

PORT ADELAIDE ENERGY PTY LTD

OCTOBER 2019

SNAPPER POINT POWER STATION DEVELOPMENT APPLICATION REPORT

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Snapper Point Power Station Development Application Report

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GLOSSARY

ARI event	Average recurrence interval (ARI) is the average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration. It is implicit in this definition that the periods between exceedances are generally random (Australian Bureau of Meteorology, 2018).
BDBSA	Biological Database of South Australia (BDBSA) is an integrated collection of corporate databases including data from the Department of Environment, Water and Natural Resources, Birds Australia, Birds SA, Australasian Wader Study Group, SA Museum and other State Government Agencies.
Landscape characterisation	The assessment of the character and quality of the landscape. Elements comprising landscape character include landform, land use and cultural influences.
Project site	The land defined by the project boundary.
SCAP	The State Commission Assessment Panel (SCAP) is established under South Australia's Planning, Development and Infrastructure Act 2016. The SCAP has assumed the functions, powers and duties of the Development Assessment Commission.

ABBREVIATIONS

AAQA	Ambient Air Quality Assessment Guidelines
AQQMS	Ambient air quality monitoring station
AH Act	<i>Aboriginal Heritage Act 1988</i>
AHD	Australian Height Datum
AEMO	Australian Energy Market Operator
Air EPP	Environment Protection (Air Quality) Policy 2016
Air NEPM	National Environment Protection (Ambient Air Quality) Measure
Air Toxics NEPM	National Environment (Air Toxics) Measure
ARI	Average recurrence interval
ASRIS	Australian Soil Resource Information System
ASS	Acid sulfate soils
BDBSA	Biological Databases of South Australia
CEMP	Construction Environmental Management Plan
CHR	Channelised right turn
Council	City of Port Adelaide Enfield
CPB	Coast Protection Board
CT	Certificate of Title
CTMP	Construction Traffic Management Plan
DEM	Department for Energy and Mining
Development Act	<i>Development Act 1993</i>
Development Plan	Port Adelaide Enfield Council Development Plan
Development Regulations	Development Regulations 2008
DMP	Dust Management Plan
DPC-AAR	Department of Premier and Cabinet – Aboriginal Affairs and Reconciliation
DPTI	Department of Planning, Transport and Infrastructure
EPA	Environment Protection Authority of South Australia
EPA Act	<i>Environment Protection Act 1993</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESCOSA	Essential Services Commission of South Australia
HS Act	<i>Historic Shipwrecks Act 1981</i>

HV	High voltage
MNES	Matters of National Environmental Significance
MW	Megawatt
Nexif Energy	Nexif Energy Australia Pty Ltd
NPW Act	<i>National Parks and Wildlife Act 1972</i>
NV Act	<i>Native Vegetation Act 1991</i>
NVC	Native Vegetation Council
OTR	Office of the Technical Regulator
P A Energy P/L	Port Adelaide Energy Pty Ltd
PDC	Principle of Development Control
PMST	Protected Matters Search Tool
PPE	Personal Protective Equipment
PSI	Preliminary Site Investigation
SA Government	Government of South Australia
SCAP	State Commission Assessment Panel
SEDMP	Soil Erosion and Drainage Management Plan
TEC	Threatened Ecological Community
TIS	Traffic Impact Statement
TSP	Total Suspended Particulates
VA	Vegetation Associations
WHS	Work, health and safety
ZTIV	Zone Theoretical of Visual Influence

EXECUTIVE SUMMARY

PROJECT DESCRIPTION

Port Adelaide Energy Pty Ltd (P A Energy P/L) propose to develop the Snapper Point Power Station at Outer Harbor, South Australia. Works will involve the de-commissioning, relocation and re-commissioning of five (5) trailer-mounted GE TM2500 Gen 8 aero-derivative turbine generators and ancillary infrastructure from an existing site at Elizabeth to a proposed new site at Outer Harbor.

P A Energy P/L, an affiliate of Nexif Energy Australia Pty Ltd (Nexif Energy), plan to operate the turbines on a commercial basis to supplement the energy grid at high demand times, and eliminate the risk of load shedding.

The turbines will be converted to operate primarily on natural gas, with diesel as a secondary source. The turbines are rated to produce 30.8 MW and together the turbines are expected to produce approximately 154 MW of energy.

The Project proposes to undertake a prescribed activity of environmental significance under Schedule 1 Part A of the *Environment Protection Act 1993* (EPA Act); being fuel burning at a heat release rate exceeding 5 MW.

SITE DESCRIPTION

The proposed Project site (the Site) is located to the north of the Pelican Point Power Station and south of the Port River. Primary access to the Site is gained from Pelican Point Road.

The Site (including access tracks) spans across three allotments, as follows:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – Title reference CT 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of Allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6012/888

An allotment adjacent to the Site will also be utilised for site assess. Allotment details are as follows:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.
-

STAKEHOLDER CONSULTATION

To address and mitigate potential project impacts at an early stage in the Project, P A Energy P/L have engaged with key stakeholders throughout the planning and design process. Key stakeholders engaged with to date include the City of Port Adelaide Enfield, the Coast Protection Board, the Environment Protection Authority, the Office of the Technical Regulator and the Adelaide Dolphin Sanctuary.

COUNCIL AREA AND ZONING

The Project site is located within the City of Port Adelaide Enfield, and is covered by the Industry Zone and Ports Policy Area 23; within the Port Adelaide Enfield Council Development Plan.

ENVIRONMENTAL ASSESSMENTS AND SPECIALIST STUDIES

This Development Application was informed by several specialist technical reports including Aboriginal cultural heritage, air quality, flora and fauna, geotechnical, noise, non-Indigenous heritage, site contamination, stormwater and flooding, traffic and access, and visual amenity.

ABORIGINAL CULTURAL HERITAGE

The Kurna People are the first nations Aboriginal community who are custodians for the land in which the Project Site is situated. Native Title was awarded to the Kurna people in March of 2019 from the Government of South Australia.

An Aboriginal Cultural Heritage Survey was undertaken as part of the Project. The final report and recommendations of the survey have not been incorporated into this report, but have been provided separately to the State Commission Assessment Panel (SCAP) and the Department for Premier and Cabinet – Aboriginal Affairs and Reconciliation (DPC-AAR). Site discovery procedures and other management and mitigation measures have been recommended for the project and these will be incorporated into the Project's Construction Environmental Management Plan.

AIR QUALITY

A preliminary air quality review was undertaken for the Project. As part of this review, pollutants of interest were identified for the Project and discussed in relation to relevant air quality legislation, policies, measures and pollutant concentration criteria for stack emission and ambient air ground level concentrations. Air quality impacts were qualitatively assessed for the construction, operation and decommissioning stages of the Project. Management measures for each stage were discussed to minimise potential air emissions. The overview covered the suburbs of St Kilda, Outer Harbor, North Haven and Osborne. The overview identified that potential Air quality impacts could occur during the construction, operation and decommissioning stages of the Project, and subsequently provided a number of recommendations, including that an air dispersion modelling assessment should be undertaken and that the Project should comply with the Air EPP maximum pollutant concentrations.

FLORA AND FAUNA

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's primary environmental legislation. The act applies to all of Australia's territories and waters. EBS Ecology were commissioned to investigate Matters of National Environmental Significance (MNES), protected under the EPBC Act that may be associated with the Project site.

A threatened Ecological Community (TEC); *Subtropical and Temperate Coastal Saltmarsh*, was observed during a field assessment of the Site. This TEC is rated as Vulnerable under the EPBC Act and although it qualifies as the listed community under the EPBC Act, an EPBC Referral is not required to be submitted for ecological communities allocated a Vulnerable listing.

The Curlew Sandpiper (*Calidris ferruginea*) was recorded as likely to occur within the project site, and is registered as a Nationally Threatened Species. Seven (7) Nationally Threatened fauna species were considered likely to occur in the tidal mudflat opposite to the proposed project Site.

The assessment concluded that no threatened species or communities would be significantly impacted by the Project and therefore a Referral under the EPBC Act would not be required.

The *Native Vegetation Act 1991* (NV Act) restricts clearance of native vegetation and sets requirements for approval before commencing any activity that could affect the natural state of vegetation. The terrestrial portion of the Site is located within an NV Act-exempt area, however a small section of the boundary encroaches on the Port River which is covered under the NV Act. Any seagrasses present in this small marine area would therefore be protected under the NV Act. Despite this, the Project does not incorporate any marine works and is not anticipated to impact upon the marine environment, and as such; clearance approvals are not required.

GEOTECHNICAL

A Geotechnical Investigation Report had previously been undertaken for the Project site. It was identified that the Site consists of predominantly coastal marine sediments comprising St Kilda Formation, Glanville Formation and Hindmarsh Clay. The report provided a number of recommendations relating to footing design, site levels, and construction methods.

NOISE

An Environmental Noise Assessment was undertaken for the Project. The assessment identified that dwellings in the Residential Zone; located in North Haven, constitute the nearest sensitive receivers in respect to noise impacts. This Residential Zone is south-west of the project site and is located approximately 2.1 km away. Furthermore, sensitive receivers in St Kilda are located 3.5 km north-east of the Project.

The assessment identified that the Project will potentially exceed the EPA prescribed night time noise criteria for sensitive receivers in North Haven, but that this noise criteria could be achieved with the installation of noise mitigation; most likely in the form of exhaust silencers for the gas turbine units.

NON-INDIGENOUS HERITAGE

An assessment of potential impact on non-Indigenous Heritage places in the vicinity of the Project site was undertaken. This included a search of the Commonwealth Heritage List National Heritage List, SA Heritage Register, Port Adelaide Enfield Council Development Plan and the Department for Environment and Water's Shipwrecks Dataset, within a 2,000 m radius of the Site. The search identified five protected shipwrecks and one State Heritage place.

All identified heritage places are located greater than 300 m from the Project site. As such, the Project will not impact any non-Indigenous heritage places in the area.

SITE CONTAMINATION

A Preliminary Site Investigation (PSI) was undertaken for the Project site, to identify potential site contamination issues which may have resulted from past and/or current use(s) of the land, and which may significantly impact the proposed use of the Site or represent potential public health or environmental risks. The PSI included desktop searches for the purpose of site characterisation and historical information, as well as review of a Lotsearch report to provide an overview of some of the relevant site history, environmental risk and planning information.

The PSI recommended that consideration should be given to the potential occurrence of acid sulfate soils (ASS) at the Site during excavation works and that given the sites' proximity to the marine environment of the Port River, a Construction Environmental Management Plan should be developed for implementation during the construction phase of the Project.

STORM WATER AND FLOODING

A Flooding, Erosion and Stormwater Assessment was undertaken for the Project to assess the topography and drainage characteristics of the Site, to identify any flooding and drainage issues, and to identify existing services across the Site. The assessment provided a number of recommendations; relating to site levels, excavation, and construction management.

TRAFFIC AND ACCESS

A Traffic Impact Statement (TIS) was undertaken for the Project; to identify any key traffic operational and safety issues that may arise out of the construction and operational phases of the Project, and to recommend appropriate mitigation measures.

The TIS identified that the key traffic routes that are likely to be utilised for the Project are the Port River Expressway, Victoria Road and Pelican Point Road / Mersey Road N; and that these roads were deemed to have the capacity to support the anticipated traffic increases that may result from the construction of the Project.

VISUAL AMENITY

The Project site is located within a heavily industrialised area, adjacent the existing Pelican Point Power Station to the south and the Port River to the north. Land use further south contains key state infrastructure and transport assets, including two other power stations, grain silos and berthing facilities for passenger cruise and container ships. The greater landscape is predominantly flat, with occasional visually-dominating industrial development including grain silos and electricity transmission towers.

A Landscape Character and Visual Considerations assessment was undertaken for the Project, in line with best practice as prescribed by the *Guidelines for Landscape and Visual Impact Assessment* (Third Edition). The assessment recommended that the contextual landscape, as discussed above, is of low scenic quality and that the Project was not likely to have irreparable consequences for the visual amenity of the locality and wider contextual landscape.

1 INTRODUCTION

1.1 PROJECT OUTLINE

The Snapper Point Power Station (the Project) involves the de-commissioning, relocation and re-commissioning of five (5) trailer-mounted GE TM2500 Gen 8 aero-derivative turbine generators, and ancillary infrastructure, from an existing site at Elizabeth in Adelaide's northern suburbs, to a new site adjacent to the Pelican Point Power Station at Outer Harbor. Each turbine has an individual rated output of approximately 30.8 MW. The Project will have a total combined rated output of approximately 154 MW. The turbines are currently operated by APR Energy on behalf of the Government of South Australia (SA Government or the State) for emergency electricity generation, as part of South Australia's emergency power plant project.

Port Adelaide Energy Pty Ltd (P A Energy P/L), an affiliate of Nexif Energy Australia Pty Ltd (Nexif Energy) has entered into an agreement with the SA Government to lease the turbines from the SA Government, and operate them for commercial use for a period of 25 years. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up fuel.

1.1.1 SOUTH AUSTRALIA'S EMERGENCY POWER PLANT

South Australia's emergency power plant project was developed in response to state-wide blackouts in 2017. The project involved the procurement and installation of nine (9) GE TM2500 Gen 8 aero-derivative turbine generators and ancillary infrastructure across two locations in metropolitan Adelaide; with five (5) units installed at the former Holden site at Elizabeth, and four (4) units installed at a site adjacent to the Desalination Plant at Lonsdale. The project had a combined total capacity of 276 MW.

As part of the emergency power plant project, the turbines utilised diesel fuel, and operated only for emergency power generation. Additionally, the turbines were operated by APR Energy under an arrangement with the SA Government, with ownership of the turbines having been transferred from APR Energy to the SA Government in December 2017.

To utilise the fuller potential of the generators, in December 2018, the SA Government released a tender for the long-term lease of the turbines, allowing the successful party(s) the opportunity to operate the generators commercially while bearing responsibility for maintenance of the equipment and ensuring availability of the units across peak periods. As a successful tenderer for five (5) of the generators, Nexif Energy now proposes the current Project, as described in this Development Application.

1.2 PROJECT RATIONALE

The primary objective of the Project is to operate the leased turbine units on a commercial basis as a flexible fast start peaking station, to meet the energy demand in South Australia during periods of high demand and to mitigate the risk of load shedding in peak demand periods.

1.2.1 BROAD PROJECT BENEFITS

The Project will support the energy security objectives of South Australia, providing fast-response dispatchable generation capacity during periods of high demand. The Project will also offer services to renewable energy generation, which alone have intermittent output due to the dependence on external forces, to offer baseload style firm generation products. The Project can provide reliable and responsive energy output, to support the consistent availability of energy throughout the network.

Furthermore, in converting the generators from their current state of burning diesel to predominantly burning natural gas, the Project has the potential to decrease the carbon emissions and air quality impacts of the generator infrastructure (in their current operation).

1.2.2 LOCAL PROJECT BENEFITS

It is envisaged that the Project will offer direct economic benefits to the community through employment and investment opportunities. It is estimated that the Project will employ up to 70 workers over the approximate 10-month construction period, including electricians, fitters, welders and earth works personnel. This number will vary throughout construction. Up to three full-time workers will be employed during operations.

1.3 SCOPE OF THIS DOCUMENT

The scope of this report is to provide an assessment of the Snapper Point Power Station at Outer Harbor against the relevant provisions of the Port Adelaide Enfield Council Development Plan (the Development Plan), the *Development Act 1993* (Development Act), and the Development Regulations 2008 (the Development Regulations).

1.4 STRUCTURE AND CONTENT OF THIS REPORT

This report contains the necessary information for assessment of the Development Application, pursuant to the requirements of the Development Act, the Development Regulations and the relevant provisions of the Development Plan.

- 1 **Section 1 – Introduction** provides an overview of the proposal, the approval pathway and the proponent.
- 2 **Section 2 – Project site** provides an overview of the site locality and existing infrastructure present.
- 3 **Section 3 – Nature of development** describes the details of the proposed development, including key components of the proposal and capital investment.
- 4 **Section 4 – Alternatives considered** provides an overview of the alternatives considered in developing the proposed Project.
- 5 **Section 5 – Key stakeholder consultation** provides an overview of the key stakeholders for the proposed Project and the consultation activities undertaken to date.
- 6 **Section 6 – Environmental assessment** details the results of the environmental assessments completed for the proposed Project, including; air quality, flora and fauna, geotechnical, heritage, noise, site contamination, stormwater and flooding, traffic and access and visual amenity.
- 7 **Section 7 – Planning assessment** details the results of the planning and land use assessment completed for the proposed Project.
- 8 **Section 8 – Construction, operation and decommissioning** has been structured to provide details on how the proposed Project will generally be managed during the construction and operation phase.
- 9 **Section 9 – Conclusion and recommendations** concludes the assessment, and provides a summary of the recommendations provided in environmental and planning assessment undertaken for the proposed Project.
- 10 **Section 10 – Limitations** identifies the limitations of the assessment undertaken to complete this Development Application.

1.5 DEVELOPMENT APPROVAL PATHWAY

The Project, comprising both building works and a change in land use, constitutes ‘development’ under the Development Act, and as such, can only be undertaken with Approval under the Act.

The Project will be connected to the State’s power system for sale of electricity to the public. As such, the project falls under the definition of ‘public infrastructure’ as per Section 49(1)(a) of the Development Act:

‘the infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, or the drainage or treatment of waste water or sewage’

This Development Application is therefore being submitted to the State Commission Assessment Panel (SCAP), seeking Development Approval under Section 49 of the Development Act.

1.5.1 CROWN SPONSORSHIP

The Project has secured Crown Sponsorship from the Department for Energy and Mining (DEM), under Section 49 of the Development Act.

A sponsorship letter from DEM, dated 10 September 2019, is attached in Appendix A.

1.5.2 CERTIFICATE FROM THE OFFICE OF THE TECHNICAL REGULATOR

Under Schedule 5, clause 12 of the Development Regulations, prior to the lodgement of an application for certain electricity generating plants with SCAP under Schedule 10, clause 14 of the Development Regulations (an electricity generating plant with a capacity of more than 5 MW which is to be connected to the State’s power system), approval must first be sought from the Officer of the Technical Regulator (OTR). The purpose of the prior approval from the OTR is to demonstrate that the project will contribute to the security and reliability of the State’s power system.

A certificate from the OTR, verifying that the Project meets the Technical Regulator’s requirements in relation to security and stability of the State’s power system, was received on 25 July 2019 and is attached in Appendix B.

1.5.3 REFERRAL TO STATE AGENCIES

Under Schedule 8 of the Development Regulations 2008, it is anticipated that the following statutory referrals to State Agencies will be required during the development assessment process:

- Coast Protection Board; due to the Project site being located on coastal land
- Environment Protection Authority; due to the works proposing to undertaken an Activity of Environmental Significance under Schedule 22 of the Development Regulations (fuel burning) (please refer to Section 1.6.2 regarding an anticipated addendum to the Development Application, required prior to referral of the Development Application to the EPA)
- Minister administering the *Historic Shipwrecks Act 1981*; due to the Project site being located within 500 m of a historic shipwreck under the *Historic Shipwrecks Act 1981*.

1.5.4 PUBLIC NOTIFICATION

It is anticipated that the project will undergo public notification as per Section 49(7d) of the Development Act; as the Project is to be lodged under Section 49 of the Development Act and has a development cost exceeding \$4,000,000 (please refer to Section 1.6.2 regarding an anticipated addendum to the Development Application, required prior to the release of the Development Application for public notification).

1.5.5 FUTURE WORKS

Nexif Energy is investigating the possibility of potentially converting the units to combined-cycle through the addition of a steam turbine so that the new power station could also operate as an efficient and flexible mid-merit power plant.

Based on the outcome of technical and economic feasibility studies, either an amendment to this application or a new development application may be lodged in the future.

1.6 OTHER APPROVALS

Other environmental approvals, authorisations and permits may be required in both the pre-construction and construction phases of the Project under the following legislation:

- *Environment Protection Biodiversity Conservation Act 1999 (EPBC Act)*
- *Environment Protection Act 1993*
- *Natural Resources Management Act 2004 (NRM Act)*
- *Native Vegetation Act 1991*
- *National Parks and Wildlife Act 1972 (NPW Act)*
- *Aboriginal Heritage Act 1988*
- *Native Title Act 1993.*

1.6.1 EPBC RISK ASSESSMENT

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. It applies to all Australian territory and waters. Under the Act, actions that are likely to have a significant impact upon defined Matters of National Environmental Significance (MNES) are subject to an assessment and approval process. A company proposing to take an action that may have a significant impact on a MNES must refer that action to the Commonwealth Minister for the Environment.

In order to decide whether an action is likely to have a significant impact on a MNES, it is necessary to take into account the nature and magnitude of potential impacts. In determining this, it is important to consider:

- all on-site and off-site impacts
- all direct and indirect impacts
- the frequency and duration of the action
- the total impact, which can be attributed to that action over the entire geographic area affected, and over time
- the sensitivity of the receiving environment, and
- the degree of confidence with which the impacts of the action are known and understood.

The EPBC Act prescribes nine MNES as triggers for Commonwealth assessment. An EPBC risk assessment was undertaken for the Project (Appendix F) to assess whether an EPBC referral would be required. The aim of the assessment was to determine the likelihood of the proposed Project impacting on a MNES. Of the nine MNES, there were three which could potentially trigger a Commonwealth assessment for the Project:

- nationally threatened ecological communities
- nationally threatened species
- listed migratory species.

The EPBC risk assessment process was undertaken using the following methodology:

- a desktop assessment using data derived from the Biological Databases of South Australia (BDBSA) and the Protected Matters Search Tool (PMST), and
- a field assessment conducted by two ecologists over a six-hour period; including a targeted bird survey and assessment of ecological communities and habitats.

During the desktop assessment, a search of the Project site, including a 5 km buffer distance, was undertaken using the BDBSA and PMST. One Threatened Ecological Community (TEC) was identified as potentially occurring within the PMST search area, being *Subtropical and Temperate Coastal Saltmarsh*, which is rated as Vulnerable under the EPBC Act. Four nationally threatened flora species were identified in the desktop assessment, all of which were considered unlikely to occur within the Site. Suitable habitat was recorded for one nationally threatened flora species; *Tecticornia flabelliformis* (Bead Glasswort), however, the species was not recorded during the targeted surveys and is therefore deemed unlikely to occur at the site. Twenty-seven (27) threatened fauna species (excluding marine species), were identified in the desktop assessment, however following the field assessment, only one species; the Curlew Sandpiper (*Calidris ferruginea*), was considered to possibly occur within the Project site, and seven fauna species were considered to possibly occur on the adjacent tidal mudflat.

During the field survey, two nationally threatened species were targeted; *Tecticornia flabelliformis* (Bead Samphire) and *Acanthiza iredalei rosinae* (Slender-billed Thornbill Gulf St Vincent). Four Vegetation Associations were recorded over the Project site and were assessed for the presence of the targeted species or their suitable habitat. Vegetation Associations consisted of:

- VA 1: *Melaleuca halmaturorum* (Swamp Paperbark) / *Melaleuca lanceolata* (Dryland Tea-tree) planted woodland +/- native *Carpobrotus rossii* (Native Pigface), *Suaeda australis* (Austral Seablite)
- VA 2: *Tecticornia halocnemoides* (Grey Samphire) / *Tecticornia pergranulata* (Blackseed Samphire) low closed shrubland +/- *Melaleuca halmaturorum* (Swamp Paperbark), *Suaeda australis* (Austral Seablite), *Sarcocornia* sp. (Glasswort), *Myoporum insulare* (Boobialla)
- VA 3: *Maireana brevifolia* (Small-leaf Bluebush) / *Nitraria billardierei* (Nitre Bush) low very open shrubland
- VA 4: *Dianella brevicaulis* (Short-stem Flax-lily) / *Ficinia nodosa* (Knobby Club-rush) low very open shrubland.

Within the four Vegetation Associations, the targeted species and their required habitat were not identified. However, migratory species including the Fork-tailed Swift (*Apus pacificus*), White-throated Needletail (*Hirundapus caudacutus*) and Curlew Sandpiper (*Calidris ferruginea*) may occur across the general area. It was assessed, however, that the Project would not significantly impact any migratory shorebird species, as none of the Significant Impact Criteria (defined under the EPBC Act) would be met.

There were no nationally threatened flora species identified within the Project site, however regionally threatened species were recorded within VA 2.

VA 2 was determined to represent the Subtropical and Temperate Coastal Saltmarsh TEC, listed as Vulnerable under the EPBC Act. Although this qualifies as the listed community under the EPBC Act, it is understood that an EPBC Referral is not required for ecological communities allocated a Vulnerable listing. Regardless of a Referral not being required in this instance, Coastal Saltmarsh is considered a valuable and threatened ecological community and impacts to this area should be minimised or avoided, where possible. Areas of Coastal Saltmarsh remaining on LeFevre Peninsula are largely restricted to degraded relics; the majority of which are earmarked for, or may already be developed.

The assessment determined that no threatened fauna and flora species or communities would be significantly impacted by the Project and therefore it was recommended that a Referral under the EPBC Act would not be required. In addition, the following general management recommendations were provided:

- Clearance of native vegetation should be avoided where possible.
- Weed hygiene measures should be employed during construction works (including vegetation removal) to ensure that no new weeds are introduced to existing native vegetation.
- If feasible, construction activities should be minimised to the extent possible near tidal mudflats during the migratory shorebird season (September to April), especially in their peak season (December to February), to reduce disturbance to foraging migratory shorebird and tern species.
- If movement of personnel near the tidal mudflat is required during the migratory shorebird season then personnel should remain within vehicles, as much as possible, as movement on foot is more disruptive to migratory shorebirds.

1.6.2 EPA LICENCE

The Project proposes to undertake a prescribed activity of environmental significance under Schedule 1 Part A of the *Environment Protection Act 1993* (EPA Act); being fuel burning at a heat release rate exceeding 5 MW. As such, the Project requires a licence under the EPA Act to undertake this activity. This will be applied for shortly after the submission of the Development Application with SCAP.

Early consultation with the EPA has taken place, to discuss the EPA’s requirements for supporting documentation. The EPA has indicated that their key concern is air quality impacts, and as such, have requested the proponent to undertake detailed air modelling. Furthermore, the EPA has indicated that their preference is for this air quality modelling to be submitted to the EPA during the Schedule 8 referral process. Detailed air quality modelling has been commissioned by Nexif Energy, and is expected to be completed by 31 October 2019. Given the time constraints of the Project, the Development Application has been lodged with SCAP prior to the completion of the detailed air quality monitoring. WSP requests that Schedule 8 referrals and public notification of the Development Application be withheld until the submission of an addendum, pertaining to the detailed air quality monitoring, anticipated on 31 October 2019.

1.6.3 ESCOSA GENERATOR LICENCE

The Project will require a Generation Licence from the Essential Services Commission of South Australia (ESCOSA). This will be applied for after the receipt of Development Approval from SCAP, and prior to the start of generation of electricity.

1.6.4 AEMO REGISTRATION

All energy generators that intend to connect into the national energy market must first register with the Australian Energy Market Operator (AEMO) and demonstrate that they will participate in the market in accordance with the National Electricity Rules.

1.7 PROJECT TIMING

The proposed timing for construction of the Project is early-2020 to late-2020 (approximately 10 months). An indicative timeline for critical stages of the Project is displayed below: [Note: Project planning and Development Approval to be completed by Dec 2019. Construction to start by Jan 2020]

Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Year	2019						2020												
Project planning and Development Approval	█	█	█	█	█	█													
Financing and internal approvals			█	█	█	█													
Construction							█	█	█	█	█	█	█	█	█	█	█	█	
ESCOSA licencing									█	█	█	█	█	█	█	█	█	█	
Testing and commissioning																		█	
Operation																			→

As per the terms of lease with the SA Government, the Generators must be operational by 1 December 2020.

