.036	0.069	0.102	0.135		0.250		0.155	0.128	0.101	0.074	0.000
HORIZ. OFFSET	-13.945	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	6.953	

CHAINAGE 0

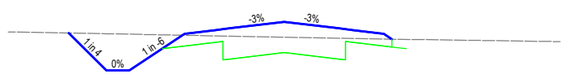


REF. STRING MC10
X = 725423.399
Y = 6321523.492

DATUM R.L. 3.8

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.663	5.069	5.069		5.669	5.699	5.729	5.759		5.864		5.969	5.939	5.909	5.879	5.584
LEVEL DIFF.		0.000	-0.586	-0.581		0.032	0.065	0.099	0.133		0.250		0.367	0.341	0.315	0.288	0.000
HORIZ. OFFSET	-13.979	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	8.266	

CHAINAGE 300



REF. STRING MC10
X = 725464.414
Y = 6321820.666

DATUM R.L. 3.4

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.269	4.658	4.658		5.258	5.288	5.318	5.348		5.453		5.348	5.318	5.288	5.258	5.170
LEVEL DIFF.		0.000	-0.600	-0.593		0.024	0.059	0.094	0.128		0.250		0.162	0.136	0.111	0.086	0.000
HORIZ. OFFSET	-14.045	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.029	

CHAINAGE 600

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H; 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

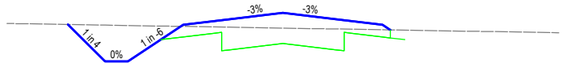
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 0 TO CH 800
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK024	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

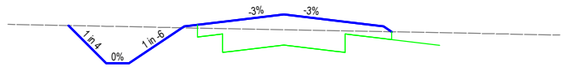


REF. STRING MC10
X = 725507.172
Y = 6322318.768

DATUM R.L. 3.2

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.148	4.544	4.544		5.144	5.174	5.204	5.234		5.339		5.234	5.204	5.174	5.144	5.060
LEVEL DIFF.		0.000	-0.594	-0.587		0.028	0.062	0.096	0.130		0.250		0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET		-14.015	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.006

CHAINAGE 1100

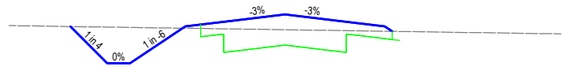


REF. STRING MC10
X = 725524.724
Y = 6322618.254

DATUM R.L. 3.9

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.800	5.188	5.188		5.788	5.818	5.848	5.878		5.983		5.878	5.848	5.818	5.788	5.699
LEVEL DIFF.		0.000	-0.601	-0.593		0.024	0.059	0.093	0.128		0.250		0.162	0.137	0.111	0.086	0.000
HORIZ. OFFSET		-14.050	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.033

CHAINAGE 1400

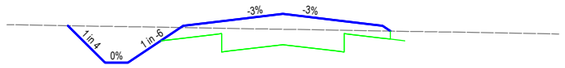


REF. STRING MC10
X = 725536.282
Y = 6322918.021

DATUM R.L. 4.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		6.228	5.631	5.631		6.231	6.261	6.291	6.321		6.426		6.321	6.291	6.261	6.231	6.150
LEVEL DIFF.		0.000	-0.598	-0.583		0.031	0.064	0.098	0.132		0.250		0.158	0.132	0.106	0.079	0.000
HORIZ. OFFSET		-13.990	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	6.987

CHAINAGE 1700

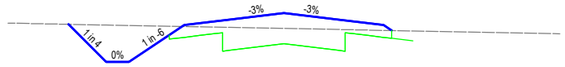


REF. STRING MC10
X = 725499.92
Y = 6322219.032

DATUM R.L. 3.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.191	4.587	4.587		5.187	5.217	5.247	5.277		5.382		5.277	5.247	5.217	5.187	5.103
LEVEL DIFF.		0.000	-0.594	-0.587		0.028	0.062	0.096	0.130		0.250		0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET		-14.015	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.006

CHAINAGE 1000

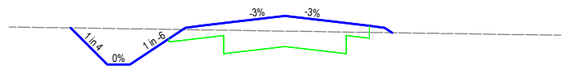


REF. STRING MC10
X = 725518.993
Y = 6322518.418

DATUM R.L. 3.6

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.542	4.929	4.929		5.529	5.559	5.589	5.619		5.724		5.619	5.589	5.559	5.529	5.440
LEVEL DIFF.		0.000	-0.601	-0.594		0.024	0.059	0.093	0.128		0.250		0.162	0.137	0.111	0.086	0.000
HORIZ. OFFSET		-14.050	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.033

CHAINAGE 1300

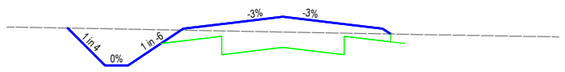


REF. STRING MC10
X = 725533.212
Y = 6322818.068

DATUM R.L. 4.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		6.203	5.605	5.605		6.205	6.235	6.265	6.295		6.400		6.295	6.265	6.235	6.205	6.124
LEVEL DIFF.		0.000	-0.598	-0.583		0.031	0.064	0.098	0.132		0.250		0.158	0.132	0.106	0.079	0.000
HORIZ. OFFSET		-13.990	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	6.987

CHAINAGE 1600

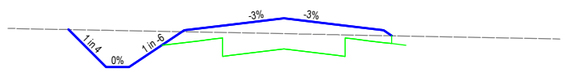


REF. STRING MC10
X = 725491.949
Y = 6322119.351

DATUM R.L. 3.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.207	4.598	4.598		5.198	5.228	5.258	5.288		5.393		5.288	5.258	5.228	5.198	5.112
LEVEL DIFF.		0.000	-0.597	-0.591		0.026	0.060	0.095	0.129		0.250		0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET		-14.033	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.020

CHAINAGE 900

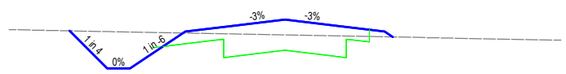


REF. STRING MC10
X = 725513.234
Y = 6322418.584

DATUM R.L. 3.4

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.283	4.670	4.670		5.270	5.300	5.330	5.360		5.465		5.360	5.330	5.300	5.270	5.162
LEVEL DIFF.		0.000	-0.601	-0.594		0.024	0.059	0.093	0.128		0.250		0.162	0.137	0.111	0.086	0.000
HORIZ. OFFSET		-14.050	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.033

CHAINAGE 1200



REF. STRING MC10
X = 725529.591
Y = 6322718.135

DATUM R.L. 4.2

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10		MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		6.063	5.451	5.451		6.051	6.081	6.111	6.141		6.246		6.141	6.111	6.081	6.051	5.962
LEVEL DIFF.		0.000	-0.600	-0.593		0.024	0.059	0.094	0.128		0.250		0.162	0.136	0.111	0.086	0.000
HORIZ. OFFSET		-14.048	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500		0.000		3.500	4.500	5.500	6.500	7.031

CHAINAGE 1500

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

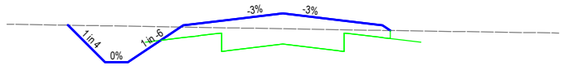
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 900 TO CH 1700
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK025	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

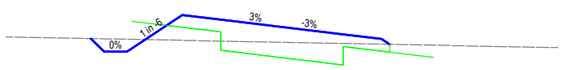


REF. STRING MC10
X = 725545.492
Y = 6323217.88

DATUM R.L. 4.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.314	5.710	5.710	6.310	6.340	6.370	6.400	6.505	6.400	6.370	6.340	6.310	6.227
LEVEL DIFF.	0.000	-0.593	-0.587	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET	-14.012	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.003

CHAINAGE 2000

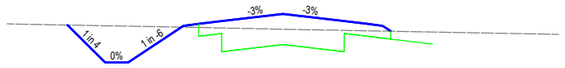


REF. STRING MC10
X = 725559.036
Y = 6323517.444

DATUM R.L. 4.7

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.180	5.965	5.965	6.965	6.535	6.505	6.475	6.370	6.265	6.235	6.205	6.175	6.086
LEVEL DIFF.	0.000	-0.211	-0.204	0.414	0.388	0.363	0.338	0.250	0.162	0.137	0.112	0.086	0.000
HORIZ. OFFSET	-12.461	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.034

CHAINAGE 2300



REF. STRING MC10
X = 725644.722
Y = 6323804.388

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.459	4.847	4.847	5.447	5.477	5.507	5.537	5.642	5.537	5.507	5.477	5.447	5.359
LEVEL DIFF.	0.000	-0.600	-0.593	0.024	0.059	0.094	0.128	0.250	0.162	0.136	0.111	0.086	0.000
HORIZ. OFFSET	-14.045	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.029

CHAINAGE 2600

REF. STRING MC10
X = 725542.422
Y = 6323117.927

DATUM R.L. 4.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.280	5.682	5.682	6.282	6.312	6.342	6.372	6.477	6.372	6.342	6.312	6.282	6.201
LEVEL DIFF.	0.000	-0.588	-0.583	0.031	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.079	0.000
HORIZ. OFFSET	-13.990	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.987

CHAINAGE 1900



REF. STRING MC10
X = 725551.632
Y = 6323417.786

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.324	5.876	5.876	6.476	6.481	6.487	6.493	6.512	6.407	6.377	6.347	6.317	6.227
LEVEL DIFF.	0.000	-0.441	-0.435	0.181	0.192	0.202	0.213	0.250	0.163	0.138	0.113	0.088	0.000
HORIZ. OFFSET	-13.395	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.042

CHAINAGE 2200

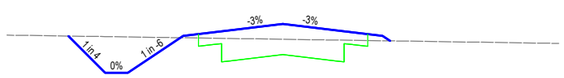


REF. STRING MC10
X = 725612.093
Y = 6323709.861

DATUM R.L. 3.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.712	5.105	5.105	5.705	5.735	5.765	5.795	5.900	5.795	5.765	5.735	5.705	5.619
LEVEL DIFF.	0.000	-0.596	-0.590	0.026	0.061	0.095	0.130	0.250	0.160	0.135	0.109	0.084	0.000
HORIZ. OFFSET	-14.028	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.016

CHAINAGE 2500

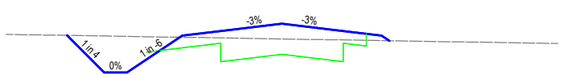


REF. STRING MC10
X = 725539.352
Y = 6323017.974

DATUM R.L. 4.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.254	5.657	5.657	6.257	6.287	6.317	6.347	6.452	6.347	6.317	6.287	6.257	6.175
LEVEL DIFF.	0.000	-0.588	-0.583	0.031	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.079	0.000
HORIZ. OFFSET	-13.990	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.987

CHAINAGE 1800

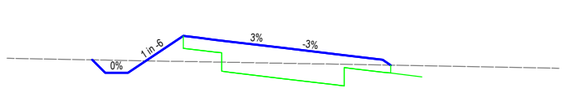


REF. STRING MC10
X = 725548.562
Y = 6323317.833

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.365	5.762	5.762	6.362	6.392	6.422	6.452	6.557	6.452	6.422	6.392	6.362	6.278
LEVEL DIFF.	0.000	-0.593	-0.587	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET	-14.012	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.004

CHAINAGE 2100



REF. STRING MC10
X = 725580.211
Y = 6323615.089

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.967	5.755	5.755	6.355	6.325	6.295	6.265	6.160	6.055	6.025	5.995	5.965	5.878
LEVEL DIFF.	0.000	-0.208	-0.201	0.415	0.380	0.365	0.339	0.250	0.161	0.135	0.110	0.085	0.000
HORIZ. OFFSET	-12.446	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 2400

NOTES:

1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H; 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

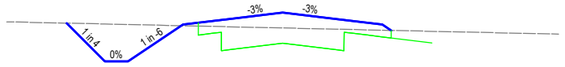
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 1800 TO CH 2600
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK026	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

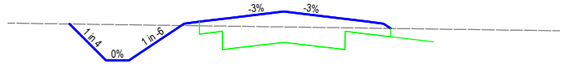


REF. STRING MC10
X = 725742.608
Y = 6324087.969

DATUM R.L. 3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		4.960	4.337	4.337		4.937	4.967	4.997	5.027	5.132		5.027	4.997	4.967	4.937	4.842
LEVEL DIFF.		0.000	-0.610	-0.601		0.019	0.054	0.090	0.125	0.250		0.165	0.140	0.116	0.091	0.000
HORIZ. OFFSET		-14.095	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	7.067

CHAINAGE 2900

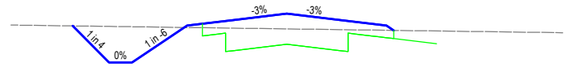


REF. STRING MC10
X = 725840.495
Y = 6324371.55

DATUM R.L. 3.3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.160	4.566	4.566		5.166	5.196	5.226	5.256	5.361		5.256	5.226	5.196	5.166	5.087
LEVEL DIFF.		0.000	-0.585	-0.580		0.032	0.066	0.099	0.133	0.250		0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET		-13.974	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.975

CHAINAGE 3200

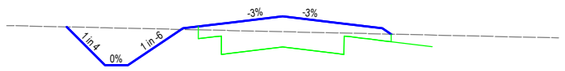


REF. STRING MC10
X = 725938.381
Y = 6324655.131

DATUM R.L. 4

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.861	5.267	5.267		5.867	5.897	5.927	5.957	6.062		5.957	5.927	5.897	5.867	5.788
LEVEL DIFF.		0.000	-0.585	-0.580		0.032	0.066	0.099	0.133	0.250		0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET		-13.974	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.975

CHAINAGE 3500

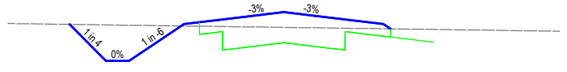


REF. STRING MC10
X = 725709.98
Y = 6323993.442

DATUM R.L. 3.2

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.141	4.517	4.517		5.117	5.147	5.177	5.207	5.312		5.207	5.177	5.147	5.117	5.023
LEVEL DIFF.		0.000	-0.610	-0.601		0.019	0.054	0.090	0.125	0.250		0.165	0.140	0.116	0.091	0.000
HORIZ. OFFSET		-14.095	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	7.067

CHAINAGE 2800

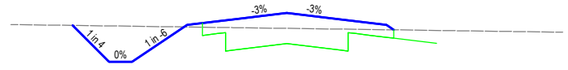


REF. STRING MC10
X = 725807.866
Y = 6324277.023

DATUM R.L. 3

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		4.926	4.333	4.333		4.933	4.963	4.993	5.023	5.128		5.023	4.993	4.963	4.933	4.853
LEVEL DIFF.		0.000	-0.585	-0.580		0.032	0.066	0.099	0.133	0.250		0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET		-13.974	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.975

CHAINAGE 3100

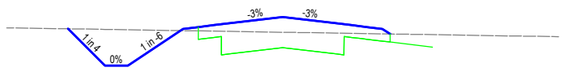


REF. STRING MC10
X = 725905.752
Y = 6324560.604

DATUM R.L. 3.7

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.627	5.034	5.034		5.634	5.664	5.694	5.724	5.829		5.724	5.694	5.664	5.634	5.554
LEVEL DIFF.		0.000	-0.585	-0.580		0.032	0.066	0.099	0.133	0.250		0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET		-13.974	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.975

CHAINAGE 3400

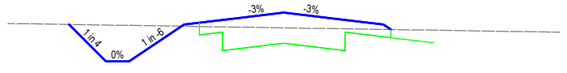


REF. STRING MC10
X = 725677.351
Y = 6323898.915

DATUM R.L. 3.4

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.263	4.662	4.662		5.262	5.292	5.322	5.352	5.457		5.352	5.322	5.292	5.262	5.179
LEVEL DIFF.		0.000	-0.592	-0.586		0.029	0.063	0.097	0.131	0.250		0.159	0.133	0.107	0.081	0.000
HORIZ. OFFSET		-14.005	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.999

CHAINAGE 2700

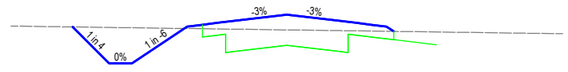


REF. STRING MC10
X = 725775.237
Y = 6324182.496

DATUM R.L. 2.9

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		4.850	4.250	4.250		4.850	4.880	4.910	4.940	5.045		4.940	4.910	4.880	4.850	4.767
LEVEL DIFF.		0.000	-0.591	-0.585		0.029	0.063	0.097	0.131	0.250		0.159	0.133	0.107	0.081	0.000
HORIZ. OFFSET		-14.001	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.996

CHAINAGE 3000



REF. STRING MC10
X = 725873.124
Y = 6324466.077

DATUM R.L. 3.5

DESIGN LABEL		IA10	IE10	ID10		EH10	ES10	CE10	LE10	MC10		LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS		5.393	4.800	4.800		5.400	5.430	5.460	5.490	5.595		5.490	5.460	5.430	5.400	5.321
LEVEL DIFF.		0.000	-0.585	-0.580		0.032	0.066	0.099	0.133	0.250		0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET		-13.974	-11.600	-10.100		-6.500	-5.500	-4.500	-3.500	0.000		3.500	4.500	5.500	6.500	6.975

CHAINAGE 3300

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

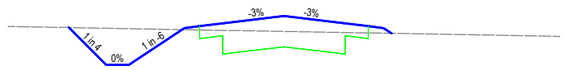
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 2700 TO CH 3500
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.
PDP	PDP	DIT	-	SK027	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

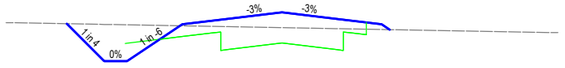


REF. STRING MC10
X = 726036.268
Y = 6324938.712

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.538	5.929	5.929	6.529	6.569	6.589	6.619	6.724	6.619	6.589	6.559	6.529	6.442
LEVEL DIFF.	0.000	-0.598	-0.591	0.026	0.060	0.095	0.129	0.250	0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.035	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 3800

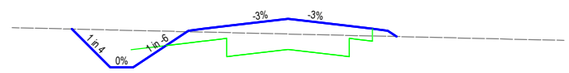


REF. STRING MC10
X = 726134.154
Y = 6325222.293

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.467	5.858	5.858	6.458	6.488	6.518	6.548	6.653	6.548	6.518	6.488	6.458	6.372
LEVEL DIFF.	0.000	-0.598	-0.591	0.026	0.060	0.095	0.129	0.250	0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.035	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 4100

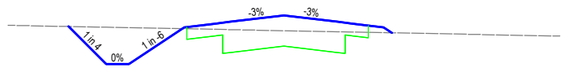


REF. STRING MC10
X = 726232.041
Y = 6325505.875

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.434	5.808	5.808	6.408	6.438	6.468	6.498	6.603	6.498	6.468	6.438	6.408	6.312
LEVEL DIFF.	0.000	-0.612	-0.603	0.018	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.092	0.000
HORIZ. OFFSET	-14.105	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.075

CHAINAGE 4400

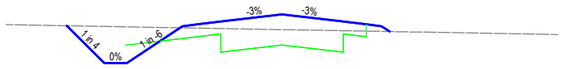


REF. STRING MC10
X = 726003.639
Y = 6324844.185

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.462	5.848	5.848	6.448	6.478	6.508	6.538	6.643	6.538	6.508	6.478	6.448	6.359
LEVEL DIFF.	0.000	-0.602	-0.594	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.055	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.036

CHAINAGE 3700

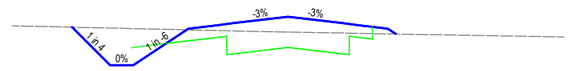


REF. STRING MC10
X = 726101.525
Y = 6325127.766

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.491	5.882	5.882	6.482	6.512	6.542	6.572	6.677	6.572	6.542	6.512	6.482	6.395
LEVEL DIFF.	0.000	-0.598	-0.591	0.026	0.060	0.095	0.129	0.250	0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.035	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 4000

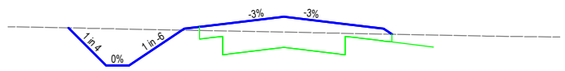


REF. STRING MC10
X = 726199.412
Y = 6325411.348

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.435	5.811	5.811	6.411	6.441	6.471	6.501	6.606	6.501	6.471	6.441	6.411	6.324
LEVEL DIFF.	0.000	-0.609	-0.600	0.020	0.056	0.092	0.128	0.250	0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.093	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 4300

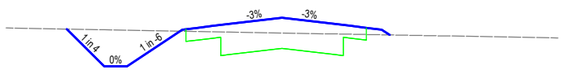


REF. STRING MC10
X = 725971.01
Y = 6324749.658

DATUM R.L. 4.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.133	5.520	5.520	6.120	6.150	6.180	6.210	6.315	6.210	6.180	6.150	6.120	6.030
LEVEL DIFF.	0.000	-0.602	-0.594	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.055	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.036

CHAINAGE 3600

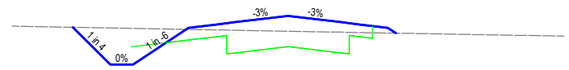


REF. STRING MC10
X = 726068.897
Y = 6325033.239

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.514	5.906	5.906	6.506	6.536	6.566	6.596	6.701	6.596	6.566	6.536	6.506	6.419
LEVEL DIFF.	0.000	-0.598	-0.591	0.026	0.060	0.095	0.129	0.250	0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.035	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 3900



REF. STRING MC10
X = 726166.783
Y = 6325316.821

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.443	5.835	5.835	6.435	6.465	6.495	6.525	6.630	6.525	6.495	6.465	6.435	6.348
LEVEL DIFF.	0.000	-0.598	-0.591	0.026	0.060	0.095	0.129	0.250	0.161	0.135	0.110	0.084	0.000
HORIZ. OFFSET	-14.035	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.021

CHAINAGE 4200

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H; 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

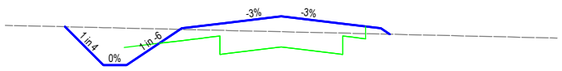
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 3600 TO CH 4400
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK028	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

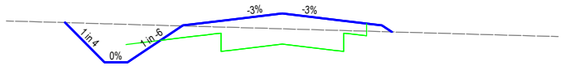


REF. STRING MC10
X = 726329.927
Y = 6325789.456

DATUM R.L. 4.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.294	5.668	5.668	6.268	6.298	6.328	6.358	6.463	6.358	6.328	6.298	6.268	6.172
LEVEL DIFF.	0.000	-0.612	-0.603	0.018	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.092	0.000
HORIZ. OFFSET	-14.104	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.074

CHAINAGE 4700

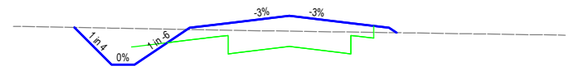


REF. STRING MC10
X = 726427.814
Y = 6326073.037

DATUM R.L. 4.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.032	5.386	5.386	5.986	6.016	6.046	6.076	6.181	6.076	6.046	6.016	5.986	5.880
LEVEL DIFF.	0.000	-0.627	-0.617	0.009	0.046	0.083	0.120	0.250	0.170	0.147	0.124	0.101	0.000
HORIZ. OFFSET	-14.183	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.134

CHAINAGE 5000

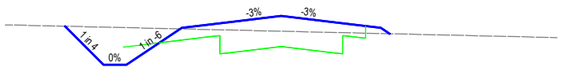


REF. STRING MC10
X = 726525.7
Y = 6326356.618

DATUM R.L. 4.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.697	6.092	6.092	6.692	6.722	6.752	6.782	6.887	6.782	6.752	6.722	6.692	6.611
LEVEL DIFF.	0.000	-0.594	-0.587	0.029	0.064	0.099	0.132	0.250	0.158	0.131	0.105	0.079	0.000
HORIZ. OFFSET	-14.022	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.983

CHAINAGE 5300

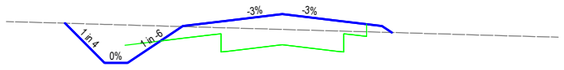


REF. STRING MC10
X = 726297.298
Y = 6325694.929

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.433	5.807	5.807	6.407	6.437	6.467	6.497	6.602	6.497	6.467	6.437	6.407	6.311
LEVEL DIFF.	0.000	-0.612	-0.603	0.018	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.092	0.000
HORIZ. OFFSET	-14.105	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.075

CHAINAGE 4600

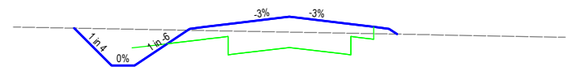


REF. STRING MC10
X = 726395.185
Y = 6325978.51

DATUM R.L. 4.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.042	5.396	5.396	5.996	6.026	6.056	6.086	6.191	6.086	6.056	6.026	5.996	5.891
LEVEL DIFF.	0.000	-0.627	-0.617	0.009	0.046	0.083	0.120	0.250	0.170	0.147	0.124	0.101	0.000
HORIZ. OFFSET	-14.183	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.134

CHAINAGE 4900

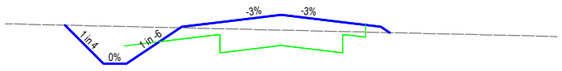


REF. STRING MC10
X = 726493.071
Y = 6326262.091

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.439	5.829	5.829	6.429	6.459	6.489	6.519	6.624	6.519	6.489	6.459	6.429	6.342
LEVEL DIFF.	0.000	-0.599	-0.592	0.025	0.060	0.094	0.129	0.250	0.161	0.136	0.110	0.085	0.000
HORIZ. OFFSET	-14.039	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.025

CHAINAGE 5200

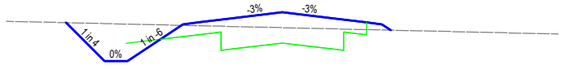


REF. STRING MC10
X = 726264.669
Y = 6325600.402

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.434	5.807	5.807	6.407	6.437	6.467	6.497	6.602	6.497	6.467	6.437	6.407	6.312
LEVEL DIFF.	0.000	-0.612	-0.603	0.018	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.092	0.000
HORIZ. OFFSET	-14.105	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.075

CHAINAGE 4500

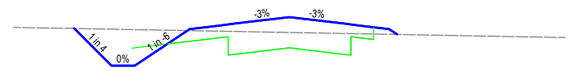


REF. STRING MC10
X = 726362.556
Y = 6325883.983

DATUM R.L. 4.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.074	5.448	5.448	6.048	6.078	6.108	6.138	6.243	6.138	6.108	6.078	6.048	5.952
LEVEL DIFF.	0.000	-0.612	-0.603	0.018	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.092	0.000
HORIZ. OFFSET	-14.104	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.074

CHAINAGE 4800



REF. STRING MC10
X = 726460.442
Y = 6326167.564

DATUM R.L. 4.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.181	5.571	5.571	6.171	6.201	6.231	6.261	6.366	6.261	6.231	6.201	6.171	6.083
LEVEL DIFF.	0.000	-0.599	-0.592	0.025	0.060	0.094	0.129	0.250	0.161	0.136	0.110	0.085	0.000
HORIZ. OFFSET	-14.039	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.025

CHAINAGE 5100

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

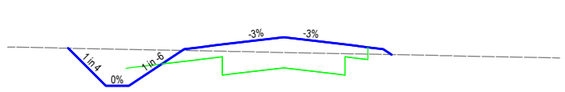
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 4500 TO CH 5300
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK029	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

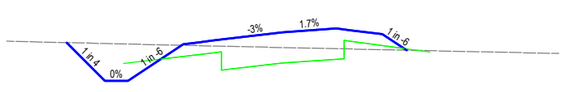


REF. STRING MC10
X = 726623.586
Y = 6326640.199

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.474	5.860	5.860	6.460	6.490	6.520	6.550	6.655	6.550	6.520	6.490	6.460	6.370
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 5600

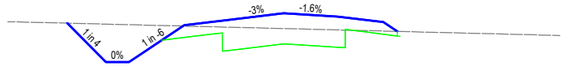


REF. STRING MC10
X = 726721.446
Y = 6326923.789

DATUM R.L. 3.9

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.857	5.232	5.232	5.832	5.862	5.892	5.922	6.027	6.087	6.057	6.027	5.997	5.734
LEVEL DIFF.	0.000	-0.610	-0.602	0.019	0.055	0.091	0.126	0.250	0.329	0.304	0.279	0.255	0.000
HORIZ. OFFSET	-14.100	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	8.079

CHAINAGE 5900

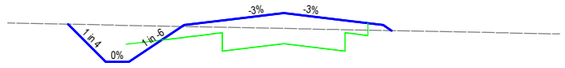


REF. STRING MC10
X = 726754.703
Y = 6327219.792

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.555	4.921	4.921	5.521	5.551	5.581	5.611	5.716	5.661	5.631	5.601	5.571	5.420
LEVEL DIFF.	0.000	-0.617	-0.608	0.014	0.051	0.087	0.123	0.250	0.217	0.193	0.169	0.146	0.000
HORIZ. OFFSET	-14.133	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.407

CHAINAGE 6200

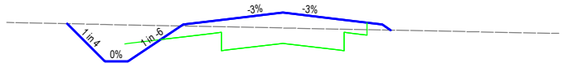


REF. STRING MC10
X = 726590.958
Y = 6326545.672

DATUM R.L. 4.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.673	6.058	6.058	6.658	6.688	6.718	6.748	6.853	6.748	6.718	6.688	6.658	6.568
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 5500

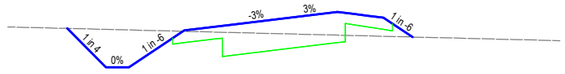


REF. STRING MC10
X = 726688.844
Y = 6326829.253

DATUM R.L. 4.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.077	5.462	5.462	6.062	6.092	6.122	6.152	6.257	6.152	6.122	6.092	6.062	5.972
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 5800

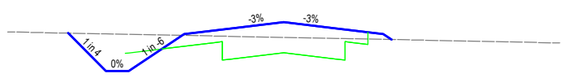


REF. STRING MC10
X = 726757.225
Y = 6327119.872

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.573	4.940	4.940	5.540	5.570	5.600	5.630	5.735	5.840	5.810	5.780	5.750	5.433
LEVEL DIFF.	0.000	-0.617	-0.608	0.015	0.051	0.087	0.123	0.250	0.377	0.353	0.329	0.305	0.000
HORIZ. OFFSET	-14.131	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	8.403

CHAINAGE 6100

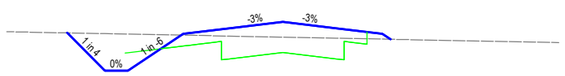


REF. STRING MC10
X = 726558.329
Y = 6326451.145

DATUM R.L. 5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.871	6.257	6.257	6.857	6.887	6.917	6.947	7.052	6.947	6.917	6.887	6.857	6.767
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 5400

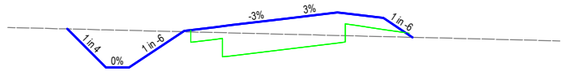


REF. STRING MC10
X = 726656.215
Y = 6326734.726

DATUM R.L. 4.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.275	5.661	5.661	6.261	6.291	6.321	6.351	6.456	6.351	6.321	6.291	6.261	6.171
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 5700



REF. STRING MC10
X = 726746.35
Y = 6327020.551

DATUM R.L. 3.7

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.673	5.042	5.042	5.642	5.672	5.702	5.732	5.837	5.942	5.912	5.882	5.852	5.536
LEVEL DIFF.	0.000	-0.615	-0.606	0.016	0.052	0.088	0.124	0.250	0.376	0.352	0.328	0.304	0.000
HORIZ. OFFSET	-14.123	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	8.396

CHAINAGE 6000

NOTES:

1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

Government of South Australia
Department for Infrastructure and Transport

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ROAD No. NCRN

MULLAQUANA ROAD-EIGHT MILE CREEK ROAD

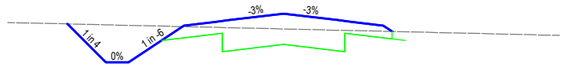
NORTHERN WATER

MC10; CH 5400 TO CH 6200

CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.
PDP	PDP	DIT	-	SK030	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

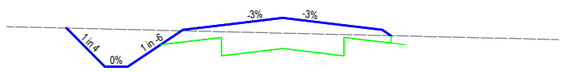


REF. STRING MC10
X = 726737.987
Y = 6327519.326

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.558	4.930	4.930	5.530	5.560	5.590	5.620	5.725	5.620	5.590	5.560	5.530	5.434
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 6500

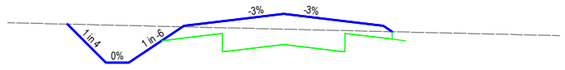


REF. STRING MC10
X = 726721.272
Y = 6327818.86

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.425	4.798	4.798	5.398	5.428	5.458	5.488	5.593	5.488	5.458	5.428	5.398	5.302
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 6800

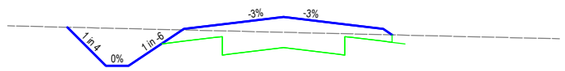


REF. STRING MC10
X = 726704.556
Y = 6328118.394

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.292	4.665	4.665	5.265	5.295	5.325	5.355	5.460	5.355	5.325	5.295	5.265	5.169
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 7100

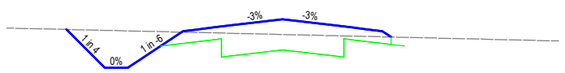


REF. STRING MC10
X = 726743.559
Y = 6327419.481

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.570	4.942	4.942	5.542	5.572	5.602	5.632	5.737	5.632	5.602	5.572	5.542	5.446
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.124	0.250	0.166	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.111	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.079

CHAINAGE 6400

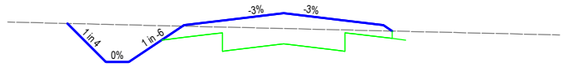


REF. STRING MC10
X = 726726.844
Y = 6327719.015

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.469	4.842	4.842	5.442	5.472	5.502	5.532	5.637	5.532	5.502	5.472	5.442	5.346
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 6700

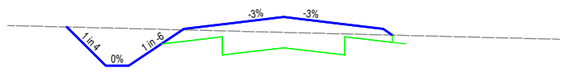


REF. STRING MC10
X = 726710.128
Y = 6328018.549

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.337	4.709	4.709	5.309	5.339	5.369	5.399	5.504	5.399	5.369	5.339	5.309	5.213
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 7000

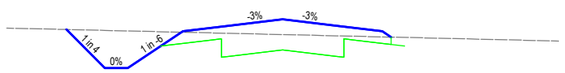


REF. STRING MC10
X = 726749.131
Y = 6327319.637

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.555	4.922	4.922	5.522	5.552	5.582	5.612	5.717	5.612	5.582	5.552	5.522	5.422
LEVEL DIFF.	0.000	-0.617	-0.608	0.014	0.051	0.087	0.123	0.250	0.167	0.143	0.119	0.096	0.000
HORIZ. OFFSET	-14.133	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.096

CHAINAGE 6300

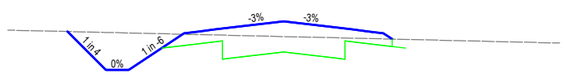


REF. STRING MC10
X = 726732.415
Y = 6327619.171

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.514	4.886	4.886	5.486	5.516	5.546	5.576	5.681	5.576	5.546	5.516	5.486	5.390
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 6600



REF. STRING MC10
X = 726715.7
Y = 6327918.704

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.381	4.754	4.754	5.354	5.384	5.414	5.444	5.549	5.444	5.414	5.384	5.354	5.257
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 6900

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

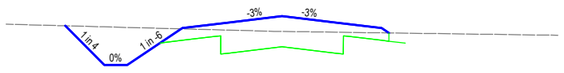
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 6300 TO CH 7100
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK031	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

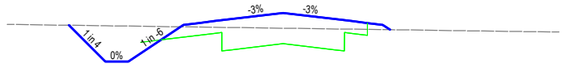


REF. STRING MC10
X = 726687.84
Y = 6328417.928

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.216	4.580	4.580	5.180	5.210	5.240	5.270	5.375	5.270	5.240	5.210	5.180	5.100
LEVEL DIFF.	0.000	-0.620	-0.610	0.014	0.050	0.087	0.124	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-14.147	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 7400

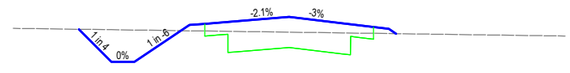


REF. STRING MC10
X = 726671.124
Y = 6328717.462

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.418	4.825	4.825	5.425	5.455	5.485	5.515	5.620	5.515	5.485	5.455	5.425	5.346
LEVEL DIFF.	0.000	-0.585	-0.580	0.032	0.066	0.099	0.133	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-13.974	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 7700

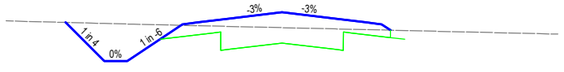


REF. STRING MC10
X = 726654.408
Y = 6329016.996

DATUM R.L. 3.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.663	5.131	5.131	5.731	5.762	5.772	5.793	5.865	5.760	5.730	5.700	5.670	5.591
LEVEL DIFF.	0.000	-0.524	-0.519	0.094	0.118	0.142	0.166	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-13.726	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 8000

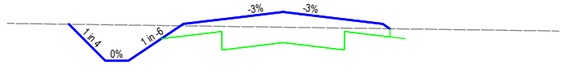


REF. STRING MC10
X = 726693.412
Y = 6328318.083

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.207	4.577	4.577	5.177	5.207	5.237	5.267	5.372	5.267	5.237	5.207	5.177	5.080
LEVEL DIFF.	0.000	-0.614	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.122	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 7300

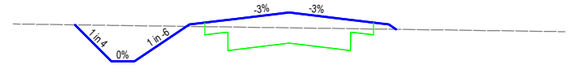


REF. STRING MC10
X = 726676.696
Y = 6328617.617

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.337	4.743	4.743	5.343	5.373	5.403	5.433	5.538	5.433	5.403	5.373	5.343	5.264
LEVEL DIFF.	0.000	-0.585	-0.580	0.032	0.066	0.099	0.133	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-13.974	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 7600

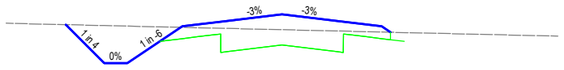


REF. STRING MC10
X = 726659.98
Y = 6328917.151

DATUM R.L. 3.7

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.582	4.988	4.988	5.588	5.618	5.648	5.678	5.783	5.678	5.648	5.618	5.588	5.509
LEVEL DIFF.	0.000	-0.585	-0.580	0.032	0.066	0.099	0.133	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-13.974	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 7900

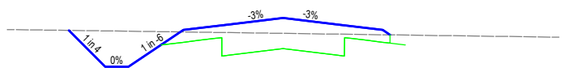


REF. STRING MC10
X = 726698.984
Y = 6328218.238

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.248	4.621	4.621	5.221	5.251	5.281	5.311	5.416	5.311	5.281	5.251	5.221	5.124
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.109	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 7200

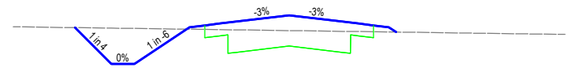


REF. STRING MC10
X = 726682.268
Y = 6328517.772

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.255	4.661	4.661	5.261	5.291	5.321	5.351	5.456	5.351	5.321	5.291	5.261	5.182
LEVEL DIFF.	0.000	-0.585	-0.580	0.032	0.066	0.099	0.133	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-13.974	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 7500