1.8 PROPONENT DETAILS

Port Adelaide Energy Pty Ltd is a subsidiary of Nexif Energy. Nexif Energy is an independent developer, specialising in power infrastructure projects. As the developer of the Snapper Point Power Station at Outer Harbor through its affiliate Port Adelaide Energy Pty Ltd, Nexif Energy has engaged WSP to prepare this Development Application Report. Relevant contact details are displayed below.

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2 PROJECT SITE

2.1 SITE LOCATION

The proposed Project site (the Site) is located on Pelican Point Road, Outer Harbor, approximately 20 km north of Adelaide. The Site is situated between the existing Pelican Point Power Station to the south, and the coastal waters of the Port River to the North. Primary access to the Site is from Pelican Point Road. The Site locality is displayed in Figure 2.1 below.

The Site (including an access track) will be located across a portion of three parcels. Details are as follows:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – Title reference CT 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of Allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6012/888.

The relevant Certificates of Title are provided in Appendix C.

It is anticipated that an additional, existing, site access road will be utilised. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.

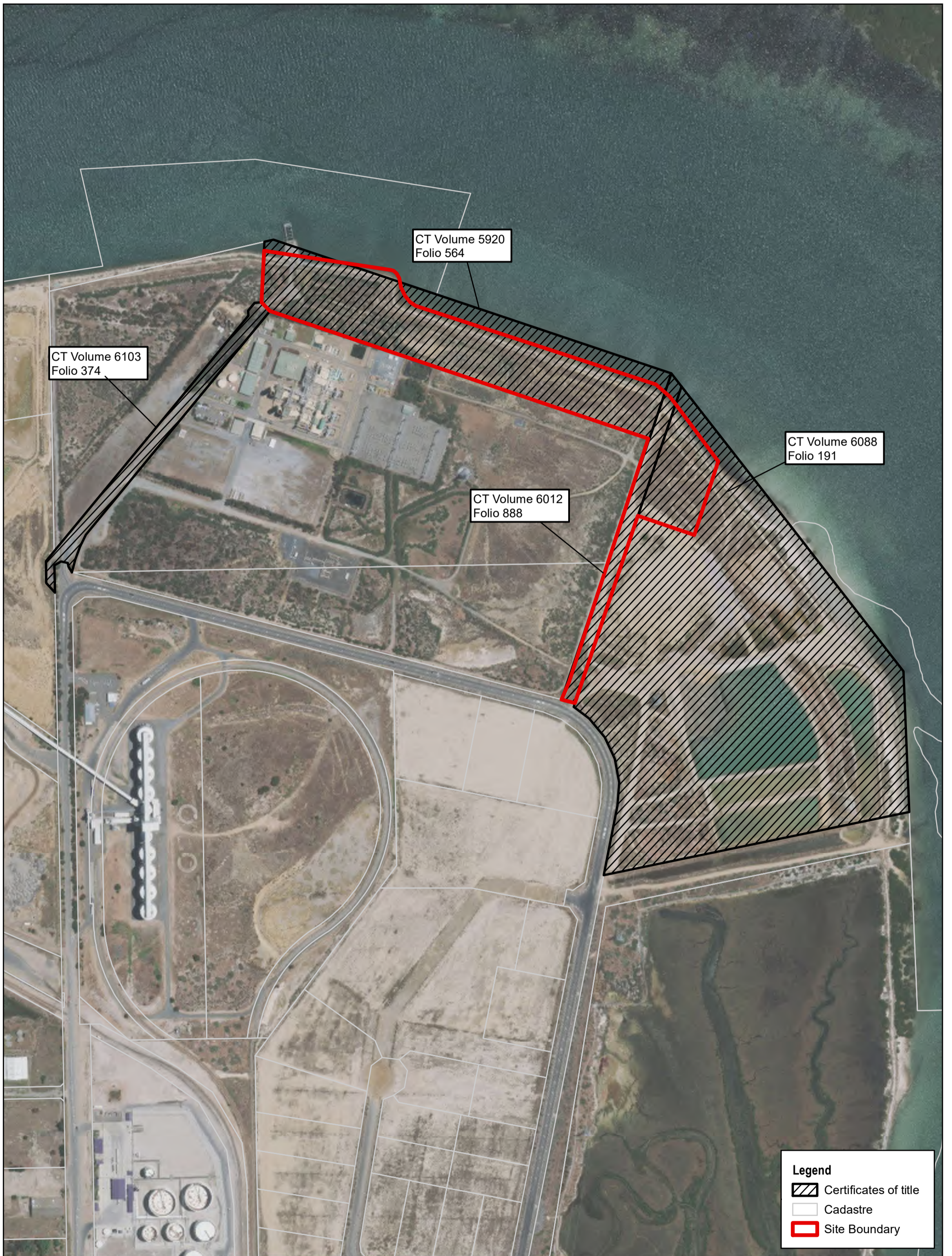
The Site and relevant Certificate of Title boundaries are shown in Figure 2.2.


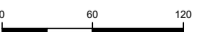

Connecting infrastructure, including a gas pipe line and 275 kV overhead cable, will extend south of the Project site to connect the Project to an existing ElectraNet substation and EPIC gas yard at the Pelican Point Power Station, located on Allotment 28 of Deposited Plan 52266, in the Hundred of Port Adelaide – title reference CT 6150/101.



Legend

- Railway
- ▭ Site Boundary



Map: PS114349_GIS_008_A3	Author: MO		 1:5,000		Snapper Point Gas Turbine Peaker Project Figure 2.2 Certificates of Title
Date: 30/09/2019	Approved by:				
<small>Data source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</small>			<small>Coordinate system: GDA 1994 MGA Zone 54 Scale ratio correct when printed at A3</small>		
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2.2 LAND MANAGEMENT AND TENURE

Nexif Energy is in the process of negotiating a land tenure agreement with Renewal SA; being the owner of the Site. The lease will cover only a portion of the three land parcels, listed above in Section 2.1. It is intended that the duration of the land lease will coincide with the term of the equipment lease with the SA Government; being 25 years. The leased area plan has been attached in Appendix D.

2.3 SITE DESCRIPTION

The Project Site is situated on the northern most point of the Lefevre Peninsula, and is located on a vacant site between the Pelican Point Power Station and the Port River. The Coastline Mean High Water Mark (of the Port River) stops at a breakwater along the northern boundary of the Site, as shown in Photo 2.1, but does not encroach onto the proposed infrastructure area; which will be contained within a fence, approximately 3 m from the Coastline Mean High Water Mark at the nearest point (west of an existing track). There are no water bodies or water courses within the Site boundary, however there are water bodies/retention dams located on land located adjacent to the south of the Site.



Photo 2.1 Breakwater to the north of the Project site

The Site is mostly undeveloped, aside from several unsealed access tracks. A seawall lines the coast along the greater allotments, outside of the leased Site area. There are patches of native vegetation across the Site, mostly consisting of *Melaleuca halmaturorum* (South Australian swamp paperbark)/*Melaleuca lanceolata* (Black Paperbark) (planted) closed woodland over native species, and *Tecticornia halocnemoides* (Shrubby Samphire)/ *Sarcocornia blackiana* (Thick-head Glasswort)/*Suaeda australis* (Austral seablite) closed very low shrubland +/- *Melaleuca halaturorum* (South Australian swamp paperback). The Site is mostly flat and low lying, with sandy soils.

Photo 2.2, Photo 2.3, Photo 2.4 and Photo 2.5, below, display the existing condition of the Site.



Photo 2.2 View from the centre of the Site, looking north-west, showing the existing Pelican Point Power Station to the south



Photo 2.3 View from the centre of the Site, looking north towards the Port River



Photo 2.4 View from the centre of the Site, looking east



Photo 2.5 View from the centre of the site, looking south, towards the Pelican Point Power Station and Pelican Point Road. Grain silos at the nearby Viterro facility are visible in the background

2.4 ZONING

The Site is covered by the Industry Zone and Ports Policy Area 23, under the Port Adelaide Enfield Council Development Plan (the Development Plan). Development Plan Zoning for the Site and locality is shown in Figure 2.3 below. Refer to Section 7.3 for an assessment of Project against the relevant Objectives and Principles of Development Control under the Development Plan.

2.5 EXISTING INFRASTRUCTURE AND SERVICES

The Site is currently vacant and contains limited existing infrastructure. Infrastructure at the Site includes:

- unsealed access tracks
- perimeter fencing
- a breakwater.

The following utilities have been identified during the Flooding, Erosion, Drainage and Services Assessment (Appendix I) undertaken for the Project:

- Epic Energy (liquid gas) pipeline
- SEAgas (liquid gas) pipeline.

Note that these services are located predominantly under the existing access road located to the west of the Site.

In addition, the following services were identified along Pelican Point Road:

- Telstra services
 - watermain
 - sewer (low pressure).
-

2.6 ADJACENT AND SURROUNDING LAND USE

The land to the south of the Site is used for the Pelican Point Power Station. The Pelican Point Power Station is a 497 MW combined cycle gas turbine power station, operated by ENGIE. The proximity and accessibility to existing infrastructure at the Pelican Point Power Station, including the ElectraNet switchyard, SEAgas gas connection and Epic Energy gas connection, were key factors in selection of the Site. Utilisation of these existing assets will:

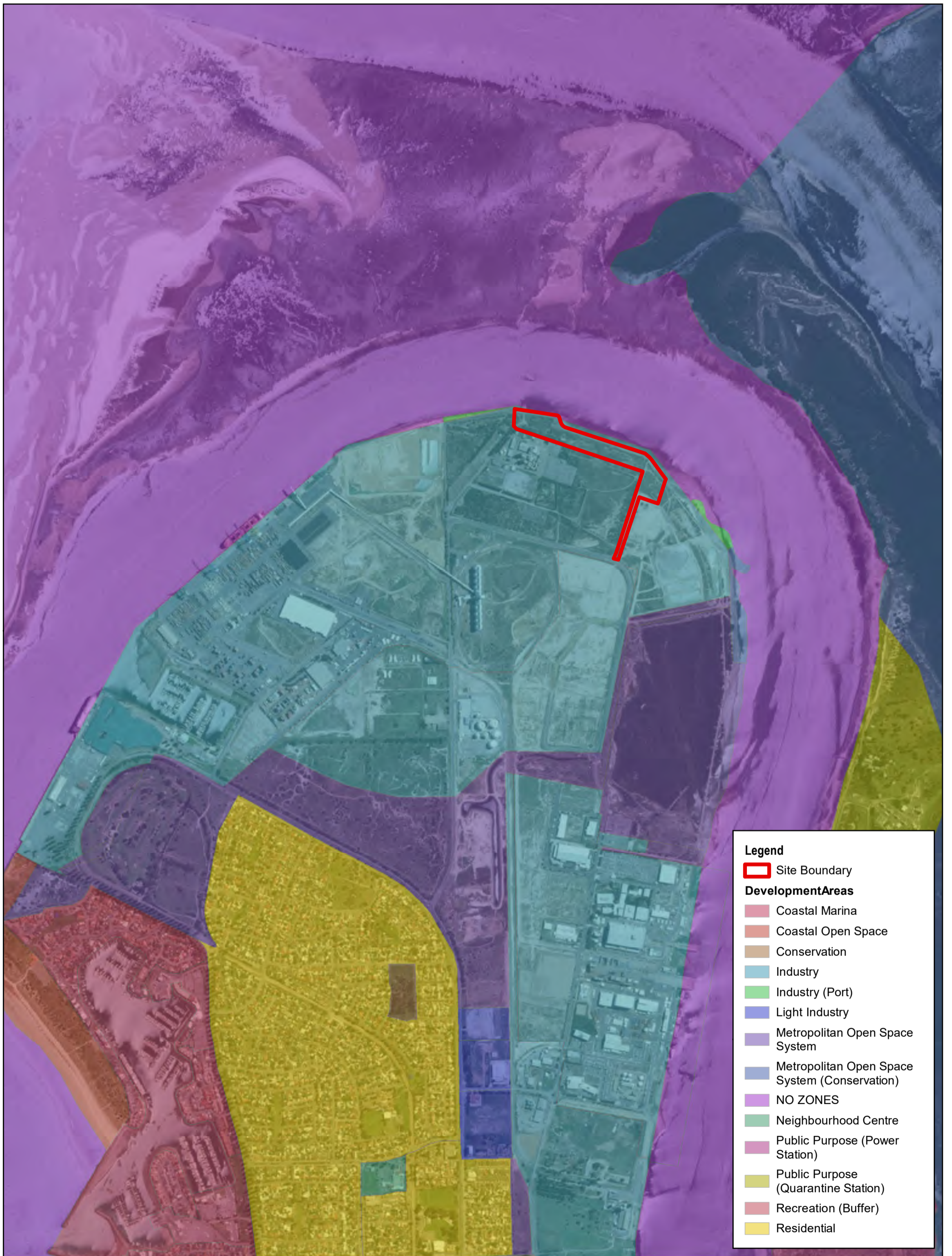
- significantly reduce construction and equipment costs
- make efficient use of existing assets
- prevent energy losses that would otherwise occur over long distances of connecting infrastructure.

The land directly to the west of the Site is mostly vacant, aside from a small area used for stockpiles (presumably associated with the existing power station). A narrow land parcel directly to the south-west of the Site contains a private access road from the Pelican Point Power Station and the Project Site, leading to Pelican Point Road.

Land directly adjacent to the east of the Site contains a high voltage overhead transmission line associated with the Pelican Point Power Station and associated towers, but is otherwise vacant. Large areas of the Site appear to have been cleared and levelled.

The Port River is located to the north of the Site. The Port River provides access to the Port of Adelaide, which is one of South Australia's busiest import/export facilities. The Port River is also environmentally significant; constituting part of the Adelaide Dolphin Sanctuary established under the *Adelaide Dolphin Sanctuary Act 2005*. The objective of the sanctuary is to protect the local dolphin population and the habitat within the Port River estuary and Barker Inlet. Furthermore, there are several shipwrecks located in the Port River, within 2 km of the Site.

Key features of the Site locality are shown below in Figure 2.4.



Legend

- Site Boundary
- Development Areas**
- Coastal Marina
- Coastal Open Space
- Conservation
- Industry
- Industry (Port)
- Light Industry
- Metropolitan Open Space System
- Metropolitan Open Space System (Conservation)
- NO ZONES
- Neighbourhood Centre
- Public Purpose (Power Station)
- Public Purpose (Quarantine Station)
- Recreation (Buffer)
- Residential



2.7 BROADER SITE CONTEXT

Outer Harbor primarily consists of industrial and transport-related land uses. Key features of the area include the Port Adelaide Passenger Terminal, the Adelaide Container Terminal, and the Pelican Point Power Station. A large portion of the suburb towards the south is dedicated to community and conservation uses within Biodiversity Park, Yardi Yarta Reserve and Playground, and Mutton Cove Conservation Reserve. There are no dedicated residential areas in this Suburb; the nearest residential area is approximately 2 km south of the Site in the suburb of North Haven.

The greater area of North Haven (as recognised by the Australian Bureau of Statistics as consisting of the suburbs of Outer Harbor, North Haven, Osbourne and Taperoo) has a population of 14,249 people. Key employment industries for people living in the greater area of North Haven include Health, Aged Care, retail and shipbuilding/repairs (Australian Bureau of Statistics, 2018).

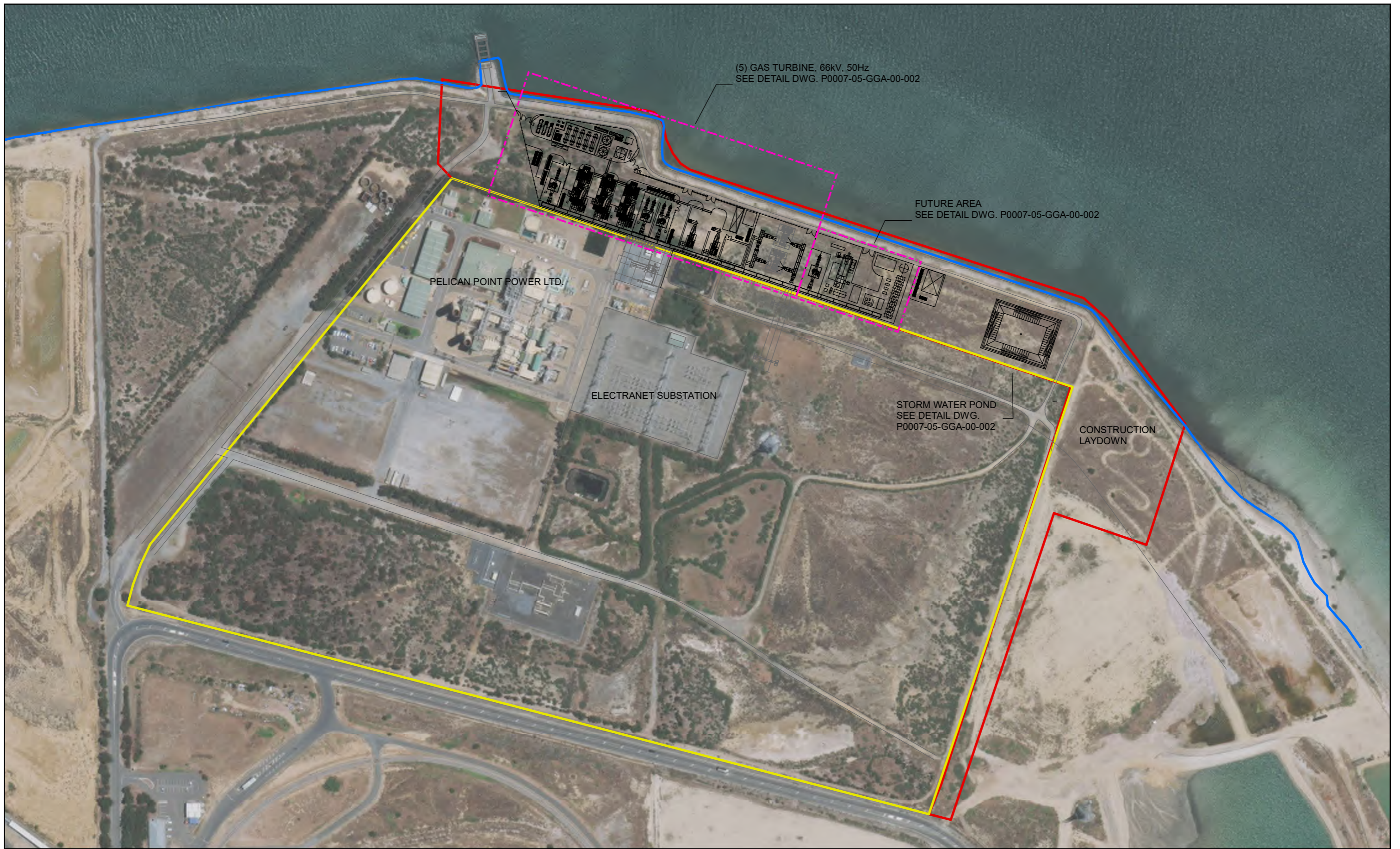
3 NATURE OF DEVELOPMENT

3.1 PROPOSED LAYOUT AND KEY COMPONENTS

The Project seeks Approval for the following key components:

- Five (5) GE TM2500 GEN8 generators, to be mounted on three (3) trailers, including; a generator trailer, control trailer, and turbine trailer.
- Three (3) 11.5 kV – 66 kV transformers.
- 275 kV overhead power line to ElectraNet switch yard including associated tower or gantry.
- One (1) 66 kV – 275 kV transformer.
- Associated 11 kV, 66 kV and 275 kV switchgear.
- Diesel fuel tanks with a storage capacity of up to 600 kL (final numbers to be finalised but is likely to be between 2-5 tanks).
- Water storage tanks with a storage capacity of up to 820 kL (final numbers to be finalised but is likely to be between 1-3 tanks).
- One (1) Osmoflo demineralised water systems and forwarding skids.
- Oily water tank with a storage capacity of up to 15 Kl (final numbers to be finalised).
- Storm Water Pond with a capacity of 3000 m³.
- Control and Administration offices, and bathroom facilities.
- Connecting pipes and cabling, racking and other storage, shipping containers (other than those that are hired), lifting frames, firefighting equipment, spill kits and eyewash stations.
- Terminal points including:
 - fuel supply, consisting of an inlet flange to the fuel storage system
 - telephone and internet connection to the closest Telstra node
 - water supply, consisting of an inlet flange to the off-loading system, and
 - power export, consisting of a connection point of the 66 kV string bus to the termination gantry in the ElectraNet yard.
- Security fencing:
 - 3 m high security fence; consisting of 2.4 m high galvanized wire mesh fence topped with 0.6 m high razor wire
 - access gates; to be secured with padlocks.
- Earthworks:
 - 64,074 m³ of Waste Derived Fill will be imported from local resource companies, to raise the existing low ground level of site. This fill will be certified and in line with all EPA and Renewal SA requirements
 - drainage for the facility will be installed to ensure there is no outflow into the Port Adelaide River. All process liquids will be contained. Transformers and liquid fuel tanks will be bunded. Additional containment will either be designed into equipment or equipment will be bunded in line with EPA guidelines
 - upgrades to existing access roads
 - a carparking area; suitable for 7–8 cars, with appropriate room for turnaround and reverse parking.

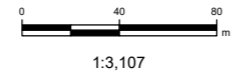
A preliminary site layout is provided in Figure 3.1 below. Accompanying preliminary drawings and photos including an Earthworks Plan; Drainage Layout Plan; Foundation Layout Plan; General Layout; Detail Layout; Fence Detail; an Indicative Floor Plan; and photos of the Control and Administration offices and bathroom facilities are provided in Appendix E. Site investigations that will help to inform detailed design are being undertaken. Please note that these drawings are preliminary only, and as such, Nexif request the final detailed design for the Project be withheld as a reserved matter, to be satisfied prior to seeking assessment against the Building Rules.



Map: PS114349_GIS_001_A6
 Date: 10/10/2019



Author: MO
 Approved by:



Data source: -
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate system: GDA 1994 MGA Zone 54
 Scale ratio correct when printed at A3



Pelican Point Gas Turbine Peaker Project

Figure 3.1
 Site Plan

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3.2 PROCESS DESCRIPTION

The Facility is comprised of five trailer-mounted Aero-derivative Gas Turbines, that can operate on both liquid fuel (Diesel) and fuel gas. Liquid fuel will be stored on-site in five self-contained ground-mounted tanks. Fuel will be delivered to the units via steel pipes installed in underground culverts. The fuel gas will be supplied through a gas reduction skid located on-site. From this skid, the gas enters the facility where the gas pressure will be reduced further to the correct operating pressure for the units.

During operation of the facility, demineralised water is used to reduce emissions. This is achieved by injecting water directly into the combustion chambers. The water is processed on-site by using a custom-built reverse osmosis plant. Water is supplied to Site via the SA Water main running adjacent to the Site. The reverse osmosis plant will use potable water; which will be stored in above ground tanks. Site amenities will also use potable water.

When operating, the turbines drive air-cooled electrical generators with a 34.2 MW output each. These generators are trailer-mounted and directly coupled to the turbine trailers. The generator circuit breakers are integral to the trailers, the output from these generator circuit breakers travel to 11 kV/66 kV step up transformers through a series of protection and metering equipment; the energy is then transported through a series of cables where voltage is further raised from 66 kV to 275 kV where the power is discharged into the ElectraNet infrastructure. During this process, all of the power is monitored, metered and protected prior to discharge to the grid. In the event of the station losing power, two generators automatically supply power to the facility to allow the gas turbines to switch on.

Each unit has their own turbine control systems that are integrated into a main control system located in a main control room. Each unit can be independently operated from the main control room. All the auxiliary systems are also operated from the main control room, these include the fuel systems, reverse osmosis plant and black start engines.

3.3 SITE WORKS AND BALANCE OF PLANT

Site works will be performed in line with State Government Regulations, Environmental Regulations and Australian Standards. The civil works will consist of removing vegetation in accordance with construction environmental conditions. Once cleared, the Site will be raised to the designed level using waste-derived fill from local resource companies (required levels have been previously discussed with the CPB). All foundations, culverts and containment bunds (where required) will be installed during civil works. All runoff from the site during civil works will be contained within site boundaries. Mitigation measures will be put in place to ensure limited soil waste is transported from site. Standard earth moving equipment will be utilised e.g. truck, grader and bulldozers.

Mechanical and Balance of Plant (BoP) works will involve the installation of five Gas Turbines. These units are trailer-mounted and will be delivered and placed by local transport contractors. Units will be moved during times of reduced traffic flow. Once in place, medium sized lifting equipment will be used to assemble ancillary equipment on the units. The installation of the BoP will be performed during normal site working hours. All equipment will be transported to site by local transport contractors during normal working hours. It is the intention that the majority of equipment will be fabricated off-site, reducing the need for excessive on-site construction activities. All piping systems will be prefabricated; with final installation occurring on site. Fuel will only be introduced to site once all construction activities are complete and signed-off. Mechanical commissioning will be staged and follow final construction sign off's. All works will be carried out in line with all State Government Regulations and Australian Standards.

All Electrical works will be performed by companies that hold current Electrical Contractor Licences. The works will consist of laying low voltage and high voltage (HV) cables which will be terminated at circuit breaker transformers and other electrical infrastructure. Cables will be installed in elevated cable trays and mechanically protected from vehicles and the environment. All HV cable terminations will be performed by suitably qualified personnel and tested to ensure compliance. All works will be carried out in-line with all relevant State Government Regulations and Australian Standards.

3.4 CAPITAL COST

P A Energy will relocate the five TM2500 generators from their current location at the former Holden factory site at Elizabeth, to the proposed new site at Outer Harbor and will undertake all necessary site levelling and preparation and installation of all plant and equipment. The equipment and facilities for electrical interconnection will be carried out by ElectraNet. Equipment and infrastructure for gas interconnection will be carried out by Epic Energy or SEA Gas. Capital and development costs of the project have not been included in this Development Application Report and have been provided separately to SCAP.

4 ALTERNATIVES CONSIDERED

4.1 ALTERNATIVE ENERGY SOURCES

South Australia's energy is mostly generated via a combination of wind, solar and gas. Energy derived from the burning of diesel fuel contributes only to a small percentage of the electricity generated in South Australia and is mostly from small-scale generators operating to meet peak demand periods, or servicing remote communities (Government of South Australia, 2018).

In transitioning the existing turbine generators from a temporary emergency use, to a permanent commercial use, the benefits of converting the primary fuel source from diesel fuel to natural gas can bring both a financial benefit to the Project and should result in lower greenhouse emissions compared to diesel (Engineers Australia, 2017).

4.2 ALTERNATIVE SITE LOCATIONS

During the tender stage, it was identified that the five (5) turbine generators located at the former Holden site at Elizabeth, would need to be relocated due to the anticipated expiry of the land lease term.

In assessing new site locations for the turbine generators, Nexif Energy considered two sites in detail; being a site to the south of the Bolivar Waste Water Treatment Plant which was proposed by the State as part of the tender, and a site at Outer Harbor.

In assessing the Bolivar site, the cost of the interconnection to the Electranet transmission system was found to be a significant cost imposition on the project; given the need to 'cut-in' to the 275 kV transmission lines and establish a new switchyard. There were also certain accessibility constraints and challenges with the site with respect to the ongoing construction of the Northern Connector Project.

The Outer Harbor Site was found to be ideal for this project, given the lower cost of interconnection and the proximity to an existing 275 kV switchyard, and access to suitable gas infrastructure. It can also be noted that the site was previously assessed by Nexif Energy for an unrelated barge-mounted power, and initial assessments were carried out for site suitability. The site has now further been assessed as being suitable for the current proposed use.

5 KEY STAKEHOLDER CONSULTATION

Nexif Energy and WSP have undertaken engagement with the City of Port Adelaide Enfield and key government agencies throughout the planning of this project, with the intention being to identify and address the requirements of the agencies, and additionally to identify and mitigate potential environment and planning impacts at an early stage of the Project.

This section of the Development Application summarises the engagement activities undertaken to date.

5.1 CITY OF PORT ADELAIDE ENFIELD

The Project is located within the City of Port Adelaide Enfield boundary area. Early engagement has been undertaken with the Council, through a meeting held between the Council (Russell Fink, Team Leader Planning), Nexif Energy, and WSP at the Council offices on 5 July 2019. Feedback from the meeting indicated that Council was generally satisfied with the Project, including the siting and scope of the technical investigations.

5.2 COAST PROTECTION BOARD

A meeting was held between the Coast Protection Board (CPB) (Murray Townsend, Manager Coastal Management and Kym Gerner, Coastal Planner), Nexif Energy and WSP on 3 July 2019. Given the location of the Project within coastal land, the key topics for discussion were the potential impacts of the Project in relation to flooding and inundation, and potential impacts to the adjacent marine environment and Adelaide Dolphin Sanctuary.

Feedback from the CPB indicated that the CPB were satisfied with the preliminary design of the Project and scope of technical investigations (to determine the likely impacts of the Project and proposed suitable mitigation/management measures).

The CPB made recommendations regarding minimum site levels and fill requirements, which should be complied with in order to meet the policy requirements of the CPB. Recommended site levels consist of:

- for the purpose of mitigating coastal flooding hazard, site and finished floor levels should meet a minimum of 3.30 mAHD and 3.55 mAHD respectively
- for the purpose of protection from flooding, mechanical and electrical equipment, as well as bunding for equipment that utilises chemicals, should be raised to a recommended floor level of 3.55 mAHD
- imported substrate material or engineered fill, to be used within the area which is subject to coastal processes, should be free of weeds and pathogens to ensure that noxious weed or contamination sources are not introduced into the coastal environment
- fill should be compacted to reduce the risk of scour and contain less than 1% of 'fine'.

The recommendations of the CPB have been incorporated into the Flooding, Drainage and Erosion Assessment, attached in Appendix I. Coastal hazards are discussed further in Section 6.8.

5.3 ENVIRONMENT PROTECTION AUTHORITY

A meeting between the Environment Protection Authority (EPA), Nexif Energy and WSP was held on 4 September 2019 to discuss the EPA's licence requirements for the Project, given that the Project constitutes a prescribed activity of environmental significance under Schedule 1, Part A of the *Environment Protection Act 1993*, under clause 8(2)(a) for fuel burning at a rate of heat release exceeding 5 megawatts.

Discussions with the EPA focused on potential noise and air emission impacts, monitoring and modelling requirements and potential mitigation. A noise study was subsequently completed (the outcomes of which are outlined in this report) and cumulative air emissions are currently being modelled for further discussion with the EPA.

5.4 OFFICE OF THE TECHNICAL REGULATOR

A meeting was held between the OTR (Mark Burns, Jurisdictional System Security Engineer and Reinhard Struve, Principal Engineer), Nexif Energy and WSP on 15 July 2019, to discuss the OTR's requirements for fast frequency response/inertia and network connection. Feedback from the OTR indicated that they were satisfied with the proposed fast frequency response/inertia solution and network connection. The statement to the OTR has since been submitted, with a certificate having been received on 25 July 2019 and attached in Appendix B.

5.5 ADELAIDE DOLPHIN SANCTUARY

Jon Emmett from the South Australian Government; representing the Adelaide Dolphin Sanctuary (ADS), was advised of the project on 27 September. Discussions were held regarding the importance of managing potential construction impacts to the marine environment. Further information about the project was subsequently provided to the ADS.

6 ENVIRONMENTAL ASSESSMENT

The following chapter discusses the outcomes of the specialist technical studies that were undertaken for the Project, including:

- Aboriginal Cultural Heritage
- Air Quality
- Flora and Fauna
- Geotechnical
- Noise
- Non-Indigenous Heritage
- Site Contamination
- Stormwater and Flooding
- Traffic and Access
- Visual Amenity.

6.1 ABORIGINAL CULTURAL HERITAGE

6.1.1 LEGISLATIVE AND POLICY REQUIREMENTS

The central legislation for the management of Aboriginal heritage in South Australia is the *Aboriginal Heritage Act 1988* (AH Act). All Aboriginal sites, objects and remains within South Australia are protected under the AH Act. Section 3 of the AH Act defines an Aboriginal site as land ‘that is of significance according to Aboriginal tradition’ or ‘that is of significance according to Aboriginal archaeology, anthropology or history’.

It is an offence under Section 23 of the AH Act to damage, disturb or interfere with Aboriginal sites, objects or remains, unless written authorisation is sought from the Minister for Aboriginal Affairs and Reconciliation.

6.1.2 ASSESSMENT METHODOLOGY

An Aboriginal cultural heritage risk summary was undertaken for the proposed Project, in-line with the methodology outlined below:

- desktop research, including searches of relevant databases, the Central Archive Register of Aboriginal Sites and Objects maintained by Aboriginal Affairs and Reconciliation Division, previous reports, relevant literature and aerial imagery and other documents relating to the development history of the area
- site visit to identify landscape features that could indicate an elevated risk of encountering Aboriginal cultural heritage on-site.

In addition, Independent Heritage Consultants (IHC) was engaged to provide heritage advice for the Project, via the following methodology:

- provide a brief summary of Aboriginal heritage and archaeological context for the project area
- undertake a site inspection of the Project area
- assess the findings of the Department of Premier and Cabinet, Aboriginal Affairs and Reconciliation (DPC-AAR) register searches
- provide a high level recommended best practice/effective approach for heritage management.

6.1.3 EXISTING CONDITIONS

The Project site is located in the traditional lands of the Kaurna people. Native Title for the Kaurna People, covering a large portion of metropolitan Adelaide and surrounds, was determined on 21 March 2019 (Government of South Australia, n.d.). Native Title rights can vary, but often relate to the possession, use or occupation of land, or the right for Native Title holders to participate in decision-making regarding the use of the land by others. Native Title is generally extinguished by the granting of freehold land (Department of Environment, Water and Natural Resources, n.d.)

At the time of European occupation, the territory of the Kaurna people extended from Port Wakefield to Cape Jervis and to the western edge of the Mount Lofty Ranges. The Port Adelaide (Yertabulti) region constituted the western most range of the territory belonging to the Wirra Kaurna (or the northern Kaurna group). This group is thought to have extended between Angaston, Lyndoch, Port Adelaide, Yatala and Tea Tree Gully (Wood, 2007). Early historical accounts suggest that the Kaurna occupied the coastal areas in summer (the beaches at North Haven, Semaphore and West Beach) and moved to the foothills during the winter (Morialta). The Kaurna continue to maintain a strong spiritual relationship to country within the broader Port Adelaide Enfield Council area.

An Aboriginal Cultural Heritage Survey was undertaken by IHC (2019), which identified that the upper soil profile of the LeFevre Peninsula has been heavily influenced by historical and modern activity. The project area was sub tidal during the pre-European period, and was raised and levelled with sandy fill and industrial dumping between the early 1940's and 1992, along with the construction of a seawall embankment in the 1950's (Cook & Coleman, 2003). As a result the upper soil within the Project area is largely anthropogenic. Underlying the sandy fill of the surface material (0–2 m) is the loose sand and silty sand of the Holocene St Kilda formation, which continues to a depth of 9 m (Sheard & Bowman, 1996). In reference to the findings of the geotechnical study undertaken by CMW (2019), it was suggested that the 3 metres of top sediment recorded (before encountering the water level) during the geotechnical investigations, area are in fact modern fill layers.

A search of the Central Archive, which includes the Register of Aboriginal Sites and Objects, was therefore requested from the Department of the Premier and Cabinet Aboriginal Affairs and Reconciliation Division (DPC-AAR), for the Site. The search response letter from the DPC-AAR, dated 30 August 2019, has been provided separately to SCAP.

6.1.4 POTENTIAL IMPACTS

With any ground disturbing works, there exists the potential to encounter Aboriginal cultural heritage sites. The risk of encountering sites is elevated in locations presenting landscape features that were integral to traditional Aboriginal life. Within the locality of the Site, features include sandy soils, undisturbed native vegetation, and sandy areas along water courses present a risk for encountering Aboriginal sites, including campsites and burial sites (Attorney-General's Department, 2006).

Further discussions regarding potential impacts and risk are outlined in the Aboriginal Cultural Heritage Assessment Report for the project. The relevant Aboriginal Group for this area have requested that this report not be attached with the Development Application and that any specific findings are not discussed in the report. The Aboriginal Cultural Heritage Survey will be provided separately to SCAP.

6.1.5 MANAGEMENT AND MITIGATION MEASURES

6.1.5.1 PLANNING

To minimise the risk of encountering Aboriginal sites, earthworks and infrastructure should generally try to avoid undisturbed areas. Furthermore, the risk of accidental damage to Aboriginal heritage sites can be reduced by avoiding, or taking extra care when working in high risk areas, including areas within sand dune systems, within 100 m of natural water sources, within rock outcrops, and areas of undisturbed vegetation (Attorney-General's Department, 2006). As this is not always possible, adequate site discovery procedures based upon those specified in the DPC-AAR's Aboriginal Heritage Guidelines should be implemented.

Further information is provided in the Aboriginal Cultural Heritage Survey Report, which will be provided separately to SCAP.

6.1.5.2 CONSTRUCTION

Cultural heritage management measures should be incorporated into the Construction Environmental Management Plan (CEMP). These should include a site discovery procedure to be implemented if Aboriginal heritage sites, objects or remains are discovered during civil works. Furthermore, heritage procedures should be included in site inductions, to be undertaken for all work personnel, covering typical Aboriginal site descriptions, potential indicators, site discovery processes and legislative obligations.

Further information is provided in the Aboriginal Cultural Heritage Survey Report, which will be provided separately to SCAP.

6.1.5.3 OPERATION

It is unlikely that the operation of the Project will result in impacts to Aboriginal cultural heritage values.

6.1.6 KEY RECOMMENDATIONS

- A site discovery procedure to be implemented for any ground disturbing works.
- Site personnel should be advised of Heritage procedures during site inductions.

6.2 AIR QUALITY

6.2.1 LEGISLATIVE AND POLICY REQUIREMENTS

The following legislation and policy is relevant to air quality matters for the proposed Project:

- National Environment Protection (Ambient Air Quality) Measure (Air NEPM)
- National Environment (Air Toxics) Measure (Air Toxics NEPM)
- *Environment Protection Act 1993*
- *Planning, Environment and Infrastructure Act 2016*
- Environment Protection (Air Quality) Policy 2016 (Air EPP)
- Ambient Air Quality Assessment Guidelines, SA EPA, 2016 (AAQA)
- Port Adelaide Enfield Council Development Plan.

6.2.2 ASSESSMENT METHODOLOGY

A preliminary air quality overview has been undertaken for the Project (noting that detailed air quality modelling will be provided as an addendum to this Development Application). As part of this overview, the pollutants of interest were identified for the Project, and discussed in relation to relevant legislation, policies, measures and pollutant concentration criteria for stack emission and ambient air ground level concentrations. Air quality impacts were qualitatively assessed for construction, operation and decommissioning stages of the Project. Management measures for each stage was discussed to minimise potential air emissions. The overview covered the suburbs of St Kilda, Outer Harbor, North Haven and Osborne.

It should be noted that this overview has been undertaken prior to conducting air dispersion modelling at the site, and as such, it is not possible to quantitatively determine impacts upon the receiving environment and compliance with the relevant legislation and policies.

6.2.3 EXISTING CONDITIONS

6.2.3.1 LOCAL SETTING

Outer Harbor primarily consists of industrial and transport related land uses including the Port Adelaide Passenger Terminal, the Adelaide Container Terminal, and the Pelican Point Power Station. The Pelican Point Power Station is situated to the south of the Site, and is a 497 MW gas turbine power station, operated by ENGIE.

6.2.3.2 SENSITIVE RECEPTORS

The South Australian (SA) Environment Protection Authority (EPA) 'Ambient Air Quality Assessment' (EPA 2016) guideline document defines a sensitive receptor as a:

'Fixed location such as a house, building, other premises or open area where health, property or amenity is affected by emissions that increase the concentration of the emitted parameter above background levels'.

There are no residential receptors within the Outer Harbor suburb. The southern end of the suburb is dedicated to community and conservation uses within Biodiversity Park, Kardi Yarta Reserve and Playground and Falie Reserve. The Mutton Cove Conservation Reserve is situated 300 m to the south-east of the Site in the suburb of Osborne. Torrens Island Conservation Park approximately 600 m north and north-east of the Site.

The nearest residential area is approximately 1.7 km south-east of the Site in the suburb of North Haven, south of Victoria Road. There are also residential receptors approximately 3.3 km to the north-east in the suburb of St Kilda and 3.2 km south in North Haven.

6.2.3.3 LOCAL AIR QUALITY

The main industrial and non-industrial air emission sources contributing to the local airshed include:

- Pelican Point power station
- Port Adelaide Passenger Terminal
- Flinders Adelaide Container Terminal
- Terminal Proprietary (Pty) Limited (Ltd)
- gas metering station
- Osborne Co-generation plant
- Torrens Island power station
- traffic using the local road networks.

These sources emit key pollutants relevant to this Project including:

- Particulate matter of varying size fractions (TSP, PM₁₀ and PM_{2.5})
- NO_x
- CO
- SO₂
- VOCs
- SVOCs.

AMBIENT AIR QUALITY

The South Australian (SA) Environment Protection Authority (EPA) undertakes ambient air quality monitoring at performance monitoring stations in compliance with the requirements of the Air NEPM.

The nearest SA EPA performance monitoring station to the Project site is the Le Fevre 2 ambient air quality monitoring station (AAQMS) located approximately 3.1 kilometres (km) south south-west of the Project site at North Have School off Sir Claud Gibb Street. This AAQMS measures PM₁₀, PM_{2.5}, NO₂, and SO₂.

A preliminary review for the most recent year (2018) of publicly available monitoring data at the Le Fevre 2 AAQMS indicates the following:

- there were no exceedances of the 24 hour PM_{2.5} NEPM standard
- there were three exceedances of the 24 hour PM₁₀ NEPM standard on:
 - 22 March 2018 (60.1 µg/m³) possibly caused by a prescribed burn in the Mt Lofty Ranges during temperature inversion conditions
 - 11 April 2018 (59.0 µg/m³) caused by local fires and a state-wide dust storm
 - 2 August 2018 (54.4 µg/m³) caused by a dust storm
- there were no exceedances of the 1 hour NO₂ standard, and the 1 hour and 24 hour SO₂ standard.

With the exception of a number exceedances of the 24 hour PM₁₀ NEPM standard, in general, the air quality at the Le Fevre AAQMS demonstrates compliance with the relevant NEPM standards.

6.2.4 POTENTIAL IMPACTS

6.2.4.1 CONSTRUCTION

The main air quality impacts during construction of the Project would be associated with airborne particulate matter (PM) of varying size fractions (deposited dust, Total Suspended Particulates [TSP] PM₁₀ and PM_{2.5}):

- site preparation works; including fencing, preliminary civil works and drainage, access road and internal track construction, construction of site offices and facilities
- installation of footings and infrastructure
- removal of temporary construction facilities and rehabilitation of disturbed areas.

The proposed timing for construction of the Project is early-2020 to late-2020 (approximately 10 months), pending Approval.

Equipment required for construction would include earth moving equipment, trucks and cranes. Materials required will include gravel, concrete and infrastructure components.

Odour emissions for some of the activities e.g. excavation works of potentially contaminated soil, may also occur although it is anticipated that any such occurrence would be localised and not impact sensitive receptors off-site. Emissions (CO, NO_x, SO₂, particulate matter fractions [PM₁₀ and PM_{2.5}], VOCs and semi-volatile organic compounds [SVOCs including PAHs]) from heavy commercial vehicles (HCVs) and mobile plant and machinery would occur from the combustion of diesel and petrol fuel.

Impacts from the operation of mobile plant and machinery would depend on the number and power outputs of the combustion engines, the quality of the fuel and engine maintenance. Notwithstanding, these sources are considered to be minor given their intermittent nature, duration, geographical extent over which these emissions occur and the low number of sensitive receptors that may be directly impacted.

Proposed management measures presented in Section 6.2.5 should ensure air quality impacts during construction are minimised.

6.2.4.2 OPERATION

It is understood, for the purposes of this report that the five GE TM2500+ diesel turbines located at the current Elizabeth site will be converted to natural gas as the primary fuel, with diesel fuel as back-up, from a temporary to a commercial enterprise and re-located to the proposed site at Outer Harbor, 20 km north of Adelaide CBD.

In 2017, Vipac conducted an air dispersion modelling assessment (Vipac, 2017) of air emissions for five gas turbines with a 100 MW generating capacity at Edinburgh, as part of the Temporary Generator Project. These existing turbines are proposed to be relocated from Elizabeth to Edinburgh and converted from diesel to natural gas, with diesel as a back-up fuel.

Impacts from the following pollutants were modelled:

- PM₁₀
- PM_{2.5}
- CO
- NO₂
- SO₂.

The following scenarios were assessed at the Edinburgh site:

- Scenario 1 – continuous operation of all five turbines over 1 year
- Scenario 2 – operation of all 5 turbines from November to March
- Scenario 3 – one turbine operating continuously.

Emissions input data was estimated based on the average of manufacturer supplied engine performance data for turbine exhaust parameters.

Meteorology for 2009 was used for the dispersion modelling assessment.

The Netley Environment Protection Authority (EPA) ambient air quality monitoring station (AAQMS) is closest to the Edinburgh site and PM₁₀, PM_{2.5} and NO₂ data was adopted as background concentration for 2016.

The closest residential receptors are approximately 800 metres (m) to the north and 900 m to the west of the Edinburgh site with the closest commercial receptor 70 m to the east.

The outcomes of the modelling at the Edinburgh site indicated the following:

- Scenario 1 – predicted cumulative ground level concentrations (GLCs) of PM₁₀, CO, NO₂, SO₂ and 24 hour PM_{2.5} are below their respective maximum pollutant concentration criteria at all identified sensitive receptor locations.
- Scenario 1 – predicted cumulative GLCs of annual PM_{2.5} are above its maximum concentration criteria.
- Scenario 2 – predicted cumulative GLCs of PM₁₀, CO, NO₂, SO₂ and 24 hour PM_{2.5} are below their respective maximum pollutant concentration criteria at all identified sensitive receptor locations.
- Scenario 2 – predicted cumulative GLCs of annual PM_{2.5} are above its maximum concentration criteria.
- Scenario 3 – predicted cumulative GLCs of PM₁₀, CO, NO₂, SO₂ and 24 hour PM_{2.5} are below their respective maximum pollutant concentration criteria at all identified sensitive receptor locations.
- Scenario 3 – predicted cumulative GLCs of annual PM_{2.5} are above its maximum concentration criterion.

The reason for the annual PM_{2.5} exceedances is due to the concentration of 9.0 µg/m³ in 2016 adopted as background at the Edinburgh site which exceeds the annual maximum concentration criterion of 8.0 µg/m³ as prescribed in the Air EPP. Annual PM_{2.5} impacts from operation of the proposed turbines contribute 9%, 7% and 2% respectively to the cumulative impact assessed for scenarios 1, 2 and 3. Additionally, predicted annual PM_{2.5} impacts for scenarios 1, 2 and 3 are 11%, 9% and 3% of the maximum concentration criterion.

The report concludes that ‘the modelling results indicate that the operation of the Temporary Generator Project will not adversely impact the amenity of local residential and commercial receptors’.

Assuming the same input parameters (e.g. emission rates, volumetric flows, stack efflux temperature, stack height and temperature), for the five turbines operating on gas, exceedances of the maximum pollutant criteria (Air EPP) for the key pollutants assessed are not expected to occur. Notwithstanding, air dispersion modelling to confirm compliance is recommended. Depending on the chosen background concentrations, there may be an exceedance of the annual PM_{2.5} pollutant concentration. For emergency diesel operation, air dispersion modelling to determine compliance recommended.

6.2.4.3 DECOMMISSIONING

At the end of the 25-year equipment lease (unless extended), the Project will be decommissioned. The main air emission sources during decommissioning are likely to be during:

- removal of all infrastructure from the Site
- remediation of the land to its original condition.

Low levels of particulate matter of varying size fractions and vehicular emissions may be generated during these works and are not expected to impact on the receiving environment.

6.2.5 MANAGEMENT AND MITIGATION MEASURES

6.2.5.1 PLANNING AND DESIGN

An air dispersion modelling assessment is currently being conducted to determine potential impacts beyond the site boundary during normal operation of the gas turbines and in the event where diesel is required to be used as a fuel. The modelling assessment is based upon the most recent concept design information e.g. stack height and emission characteristics. Please note: as discussed above in Section 1.6.2, this modelling has been commissioned, and will be provided as an addendum to this Development Application.

6.2.5.2 CONSTRUCTION

A dust management plan (DMP) should be prepared as part of the Construction Environmental Management Plan (CEMP). The DMP should incorporate a range of management measures summarised in Table 6.1.

Table 6.1 Proposed management measures

SOURCE	MANAGEMENT MEASURES
Site preparation works	— Works to be limited to the areas required to construct the works.
On-site traffic movements	— Water sprays to be used as required. — Vehicle movements to be strictly limited to designated entry/exit routes and parking area. — Speed limits to be enforced on unsealed roads and access roads. — Vehicles transporting spoil or material to/from the site to be covered immediately after loading.
Diesel exhaust emissions	— Proper maintenance and tuning of engines in accordance with manufacturers recommendations. — Catalytic converters and diesel particulate filters (if available) to be fitted to all HCVs. — Turning off idling plant and trucks when not in use. — Appropriate height of discharge above ground level. — Comply with the requirements of the National Environment Protection (Diesel Vehicle Emissions) Measure 2001.
Earthmoving and excavation	— Use of water sprays as required.
Unpaved access roads and pathways and clearing of access roads	— Use of water sprays or waters as required. — Use of wind breaks.
Wind erosion from exposed surfaces	— Stabilise all disturbed areas as soon as is practical.
Handling and transfer of materials	— Use of water sprays or water cart as required.

6.2.5.3 OPERATION

During operation, the turbines should be maintained in accordance with the manufacturers specifications with regular testing and scheduled regular maintenance.

It is recommended that emissions during operation of the turbines using gas or diesel as a fuel should comply with the relevant maximum pollutant levels (stack emissions) and the maximum ground level concentrations as prescribed in the Air EPP.

6.2.5.4 DECOMMISSIONING

To ensure air emissions are managed appropriately during decommissioning, management measures listed in Section 6.2.5.2 are recommended.

6.2.6 KEY RECOMMENDATIONS

The preliminary air quality overview identified that Air quality impacts are expected to occur during construction, operation and decommissioning stages of the Project. The following key recommendations were provided:

- At the planning and design stage, it is recommended that the air dispersion modelling assessment is completed for the five turbines during normal gas operation and during emergency back-up diesel operation, to demonstrate compliance with the relevant pollutant concentration criteria for stack emission and ambient air ground level concentrations. The outcomes would also be used as supporting information for an environmental licence application at the Outer Harbor site. Please note: as discussed above in Section 1.6.2, this modelling is currently underway, and will be provided as an addendum to this Development Application.
- To ensure the turbines continue to operate efficiently and comply with the Air EPP maximum pollutant concentrations, they should be maintained in accordance with the manufacturers specifications with regular testing and scheduled regular maintenance.
- Air emissions during decommissioning are likely to be low and can be managed using management measures proposed for the construction stage.

6.3 FLORA AND FAUNA

6.3.1 LEGISLATIVE AND POLICY REQUIREMENTS

The following legislation is relevant to flora and fauna matters for the proposed Project:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Native Vegetation Act 1991*
- *National Parks and Wildlife Act 1972*
- *Natural Resources Management Act 2004.*

6.3.1.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. It applies to all Australian territory and waters. Under the Act, actions that are likely to have a significant impact upon defined Matters of National Environmental Significance (MNES) are subject to an assessment and approval process.

6.3.1.2 NATIVE VEGETATION ACT 1991

Under the *Native Vegetation Act 1991* (NV Act), all clearance to native vegetation within the State, requires the approval of the Native Vegetation Council (NVC) unless otherwise exempted under the Act. All approved vegetation clearance must also be conditional on achieving a Significant Environmental Benefit (SEB) to offset the clearance.

The Project site is located in the NV Act exempt area, meaning that approval from the NVC for clearance of terrestrial vegetation is not required. Seagrasses in the adjacent Port River are protected under the NV Act. As such, and although unlikely, any potential damage to nearby seagrasses would require approval under the Act.

6.3.1.3 NATIONAL PARKS AND WILDLIFE ACT 1972

Within South Australia, vascular plants and vertebrate animals (e.g. mammals, birds, reptiles and amphibians) are protected under the *National Parks and Wildlife Act 1972* (NPW Act). It is not anticipated that any permits will be required under the NPW Act for activities proposed under this Project.

6.3.1.4 NATURAL RESOURCES MANAGEMENT ACT 2004

The *Natural Resources Management Act 2004* (NRM Act) aims to promote the sustainable and integrated management of the State's natural resources. Under the NRM Act, landholders have a duty of care to prevent the degradation of land and water, and to manage declared pests.

Additionally, the NRM Act established Natural Resource Management (NRM) Boards and Plans for regions across the state, to facilitate the objectives of the Act. The relevant NRM region for the Project is the Adelaide and Mount Lofty Ranges.

Under the NRM Act, certain activities, affecting water courses, dame

- undertaking water affecting activities that will impact a watercourse, dam, floodplain or lake
- undertaking activities that will impact a well, including drilling, sealing, repairing, altering or discharging water into a well
- using sing imported water in the course of carrying on a business
- using effluent in the course of carrying on a business.

It is not anticipated that the Project will require any permits under the NRM Act.

6.3.2 ASSESSMENT METHODOLOGY

EBS Ecology were commissioned to investigate Matters of National Environmental Significance (MNES), protected under the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* that may be associated with the Project site. The assessment was undertaken using the following methodology:

- undertaking a desktop assessment consisting of a database searches using a 5 km buffer from the Project site. Databases include the Biological Databases of South Australia (BDBSA) and the Protected Matters Search Tool (PMST)
- a field assessment was conducted by two ecologists over a six-hour period; undertaken in 3 June 2019. The field assessment consisted of a bird survey and a site walkover across areas high risk areas.

6.3.3 EXISTING CONDITIONS

6.3.3.1 DESKTOP ASSESSMENT

The desktop assessment identified the following species protected under the EPBC Act that may be relevant to the Project:

- One Threatened Ecological Community (TEC), being *Subtropical and Temperate Coastal Saltmarsh*, rated as Vulnerable under the EPBC Act. Note that a saltmarsh community was recorded during the field assessment and qualified as the TEC.
- Four nationally threatened flora species including; *Caladenia tensa* (Greencomb Spider-orchid), *Euphrasia collina* ssp. *Osbornii* (Osborn's Eyebright), *Prasophyllum validum* (Sturdy Leek-orchid), and *Tecticornia flabelliformis* (Bead Glasswort). Note that all flora species were considered unlikely to occur within the Study Area, however suitable habitat was recorded for the *Tecticornia flabelliformis* (Bead Glasswort) but the species itself was not recorded during the targeted search for the species, and is therefore is deemed unlikely to occur.
- Twenty-seven (27) threatened fauna species (excluding sharks, whales, turtles and sea-lions). Note that following the field assessment, only one nationally threatened fauna species; the Curlew Sandpiper (*Calidris ferruginea*) was considered to possibly occur within the Project area, while seven nationally threatened fauna species were considered to possibly occur on the tidal mudflat adjacent to the Study Area.
- Sixty-four (64) migratory fauna species (excluding sharks, whales and turtles). Note that following the field assessment, only nine species of migratory shorebird and two species of migratory aerial passerines were identified to use the Project area, whilst a further 17 species were considered to possibly occur on the tidal mudflat adjacent to the Study Area. All the migratory species that could occur on the tidal mudflats may fly-over the Project area.