REF. STRING MC10
X = 726665.552
Y = 6328817.306

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.500	4.907	4.907	5.507	5.537	5.567	5.597	5.702	5.597	5.567	5.537	5.507	5.427
LEVEL DIFF.	0.000	-0.585	-0.580	0.032	0.066	0.099	0.133	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-13.974	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.975

CHAINAGE 7800

NOTES:

1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H; 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

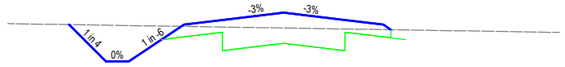
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 7200 TO CH 8000
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK032	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

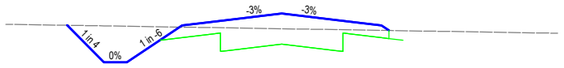


REF. STRING MC10
X = 726681.571
Y = 6329314.251

DATUM R.L. 3.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.708	5.107	5.107	5.707	5.737	5.767	5.797	5.902	5.797	5.767	5.737	5.707	5.624
LEVEL DIFF.	0.000	-0.591	-0.585	0.029	0.063	0.097	0.131	0.250	0.159	0.133	0.107	0.081	0.000
HORIZ. OFFSET	-14.002	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.997

CHAINAGE 8300

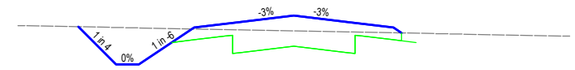


REF. STRING MC10
X = 726744.76
Y = 6329607.52

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.489	4.887	4.887	5.487	5.517	5.547	5.577	5.682	5.577	5.547	5.517	5.487	5.404
LEVEL DIFF.	0.000	-0.592	-0.586	0.029	0.063	0.097	0.131	0.250	0.159	0.133	0.107	0.081	0.000
HORIZ. OFFSET	-14.007	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.000

CHAINAGE 8600

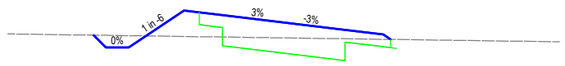


REF. STRING MC10
X = 726808.427
Y = 6329900.687

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.243	4.630	4.630	5.230	5.260	5.290	5.320	5.425	5.320	5.290	5.260	5.230	5.141
LEVEL DIFF.	0.000	-0.601	-0.594	0.024	0.059	0.093	0.128	0.250	0.162	0.137	0.111	0.086	0.000
HORIZ. OFFSET	-14.050	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.033

CHAINAGE 8900

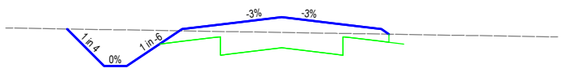


REF. STRING MC10
X = 726661.35
Y = 6329216.322

DATUM R.L. 4.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.759	5.560	5.560	6.160	6.130	6.100	6.070	5.965	5.860	5.830	5.800	5.770	5.690
LEVEL DIFF.	0.000	-0.196	-0.191	0.422	0.395	0.369	0.343	0.250	0.157	0.131	0.105	0.078	0.000
HORIZ. OFFSET	-12.397	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.979

CHAINAGE 8200

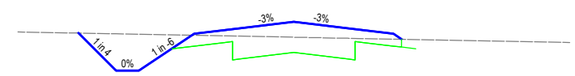


REF. STRING MC10
X = 726723.537
Y = 6329509.798

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.530	4.928	4.928	5.528	5.558	5.588	5.618	5.723	5.618	5.588	5.558	5.528	5.445
LEVEL DIFF.	0.000	-0.592	-0.586	0.029	0.063	0.097	0.131	0.250	0.159	0.133	0.107	0.081	0.000
HORIZ. OFFSET	-14.007	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.000

CHAINAGE 8500

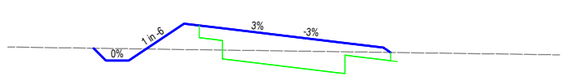


REF. STRING MC10
X = 726787.205
Y = 6329802.964

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.269	4.656	4.656	5.256	5.286	5.316	5.346	5.451	5.346	5.316	5.286	5.256	5.167
LEVEL DIFF.	0.000	-0.601	-0.594	0.024	0.059	0.093	0.128	0.250	0.162	0.137	0.111	0.086	0.000
HORIZ. OFFSET	-14.050	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.033

CHAINAGE 8800

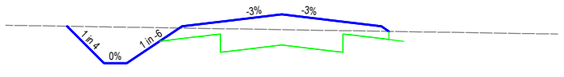


REF. STRING MC10
X = 726651.342
Y = 6329116.909

DATUM R.L. 4.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.732	5.533	5.533	6.133	6.103	6.073	6.043	5.938	5.833	5.803	5.773	5.743	5.663
LEVEL DIFF.	0.000	-0.196	-0.191	0.422	0.396	0.369	0.343	0.250	0.157	0.131	0.104	0.078	0.000
HORIZ. OFFSET	-12.395	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.978

CHAINAGE 8100

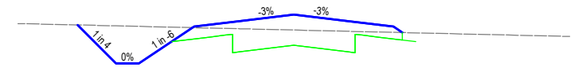


REF. STRING MC10
X = 726702.327
Y = 6329412.073

DATUM R.L. 3.7

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.590	4.990	4.990	5.590	5.620	5.650	5.680	5.785	5.680	5.650	5.620	5.590	5.507
LEVEL DIFF.	0.000	-0.591	-0.585	0.029	0.063	0.097	0.131	0.250	0.159	0.133	0.107	0.081	0.000
HORIZ. OFFSET	-14.002	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.996

CHAINAGE 8400



REF. STRING MC10
X = 726765.982
Y = 6329705.242

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.412	4.784	4.784	5.384	5.414	5.444	5.474	5.579	5.474	5.444	5.414	5.384	5.288
LEVEL DIFF.	0.000	-0.613	-0.604	0.017	0.053	0.089	0.125	0.250	0.165	0.141	0.117	0.093	0.000
HORIZ. OFFSET	-14.110	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.078

CHAINAGE 8700

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

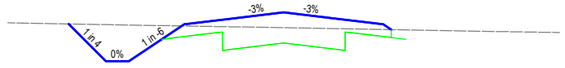
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 8100 TO CH 8900
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK033	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

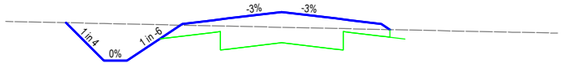


REF. STRING MC10
X = 726866.788
Y = 6330194.887

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.255	4.648	4.648	5.248	5.278	5.308	5.338	5.443	5.338	5.308	5.278	5.248	5.162
LEVEL DIFF.	0.000	-0.596	-0.590	0.026	0.061	0.095	0.130	0.250	0.160	0.135	0.109	0.084	0.000
HORIZ. OFFSET	-14.028	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.016

CHAINAGE 9200

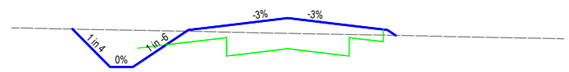


REF. STRING MC10
X = 726913.44
Y = 6330491.237

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.316	4.696	4.696	5.296	5.326	5.356	5.386	5.491	5.386	5.356	5.326	5.296	5.204
LEVEL DIFF.	0.000	-0.607	-0.599	0.020	0.056	0.091	0.126	0.250	0.164	0.139	0.114	0.090	0.000
HORIZ. OFFSET	-14.079	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.055

CHAINAGE 9500

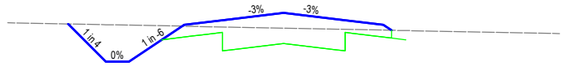


REF. STRING MC10
X = 726960.093
Y = 6330787.587

DATUM R.L. 3.7

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.621	5.006	5.006	5.606	5.636	5.666	5.696	5.801	5.696	5.666	5.636	5.606	5.516
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 9800

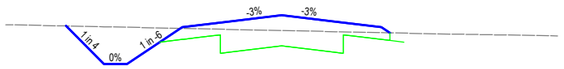


REF. STRING MC10
X = 726850.023
Y = 6330096.307

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.245	4.631	4.631	5.231	5.261	5.291	5.321	5.426	5.321	5.291	5.261	5.231	5.142
LEVEL DIFF.	0.000	-0.602	-0.594	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.055	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.037

CHAINAGE 9100

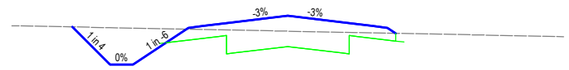


REF. STRING MC10
X = 726897.89
Y = 6330392.454

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.278	4.658	4.658	5.258	5.288	5.318	5.348	5.453	5.348	5.318	5.288	5.258	5.166
LEVEL DIFF.	0.000	-0.607	-0.599	0.020	0.056	0.091	0.126	0.250	0.164	0.139	0.114	0.090	0.000
HORIZ. OFFSET	-14.079	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.055

CHAINAGE 9400

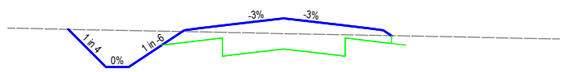


REF. STRING MC10
X = 726944.542
Y = 6330688.804

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.515	4.901	4.901	5.501	5.531	5.561	5.591	5.696	5.591	5.561	5.531	5.501	5.411
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 9700

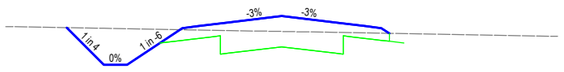


REF. STRING MC10
X = 726829.649
Y = 6329998.409

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.229	4.615	4.615	5.215	5.245	5.275	5.305	5.410	5.305	5.275	5.245	5.215	5.125
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.056	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.037

CHAINAGE 9000

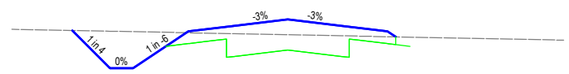


REF. STRING MC10
X = 726882.339
Y = 6330293.67

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.256	4.649	4.649	5.249	5.279	5.309	5.339	5.444	5.339	5.309	5.279	5.249	5.163
LEVEL DIFF.	0.000	-0.596	-0.590	0.026	0.061	0.095	0.130	0.250	0.160	0.135	0.109	0.084	0.000
HORIZ. OFFSET	-14.028	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.016

CHAINAGE 9300



REF. STRING MC10
X = 726928.991
Y = 6330590.02

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.410	4.796	4.796	5.396	5.426	5.456	5.486	5.591	5.486	5.456	5.426	5.396	5.306
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 9600

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H; 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

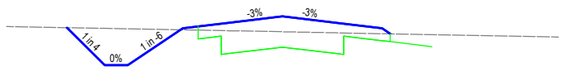
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 9000 TO CH 9800
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No..
PDP	PDP	DIT	-	SK034	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME 4 - CROSS SECTIONS.DWG

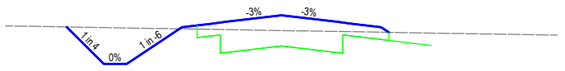


REF. STRING MC10
X = 727004.609
Y = 6331084.262

DATUM R.L. 4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.900	5.288	5.288	5.888	5.918	5.948	5.978	6.083	5.978	5.948	5.918	5.888	5.800
LEVEL DIFF.	0.000	-0.600	-0.593	0.024	0.059	0.094	0.128	0.250	0.162	0.136	0.111	0.086	0.000
HORIZ. OFFSET	-14.047	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.030

CHAINAGE 10100

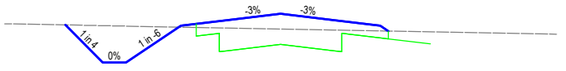


REF. STRING MC10
X = 727047.606
Y = 6331381.165

DATUM R.L. 4.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.297	5.694	5.694	6.294	6.324	6.354	6.384	6.489	6.384	6.354	6.324	6.294	6.210
LEVEL DIFF.	0.000	-0.593	-0.587	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET	-14.014	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.005

CHAINAGE 10400

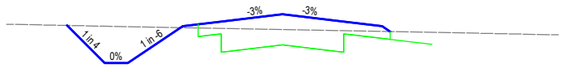


REF. STRING MC10
X = 727090.603
Y = 6331678.068

DATUM R.L. 4.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.720	6.108	6.108	6.708	6.738	6.768	6.798	6.903	6.798	6.768	6.738	6.708	6.620
LEVEL DIFF.	0.000	-0.600	-0.593	0.024	0.059	0.094	0.128	0.250	0.162	0.136	0.111	0.086	0.000
HORIZ. OFFSET	-14.046	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.029

CHAINAGE 10700

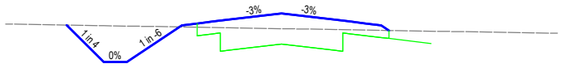


REF. STRING MC10
X = 726990.277
Y = 6330985.295

DATUM R.L. 3.9

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.813	5.202	5.202	5.802	5.832	5.862	5.892	5.997	5.892	5.862	5.832	5.802	5.713
LEVEL DIFF.	0.000	-0.600	-0.593	0.024	0.059	0.094	0.128	0.250	0.162	0.136	0.111	0.086	0.000
HORIZ. OFFSET	-14.047	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.030

CHAINAGE 10000

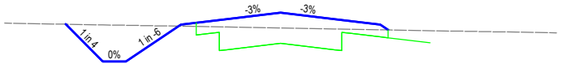


REF. STRING MC10
X = 727033.274
Y = 6331282.197

DATUM R.L. 4.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.144	5.541	5.541	6.141	6.171	6.201	6.231	6.336	6.231	6.201	6.171	6.141	6.056
LEVEL DIFF.	0.000	-0.593	-0.587	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET	-14.014	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.005

CHAINAGE 10300

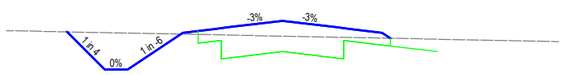


REF. STRING MC10
X = 727076.27
Y = 6331579.1

DATUM R.L. 4.7

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.599	5.992	5.992	6.592	6.622	6.652	6.682	6.787	6.682	6.652	6.622	6.592	6.506
LEVEL DIFF.	0.000	-0.596	-0.589	0.026	0.061	0.095	0.130	0.250	0.160	0.135	0.109	0.084	0.000
HORIZ. OFFSET	-14.027	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.015

CHAINAGE 10600

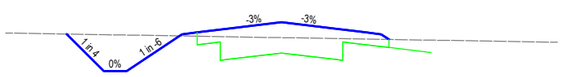


REF. STRING MC10
X = 726975.576
Y = 6330886.381

DATUM R.L. 3.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.726	5.112	5.112	5.712	5.742	5.772	5.802	5.907	5.802	5.772	5.742	5.712	5.622
LEVEL DIFF.	0.000	-0.602	-0.595	0.023	0.058	0.093	0.128	0.250	0.162	0.137	0.112	0.087	0.000
HORIZ. OFFSET	-14.058	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.039

CHAINAGE 9900

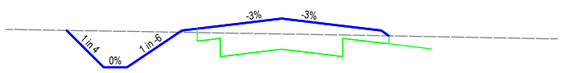


REF. STRING MC10
X = 727018.941
Y = 6331183.23

DATUM R.L. 4.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.991	5.387	5.387	5.987	6.017	6.047	6.077	6.182	6.077	6.047	6.017	5.987	5.903
LEVEL DIFF.	0.000	-0.593	-0.587	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000
HORIZ. OFFSET	-14.014	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.005

CHAINAGE 10200



REF. STRING MC10
X = 727061.938
Y = 6331480.133

DATUM R.L. 4.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.451	5.847	5.847	6.447	6.477	6.507	6.537	6.642	6.537	6.507	6.477	6.447	6.361
LEVEL DIFF.	0.000	-0.594	-0.588	0.027	0.062	0.096	0.130	0.250	0.160	0.135	0.109	0.084	0.000
HORIZ. OFFSET	-14.016	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.015

CHAINAGE 10500

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: H 4 0 2 4 6 8 — V 1 0 0.5 1 1.5 2

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

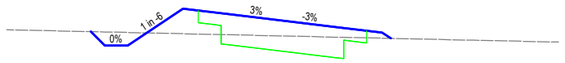
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 9900 TO CH 10700
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK035	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

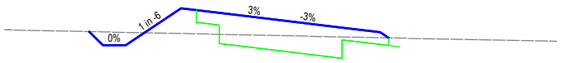


REF. STRING MC10
X = 727133.872
Y = 6331974.929

DATUM R.L. 5.2

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.743		6.518		6.518		7.118		7.088		7.058		7.028		6.923		6.818		6.788		6.758		6.728		6.633	
LEVEL DIFF.	0.000		-0.220		-0.212		0.409		0.384		0.360		0.335		0.250		0.165		0.140		0.116		0.091		0.000	
HORIZ. OFFSET	-12.501		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.068	

CHAINAGE 11000

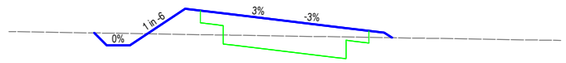


REF. STRING MC10
X = 727227.125
Y = 6332258.885

DATUM R.L. 5.2

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.710		6.490		6.490		7.090		7.060		7.030		7.000		6.895		6.790		6.760		6.730		6.700		6.608	
LEVEL DIFF.	0.000		-0.216		-0.208		0.411		0.386		0.361		0.337		0.250		0.163		0.139		0.114		0.089		0.000	
HORIZ. OFFSET	-12.482		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.052	

CHAINAGE 11300

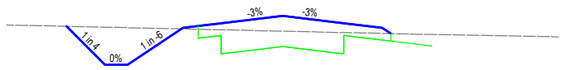


REF. STRING MC10
X = 727400.127
Y = 6332502.6

DATUM R.L. 4.9

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.405		6.200		6.200		6.800		6.770		6.740		6.710		6.605		6.500		6.470		6.440		6.410		6.327	
LEVEL DIFF.	0.000		-0.201		-0.195		0.419		0.393		0.367		0.341		0.250		0.159		0.133		0.107		0.081		0.000	
HORIZ. OFFSET	-12.419		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		6.998	

CHAINAGE 11600

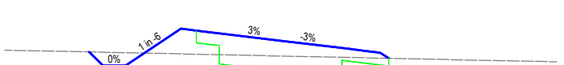


REF. STRING MC10
X = 727119.267
Y = 6331876.003

DATUM R.L. 4.8

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.725		6.101		6.101		6.701		6.731		6.761		6.791		6.896		6.791		6.761		6.731		6.701		6.607	
LEVEL DIFF.	0.000		-0.610		-0.602		0.019		0.054		0.090		0.125		0.250		0.165		0.140		0.116		0.091		0.000	
HORIZ. OFFSET	-14.096		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.068	

CHAINAGE 10900

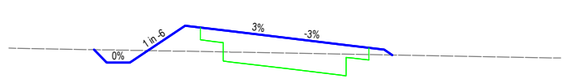


REF. STRING MC10
X = 727186.612
Y = 6332167.505

DATUM R.L. 5.3

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.772		6.551		6.551		7.151		7.121		7.091		7.061		6.956		6.851		6.821		6.791		6.761		6.668	
LEVEL DIFF.	0.000		-0.217		-0.209		0.410		0.386		0.361		0.336		0.250		0.164		0.139		0.114		0.090		0.000	
HORIZ. OFFSET	-12.486		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.055	

CHAINAGE 11200



REF. STRING MC10
X = 727334.419
Y = 6332427.274

DATUM R.L. 5

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.523		6.317		6.317		6.917		6.887		6.857		6.827		6.722		6.617		6.587		6.557		6.527		6.443	
LEVEL DIFF.	0.000		-0.203		-0.197		0.418		0.392		0.366		0.341		0.250		0.159		0.134		0.108		0.082		0.000	
HORIZ. OFFSET	-12.425		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.003	

CHAINAGE 11500

REF. STRING MC10
X = 727104.935
Y = 6331777.035

DATUM R.L. 4.8

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.698		6.074		6.074		6.674		6.704		6.734		6.764		6.869		6.764		6.734		6.704		6.674		6.579	
LEVEL DIFF.	0.000		-0.610		-0.602		0.019		0.054		0.090		0.125		0.250		0.165		0.140		0.116		0.091		0.000	
HORIZ. OFFSET	-14.096		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.068	

CHAINAGE 10800

REF. STRING MC10
X = 727155.424
Y = 6332072.536

DATUM R.L. 5.3

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.780		6.559		6.559		7.159		7.129		7.099		7.069		6.964		6.859		6.829		6.799		6.769		6.676	
LEVEL DIFF.	0.000		-0.217		-0.209		0.410		0.386		0.361		0.336		0.250		0.164		0.139		0.114		0.090		0.000	
HORIZ. OFFSET	-12.486		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.055	

CHAINAGE 11100

REF. STRING MC10
X = 727276.559
Y = 6332345.764

DATUM R.L. 5.1

DESIGN LABEL		IA10		IE10		ID10		EH10		ES10		CE10		LE10		MC10		LE1J		CE1J		ES1J		EH1J		IA10	
DESIGN LEVELS	6.618		6.407		6.407		7.007		6.977		6.947		6.917		6.812		6.707		6.677		6.647		6.617		6.530	
LEVEL DIFF.	0.000		-0.207		-0.200		0.416		0.390		0.365		0.339		0.250		0.161		0.135		0.110		0.084		0.000	
HORIZ. OFFSET	-12.443		-11.600		-10.100		-6.500		-5.500		-4.500		-3.500		0.000		3.500		4.500		5.500		6.500		7.019	

CHAINAGE 11400

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: H 4 0 2 4 6 8 — V 1 0 0.5 1 1.5 2

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

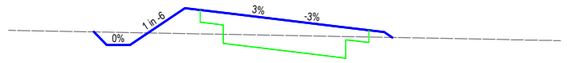
Government of South Australia
Department for Infrastructure and Transport

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ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 10800 TO CH 11600
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK036	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

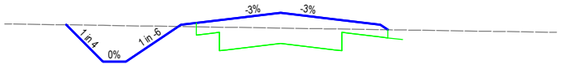


REF. STRING MC10
X = 727637.426
Y = 6332684.305

DATUM R.L. 4.5

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.011	5.797	5.797	6.397	6.367	6.337	6.307	6.202	6.097	6.067	6.037	6.007	5.919	
LEVEL DIFF.	0.000	-0.209	-0.202	0.415	0.389	0.364	0.339	0.250	0.161	0.136	0.111	0.085	0.000	
HORIZ. OFFSET	-12.453	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.028	

CHAINAGE 11900

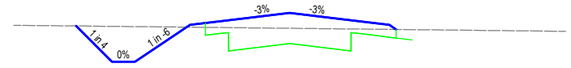


REF. STRING MC10
X = 727913.358
Y = 6332801.401

DATUM R.L. 3.4

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.315	4.716	4.716	5.316	5.346	5.376	5.406	5.511	5.406	5.376	5.346	5.316	5.225	
LEVEL DIFF.	0.000	-0.599	-0.584	0.030	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.080	0.000	
HORIZ. OFFSET	-13.995	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.991	

CHAINAGE 12200

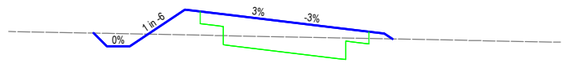


REF. STRING MC10
X = 728192.736
Y = 6332910.709

DATUM R.L. 3.1

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.935	4.352	4.352	4.952	4.982	5.012	5.042	5.147	5.042	5.012	4.982	4.952	4.878	
LEVEL DIFF.	0.000	-0.577	-0.573	0.037	0.070	0.103	0.135	0.250	0.155	0.127	0.100	0.073	0.000	
HORIZ. OFFSET	-13.933	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.944	

CHAINAGE 12500

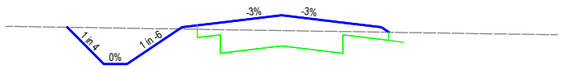


REF. STRING MC10
X = 727552.391
Y = 6332631.761

DATUM R.L. 4.7

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.184	5.969	5.969	6.569	6.539	6.509	6.479	6.374	6.269	6.239	6.209	6.179	6.090	
LEVEL DIFF.	0.000	-0.211	-0.204	0.413	0.388	0.363	0.338	0.250	0.162	0.137	0.112	0.087	0.000	
HORIZ. OFFSET	-12.462	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.035	

CHAINAGE 11800

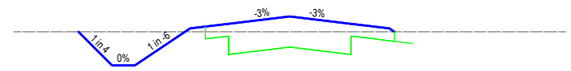


REF. STRING MC10
X = 727820.232
Y = 6332764.965

DATUM R.L. 3.6

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.508	4.909	4.909	5.509	5.539	5.569	5.599	5.704	5.599	5.569	5.539	5.509	5.427	
LEVEL DIFF.	0.000	-0.599	-0.584	0.030	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.080	0.000	
HORIZ. OFFSET	-13.995	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.991	

CHAINAGE 12100

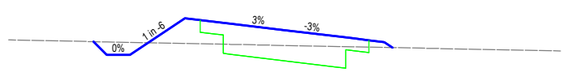


REF. STRING MC10
X = 728099.61
Y = 6332874.273

DATUM R.L. 3.2

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.000	4.455	4.455	5.055	5.085	5.115	5.145	5.250	5.145	5.115	5.085	5.055	5.000	
LEVEL DIFF.	0.000	-0.545	-0.545	0.055	0.085	0.115	0.145	0.250	0.145	0.115	0.085	0.055	0.000	
HORIZ. OFFSET	-13.780	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.830	

CHAINAGE 12400

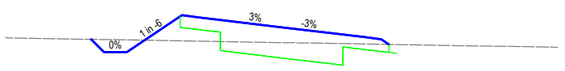


REF. STRING MC10
X = 727473.028
Y = 6332570.99

DATUM R.L. 4.8

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.309	6.092	6.092	6.692	6.662	6.632	6.602	6.497	6.392	6.362	6.332	6.302	6.212	
LEVEL DIFF.	0.000	-0.213	-0.205	0.413	0.388	0.363	0.338	0.250	0.162	0.137	0.112	0.087	0.000	
HORIZ. OFFSET	-12.468	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.040	

CHAINAGE 11700

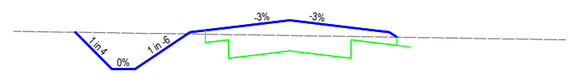


REF. STRING MC10
X = 727727.281
Y = 6332728.097

DATUM R.L. 4.2

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.747	5.539	5.539	6.139	6.109	6.079	6.049	5.944	5.839	5.809	5.779	5.749	5.684	
LEVEL DIFF.	0.000	-0.205	-0.198	0.417	0.391	0.366	0.340	0.250	0.160	0.134	0.109	0.083	0.000	
HORIZ. OFFSET	-12.433	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.010	

CHAINAGE 12000



REF. STRING MC10
X = 728006.484
Y = 6332837.837

DATUM R.L. 3.2

DESIGN LABEL		IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.123	4.524	4.524	5.124	5.154	5.184	5.214	5.319	5.214	5.184	5.154	5.124	5.042	
LEVEL DIFF.	0.000	-0.599	-0.584	0.030	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.080	0.000	
HORIZ. OFFSET	-13.995	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.991	

CHAINAGE 12300

NOTES:

1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

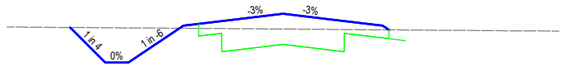
Government of South Australia
Department for Infrastructure and Transport

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ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 11700 TO CH 12500
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK037	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

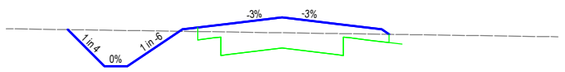


REF. STRING MC10
X = 728472.113
Y = 6333020.017

DATUM R.L. 3.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.958	4.387	4.387	4.987	5.017	5.047	5.077	5.182	5.077	5.047	5.017	4.987	4.919
LEVEL DIFF.	0.000	-0.567	-0.564	0.043	0.075	0.107	0.138	0.250	0.152	0.123	0.095	0.067	0.000
HORIZ. OFFSET	-13.885	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.908

CHAINAGE 12800

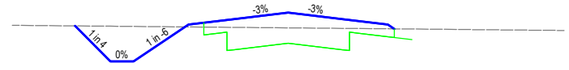


REF. STRING MC10
X = 728751.491
Y = 6333129.325

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.451	4.855	4.855	5.455	5.485	5.515	5.545	5.650	5.545	5.515	5.485	5.455	5.375
LEVEL DIFF.	0.000	-0.587	-0.582	0.031	0.065	0.099	0.132	0.250	0.158	0.131	0.105	0.079	0.000
HORIZ. OFFSET	-13.984	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.983

CHAINAGE 13100

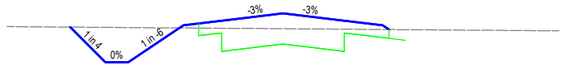


REF. STRING MC10
X = 729030.868
Y = 6333238.633

DATUM R.L. 4.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.081	5.503	5.503	6.103	6.133	6.163	6.193	6.298	6.193	6.163	6.133	6.103	6.032
LEVEL DIFF.	0.000	-0.572	-0.569	0.040	0.072	0.104	0.137	0.250	0.153	0.126	0.098	0.070	0.000
HORIZ. OFFSET	-13.910	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.927

CHAINAGE 13400

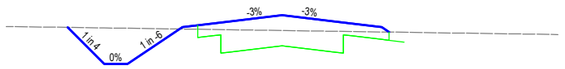


REF. STRING MC10
X = 728378.987
Y = 6332983.581

DATUM R.L. 3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.866	4.295	4.295	4.895	4.925	4.955	4.985	5.090	4.985	4.955	4.925	4.895	4.827
LEVEL DIFF.	0.000	-0.567	-0.564	0.043	0.075	0.107	0.138	0.250	0.152	0.123	0.095	0.067	0.000
HORIZ. OFFSET	-13.885	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.908

CHAINAGE 12700

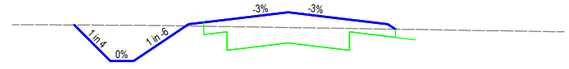


REF. STRING MC10
X = 728658.365
Y = 6333092.889

DATUM R.L. 3.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.274	4.678	4.678	5.278	5.308	5.338	5.368	5.473	5.368	5.338	5.308	5.278	5.197
LEVEL DIFF.	0.000	-0.587	-0.582	0.031	0.065	0.099	0.132	0.250	0.158	0.131	0.105	0.079	0.000
HORIZ. OFFSET	-13.984	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.983

CHAINAGE 13000

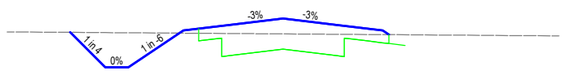


REF. STRING MC10
X = 728937.742
Y = 6333202.197

DATUM R.L. 4.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.133	5.545	5.545	6.145	6.175	6.205	6.235	6.340	6.235	6.205	6.175	6.145	6.064
LEVEL DIFF.	0.000	-0.584	-0.582	0.030	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.080	0.000
HORIZ. OFFSET	-13.949	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.991

CHAINAGE 13300

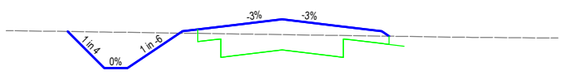


REF. STRING MC10
X = 728285.861
Y = 6332947.145

DATUM R.L. 2.9

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.782	4.212	4.212	4.812	4.842	4.872	4.902	5.007	4.902	4.872	4.842	4.812	4.745
LEVEL DIFF.	0.000	-0.566	-0.563	0.043	0.075	0.107	0.139	0.250	0.151	0.123	0.095	0.067	0.000
HORIZ. OFFSET	-13.881	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.965

CHAINAGE 12600

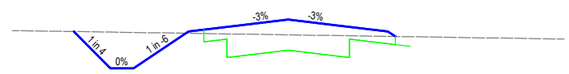


REF. STRING MC10
X = 728565.239
Y = 6333056.453

DATUM R.L. 3.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.096	4.500	4.500	5.100	5.130	5.160	5.190	5.295	5.190	5.160	5.130	5.100	5.020
LEVEL DIFF.	0.000	-0.587	-0.582	0.031	0.065	0.099	0.132	0.250	0.158	0.131	0.105	0.079	0.000
HORIZ. OFFSET	-13.984	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.983

CHAINAGE 12900



REF. STRING MC10
X = 728844.616
Y = 6333165.761

DATUM R.L. 3.9

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.796	5.197	5.197	5.797	5.827	5.857	5.887	5.992	5.887	5.857	5.827	5.797	5.715
LEVEL DIFF.	0.000	-0.599	-0.584	0.030	0.064	0.098	0.132	0.250	0.158	0.132	0.106	0.080	0.000
HORIZ. OFFSET	-13.995	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.991

CHAINAGE 13200

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

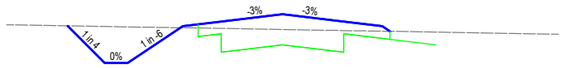
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 12600 TO CH 13400
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK038	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

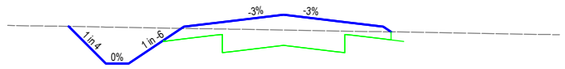


REF. STRING MC10
X = 729310.246
Y = 6333347.941

DATUM R.L. 3.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	5.429	4.824	4.824	5.424	5.454	5.484	5.514	5.619	5.514	5.484	5.454	5.424	5.339	
LEVEL DIFF.	0.000	-0.595	-0.588	0.027	0.061	0.096	0.130	0.250	0.160	0.134	0.109	0.083	0.000	
HORIZ. OFFSET	-14.021	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.011	

CHAINAGE 13700

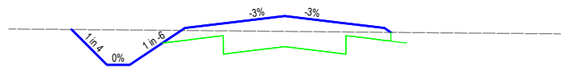


REF. STRING MC10
X = 729592.132
Y = 6333450.553

DATUM R.L. 2.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	4.678	4.074	4.074	4.674	4.704	4.734	4.764	4.869	4.764	4.734	4.704	4.674	4.590	
LEVEL DIFF.	0.000	-0.594	-0.588	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000	
HORIZ. OFFSET	-14.017	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.007	

CHAINAGE 14000

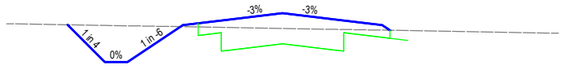


REF. STRING MC10
X = 729874.974
Y = 6333550.555

DATUM R.L. 2.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	4.247	3.671	3.671	4.271	4.301	4.331	4.361	4.466	4.361	4.331	4.301	4.271	4.201	
LEVEL DIFF.	0.000	-0.571	-0.568	0.041	0.073	0.105	0.137	0.250	0.153	0.125	0.097	0.069	0.000	
HORIZ. OFFSET	-13.904	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.923	

CHAINAGE 14300

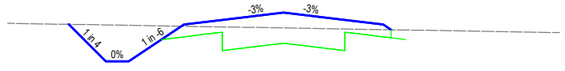


REF. STRING MC10
X = 729217.12
Y = 6333311.505

DATUM R.L. 3.8

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	5.669	5.064	5.064	5.664	5.694	5.724	5.754	5.859	5.754	5.724	5.694	5.664	5.579	
LEVEL DIFF.	0.000	-0.595	-0.588	0.027	0.061	0.096	0.130	0.250	0.160	0.134	0.109	0.083	0.000	
HORIZ. OFFSET	-14.021	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.011	

CHAINAGE 13600

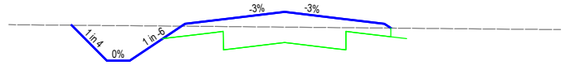


REF. STRING MC10
X = 729497.851
Y = 6333417.219

DATUM R.L. 3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	4.932	4.328	4.328	4.928	4.958	4.988	5.018	5.123	5.018	4.988	4.958	4.928	4.843	
LEVEL DIFF.	0.000	-0.594	-0.588	0.028	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.082	0.000	
HORIZ. OFFSET	-14.017	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.007	

CHAINAGE 13900

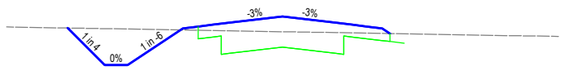


REF. STRING MC10
X = 729780.693
Y = 6333517.221

DATUM R.L. 2.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	4.296	3.720	3.720	4.320	4.350	4.380	4.410	4.515	4.410	4.380	4.350	4.320	4.250	
LEVEL DIFF.	0.000	-0.571	-0.568	0.041	0.073	0.105	0.137	0.250	0.153	0.125	0.097	0.069	0.000	
HORIZ. OFFSET	-13.904	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.923	

CHAINAGE 14200

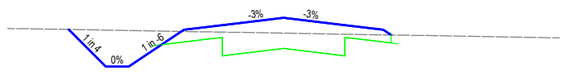


REF. STRING MC10
X = 729123.994
Y = 6333275.069

DATUM R.L. 4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	5.909	5.304	5.304	5.904	5.934	5.964	5.994	6.099	5.994	5.964	5.934	5.904	5.818	
LEVEL DIFF.	0.000	-0.595	-0.588	0.027	0.061	0.096	0.130	0.250	0.160	0.134	0.109	0.083	0.000	
HORIZ. OFFSET	-14.021	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.011	

CHAINAGE 13500

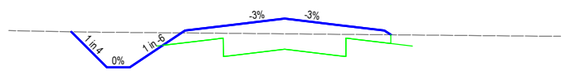


REF. STRING MC10
X = 729403.721
Y = 6333383.466

DATUM R.L. 3.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	5.185	4.580	4.580	5.180	5.210	5.240	5.270	5.375	5.270	5.240	5.210	5.180	5.095	
LEVEL DIFF.	0.000	-0.594	-0.588	0.027	0.062	0.096	0.130	0.250	0.160	0.134	0.108	0.083	0.000	
HORIZ. OFFSET	-14.018	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.009	

CHAINAGE 13800



REF. STRING MC10
X = 729686.412
Y = 6333483.887

DATUM R.L. 2.5

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10	
DESIGN LEVELS	4.348	3.769	3.769	4.369	4.399	4.429	4.459	4.564	4.459	4.429	4.399	4.369	4.298	
LEVEL DIFF.	0.000	-0.571	-0.568	0.041	0.073	0.105	0.137	0.250	0.153	0.125	0.097	0.069	0.000	
HORIZ. OFFSET	-13.919	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.923	

CHAINAGE 14100

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

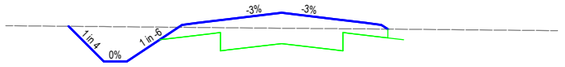
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 13500 TO CH 14300
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK039	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

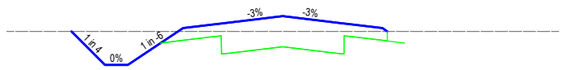


REF. STRING MC10
X = 730157.816
Y = 6333650.558

DATUM R.L. 2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	3.900	3.324	3.324	3.924	3.964	3.964	4.014	4.119	4.014	3.964	3.964	3.924	3.864
LEVEL DIFF.	0.000	-0.571	-0.568	0.041	0.073	0.105	0.137	0.250	0.153	0.125	0.097	0.069	0.000
HORIZ. OFFSET	-13.904	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.923