Additionally, a search of the BDBSA was undertaken to identify state protected species potentially occurring within the Project area, using a 5 km buffer distance. No protected species were identified on the project site however within the wider area, nine (9) flora species protected under the NPW Act were identified; including *Atriplex australasica*, *Calotis scapigera* (Tufted Burr-daisy), *Centrolepis cephaliformis* ssp. *Cephaliformis* (Cushion Centrolepis), *Crassula exserta* (Large-fruit Crassula), *Potamogeton ochreatus* (Blunt Pondweed), *Rorippa laciniata* (Jagged Bitter-cress), *Rytidosperma leave* (Smooth Wallaby-grass), *Tecticornia flabelliformis* (Bead Samphire), and *Zieria veronicea* ssp. *Veronicea* (Pink Zieria). Of the identified flora species, one is rated as vulnerable (Bead Samphire), while all others are rated as rare. Twenty-one (21) NPW protected fauna species were identified; all of which are species of birds. Three (3) of which are listed as vulnerable, being the *Cladorhynchus leucocephalus* (Banded Stilt), *Coturnix ypsilophora* (Brown Quail), and *Numenius madagascariensis* (Far Eastern Curlew).

6.3.3.2 FIELD ASSESSMENT

VEGETATION ASSOCIATIONS

During the field assessment four Vegetation Associations (VA) were recorded over the Study Area, as displayed in Table 6.2. The dominant vegetation associations over the Study Area were VA 2 and VA 4, which covered 2.16 ha and 0.22 ha, respectively. VA 1 and VA 3 were less widely spread covering 1.60 ha and 0.59 ha, respectively. A map illustrating the location and extent of each vegetation association is provided in Figure 6.1.

Table 6.2 Vegetation associations recorded over the Study area

ID	VEGETATION ASSOCIATION	AREA (ha)
1	<i>Melaleuca halmaturorum</i> (Swamp Paperbark) / <i>Melaleuca lanceolata</i> (Dryland Tea-tree) planted woodland +/- native <i>Carpobrotus rossii</i> (Native Pigface), <i>Suaeda australis</i> (Austral Seablite)	1.60
2	<i>Tecticornia halocnemoides</i> (Grey Samphire) / <i>Tecticornia pergranulata</i> (Blackseed Samphire) low closed shrubland +/- <i>Melaleuca halmaturorum</i> (Swamp Paperbark), <i>Suaeda australis</i> (Austral Seablite), <i>Sarcocornia sp.</i> (Glasswort), <i>Myoporum insulare</i> (Boobialla)	2.16
3	<i>Maireana brevifolia</i> (Small-leaf Bluebush) / <i>Nitraria billardierei</i> (Nitre Bush) low very open shrubland	0.59
4	<i>Dianella brevicaulis</i> (Short-stem Flax-lily) / <i>Ficinia nodosa</i> (Knobby Club-rush) low very open shrubland	0.22
Total		6.57

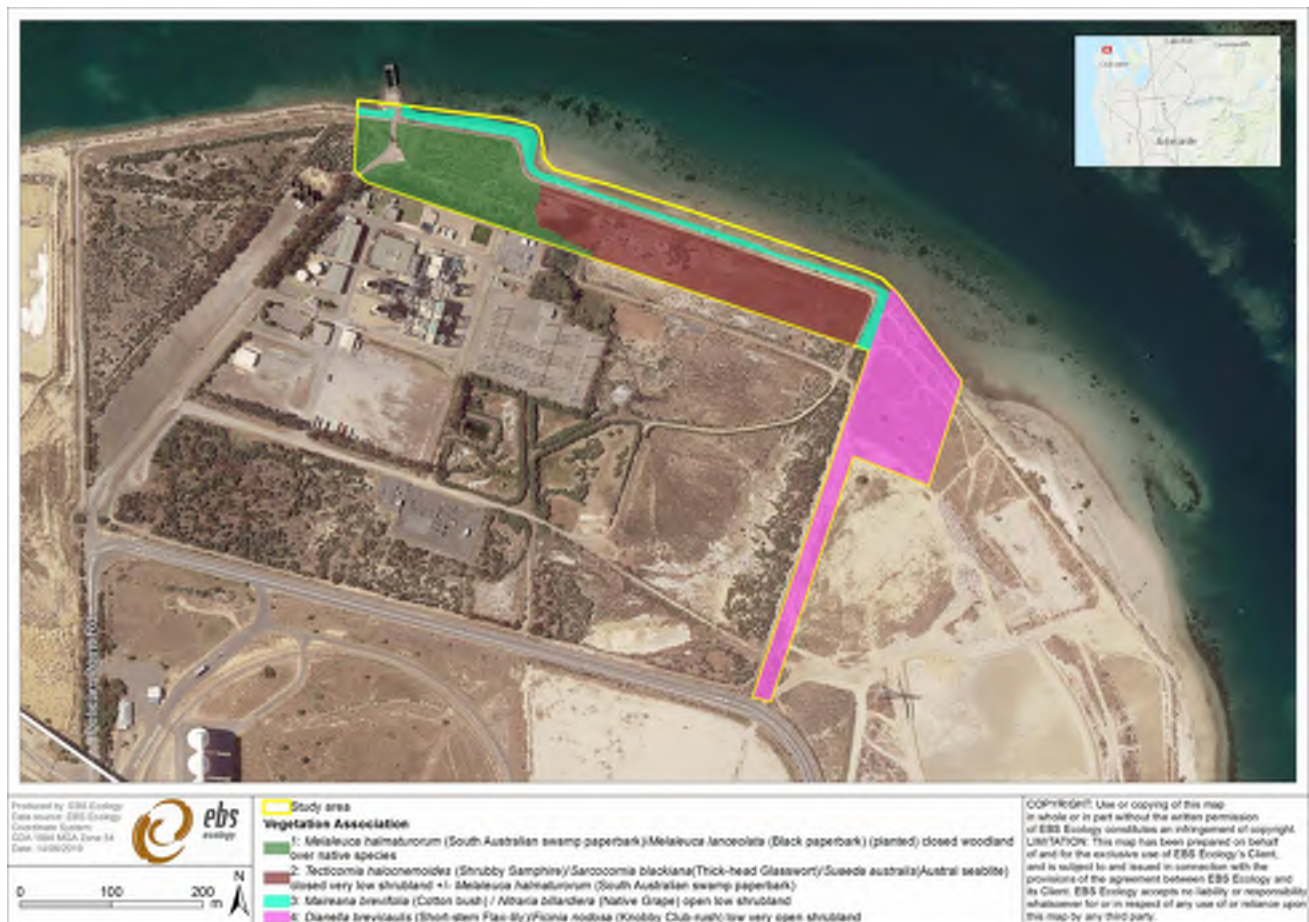


Figure 6.1 Vegetation associations mapped over the Study area

THREATENED ECOLOGICAL COMMUNITY

The coastal saltmarsh community (VA 2) identified in the Study Area (shown in Photo 6.1) was determined to represent Subtropical and Temperate Coastal Saltmarsh TEC, listed as Vulnerable under the EPBC Act. VA 2 satisfied all the key diagnostic characteristics for the TEC and did not meet any of the exclusion criteria under the Act. One of the key diagnostic characteristics for listing is some form of tidal connection. Although not directly connected to the Port River (ocean) the site is influenced by seawater to some degree by three processes:

- 1 seawater spilling from a vent connected to an underground seawater pipe
- 2 suspected tidal seepage, and
- 3 possible storm surge wave action.



Photo 6.1 Coastal saltmarsh indicating typical salt-tolerant species and trees restricted to edges of swamp

THREATENED FLORA SPECIES

There were no State or National threatened fauna species identified during the field assessment. A targeted search was conducted for the nationally threatened; *Tecticornia flabelliformis* (Bead Samphire), but no individuals were recorded.

THREATENED FAUNA SPECIES

Thirteen (13) terrestrial bird species were recorded during the field assessment. The 13 bird species were comprised of ten native and three introduced species. The most widespread species was the Singing Honeyeater (*Gavicalis vireescens*), followed by the Willie Wagtail (*Rhipidura leucophrys*) and Magpielark (*Grallina cyanoleuca*). Nine waterbird species were recorded on the coastline adjacent to the Study Area. Two species of conservation significance at National and State level were recorded. One Caspian Tern (*Hydroprogne caspia*), listed as Migratory under the EPBC Act, was recorded flying adjacent to the Study Area. In addition to this, one Sooty Oystercatcher (*Haematopus fuliginosus*), listed as Rare under the NPW Act, was observed foraging on the mudflat at low tide.

WEEDS

A number of weed species were identified across the Project site, including five within VA 1, six within VA 2, 20 in VA 3, and 15 in VA 4.

6.3.4 POTENTIAL IMPACTS

The environmental value over the Study Area was variable. The areas of High environmental value are restricted to the basin containing VA 2 and include the following MNES that will or may be impacted by construction within this area:

- clearance of Subtropical and Temperate Coastal Saltmarsh TEC (Aus: VU); and
- clearance of potential foraging habitat for the Curlew Sandpiper (Aus: CE) and a further eight migratory shorebird species (Aus: Mi). Note: this habitat would be of negligible importance for this suite of migratory shorebird species.

The area of Moderate environmental value included the following MNES that may be impacted by construction within this area:

- construction close to the tidal mudflat may increase the frequency of disturbance events on migratory shorebird and tern species (Aus: Mi).

Construction within areas of Low environmental value (green polygon) will not adversely impact any MNES except for loud noises during construction and operations that could disturb migratory shorebird and tern species (Aus: Mi).

6.3.5 KEY RECOMMENDATIONS

The following key recommendations were provided as an outcome of the investigation:

- No threatened species or communities would be significantly impacted by the Project and therefore a Referral under the EPBC Act would not be required.
- Clearance of native vegetation should be avoided as much as possible.
- Weed hygiene measures should be employed during construction works (including vegetation removal) to ensure that no new weeds are introduced to existing native vegetation.
- Construction activities should be minimised near tidal mudflats during the migratory shorebird season (September to April), especially their peak season (December to February), if feasible, to reduce disturbance to foraging migratory shorebird and tern species.
- If movement of personnel near the tidal mudflat is required during the migratory shorebird season then personnel should remain within vehicles, as much as possible, as movement on foot is more disruptive to migratory shorebirds.

6.4 GEOTECHNICAL

6.4.1 LEGISLATIVE AND POLICY REQUIREMENTS

The following legislation and Codes are relevant for the geotechnical aspects of the Project:

- *Planning, Development and Infrastructure Act 2016*
- *Work Health and Safety Act 2012*
- The Building Code of Australia
- Excavation Work Code of Practice.

6.4.2 ASSESSMENT METHODOLOGY

A Geotechnical Investigation Report of the Site was previously undertaken by CMW, commissioned by Fyfe. The investigation was undertaken as per the following methodology:

- review of relevant ‘dial before you dig’ documents and onsite service location
- review of published geological maps and previous investigations
- field investigation consisting of a walkover survey to assess landform and site conditions, collect five borehole samples, conduct dynamic cone penetrometer test (adjacent to borehole locations), collect a bulk soils sample for laboratory testing of soaked CBR and Concrete Aggressivity tests
- laboratory testing consisting of one soaked CBR test, and four pH, Cl, SO₄ and Resistivity tests.

6.4.3 EXISTING CONDITIONS

The desktop study component of the investigation identified that the soils in the area mostly consist of coastal marine sediment composed of; St Kilda Formation (shelly, organic sand, typically in a loose to medium dense state and up to 6–8 m thick), Glanville Formation (thin calcrete cap overlying variably shelly sand and sandy clay of stiff consistency, encountered below a depth of around 8 m and typically 2–4 m thick) and Hindmarsh Clay (comprised of clay and sandy clay of high plasticity and stiff to hard consistency, encountered below a depth of about 10 m) (CMW Geosciences, 2019).

Subsurface conditions encountered during site ingestions were found to be consistent with those identified during the desktop study. The report summarised these conditions as per the following sequence:

Semaphore Sand: ‘surface layers generally contained fine to medium grained’.

St Kilda Formation (interbedded sandy clay and sand layers): ‘sandy clay layers contained soft to firm, of medium plasticity clay and fine to medium grained sand’ and ‘and layers generally contained fine to medium grained lose to medium dense sand, trace shells and shell fragments, trace organics’.

(CMW Geosciences, 2019)

Ground water was encountered within a depth of 3–6 m.

6.4.4 POTENTIAL IMPACTS

Key potential impacts identified in the Report include:

- compromised stability due to sandy soils, particularly during construction. The loose, sandy soils encountered on site were identified to be unlikely to stand vertically. Furthermore, there is a risk of water ponding during excavation for footings, which could result in softening the foundation soil
- risk of encountering water during excavation work, due to the high water-table
- risk of poor trafficability of the site for vehicles during wet conditions.

6.4.5 MANAGEMENT AND MITIGATION MEASURES

6.4.5.1 PLANNING

The Report provided the following management and mitigation measures, to be implemented during the design phase of the Project:

- Shallow spread footings are suitable. Foundation systems could include conventional spread footings for columns or walls, grid foundations with columns tied together with ground beams and an integral concrete floor, or stiffened concrete raft with the floor slab cast integrally with a grid of footing beams and the combined slab-beam.
- The design of footing systems should consider settlement caused by the placement of fill on-site.

6.4.5.2 CONSTRUCTION

The Report provided the following management and mitigation measures, to be implemented during the construction phase of the Project:

- Organic topsoil, non-engineered fill, and softened/disturbed natural materials should be stripped from proposed building/pavement areas. Exposed, natural surfaces should then be proof-rolled with a vibrating pad foot roller to identify soft or weak areas, which should be treated with over excavation and replaced with a coarse grained compacted select fill.
- Where ground levels need to be raised using engineered fill, the fill should be spread and compacted in layers not exceeding 250 mm in loose thickness to achieve a dry density ratio of at least 95% or a density index of 65% for clean sand (less than 5% fines). A maximum loose layer thickness of around 250 mm is envisaged, although this would need to be assessed based on the compaction methodology and materials used.
- Geofabric wrapped rock fill could be used to increase trafficability of the site for construction plant.
- Temporary cut batter slopes of 1V:2H, or flatter, should be used. Exposed batter slopes should be protected from scour and erosion. Excavations below the water table should have suitable dewatering and temporary shoring / sheet pile wall.
- Prevent water from ponding in the base of any footing excavation. Dewatering systems could be put in place to lower the ground water table at footing excavations during construction.
- The base of footing excavations should be observed by a suitability experienced engineer, to ensure that the conditions exposed are consistent with the design assumptions. Footings should avoid non-engineered fill, organic topsoil or softened natural soils.

(CMW Geosciences, 2019)

6.4.6 KEY RECOMMENDATIONS

The findings and recommendations in the Geotechnical Investigation Report should be incorporated into the detailed design and construction of the Project.

A site Health, Environmental, and Safety plan should be created prior to site works, and should address the trafficability of the Site. This may include details of aids for accessing the site and vehicle recovery. Furthermore, site workers should have training/experience in safe operation of 4WD vehicles and vehicle recovery.

6.5 NOISE

6.5.1 LEGISLATIVE AND POLICY REQUIREMENTS

Environmental noise management for the Project is managed under the following legislation and policy:

- *Environment Protection Act 1993* (EPA Act)
- Environmental Protection (Noise) Policy (2007).

6.5.2 ASSESSMENT METHODOLOGY

An Environmental Noise Assessment was undertaken for the Project, to ascertain if operational noise from the Project is compliant with relevant noise criteria and the legislated duty of care for the environment. The assessment was undertaken using the following methodology:

- define noise-sensitive receivers (Receivers) surrounding the proposed Site
- determine the relevant operational noise criteria at the Receiver locations for the Project
- predict future noise emission levels for the Project
- compare predicted operational noise levels to the criteria; and
- outline what, if any, noise mitigation is required for compliance with the noise criteria.

6.5.3 EXISTING CONDITIONS

The closest residential noise sensitive receivers to the Site are in North Haven, and located in a Residential Zone to the Southwest of the Site. These are located approximately 2.1 km from the proposed location of the turbines.

The next closest receptors are in St Kilda, approximately 3.5 km to the Northeast of the proposed Site.

For brevity, the assessment used representative receiver locations to present noise modelling results for established medium density residential areas. The representative locations were selected such that noise levels for the surrounding residential properties would be equal to or less than levels at the representative locations.

The location of the representative receivers, the proposed Site, and the relevant Development Plan Zones are shown in Figure 6.2, below.



Figure 6.2 Noise sensitive receivers (yellow circles), site boundary (red dashed line), and Development Plan zones

Noise goals, achieve the General Environmental Duty, are set in accordance with the Environment Protection (Noise) Policy 2007 (Noise EPP) and are determined based on the land uses principally promoted by the relevant Development Plan. Both receptor localities (North Haven and St Kilda) are separated from the noise source locality by buffer areas/zones. In accordance with the Noise EPP, given that the Project is subject to development assessment, the noise criteria are therefore the Indicative Noise Factor for the receiver zone, less 5 dB(A).

Both receiver localities relevant to the Project are residential land uses. Noise criteria applicable for nearest residential receivers to the Site are therefore:

- 47 dB(A) Leq,15min during day time periods (7 am – 10 pm)
- 40 dB(A) Leq,15min during night time periods (10 pm – 7 am)
- 60 dB(A) Lmax during night time periods (10 pm – 7 am).

It is understood that the nature of a peaking power plant is that operation is be anticipated during times of peak electricity demand. In South Australia, these are typically between 6 am – 9 am and 5 pm – 10 pm. As these potential operating time periods span both the ‘day time’ and ‘night time’ criteria, we have assessed Project operation for both time periods.

Note that in accordance with the Noise EPP, the measured source noise level must be adjusted by the following amounts if the noise source contains modulation, tonal, impulsive, or low-frequency characteristics:

- +5 dB(A) if the noise source contains 1 characteristics
- +8 dB(A) if the noise source contains 2 characteristics
- +10 dB(A) if the noise source contains 3 or 4 characteristics.

6.5.4 POTENTIAL IMPACTS

Noise levels from the Project were predicted using SoundPLAN 8.1 environmental noise modelling software. Noise models were developed which considered the site layout and turbine source locations, natural and future ground surface surrounding the Project, ground absorption and receiver locations; and were undertaken and assessed in accordance with the requirements of the Noise EPP and guidelines.

Sound power data for the TM2500 turbines was provided through Nexif, by Emanden Technical Solutions Pty Ltd. It is understood that the turbines to be installed at the site are not fitted with any additional noise mitigation when compared to the turbine which was subject to the sound power testing. Other ancillary equipment such as transformers, backup generators and standby generators were also included in the model as noise sources.

For the purposes of noise modelling, a site layout was developed based upon the WSP General Layout (OPT-1) for the site. This site layout is shown in Figure 6.3.

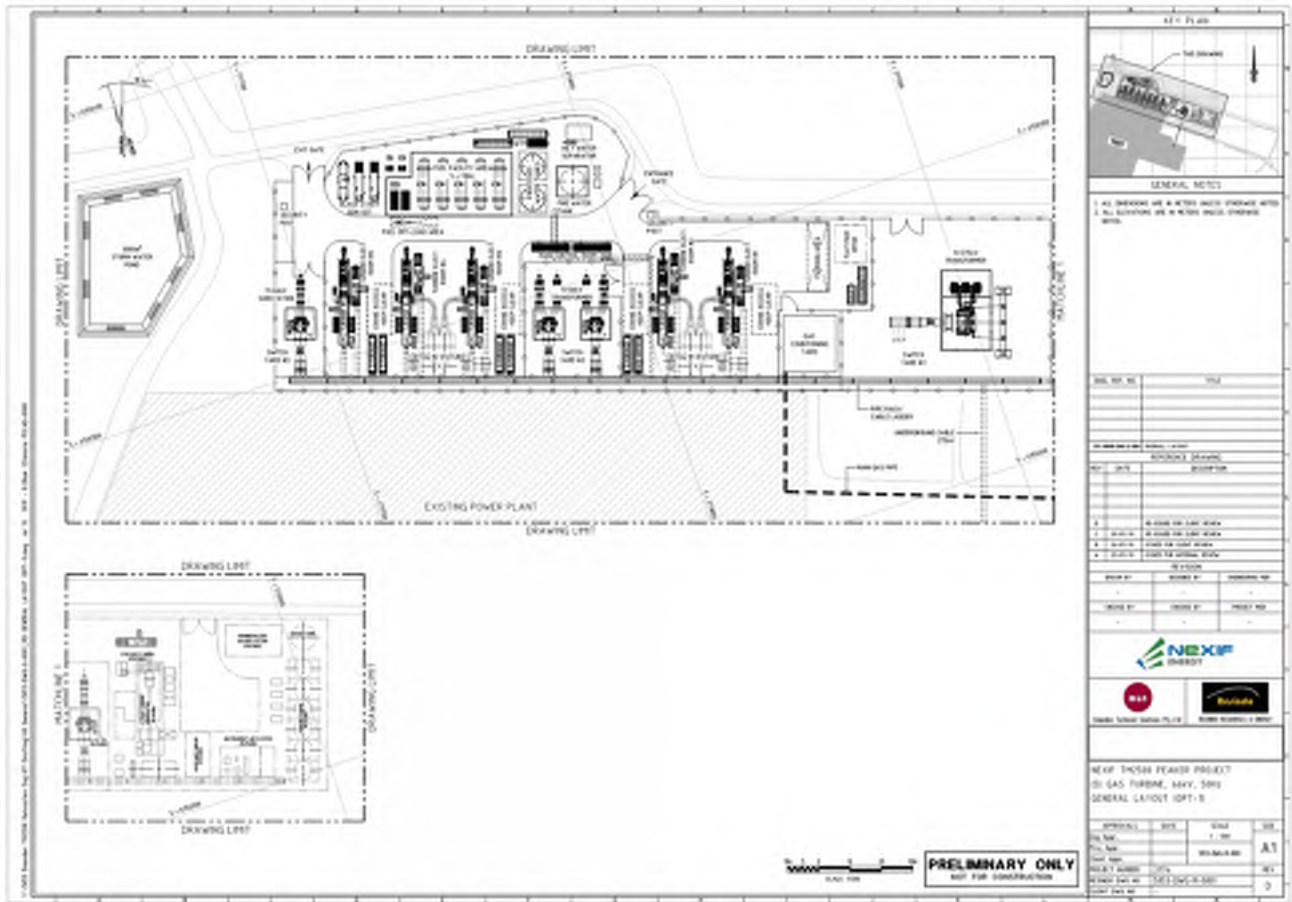


Figure 6.3 Preliminary Site Plan used for noise assessment

6.5.4.1 PREDICTED NOISE LEVELS

Predicted operational noise levels for the Project, at the noise sensitive receiver locations, are provided in Table 6.3. These levels are based upon steady state running of the turbines continuously over the 15-minute assessment period. L_{Amax} data was not available for the TM2500 turbines, however the steady state nature of gas turbines is such that any noise criteria exceedance will be controlled by the L_{Aeq} criterion.

Table 6.3 Predicted future noise levels (ISO 9613:1996)

RECEIVER LOCATION	PREDICTED NOISE LEVEL [dB(A)]	NIGHT TIME NOISE CRITERIA [dB(A)]	COMPLIANT WITH NIGHT NOISE CRITERIA
NH01	44	40	No
NH02	44	40	No
NH03	44	40	No
NH04	43	40	No
SK01	37	40	Yes
SK02	37	40	Yes

The results provided in Table 6.4 indicate that noise mitigation will be required for the Site to comply with the night time noise criteria. For reference, noise levels from the Project predicted using CONCAWE (as required by the EPP Guidelines) are provided in Table 6.4. Due to the uncertainty in the validity of the CONCAWE algorithm at the relevant source-receiver distances noise levels have not been compared to the assessment criteria.

Table 6.4 Predicted future noise levels (CONCAWE)

RECEIVER LOCATION	PREDICTED NOISE LEVEL [dB(A)]	
	CONCAWE DAY	CONCAWE NIGHT
NH01	45	45
NH02	46	46
NH03	46	46
NH04	45	45
SK01	46	45
SK02	45	44

6.5.5 MANAGEMENT AND MITIGATION MEASURES

Noise mitigation will be required for the Site to operate during the night-time period. The noise modelling has been used to determine the requirements for such mitigation, based upon the contribution of the noise sources to noise levels at the receiver locations.

The controlling source at all the noise-sensitive receivers was found to be the TM2500 exhaust stacks, followed by the TM2500 GLO pumps.

To mitigate noise from the turbines to acceptable levels, the noise contribution from the exhaust stacks needs to be reduced by the levels indicated on Table 6.5. These levels can be considered indicative of the minimum additional Insertion Loss performance requirements for the exhaust stack to achieve noise criteria compliance (i.e. in addition to any existing exhaust noise reduction already in place on the standard TM2500 packages).

Table 6.5 Noise reduction requirements

ITEM	OCTAVE-BAND NOISE REDUCTION REQUIRED (SILENCER INSERTION LOSS) [dB]								
	31.5 HZ	63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ
TM2500 Exhaust Stack	4	4	6	9	7	4	1	0	0

The design, fabrication and installation of gas turbine exhaust silencers is a costly and time consuming exercise. A risk-based approach to the implementation of noise mitigation is suggested to ensure that noise mitigation is optimised to achieve the required noise reduction at minimum capital cost.

We have documented risks associated with noise mitigation implementation in Table 6.6.

Table 6.6 Noise mitigation risk analysis

RISK ITEM	CAUSE(S)	CONSEQUENCE
Residual exceedance of noise criteria with suggested additional exhaust noise mitigation in place.	<ul style="list-style-type: none"> — Incorrect sound power data provided for modelling. — Additional noise sources present on site which are not included in noise modelling. — Over prediction of atmospheric noise attenuation effects (for example under atmospheric temperature inversion conditions). 	Redesign of noise mitigation or requirements for further noise attenuation.
Over specification of noise mitigation.	<ul style="list-style-type: none"> — Incorrect sound power data provided for modelling. — Underprediction of atmospheric noise attenuation effects. 	Installation of expensive noise mitigation when not required.

The sound power data input into the model is a common potential cause for both under and over prediction by the noise modelling.

The noise data received from Nexif Energy was supplied by the distributor on behalf of General Electric (turbine manufacturer) and is generic for new TM2500 turbines. Noise measurements of the specific turbines, operational on their existing site were undertaken after installation by Vipac in November 2017. We are not aware of more recent test data for either the site, or specific in-situ sound power data for the five turbines to be installed at the site.

To reduce the risk of under or over specification of turbine exhaust silencers, it is suggested one of two approaches is taken:

- 1 undertake in-situ sound power testing of the TM2500 turbines as currently installed at Elizabeth, and design noise mitigation based upon the outcome of this testing; or
- 2 install the TM2500 turbines on site without additional noise mitigation (e.g. exhaust silencers). During commissioning undertake sound power level testing of the units, and undertake measurements of noise at the nearest noise sensitive receiver locations. Based upon the outcomes of this investigation determine the exact requirements for noise mitigation based on the specific turbines installed on site.

It is noted that while Approach 2 will provide optimal noise mitigation based on the most accurate representation of the Site. The lead times associated with manufacture and installation of the silences (if required) may lead to additional delays in obtaining operational approvals and licensing, or may restrict operation to the day time period only until noise mitigation is installed and tested.

6.5.6 KEY RECOMMENDATIONS

Key recommendations from the assessment are as follows:

- Noise criteria can be achieved with the installation of noise mitigation; most likely in the form of exhaust silencers for the gas turbine units.
- It is recommended that further testing of the TM2500 gas turbine units is undertaken to confirm the sound power levels of the specific turbines, and ensure that noise mitigation is designed specific to the Project.

6.6 NON-INDIGENOUS HERITAGE

6.6.1 LEGISLATIVE AND POLICY REQUIREMENTS

Non-Indigenous heritage in South Australia is managed under the following legislation:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Heritage Places Act 1993*
- *Development Act 1993* and the *Planning, Development and Infrastructure Act 2016*
- *Historic Shipwrecks Act 1981*
- *Underwater Cultural Heritage Act 2018* (Commonwealth).

6.6.2 ASSESSMENT METHODOLOGY

To assess potential impacts of the Project on non-Indigenous heritage, a search of the following registers was undertaken to identify non-Indigenous heritage items surrounding the Site:

- Commonwealth Heritage List
- National Heritage List
- SA Heritage Register
- Port Adelaide Enfield Council Development Plan
- Department for Environment and Water's Shipwrecks Dataset.

All places identified within 2,000 m of the Site were considered further.

6.6.3 EXISTING CONDITIONS

The searches identified seven shipwrecks (five of which are protected) and one State heritage place within 2,000 m of the Site. Identified non-Indigenous places are recorded in Table 6.7 below.

Table 6.7 Non-indigenous heritage places identified within 2000 m of the Site

NAME	ADDRESS	RECORD	DISTANCE FROM SITE
Sigrid shipwreck	Port River, near Pelican Point, Port Adelaide	Shipwreck (not protected)	330 m
Excelsior shipwreck	Mutton Cove, near Pelican Point, Outer Harbor, SA	Shipwreck (not protected)	380 m
Wildflower shipwreck	Port River, east of Mersey Road North, Outer Harbor, SA	State historic shipwreck	450 m
Enchantress shipwreck	Port River, west of Mersey Road North, Outer Harbor, SA	State historic shipwreck	750 m
Jupiter shipwreck	Mutton Cove, near Pelican Point, Outer Harbor, SA	State historic shipwreck	850 m
Napperby shipwreck	Port River, west of Mersey Road North, Outer Harbor, SA	State historic shipwreck	950 m
Corsair shipwreck	Port River, adjacent to Flinders Ports Grain Berth 8	State historic shipwreck	1050 m
Torrens Island Quarantine Station Complex	Torrens Island	State heritage place	1250 m

6.6.4 POTENTIAL IMPACTS

The Project will not impact upon any non-Indigenous heritage places. Potential indirect impacts have been considered in the sections below.

6.6.4.1 STATE HERITAGE

The Project is greater than 1250 m from the nearest State heritage place; being the Torrens Island Quarantine Station located to the east of the Site, on Torrens Island. The Project site is separated by the Port River, and several terrestrial land parcels. It is unlikely that there will be any impact to the Quarantine Station, given the large separation distance.

6.6.4.2 SHIPWRECKS

Seven shipwrecks were identified within 2,000 m of the Site; the nearest being approximately 330 m away. Of the identified shipwrecks, the nearest two, consisting of the Sigrid and Excelsior shipwrecks, being 330 m and 380 m away respectively, are not protected under the HS Act as they do not meet the prescribed timeframes under the Act (being 75 years or more in relation to the loss date) and have not otherwise been declared a protected shipwreck.

The remaining five shipwrecks, ranging from approximately 450 m to 1050 m away, are protected under the HS Act. Under the Act, it is an offence to damage, destroy or interfere with a protected shipwreck. The project does not propose any activities within the Port River, and will not impact on identified shipwreck, however under Schedule 8 of the Development Regulations, During the development assessment process, a referral to the Minister for the time being administering the *Historic Shipwrecks Act 1981* is required for any development within 500 metres of a historic shipwreck protected under the *Historic Shipwrecks Act 1981*.

6.6.5 MANAGEMENT AND MITIGATION MEASURES

There are no anticipated impacts to non-Indigenous heritage places. As such, no management or mitigation measures are proposed.

Should any changes to the Project be proposed, involving activities within the Port River, potential impact to nearby shipwrecks should be re-evaluated, particularly potential impacts from underwater vibration.

6.6.6 KEY RECOMMENDATIONS

It is recommended that, given the distance from any registered non-Indigenous heritage place, that that Project is unlikely to impact non-Indigenous heritage values in the area.

6.7 SITE CONTAMINATION

6.7.1 LEGISLATIVE AND POLICY REQUIREMENTS

The following legislation and policy are relevant to the Site Contamination aspects of the Project:

- *Environment Protection Act 1993*
- National Environment Protection Council (NEPC 2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended in 2013 (ASC NEPM)
- Planning SA (2001) *Site Contamination*. Planning Advisory Notice 20
- Standards Australia (2005) *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds*. AS4482.1-2005 Homebush NSW.

6.7.2 ASSESSMENT METHODOLOGY

A Preliminary Site Investigation (PSI) was undertaken to identify site contamination issues which may have resulted from past and/or current use(s) of the Project site, which may significantly impact the proposed use of the Site for commercial/industrial use and/or represent potential public health or environmental risks. The PSI was undertaken using the following methodology:

- desktop searches for the purpose of site characterisation and historical information. Specifically, the searches covered site identification, site features, adjacent land uses and sensitive receptors, regional geology, regional hydrogeology, zoning, history of Certificates of Title, aerial photographs, EPA Section 7 search, EPA Public Register search, and historical business directories
- review of a Lotsearch report to provide an overview of some of the site history, environmental risk and planning information.

6.7.3 EXISTING CONDITIONS

Site information details are provided in Table 6.8 below.

Table 6.8 Site information

SITE ADDRESS	Pelican Point Road, Outer Harbor, SA, 5018 (Parcel 1, 3 and Parcel 4) Mersey Road, Osborne, SA, 5017 (Parcel 2)
TITLE REFERENCE	CT Volume 5920 Folio 564 (Parcel 1) CT Volume 6088 Folio 191 (Parcel 2) CT Volume 6012 Folio 888 (Parcel 3) CT Volume 6103 Folio 374 (Parcel 4)
PROPERTY DESCRIPTION	Portion of Allotment 205 in Deposited Plan 64682 In the Area named Outer Harbor (Parcel 1) Portion of Allotment 502 in Deposited Plan 87145 In the Area named Osborne (Parcel 2) Portion of Allotment 27 in Deposited Plan 76309 In the Area named Outer Harbor (Parcel 3) Piece 152 in Deposited Plan 88633 In the Area named Outer Harbor (Parcel 4) Hundred of Port Adelaide
PROPERTY OWNER	Urban Renewal Authority
COUNCIL ZONING	Industry (In)
CURRENT SITE USE	Vacant/undeveloped (Parcel 1 & 2) and road (Parcel 3 & 4)
PROPOSED SITE USE	Commercial/Industrial
LAND AREA	Approximately 8.6 hectares (leased area only)

A site inspection was not undertaken for the specific purpose of the PSI; however a brief description of some site features is provided below based on photographs provided by others:

- A pile of concrete (possibly over an area up to 15 m²) is present on CT 6088/191 however may be outside the site boundary of Parcel 2.
- Small (estimated to be < 3 m³), possibly sand, stockpiles are present on CT 6088/191, but as with the concrete appear to be outside the site boundary.
- Parcel 3 is generally a dirt road which has been built up compared to the surrounds, and a dirt road and sea wall is present adjacent the coastline of Parcel 1. Immediately south of this is low-lying vacant land with grasses and sparse coastal shrubs, likely prone to tidal seepage and possibly seawater inundation during extreme weather conditions.
- No photos were provided of Parcel 4.

At the time of the inspection, the observed immediately surrounding land uses were as detailed in Table 6.9 below:

Table 6.9 Surrounding land uses

NORTH	Port Adelaide River
SOUTH	Pelican Point Power Station
EAST	Vacant, undeveloped land then Port Adelaide River
WEST	Vacant, undeveloped land then cleared land further west

The site is located in an industrial area of Outer Harbor and Osborne. Port Adelaide River surrounds the site to the north and a wetland/waterbody associated with Mutton Cove Conservation Reserve is located approximately 300 m south-east of the site. Two dams or reservoirs are located in the adjacent Pelican Point Power Station, immediately south of the site.

Sensitive human and environmental receptors located within the vicinity of the site are considered likely to include the following:

- Mutton Cove Conservation Reserve approximately 300 m south-east and Torrens Island Conservation Park approximately 600 m north and north-east of the site at its closest point
- future users of and maintenance workers on the site
- adjacent site users
- workers who may undertake excavation, maintenance or construction work within the surrounding area (i.e. to the site developments, underground services).

The 1:100,000 surface geology indicates that the region is underlain by the Saint Kilda Formation. This formation is characterised by coastal marine sediment: calcareous, fossiliferous sand and mud of intertidal sand flats, beaches and tidal marshes; organic, gypseous clay of supratidal flats. According to the Australian Soil Resource Information System (ASRIS), the area of Outer Harbor and Osborne that includes the site has a low probability of acid sulfate soils (ASS) occurring. Mutton Cove Conservation Reserve approximately 300 m south-east of the site however, has a high probability of ASS occurring.

A summary of the Department for Environment and Water (Department for Environment and Water, 2019) WaterConnect bore database for the area (Lotsearch, 2019) indicates that one registered bore is located on the site. It was drilled to 35.8 m depth in 1970 for exploration purposes, however the status is abandoned. Outside the site boundary, there are 107 registered bores within a 2 km radius of the site, of which, 83 were listed as groundwater bores. A summary of the registered bores including status, purpose, maximum drill depth, salinity and standing water level is included in the Lotsearch report. The majority of bores are located south of the site and are for investigation purposes.

According to the Port Adelaide Enfield Council Development Plan (consolidated 6 February 2018), the site is currently zoned Industry.

6.7.4 POTENTIAL IMPACTS

The PSI identified the following potential impacts for consideration:

- The site is located in an industrial area of Outer Harbor and Osborne, and immediately surrounding land uses included Port Adelaide River and Pelican Point Power Station, with the areas west and east being vacant, undeveloped land. Sensitive ecological receptors include Mutton Cove Conservation Reserve approximately 300 m south-east and Torrens Island Conservation Park approximately 600 m north and north-east of the site at its closest point.
- Review of historical aerial images generally indicated all four parcels were vacant and undeveloped from at least 1959. Construction within the site boundary has generally been limited to unsealed roads and filling, as well as construction of a jetty or berth in the north-west corner of Parcel 1 from at least 2004.
- From 1991–1992 the site was licensed as a solid waste landfill depot for the disposal of limestone grits from Penrice Soda Products Pty Ltd. Based on a historical title image search for the stated piece of land, it appeared that the location of the depot was off-site, adjoining Parcel 2 (CT 6088/191) to the east.
- A section 83A site contamination notification (May 2019) exists for CT 6088/191 relating to a portion of the CT located off-site approximately 50 m east/south-east at its closest point. The potentially contaminating activity was described as ‘placement of dredge material’. The concentration of metals and cyanide in groundwater exceeded the adopted ecological assessment criteria (marine waters).
- The following potentially contaminating activities were *confirmed* to have occurred at the site:
 - landfill operations/disposal of waste
 - use of imported, and potentially impacted fill materials.
- The following potentially contaminating activity was *confirmed* to have occurred *adjacent* the site:
 - placement of dredge material
 - stockpiling of waste and soil.
- It is considered possible that the following potentially contaminating activities *may* have occurred at the site:
 - placement of dredge material
 - port activities, including cleaning or maintenance of vessels - corrosion of metal structures and use of metal based anti-fouling paints.
- The extent and contamination status of fill material and landfill waste has not been investigated. However, given that the licence was issued for disposal of limestone grit only, this activity and the use of fill material which appears to be confined to roadways, have been considered to represent a relatively minor risk with respect to site contamination.
- The extent and contamination status of the stockpiles has not been investigated but appear to be outside the site boundary (adjacent Parcel 2). The location and extent of this material, along with the dumped pieces of concrete, should be investigated to confirm it does not extend into the site. Based on photographs the stockpiled material appears to comprise sand which may be from the local area. Therefore, the risk has been considered to be minor due to the general localised nature and confinement of any potential contamination to shallow soils.
- The placement of dredge material has not been confirmed at the site and therefore the possible significance is unknown. It has however been confirmed at an adjacent site and contamination of groundwater has been reported. It is therefore possible that contaminants may migrate in groundwater and extend beneath the site.
- The use of anti-fouling paints or occurrence of cleaning or maintenance activities associated with vessels has not been confirmed at the site. However, based on the activity and associated potential contaminants the risk has generally been considered to be minor due to the general localised nature and confinement of the potential contamination to shallow soils.

6.7.5 MANAGEMENT AND MITIGATION MEASURES

The following management and mitigation measures were recommended in the PSI:

- Consideration should be given to the occurrence of acid sulfate soils (ASS) at the site, during excavation works. Although the site was classified as low probability of occurrence, Mutton Cove approximately 300 m south-east of the site had a high probability of ASS occurring. This may have implications for buried structures or management of excavated soil during construction phase of the project.
- Given the sites' proximity to the marine environment of Port River, it is recommended that a Construction and Environmental Management Plan (CEMP) be developed for implementation during construction phase of the project. The CEMP is designed to provide a framework to effectively manage all significant work, health and safety (WHS) and environmental risks associated with the project.

6.8 STORMWATER AND FLOODING

6.8.1 LEGISLATIVE AND POLICY REQUIREMENTS

Legislation and policy guidance relevant to stormwater and flooding requirements for the Project are detailed in the following documents:

- Coastal Protection Board's Policy Document – 29 July 2016
- *Environment Protection Act 1993*
- The Environment Protection (Water Quality) Policy 2015 (under the *Environment Protection Act 1993*)
- Environmental Protection Agency Government of South Australia (EPA) 1999, Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry 1999
- Environmental Protection Authority Government of South Australia 1999, EPA Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry 1999
- Port Adelaide Enfield Council Development Plan – Flooding and Hazard protection measure requirements.

6.8.2 ASSESSMENT METHODOLOGY

A Flooding, Erosion and Stormwater Assessment was undertaken for the Project; to assess the topography and drainage characteristics of the Site; to identify any flooding and drainage issues which may result from the Project; and to identify existing services across the Site.

The assessment was undertaken using the following methodology:

- review of Dial before you Dig information and note key constraints
- review of all available mapping of the Site
- consideration of advice provided by the Coast Protection Board
- review of all available geotechnical information regarding soil types, refer Appendix B - CMW Geosciences Geotechnical Investigation Report
- review of the layout of the site infrastructure and access road against topography
- identification of any road drainage crossings and propose likely crossing types (floodway, culvert/pipe crossing)
- preparation typical stormwater requirement details
- identification of potential detention basins and sediment control measures, and
- recommendation of high-level SEDMP requirements.

6.8.3 EXISTING CONDITIONS

6.8.3.1 GENERAL

The Project Site is an undeveloped, featuring low-lying coastal lands, with raised access tracks constructed on materials imported or won from site.

A previous geotechnical investigations report undertaken for the Site confirms that it features varying soil types, and primarily features underlying sands to 3 m plus, with a layer near the surface of sandy clay, and overlaying sand top soil (CMW Geosciences, 2019).

6.8.3.2 SERVICES

A combination of publicly available sources was used in locating existing utility services and constraints on Site. These include:

- Dial before you dig search
- Location SA Map Viewer and
- Google Earth and Google Maps.

A number of service utilities were identified as occurring on, or near, the site. These are displayed in Table 6.10, below.

Table 6.10 Identified utilities in the area of the Site

SERVICE UTILITY	PELICAN POINT ROAD	PROJECT SITE
Epic Energy (liquid gas)	x	✓ (under access road)
SEAGAS (liquid gas)	x	✓ (under access road)
Telstra	✓ (P100 services both sides)	x
Water	✓ (250 PVC)	x
Sewer	✓ (low pressure)	x
Electricity LV – UG	✓	x
Electricity HV – OH	✓	x

6.8.4 POTENTIAL IMPACTS

During construction of the project, earth works, including civil works and trenching, will be required for the formalisation of access roads, creation of hardstands, and service links. Any localised regrading across the site will need to be considered in terms of drainage outlets, and the potential impacts to the existing coastal region. Excess excavated material, particularly due to trenching, shall be utilised in fill zones elsewhere on the site or transferred offsite to an appropriate facility for reuse, and may need testing for contamination if removed from site.

Storm events during construction may result in sediment damaging downstream watercourses. As such, appropriate sediment control practices during construction will need to be adhered to; ensuring the coast is protected from soil runoff during storm events. All contractors onsite will need to abide by the Soil Erosion and Drainage Management Plan (SEDMP) prepared by the Construction Contractor.

Pollutants used during construction have the potential to enter the sea and waterways, and seriously damage the wider stormwater network. Pollutants are listed under the *Environment Protection (Water Quality) Policy 2015*, which explicitly states that a person must not discharge these pollutants into waterways or onto land from which it is likely they will enter a waterway. Significant financial penalties apply where the policy is not abided by.

The development of the power plant will increase the quantity of impervious surfaces across the Site, due to the construction of hardstand zones and buildings; which will in turn will increase stormwater runoff. Increased runoff will need to be detained to predevelopment levels by means of detention basins located downstream from the plant site. A slow release outlet shall be incorporated into the basin, noting the lower elevations and proximity to tidal events need to be taken into account for the design of the stormwater management system onsite. Furthermore, during operation, spill kits for vehicles and plants will be required.

During decommissioning, removal of plant is to be reviewed for potential contamination upon decommissioning and transporting from site. It should also be noted that maintenance of the stormwater network for the Site may still be required once Site is decommissioned, given the likelihood that the hardstands and access road will remain in place after plant is removed.

6.8.5 MANAGEMENT AND MITIGATION MEASURES

The assessment formulated a series of management and mitigation measures, to minimise the identified potential impacts.

During construction and operation, Site access should cater to the largest vehicle swept paths of construction, transport and maintenance vehicles (which should be confirmed during detailed design). In the event of road drainage crossings being required, a reinforced concrete box culvert should be utilised.

During the detailed design phase of the project, major and minor storm average exceedance probabilities (AEP's) shall be reviewed on a risk-based approach, to identify critical events, in consultation with the asset owner who will maintain the project sites including the access track. The Power Plant hardstands should be designed with appropriate stormwater and tidal protection. It is anticipated a detention basin will be required to capture the additional runoff given the increased impermeable areas of roof and pavement associated with the development. The outlet of the basin shall need to accommodate tidal effects and may require flap gates (or similar structures) at outlets directed into the sea.

Constriction, appropriate sediment and erosion controls should be implemented, and the Environment Protection (Water Quality) Policy 2015 must be complied with. If a significant rainfall event has been forecasted, all work may need to be temporarily halted until the storm has passed. Any washing of site vehicles and equipment should also be prohibited on-site to prevent stormwater contamination, unless an appropriate facility is provided.

If there is a risk that contaminants have entered the sea/waterways, it is recommended that water quality tests be undertaken immediately. If there is any trace of contamination, works should be suspended until an appropriate treatment is implemented. Development boundaries within the tidal zones may require protection from tidal flow and wave actions. All exposed soil batters should be top dressed with topsoil and re-seeded with native grasses following completion of construction works.

During operation, Stormwater runoff from developed zones across the site should to be addressed in accordance with planning conditions, limiting flows from the site to pre-development peak flow levels (subject to further detailed investigation), and the provision of suitable erosion control for new earthwork zones. The location, siting, design and operation of renewable energy facilities should be completed such that the 'adverse impacts to the natural environment and other land uses' are minimised. Any development must also be 'located and designed to minimise the risks to safety and property from flooding' during a 1% AEP (1 in 100-year ARI equivalent event). It is likely detention basins will be necessary to ensure post-development flows match pre-development flows from the site (subject to further detailed investigation).

During decommissioning, sediment and erosion controls should be maintained. The potential for contamination transporting of plant from site is to be reviewed and documented with mitigation measures in place, prior to decommissioning works commencing onsite. Stormwater network may require ongoing inspection and maintenance once the site is decommissioned (given the likelihood that the hardstands and access road will remain in place after plant is removed).

6.8.6 KEY RECOMMENDATIONS

The assessment made the following key recommendation:

- The Relevant Authority must review and approve a Soil Erosion and Drainage Management Plan (SEDMP) prior to the commencement of any construction.
- Stormwater detention requirements are to be investigated during concept design phase.
- Coastal Protection Board development levels are to be adhered to.
- New earth batters (in cut or fill) should be reseeded following construction works. Exposed rock batters do not require revegetation works.
- Work should be temporarily halted if a significant storm is forecast; making sure to secure any loose materials, including construction waste and equipment, or alternatively removing them from the site.
- The washing of vehicles and equipment should be prohibited onsite (other than where an appropriate facility can be provided).
- Erosion and sediment controls should be implemented.
- Development boundaries within the tidal zones may require erosion protection from tidal flow/wave actions.
- It should be ensured that civil works are designed with appropriate consideration of all drainage requirements across the site.

6.9 TRAFFIC AND ACCESS

6.9.1 LEGISLATIVE AND POLICY REQUIREMENTS

The following legislation and policy documents are relevant to traffic and access requirements for the Project:

- *Road Traffic Act 1961*
- *Environment Protection Act 1993*
- *Heavy Vehicle National Law Act 2013*
- Port Adelaide Enfield Council Development Plan.

6.9.2 ASSESSMENT METHODOLOGY

A Traffic Impact Statement (TIS) was undertaken for Project. The objective of the TIA was to identify any key traffic operational and safety issues that may arise out of the construction and operational phases of the Project, and to suggest appropriate mitigation measures. The assessment approach included:

- determining the existing (baseline) road and traffic conditions near the Project site that may be impacted
- developing an understanding of the proposed construction staging and traffic generating activities
- identifying and assessing options for access to the Project site
- estimating the volume, type, frequency and patterns of traffic movements associated with the construction and ongoing operations activities of the Project
- assessing the impacts of the traffic generated by the Project on the existing (baseline) road and traffic operations, and
- identifying and suggesting mitigation measures that may be implemented to minimise or eliminate these impacts.

The TIS has been attached in Appendix J.

6.9.3 *EXISTING CONDITIONS*

The Project site is located at the northern tip of the Le Fevre Peninsula. Surrounding land uses on the Le Fever Peninsula include a mix of industrial, commercial (port), Defence establishments (Naval shipyard), natural reserves and residential land.

Key roads in the area include:

- Port River Expressway: a multi-lane, divided motorway connecting into North-South Corridor and other key routes such as Salisbury Highway and Port Wakefield Road. Port River Expressway is estimated to carry between 22,500 (western end) and 68,000 (eastern end) vehicles per day.
- Victoria Road: a four-lane, arterial road oriented north-south and serves as the main access route for the Le Fevre Peninsula. Adelaide port is located at the northern end of Victoria Road. Pelican Point Road and Mersey Road N connect into Victoria Road. Victoria Road is estimated to carry between 30,000 (southern end) to 8,000 (northern end near Pelican Point Road) vehicles per day.
- Pelican Point Road/Mersey Road N: a two-lane, undivided local access road. Mersey Road N is a two-lane, divided local access road oriented north-south. Pelican Point Road and Mersey Road N provide access to major industrial/commercial and Defence land uses along its length. Channelised turn lanes are provided at accesses to key industries/properties along its length. A 70 km/hr speed limit applies to Pelican Point Road and the northern half of Mersey Road N (section north of Falie Reserve). A 50 km/hr speed limit applies to the southern half of Mersey Road N (section south of Falie Reserve). Pelican Point Road is estimated to carry 4,200 vehicles/day with up to 13% heavy vehicles. A total four crashes were reported along Pelican Point Road and Mersey Road North near the Project site, between 2013 and 2017.

6.9.4 *POTENTIAL IMPACTS*

6.9.4.1 *RELOCATING TURBINES*

The five turbines currently located at Elizabeth will be transported to the Project site. This will be one off exercise and will be undertaken when the Site is ready to house these turbines. A preliminary assessment, including review of TM2500 turbine specifications (width, height, length, weight etc.) along with restricted access vehicle routes (RAV net), was undertaken to identify route options for transporting the turbines. The preferred transport route for relocating turbines is shown in Figure 6.4 below.



Figure 6.4 Preferred transport route for turbines from Elizabeth to Snapper Point

6.9.5 CONSTRUCTION RELATED TRAFFIC

Equipment required for construction would include earth moving equipment and cranes which will be transported to the Site at the start and removed toward the end of construction. Materials required will include gravel, concrete, steel, sand and other infrastructure components which will be transported consistent with the construction schedule.

During peak construction activity, up to 70 construction workers may be present at the Site. It is envisaged that there will be one work shift between 7 am to 5 pm resulting in construction workers:

- arriving between 6.30 am and 7.30 am
- leave after 4.30 pm and 6 pm
- some trips around lunch and coffee/tea breaks.

While some level of ride sharing is anticipated, for the purpose of estimating vehicular trips related to staff movements, staff were considered to travel in individual vehicles (one return trip per day per staff). No public transport trips to the Site were envisaged.

Construction related traffic movement to and from the Site is anticipated to primarily use Pelican Point Road via Victoria Road. The majority of traffic to and from the site is anticipated to use Port River Expressway with some light vehicle trips (construction workers) using alternative routes (e.g. Military Road, Nelson Street, Commercial Street, Grand Junction Road etc).

The assessment recommended that the estimated resultant increase due to construction related traffic movements in peak hour and daily traffic on Port River Expressway is less than 1%, and is deemed negligible. Increase in daily and peak hour traffic on Victoria Road due to construction activity at the proposed Project site was estimated to be less than 10%, which is not deemed to adversely impact on traffic movements on these roads. Resultant increase in traffic using Pelican Point Road was estimated to be in the order of 10 to 15% during peak hours (morning and afternoon) corresponding to traffic generation around construction shift start and end times. Pelican Point Road was deemed to have sufficient capacity to cater for additional traffic during construction of Snapper Point Power Station.

It is anticipated that heavy vehicle movements (removing excavated earth and bringing in fill material) will be spread throughout the day, thus the overall impact on traffic movement along the surrounding road network during daytime is envisaged to be low.

It is understood that once operational, Snapper Point Power Station will be attended by three (3) staff permanently with regular maintenance/service activities attracting additional workers over a shorter duration. Thus, up to 10 two-way daily trips were estimated to be generated by the Snapper Point Power Station once operational.

6.9.6 MANAGEMENT AND MITIGATION MEASURES

The travel route to the construction site via Mersey Road North requires crossing rail track on Veitch Road before passing through a roundabout at Mersey Road North intersection with Veitch Road. It is recommended that preferred travel route for heavy vehicles is via Victoria Road and then Pelican Point Road.

The proposed access to the Snapper Point Power Station is located along a curve in road alignment of Pelican Point Road/Mersey Road North. There may be a need to be a channelised right turn (CHR) lane created for traffic arriving from the south on Mersey Road N to enter the Project site. The median appears to be sufficiently wide to allow creation of such channelised right turn lane (CHR) and should be reviewed at the time of detailed design.