CHAINAGE 14600

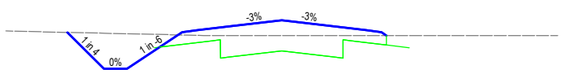


REF. STRING MC10
X = 730440.657
Y = 6333750.56

DATUM R.L. 2.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.000	3.455	3.455	4.055	4.085	4.115	4.145	4.250	4.145	4.115	4.085	4.055	4.000
LEVEL DIFF.	0.000	-0.545	-0.545	0.055	0.085	0.115	0.145	0.250	0.145	0.115	0.085	0.055	0.000
HORIZ. OFFSET	-13.780	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.830

CHAINAGE 14900

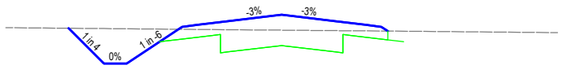


REF. STRING MC10
X = 730723.499
Y = 6333850.563

DATUM R.L. 2.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.050	3.455	3.455	4.055	4.085	4.115	4.145	4.250	4.145	4.115	4.085	4.055	4.000
LEVEL DIFF.	0.000	-0.582	-0.573	0.047	0.083	0.115	0.145	0.250	0.145	0.115	0.085	0.055	0.000
HORIZ. OFFSET	-13.981	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.830

CHAINAGE 15200

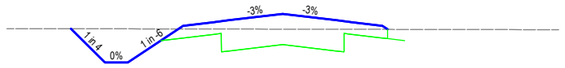


REF. STRING MC10
X = 730063.535
Y = 6333617.224

DATUM R.L. 2.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.037	3.461	3.461	4.061	4.091	4.121	4.151	4.256	4.151	4.121	4.091	4.061	3.991
LEVEL DIFF.	0.000	-0.571	-0.568	0.041	0.073	0.105	0.137	0.250	0.153	0.125	0.097	0.069	0.000
HORIZ. OFFSET	-13.904	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.923

CHAINAGE 14500

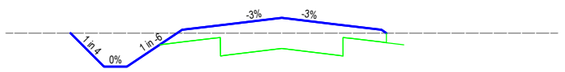


REF. STRING MC10
X = 730346.377
Y = 6333717.226

DATUM R.L. 2.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	3.915	3.363	3.363	3.963	3.993	4.023	4.053	4.158	4.053	4.023	3.993	3.963	3.905
LEVEL DIFF.	0.000	-0.551	-0.550	0.052	0.082	0.113	0.143	0.250	0.147	0.117	0.088	0.058	0.000
HORIZ. OFFSET	-13.808	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.851

CHAINAGE 14800

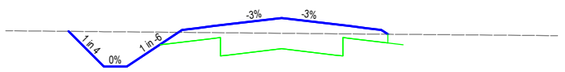


REF. STRING MC10
X = 730629.219
Y = 6333817.229

DATUM R.L. 2.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.000	3.455	3.455	4.055	4.085	4.115	4.145	4.250	4.145	4.115	4.085	4.055	4.000
LEVEL DIFF.	0.000	-0.545	-0.545	0.055	0.085	0.115	0.145	0.250	0.145	0.115	0.085	0.055	0.000
HORIZ. OFFSET	-13.780	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.830

CHAINAGE 15100

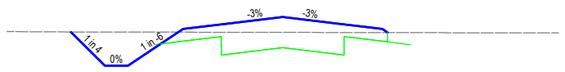


REF. STRING MC10
X = 729969.254
Y = 6333583.89

DATUM R.L. 2.3

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.174	3.598	3.598	4.198	4.228	4.258	4.288	4.393	4.288	4.258	4.228	4.198	4.128
LEVEL DIFF.	0.000	-0.571	-0.568	0.041	0.073	0.105	0.137	0.250	0.153	0.125	0.097	0.069	0.000
HORIZ. OFFSET	-13.904	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.923

CHAINAGE 14400

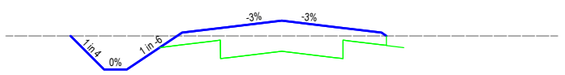


REF. STRING MC10
X = 730252.096
Y = 6333683.892

DATUM R.L. 1.9

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	3.765	3.213	3.213	3.813	3.843	3.873	3.903	4.008	3.903	3.873	3.843	3.813	3.754
LEVEL DIFF.	0.000	-0.551	-0.550	0.052	0.082	0.113	0.143	0.250	0.147	0.117	0.088	0.058	0.000
HORIZ. OFFSET	-13.808	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.851

CHAINAGE 14700



REF. STRING MC10
X = 730534.938
Y = 6333783.894

DATUM R.L. 2.2

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.000	3.455	3.455	4.055	4.085	4.115	4.145	4.250	4.145	4.115	4.085	4.055	4.000
LEVEL DIFF.	0.000	-0.545	-0.545	0.055	0.085	0.115	0.145	0.250	0.145	0.115	0.085	0.055	0.000
HORIZ. OFFSET	-13.780	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	6.830

CHAINAGE 15000

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: H 4 0 2 4 6 8 — V 1 0 0.5 1 1.5 2

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

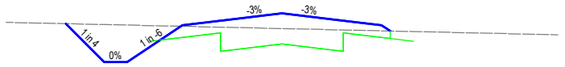
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 14400 TO CH 15200
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK040	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

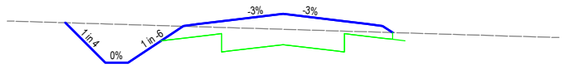


REF. STRING MC10
X = 731006.341
Y = 6333950.565

DATUM R.L. 2.9

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.803	4.178	4.178	4.778	4.808	4.838	4.688	4.973	4.688	4.838	4.808	4.778	4.683
LEVEL DIFF.	0.000	-0.611	-0.602	0.018	0.054	0.090	0.125	0.250	0.165	0.140	0.116	0.092	0.000
HORIZ. OFFSET	-14.099	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.070

CHAINAGE 15500

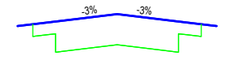


REF. STRING MC10
X = 731289.183
Y = 6334050.568

DATUM R.L. 4.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.557	5.905	5.905	6.505	6.535	6.565	6.595	6.700	6.595	6.565	6.535	6.505	6.396
LEVEL DIFF.	0.000	-0.632	-0.621	0.006	0.044	0.081	0.119	0.250	0.171	0.149	0.126	0.104	0.000
HORIZ. OFFSET	-14.207	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.152

CHAINAGE 15800

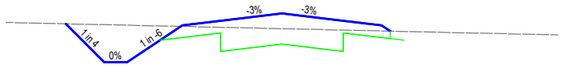


REF. STRING MC10
X = 731572.025
Y = 6334150.57

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16100

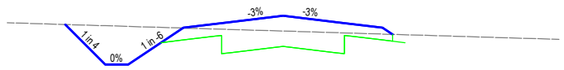


REF. STRING MC10
X = 730912.061
Y = 6333917.231

DATUM R.L. 2.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.552	3.927	3.927	4.527	4.557	4.587	4.617	4.722	4.617	4.587	4.557	4.527	4.432
LEVEL DIFF.	0.000	-0.611	-0.602	0.018	0.054	0.090	0.125	0.250	0.165	0.140	0.116	0.092	0.000
HORIZ. OFFSET	-14.099	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.070

CHAINAGE 15400

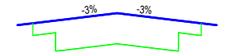


REF. STRING MC10
X = 731194.902
Y = 6334017.233

DATUM R.L. 4.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	6.042	5.390	5.390	5.990	6.020	6.050	6.080	6.185	6.080	6.050	6.020	5.990	5.881
LEVEL DIFF.	0.000	-0.632	-0.621	0.006	0.044	0.081	0.119	0.250	0.171	0.149	0.126	0.104	0.000
HORIZ. OFFSET	-14.207	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.152

CHAINAGE 15700

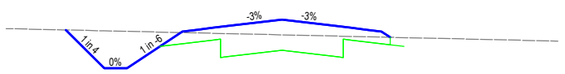


REF. STRING MC10
X = 731477.744
Y = 6334117.236

DATUM R.L. 6.2

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.534	7.564	7.594	7.624	7.729	7.624	7.594	7.564	7.534
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16000

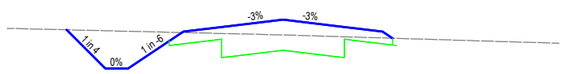


REF. STRING MC10
X = 730817.78
Y = 6333883.897

DATUM R.L. 2.4

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	4.301	3.677	3.677	4.277	4.307	4.337	4.367	4.472	4.367	4.337	4.307	4.277	4.182
LEVEL DIFF.	0.000	-0.611	-0.602	0.018	0.054	0.090	0.125	0.250	0.165	0.140	0.116	0.092	0.000
HORIZ. OFFSET	-14.099	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.070

CHAINAGE 15300

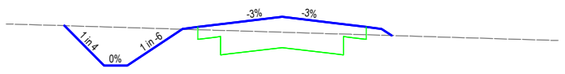


REF. STRING MC10
X = 731100.622
Y = 6333983.899

DATUM R.L. 3.6

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	5.504	4.875	4.875	5.475	5.505	5.535	5.565	5.670	5.565	5.535	5.505	5.475	5.367
LEVEL DIFF.	0.000	-0.614	-0.605	0.016	0.052	0.088	0.124	0.250	0.171	0.149	0.126	0.104	0.000
HORIZ. OFFSET	-14.116	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.152

CHAINAGE 15600



REF. STRING MC10
X = 731383.464
Y = 6334083.902

DATUM R.L. 5.1

DESIGN LABEL	IA10	IE10	ID10	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	IA10
DESIGN LEVELS	7.071	6.420	6.420	7.020	7.050	7.080	7.110	7.215	7.110	7.080	7.050	7.020	6.911
LEVEL DIFF.	0.000	-0.632	-0.621	0.006	0.044	0.081	0.119	0.250	0.171	0.149	0.126	0.104	0.000
HORIZ. OFFSET	-14.207	-11.600	-10.100	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500	7.152

CHAINAGE 15900

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

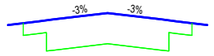
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 15300 TO CH 16100
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK041	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

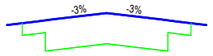


REF. STRING MC10
X = 731854.867
Y = 6334250.572

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16400

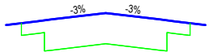


REF. STRING MC10
X = 732137.709
Y = 6334350.575

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16700

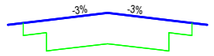


REF. STRING MC10
X = 732420.55
Y = 6334450.577

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17000

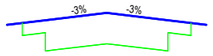


REF. STRING MC10
X = 731760.586
Y = 6334217.238

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16300

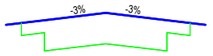


REF. STRING MC10
X = 732043.428
Y = 6334317.241

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16600

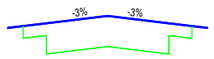


REF. STRING MC10
X = 732326.27
Y = 6334417.243

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16900

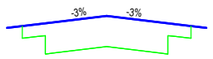


REF. STRING MC10
X = 731666.305
Y = 6334183.904

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16200

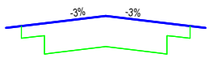


REF. STRING MC10
X = 731949.147
Y = 6334283.907

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16500



REF. STRING MC10
X = 732231.989
Y = 6334383.909

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 16800

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

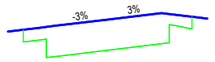
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 16200 TO CH 17000
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK042	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

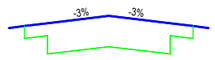


REF. STRING MC10
X = 732685.305
Y = 6334587.61

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	8.105	8.075	8.045	8.015
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17300

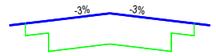


REF. STRING MC10
X = 732884.914
Y = 6334810.677

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17600

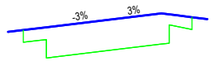


REF. STRING MC10
X = 733073.506
Y = 6335043.986

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17900

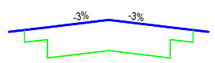


REF. STRING MC10
X = 732603.531
Y = 6334530.198

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	8.105	8.075	8.045	8.015
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17200

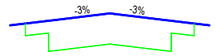


REF. STRING MC10
X = 732822.05
Y = 6334732.907

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17500

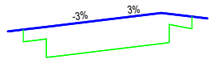


REF. STRING MC10
X = 733010.642
Y = 6334966.216

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17800

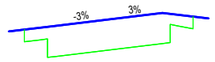


REF. STRING MC10
X = 732514.417
Y = 6334485.013

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	8.105	8.075	8.045	8.015
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17100

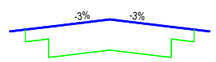


REF. STRING MC10
X = 732758.071
Y = 6334656.079

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	8.105	8.075	8.045	8.015
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17400



REF. STRING MC10
X = 732947.778
Y = 6334888.447

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 17700

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
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SCALES: H 4 0 2 4 6 8 — V 1 0 0.5 1 1.5 2

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

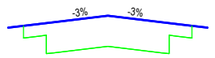
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 17100 TO CH 17900
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK043	D

CAD FILE NAME 4 - CROSS SECTIONS.DWG

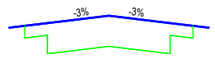


REF. STRING MC10
X = 733262.098
Y = 6335277.295

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18200

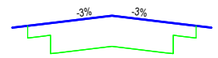


REF. STRING MC10
X = 733450.69
Y = 6335510.604

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18500

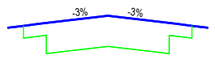


REF. STRING MC10
X = 733639.281
Y = 6335743.913

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18800

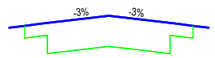


REF. STRING MC10
X = 733199.234
Y = 6335199.525

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18100

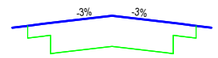


REF. STRING MC10
X = 733387.826
Y = 6335432.835

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18400

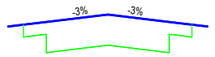


REF. STRING MC10
X = 733576.417
Y = 6335666.144

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18700

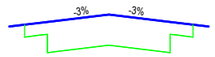


REF. STRING MC10
X = 733136.37
Y = 6335121.756

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18000

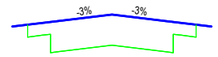


REF. STRING MC10
X = 733324.962
Y = 6335355.065

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18300



REF. STRING MC10
X = 733513.553
Y = 6335588.374

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 18600

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
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SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

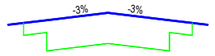
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 18000 TO CH 18800
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK044	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

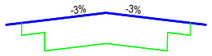


REF. STRING MC10
X = 733827.873
Y = 6335977.223

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19100

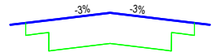


REF. STRING MC10
X = 734016.465
Y = 6336210.532

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19400

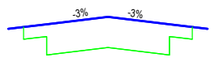


REF. STRING MC10
X = 734205.056
Y = 6336443.841

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19700

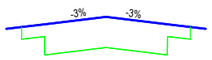


REF. STRING MC10
X = 733765.009
Y = 6335899.453

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19000

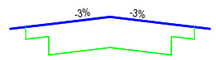


REF. STRING MC10
X = 733953.601
Y = 6336132.762

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19300

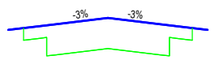


REF. STRING MC10
X = 734142.193
Y = 6336366.071

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19600

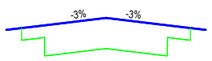


REF. STRING MC10
X = 733702.145
Y = 6335821.683

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 18900

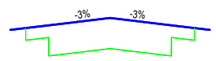


REF. STRING MC10
X = 733890.737
Y = 6336054.992

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19200



REF. STRING MC10
X = 734079.329
Y = 6336288.302

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 19500

NOTES:

1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

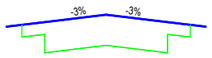
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 18900 TO CH 19700
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK045	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

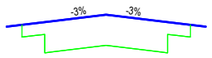


REF. STRING MC10
X = 734393.648
Y = 6336677.15

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20000

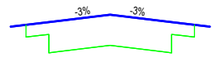


REF. STRING MC10
X = 734582.24
Y = 6336910.459

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20300

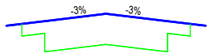


REF. STRING MC10
X = 734770.832
Y = 6337143.768

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20600

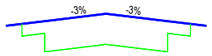


REF. STRING MC10
X = 734330.784
Y = 6336599.38

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 19900

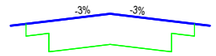


REF. STRING MC10
X = 734519.376
Y = 6336832.69

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20200

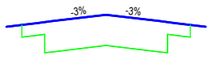


REF. STRING MC10
X = 734707.968
Y = 6337065.999

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20500

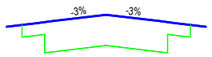


REF. STRING MC10
X = 734267.92
Y = 6336521.611

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 19800

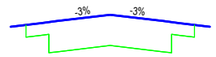


REF. STRING MC10
X = 734456.512
Y = 6336754.92

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20100



REF. STRING MC10
X = 734645.104
Y = 6336988.229

DATUM R.L. 6.5

	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LABEL									
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 20400

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

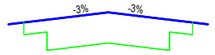
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 19800 TO CH 20600
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK046	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

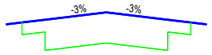


REF. STRING MC10
X = 734959.423
Y = 6337377.078

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 20900

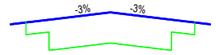


REF. STRING MC10
X = 735148.015
Y = 6337610.387

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21200

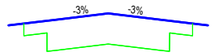


REF. STRING MC10
X = 735336.607
Y = 6337843.696

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21500

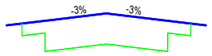


REF. STRING MC10
X = 734896.559
Y = 6337299.308

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 20800

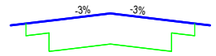


REF. STRING MC10
X = 735085.151
Y = 6337532.617

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21100

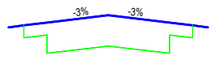


REF. STRING MC10
X = 735273.743
Y = 6337765.926

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21400

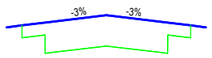


REF. STRING MC10
X = 734833.695
Y = 6337221.538

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 20700

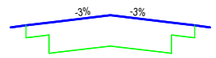


REF. STRING MC10
X = 735022.287
Y = 6337454.847

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21000



REF. STRING MC10
X = 735210.879
Y = 6337688.156

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21300

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

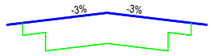
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 20700 TO CH 21500
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK047	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: x - CROSS SECTIONS.DWG

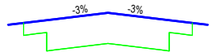


REF. STRING MC10
X = 735525.198
Y = 6338077.005

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21800

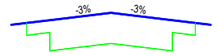


REF. STRING MC10
X = 735713.79
Y = 6338310.314

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 22100

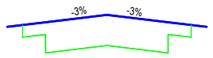


REF. STRING MC10
X = 735902.382
Y = 6338543.623

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 22400

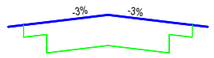


REF. STRING MC10
X = 735462.335
Y = 6337999.235

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21700

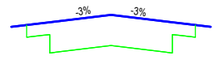


REF. STRING MC10
X = 735650.926
Y = 6338232.545

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 22000

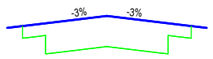


REF. STRING MC10
X = 735839.518
Y = 6338465.854

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 22300

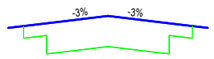


REF. STRING MC10
X = 735399.471
Y = 6337921.466

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21600

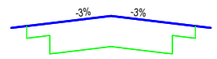


REF. STRING MC10
X = 735588.062
Y = 6338154.775

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 21900



REF. STRING MC10
X = 735776.654
Y = 6338388.084

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J	
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805	
LEVEL DIFF.											
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500		

CHAINAGE 22200

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

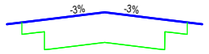
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 21600 TO CH 22400
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK048	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

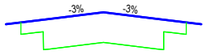


REF. STRING MC10
X = 736090.974
Y = 6338776.933

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 22700

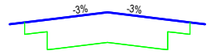


REF. STRING MC10
X = 736279.565
Y = 6339010.242

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23000

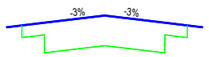


REF. STRING MC10
X = 736468.157
Y = 6339243.551

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23300

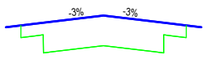


REF. STRING MC10
X = 736028.11
Y = 6338699.163

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 22600

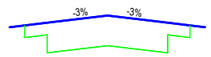


REF. STRING MC10
X = 736216.701
Y = 6338932.472

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 22900

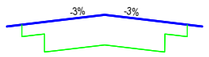


REF. STRING MC10
X = 736405.293
Y = 6339165.781

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23200

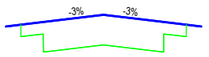


REF. STRING MC10
X = 735965.246
Y = 6338621.393

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 22500

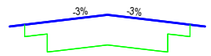


REF. STRING MC10
X = 736153.838
Y = 6338854.702

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 22800



REF. STRING MC10
X = 736342.429
Y = 6339088.011

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23100

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

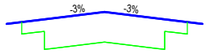
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 22500 TO CH 23300
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK049	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

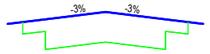


REF. STRING MC10
X = 736656.749
Y = 6339476.86

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23600

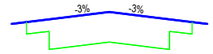


REF. STRING MC10
X = 736845.34
Y = 6339710.169

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23900

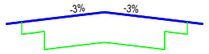


REF. STRING MC10
X = 737033.932
Y = 6339943.478

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24200

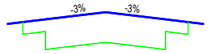


REF. STRING MC10
X = 736593.885
Y = 6339399.09

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23500

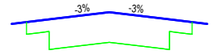


REF. STRING MC10
X = 736782.477
Y = 6339632.399

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23800

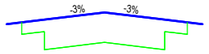


REF. STRING MC10
X = 736971.068
Y = 6339865.709

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24100

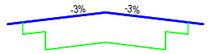


REF. STRING MC10
X = 736531.021
Y = 6339321.321

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23400

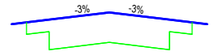


REF. STRING MC10
X = 736719.613
Y = 6339554.63

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 23700



REF. STRING MC10
X = 736908.204
Y = 6339787.939

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24000

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

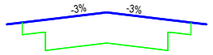
Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 23400 TO CH 24200
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
PDP	PDP	DIT	-	SK050	D

CAD FILE NAME: 4 - CROSS SECTIONS.DWG

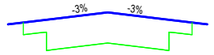


REF. STRING MC10
X = 737222.524
Y = 6340176.787

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24500

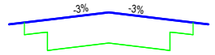


REF. STRING MC10
X = 737411.116
Y = 6340410.097

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24800

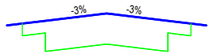


REF. STRING MC10
X = 737599.707
Y = 6340643.406

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25100

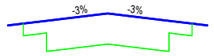


REF. STRING MC10
X = 737159.66
Y = 6340099.018

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24400

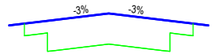


REF. STRING MC10
X = 737348.252
Y = 6340332.327

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24700

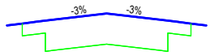


REF. STRING MC10
X = 737536.843
Y = 6340565.636

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25000

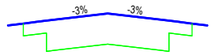


REF. STRING MC10
X = 737096.796
Y = 6340021.248

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24300

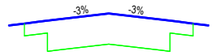


REF. STRING MC10
X = 737285.388
Y = 6340254.557

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24600



REF. STRING MC10
X = 737473.98
Y = 6340487.866

DATUM R.L. 6.5

DESIGN LABEL	EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS	7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.									
HORIZ. OFFSET	-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 24900

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

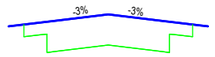
Government of South Australia
Department for Infrastructure and Transport

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 24300 TO CH 25100
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.
PDP	PDP	DIT	-	SK051	D

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: x - CROSS SECTIONS.DWG

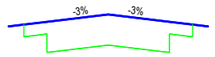


REF. STRING MC10
X = 737616.934
Y = 6340915.699

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.										
HORIZ. OFFSET		-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25400



REF. STRING MC10
X = 737644.751
Y = 6340819.646

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.										
HORIZ. OFFSET		-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25300

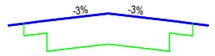


REF. STRING MC10
X = 737561.299
Y = 6341107.805

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.										
HORIZ. OFFSET		-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25600

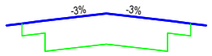


REF. STRING MC10
X = 737660.114
Y = 6340722.77

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.										
HORIZ. OFFSET		-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25200



REF. STRING MC10
X = 737589.116
Y = 6341011.752

DATUM R.L. 6.5

DESIGN LABEL		EH10	ES10	CE10	LE10	MC10	LE1J	CE1J	ES1J	EH1J
DESIGN LEVELS		7.805	7.835	7.865	7.895	8.000	7.895	7.865	7.835	7.805
LEVEL DIFF.										
HORIZ. OFFSET		-6.500	-5.500	-4.500	-3.500	0.000	3.500	4.500	5.500	6.500

CHAINAGE 25500

NOTES:
1. CONCEPT ONLY, SUBJECT TO DETAILED DESIGN.
2. THIS DESIGN MAY INCLUDE THE POSSIBILITY OF SERVICE CONFLICT AND / OR ENCROACHMENT WITHIN SAFETY CLEARANCES REQUIRING ASSESSMENT AND APPROVAL BY THE OFFICE OF TECHNICAL REGULATOR AND SERVICES AUTHORITIES.

SCALES: 4 0 2 4 6 8 H 1 0 0.5 1 1.5 2 V

No.	AMENDMENT DESCRIPTION	BY	DATE
D	CONCEPT	PDP	06.08.25
C	CONCEPT	PDP	21.07.25
B	CONCEPT	PDP	01.07.25
A	CONCEPT	PDP	26.05.25

Government of South Australia
Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. NCRN
MULLAQUANA ROAD-EIGHT MILE CREEK ROAD
NORTHERN WATER
MC10; CH 25200 TO CH 26000
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.
PDP	PDP	DIT	-	SK052	D

CAD FILE NAME: x - CROSS SECTIONS.DWG

Appendix C

Road safety treatment recommendations

Table 49 Summary of road treatments

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
Mullaquana Station Desalination Plant					
Lincoln Highway (south of Whyalla)	Sealed arterial road owned by the Department	Construction	6 m (for specific study extents)	Good	No specific treatments recommended
Horseshoe Road	Sealed collector road owned by Whyalla City Council	Construction	7 m	Good	No specific treatments recommended
Mullaquana Road	Sealed collector road owned by Whyalla City Council	Construction	7 m	Good	No specific treatments recommended
New Mullaquana Station Access Road	*Sealed collector road owned by the Department*	*Construction and access road*	*7 m*	*Excellent (New)*	*This is a new road proposed to be constructed prior to construction of the Northern Water Project infrastructure.*
Eight Mile Creek Road	Unsealed collector road owned by Whyalla City Council	Construction and access road	Approximately 9 m wide from Mullaquana Road to pipeline CH7400 Approximately 4.2 m between CH1800 and Mullaquana Desalination Plant	Good	Localised road widening, road sealing and pavement stabilisation subject to economic assessment
Lincoln Gap Pump Station					
Eyre Highway (North)	Sealed highway owned by the Department	Construction	6 m	Good	Localised road widening if necessary, following a site inspection
Eyre Highway (West)	Sealed highway owned by the Department	Construction	6 m	Good	Localised road widening if necessary, following a site inspection
Lincoln Highway	Sealed arterial road owned by the Department	Construction	7 m	Good	Localised road widening if necessary, following a site inspection
Kalaya and Mangata Pump Stations					
Stuart Highway	Sealed highway owned by the Department	Construction	6 m	Average to good	Localised road widening if necessary, following a site inspection
Bimba Product Water Storage					
Stuart Highway	Sealed highway owned by the Department	Construction	6 m	Good	Localised road widening if necessary, following a site inspection
Unnamed Access Road	Predominantly unsealed road (only first 55 m from Stuart Highway sealed)	Access	8 m	Poor	Localised road widening, road gravelling and pavement stabilisation

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
					(if required following site inspection)
New sites - temporary					
Olympic Dam Highway (accessing Purple Downs Laydown)	Sealed undivided highway owned by the Department	Construction	9 m	Good	No specific treatments recommended
Arthur Glennie Drive	Sealed sub-arterial road owned by the Department	Construction	14 m	Good	No specific treatments recommended
Industry Drive	Collector road owned by Whyalla City Council	Construction	16 m	Good	No specific treatments recommended
Shipyard Road	Sealed local access road that is privately owned by Whyalla Steelworks	Construction	7 m	Average to good	Localised road widening and pavement upgrades if necessary, following a site inspection
Madland Street	Sealed (east of Press Road) undivided local road owned by Port Augusta Council	Construction	9 m	Good	No specific treatments recommended
Press Road	Sealed (south of Madland Street eastern arm) undivided local road owned by Port Augusta Council	Construction	7 m	Good	Localised road widening if necessary, following a site inspection
Olympic Way	Sealed local road partially owned by the Department	Construction	7 m	Good	Localised road widening if necessary, following a site inspection
Broadbent Terrace	Sealed divided arterial road owned by the Department for the portion south of Roxby Downs and owned by Roxby Downs Council for the northern portion.	Construction	6 m per carriageway	Good	No specific treatments recommended
Norrie Avenue	Sealed divided arterial road owned by the Department	Construction	7 m per carriageway	Good	No specific treatments recommended
Playford Avenue	Sealed divided arterial road owned by the Department	Construction	7 m per carriageway	Good	No specific treatments recommended
Borefield Road	Unsealed local road understood to be owned by Roxby Downs Council for portion east of Olympic Dam. Owned by the Department for the portion further north.	Construction	7 m	Poor to average	Localised road widening and pavement upgrades if necessary, following a site inspection
Existing sites					
Iron Knob Road	Sealed undivided sub-arterial road owned by the Department	Construction and access road	6 m	Average to good	Localised road widening if necessary, following a site inspection

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
Olympic Dam Highway (accessing Pimba Rail Line)	Sealed undivided highway owned by the Department	Construction and access road	7 m	Good	Localised road widening if necessary, following a site inspection
Lincoln Highway (accessing Whyalla Port)	Sealed arterial road owned by the Department	Construction and access road	7 m per carriageway	Good	No specific treatments recommended
Kloeden Street	Sealed undivided local road owned by Whyalla City Council	Construction and access road	7 m	Good	Localised road widening if necessary, following a site inspection
Opal Road	Unsealed, undivided local road owned by the Municipal Council of Roxby Downs	Construction and access road	12 m	Average	Localised pavement upgrades if necessary, following a site inspection
Addison Road	Sealed, undivided collector road owned by Port Augusta City Council	Construction and access road	10 m	Average to good	Localised pavement upgrades if necessary, following a site inspection
Caroona Road	Sealed, undivided collector road owned by Port Augusta City Council	Construction and access road	8 m	Good	No specific treatments recommended
Blinman Road	Unsealed, undivided local road owned by the Department	Construction and access road	7 m	Average to good	Localised road widening if necessary, following a site inspection
Intersections					
Mullaquana Desalination Plant					
Lincoln Highway / Horseshoe Road	-	-	-	-	Turn treatment: **CHR/CHL(s)** Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Lincoln Gap Pump Station					
Eyre Highway / Lincoln Gap Pump Station Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Kalaya Pump Station					
Stuart Highway / Kalaya Pump Station Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
					construction related activities.
Mangata Pump Station					
Stuart Highway / Mangata Pump Station Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Bimba Product Water Storage					
Stuart Highway / Bimba Product Water Storage Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Mullaquana Station Substation					
Lincoln Highway / Mullaquana Station Substation Site Access	-	-	-	-	Turn treatment: BAR/**CHL(s)** Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Kootaberra Substation					
Stuart Highway / Kootaberra Substation Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Whyalla Laydown					
Industry Drive / Whyalla Laydown Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Carriewerloo Laydown					
Stuart Highway / Carriewerloo	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
Laydown Site Access					road users of increased truck movements and other construction related activities.
Nutt Laydown					
Stuart Highway / Nutt Laydown Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Oakden Hills Stack Site					
Stuart Highway / Oakden Hills Stack Site Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Mount Gunson Laydown					
Stuart Highway / Mount Gunson Laydown Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Lake Windabout Stack Site					
Stuart Highway / Lake Windabout Stack Site Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Pimba KAC Laydown					
Stuart Highway / Pimba KAC Laydown Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Purple Downs Laydown					

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
Olympic Dam Highway / Purple Downs Laydown Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Whyalla Segment Yard					
Arthur Glennie Drive / Whyalla Segment Yard Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Coraberra Hill Substation					
Eyre Highway / Coraberra Hill Substation Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Mount Gunson Substation					
Stuart Highway / Mount Gunson Substation Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Whyalla Camp					
Kloeden Street / Whyalla Camp Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Pimba KAC Camp					
Stuart Highway / Pimba KAC Camp Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other

Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
					construction related activities.
Roxby Downs Camp					
Olympic Way / Roxby Downs Camp Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Whyalla Quarry					
Iron Knob Road / Whyalla Quarry Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Port Augusta Quarry					
Eyre Highway / Port Augusta Quarry Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Mount Gunson Quarry					
Stuart Highway / Mount Gunson Quarry Site Access	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Roxby Downs Quarry					
Olympic Way / Opal Road	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.
Pimba Rail Line					
Olympic Dam Highway /	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert

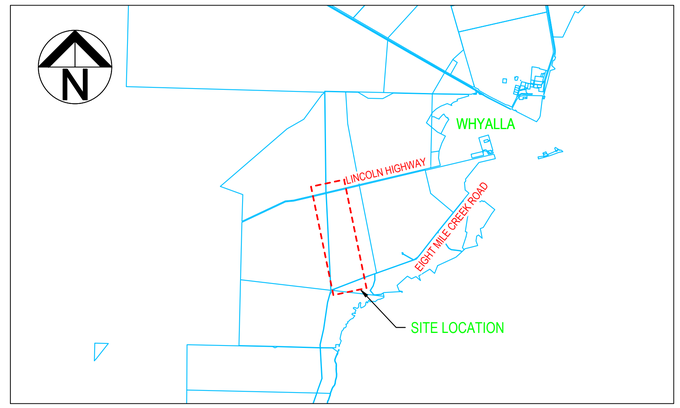
Road network	Road type	Assumed route use	Approximate carriageway width	Road condition	Treatments and upgrades
Pimba Rail Line Site Access					road users of increased truck movements and other construction related activities.
Whyalla Port					
Lincoln Highway / Ship Yard Road	-	-	-	-	Turn treatment: BAR/BAL Provide signage at intersection to alert road users of increased truck movements and other construction related activities.

Appendix D

New Mullaquana Station Access Road – GHD Concept Design Drawings (April 2026)

NEW MULLAQUANA STATION ACCESS ROAD

BETWEEN WHYALLA TO COWELL



LOCALITY PLAN
NTS



TITLE AND INDEX

SHEET	LOCATION
1	MC00; CH 0 TO CH 6105.689, MC10; CH 0 TO 326.301

TYPICAL CROSS SECTIONS

SHEET	LOCATION
2	TYPICAL CROSS SECTIONS

PLAN AND PROFILE

SHEET	LOCATION
11	MC00; CH 0 TO CH 300
12	MC00; CH 300 TO CH 600
13	MC00; CH 600 TO CH 900
14	MC00; CH 900 TO CH 1200
15	MC00; CH 1200 TO CH 1500
16	MC00; CH 1500 TO CH 1800
17	MC00; CH 1800 TO CH 2100
18	MC00; CH 2100 TO CH 2400
19	MC00; CH 2400 TO CH 2700
20	MC00; CH 2700 TO CH 3000
21	MC00; CH 3000 TO CH 3300
22	MC00; CH 3300 TO CH 3600
23	MC00; CH 3600 TO CH 3900
24	MC00; CH 3900 TO CH 4200

PLAN AND PROFILE

SHEET	LOCATION
25	MC00; CH 4200 TO CH 4500
26	MC00; CH 4500 TO CH 4800
27	MC00; CH 4800 TO CH 5100
28	MC00; CH 5100 TO CH 5400
29	MC00; CH 5400 TO CH 5700
30	MC00; CH 5700 TO CH 6000
31	MC00; CH 6000 TO CH 6105.689
32	MC10; CH 0 TO 300
33	MC10; CH 300 TO 326.301

INTERSECTION LAYOUTS

SHEET	LOCATION
52	INTERSECTION LAYOUT
54	MC10; CH 0 TO CH 184
55	MC10; CH 184 TO CH 326.301

CROSS SECTIONS

SHEET	LOCATION
61	MC00; CH 50 TO CH 700
62	MC00; CH 800 TO CH 1500
63	MC00; CH 1600 TO CH 2300
64	MC00; CH 2400 TO CH 3100
65	MC00; CH 3200 TO CH 3900

CROSS SECTIONS

SHEET	LOCATION
66	MC00; CH 4000 TO CH 4700
67	MC00; CH 4800 TO CH 5500
68	MC00; CH 5600 TO CH 6105.689
69	MC10; CH 50 TO CH 326.301

PAVEMENT SCHEDULES

SHEET	LOCATION
91	PAVEMENT SCHEDULE

SCALES: 200 0 100 200 300 400

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

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Department for Infrastructure and Transport

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

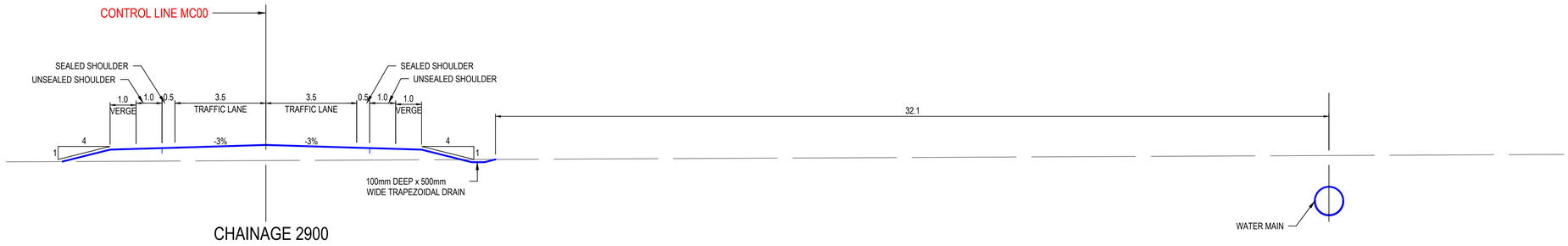
CONCEPT DESIGN

MC00; CH 0 TO CH 6105.689, MC10; CH 0 TO 326.301

TITLE AND INDEX

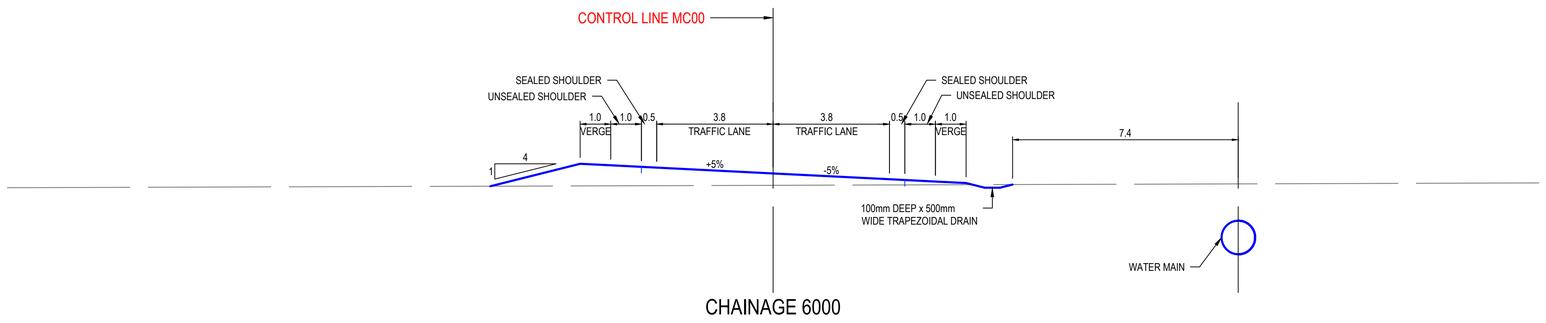
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L.F	S.G	S.G		24C347-MSAR-SK0001	0A

CAD FILE NAME: 12601676-GHD-10-00-DRG-LI-00001.DWG



TYPICAL CROSS SECTION - MULLAQUANA STATION ACCESS ROAD

SCALE 1:100



TYPICAL CROSS SECTION - MULLAQUANA STATION ACCESS ROAD

SCALE 1:100

SCALES: 2 0 1 2 3 4

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

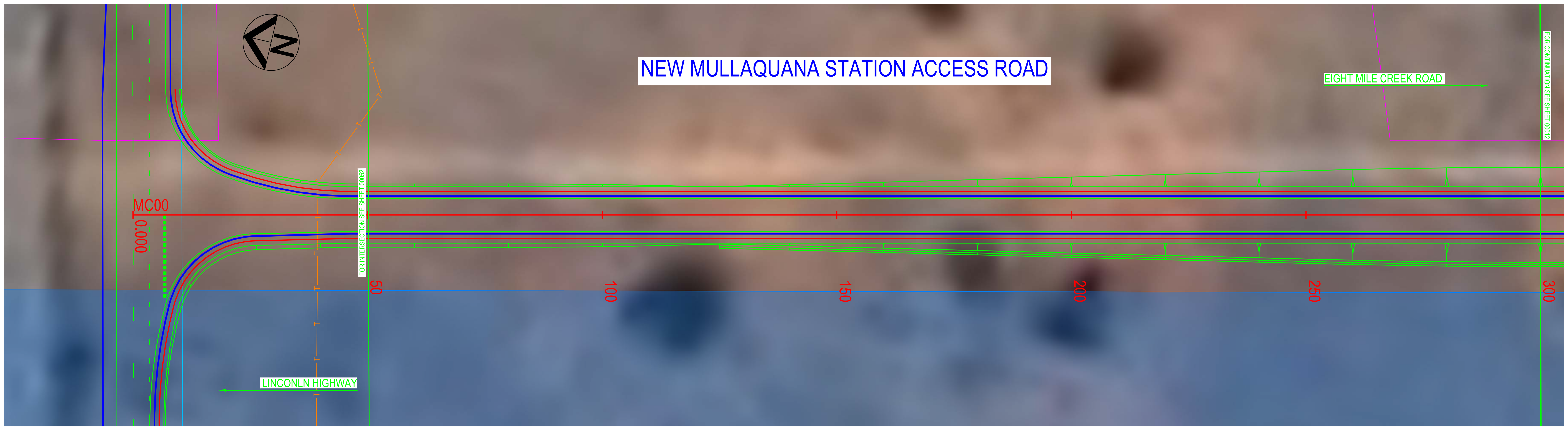
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TYPICAL CROSS SECTIONS

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ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

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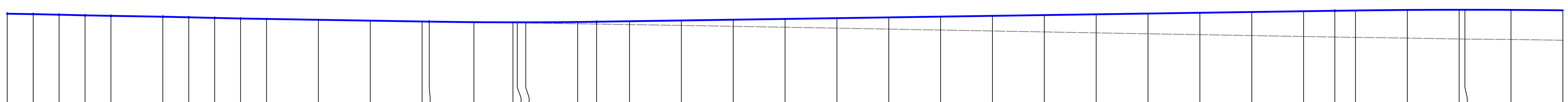


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



REF. STRING MC00
DATUM R.L. = 17.000

CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
0.000	20.463		20.463
5.000	20.445	20.445	20.445
10.000	20.423	20.423	20.423
15.000	20.398	20.398	20.398
20.000	20.380	20.380	20.380
30.000	20.346	20.346	20.346
35.000	20.323	20.323	20.323
40.000	20.299	20.299	20.299
45.000	20.277	20.277	20.277
50.000	20.260	20.260	20.260
60.000	20.227	20.227	20.226
70.000	20.193	20.193	20.194
80.000	20.160	20.160	20.164
81.380	20.156	20.156	20.160
90.000	20.134	20.134	20.134
97.520	20.127	20.128	20.111
98.359	20.127	20.127	20.108
100.000	20.128	20.128	20.103
110.000	20.141	20.141	20.071
113.659	20.150	20.150	20.060
120.000	20.169	20.169	20.040
130.000	20.199	20.199	20.008
140.000	20.229	20.229	19.973
150.000	20.259	20.259	19.938
160.000	20.289	20.289	19.902
170.000	20.319	20.319	19.866
180.000	20.349	20.349	19.828
190.000	20.379	20.379	19.792
200.000	20.409	20.409	19.756
210.000	20.439	20.439	19.719
220.000	20.469	20.469	19.682
230.000	20.499	20.499	19.649
240.000	20.529	20.529	19.613
250.000	20.559	20.559	19.578
256.029	20.577	20.577	19.556
260.000	20.588	20.588	19.543
270.000	20.608	20.608	19.517
280.000	20.615	20.615	19.481
281.109	20.615	20.615	19.478
290.000	20.610	20.610	19.462
300.000	20.594	20.594	19.431

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- L=5.000 G=-0.442%
- L=5.000 G=-0.514%
- L=5.000 G=-0.355%
- L=10.000 G=-0.340%
- L=5.000 G=-0.450%
- L=5.000 G=-0.492%
- L=5.000 G=-0.442%
- L=36.380 G=-0.333%
- K=51.000 L=32.280
- L=142.370 G=0.300%
- K=83.600 L=91.960

10	0	5	10	15	20	H	
2	0	1	2	3	4	V	

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
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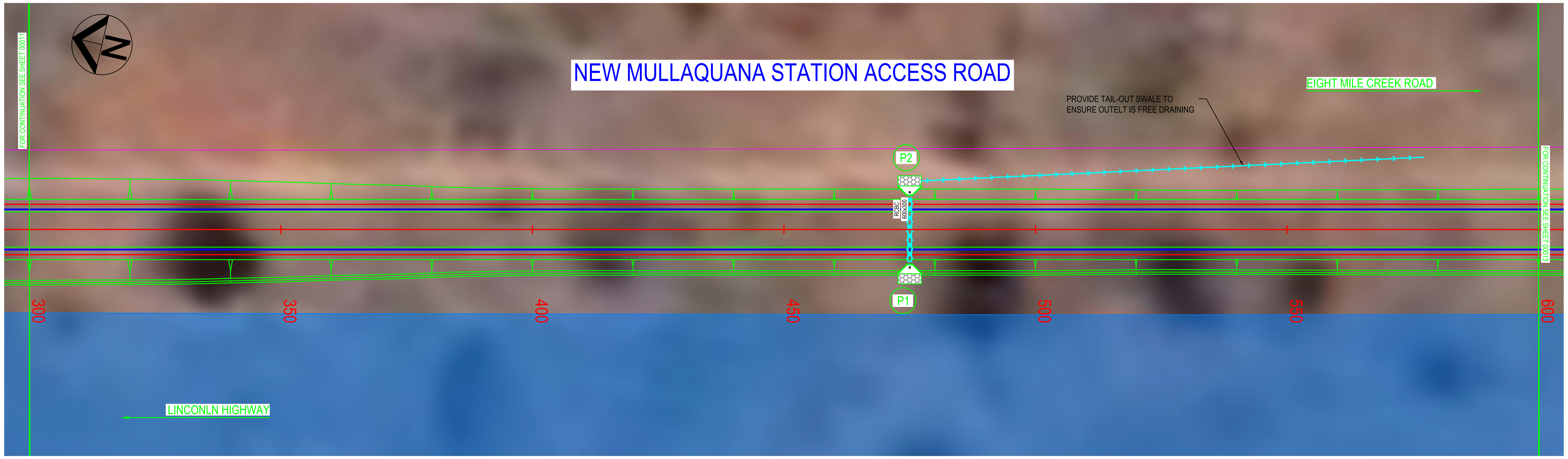
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH0 TO CH 300
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0011	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00011.DWG



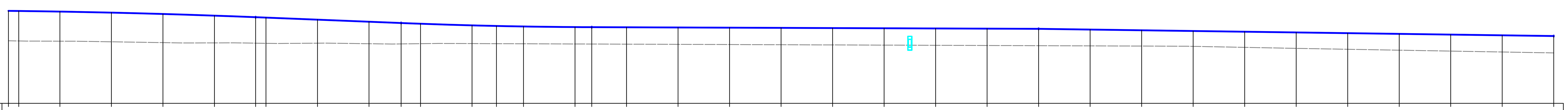
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 17.000



CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
300.000	20.594	20.594	19.431
302.009	20.589	20.589	19.424
310.000	20.565	20.565	19.415
320.000	20.525	20.525	19.391
330.000	20.472	20.472	19.359
340.000	20.408	20.408	19.349
347.989	20.347	20.347	19.338
350.000	20.331	20.331	19.332
360.000	20.251	20.251	19.338
370.000	20.171	20.171	19.317
376.241	20.121	20.121	19.309
380.000	20.093	20.093	19.318
390.000	20.030	20.030	19.322
394.745	20.007	20.007	19.319
400.000	19.987	19.987	19.315
410.000	19.963	19.963	19.307
413.249	19.960	19.960	19.305
420.000	19.955	19.955	19.300
430.000	19.947	19.947	19.292
440.000	19.940	19.940	19.285
450.000	19.932	19.932	19.277
460.000	19.925	19.925	19.270
470.000	19.917	19.917	19.262
480.000	19.910	19.910	19.255
490.000	19.903	19.903	19.248
500.000	19.895	19.895	19.240
510.000	19.867	19.867	19.233
520.000	19.839	19.839	19.225
530.000	19.811	19.811	19.214
540.000	19.783	19.783	19.175
550.000	19.755	19.755	19.136
560.000	19.727	19.727	19.101
570.000	19.699	19.699	19.065
580.000	19.671	19.671	19.030
590.000	19.642	19.642	18.995
600.000	19.614	19.614	18.959

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H: 10 0 5 10 15 20
V: 2 0 1 2 3 4

SCALES: 10 0 5 10 15 20			
0A	CONCEPT DESIGN	GHD	24.04.26
No.	AMENDMENT DESCRIPTION	BY	DATE

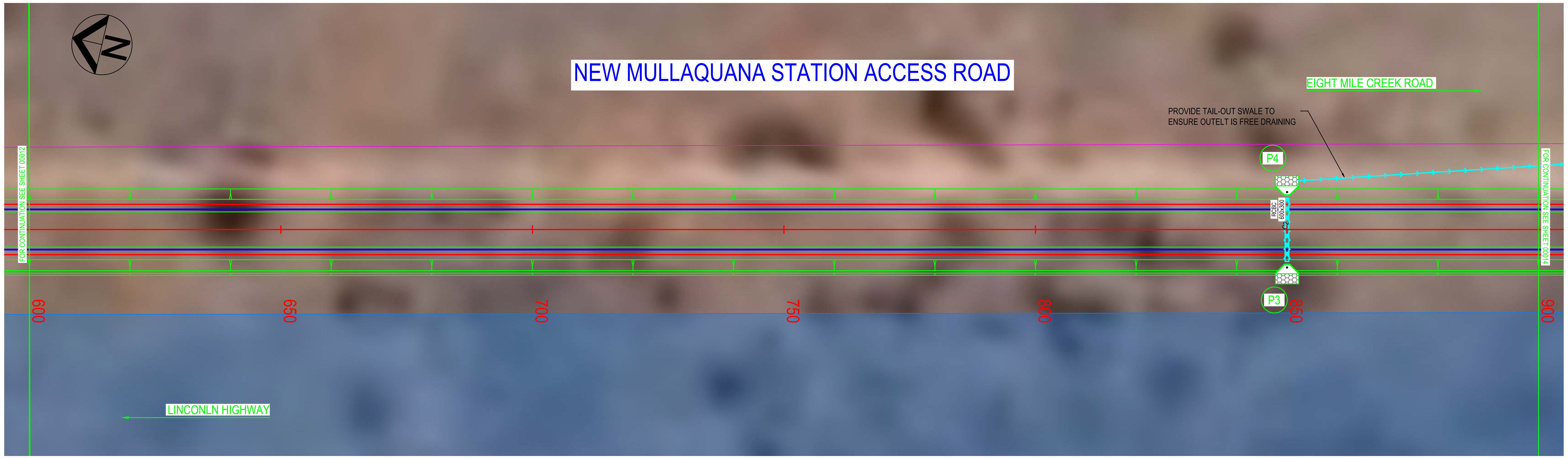
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 300 TO CH 600
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0012	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00012.DWG

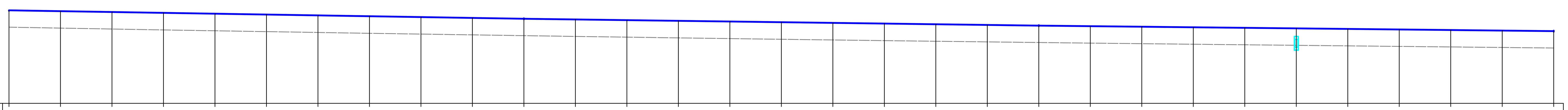


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



REF. STRING MC00
DATUM R.L. = 16.000

REF. STRING MC00	19.614	19.582	19.549	19.516	19.483	19.450	19.417	19.384	19.351	19.318	19.285	19.259	19.232	19.205	19.179	19.152
DESIGN SURFACE	19.614	19.582	19.549	19.516	19.483	19.450	19.417	19.384	19.351	19.318	19.285	19.259	19.232	19.205	19.179	19.152
EXISTING SURFACE	18.959	18.924	18.888	18.853	18.820	18.787	18.754	18.721	18.691	18.661	18.630	18.600	18.572	18.544	18.516	18.489
HORIZONTAL																L=2242.070
VERTICAL	L=100.000 G=-0.281%					L=100.000 G=-0.329%										L=100.000 G=-0.267%
CHAINAGE	600.000	610.000	620.000	630.000	640.000	650.000	660.000	670.000	680.000	690.000	700.000	710.000	720.000	730.000	740.000	750.000

REF. STRING MC00	19.125	19.099	19.072	19.045	19.019	18.997	18.976	18.955	18.933	18.912	18.891	18.869	18.848	18.826	18.805
DESIGN SURFACE	19.125	19.099	19.072	19.045	19.019	18.997	18.976	18.955	18.933	18.912	18.891	18.869	18.848	18.826	18.805
EXISTING SURFACE	18.463	18.437	18.412	18.388	18.364	18.340	18.318	18.297	18.275	18.254	18.234	18.212	18.191	18.171	18.150
HORIZONTAL															
VERTICAL										L=100.000 G=-0.214%					L=100.000 G=-0.203%
CHAINAGE	760.000	770.000	780.000	790.000	800.000	810.000	820.000	830.000	840.000	850.000	860.000	870.000	880.000	890.000	900.000

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

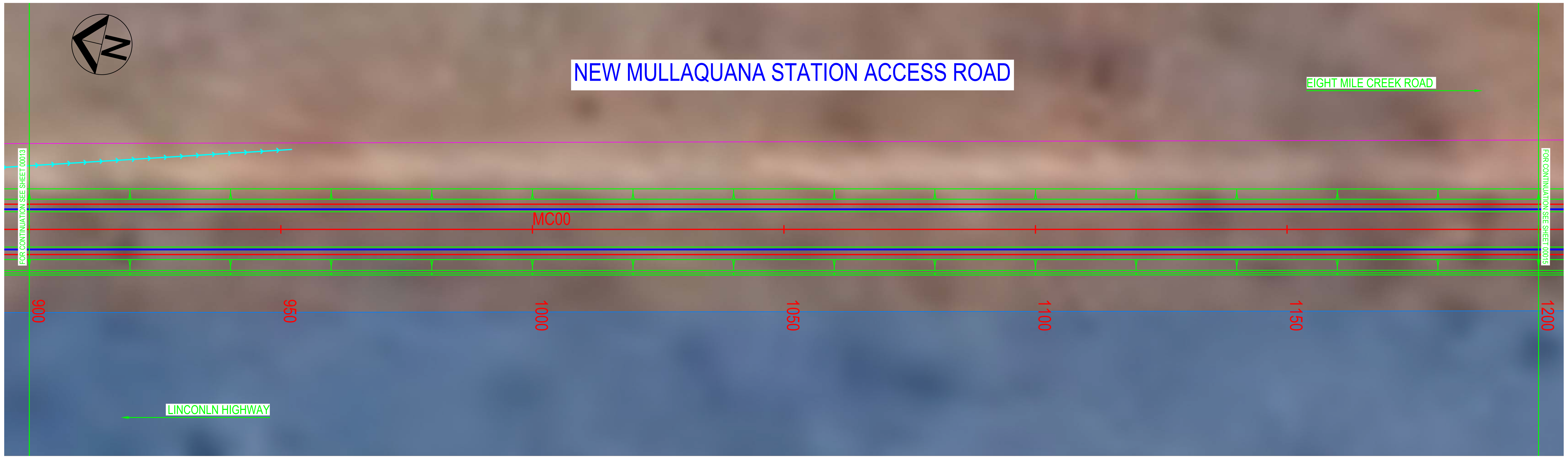
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 600 TO CH 900
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0013	0A

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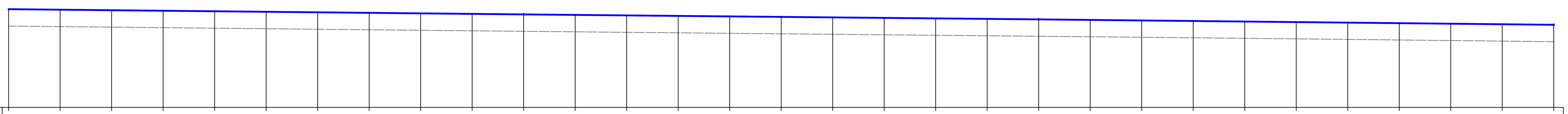
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 15.000



CHAINAGE	900.000	910.000	920.000	930.000	940.000	950.000	960.000	970.000	980.000	990.000	1000.000	1010.000	1020.000	1030.000	1040.000	1050.000
REF. STRING MC00	18.805	18.785	18.765	18.744	18.724	18.704	18.683	18.663	18.643	18.623	18.602	18.583	18.564	18.545	18.525	18.506
DESIGN SURFACE	18.805	18.785	18.765	18.744	18.724	18.704	18.683	18.663	18.643	18.623	18.602	18.583	18.564	18.545	18.525	18.506
EXISTING SURFACE	18.150	18.129	18.109	18.088	18.068	18.048	18.027	18.007	17.987	17.967	17.947	17.928	17.908	17.889	17.869	17.850
HORIZONTAL																L=2242.070
VERTICAL	L=100.000 G=-0.214%					L=100.000 G=-0.203%										L=100.000 G=-0.192%

CHAINAGE	1060.000	1070.000	1080.000	1090.000	1100.000	1110.000	1120.000	1130.000	1140.000	1150.000	1160.000	1170.000	1180.000	1190.000	1200.000
REF. STRING MC00	18.487	18.468	18.449	18.429	18.410	18.389	18.368	18.347	18.326	18.304	18.283	18.262	18.241	18.220	18.199
DESIGN SURFACE	18.487	18.468	18.449	18.429	18.410	18.389	18.368	18.347	18.326	18.304	18.283	18.262	18.241	18.220	18.199
EXISTING SURFACE	17.831	17.812	17.793	17.774	17.755	17.736	17.716	17.697	17.676	17.655	17.634	17.612	17.590	17.567	17.544
HORIZONTAL															
VERTICAL										L=100.000 G=-0.211%					L=100.000 G=-0.248%

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

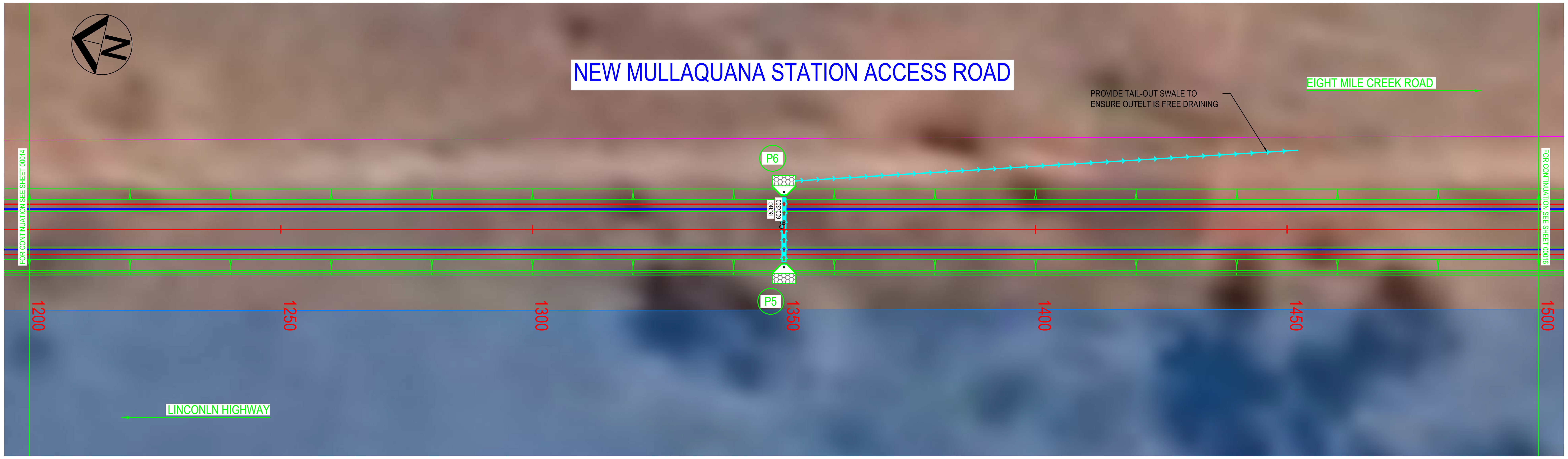
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 900 TO CH 1200
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0014	0A

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CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00014.DWG

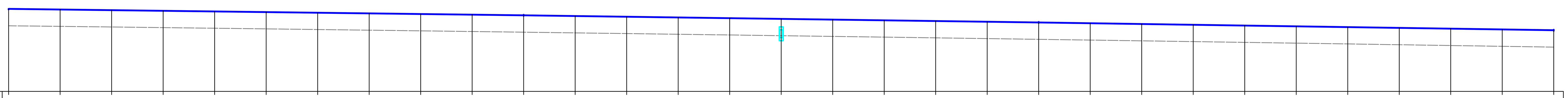


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
1200.000	18.199	18.199	17.544
1210.000	18.174	18.174	17.521
1220.000	18.149	18.149	17.498
1230.000	18.124	18.124	17.473
1240.000	18.100	18.100	17.449
1250.000	18.075	18.075	17.424
1260.000	18.050	18.050	17.399
1270.000	18.025	18.025	17.374
1280.000	18.000	18.000	17.348
1290.000	17.975	17.975	17.322
1300.000	17.951	17.951	17.296
1310.000	17.923	17.923	17.269
1320.000	17.895	17.895	17.242
1330.000	17.867	17.867	17.215
1340.000	17.840	17.840	17.188
1350.000	17.812	17.812	17.160
1360.000	17.784	17.784	17.132
1370.000	17.757	17.757	17.104
1380.000	17.729	17.729	17.076
1390.000	17.701	17.701	17.047
1400.000	17.673	17.673	17.018
1410.000	17.643	17.643	16.990
1420.000	17.613	17.613	16.960
1430.000	17.583	17.583	16.930
1440.000	17.553	17.553	16.900
1450.000	17.522	17.522	16.871
1460.000	17.492	17.492	16.840
1470.000	17.462	17.462	16.809
1480.000	17.432	17.432	16.778
1490.000	17.402	17.402	16.747
1500.000	17.372	17.372	16.717

HORIZONTAL: L=2242.070

VERTICAL: L=100.000 G=-0.211% (at 1200.000); L=100.000 G=-0.248% (1200–1300); L=100.000 G=-0.277% (1300–1400); L=100.000 G=-0.302% (1400–1500); L=100.000 G=-0.326% (at 1500.000)

Scales: 10 0 5 10 15 20 H; 2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

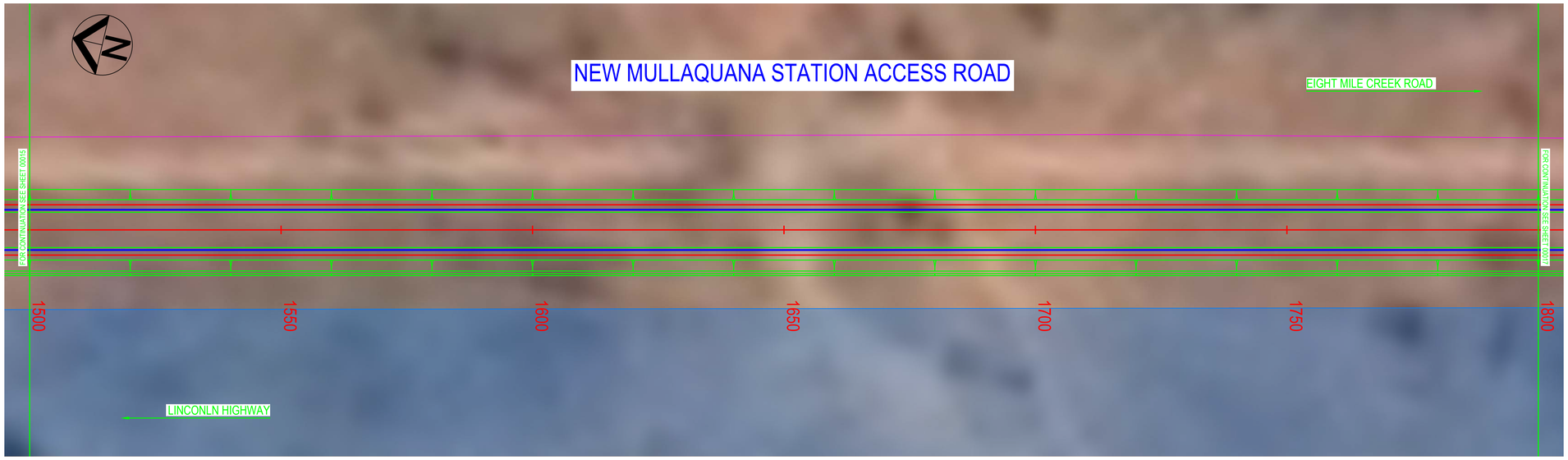
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 1200 TO CH 1500
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0015	0A

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CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00015.DWG



LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 14.000

CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
1500.000	17.372	17.372	16.717
1510.000	17.339	17.339	16.685
1520.000	17.306	17.306	16.653
1530.000	17.274	17.274	16.621
1540.000	17.241	17.241	16.589
1550.000	17.208	17.208	16.557
1560.000	17.176	17.176	16.524
1570.000	17.143	17.143	16.491
1580.000	17.110	17.110	16.457
1590.000	17.078	17.078	16.423
1600.000	17.045	17.045	16.390
1610.000	17.011	17.011	16.357
1620.000	16.977	16.977	16.324
1630.000	16.943	16.943	16.289
1640.000	16.909	16.909	16.255
1650.000	16.875	16.875	16.221
1660.000	16.840	16.840	16.188
1670.000	16.806	16.806	16.153
1680.000	16.772	16.772	16.118
1690.000	16.738	16.738	16.084
1700.000	16.704	16.704	16.049
1710.000	16.668	16.668	16.014
1720.000	16.632	16.632	15.979
1730.000	16.597	16.597	15.943
1740.000	16.561	16.561	15.908
1750.000	16.525	16.525	15.872
1760.000	16.489	16.489	15.836
1770.000	16.454	16.454	15.800
1780.000	16.418	16.418	15.765
1790.000	16.382	16.382	15.728
1800.000	16.346	16.346	15.691

HORIZONTAL: L=2242.070

VERTICAL: L=100.000 G=-0.302%; L=100.000 G=-0.326%; L=100.000 G=-0.341%; L=100.000 G=-0.357%; L=100.000 G=-0.366%

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

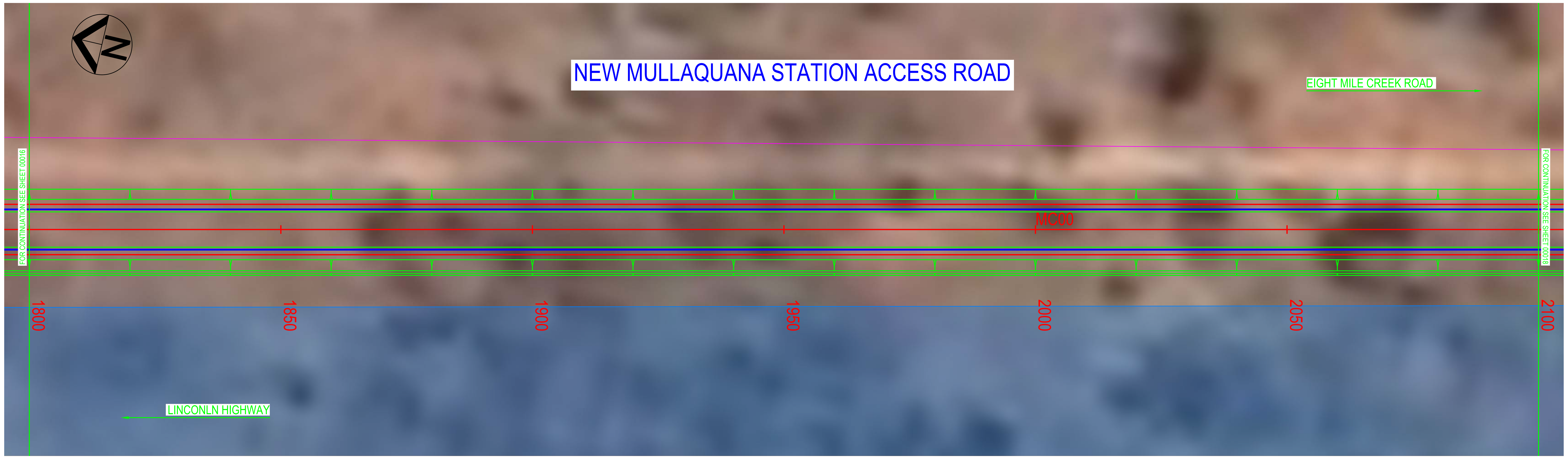
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Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 1500 TO CH 1800
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0016	0A

CAD FILE NAME: 126016776-GHD-10-00-DRG-CI-00016.DWG

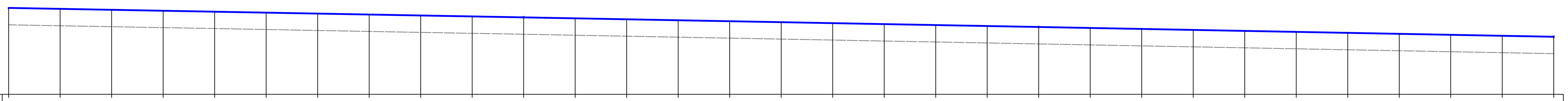


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



REF. STRING MC00
DATUM R.L. = 13.000

CHAINAGE	1800.000	1810.000	1820.000	1830.000	1840.000	1850.000	1860.000	1870.000	1880.000	1890.000	1900.000
REF. STRING MC00	16.346	16.310	16.273	16.237	16.200	16.163	16.127	16.090	16.054	16.017	15.980
DESIGN SURFACE	16.346	16.310	16.273	16.237	16.200	16.163	16.127	16.090	16.054	16.017	15.980
EXISTING SURFACE	15.691	15.655	15.619	15.583	15.547	15.510	15.472	15.435	15.398	15.362	15.325
HORIZONTAL											
VERTICAL	L=100.000 G=-0.357%					L=100.000 G=-0.366%					

CHAINAGE	1910.000	1920.000	1930.000	1940.000	1950.000	1960.000	1970.000	1980.000	1990.000	2000.000
REF. STRING MC00	15.943	15.906	15.868	15.831	15.793	15.756	15.719	15.681	15.644	15.606
DESIGN SURFACE	15.943	15.906	15.868	15.831	15.793	15.756	15.719	15.681	15.644	15.606
EXISTING SURFACE	15.289	15.251	15.213	15.176	15.139	15.101	15.064	15.027	14.989	14.951
HORIZONTAL					L=2242.070					
VERTICAL					L=100.000 G=-0.374%					

CHAINAGE	2010.000	2020.000	2030.000	2040.000	2050.000	2060.000	2070.000	2080.000	2090.000	2100.000
REF. STRING MC00	15.569	15.531	15.493	15.456	15.418	15.380	15.342	15.305	15.267	15.229
DESIGN SURFACE	15.569	15.531	15.493	15.456	15.418	15.380	15.342	15.305	15.267	15.229
EXISTING SURFACE	14.914	14.876	14.838	14.801	14.763	14.725	14.687	14.650	14.612	14.574
HORIZONTAL										
VERTICAL					L=100.000 G=-0.377%					L=135.014 G=-0.376%

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

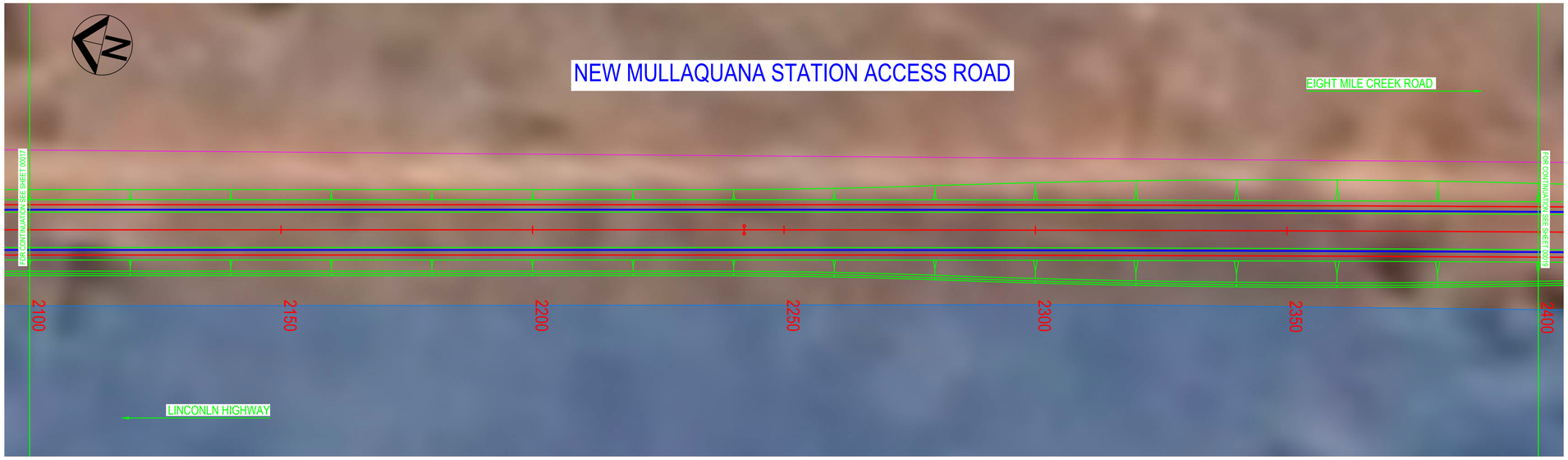
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 1800 TO CH 2100
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0017	0A

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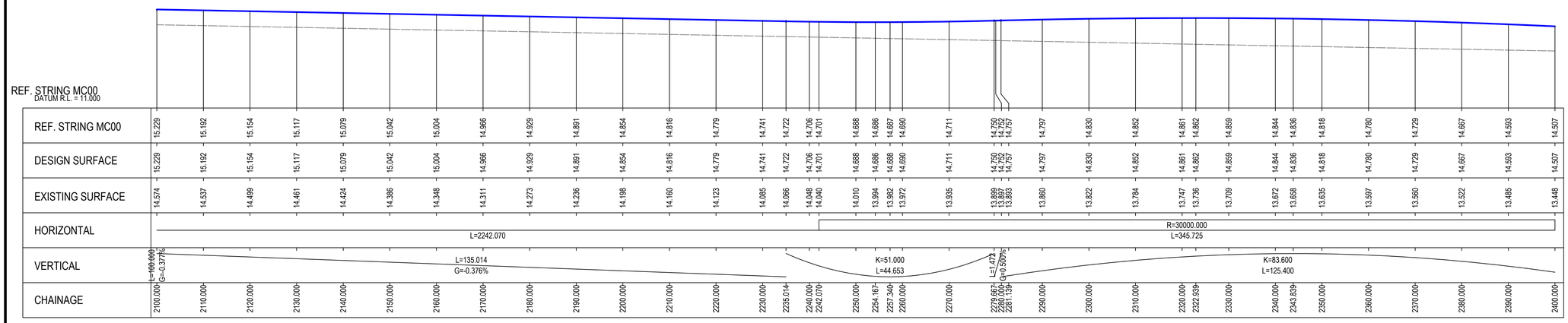


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



10 0 5 10 15 20 H

2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

CONCEPT DESIGN

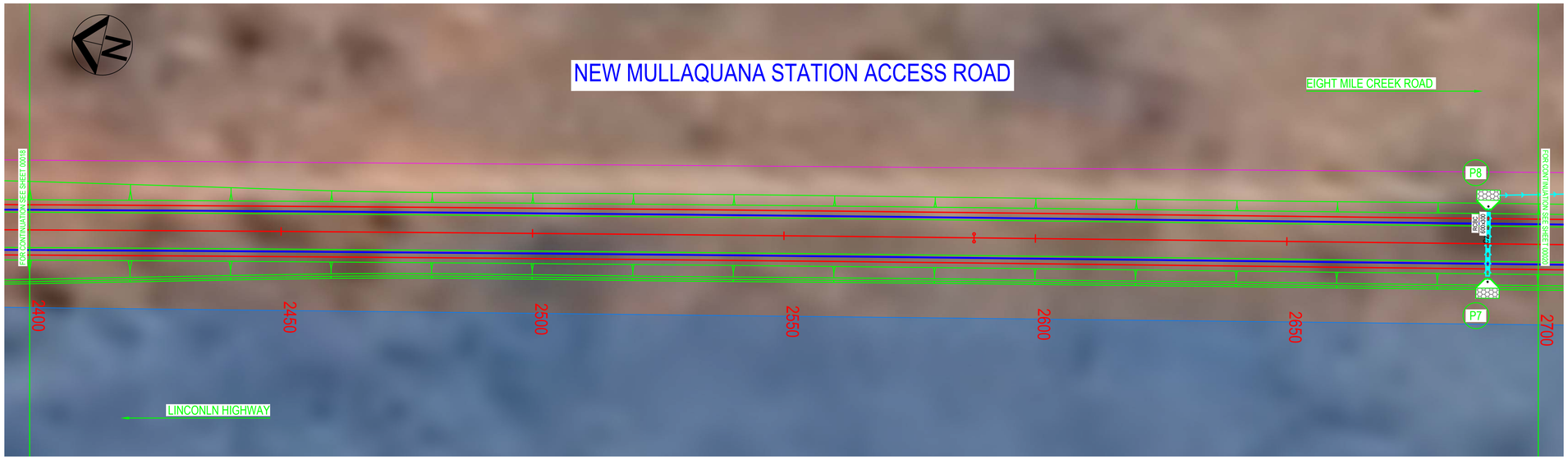
MC00; CH 2100 TO CH 2400

PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0018	0A

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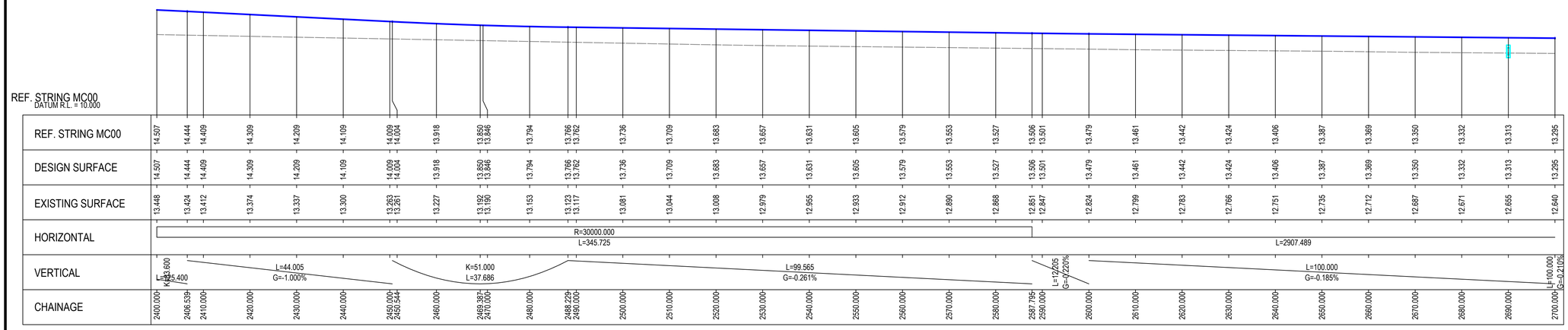


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.





SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

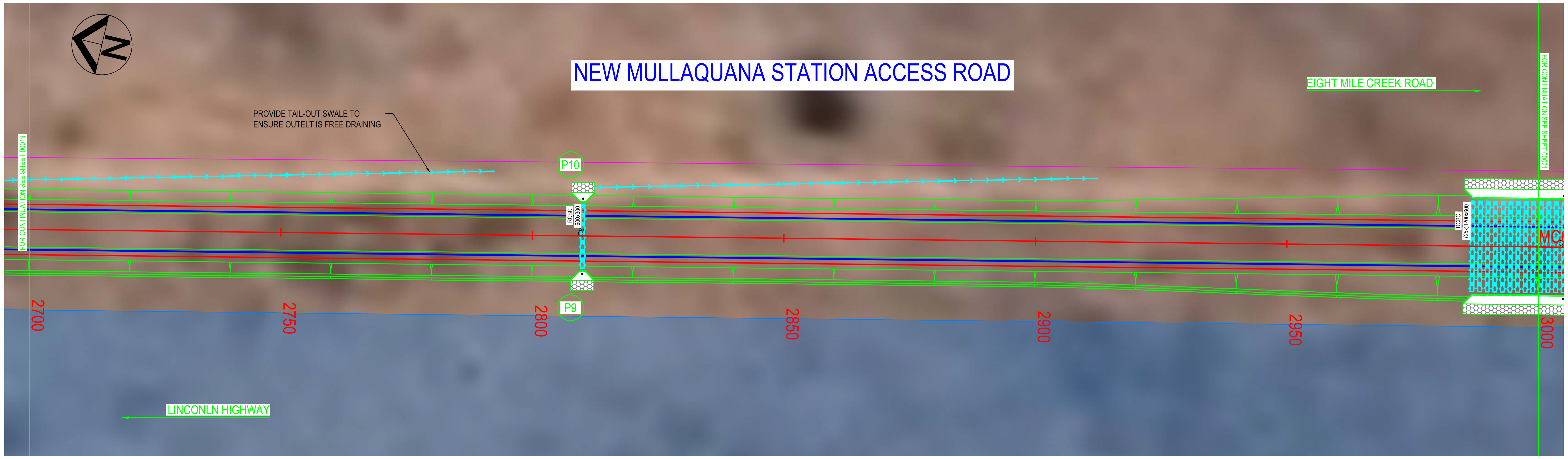
CONCEPT DESIGN

MC00; CH 2400 TO CH 2700

PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0019	0A

CAD FILE NAME: 126016776-GHD-10-00-DRG-CI-00019.DWG



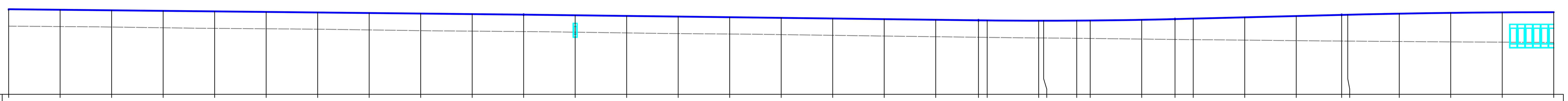
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 10.000



CHAINAGE	2700.000	2710.000	2720.000	2730.000	2740.000	2750.000	2760.000	2770.000	2780.000	2790.000	2800.000	2810.000
REF. STRING MC00	13.295	13.274	13.253	13.232	13.211	13.190	13.169	13.148	13.127	13.106	13.085	13.060
DESIGN SURFACE	13.295	13.274	13.253	13.232	13.211	13.190	13.169	13.148	13.127	13.106	13.085	13.060
EXISTING SURFACE	12.640	12.624	12.606	12.578	12.554	12.538	12.522	12.494	12.466	12.446	12.430	12.406
HORIZONTAL												
VERTICAL	L=100.000 G=-0.185%					L=100.000 G=-0.210%						

CHAINAGE	2820.000	2830.000	2840.000	2850.000	2860.000	2870.000	2880.000	2888.306	2890.000	2900.000	2900.962	2907.384
REF. STRING MC00	13.035	13.010	12.985	12.961	12.936	12.911	12.886	12.866	12.862	12.850	12.850	12.854
DESIGN SURFACE	13.035	13.010	12.985	12.961	12.936	12.911	12.886	12.866	12.862	12.850	12.850	12.855
EXISTING SURFACE	12.377	12.352	12.335	12.313	12.284	12.256	12.231	12.209	12.205	12.184	12.182	12.170
HORIZONTAL				L=2907.489								
VERTICAL			L=88.306 G=-0.248%									K=51.000 L=38.156

CHAINAGE	2910.000	2920.000	2926.462	2930.000	2940.000	2950.000	2958.818	2960.000	2970.000	2980.000	2990.000	3000.000
REF. STRING MC00	12.858	12.885	12.914	12.931	12.981	13.031	13.075	13.081	13.124	13.154	13.173	13.180
DESIGN SURFACE	12.858	12.885	12.914	12.931	12.981	13.031	13.075	13.081	13.124	13.154	13.173	13.180
EXISTING SURFACE	12.163	12.139	12.124	12.117	12.099	12.078	12.063	12.061	12.045	12.029	12.019	12.009
HORIZONTAL												
VERTICAL					L=32.356 G=0.500%					K=83.600 L=83.600		

10 0 5 10 15 20 H

2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

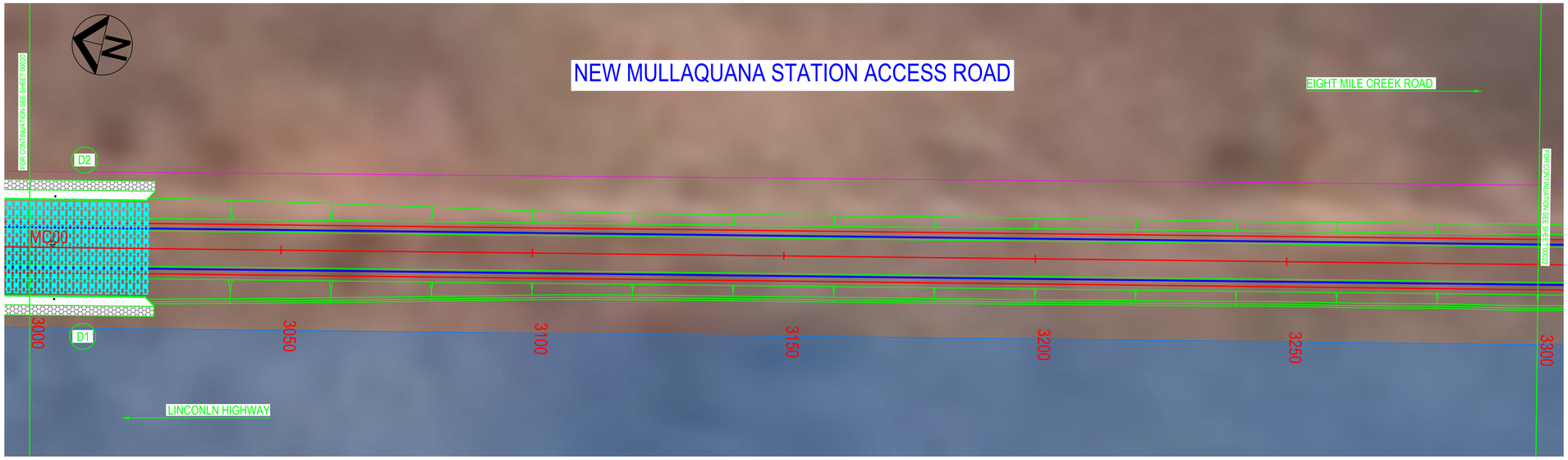
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 2700 TO CH 3000
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0020	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00020.DWG

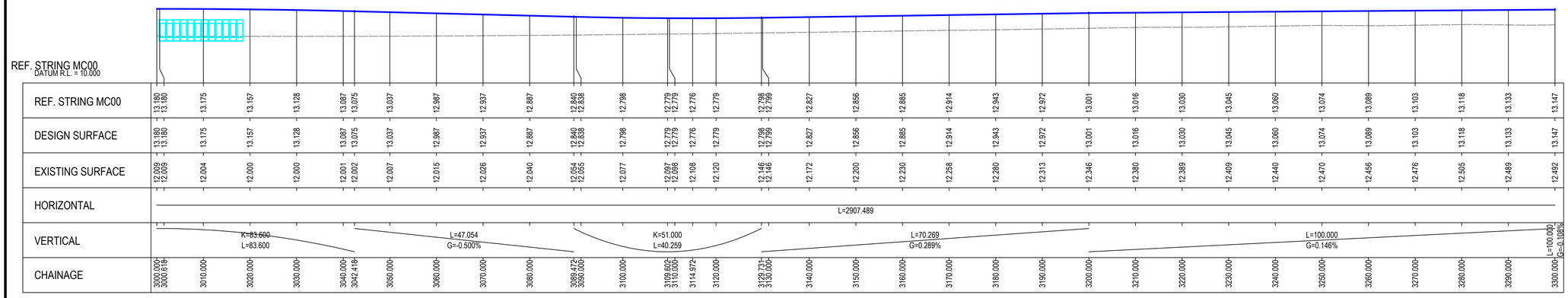


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



10 0 5 10 15 20 H

2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

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ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

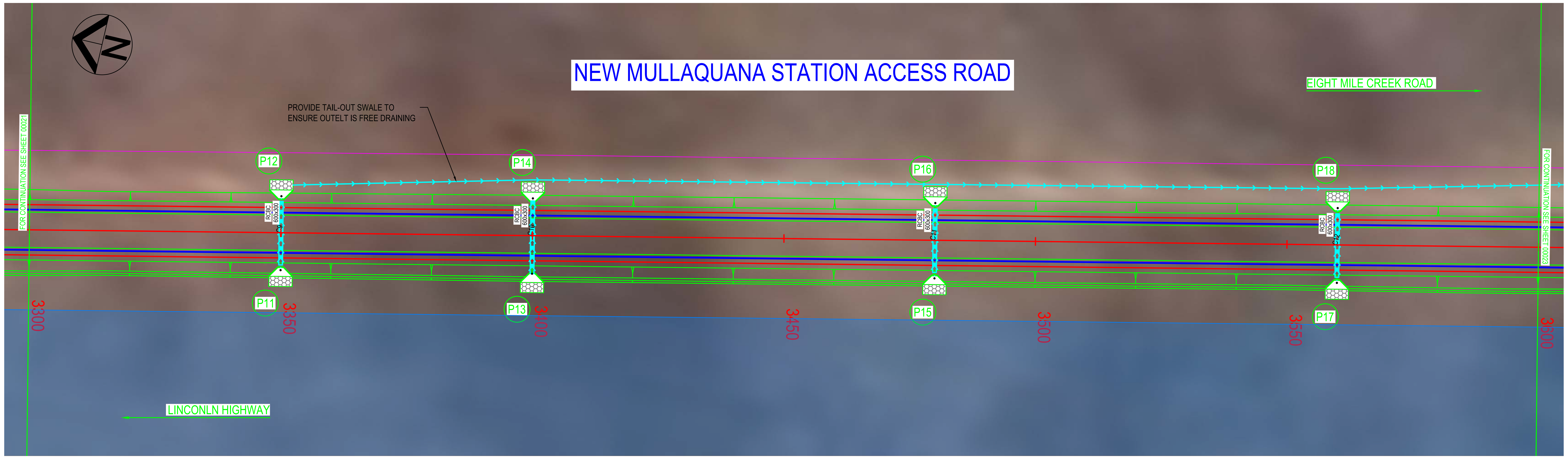
CONCEPT DESIGN

MC00; CH 3000 TO CH 3300

PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0021	0A

CAD FILE NAME: 126076-GHD-10-00-DRG-CI-00021.DWG

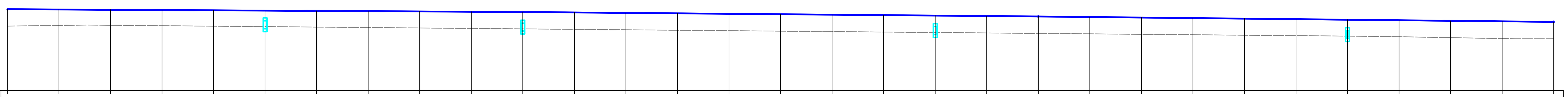


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



REF. STRING MC00
DATUM R.L. = 10.000

REF. STRING MC00	13.147	13.136	13.126	13.115	13.104	13.093	13.082	13.072	13.061	13.050	13.039
DESIGN SURFACE	13.147	13.136	13.126	13.115	13.104	13.093	13.082	13.072	13.061	13.050	13.039
EXISTING SURFACE	12.492	12.518	12.524	12.507	12.489	12.472	12.454	12.437	12.419	12.402	12.384
HORIZONTAL											
VERTICAL	L=100.000 G=0.146%					L=100.000 G=-0.108%					
CHAINAGE	3300.000	3310.000	3320.000	3330.000	3340.000	3350.000	3360.000	3370.000	3380.000	3390.000	3400.000

REF. STRING MC00	13.022	13.004	12.987	12.969	12.952	12.934	12.917	12.899	12.882	12.864
DESIGN SURFACE	13.022	13.004	12.987	12.969	12.952	12.934	12.917	12.899	12.882	12.864
EXISTING SURFACE	12.367	12.349	12.332	12.314	12.297	12.279	12.262	12.244	12.227	12.209
HORIZONTAL					L=2907.489					
VERTICAL					L=100.000 G=-0.175%					
CHAINAGE	3410.000	3420.000	3430.000	3440.000	3450.000	3460.000	3470.000	3480.000	3490.000	3500.000

REF. STRING MC00	12.843	12.822	12.801	12.781	12.760	12.739	12.718	12.697	12.676	12.655
DESIGN SURFACE	12.843	12.822	12.801	12.781	12.760	12.739	12.718	12.697	12.676	12.655
EXISTING SURFACE	12.192	12.174	12.157	12.139	12.122	12.104	12.080	12.045	12.009	12.000
HORIZONTAL										
VERTICAL					L=100.000 G=-0.209%					L=100.000 G=-0.252%
CHAINAGE	3510.000	3520.000	3530.000	3540.000	3550.000	3560.000	3570.000	3580.000	3590.000	3600.000

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

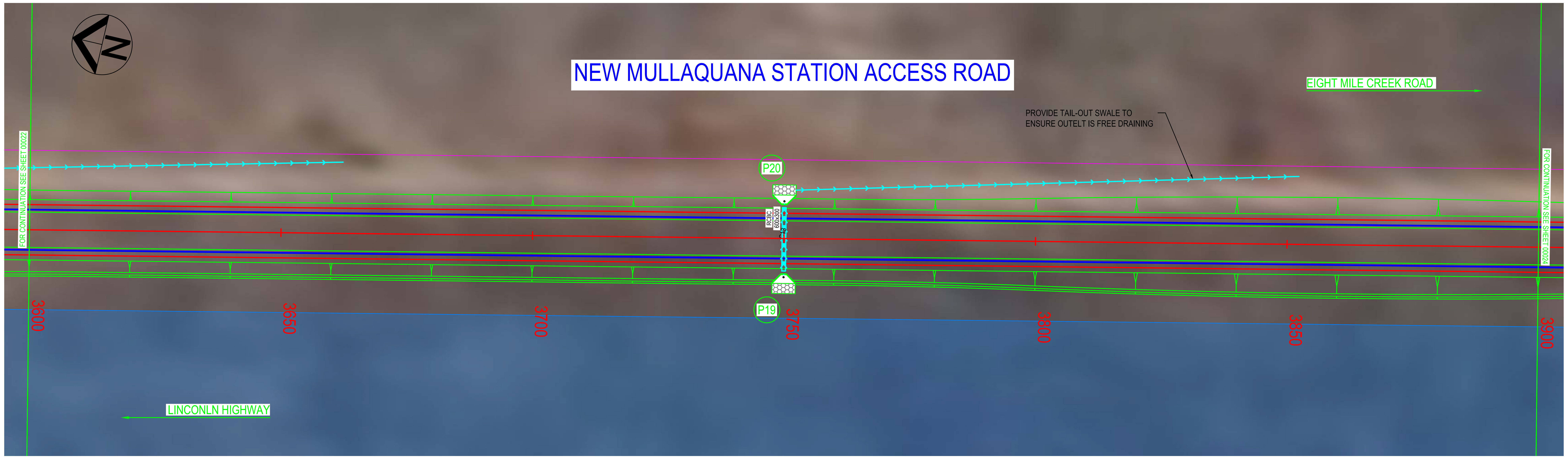
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 3300 TO CH 3600
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0022	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00022.DWG



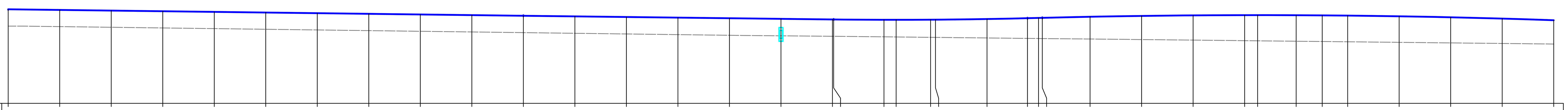
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 9.000



CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE	VERTICAL
3600.000	12.655	12.655	12.000	L=100.000 G=-0.209%
3610.000	12.630	12.630	11.982	
3620.000	12.605	12.605	11.956	
3630.000	12.579	12.579	11.930	
3640.000	12.554	12.554	11.904	
3650.000	12.529	12.529	11.878	L=100.000 G=-0.252%
3660.000	12.504	12.504	11.852	
3670.000	12.478	12.478	11.826	
3680.000	12.453	12.453	11.800	
3690.000	12.428	12.428	11.774	
3700.000	12.403	12.403	11.748	
3710.000	12.379	12.379	11.722	
3720.000	12.355	12.355	11.696	
3730.000	12.332	12.332	11.670	L=60.228 G=-0.238%
3740.000	12.308	12.308	11.644	
3750.000	12.284	12.284	11.624	
3760.000	12.260	12.260	11.605	
3760.228	12.260	12.260	11.605	
3770.000	12.246	12.246	11.584	
3772.355	12.245	12.245	11.579	
3779.041	12.250	12.250	11.564	K=51.000 L=37.627
3780.000	12.251	12.251	11.562	
3790.000	12.276	12.276	11.540	
3797.855	12.309	12.309	11.523	L=2.870 G=0.500%
3800.000	12.320	12.320	11.519	
3800.725	12.323	12.323	11.517	
3810.000	12.365	12.365	11.499	
3820.000	12.397	12.397	11.479	
3830.000	12.418	12.418	11.457	
3840.000	12.427	12.427	11.435	
3842.525	12.428	12.428	11.430	
3850.000	12.424	12.424	11.413	K=83.600 L=108.680
3855.065	12.418	12.418	11.402	
3860.000	12.410	12.410	11.392	
3870.000	12.383	12.383	11.370	
3880.000	12.344	12.344	11.348	
3890.000	12.293	12.293	11.327	
3900.000	12.230	12.230	11.305	

HORIZONTAL: L=2907.489

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

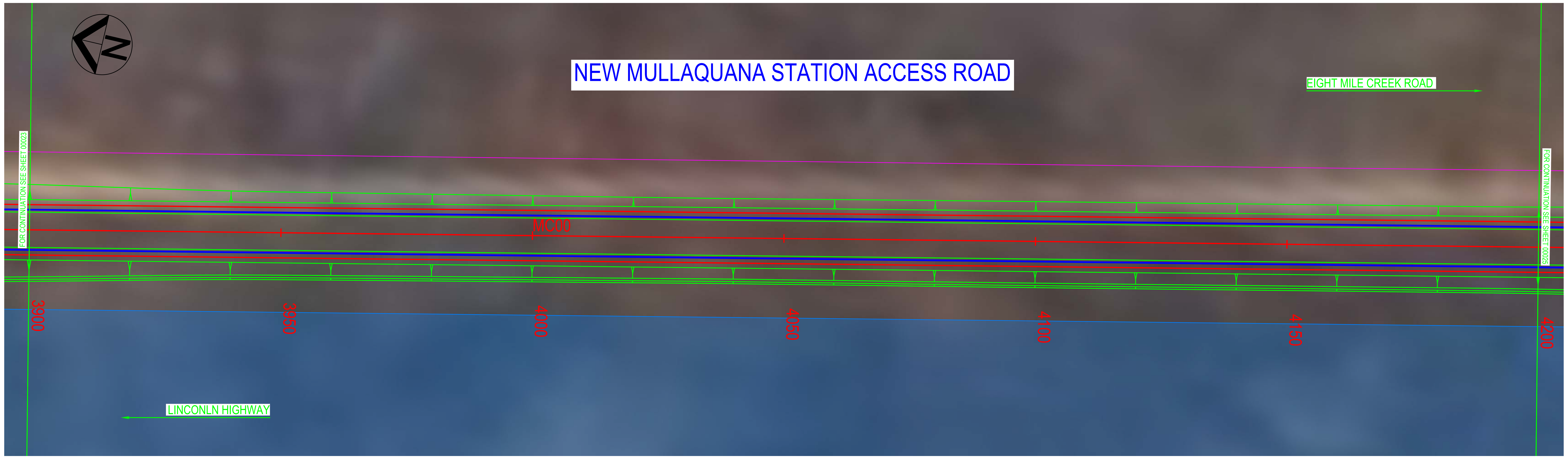
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 3600 TO CH 3900
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0023	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00023.DWG



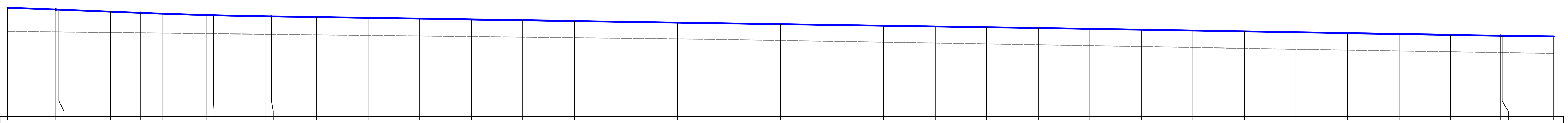
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 8.000



CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
3900.000	12.230	12.230	11.305
3909.405	12.160	12.160	11.284
3910.000	12.156	12.156	11.283
3920.000	12.076	12.076	11.261
3925.865	12.029	12.029	11.249
3930.000	11.997	11.997	11.240
3938.545	11.943	11.943	11.221
3940.000	11.935	11.935	11.218
3950.000	11.893	11.893	11.196
3951.226	11.889	11.889	11.194
3960.000	11.862	11.862	11.174
3970.000	11.832	11.832	11.153
3980.000	11.802	11.802	11.131
3990.000	11.771	11.771	11.109
4000.000	11.741	11.741	11.086
4010.000	11.711	11.711	11.063
4020.000	11.681	11.681	11.039
4030.000	11.650	11.650	11.016
4040.000	11.620	11.620	10.989
4050.000	11.590	11.590	10.954
4060.000	11.559	11.559	10.920
4070.000	11.529	11.529	10.886
4080.000	11.499	11.499	10.852
4090.000	11.469	11.469	10.818
4100.000	11.438	11.438	10.783
4110.000	11.405	11.405	10.749
4120.000	11.372	11.372	10.715
4130.000	11.338	11.338	10.680
4140.000	11.305	11.305	10.646
4150.000	11.272	11.272	10.613
4160.000	11.238	11.238	10.581
4170.000	11.205	11.205	10.548
4180.000	11.172	11.172	10.515
4189.613	11.140	11.140	10.484
4190.000	11.138	11.138	10.483
4200.000	11.116	11.116	10.450

HORIZONTAL: L=2907.489

VERTICAL: K=33.600 L=108.680; L=16.460 G=-0.800%; K=51.000 L=25.361; L=148.774 G=-0.303%; L=89.613 G=-0.333%; K=41.000 L=12.504

SCALES: H 10 0 5 10 15 20; V 2 0 1 2 3 4

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

SCALES: 10 0 5 10 15 20

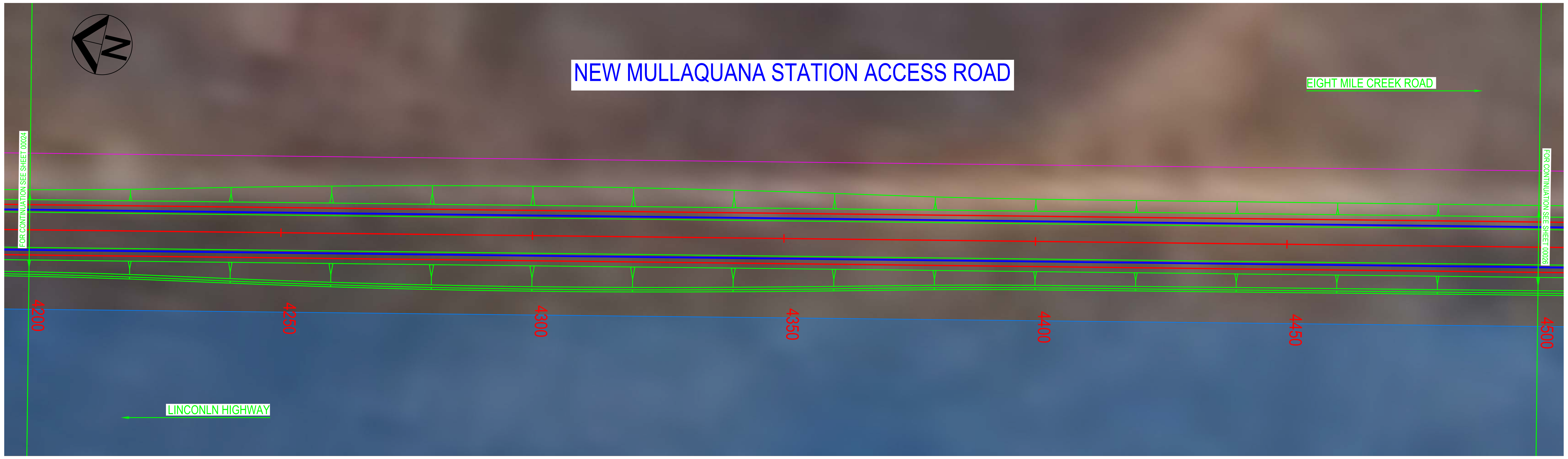
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 3900 TO CH 4200
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0024	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00024.DWG



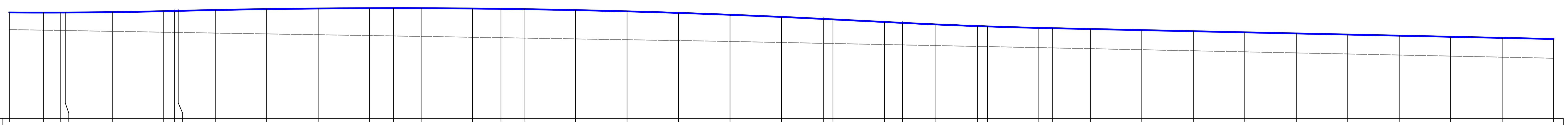
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 7.000



CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
4200.000	11.116	11.116	10.450
4206.618	11.111	11.111	10.428
4210.000	11.112	11.112	10.416
4210.865	11.113	11.113	10.413
4220.000	11.129	11.129	10.382
4230.000	11.165	11.165	10.349
4232.118	11.175	11.175	10.341
4232.806	11.178	11.178	10.339
4240.000	11.211	11.211	10.315
4250.000	11.247	11.247	10.282
4260.000	11.270	11.270	10.249
4270.000	11.282	11.282	10.217
4274.606	11.283	11.283	10.202
4280.000	11.281	11.281	10.185
4290.000	11.269	11.269	10.153
4295.506	11.257	11.257	10.135
4300.000	11.244	11.244	10.120
4310.000	11.208	11.208	10.088
4320.000	11.160	11.160	10.056
4330.000	11.099	11.099	10.023
4340.000	11.027	11.027	9.989
4350.000	10.943	10.943	9.949
4358.206	10.865	10.865	9.916
4360.000	10.847	10.847	9.909
4370.000	10.747	10.747	9.869
4373.496	10.712	10.712	9.854
4380.000	10.651	10.651	9.828
4388.056	10.587	10.588	9.796
4390.000	10.574	10.574	9.788
4400.000	10.516	10.516	9.748
4402.615	10.504	10.504	9.738
4410.000	10.472	10.472	9.708
4420.000	10.429	10.429	9.667
4430.000	10.386	10.386	9.626
4440.000	10.344	10.344	9.584
4450.000	10.301	10.301	9.543
4460.000	10.258	10.258	9.502
4470.000	10.215	10.215	9.460
4480.000	10.172	10.172	9.419
4490.000	10.129	10.129	9.378
4500.000	10.086	10.086	9.337

HORIZONTAL: L=2907.489

VERTICAL: K=51.000 L=42.504; L=0.688 G=0.500%; K=83.600 L=125.400; L=15.291 G=-1.000%; K=51.000 L=29.119; L=197.385 G=-0.429%

SCALES: 10 0 5 10 15 20 H; 2 0 1 2 3 4 V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

SCALES: 10 0 5 10 15 20

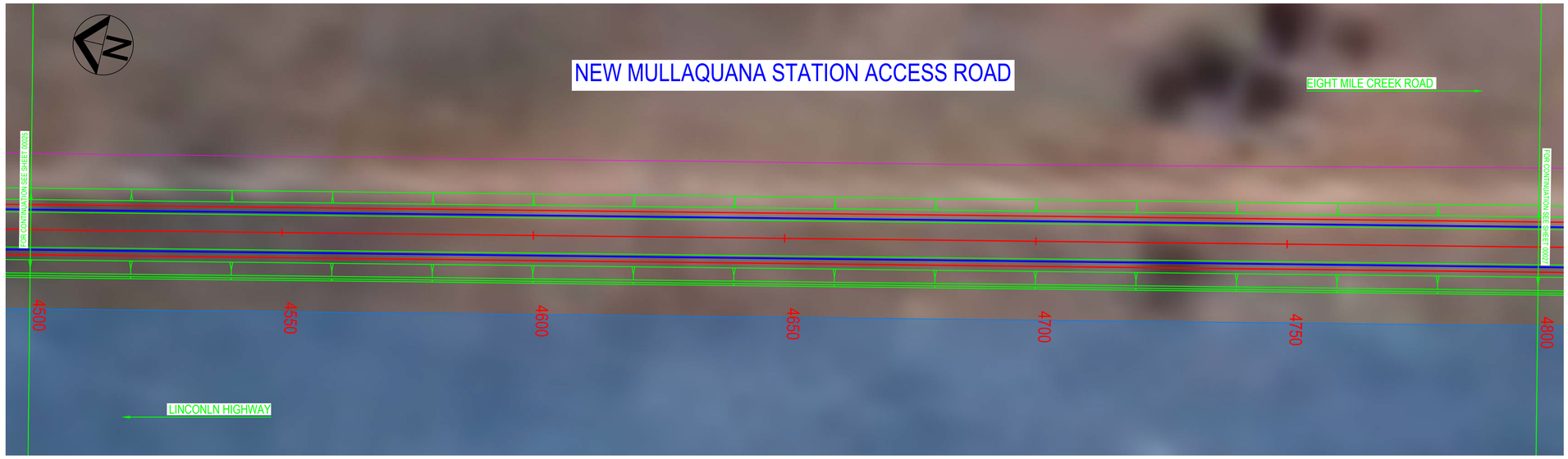
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 4200 TO CH 4500
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0025	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00025.DWG



LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 6.000

CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
4500.000	10.086	10.086	9.337
4510.000	10.043	10.043	9.296
4520.000	10.000	10.000	9.255
4530.000	9.957	9.957	9.215
4540.000	9.915	9.915	9.173
4550.000	9.872	9.872	9.132
4560.000	9.829	9.829	9.090
4570.000	9.786	9.786	9.048
4580.000	9.743	9.743	9.007
4590.000	9.700	9.700	8.962
4600.000	9.657	9.657	8.917
4610.000	9.612	9.612	8.872
4620.000	9.567	9.567	8.827
4630.000	9.522	9.522	8.782
4640.000	9.476	9.476	8.736
4650.000	9.431	9.431	8.691
4660.000	9.386	9.386	8.646
4670.000	9.341	9.341	8.601
4680.000	9.296	9.296	8.556
4690.000	9.251	9.251	8.511
4700.000	9.206	9.206	8.466
4710.000	9.160	9.160	8.420
4720.000	9.114	9.114	8.375
4730.000	9.069	9.069	8.330
4740.000	9.023	9.023	8.285
4750.000	8.978	8.978	8.240
4760.000	8.932	8.932	8.195
4770.000	8.886	8.886	8.149
4780.000	8.841	8.841	8.103
4790.000	8.795	8.795	8.056
4800.000	8.750	8.750	8.010

HORIZONTAL: L=2907.489

VERTICAL: L=197.385 G=-0.429%; L=100.000 G=-0.452%; L=100.000 G=-0.456%; L=100.000 G=-0.434%

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

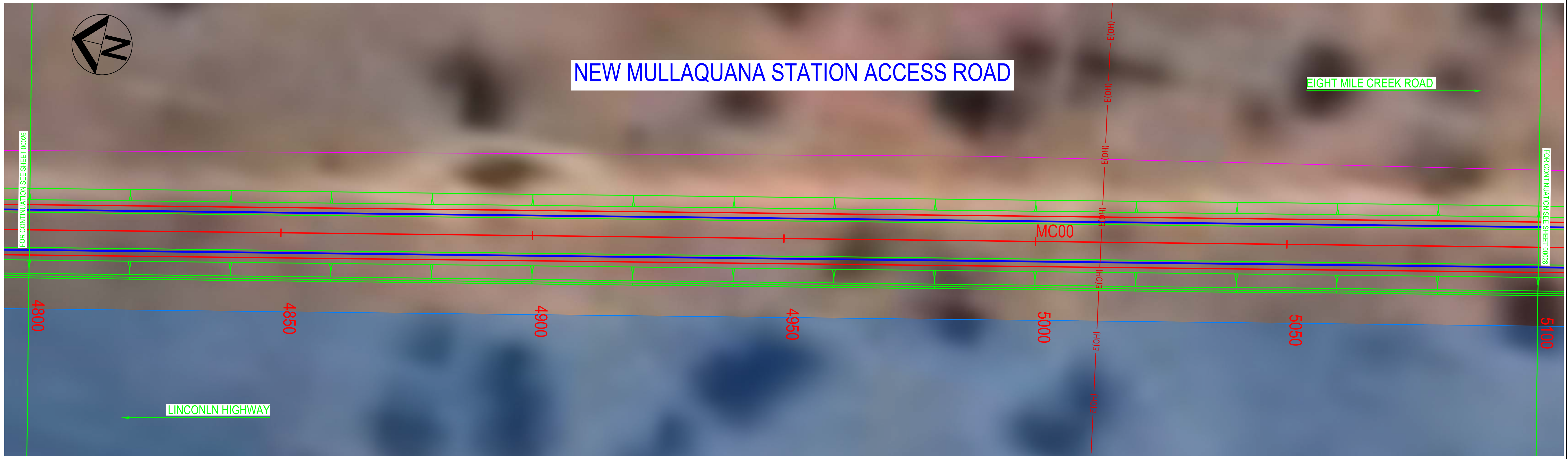
ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 4500 TO CH 4800
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0026	0A

CAD FILE NAME: 126076-GHD-10-00-DRG-CI-00026.DWG



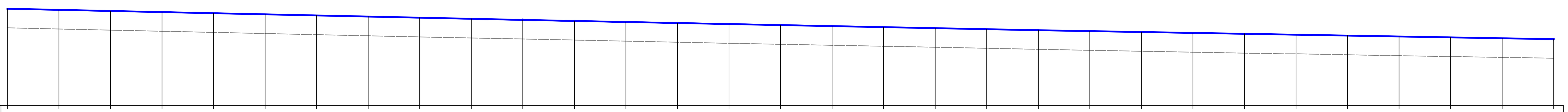
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
E(OH)	HIGH VOLTAGE OVERHEAD CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 5.000



REF. STRING MC00	8.750	8.706	8.663	8.620	8.576	8.533	8.490	8.446	8.403	8.360	8.316
DESIGN SURFACE	8.750	8.706	8.663	8.620	8.576	8.533	8.490	8.446	8.403	8.360	8.316
EXISTING SURFACE	8.010	7.964	7.919	7.876	7.832	7.788	7.744	7.700	7.656	7.615	7.576
HORIZONTAL											
VERTICAL	L=100.000 G=-0.456%					L=100.000 G=-0.434%					
CHAINAGE	4800.000	4810.000	4820.000	4830.000	4840.000	4850.000	4860.000	4870.000	4880.000	4890.000	4900.000

REF. STRING MC00	8.276	8.236	8.196	8.156	8.116	8.076	8.036	7.996	7.956	7.916
DESIGN SURFACE	8.276	8.236	8.196	8.156	8.116	8.076	8.036	7.996	7.956	7.916
EXISTING SURFACE	7.535	7.493	7.451	7.409	7.371	7.333	7.295	7.257	7.216	7.176
HORIZONTAL					L=2907.489					
VERTICAL					L=100.000 G=-0.400%					
CHAINAGE	4910.000	4920.000	4930.000	4940.000	4950.000	4960.000	4970.000	4980.000	4990.000	5000.000