Transportation of TM2500 turbines from Elizabeth to the proposed Project site will require special permits from NHVR for oversized/overmass goods movement. This should be undertaken before commencing relocation of TM2500 turbines.

Existing rail crossing on Pelican Point Road could potentially impact movement of delivery/construction vehicle movements. It is recommended that train schedule should be reviewed to avoid any delays when scheduling deliveries (in particular TM2500 turbine relocation) to the Site.

The assessment presented in this report is a desktop assessment, and is based on information provided by the client. It is recommended that a detailed route assessment be undertaken when planning relocation of TM2500 turbines from Elizabeth to the proposed Project site to minimise/eliminate any impacts due to road network deficiencies.

6.9.6.1 KEY RECOMMENDATIONS

- The preferred travel route for heavy vehicles is via Victoria Road and then Pelican Point Road.
- A channelised right turn (CHR) lane for traffic arriving from the south on Mersey Road N to enter the Project site may be required.
- Permits will be required for the transportation of TM2500 turbines from Elizabeth to the proposed Project site.
- The train schedule for the crossing on Pelican Point Road should be reviewed to avoid any delays when scheduling deliveries.
- A detailed route assessment be undertaken when planning relocation of TM2500 turbines from Elizabeth to the proposed Project site.

6.10 VISUAL AMENITY

6.10.1 LEGISLATIVE AND POLICY REQUIREMENTS

The primary guiding policy for the visual amenity aspects of the Project is Port Adelaide Enfield Council Development Plan, established under the *Development Act 1993*.

Relevant policies under the Development Plan include:

- *Electricity infrastructure should be designed and located to minimise its visual and environmental impacts* (Infrastructure)
- *Development should be sited and designed to minimise its visual impact on:*
 - (a) the natural, rural or heritage character of the area
 - (b) areas of high visual or scenic value, particularly rural and coastal areas
 - (c) views from the coast, near-shore waters, public reserves, tourist routes and walking trails
 - (d) the amenity of public beaches(Siting and Visibility).

6.10.2 ASSESSMENT METHODOLOGY

A Landscape Character and Visual Considerations assessment was undertaken for the Project, in line with best practice as prescribed by the *Guidelines for Landscape and Visual Impact Assessment* (Third Edition). The assessment involved:

- review of relevant Project documentation and plans
- identification of a ‘Zone Theoretical of Visual Influence (ZTVI)’ and potential views within the ZTVI to the proposed ‘licensed site’
- a site assessment to determine the character of the contextual landscape
- a high-level visual summary, which broadly described the prevailing landscape character and likely visual issues from within the ZTVI.

The assessment report has been attached in Appendix K.

6.10.3 EXISTING CONDITIONS

The proposed Site is located within a heavily industrialised area, adjacent the existing Pelican Point Power Station to the south and Port River to the north. Land use further south contains key state infrastructure and transport assets, including two other power stations, grain silos and berthing facilities for passenger cruise and container ships. Additionally, there are large pockets of undeveloped vacant land within tracts of extensive native scrub.

The greater landscape is predominantly flat, with occasional visually dominating industrial development including grain silos and electricity transmission towers. The skyline to the east offers views of the distant hills, while the skyline to the west offers coastal views.

Two viewpoints were visited during the assessment, to identify the likely visual impact of the proposed Project. These locations are displayed in Figure 6.5.



Figure 6.5 Viewpoints assessed under the Landscape Character and Visual Impact Assessment

Viewpoint (VP) 01, comprised a roadside location along Pelican Point Road, which provided views typically obtained whilst driving along the road, as shown in Photo 6.2. The views of the site were mostly screened by vegetation, however brief glimpses of the site would be visible towards the intersection of Mersey Road and Pelican Point. This site was not identified as a potential sensitive receptor.



Photo 6.2 View from VP 01

VP 02, being within the Mutton Cove Conservation Park, located approximately one km to the south-east, provides an environment of native samphire and estuarine plantings, and views of the Port River set against the panorama of the Adelaide hills and significant stretches of mangroves along Torrens Island. From the Mutton Cove lookout off Mersey Road, the vistas to the north across the conservation park are distilled by the imposing transmission towers and nearby incongruous Viterra grain silos. With the exception of the higher aspects of the chimneys, views of the Pelican Point Power Station, and similarly of the proposed Project Site, are concealed behind native trees and large shrubs, as shown in Photo 6.3. The roofline of the generators may be visible; however this was assessed to be largely inconsequential. This site was identified as a potential sensitive receptor, but that it was unlikely the generators would be notable features within these vistas.



Photo 6.3 View from VP 02

6.10.4 *POTENTIAL IMPACTS AND RECOMMENDATIONS*

The assessment recommended that the contextual landscape, as discussed above, is of low scenic quality and low sensitive change and that the Project was not likely to have irreparable consequences for the visual amenity of the locality and wider contextual landscape.

7 PLANNING ASSESSMENT

7.1 STATUTORY REQUIREMENTS

The following legislation and policy are relevant to the planning assessment of the proposed Project:

7.1.1 DEVELOPMENT ACT 1993

Under the Development Act, Development Approval must be sought and obtained prior to undertaking any activity constituting ‘development’ under the act. Under Section 4, the definition of ‘development’ includes, but is not limited to, building work or a change in land use. As such, the Project requires Development Approval under the act.

The Project is seeking Approval under Section 49 of the Development Act, given that it will be connected to the State’s power system for sale of electricity to the public. As such, the Project falls under the definition of ‘public infrastructure’ as per Section 49(1)(a) of the Development Act:

‘the infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, or the drainage or treatment of waste water or sewage’

Crown Sponsorship, enabling the utilisation of the Section 49 pathways, was received on 10 September 2019 and has been provide in Appendix A.

7.1.2 PORT ADELAIDE ENFIELD COUNCIL DEVELOPMENT PLAN

Under the Development Act, an application for Approval of development must be assessed against the relevant provisions of the Development Plan applicable to the project site. For this Project, the relevant Development Plan is the Port Adelaide Enfield Council Development Plan.

7.2 STRATEGIC ALIGNMENT

7.2.1 THE PLANNING STRATEGY FOR SOUTH AUSTRALIA

The Planning Strategy for South Australia (the Planning Strategy) guides land use and development across the State. The Planning Strategy is presented across eight volumes, each covering a distinct geographical region. The Planning Strategy has been developed to guide the formulation of Development Plans for local areas, and as such, can provide an indication of the envisaged land use and development for a region. The relevant volume of the Planning Strategy for this project area is the 30-Year Plan for Greater Adelaide (2017 update) (the 30-Year Plan).

The 30-Year Plan has a strong focus on creating liveable neighbourhoods, and protecting biodiversity and natural resources. Through providing a reliable, low emissions source of energy, in a responsible and efficient manner, the Project will support the following key policies of the 30-Year Plan:

- *Policy 82: Coordinate and link strategic infrastructure across Greater Adelaide to ensure it meets the needs of a growing population with a changing demographic profile and supports a more productive economy.*
- *Policy 118: Minimise risk to people, property and the environment from exposure to hazards (including bushfire, terrestrial and coastal flooding, erosion, dune drift and acid sulfate soils) by designing and planning for development in accordance with a risk hierarchy of avoidance, adaptation and protection.*

7.2.2 SOUTH AUSTRALIA'S CLIMATE CHANGE STRATEGY 2015–2050

South Australia's Climate Change Strategy 2015–2050 (the Climate Change Strategy) sets out South Australia's framework and initiatives to meet the targets established under the *Climate Change and Greenhouse Emissions Reduction Act 2007 (SA)*. It is intended that the Project will operate primarily on natural gas. As discussed within this Climate Change Strategy, natural gas emits approximately half of the greenhouse gas emissions as coal, and has the capability to respond quickly to changes in energy demand. As such, the Project provides a low emissions complimentary energy source to support fully renewable technology, to provide a sustainable, reliable, and low emissions energy system.

This project will support two of the five targets set out in the document:

- *achieve net zero emissions by 2050*
 - *generate 50% of our electricity from renewable sources by 2025.*
-

7.3 PLANNING ASSESSMENT

The following section provides a summary of the Planning and Land Use Assessment undertaken for the Project, attached as Appendix L. The Planning and Land Use Assessment assessed the Project against the relevant provisions of the Development Plan. At the time of undertaking the assessment, the relevant Development Plan for the Site was the Port Adelaide Enfield Council Development Plan – Consolidated 6 February 2018 (the Development Plan).

The Project site is located within the Industry Zone and Ports Policy Area 12, under the Development Plan. Under the procedural matters of the Industry Zone, electricity generators and infrastructure are neither listed as complying or non-complying, therefore the Project must be assessed on its merits against the relevant objectives and principles of development control under the Development Plan.

The Industry Zone seeks to accommodate primarily industrial, warehouse storage and transport land uses, while protecting development, both existing and future, from sea level rise and inundation by sea and storm water. The Project, consisting of electricity infrastructure, is not explicitly envisaged under the Zone nor is it listed as non-complying. With appropriate mitigation and management of environmental impacts, including protection from sea level rise and inundation, the Project will be compatible with the adjacent infrastructure land use and surrounding industrial development.

The Ports Policy Area 12 envisages that waterfront land will accommodate immediate and long-term port activities, that will not adversely affect the ongoing strategic and economic function of the port area; being one of South Australia major import/export facilities. As such, it is specified that land uses that do not rely upon direct water frontage should be located inland. The allotment comprising the Project Site is located adjacent to the water front; however, project infrastructure is proposed to be oriented away from the water front towards the south boundary of the site. It should also be noted that a barge mounted project was previously considered for the site, however site investigations determined that that site would be generally unsuitable for the project. While the siting of the Project is not explicitly supported by the relevant Policy Area, it is reasoned that the selected site for the Project is justified given the proximity and accessibility to electrical and gas connection, and that impacts to the water front will be managed by appropriately siting infrastructure on Site away from the water front and managing environmental impacts so as not to impact nearby port activities. Further, in a meeting held with the City of Port Adelaide Enfield's Planning Team Leader; it was agreed that this specific site was appropriate for the proposed use due to the other infrastructure assets located in the immediate vicinity.

An analysis of the Project against the relevant provisions of Development Plan – consolidated 6 February 2018 is provided below in Table 7.1.

Table 7.1 Assessment of the Project against the relevant provision of the Port Adelaide Enfield Council Development Plan – consolidated 6 February 2018

POLICY	COMMENT
<p>Land Use</p> <p>Ports Policy Area 12: Objectives 1-3 and PDCs 1 and 2</p> <p>Industry Zone: Objective 1 and PDC 1</p>	<p>The Industry Zone promotes a range of land uses, including industrial, warehouse, storage and transport. The Project, constituting infrastructure, is not explicitly envisaged under the zone, however is consistent with adjacent and surrounding land uses.</p> <p>The Ports Policy Area 12 envisages land use that promotes the long-term growth of the port, and the accommodation of port dependent activities. Under the policy area, waterfront land should only be development for activities that rely on direct waterfront access. As the Project does not rely on waterfront access, the location of the Project is discouraged under the Policy area. However, it is reasoned that the siting of the Project is strategic in that it allows access to resources that the Project is directly dependent on, and that are not readily available at other sites; primarily the proximity the nearby gas yard pipelines and electricity substation. Furthermore, it should also be noted that a barge mounted project was previously considered for the site, however site investigations determined that that site would be generally unsuitable for the project.</p>
<p>Form and Character</p> <p>Ports Policy Area: PDCs 5 and 7</p> <p>Industry Zone: Objective 4 and PDCs 3, 4 and 6</p>	<p>The Project is consistent with surrounding land uses in the Industry Zone, and does not constitute a sensitive land use that would impact on the continuation of industrial operations in the area. Furthermore, it is unlikely that the Project would have any impact on port related activities. It is intended that Project impacts, such as noise and air emissions, will be managed so as not to impact sensitive uses, such as the marine environment or distant residential zoned land.</p> <p>The Site is located in a low-lying coastal area, and presents immediate risk in relation to flooding and inundation. Consultation has been undertaken with the Coast Protection Board, who have provided advice regarding the site levels required to protect infrastructure from inundation and which will be incorporated in the detailed design of the Project. Investigations into Stormwater, Drainage and Flooding (discussed in Section 6.8) and Site Contamination (including Acid Sulfate Soils) (discussed in Section 6.7) have been undertaken, and will help to inform of risks and mitigation measures in relation to coastal hazards.</p>

POLICY	COMMENT
<p>Coastal Areas / Flooding and Sea Level Rise / Hazards</p> <p>Industry Zone Objectives 2 and 3</p> <p>Council Wide - Coastal Areas: Objectives 2, 5 and 6 and PDCs 1-6, 8, 20, 21, 23, 25, 27 and 33</p> <p>Council Wide – Hazards: Objectives 2, 4, 7, 9 and 10 and PDCs 1, 3, 4, 5, 6, 7, 8, 9, 17, 20, 21, 22, 24, 25, 26, 27, 28, 29</p>	<p>The Project will be located on coastal land directly adjacent the Port River. Being a land mounted project it is unlikely that the Project will impact the nearby coastal resources or port Activities.</p> <p>Consultation has been undertaken with the Coast Protection Board and City of Port Adelaide Enfield, to assist in the identification of coastal risks and mitigation/management measures that should be implemented.</p> <p>The locality of the Site is highly industrialised and modified from a natural coastal environment. A Landscape Character and Visual Considerations assessment was undertaken for the site (discussed in Section 6.10), and recommended that the Project would not have irreparable consequences for the visual amenity of the locality. Furthermore, the siting of the Project will be informed by a series of technical studies, covering issues such as native vegetation and erosion, to ensure that impact to coastal areas can be avoided or managed.</p> <p>It is proposed that the Site will have two vehicle access points. These access roads should be raised in accordance with CPB requirements, to protect against the risk of inundation, and allow suitable access for emergency vehicles.</p>
<p>Crime Prevention</p> <p>Council Wide - Crime Prevention: PDCs 5 and 7</p>	<p>The Site is located in a fenced off area, behind the existing Pelican Point Power Station. Existing signage along Pelican Point Road explicitly advises that access to the Site is restricted.</p>
<p>Infrastructure</p> <p>Council Wide – Infrastructure: Objectives 1, 4 and 5 and PDC 8</p>	<p>The siting of the Project will allow for the utilisation of existing gas and electricity infrastructure, which will both ensure that the Project is developed in a cost-efficient manner, and promote efficiency whereby transmission losses over long distances of transmission lines are minimised.</p> <p>A Landscape Character and Visual Considerations assessment, undertaken for the Project, identified that when viewed from the nearby Pelican Point Road, or Mutton Cove Conservation Park (having been identified as a potential sensitive receptor), infrastructure associated with the Project would mostly be concealed behind existing vegetation.</p>
<p>Interface Between Land Uses</p> <p>Council Wide – Interface Between Land Uses: Objectives 1, 2 and 3 and PDCs 1, 2, 7, 8 and 11</p>	<p>Key interface issues for the Project include noise and air quality impacts. Technical studies covering these issues have been commissioned, and will be used to assist in informing project design to minimise adverse impacts to surrounding land uses.</p> <p>The Project is approximately 2 km from the nearest Residential Zone; which constitutes the nearest sensitive receptor assessed for noise impacts.</p>
<p>Landscaping, Fences and Walls</p> <p>Council Wide - Landscaping, Fences and Walls: PDCs 5, 9 and 10</p>	<p>A portion of the Site is covered by native coastal saltmarsh, with additional areas covered by native woodland and scrubland species, as identified by an ecological assessment undertaken for the Site (discusses further in Section 6.3). Clearance of existing native vegetation should be avoided where possible.</p>

POLICY	COMMENT
<p>Natural Resources Council Wide – Natural Resources: Objectives 6 and 10 and PDCs 1, 5, 8, 9, 10, 11 and 12</p>	<p>Key natural resources in proximity to the project include native fauna and flora and marine waterways. Furthermore, the Adelaide Dolphin Sanctuary is located adjacent to the site.</p> <p>Recommendations made during consultation with the CPB, and through the outcomes of technical studies, should be incorporated into the Project design, to ensure that potential impact to natural resources are mitigated and managed.</p>
<p>Siting and Visibility Council Wide – Siting and Visibility: Objective 1 and PDCs 1 and 6</p>	<p>The locality of the Site is a highly industrialised and modified from a natural coastal environment. A Landscape Character and Visual Considerations assessment was undertaken for the Site (discussed in Section 6.10), and recommended that the Project would not have irreparable consequences for the visual amenity of the locality. It was recommended that Project infrastructure would mostly be obscured from view by existing vegetation.</p>
<p>Transportation and Access Council Wide – Transportation and Access: Objective 2 PDCs 13, 30, 31, 37 and 38</p>	<p>The Site is located off Pelican Point Road, which is a two-lane, undivided local access road. The road provides access to major industrial/commercial and defence land uses in the area.</p> <p>The Site can be accessed via two access points along Pelican Point road. One being an all-weather access road to the west of the Site, and the other being an existing unsealed track to the east of the Site (which will be assessable for construction only). The fenced site area is accessible from an unsealed track to the north; which will be upgraded to minimum DRT standards. A road dilapidation report will be prepared for site assess north of the Pelican Point Power Station. Suitable site access for emergency services is provided via the western access road.</p> <p>The Project will provide off street car parking for 7-8 vehicles.</p> <p>A Traffic Impact Statement has been undertaken for the Project (Appendix J) and has provided recommendations on minimising and eliminating potential traffic impacts that might arise during and after construction of the Project.</p>

7.3.1 KEY RECOMMENDATIONS

In assessing the proposed Project against the relevant provisions of the Port Adelaide Enfield Council Development Plan (consolidated 6 February 2018), it is recommended that the Project is generally consistent with the relevant policy provisions of the Development Plan and that the Project warrants the granting of Development Approval.

8 CONSTRUCTION, OPERATION AND DECOMMISSIONING

8.1 CONSTRUCTION

8.1.1 INDICATIVE TIMELINES

The proposed timing for construction of the Project is at the start of 2020 to late-2020 (up to 11 months), pending Approval. Project timelines are discussed further in Section 1.7.

8.1.2 CONSTRUCTION ACTIVITIES

Key construction activities will involve:

- site preparation works; including fencing, preliminary civil works and drainage, access road and internal track construction, construction of site offices and facilities
- transportation and installation of the five (5) aero-derivative TM 2500 turbine generators and ancillary infrastructure
- installation of footings and infrastructure
- removal of temporary construction facilities and rehabilitation of disturbed areas.

Construction activities will take place between 6am and 6pm Monday to Saturday.

8.1.3 RESOURCING REQUIREMENTS

It is estimated that up to 70 workers will be employed as a direct result of the Project over the estimated 10–11 month construction period, including electricians, fitters, welders and earth works personnel. This number will fluctuate throughout construction, depending on need.

Equipment required for construction would include earth moving equipment, trucks and cranes. Materials required will include gravel, concrete and infrastructure components.

8.1.4 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

A CEMP should be prepared for the Project, prior to the commencement of construction. The CEMP should focus on the following key issues, relevant to the Project and Site:

- acid sulfate soils
- Aboriginal Cultural Heritage
- air quality and dust suppression
- emergency and fire management
- flora and fauna
- materials, fuels and waste management
- noise and vibration
- storage of hazardous substances
- traffic and access
- water quality protection, erosion and sediment control, and flooding
- weeds, pests and diseases control
- a Soil, Erosion and Drainage Management Plan will also need to be prepared for the project.

8.1.5 HEALTH AND SAFETY

The Project should be designed in accordance with the *South Australian Work Health and Safety Act 2012*. Health and safety risks should be managed through a site Health and Safety Plan.

Site access will be provided by existing access points and via existing access tracks. A road dilapidation report will be prepared for the access past PPPS, this access will be repaired. The northern access road into the plant will be upgraded to minimum DRT standards. The western road is suitable for emergency access, the access from the east will only be accessible for construction. A Construction Traffic Management Plan (CTMP) should be prepared to the satisfaction of DPTI (and/or the City of Port Adelaide Enfield) prior to construction commencement.

All site personnel should be inducted on to the Project, including safety requirements and responsibilities. Site personnel should be equipped with appropriate Personal Protective Equipment (PPE). Machinery and equipment used should be maintained and regularly checked for functionality and safety.

Site security should be established prior to construction to ensure there is no risk to public safety through accessing the site.

A portal will be available on the contractors' website to allow community members to report incidents, near-misses, concerns and feedback relating to construction health and safety.

8.2 OPERATION

8.2.1 HOURS OF OPERATION

The Project will operate intermittently, across a 24-hour/seven days a week period. The facility will operate as required, providing fast-response dispatchable generation capacity to the network during periods of high demand.

The Project has an expected operational span of 25 years, unless the equipment lease is extended.

8.2.2 MAINTENANCE

Two-three permanent staff will be required during the operational phase for maintenance purposes. Maintenance activities are likely to involve:

- preventative maintenance, including scheduled upgrades, cleaning and serving of infrastructure
- corrective maintenance, including repairs or replacements of infrastructure
- performance tests
- maintenance/grading of access tracks
- vegetation maintenance, including buffers between fencing, transmission lines and infrastructure as well as screening vegetation
- general inspection of the site, including fencing and security systems
- maintenance operations are expected to be within normal business hours.

8.2.3 EMERGENCY MANAGEMENT

An Emergency Plan should be developed for the Project site, and should include:

- hazard minimization, including fire and chemical management
- key responsibilities and authorities
- emergency contacts
- evacuation plan
- incident and injury management
- emergency preparedness information
- emergency response actions
- post emergency investigations, rehabilitation and records.

8.2.4 *SITE SECURITY*

Project infrastructure will be contained within a 3 m high, galvanized wire mesh fence; fencing will be 2.4 m high, topped with 0.6 m of barbed wire. All vehicle gates will be secured with padlocks. Refer to drawings attached in Appendix E. Additional security, including security lighting, is proposed and will be addressed in detailed design.

8.2.5 *RESOURCING REQUIREMENTS*

It is estimated that two-three permanent staff will be employed during the operation phase of the Project.

8.3 DECOMMISSIONING

At the end of the 25-year equipment lease (unless extended), the Project will be decommissioned. Decommissioning will involve:

- 1 removal of all infrastructure from the Site, unless SA Government require those to remain for its use
- 2 undertake various specialist assessments (if required) to ensure that any obligation outlined in the land lease have been fulfilled.

Following decommissioning, both Project infrastructure and the Project site will revert to the care of the SA Government.

9 CONCLUSION AND RECOMMENDATIONS

This Development Application Report outlines Port Adelaide Energy Pty Ltd's proposal to develop the Snapper Point Power Station at Outer Harbor, South Australia. The Project will have a total combined rated output of approximately 154 MW, and will operated as a flexible fast start peaking station, to meet the energy demand in South Australia during periods of high demand and to mitigate the risk of load shedding in peak demand periods.

The project has secured Section 49 (Crown Development) status under the Development Act, with the Department for Energy and Mining providing sponsorship/endorsement.

Port Adelaide Energy Pty Ltd has engaged with key stakeholders, including the City of Port Adelaide Enfield, the EPA and the Coast Protection Board.

This document provides a detailed description of the Project and the site, a justification for the development and assessment of potential impacts. The Development Application Report also provides a review of the proposed Project against the relevant provisions of the Port Adelaide Enfield Council Development Plan, as well as State and Commonwealth level policies and legislation.

The assessment found that the proposed development of an electricity generator is consistent and not at variance with the relevant policy provisions set out in the Port Adelaide Enfield Council Development Plan (Consolidated 6 February 2018), and that the project warrants the granting of Development Approval.

The report considers that the Project is compliant with the strategic and statutory planning context of the area and there are no major environmental impacts that would result from the construction of the Project that could not be appropriately managed, mitigated or avoided. Key management and mitigation measures relate to infrastructure layout in the planning stage of the project as well as the development of a range of management plans.

The Project proposes to undertake a prescribed activity of environmental significance under Schedule 1 Part A of the *Environment Protection Act 1993* (EPA Act); being fuel burning at a heat release rate exceeding 5 MW. As such, the Project requires a licence under the EPA Act to undertake this activity. This will be applied for shortly after the submission of the Development Application with SCAP.

10 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (*WSP*) for Nexif Energy Australia Development Pty Ltd (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 23 May 2019 and agreement with the Client dated 7 June 2019 (*Agreement*).

10.1 PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

10.2 QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (*Conclusions*) are based in whole or in part on information provided by the Client and other parties identified in the report (*Information*), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

10.3 USE AND RELIANCE

This Report should be read in its entirety and must not be copied, distributed or referred to in part only. The Report must not be reproduced without the written approval of WSP. WSP will not be responsible for interpretations or conclusions drawn by the reader. This Report (or sections of the Report) should not be used as part of a specification for a project or for incorporation into any other document without the prior agreement of WSP.

WSP is not (and will not be) obliged to provide an update of this Report to include any event, circumstance, revised Information or any matter coming to WSP's attention after the date of this Report. Data reported and Conclusions drawn are based solely on information made available to WSP at the time of preparing the Report. The passage of time; unexpected variations in ground conditions; manifestations of latent conditions; or the impact of future events (including (without limitation) changes in policy, legislation, guidelines, scientific knowledge; and changes in interpretation of policy by statutory authorities); may require further investigation or subsequent re-evaluation of the Conclusions.

This Report can only be relied upon for the Permitted Purpose and may not be relied upon for any other purpose. The Report does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise. It is the responsibility of the Client to accept (if the Client so chooses) any Conclusions contained within the Report and implement them in an appropriate, suitable and timely manner.

In the absence of express written consent of WSP, no responsibility is accepted by WSP for the use of the Report in whole or in part by any party other than the Client for any purpose whatsoever. Without the express written consent of WSP, any use which a third party makes of this Report or any reliance on (or decisions to be made) based on this Report is at the sole risk of those third parties without recourse to WSP. Third parties should make their own enquiries and obtain independent advice in relation to any matter dealt with or Conclusions expressed in the Report.

10.4 DISCLAIMER

No warranty, undertaking or guarantee whether expressed or implied, is made with respect to the data reported or the Conclusions drawn. To the fullest extent permitted at law, WSP, its related bodies corporate and its officers, employees and agents assumes no responsibility and will not be liable to any third party for, or in relation to any losses, damages or expenses (including any indirect, consequential or punitive losses or damages or any amounts for loss of profit, loss of revenue, loss of opportunity to earn profit, loss of production, loss of contract, increased operational costs, loss of business opportunity, site deprecation costs, business interruption or economic loss) of any kind whatsoever, suffered on incurred by a third party.

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APPENDIX A

CROWN SPONSORSHIP





Government
of South Australia

Department for
Energy and Mining

Our Ref: D19100023

Ms Bronte Nixon
Principal Environmental Scientist and Planner
WSP Australia Pty Ltd
GPO Box 398
ADELAIDE SA 5001
Bronte.Nixon@wsp.com

Dear Ms Nixon

REQUEST FOR CROWN SPONSORSHIP FOR THE PELICAN POINT GAS TURBINE PEAKER PROJECT

I refer to your letter of 16 July 2019 and subsequent letter of 3 September 2019 regarding the request for support and endorsement pursuant to Section 49(2)(c) of the *Development Act 1993* (the Act) for the Pelican Point gas turbine peaking project (Project).

I note that WSP Australia Pty Ltd is requesting Crown Sponsorship for the Project on behalf of Port Adelaide Energy Pty Ltd, a special purposes entity for project delivery. Further, I note that Port Adelaide Energy Pty Ltd (Port Adelaide Energy) is a wholly owned subsidiary of Nexif Energy Australia Pty Ltd.