REF. STRING MC00	7.881	7.847	7.812	7.778	7.743	7.708	7.674	7.639	7.604	7.570
DESIGN SURFACE	7.881	7.847	7.812	7.778	7.743	7.708	7.674	7.639	7.604	7.570
EXISTING SURFACE	7.138	7.101	7.064	7.027	7.000	6.963	6.927	6.895	6.862	6.830
HORIZONTAL										
VERTICAL					L=100.000 G=-0.346%					L=100.000 G=-0.330%
CHAINAGE	5010.000	5020.000	5030.000	5040.000	5050.000	5060.000	5070.000	5080.000	5090.000	5100.000

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

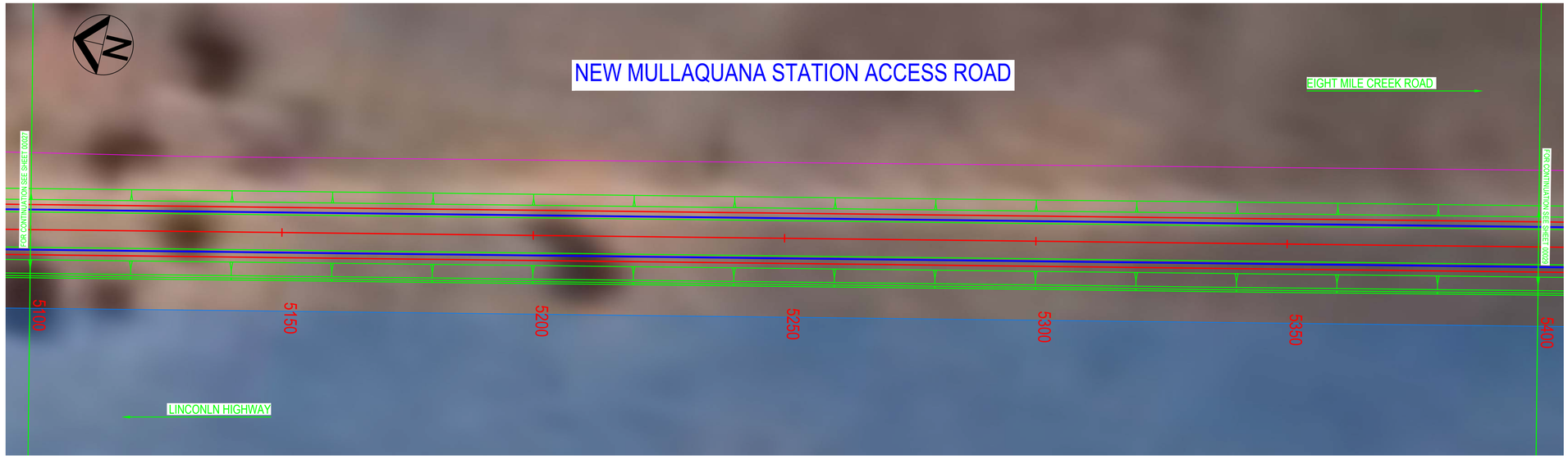
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 4800 TO CH 5100
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0027	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00027.DWG



LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 4.000

REF. STRING MC00	7.570	7.537	7.504	7.471	7.438	7.405	7.372	7.339	7.305	7.272	7.239	7.205	7.171	7.137	7.102	7.068	7.034	6.999	6.965	6.931	6.897	6.866	6.835	6.804	6.773	6.743	6.712	6.681	6.650	6.619	6.589
DESIGN SURFACE	7.570	7.537	7.504	7.471	7.438	7.405	7.372	7.339	7.305	7.272	7.239	7.205	7.171	7.137	7.102	7.068	7.034	6.999	6.965	6.931	6.897	6.866	6.835	6.804	6.773	6.743	6.712	6.681	6.650	6.619	6.589
EXISTING SURFACE	6.830	6.797	6.765	6.733	6.700	6.665	6.631	6.598	6.565	6.532	6.499	6.466	6.431	6.395	6.362	6.328	6.295	6.261	6.226	6.191	6.157	6.123	6.089	6.054	6.020	5.989	5.961	5.933	5.905	5.877	5.849
HORIZONTAL	L=2907.489																														
VERTICAL	L=100.000 G=-0.348%					L=100.000 G=-0.330%										L=100.000 G=-0.343%										L=100.000 G=-0.308%					L=95.293 G=-0.289%
CHAINAGE	5100.000	5110.000	5120.000	5130.000	5140.000	5150.000	5160.000	5170.000	5180.000	5190.000	5200.000	5210.000	5220.000	5230.000	5240.000	5250.000	5260.000	5270.000	5280.000	5290.000	5300.000	5310.000	5320.000	5330.000	5340.000	5350.000	5360.000	5370.000	5380.000	5390.000	5400.000

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

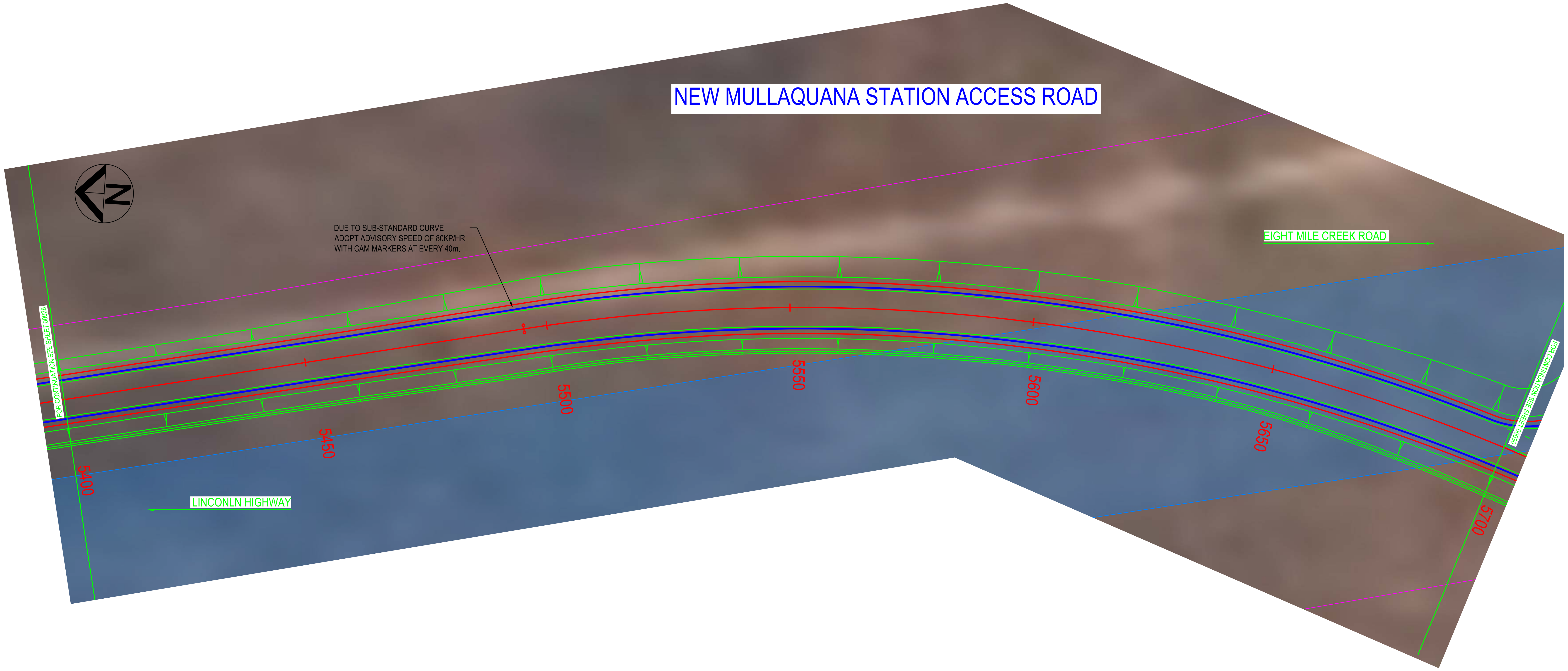
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 5100 TO CH 5400
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0028	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 126076-GHD-10-00-DRG-CI-00028.DWG



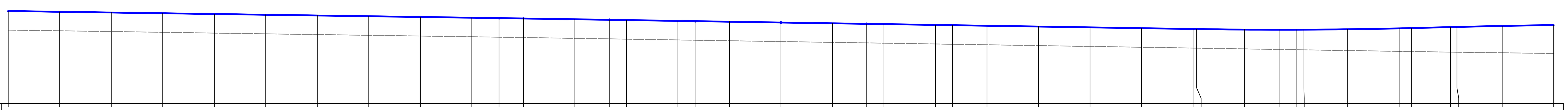
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 3.000



CHAINAGE	5400.000	5410.000	5420.000	5430.000	5440.000	5450.000	5460.000	5470.000	5480.000	5490.000	5495.283	5500.000	5510.000	5516.667
REF. STRING MC00	6.589	6.560	6.531	6.502	6.473	6.444	6.416	6.387	6.358	6.329	6.314	6.299	6.268	6.247
DESIGN SURFACE	6.589	6.560	6.531	6.502	6.473	6.444	6.416	6.387	6.358	6.329	6.314	6.299	6.268	6.247
EXISTING SURFACE	5.849	5.821	5.793	5.762	5.732	5.703	5.674	5.646	5.617	5.589	5.574	5.559	5.528	5.507

CHAINAGE	5520.000	5530.000	5533.333	5540.000	5550.000	5560.000	5566.667	5570.000	5580.000	5583.333	5590.000	5600.000	5610.000	5620.000
REF. STRING MC00	6.237	6.206	6.195	6.174	6.143	6.112	6.091	6.081	6.049	6.039	6.018	5.986	5.954	5.923
DESIGN SURFACE	6.237	6.206	6.195	6.174	6.143	6.112	6.091	6.081	6.049	6.039	6.018	5.986	5.954	5.923
EXISTING SURFACE	5.497	5.466	5.455	5.434	5.403	5.372	5.351	5.341	5.309	5.299	5.278	5.246	5.214	5.182

CHAINAGE	5630.000	5630.690	5640.000	5646.854	5650.000	5651.522	5660.000	5670.000	5672.354	5680.000	5681.213	5690.000	5700.000
REF. STRING MC00	5.891	5.889	5.868	5.863	5.864	5.865	5.880	5.916	5.927	5.965	5.971	6.010	6.044
DESIGN SURFACE	5.891	5.889	5.868	5.863	5.864	5.866	5.880	5.916	5.927	5.965	5.971	6.010	6.044
EXISTING SURFACE	5.150	5.148	5.117	5.095	5.085	5.081	5.054	5.023	5.015	4.993	4.990	4.966	4.940

HORIZONTAL: L=2907.489; R=375.000 L=533.049

VERTICAL: L=100.000 G=-0.308%; L=95.283 G=-0.289%; L=4.717 G=-0.308%; L=16.667 G=-0.310%; L=16.667 G=-0.313%; L=16.667 G=-0.315%; L=16.667 G=-0.310%; L=16.667 G=-0.314%; L=47.357 G=-0.317%; K=51.000 L=41.664; L=8.859 G=0.500%; K=83.600 L=75.240

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

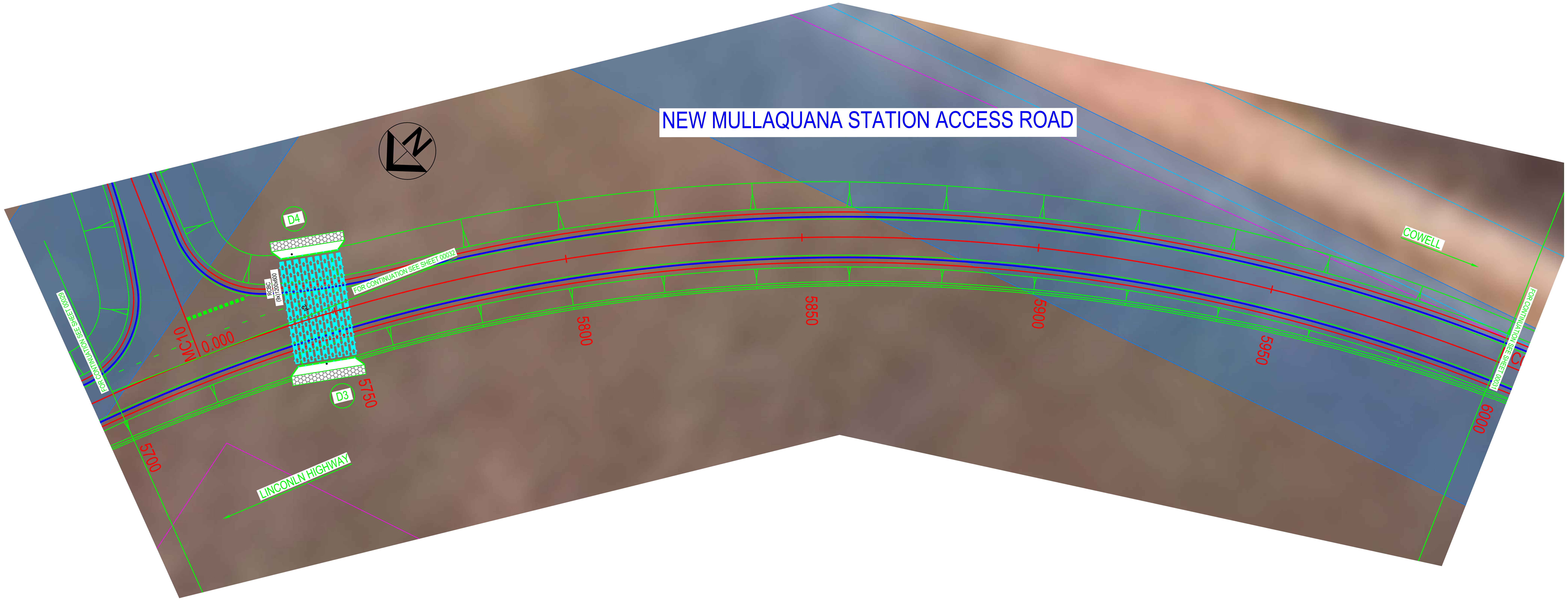
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 5400 TO CH 5700
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0029	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00029.DWG



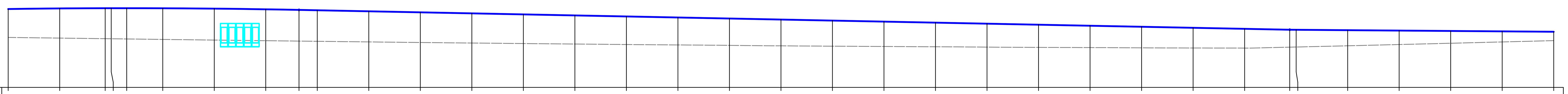
LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

REF. STRING MC00
DATUM R.L. = 3.000



CHAINAGE	REF. STRING MC00	DESIGN SURFACE	EXISTING SURFACE
5700.000	6.044	6.044	4.940
5710.000	6.065	6.065	4.914
5718.833	6.075	6.075	4.891
5720.000	6.075	6.075	4.888
5723.013	6.076	6.076	4.881
5730.000	6.073	6.073	4.863
5740.000	6.058	6.058	4.837
5750.000	6.032	6.032	4.813
5756.453	6.009	6.009	4.798
5760.000	5.995	5.994	4.789
5770.000	5.954	5.954	4.766
5780.000	5.915	5.914	4.743
5790.000	5.875	5.874	4.722
5800.000	5.835	5.834	4.703
5810.000	5.794	5.795	4.683
5820.000	5.755	5.754	4.664
5830.000	5.715	5.715	4.648
5840.000	5.675	5.674	4.632
5850.000	5.634	5.635	4.613
5860.000	5.595	5.594	4.600
5870.000	5.555	5.554	4.588
5880.000	5.515	5.514	4.578
5890.000	5.475	5.474	4.564
5900.000	5.434	5.435	4.553
5910.000	5.395	5.394	4.546
5920.000	5.355	5.355	4.535
5930.000	5.315	5.314	4.529
5940.000	5.274	5.274	4.526
5948.754	5.239	5.239	4.562
5950.000	5.238	5.238	4.568
5960.000	5.222	5.222	4.615
5970.000	5.207	5.207	4.664
5980.000	5.192	5.192	4.714
5990.000	5.177	5.177	4.765
6000.000	5.161	5.161	4.816

HORIZONTAL: R=375.000, L=533.049

VERTICAL: K=83.600, L=75.240; L=192.300, G=-0.400%; L=156.936, G=-0.153%

10 0 5 10 15 20 H
2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

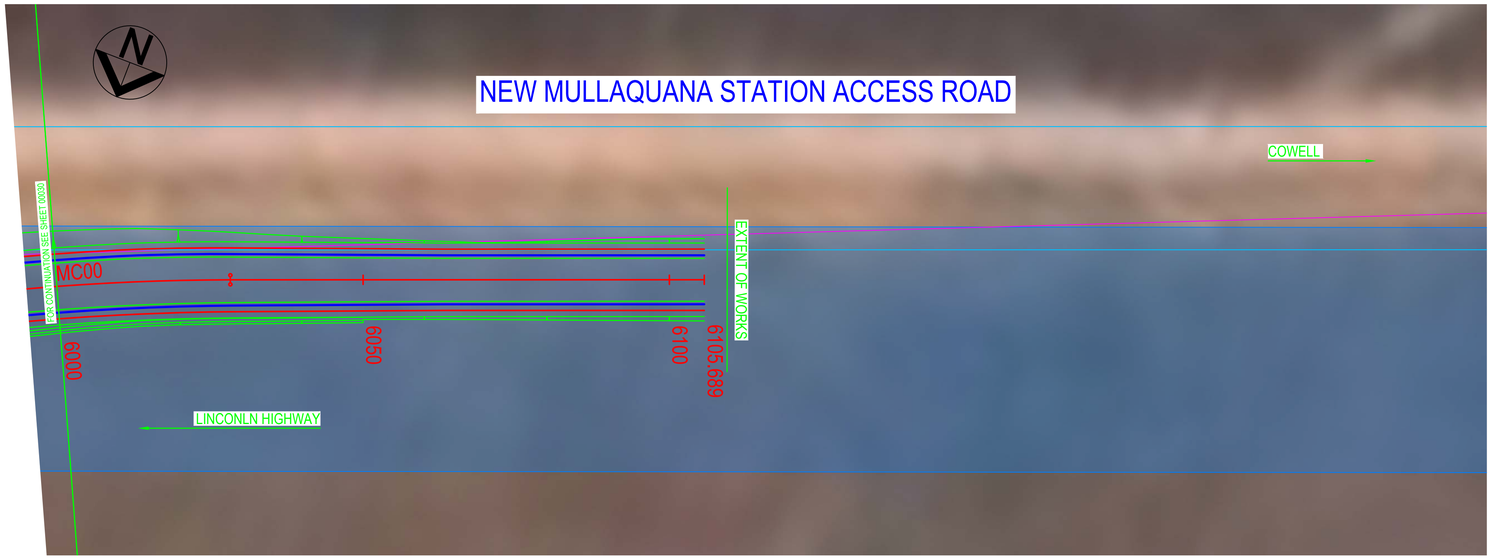
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 5700 TO CH 6000
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0030	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00030.DWG

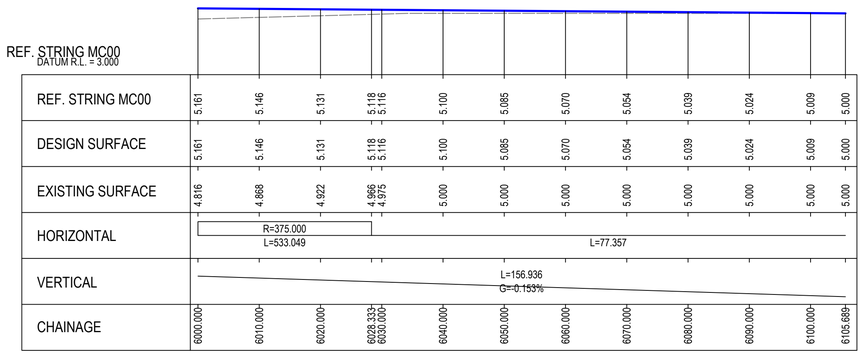


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



REF. STRING MC00	5.161	5.146	5.131	5.118 5.116	5.100	5.085	5.070	5.054	5.039	5.024	5.009	5.000
DESIGN SURFACE	5.161	5.146	5.131	5.118 5.116	5.100	5.085	5.070	5.054	5.039	5.024	5.009	5.000
EXISTING SURFACE	4.816	4.868	4.922	4.966 4.975	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
HORIZONTAL		R=375.000 L=533.049					L=77.357					
VERTICAL						L=156.936 G=-0.153%						
CHAINAGE	6000.000	6010.000	6020.000	6028.333 6030.000	6040.000	6050.000	6060.000	6070.000	6080.000	6090.000	6100.000	6105.689



SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

CONCEPT DESIGN

MC00; CH 6000 TO CH 6105.689

PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0031	0A

CAD FILE NAME: 126067 6-GHD-10-00-DRG-CI-00031.DWG

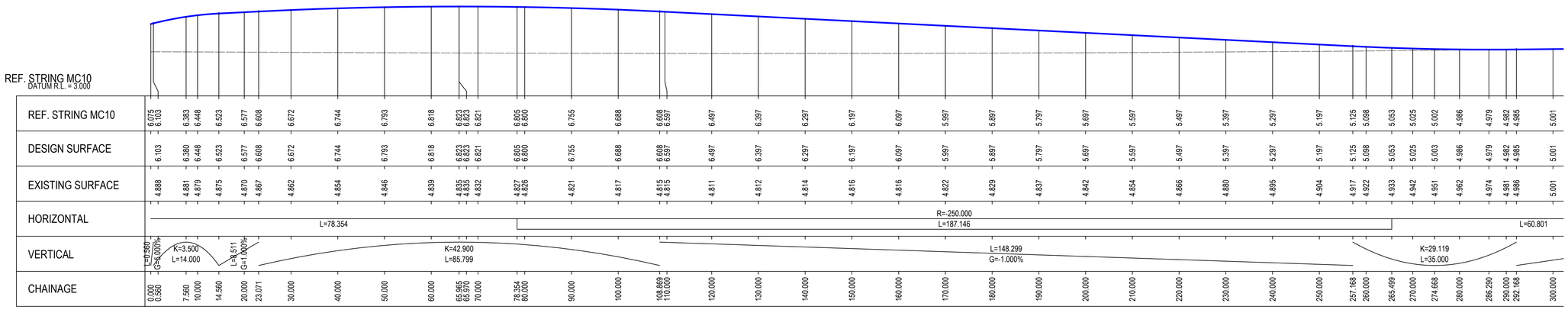


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



10 0 5 10 15 20 H

2 0 1 2 3 4 V

SCALES: 10 0 5 10 15 20

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

CONCEPT DESIGN

MC10; CH 0 TO 300

PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0032	0A

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CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00032.DWG

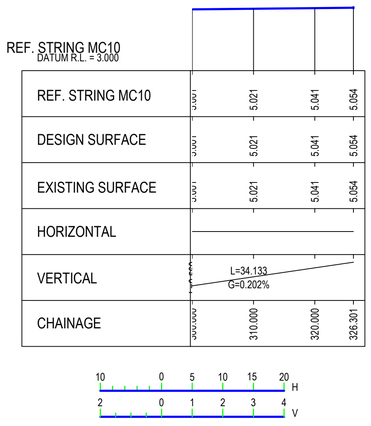


LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.



SCALES: 10 0 5 10 15 20

Government of South Australia

Department for Infrastructure and Transport

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

CONCEPT DESIGN

MC10; CH 300 TO 326.301

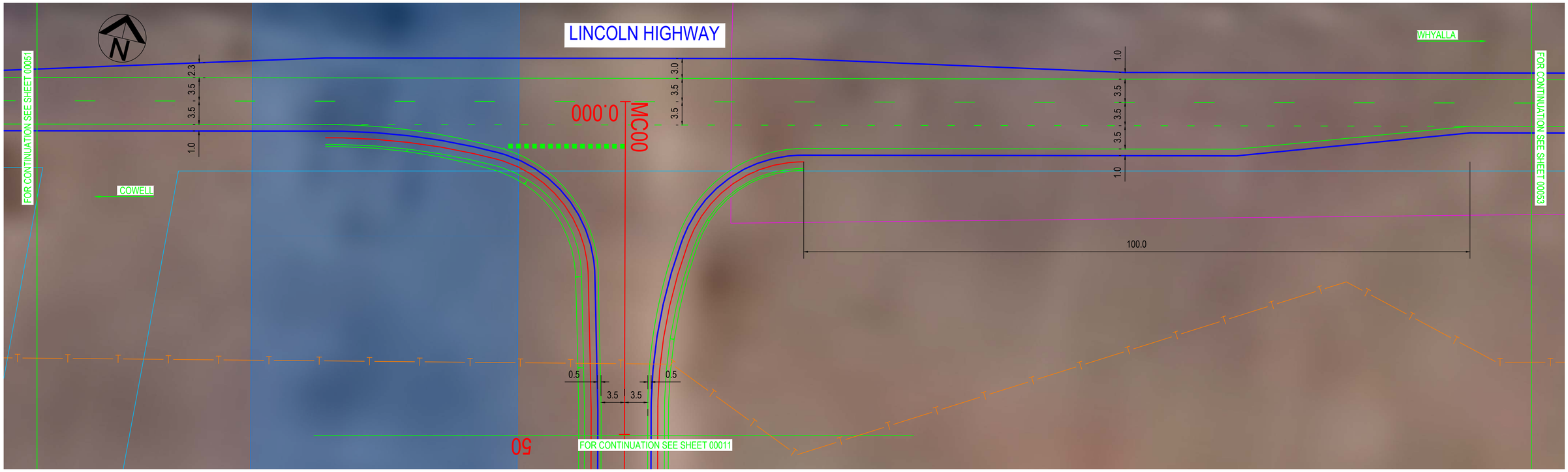
PLAN AND PROFILE

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0033	0A

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00033.DWG



LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

SCALES: 6 0 3 6 9 12

0A	CONCEPT DESIGN	GHD	24.04.26
1R	$0(1'0(17 '(6&5,37,21	%<	'$7(

*RYHUQPHQW RI 6RXWK $XVWUDOLD

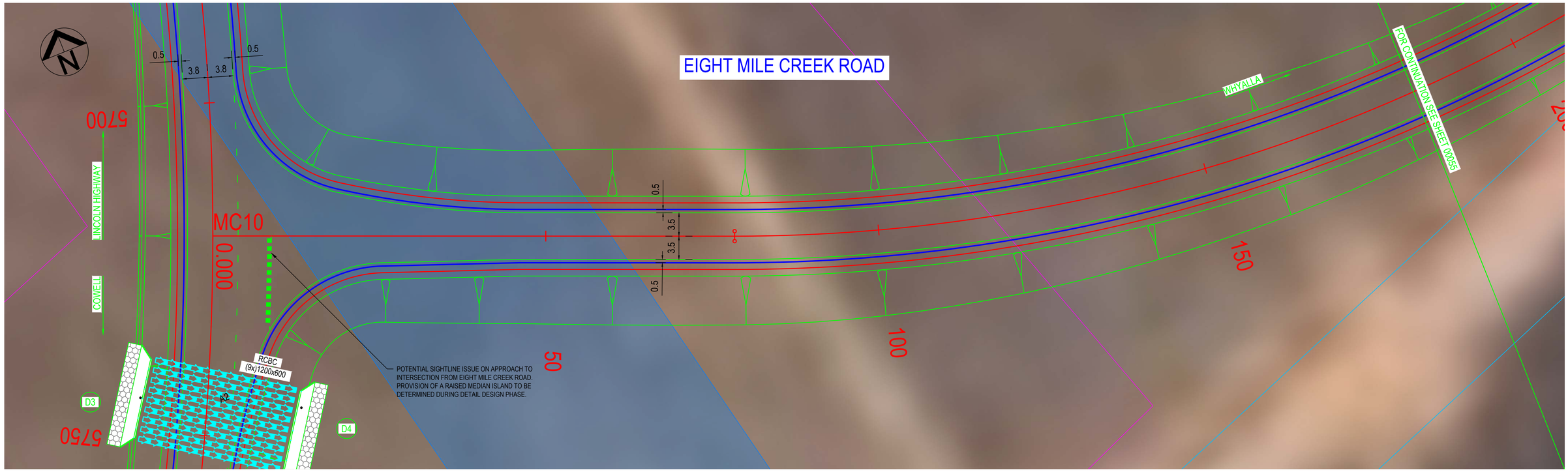
'HSDUWPHQW IRU 7UDQVSRUW DQG

52$' 1R ;;;;
08//$48$1$ 67$7,21 $&&(66 52$
&21&(37 '(6,*1
,17(56(&7,21 /$<2876

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
)	6 *	6 *		& ^ 06$5 6. ˘	$

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CAD FILE NAME: 1260676-GHD-DWG-CI-00052.DWG



LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

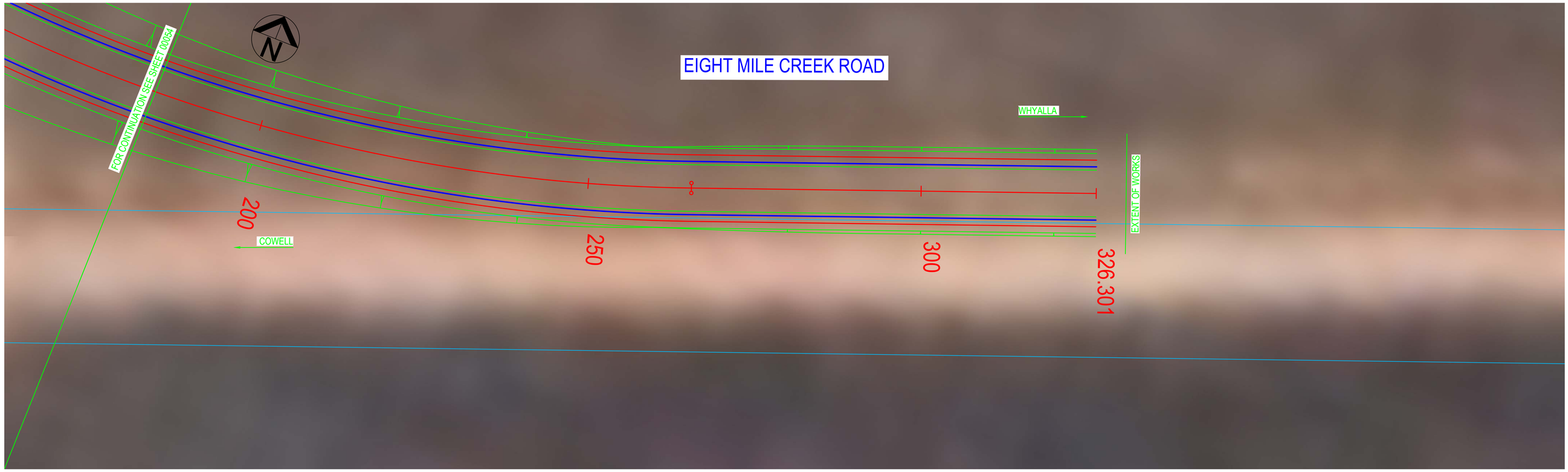
CONCEPT DESIGN

MC10; CH 0 TO CH 184

INTERSECTION LAYOUTS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0054	0A

CAD FILE NAME: 126076-GHD-10-00-DRG-CI-00054.DWG



LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE
	PROPERTY BOUNDARY
	PROJECT EXTENTS
T	TELSTRA CABLE
	TAIL OUT SWALE
	PROPOSED CULVERT
	HEADWALL WITH EROSION PROTECTION TREATMENT
D52	DRAINAGE STRUCTURE IDENTIFIER
	EASEMENT MAIN PIPELINE

GENERAL NOTES:

1. REFER SHEET 91 FOR PRELIMINARY PAVEMENT TREATMENT DETAILS.

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia

Department for Infrastructure and Transport

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

ROAD No. XXXX

MULLAQUANA STATION ACCESS ROAD

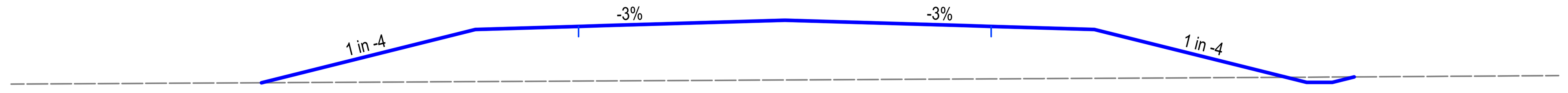
CONCEPT DESIGN

MC10; CH 184 TO CH 326.301

INTERSECTION LAYOUTS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
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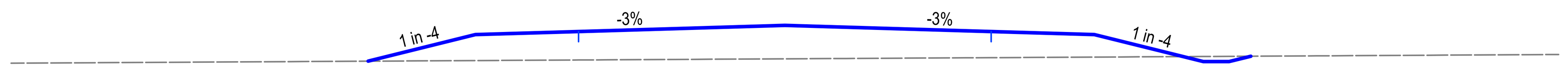
CAD FILE NAME: 126076-GHD-10-00-DRG-CI-00055.DWG



REF. STRING MC00
X = 727171.969
Y = 6338372.161
DATUM R.L. 17.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	19.377	20.414	20.444	20.474	20.489	20.594	20.489	20.474	20.444	20.414	19.385	19.385	19.491
EXISTING LEVELS	19.377	19.399	19.404	19.410	19.412	19.431	19.450	19.452	19.458	19.463	19.485	19.488	19.491
LEVEL DIFF.	0.000	1.015	1.039	1.064	1.076	1.163	1.039	1.021	0.986	0.951	-0.100	-0.103	0.000
HORIZ. OFFSET	-10.147	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	10.114	10.614	11.038

CHAINAGE 300



REF. STRING MC00
X = 727149.223
Y = 6338469.540
DATUM R.L. 17.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	19.710	20.229	20.259	20.289	20.304	20.409	20.304	20.289	20.259	20.229	19.701	19.701	19.807
EXISTING LEVELS	19.710	19.722	19.727	19.733	19.736	19.756	19.776	19.778	19.784	19.790	19.801	19.804	19.807
LEVEL DIFF.	0.000	0.508	0.532	0.556	0.568	0.654	0.529	0.511	0.475	0.440	-0.100	-0.103	0.000
HORIZ. OFFSET	-8.078	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.112	8.612	9.032

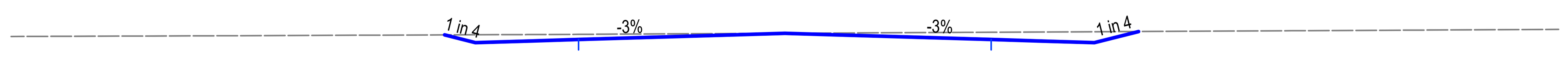
CHAINAGE 200



REF. STRING MC00
X = 727126.477
Y = 6338566.919
DATUM R.L. 17.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	IA0I
DESIGN LEVEL	20.069	19.948	19.978	20.008	20.023	20.128	20.023	20.008	19.978	19.948	20.138
EXISTING LEVELS	20.069	20.072	20.077	20.082	20.085	20.103	20.121	20.123	20.129	20.134	20.138
LEVEL DIFF.	0.000	-0.124	-0.100	-0.075	-0.062	0.025	-0.098	-0.116	-0.151	-0.186	0.000
HORIZ. OFFSET	-6.488	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	6.760

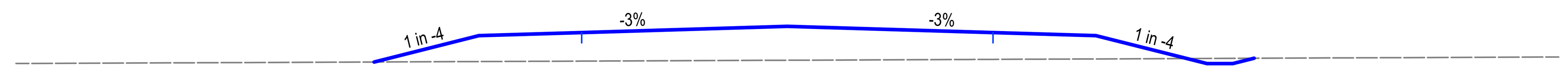
CHAINAGE 100



REF. STRING MC00
X = 727115.104
Y = 6338615.608
DATUM R.L. 18.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	IA0I
DESIGN LEVEL	20.229	20.080	20.110	20.140	20.155	20.260	20.155	20.140	20.110	20.080	20.295
EXISTING LEVELS	20.229	20.231	20.235	20.240	20.242	20.260	20.278	20.280	20.285	20.290	20.295
LEVEL DIFF.	0.000	-0.151	-0.125	-0.100	-0.087	0.000	-0.123	-0.140	-0.175	-0.210	0.000
HORIZ. OFFSET	-6.596	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	6.858

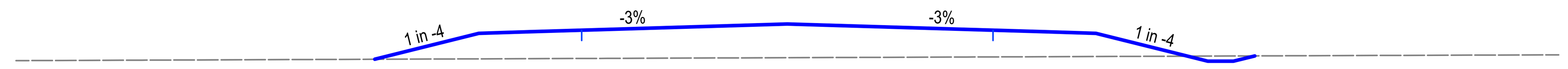
CHAINAGE 50



REF. STRING MC00
X = 727262.952
Y = 6337982.646
DATUM R.L. 16.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	18.596	19.105	19.135	19.165	19.180	19.285	19.180	19.165	19.135	19.105	18.565	18.565	18.669
EXISTING LEVELS	18.596	18.605	18.609	18.613	18.616	18.630	18.645	18.647	18.652	18.656	18.665	18.667	18.669
LEVEL DIFF.	0.000	0.500	0.526	0.552	0.565	0.655	0.535	0.518	0.484	0.450	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.036	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.162	8.662	9.078

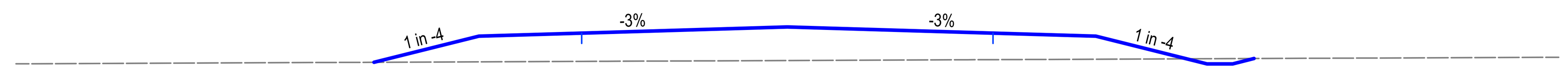
CHAINAGE 700



REF. STRING MC00
X = 727240.206
Y = 6338080.025
DATUM R.L. 16.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	18.929	19.434	19.464	19.494	19.509	19.614	19.509	19.494	19.464	19.434	18.891	18.891	18.994
EXISTING LEVELS	18.929	18.937	18.940	18.944	18.946	18.959	18.973	18.975	18.978	18.982	18.991	18.992	18.994
LEVEL DIFF.	0.000	0.498	0.524	0.550	0.563	0.655	0.537	0.520	0.486	0.452	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.022	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.175	8.675	9.089

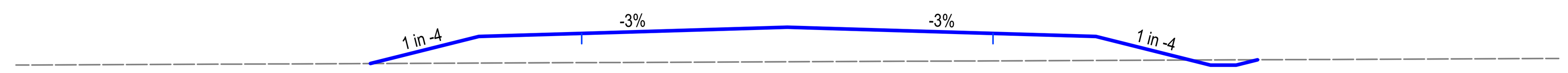
CHAINAGE 600



REF. STRING MC00
X = 727217.460
Y = 6338177.403
DATUM R.L. 17.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	19.206	19.715	19.745	19.775	19.790	19.895	19.790	19.775	19.745	19.715	19.175	19.175	19.279
EXISTING LEVELS	19.206	19.215	19.219	19.223	19.225	19.240	19.255	19.257	19.262	19.266	19.275	19.277	19.279
LEVEL DIFF.	0.000	0.501	0.526	0.552	0.565	0.655	0.535	0.518	0.484	0.449	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.038	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.160	8.660	9.076

CHAINAGE 500



REF. STRING MC00
X = 727194.715
Y = 6338274.782
DATUM R.L. 17.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	19.280	19.807	19.837	19.867	19.882	19.987	19.882	19.867	19.837	19.807	19.250	19.250	19.354
EXISTING LEVELS	19.280	19.289	19.293	19.297	19.300	19.315	19.330	19.332	19.336	19.340	19.350	19.352	19.354
LEVEL DIFF.	0.000	0.518	0.544	0.569	0.582	0.672	0.552	0.535	0.501	0.466	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.108	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.228	8.728	9.144

CHAINAGE 400

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

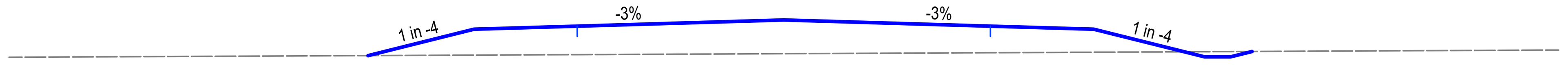
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 50 TO CH 700
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0061	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

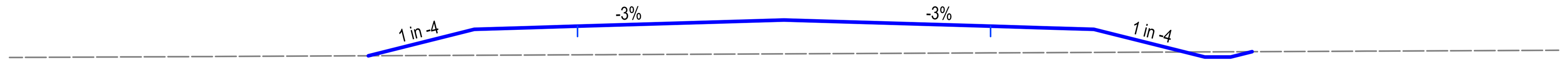
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00061.DWG



REF. STRING MC00
X = 727353.935
Y = 6337593.131
DATUM R.L. 15.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	17.717	18.230	18.260	18.290	18.305	18.410	18.305	18.290	18.260	18.230	17.693	17.693	17.798
EXISTING LEVELS	17.717	17.727	17.732	17.736	17.739	17.755	17.771	17.774	17.778	17.783	17.793	17.796	17.798
LEVEL DIFF.	0.000	0.503	0.528	0.554	0.566	0.655	0.534	0.516	0.482	0.447	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.051	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.147	8.647	9.065

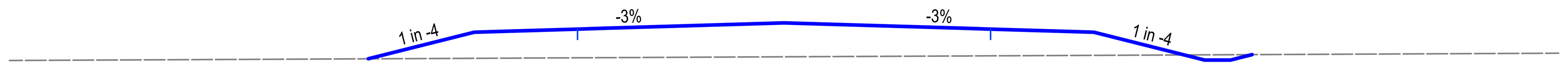
CHAINAGE 1100



REF. STRING MC00
X = 727331.189
Y = 6337690.509
DATUM R.L. 15.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	17.910	18.422	18.452	18.482	18.497	18.602	18.497	18.482	18.452	18.422	17.885	17.885	17.990
EXISTING LEVELS	17.910	17.919	17.924	17.929	17.931	17.947	17.964	17.966	17.971	17.975	17.985	17.988	17.990
LEVEL DIFF.	0.000	0.503	0.528	0.554	0.566	0.655	0.534	0.516	0.482	0.447	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.050	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.148	8.648	9.065

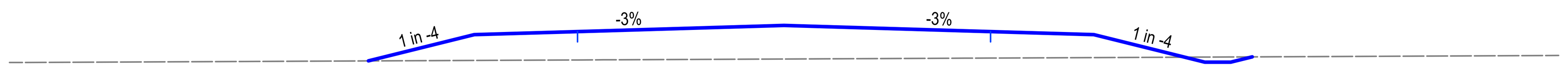
CHAINAGE 1000



REF. STRING MC00
X = 727308.444
Y = 6337787.888
DATUM R.L. 16.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	18.112	18.625	18.655	18.685	18.700	18.805	18.700	18.685	18.655	18.625	18.088	18.088	18.193
EXISTING LEVELS	18.112	18.122	18.127	18.131	18.134	18.150	18.166	18.169	18.174	18.178	18.188	18.191	18.193
LEVEL DIFF.	0.000	0.503	0.528	0.554	0.566	0.655	0.534	0.516	0.482	0.447	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.051	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.147	8.647	9.064

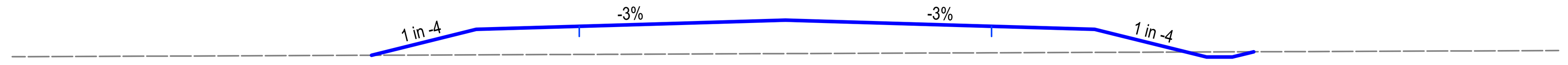
CHAINAGE 900



REF. STRING MC00
X = 727285.698
Y = 6337885.267
DATUM R.L. 16.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	18.327	18.839	18.869	18.899	18.914	19.019	18.914	18.899	18.869	18.839	18.301	18.301	18.406
EXISTING LEVELS	18.327	18.336	18.341	18.345	18.348	18.364	18.380	18.382	18.387	18.391	18.401	18.404	18.406
LEVEL DIFF.	0.000	0.503	0.528	0.553	0.566	0.655	0.534	0.517	0.482	0.447	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.049	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.149	8.649	9.066

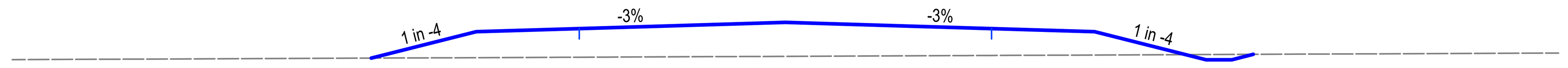
CHAINAGE 800



REF. STRING MC00
X = 727444.918
Y = 6337203.615
DATUM R.L. 14.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	16.684	17.192	17.222	17.252	17.267	17.372	17.267	17.252	17.222	17.192	16.649	16.649	16.753
EXISTING LEVELS	16.684	16.692	16.696	16.700	16.702	16.717	16.730	16.732	16.736	16.740	16.749	16.751	16.753
LEVEL DIFF.	0.000	0.499	0.525	0.551	0.564	0.655	0.536	0.519	0.485	0.451	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.030	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.171	8.671	9.085

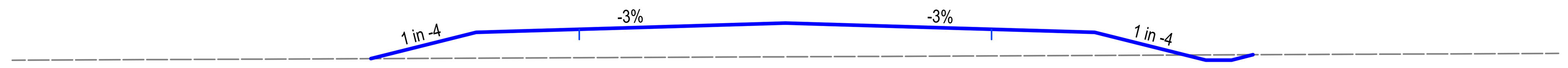
CHAINAGE 1500



REF. STRING MC00
X = 727422.173
Y = 6337300.994
DATUM R.L. 14.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	16.984	17.493	17.523	17.553	17.568	17.673	17.568	17.553	17.523	17.493	16.953	16.953	17.057
EXISTING LEVELS	16.984	16.993	16.997	17.001	17.004	17.018	17.033	17.035	17.040	17.044	17.053	17.055	17.057
LEVEL DIFF.	0.000	0.500	0.526	0.552	0.565	0.655	0.535	0.518	0.484	0.450	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.036	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.161	8.661	9.077

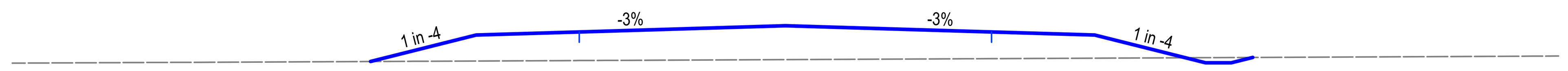
CHAINAGE 1400



REF. STRING MC00
X = 727399.427
Y = 6337398.373
DATUM R.L. 15.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	17.260	17.771	17.801	17.831	17.846	17.951	17.846	17.831	17.801	17.771	17.232	17.232	17.336
EXISTING LEVELS	17.260	17.269	17.273	17.278	17.280	17.296	17.311	17.313	17.318	17.322	17.332	17.334	17.336
LEVEL DIFF.	0.000	0.502	0.527	0.553	0.565	0.655	0.535	0.517	0.483	0.448	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.042	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.156	8.656	9.072

CHAINAGE 1300



REF. STRING MC00
X = 727376.681
Y = 6337495.752
DATUM R.L. 15.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	17.507	18.019	18.049	18.079	18.094	18.199	18.094	18.079	18.049	18.019	17.481	17.481	17.586
EXISTING LEVELS	17.507	17.516	17.521	17.525	17.528	17.544	17.560	17.562	17.567	17.572	17.581	17.584	17.586
LEVEL DIFF.	0.000	0.503	0.528	0.553	0.566	0.655	0.534	0.517	0.482	0.447	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.048	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.150	8.650	9.067

CHAINAGE 1200

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

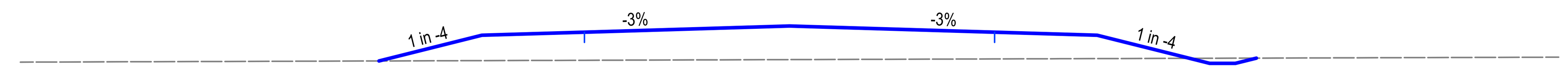
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 800 TO CH 1500
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0062	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

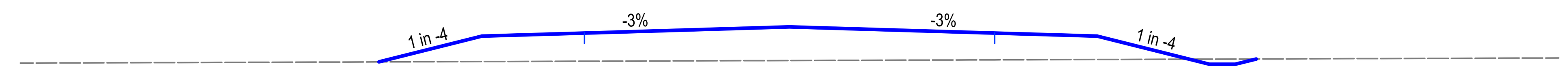
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00062.DWG



REF. STRING MC00
X = 727535.902
Y = 6336814.100
DATUM R.L. 13.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	15.299	15.800	15.830	15.860	15.875	15.980	15.875	15.860	15.830	15.800	15.252	15.252	15.355
EXISTING LEVELS	15.299	15.306	15.309	15.312	15.314	15.325	15.337	15.339	15.342	15.345	15.352	15.353	15.355
LEVEL DIFF.	0.000	0.495	0.521	0.548	0.561	0.655	0.539	0.522	0.489	0.455	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.005	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.195	8.695	9.106

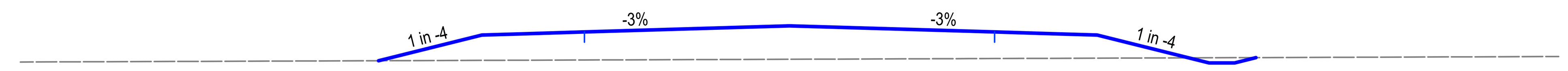
CHAINAGE 1900



REF. STRING MC00
X = 727513.156
Y = 6336911.479
DATUM R.L. 13.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	15.665	16.166	16.196	16.226	16.241	16.346	16.241	16.226	16.196	16.166	15.619	15.619	15.722
EXISTING LEVELS	15.665	15.671	15.675	15.678	15.680	15.691	15.703	15.705	15.708	15.711	15.719	15.720	15.722
LEVEL DIFF.	0.000	0.495	0.522	0.548	0.562	0.655	0.538	0.522	0.488	0.455	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.007	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.191	8.691	9.103

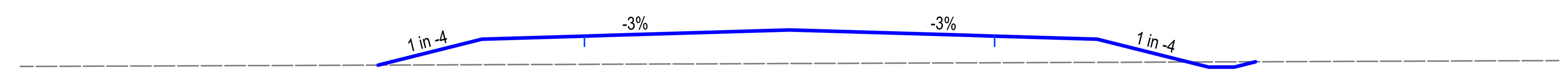
CHAINAGE 1800



REF. STRING MC00
X = 727490.410
Y = 6337008.858
DATUM R.L. 13.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	16.020	16.524	16.554	16.584	16.599	16.704	16.599	16.584	16.554	16.524	15.978	15.978	16.081
EXISTING LEVELS	16.020	16.027	16.031	16.035	16.036	16.049	16.061	16.063	16.067	16.070	16.078	16.080	16.081
LEVEL DIFF.	0.000	0.496	0.523	0.549	0.563	0.655	0.537	0.521	0.487	0.454	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.015	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.183	8.683	9.096

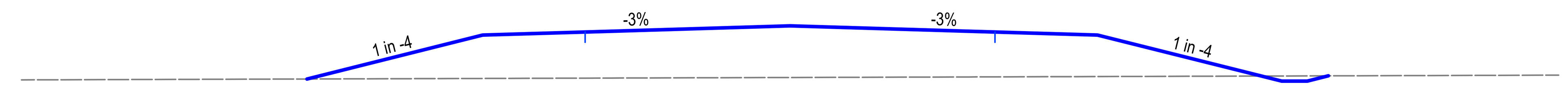
CHAINAGE 1700



REF. STRING MC00
X = 727467.664
Y = 6337106.237
DATUM R.L. 14.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	16.360	16.865	16.895	16.925	16.940	17.045	16.940	16.925	16.895	16.865	16.321	16.321	16.425
EXISTING LEVELS	16.360	16.367	16.371	16.375	16.377	16.390	16.404	16.406	16.409	16.413	16.421	16.423	16.425
LEVEL DIFF.	0.000	0.498	0.524	0.550	0.563	0.655	0.537	0.520	0.486	0.452	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.023	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.175	8.675	9.089

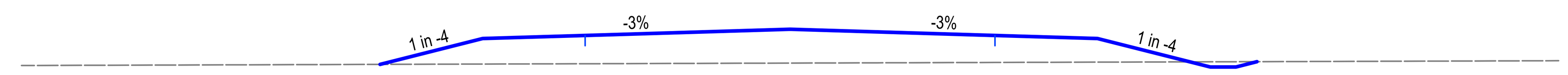
CHAINAGE 1600



REF. STRING MC00
X = 727626.830
Y = 6336424.572
DATUM R.L. 11.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	13.793	14.650	14.680	14.710	14.725	14.830	14.725	14.710	14.680	14.650	13.752	13.752	13.854
EXISTING LEVELS	13.793	13.804	13.807	13.810	13.811	13.822	13.833	13.834	13.837	13.841	13.852	13.853	13.854
LEVEL DIFF.	0.000	0.847	0.874	0.901	0.914	1.008	0.893	0.876	0.843	0.810	-0.100	-0.102	0.000
HORIZ. OFFSET	-9.430	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	9.595	10.095	10.506

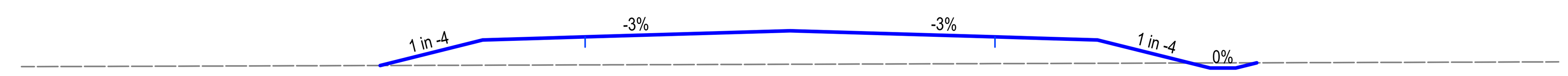
CHAINAGE 2300



REF. STRING MC00
X = 727604.139
Y = 6336521.964
DATUM R.L. 12.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	14.173	14.674	14.704	14.734	14.749	14.854	14.749	14.734	14.704	14.674	14.123	14.123	14.226
EXISTING LEVELS	14.173	14.179	14.183	14.186	14.187	14.198	14.209	14.210	14.213	14.216	14.223	14.225	14.226
LEVEL DIFF.	0.000	0.494	0.521	0.548	0.562	0.656	0.540	0.523	0.490	0.457	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.002	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.203	8.703	9.114

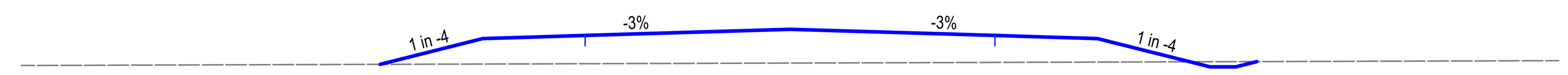
CHAINAGE 2200



REF. STRING MC00
X = 727581.393
Y = 6336619.343
DATUM R.L. 12.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	14.549	15.049	15.079	15.109	15.124	15.229	15.124	15.109	15.079	15.049	14.500	14.500	14.603
EXISTING LEVELS	14.549	14.556	14.559	14.562	14.563	14.574	14.585	14.587	14.590	14.593	14.600	14.601	14.603
LEVEL DIFF.	0.000	0.494	0.521	0.547	0.561	0.655	0.539	0.523	0.489	0.456	-0.100	-0.102	0.000
HORIZ. OFFSET	-7.999	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.198	8.698	9.109

CHAINAGE 2100



REF. STRING MC00
X = 727558.647
Y = 6336716.722
DATUM R.L. 12.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	14.926	15.426	15.456	15.486	15.501	15.606	15.501	15.486	15.456	15.426	14.877	14.877	14.980
EXISTING LEVELS	14.926	14.933	14.936	14.939	14.940	14.951	14.962	14.964	14.967	14.970	14.977	14.978	14.980
LEVEL DIFF.	0.000	0.494	0.521	0.547	0.561	0.655	0.539	0.523	0.489	0.456	-0.100	-0.102	0.000
HORIZ. OFFSET	-7.999	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.198	8.698	9.110

CHAINAGE 2000

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

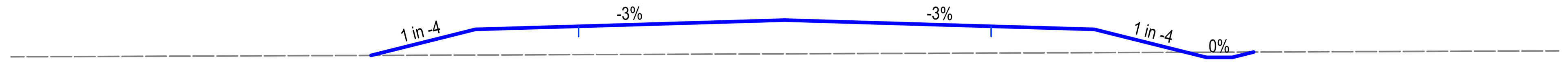
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 1600 TO CH 2300
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0063	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE ◄ 100 MILLIMETRES ON ORIGINAL DRAWING ► UNCONTROLLED COPY WHEN PRINTED

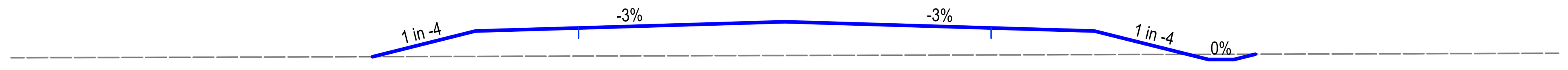
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00063.DWG



REF. STRING MC00
X = 727714.666
Y = 6336034.337
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.609	13.115	13.145	13.175	13.190	13.295	13.190	13.175	13.145	13.115	12.571	12.571	12.675
EXISTING LEVELS	12.609	12.617	12.620	12.624	12.626	12.640	12.653	12.655	12.659	12.663	12.671	12.673	12.675
LEVEL DIFF.	0.000	0.498	0.524	0.550	0.563	0.655	0.537	0.520	0.486	0.452	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.024	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.174	8.674	9.088

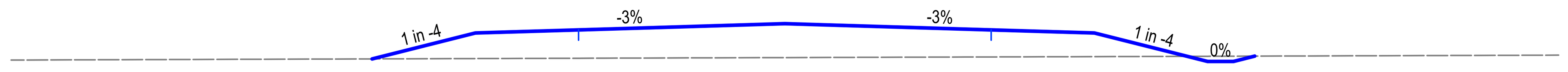
CHAINAGE 2700



REF. STRING MC00
X = 727693.043
Y = 6336131.972
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.801	13.299	13.329	13.359	13.374	13.479	13.374	13.359	13.329	13.299	12.747	12.747	12.850
EXISTING LEVELS	12.801	12.807	12.810	12.813	12.814	12.824	12.834	12.836	12.838	12.841	12.847	12.849	12.850
LEVEL DIFF.	0.000	0.493	0.520	0.547	0.560	0.655	0.540	0.524	0.491	0.458	-0.100	-0.101	0.000
HORIZ. OFFSET	-7.994	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.209	8.709	9.119

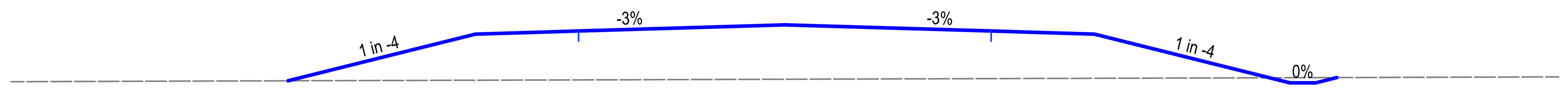
CHAINAGE 2600



REF. STRING MC00
X = 727671.296
Y = 6336229.578
DATUM R.L. 11.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	13.055	13.556	13.586	13.616	13.631	13.736	13.631	13.616	13.586	13.556	13.006	13.006	13.109
EXISTING LEVELS	13.055	13.062	13.065	13.068	13.069	13.081	13.091	13.093	13.096	13.099	13.106	13.108	13.109
LEVEL DIFF.	0.000	0.494	0.521	0.548	0.561	0.655	0.539	0.523	0.490	0.456	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.001	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.198	8.698	9.110

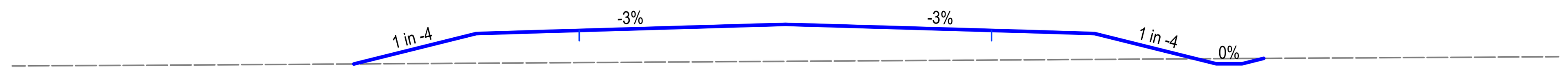
CHAINAGE 2500



REF. STRING MC00
X = 727649.226
Y = 6336327.113
DATUM R.L. 11.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	13.418	14.327	14.357	14.387	14.402	14.507	14.402	14.387	14.357	14.327	13.379	13.379	13.482
EXISTING LEVELS	13.418	13.430	13.433	13.436	13.437	13.448	13.459	13.461	13.464	13.467	13.479	13.480	13.482
LEVEL DIFF.	0.000	0.897	0.924	0.951	0.964	1.058	0.942	0.926	0.893	0.859	-0.100	-0.102	0.000
HORIZ. OFFSET	-9.634	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	9.791	10.291	10.702

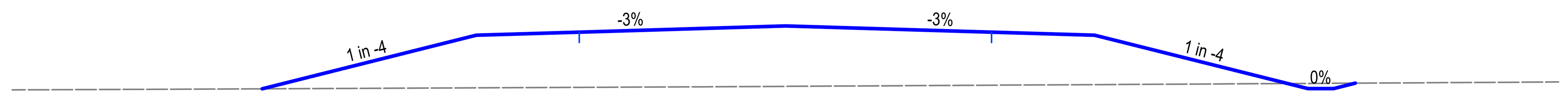
CHAINAGE 2400



REF. STRING MC00
X = 727801.154
Y = 6335643.800
DATUM R.L. 9.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.025	12.618	12.648	12.678	12.693	12.798	12.693	12.678	12.648	12.618	12.029	12.029	12.135
EXISTING LEVELS	12.025	12.040	12.046	12.052	12.055	12.077	12.099	12.102	12.108	12.114	12.129	12.132	12.135
LEVEL DIFF.	0.000	0.579	0.602	0.626	0.638	0.721	0.595	0.577	0.540	0.504	-0.100	-0.103	0.000
HORIZ. OFFSET	-8.373	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.358	8.858	9.281

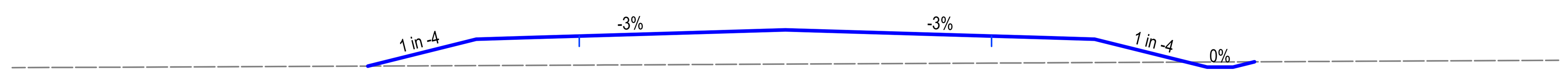
CHAINAGE 3100



REF. STRING MC00
X = 727779.532
Y = 6335741.434
DATUM R.L. 9.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	11.962	13.000	13.030	13.060	13.075	13.180	13.075	13.060	13.030	13.000	11.966	11.966	12.071
EXISTING LEVELS	11.962	11.981	11.985	11.989	11.992	12.009	12.029	12.032	12.037	12.043	12.066	12.069	12.071
LEVEL DIFF.	0.000	1.019	1.045	1.070	1.083	1.171	1.046	1.028	0.993	0.957	-0.100	-0.103	0.000
HORIZ. OFFSET	-10.151	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	10.135	10.635	11.056

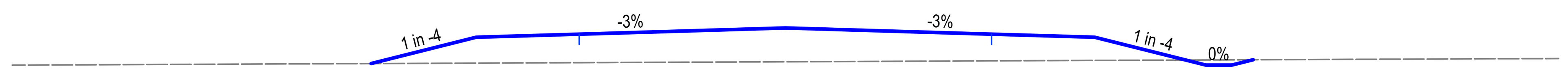
CHAINAGE 3000



REF. STRING MC00
X = 727757.910
Y = 6335839.069
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.144	12.670	12.700	12.730	12.745	12.850	12.745	12.730	12.700	12.670	12.124	12.124	12.229
EXISTING LEVELS	12.144	12.154	12.159	12.164	12.166	12.184	12.201	12.204	12.209	12.213	12.224	12.227	12.229
LEVEL DIFF.	0.000	0.516	0.541	0.566	0.579	0.666	0.544	0.526	0.491	0.456	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.103	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.183	8.683	9.101

CHAINAGE 2900



REF. STRING MC00
X = 727736.288
Y = 6335936.703
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.395	12.905	12.935	12.965	12.980	13.085	12.980	12.965	12.935	12.905	12.365	12.365	12.469
EXISTING LEVELS	12.395	12.404	12.408	12.412	12.415	12.430	12.445	12.447	12.451	12.456	12.465	12.467	12.469
LEVEL DIFF.	0.000	0.501	0.527	0.552	0.565	0.655	0.535	0.518	0.483	0.449	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.039	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.159	8.659	9.075

CHAINAGE 2800

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

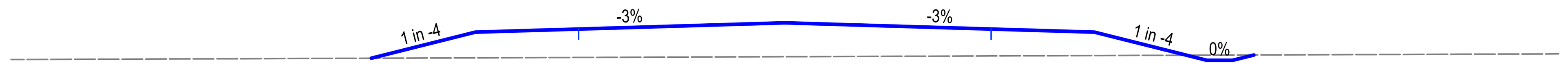
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 2400 TO CH 3100
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0064	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

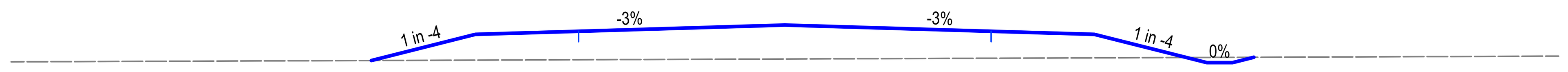
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00064.DWG



REF. STRING MC00
X = 727887.642
Y = 6335253.262
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.180	12.684	12.714	12.744	12.759	12.864	12.759	12.744	12.714	12.684	12.139	12.139	12.243
EXISTING LEVELS	12.180	12.187	12.191	12.195	12.196	12.209	12.222	12.224	12.228	12.231	12.239	12.241	12.243
LEVEL DIFF.	0.000	0.497	0.523	0.550	0.563	0.655	0.537	0.520	0.487	0.453	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.017	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.180	8.680	9.094

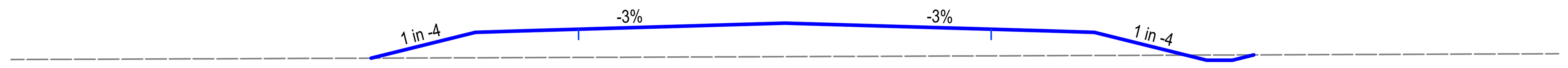
CHAINAGE 3500



REF. STRING MC00
X = 727866.020
Y = 6335350.896
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.355	12.859	12.889	12.919	12.934	13.039	12.934	12.919	12.889	12.859	12.314	12.314	12.418
EXISTING LEVELS	12.355	12.362	12.366	12.370	12.371	12.384	12.397	12.399	12.403	12.406	12.414	12.416	12.418
LEVEL DIFF.	0.000	0.497	0.523	0.550	0.563	0.655	0.537	0.520	0.487	0.453	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.017	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.180	8.680	9.094

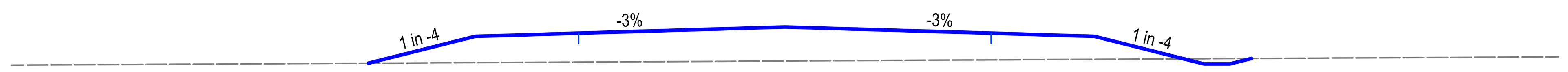
CHAINAGE 3400



REF. STRING MC00
X = 727844.398
Y = 6335448.531
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.462	12.967	12.997	13.027	13.042	13.147	13.042	13.027	12.997	12.967	12.423	12.423	12.526
EXISTING LEVELS	12.462	12.470	12.473	12.477	12.479	12.492	12.505	12.507	12.511	12.515	12.523	12.525	12.526
LEVEL DIFF.	0.000	0.498	0.524	0.550	0.563	0.655	0.537	0.520	0.486	0.452	-0.100	-0.102	0.000
HORIZ. OFFSET	-8.021	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.177	8.677	9.091

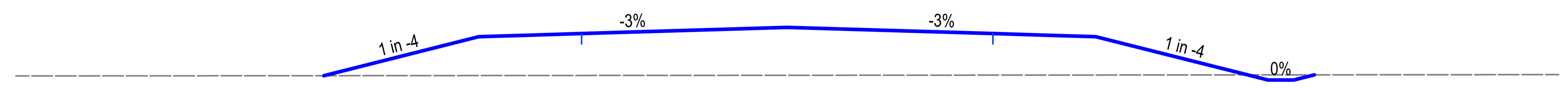
CHAINAGE 3300



REF. STRING MC00
X = 727822.776
Y = 6335546.165
DATUM R.L. 10.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.303	12.821	12.851	12.881	12.896	13.001	12.896	12.881	12.851	12.821	12.289	12.289	12.394
EXISTING LEVELS	12.303	12.314	12.319	12.325	12.327	12.346	12.365	12.367	12.373	12.378	12.389	12.392	12.394
LEVEL DIFF.	0.000	0.507	0.532	0.556	0.569	0.655	0.531	0.514	0.478	0.443	-0.100	-0.103	0.000
HORIZ. OFFSET	-8.072	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.127	8.627	9.046

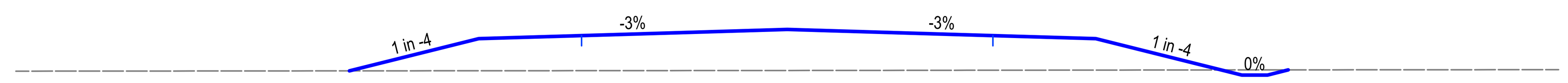
CHAINAGE 3200



REF. STRING MC00
X = 727974.131
Y = 6334862.724
DATUM R.L. 9.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	11.297	12.050	12.080	12.110	12.125	12.230	12.125	12.110	12.080	12.050	11.213	11.213	11.314
EXISTING LEVELS	11.297	11.300	11.301	11.301	11.302	11.305	11.308	11.308	11.309	11.310	11.313	11.313	11.314
LEVEL DIFF.	0.000	0.751	0.780	0.809	0.823	0.925	0.817	0.802	0.771	0.740	-0.100	-0.100	0.000
HORIZ. OFFSET	-9.013	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	9.349	9.849	10.253

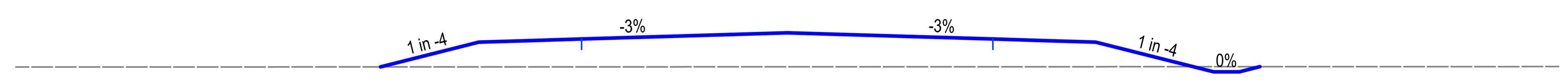
CHAINAGE 3900



REF. STRING MC00
X = 727952.509
Y = 6334960.359
DATUM R.L. 9.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	11.511	12.140	12.170	12.200	12.215	12.320	12.215	12.200	12.170	12.140	11.430	11.430	11.531
EXISTING LEVELS	11.511	11.513	11.514	11.515	11.516	11.519	11.523	11.524	11.525	11.527	11.530	11.530	11.531
LEVEL DIFF.	0.000	0.626	0.655	0.685	0.699	0.801	0.692	0.676	0.644	0.613	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.514	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.840	9.340	9.743

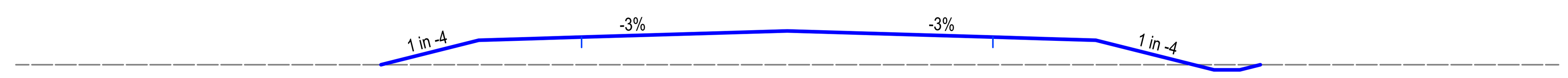
CHAINAGE 3800



REF. STRING MC00
X = 727930.886
Y = 6335057.993
DATUM R.L. 9.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	11.746	12.223	12.253	12.283	12.298	12.403	12.298	12.283	12.253	12.223	11.650	11.650	11.750
EXISTING LEVELS	11.746	11.746	11.747	11.747	11.747	11.748	11.749	11.749	11.749	11.749	11.750	11.750	11.750
LEVEL DIFF.	0.000	0.477	0.506	0.536	0.551	0.655	0.549	0.534	0.504	0.473	-0.100	-0.100	0.000
HORIZ. OFFSET	-7.908	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.291	8.791	9.192

CHAINAGE 3700



REF. STRING MC00
X = 727909.264
Y = 6335155.627
DATUM R.L. 9.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	12.000	12.475	12.505	12.535	12.550	12.655	12.550	12.535	12.505	12.475	11.900	11.900	12.000
EXISTING LEVELS	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000
LEVEL DIFF.	0.000	0.475	0.505	0.535	0.550	0.655	0.550	0.535	0.505	0.475	-0.100	-0.100	0.000
HORIZ. OFFSET	-7.900	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.300	8.800	9.200

CHAINAGE 3600

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia
Department for Infrastructure and Transport

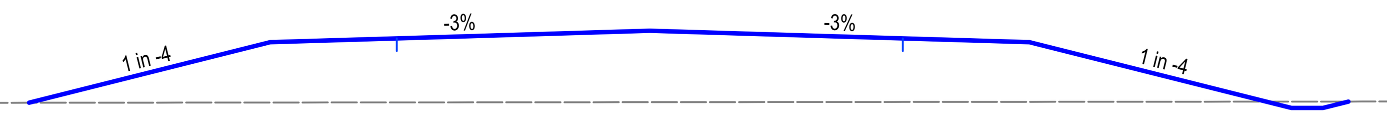
ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 3200 TO CH 3900
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0065	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00065.DWG

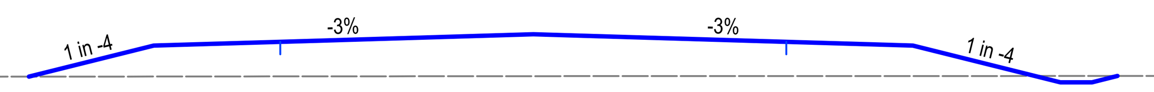
CHAINAGE 4300



REF. STRING MC00
X = 728060.619
Y = 6334472.186
DATUM R.L. 8.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	10.111	11.064	11.094	11.124	11.139	11.244	11.139	11.124	11.094	11.064	10.029	10.029	10.130
EXISTING LEVELS	10.111	10.115	10.116	10.117	10.117	10.120	10.123	10.124	10.125	10.126	10.129	10.130	10.130
LEVEL DIFF.	0.000	0.950	0.979	1.008	1.022	1.124	1.016	1.001	0.970	0.939	-0.100	-0.100	0.000
HORIZ. OFFSET	-9.812	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	10.141	10.641	11.044

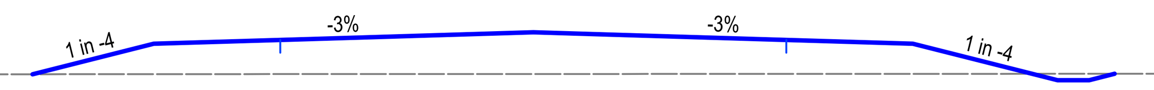
CHAINAGE 4200



REF. STRING MC00
X = 728038.997
Y = 6334569.821
DATUM R.L. 8.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	10.442	10.936	10.966	10.996	11.011	11.116	11.011	10.996	10.966	10.936	10.352	10.352	10.453
EXISTING LEVELS	10.442	10.444	10.445	10.446	10.447	10.450	10.451	10.451	10.451	10.452	10.452	10.453	10.453
LEVEL DIFF.	0.000	0.491	0.520	0.549	0.564	0.666	0.560	0.544	0.514	0.484	-0.100	-0.100	0.000
HORIZ. OFFSET	-7.973	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.332	8.832	9.233

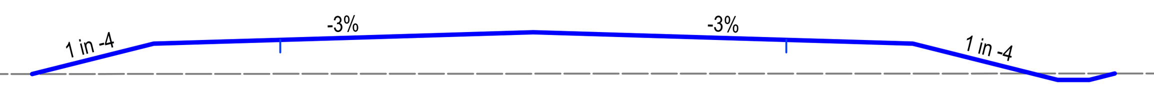
CHAINAGE 4100



REF. STRING MC00
X = 728017.375
Y = 6334667.455
DATUM R.L. 8.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	10.779	11.258	11.288	11.318	11.333	11.438	11.333	11.318	11.288	11.258	10.686	10.686	10.787
EXISTING LEVELS	10.779	10.781	10.782	10.782	10.782	10.783	10.785	10.785	10.785	10.786	10.786	10.787	10.787
LEVEL DIFF.	0.000	0.477	0.507	0.536	0.551	0.655	0.549	0.534	0.503	0.473	-0.100	-0.100	0.000
HORIZ. OFFSET	-7.916	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.288	8.788	9.189

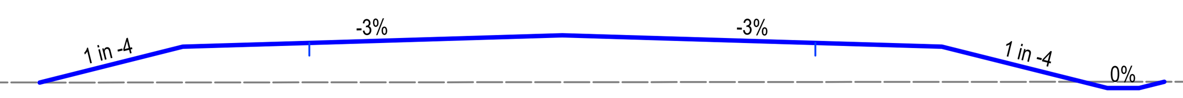
CHAINAGE 4000



REF. STRING MC00
X = 727995.753
Y = 6334765.090
DATUM R.L. 8.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	11.081	11.561	11.591	11.621	11.636	11.741	11.636	11.621	11.591	11.561	10.989	10.989	11.089
EXISTING LEVELS	11.081	11.082	11.083	11.084	11.085	11.086	11.087	11.087	11.088	11.088	11.089	11.089	11.089
LEVEL DIFF.	0.000	0.479	0.508	0.537	0.552	0.655	0.549	0.534	0.504	0.473	-0.100	-0.100	0.000
HORIZ. OFFSET	-7.922	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.290	8.790	9.191