Given that the proposed works meet the definition of "public infrastructure" as outlined in Section 49(1)(a) of *Development Act 1993*, and that the project will provide dispatchable power to contribute to the security and reliability of the State's electricity network, I am prepared to support and specifically endorse, pursuant to Section 49(2)(c) of the *Development Act 1993* the:

- proposed Project which consists of the relocation of five trailer-mounted gas turbines and ancillary infrastructure, to a site adjacent to the Pelican Point Power Station at Outer Harbour.

The project would provide various benefits to the State including by assisting in improving the reliability of the power system as the gas peaking power plant will be able to respond quickly to variations in grid voltage and frequency, which in turn, is expected to improve grid stability.

The Department for Energy and Mining makes no representations or gives no warranties in relation to the outcome of the development application or time that it takes to secure a planning outcome for the project.

Chief Executive

Address Level 12, 11 Waymouth Street, Adelaide 5000 | GPO Box 320 Adelaide SA 5001 | DX452

Tel (+61) 08 8429 3216 | Email DEM.OCE@sa.gov.au | www.energymining.sa.gov.au | ABN 83 768 683 934





**Government
of South Australia**

Department for
Energy and Mining

It is Port Adelaide Energy's responsibility to obtain all other statutory approvals, licenses and permits from relevant authorities, manage community expectations and to fund the project. The State Government makes no commitment to provide any funding towards the project or to purchase any product or service related to the project.

A development application must be lodged by Port Adelaide Energy at its own cost with the Development Assessment Commission on or prior to 30 August 2020. If this is not achieved by that time, my support under Section 49(2)(c) of the Act for the project will lapse.

Should you have any questions regarding preparation of the material to support this Section 49 Development Application, please contact the nominated Case Manager, Mr Chris Lim on (08) 8303 2018 or mobile 0439 873 104.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Vince Duffy'.

Vince Duffy
ACTING CHIEF EXECUTIVE

10/9/2019



APPENDIX B

CERTIFICATE FROM THE OFFICE OF THE
TECHNICAL REGULATOR





Ref: D19034772

25th July 2019

Torb Stolpe
Senior Development Manager
Nexif Energy
Level 2, 70 Hindmarsh Square
Adelaide SA 5000
torb.stolpe@Nexif.com

Energy and Technical
Regulation

Office of the
Technical Regulator

Level 8, 11 Waymouth Street
Adelaide SA 5000

GPO Box 320
Adelaide SA 5001

Telephone: 08 8226 5500
Facsimile: 08 8226 5866

www.sa.gov.au/otr

Dear Torb,

RE: Pelican Point Gas Turbine Peaker Project.

The development of the Pelican Point Gas Turbine Peaker Project has been assessed by the Office of the Technical Regulator (OTR) under Section 37 of the Development Act 1993.

The *Development Regulations 2008* prescribe if the proposed development is for the purposes of the provision of electricity generating plant with a generating capacity of more than 5 MW that is to be connected to the State's power system – a certificate from the Technical Regulator is required, certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system.

In making a decision on your application, our office has taken the following information into account:

- OTR requirement – Nexif Energy SA Peaker v5 received 26th June 2019.
- Your letter dated 1st July 2019.
- Memorandum from Emanden Technical Solutions received 1st July 2019.
- OTR meeting with Nexif Energy 15th July 2019

After assessing the information provided, I advise that approval is granted for the proposed generator on the understanding that the shortfall in inertia of the turbines will be compensated via the following additional capabilities:

- 10MW of FFR to be provided by the 10MW Lincoln Gap BESS project.



- When not operating at unity power factor an additional 15 – 25MW of FFR is available via reducing the excitation current of the generator.
- Implementation of a specific generator over firing logic achieves an additional 10MW of FFR.

It should be noted that should the shortfall in inertia not be addressed this will have impact on the ESCOSA license for the proposed generator.

Should you have any questions regarding this matter, please do not hesitate to call Mark Burns on (08) 8429 2707.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Rob Faunt'.

Rob Faunt
TECHNICAL REGULATOR

APPENDIX C

CERTIFICATES OF TITLE





The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 5920 Folio 564

Parent Title(s) CT 5651/59, CT 5858/212, CT 5904/106, CT 5913/343
Creating Dealing(s) RTC 10026663
Title Issued 20/07/2004 Edition 4 Edition Issued 26/07/2012

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 205 DEPOSITED PLAN 64682
IN THE AREA NAMED OUTER HARBOR
OUT OF HUNDREDS (ADELAIDE) AND HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B AND E (RTC 8674520)
SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED E (RTC 8674520)
TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER ALLOTMENT 213
TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED T.U.AA AND AB
TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED V (RTC 10026663)

Schedule of Dealings

NIL

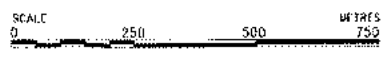
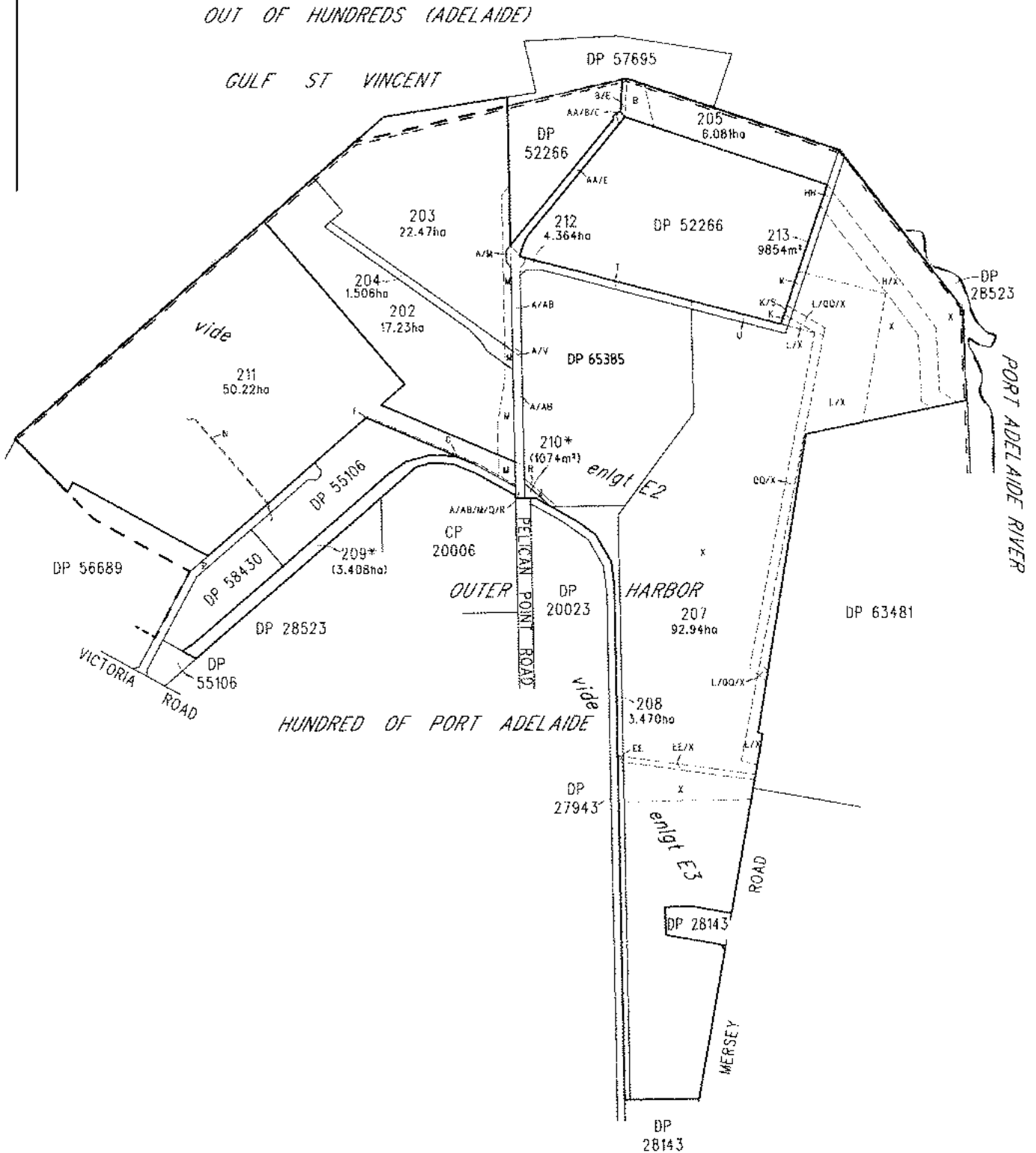
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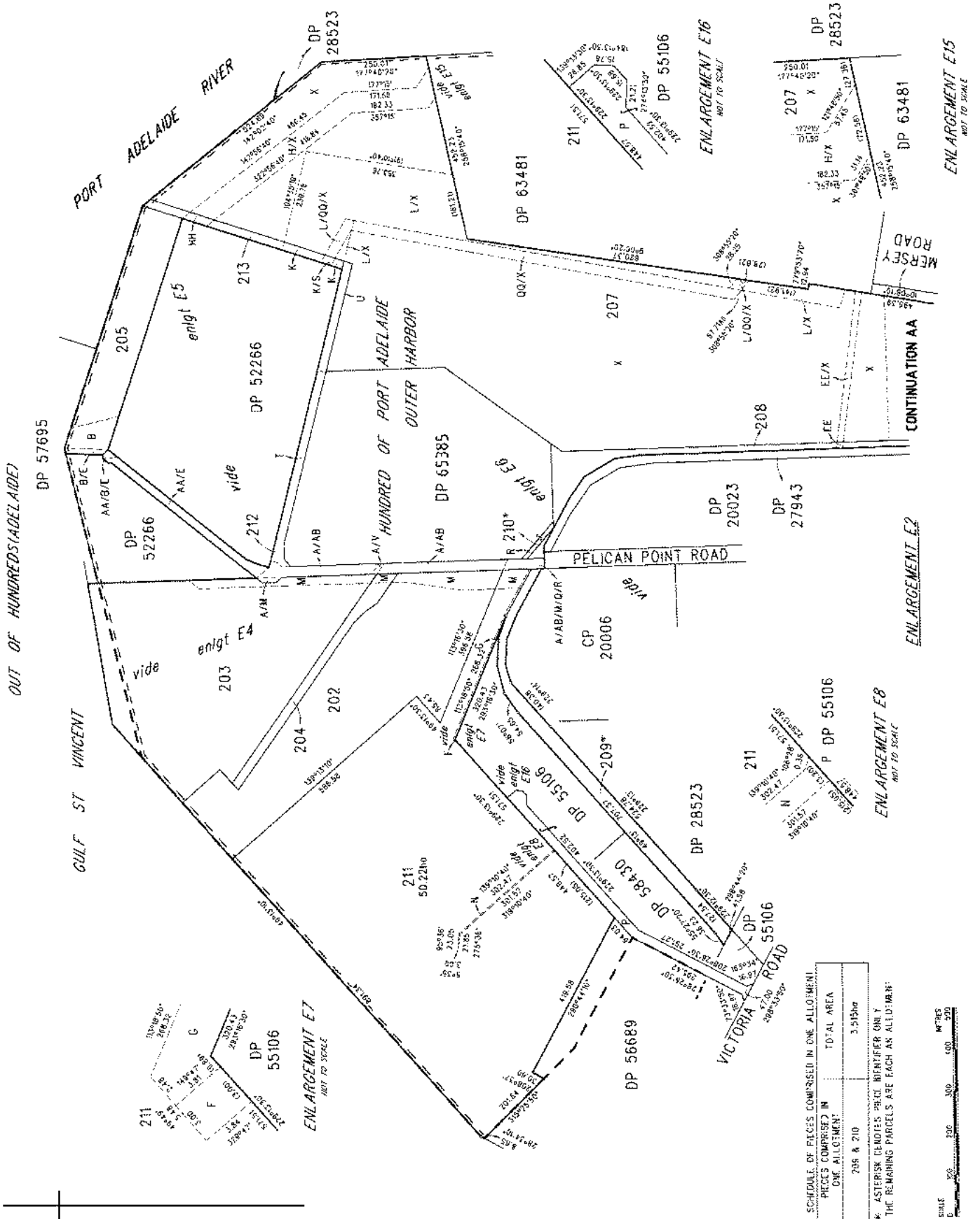
Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

SCHEDULE OF PIECES COMPRISED IN ONE ALLOTMENT

PIECES COMPRISED IN ONE ALLOTMENT	TOTAL AREA
209 & 210	3.615ha

* ASTERISK DENOTES PIECE IDENTIFIER ONLY
THE REMAINING PARCELS ARE EACH AN ALLOTMENT



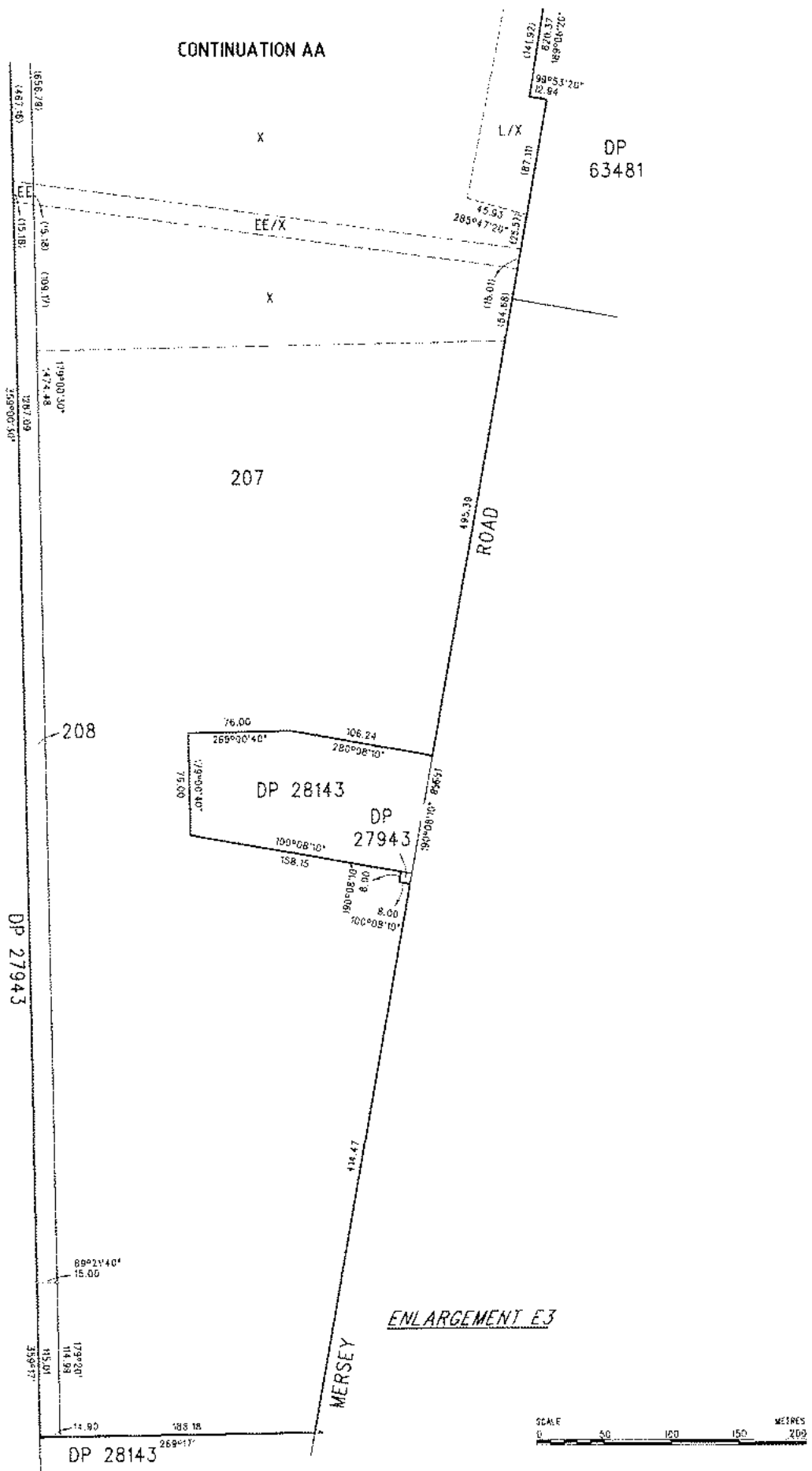


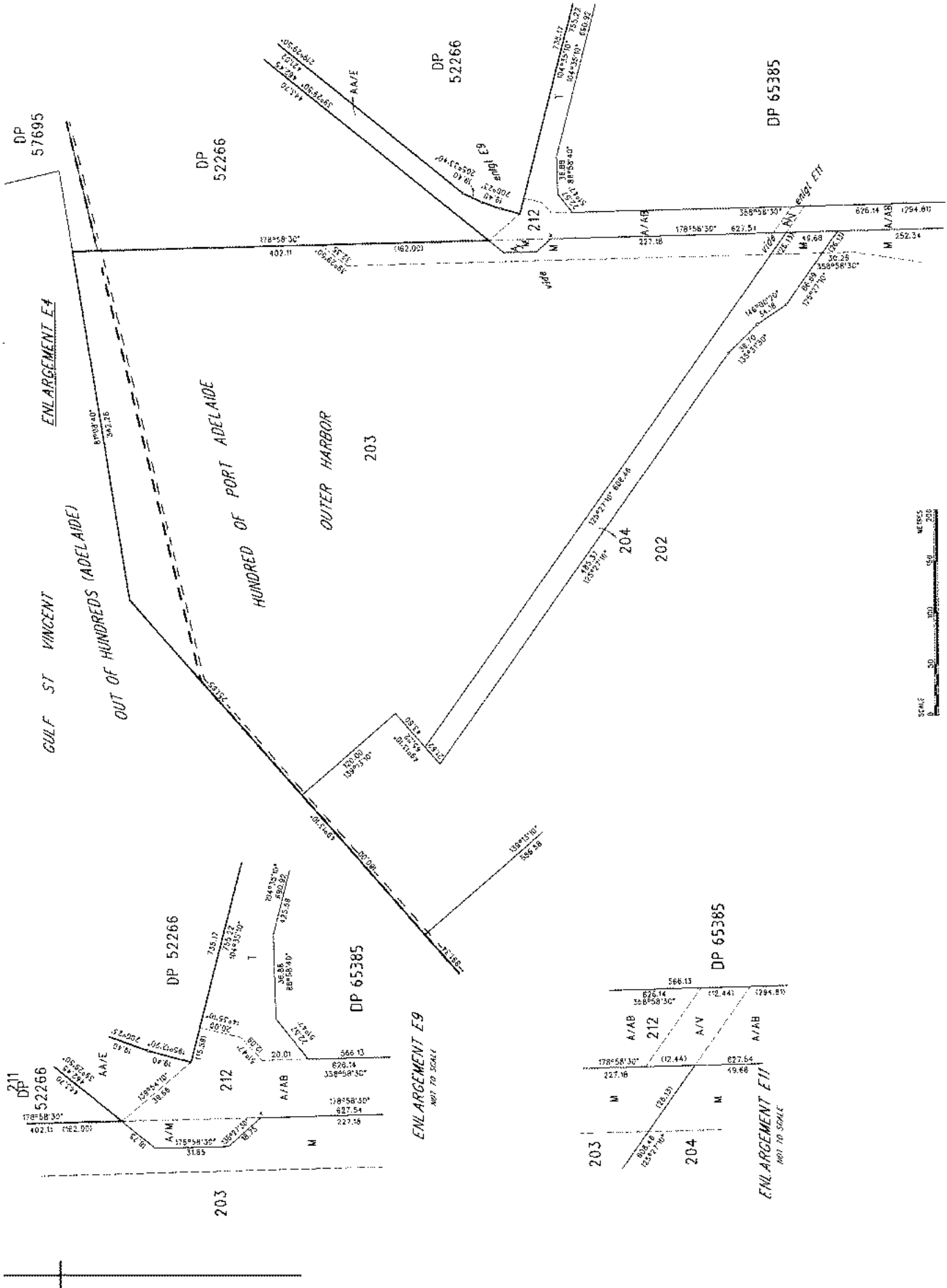
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PIECES COMPRISED IN ONE ALLOTMENT	TOTAL AREA
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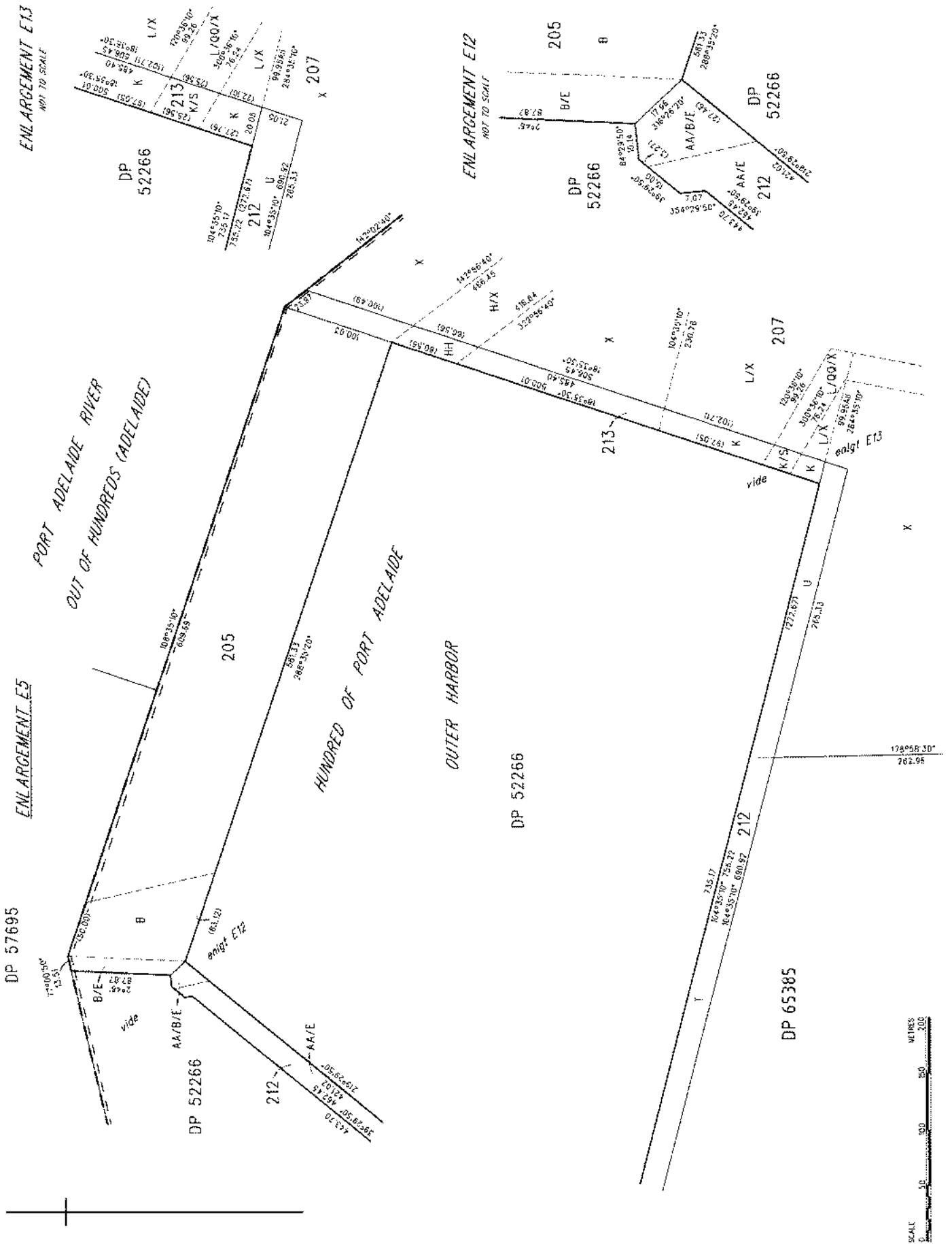
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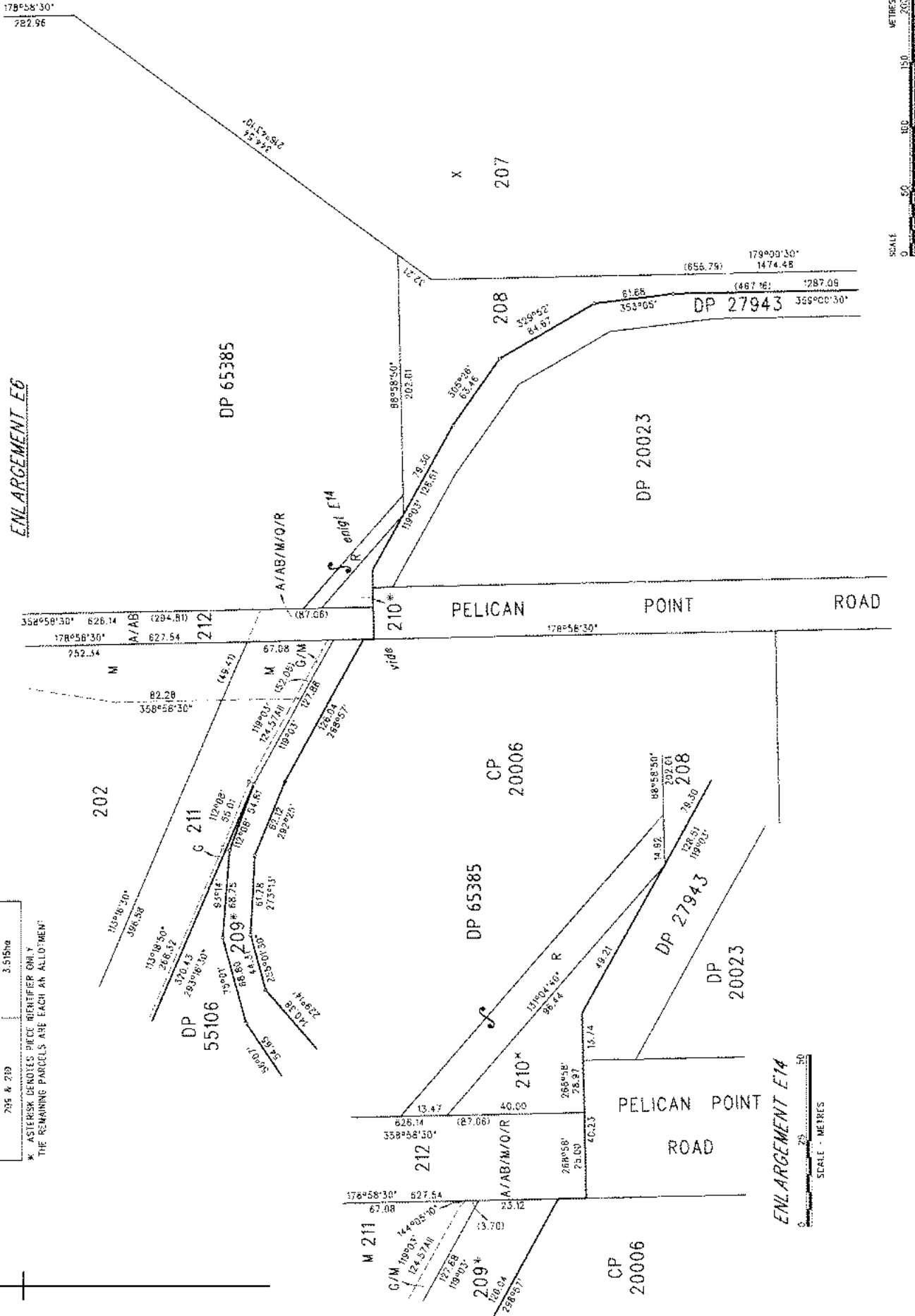
SCALE
0 10 20 30 40 METRES