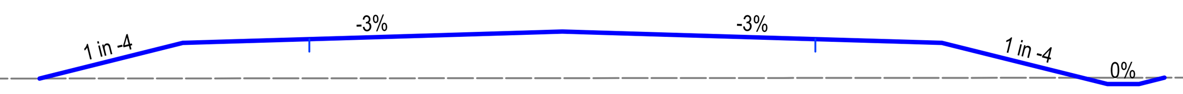
CHAINAGE 4700



REF. STRING MC00
X = 728147.107
Y = 6334081.649
DATUM R.L. 6.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	8.460	9.026	9.056	9.086	9.101	9.206	9.101	9.086	9.056	9.026	8.372	8.372	8.472
EXISTING LEVELS	8.460	8.461	8.462	8.463	8.463	8.466	8.468	8.468	8.469	8.470	8.472	8.472	8.472
LEVEL DIFF.	0.000	0.564	0.594	0.623	0.638	0.740	0.632	0.617	0.586	0.556	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.261	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.615	9.115	9.515

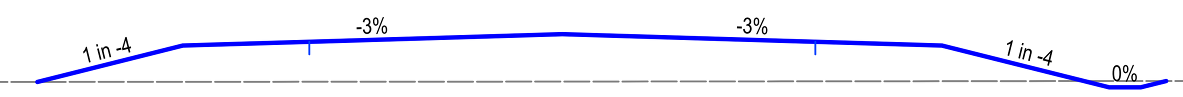
CHAINAGE 4600



REF. STRING MC00
X = 728125.485
Y = 6334179.283
DATUM R.L. 6.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	8.911	9.477	9.507	9.537	9.552	9.657	9.552	9.537	9.507	9.477	8.823	8.823	8.924
EXISTING LEVELS	8.911	8.913	8.914	8.914	8.915	8.917	8.920	8.920	8.921	8.921	8.923	8.924	8.924
LEVEL DIFF.	0.000	0.564	0.594	0.623	0.638	0.740	0.632	0.617	0.586	0.556	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.264	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.615	9.115	9.518

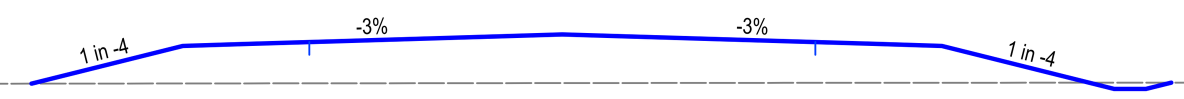
CHAINAGE 4500



REF. STRING MC00
X = 728103.863
Y = 6334276.917
DATUM R.L. 7.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	9.332	9.906	9.936	9.966	9.981	10.086	9.981	9.966	9.936	9.906	9.245	9.245	9.346
EXISTING LEVELS	9.332	9.333	9.334	9.334	9.334	9.337	9.341	9.341	9.342	9.343	9.345	9.346	9.346
LEVEL DIFF.	0.000	0.573	0.603	0.632	0.647	0.749	0.641	0.625	0.594	0.563	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.298	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.643	9.143	9.546

CHAINAGE 4400



REF. STRING MC00
X = 728082.241
Y = 6334374.552
DATUM R.L. 7.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	9.739	10.336	10.366	10.396	10.411	10.516	10.411	10.396	10.366	10.336	9.655	9.655	9.755
EXISTING LEVELS	9.739	9.742	9.743	9.744	9.744	9.748	9.752	9.752	9.753	9.753	9.755	9.755	9.755
LEVEL DIFF.	0.000	0.594	0.623	0.652	0.666	0.768	0.659	0.644	0.613	0.583	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.386	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.724	9.224	9.626

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

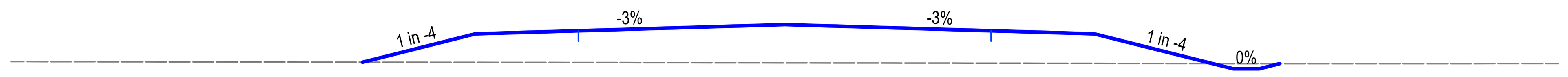
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 4000 TO CH 4700
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0066	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

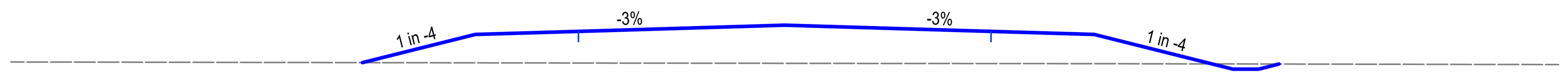
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00066.DWG



REF. STRING MC00
X = 728233.596
Y = 6333691.111
DATUM R.L. 4.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	6.843	7.390	7.420	7.450	7.465	7.570	7.465	7.450	7.420	7.390	6.716	6.716	6.814
EXISTING LEVELS	6.843	6.840	6.838	6.836	6.836	6.830	6.824	6.823	6.822	6.820	6.816	6.815	6.814
LEVEL DIFF.	0.000	0.550	0.582	0.613	0.629	0.740	0.641	0.627	0.598	0.570	-0.100	-0.099	0.000
HORIZ. OFFSET	-8.186	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.697	9.197	9.591

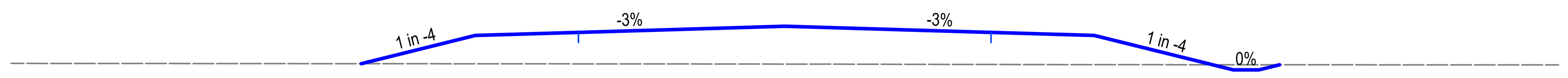
CHAINAGE 5100



REF. STRING MC00
X = 728211.974
Y = 6333788.745
DATUM R.L. 5.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	7.189	7.736	7.766	7.796	7.811	7.916	7.811	7.796	7.766	7.736	7.064	7.064	7.162
EXISTING LEVELS	7.189	7.185	7.184	7.182	7.181	7.176	7.172	7.171	7.170	7.169	7.164	7.163	7.162
LEVEL DIFF.	0.000	0.551	0.582	0.614	0.630	0.740	0.639	0.625	0.596	0.567	-0.100	-0.099	0.000
HORIZ. OFFSET	-8.186	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.688	9.188	9.582

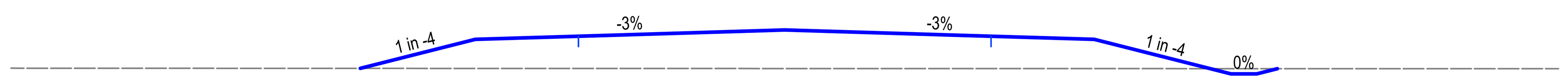
CHAINAGE 5000



REF. STRING MC00
X = 728190.352
Y = 6333886.380
DATUM R.L. 5.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	7.584	8.136	8.166	8.196	8.211	8.316	8.211	8.196	8.166	8.136	7.463	7.463	7.562
EXISTING LEVELS	7.584	7.582	7.581	7.581	7.580	7.576	7.569	7.568	7.567	7.565	7.563	7.563	7.562
LEVEL DIFF.	0.000	0.554	0.585	0.616	0.631	0.740	0.642	0.628	0.600	0.572	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.209	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.693	9.193	9.591

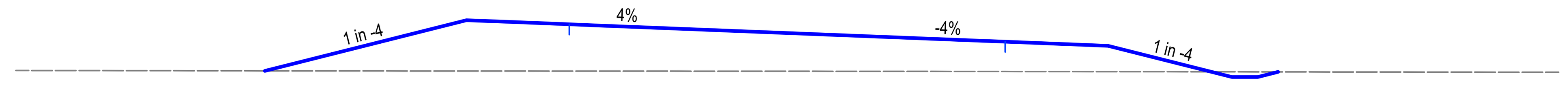
CHAINAGE 4900



REF. STRING MC00
X = 728168.730
Y = 6333984.014
DATUM R.L. 5.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	8.013	8.570	8.600	8.630	8.645	8.750	8.645	8.630	8.600	8.570	7.907	7.907	8.007
EXISTING LEVELS	8.013	8.011	8.011	8.011	8.011	8.010	8.009	8.009	8.008	8.008	8.007	8.007	8.007
LEVEL DIFF.	0.000	0.558	0.589	0.619	0.634	0.740	0.636	0.621	0.591	0.562	-0.100	-0.100	0.000
HORIZ. OFFSET	-8.229	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.649	9.149	9.548

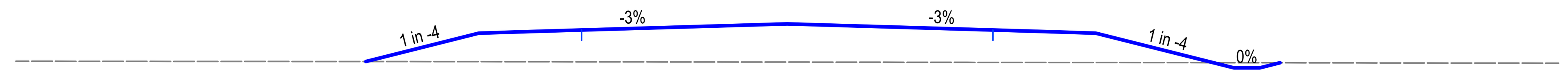
CHAINAGE 4800



REF. STRING MC00
X = 728320.055
Y = 6333300.567
DATUM R.L. 3.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	5.567	6.547	6.507	6.467	6.448	6.299	6.151	6.131	6.091	6.051	5.448	5.448	5.547
EXISTING LEVELS	5.567	5.564	5.563	5.562	5.562	5.559	5.555	5.555	5.553	5.552	5.548	5.548	5.547
LEVEL DIFF.	0.000	0.983	0.944	0.905	0.886	0.740	0.595	0.576	0.538	0.500	-0.100	-0.099	0.000
HORIZ. OFFSET	-10.158	-6.238	-5.238	-4.238	-3.738	0.000	3.738	4.238	5.238	6.238	8.650	9.150	9.545

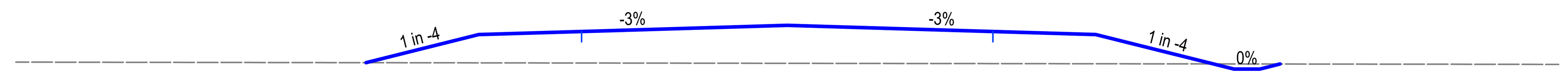
CHAINAGE 5500



REF. STRING MC00
X = 728298.462
Y = 6333398.207
DATUM R.L. 3.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	5.860	6.409	6.439	6.469	6.484	6.589	6.484	6.469	6.439	6.409	5.737	5.737	5.836
EXISTING LEVELS	5.860	5.857	5.855	5.854	5.853	5.849	5.844	5.843	5.842	5.840	5.837	5.836	5.836
LEVEL DIFF.	0.000	0.552	0.583	0.615	0.630	0.740	0.640	0.625	0.597	0.568	-0.100	-0.099	0.000
HORIZ. OFFSET	-8.195	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.688	9.188	9.583

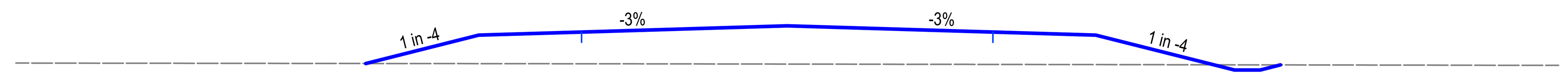
CHAINAGE 5400



REF. STRING MC00
X = 728276.840
Y = 6333495.842
DATUM R.L. 4.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	6.169	6.717	6.747	6.777	6.792	6.897	6.792	6.777	6.747	6.717	6.044	6.044	6.143
EXISTING LEVELS	6.169	6.166	6.164	6.163	6.162	6.157	6.152	6.151	6.150	6.148	6.144	6.144	6.143
LEVEL DIFF.	0.000	0.551	0.582	0.614	0.630	0.740	0.640	0.626	0.597	0.568	-0.100	-0.099	0.000
HORIZ. OFFSET	-8.189	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.689	9.189	9.584

CHAINAGE 5300



REF. STRING MC00
X = 728255.218
Y = 6333593.476
DATUM R.L. 4.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	6.510	7.059	7.089	7.119	7.134	7.239	7.134	7.119	7.089	7.059	6.385	6.385	6.483
EXISTING LEVELS	6.510	6.508	6.507	6.505	6.505	6.499	6.494	6.493	6.491	6.489	6.485	6.484	6.483
LEVEL DIFF.	0.000	0.552	0.583	0.614	0.629	0.740	0.641	0.627	0.598	0.570	-0.100	-0.099	0.000
HORIZ. OFFSET	-8.196	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.698	9.198	9.592

CHAINAGE 5200

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

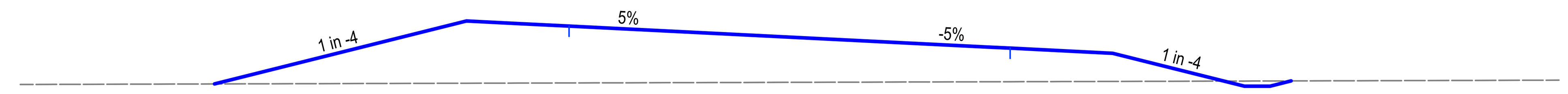
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 4800 TO CH 5500
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0067	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

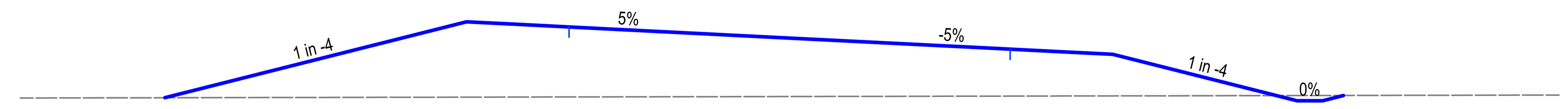
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00067.DWG



REF. STRING MC00
X = 728197.229
Y = 6332939.586
DATUM R.L. 2.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	4.521	5.750	5.700	5.650	5.625	5.435	5.245	5.220	5.169	5.120	4.478	4.478	4.580
EXISTING LEVELS	4.521	4.535	4.538	4.541	4.542	4.553	4.563	4.565	4.568	4.570	4.578	4.579	4.580
LEVEL DIFF.	0.000	1.214	1.162	1.109	1.082	0.882	0.681	0.655	0.602	0.549	-0.100	-0.101	0.000
HORIZ. OFFSET	-11.213	-6.300	-5.300	-4.300	-3.800	0.000	3.800	4.300	5.300	6.300	8.868	9.368	9.778

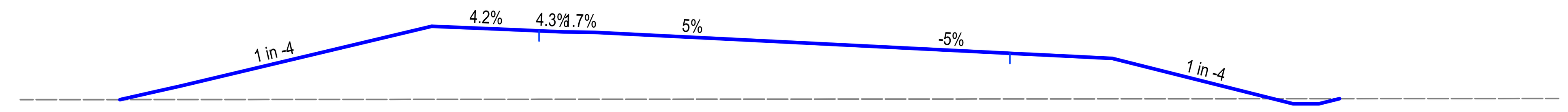
CHAINAGE 5900



REF. STRING MC00
X = 728263.568
Y = 6333014.018
DATUM R.L. 2.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	4.679	6.150	6.099	6.050	6.025	5.835	5.645	5.619	5.569	5.520	4.622	4.622	4.723
EXISTING LEVELS	4.679	4.690	4.692	4.694	4.695	4.703	4.710	4.711	4.713	4.715	4.722	4.723	4.723
LEVEL DIFF.	0.000	1.459	1.407	1.355	1.329	1.132	0.935	0.909	0.857	0.805	-0.100	-0.101	0.000
HORIZ. OFFSET	-12.181	-6.300	-5.300	-4.300	-3.800	0.000	3.800	4.300	5.300	6.300	9.892	10.392	10.799

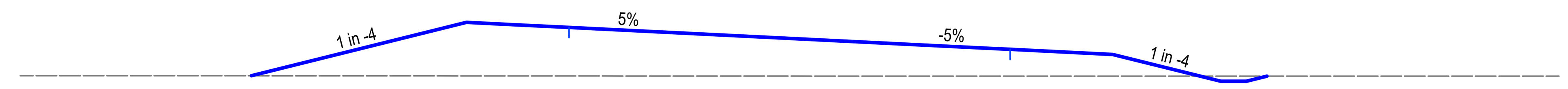
CHAINAGE 5800



REF. STRING MC00
X = 728307.947
Y = 6333103.300
DATUM R.L. 2.000

	IA04	EH04	ES04	CE04	LO04	LA00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	4.930	6.353	6.309	6.265	6.243	6.234	6.044	5.854	5.829	5.779	5.729	4.848	4.848	4.948
EXISTING LEVELS	4.930	4.935	4.936	4.936	4.937	4.937	4.940	4.943	4.943	4.944	4.945	4.948	4.948	4.948
LEVEL DIFF.	0.000	1.418	1.374	1.329	1.307	1.297	1.104	0.911	0.885	0.835	0.784	-0.100	-0.100	0.000
HORIZ. OFFSET	-13.056	-6.955	-5.917	-4.883	-4.367	-3.800	0.000	3.800	4.300	5.300	6.300	9.825	10.325	10.727

CHAINAGE 5700



REF. STRING MC00
X = 728327.231
Y = 6333201.121
DATUM R.L. 3.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	5.252	6.301	6.251	6.201	6.176	5.986	5.796	5.771	5.721	5.671	5.144	5.144	5.244
EXISTING LEVELS	5.252	5.250	5.249	5.249	5.248	5.246	5.244	5.244	5.244	5.244	5.244	5.244	5.244
LEVEL DIFF.	0.000	1.051	1.002	0.952	0.928	0.740	0.552	0.527	0.477	0.427	-0.100	-0.100	0.000
HORIZ. OFFSET	-10.494	-6.300	-5.300	-4.300	-3.800	0.000	3.800	4.300	5.300	6.300	8.406	8.906	9.307

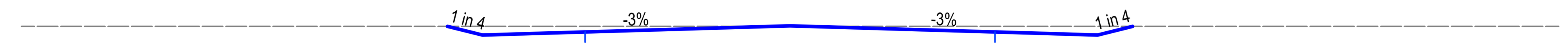
CHAINAGE 5600



REF. STRING MC00
X = 728015.390
Y = 6332846.327
DATUM R.L. 2.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	IA0I
DESIGN LEVEL	5.000	4.820	4.850	4.880	4.895	5.000	4.895	4.880	4.850	4.820	5.000
EXISTING LEVELS	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
LEVEL DIFF.	0.000	-0.180	-0.150	-0.120	-0.105	-0.000	-0.105	-0.120	-0.150	-0.180	0.000
HORIZ. OFFSET	-6.720	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	6.720

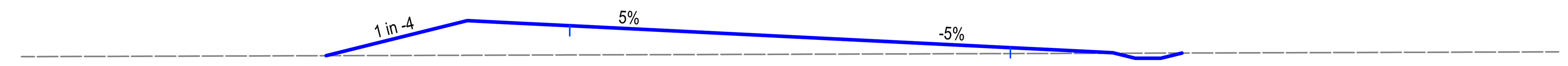
CHAINAGE 6105.689



REF. STRING MC00
X = 728020.700
Y = 6332848.370
DATUM R.L. 2.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	IA0I
DESIGN LEVEL	5.000	4.829	4.859	4.889	4.904	5.009	4.904	4.889	4.859	4.829	5.000
EXISTING LEVELS	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
LEVEL DIFF.	0.000	-0.171	-0.141	-0.111	-0.096	0.009	-0.096	-0.111	-0.141	-0.171	0.000
HORIZ. OFFSET	-6.685	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	6.685

CHAINAGE 6100



REF. STRING MC00
X = 728113.621
Y = 6332885.266
DATUM R.L. 2.000

	IA00	EH00	ES00	CE00	LO00	L300	LO0I	CE0I	ES0I	EH0I	ID0I	IE0I	IA0I
DESIGN LEVEL	4.788	5.476	5.426	5.376	5.351	5.161	4.971	4.946	4.896	4.846	4.737	4.737	4.840
EXISTING LEVELS	4.788	4.796	4.800	4.803	4.804	4.816	4.828	4.830	4.833	4.836	4.837	4.839	4.840
LEVEL DIFF.	0.000	0.680	0.627	0.574	0.547	0.345	0.143	0.117	0.064	0.010	-0.100	-0.102	0.000
HORIZ. OFFSET	-9.054	-6.300	-5.300	-4.300	-3.800	0.000	3.800	4.300	5.300	6.300	6.737	7.237	7.648

CHAINAGE 6000

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

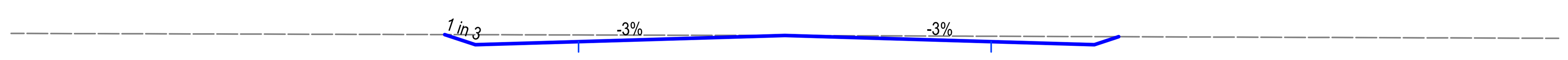
Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC00; CH 5600 TO CH 6105.689
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0068	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

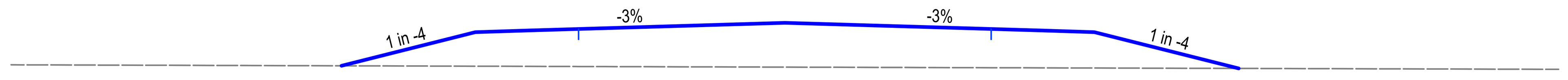
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00068.DWG



REF. STRING MC10
X = 728588.731
Y = 6333066.496
DATUM R.L. 2.000

	IA10	EH10	ES10	CE10	LO10	L310	LO1I	CE1I	ES1I	EH1I	IA1I
DESIGN LEVEL	5.019	4.821	4.851	4.881	4.896	5.001	4.896	4.881	4.851	4.821	4.978
EXISTING LEVELS	5.019	5.017	5.015	5.012	5.011	5.001	4.989	4.987	4.983	4.980	4.978
LEVEL DIFF.	0.000	-0.196	-0.164	-0.131	-0.115	0.000	-0.093	-0.106	-0.132	-0.159	0.000
HORIZ. OFFSET	-6.594	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	6.471

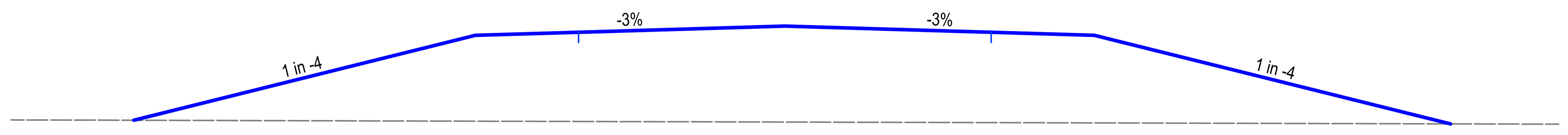
CHAINAGE 300



REF. STRING MC10
X = 728493.034
Y = 6333038.819
DATUM R.L. 2.000

	IA10	EH10	ES10	CE10	LO10	L310	LO1I	CE1I	ES1I	EH1I	IA1I
DESIGN LEVEL	4.868	5.517	5.547	5.577	5.592	5.697	5.592	5.577	5.547	5.517	4.817
EXISTING LEVELS	4.868	4.860	4.857	4.854	4.853	4.842	4.832	4.831	4.828	4.825	4.817
LEVEL DIFF.	0.000	0.657	0.690	0.722	0.739	0.854	0.759	0.746	0.719	0.692	0.000
HORIZ. OFFSET	-8.596	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	8.798

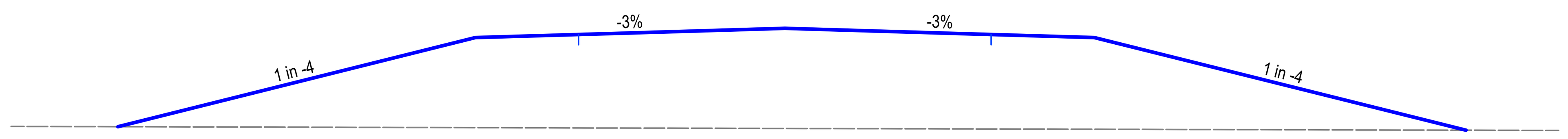
CHAINAGE 200



REF. STRING MC10
X = 728394.145
Y = 6333048.213
DATUM R.L. 2.000

	IA10	EH10	ES10	CE10	LO10	L310	LO1I	CE1I	ES1I	EH1I	IA1I
DESIGN LEVEL	4.852	6.508	6.538	6.568	6.583	6.688	6.583	6.568	6.538	6.508	4.782
EXISTING LEVELS	4.852	4.834	4.831	4.828	4.827	4.817	4.808	4.806	4.803	4.801	4.782
LEVEL DIFF.	0.000	1.674	1.706	1.739	1.755	1.870	1.775	1.761	1.734	1.707	0.000
HORIZ. OFFSET	-12.621	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	12.904

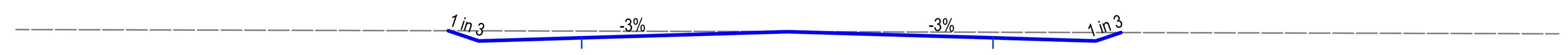
CHAINAGE 100



REF. STRING MC10
X = 728347.412
Y = 6333065.940
DATUM R.L. 2.000

	IA10	EH10	ES10	CE10	LO10	L310	LO1I	CE1I	ES1I	EH1I	IA1I
DESIGN LEVEL	4.880	6.613	6.643	6.673	6.688	6.793	6.688	6.673	6.643	6.613	4.812
EXISTING LEVELS	4.880	4.862	4.859	4.856	4.855	4.846	4.837	4.835	4.833	4.830	4.812
LEVEL DIFF.	0.000	1.751	1.784	1.817	1.833	1.947	1.851	1.837	1.810	1.783	0.000
HORIZ. OFFSET	-12.930	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	13.205

CHAINAGE 50



REF. STRING MC10
X = 728613.278
Y = 6333075.940
DATUM R.L. 2.000

	IA10	EH10	ES10	CE10	LO10	L310	LO1I	CE1I	ES1I	EH1I	IA1I
DESIGN LEVEL	5.072	4.874	4.904	4.934	4.949	5.054	4.949	4.934	4.904	4.874	5.036
EXISTING LEVELS	5.072	5.070	5.068	5.065	5.064	5.054	5.045	5.043	5.040	5.038	5.036
LEVEL DIFF.	0.000	-0.196	-0.164	-0.131	-0.115	0.000	-0.095	-0.109	-0.136	-0.164	0.000
HORIZ. OFFSET	-6.594	-6.000	-5.000	-4.000	-3.500	0.000	3.500	4.000	5.000	6.000	6.487

CHAINAGE 326.301

SCALES: 2 0 1 2 3 4 H & V

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN
MC10; CH 50 TO CH 326.301
CROSS SECTIONS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		24C347-MSAR-SK0069	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE | 100 MILLIMETRES ON ORIGINAL DRAWING | UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00069.DWG

DESIGN TRAFFIC = 4.7 e^5 ESA

PAVEMENT SCHEDULE - TYPE A

PAVEMENT LAYER	MATERIAL	COMPACTED THICKNESS (mm)	DEPTH BELOW FINISHED SURFACE (mm)	TOLERANCE	ADDITIONAL DETAILS
SPRAY SEAL	DOUBLE - 16 / 7mm, XXXX BINDER	0	0	5-0 (k&g) ± 5 OTHER	THE DESIGNER SHALL DESIGN THE SPRAY SEAL BASED ON AP-T68/06 - UPDATE OF THE AUSTROADS SPARED SEAL DESIGN METHOD 2006.
PRIME	CUTBACK BITUMEN			5-0 (k&g) ± 5 OTHER	DESIGNER TO NOMINATE PRIME GRADE AND APPLICATION RATES BASED ON CONDITION OF FINISHED PAVEMENT.
BASE - (UNBOUND)	PM 1 / 20 QG	125	0	5-0 (k&g) ± 5 OTHER	98% MDD (Mod) COMPACTION, 60% DRY OF OMC (Mod)
SUB-BASE - (UNBOUND)	PM 2 / 20	125	125	± 20	96% MDD (Mod) COMPACTION, 80% DRY OF OMC (Mod)
SUB-BASE - (UNBOUND)	PM 3 / 20	125	250	± 20	96% MDD (Mod) COMPACTION, 80% DRY OF OMC (Mod)
EARTHWORKS	TYPE A FILL	150	-530	± 20	95% MODIFIED COMPACTION (MOISTURE CONTENT: OMC ± 2%)
SUB-GRADE	CBR = 5		375	± 0-40	

NOTES:

1. PAVEMENT O&M DESIGN PERIOD OF 20 YEARS, WITH A NOMINAL 3 YEARS CONSTRUCTION PERIOD.
2. DESIGN ESA OF 4.7 e^5 ESA. TRAFFIC TO BE CONFIRMED BY DBOM CONTRACTOR.
3. SUB-GRADE TO BE CONFIRMED BY TESTING AND TO CONFIRM CONDITIONS AND CBR PRIOR TO DETAILED DESIGN.
4. REFER TO GEOTECHNICAL INVESTIGATION FROM WSP.
5. CONCEPT DESIGN ONLY FOR ESTIMATING AND APPROVAL PURPOSES ONLY.

SCALES: NOT TO SCALE

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	CONCEPT DESIGN	GHD	24.04.26

Government of South Australia
Department for Infrastructure and Transport

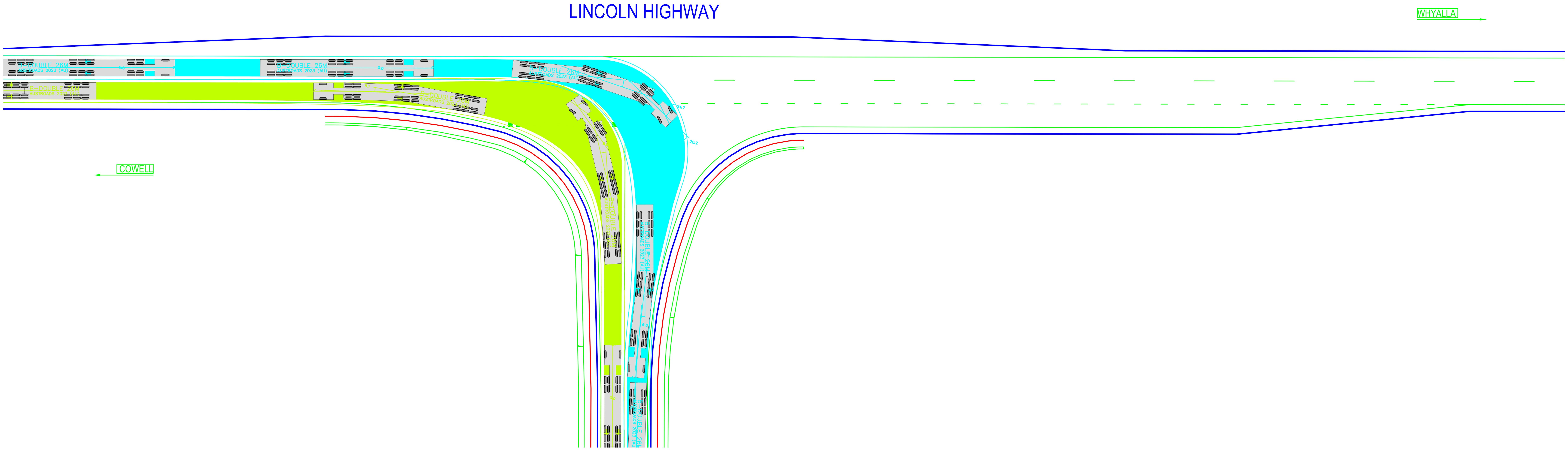
ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
CONCEPT DESIGN

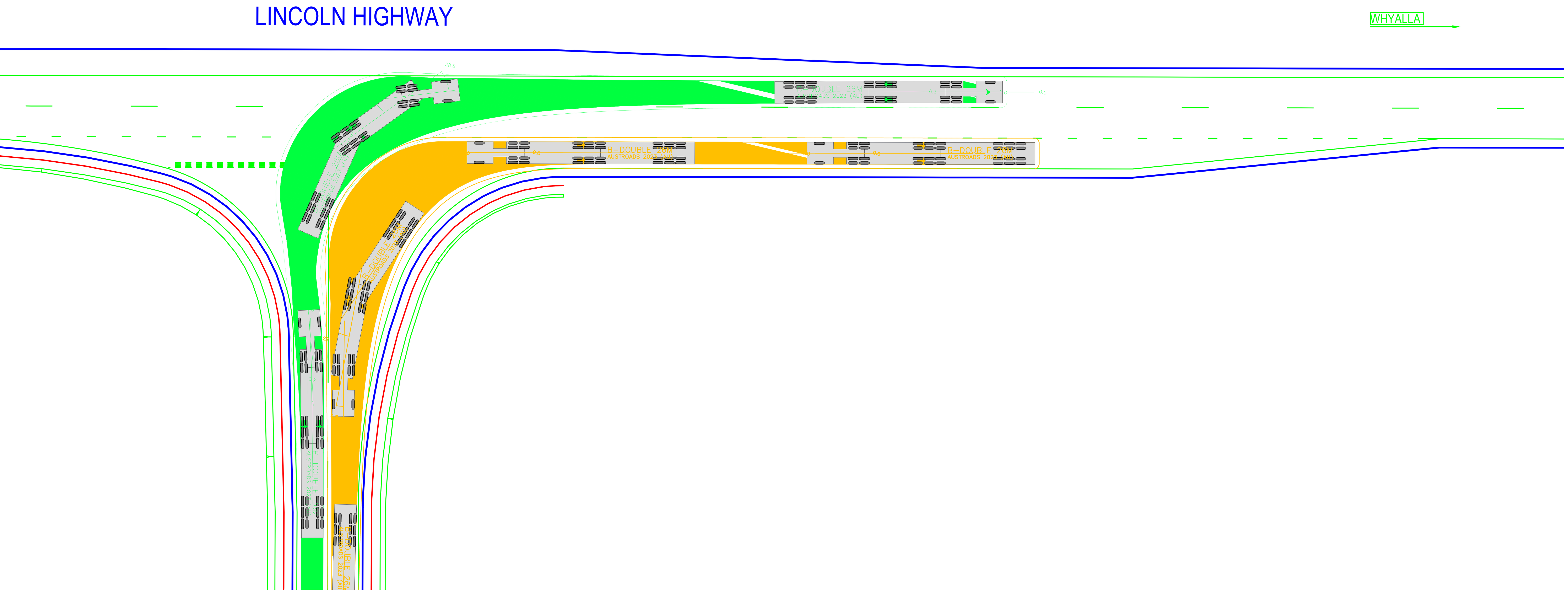
PAVEMENT SCHEDULE

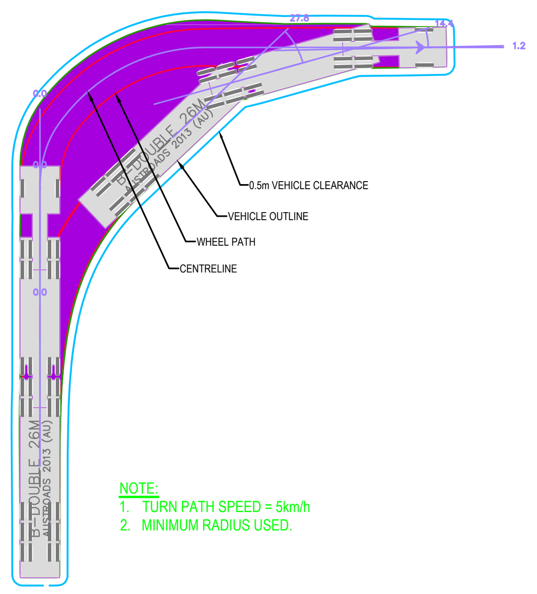
DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
DIT	S.G	DIT		24C347-MSAR-SK0091	0A

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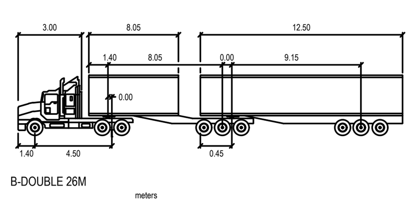
CAD FILE NAME: 12601676-GHD-10-00-DRG-CI-00091.DWG







NOTE:
1. TURN PATH SPEED = 5km/h
2. MINIMUM RADIUS USED.



B-DOUBLE 26M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

LEGEND

SYMBOL	DESCRIPTION
	BATTER
	EDGE OF SHOULDER
	EDGE OF BITUMEN
	EDGE OF LANE
	CENTRE LINE

SCALES: 6 0 3 6 9 12

No.	AMENDMENT DESCRIPTION	BY	DATE
0A	ISSUED FOR PRELIMINARY DESIGN REVIEW	GHD	23.04.26

Government of South Australia
Department for Infrastructure and Transport

ROAD No. XXXX
MULLAQUANA STATION ACCESS ROAD
WHYALLA SOUTH AUSTRALIA
LINCOLN HIGHWAY
TURN PATHS

DESIGNED	DRAFTED	CHECKED	PATCHS No	SKETCH No.	AMEND No.:
L.F	S.G	S.G		SKT-CI-00001	0A

ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE — 100 MILLIMETRES ON ORIGINAL DRAWING — UNCONTROLLED COPY WHEN PRINTED

CAD FILE NAME: 12601676-GHD-10-00-SKT-CI-00001.DWG

Appendix E

Turn Warrant Assessment for New Mullaquana Station Access Road

Turn Warrant Assessment – Lincoln Highway / New Mullaquana Station Access Road

The turn warrant assessment outcome, parameters and assumptions for the proposed intersection between Lincoln Highway and the New Mullaquana Station Access Road is shown in Table 50. While a BAL only is warranted, an AUL(s) has been designed as agreed with DIT to allow for variability in the estimated traffic volumes and improve the safety of the proposed intersection. This conservative approach also allows for potential growth in the existing traffic volumes on Lincoln Highway.

Table 50 Turn warrant assessment outcome, parameters and assumptions

Major Road	Minor Road	Assessment Type	Peak Period Volumes (including existing volumes)						RT treatment	LT treatment	Parameters	Assumptions
			QT2	QL	QT1	QR	QMRT	QMLT				
Lincoln Highway	New Mullaquana Station Access Road	Peak Construction	164	27	94	1	285	164	BAR	BAL	– Design speed (major road): 110km/h – Two-lane two-way road – No right turn splitter island – No existing turn treatments – Existing AADT Major Road = 1200 vpd – Peak Construction Hour Major Road volumes = 107 vph – Peak Construction Hour Minor Road volumes = 58 vph	**Existing** • 15% used for conversion of AADT/Daily volumes to Peak Hour volumes (refer 3.6 of AGTM06-20) • Major Road existing volumes assume 50% directional split **Construction** • Construction volumes for the minor road assumed to be the same as those for Horseshoe Road for the alternative route • Minor Road construction volumes assume 50% directional split
		Peak Operation	91	1	90	0	182	91	BAR	BAL	– As above but Peak Operation Hour volumes as below.	

Major Road	Minor Road	Assessment Type	Peak Period Volumes (including existing volumes)						RT treatment	LT treatment	Parameters	Assumptions
			QT2	QL	QT1	QR	QMRT	QMLT				
											– Peak Operation Hour Major Road volumes = 2 vph – Peak Operation Hour Minor Road volumes = 2vph	• Major Road construction volumes assume a directional split of 95% from east (also making the left turn onto the Minor Road) and 5% from the west (also making the right turn onto the Minor Road) **Operation** • Operation volumes for the minor road assumed to be the same as those for Horseshoe Road for the alternative route • Minor Road operation volumes assume 50% directional split • Major Road operation volumes assume a directional split of 95% from east (also making the left turn onto the Minor Road) and 5% from the west (also making the right turn onto the Minor Road)