SCHEDULE OF PIECES COMPRISED IN OUR ALLOTMENT:

PIECES COMPRISED IN OUR ALLOTMENT	TOTAL AREA
705 & 209	3.55ha

* ASTERISK DENOTES PIECE IDENTIFIER ONLY
 THE REMAINING PARCELS ARE EACH AN ALLOTMENT:





The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 6012 Folio 888

Parent Title(s) CT 6011/465, CT 6011/471
Creating Dealing(s) RTC 10984627
Title Issued 07/07/2008 Edition 2 Edition Issued 26/07/2012

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 27 DEPOSITED PLAN 76309
IN THE AREA NAMED OUTER HARBOR
HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE WITHIN LAND

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED TT TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8683997)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED HH AND Z (TG 8683996 AND TG 9618968 RESPECTIVELY)

TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED V (RTC 10026663)

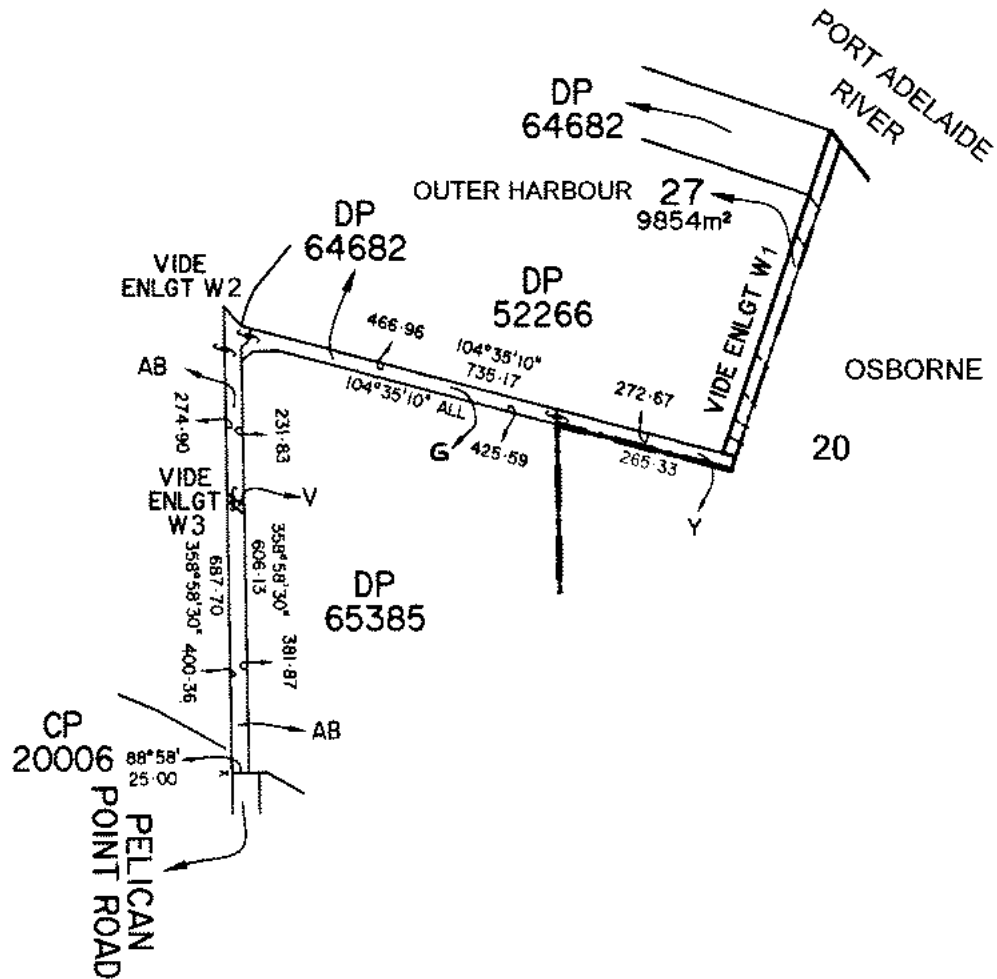
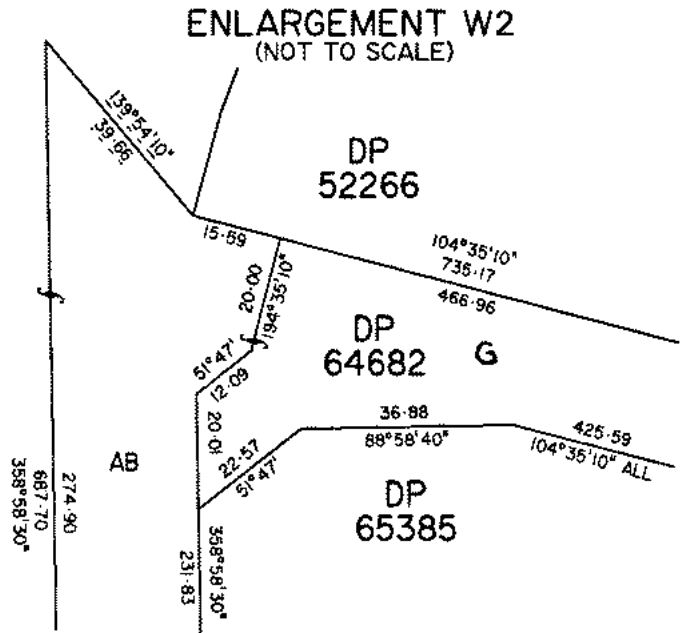
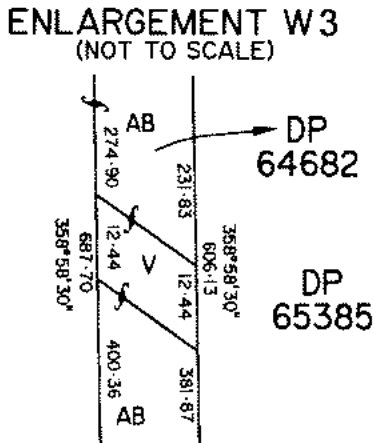
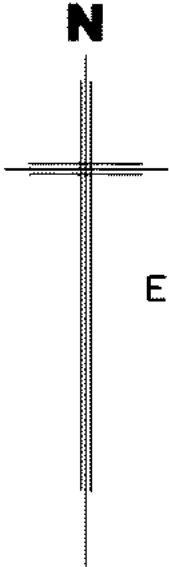
TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED AB.G AND Y

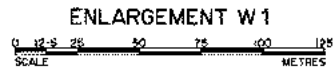
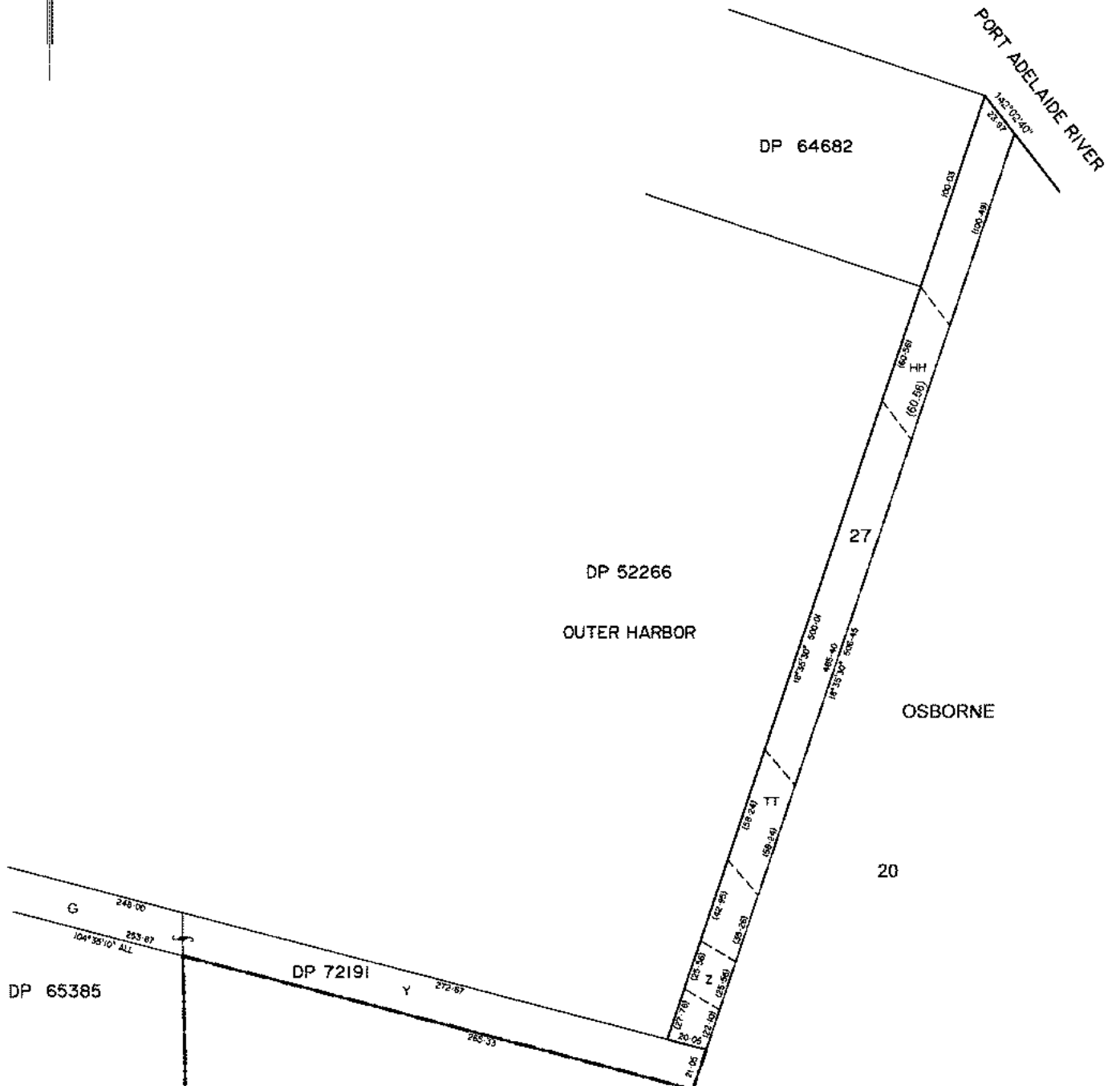
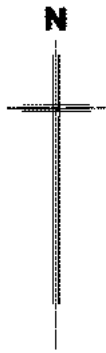
Schedule of Dealings

NIL

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL







The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 6088 Folio 191

Parent Title(s) CT 6067/114
Creating Dealing(s) RTC 11667107
Title Issued 16/12/2011 Edition 3 Edition Issued 26/07/2012

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 502 DEPOSITED PLAN 87145
IN THE AREA NAMED OSBORNE
HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED T TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8684000)

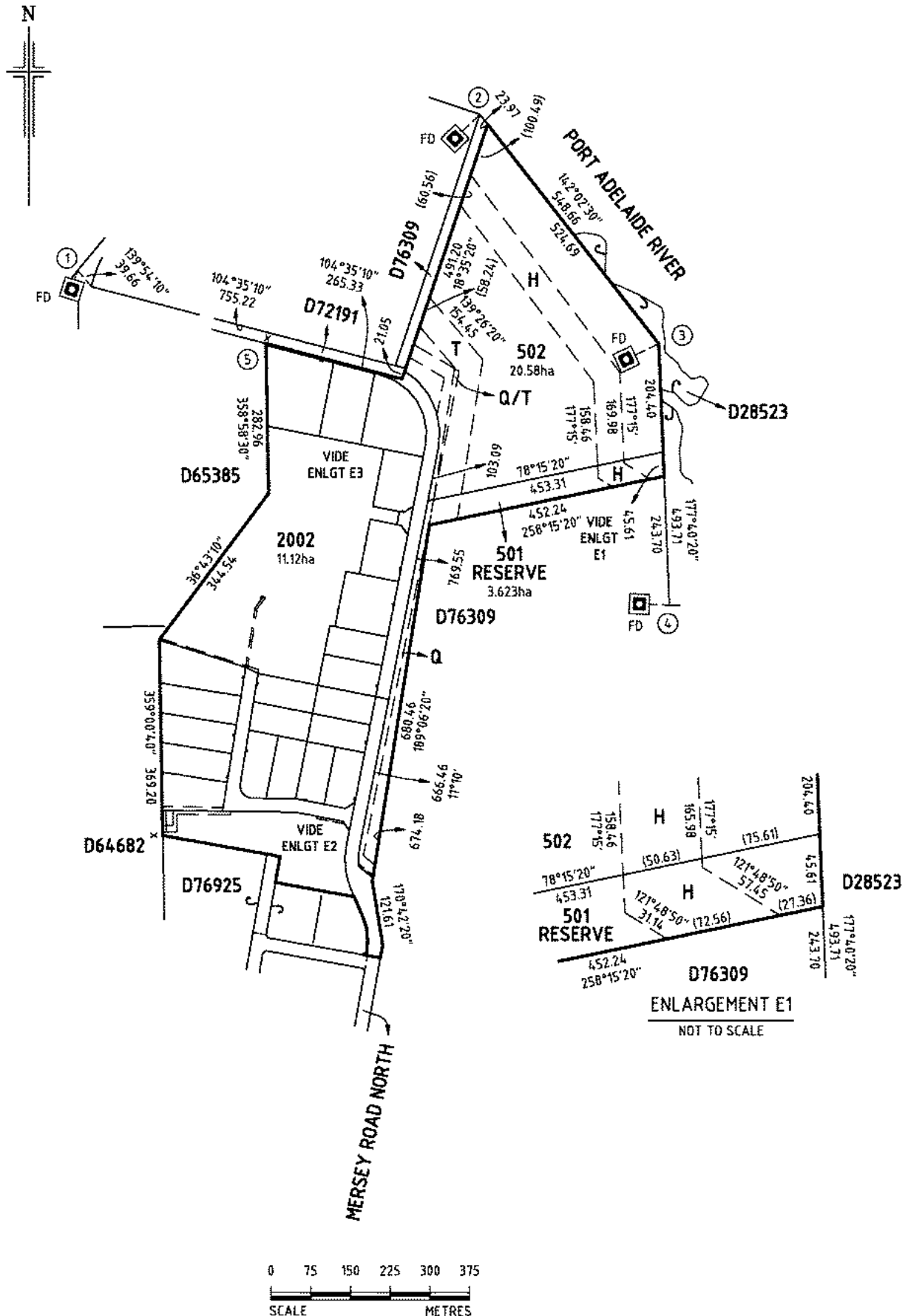
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Schedule of Dealings

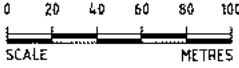
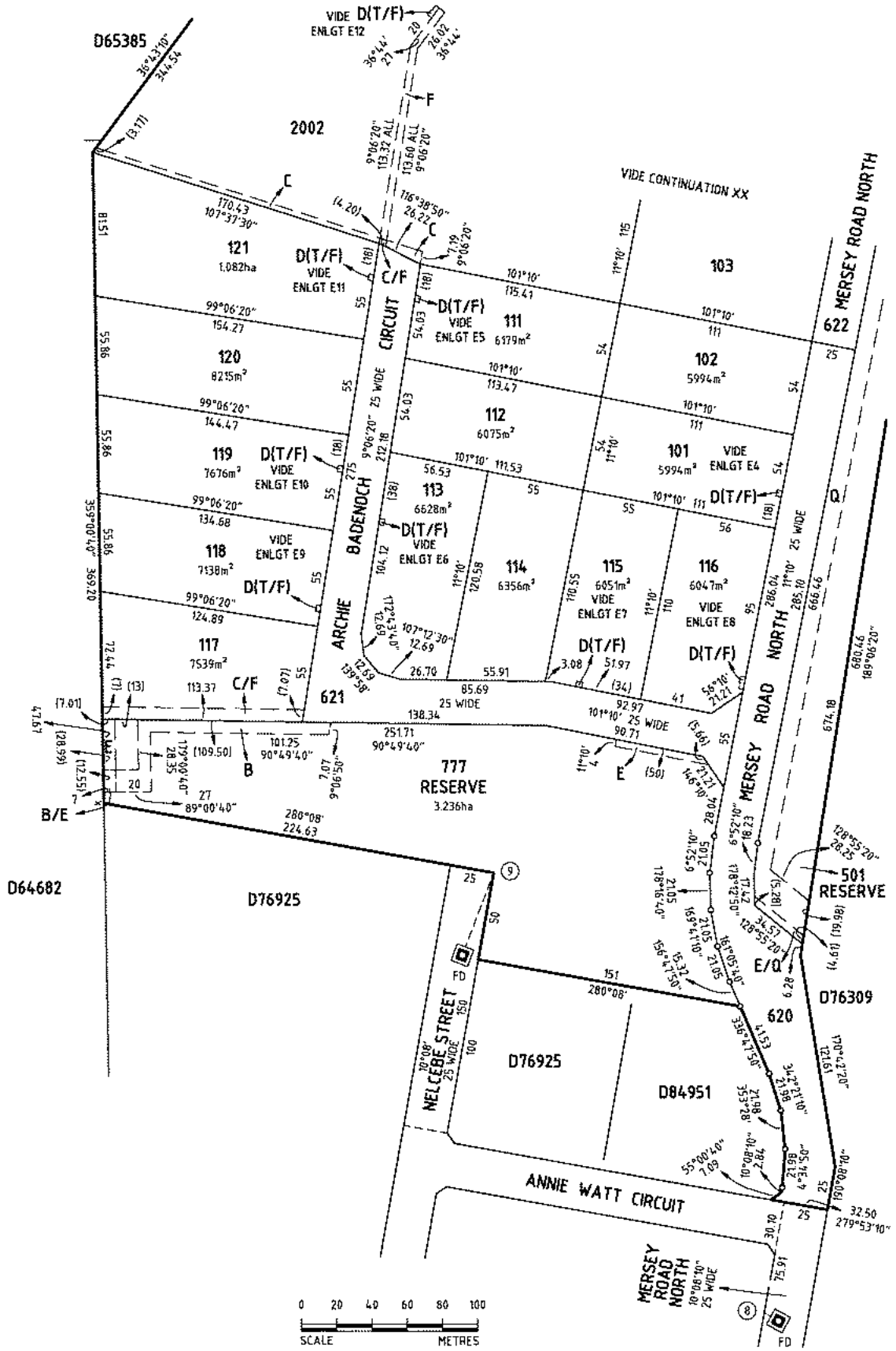
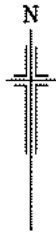
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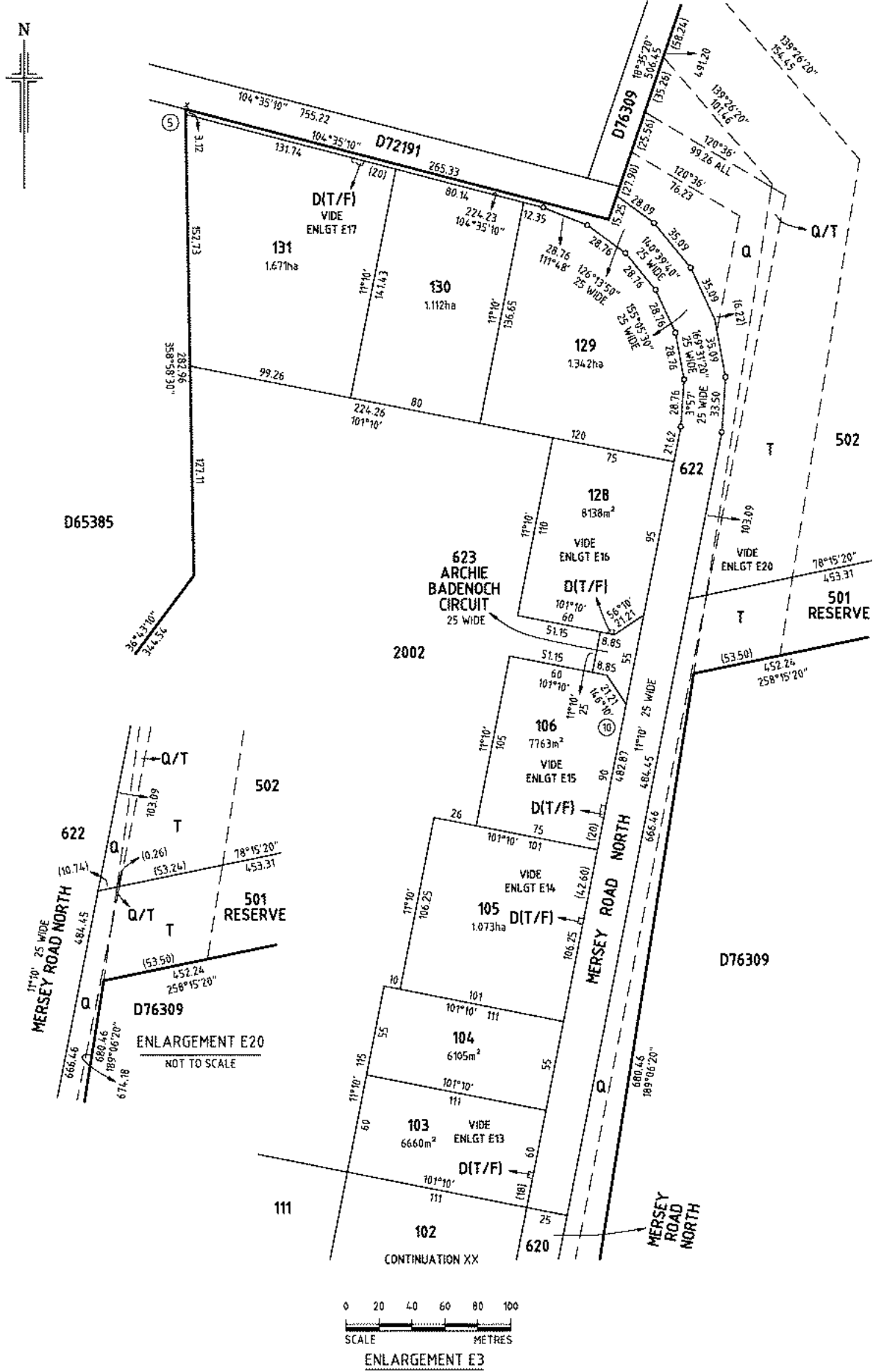
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Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

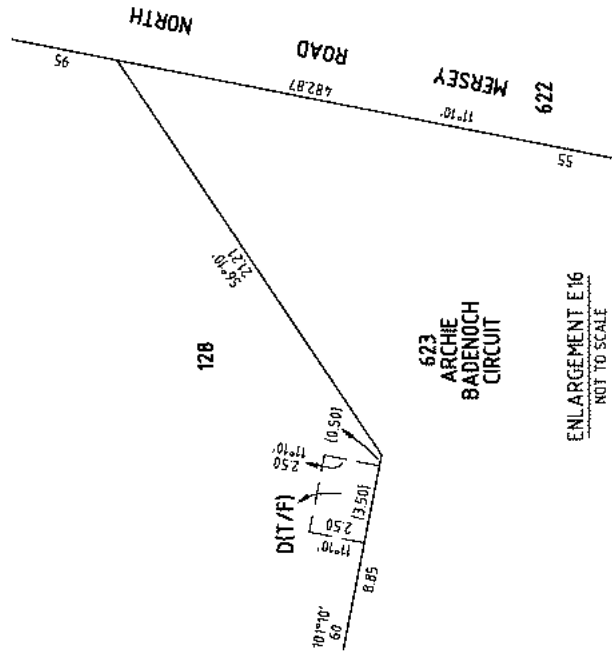
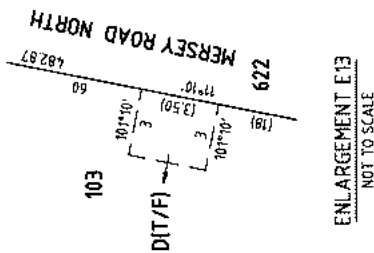
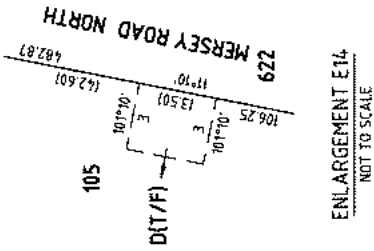
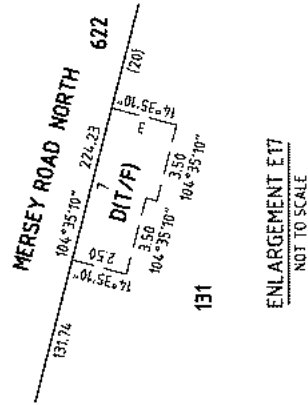
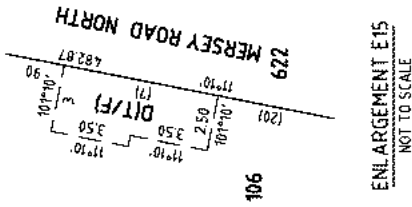


SURVEY INFORMATION IS DERIVED FROM DEPOSITED PLAN 87145



ENLARGEMENT E2







APPENDIX D

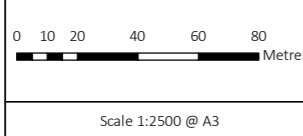
LICENSED AREA PLAN





LICENCE PLAN - D64682 A205, D76309 A27 AND PORTION D87145 A502

- Legend**
-  Leased Area
 -  Parcel Cadastre

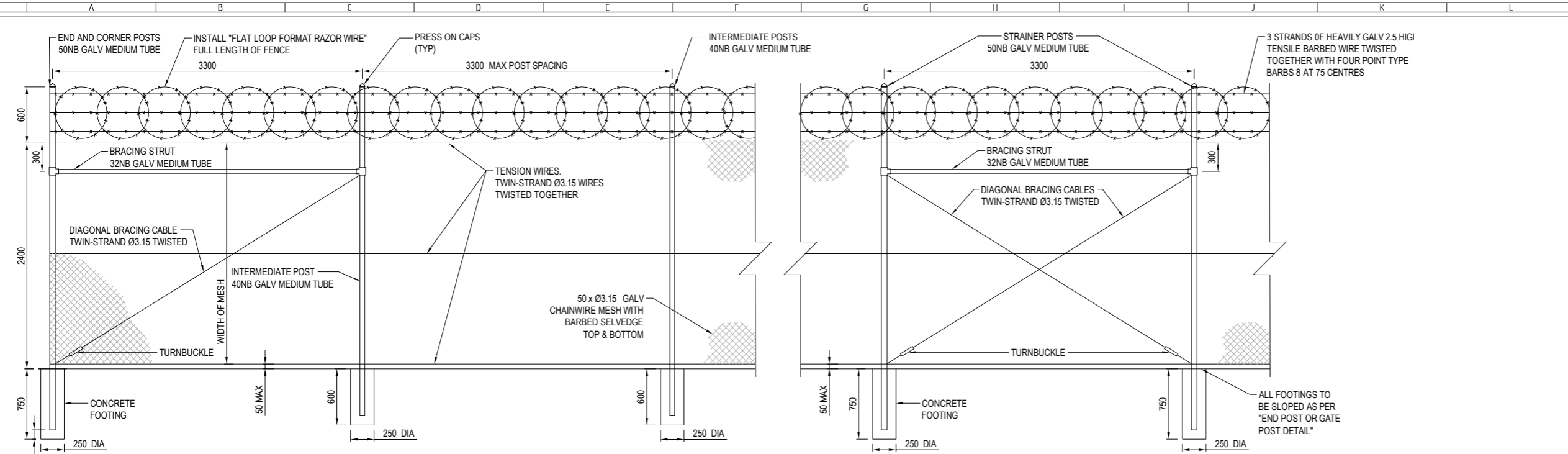


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 Datum: GDA 94
 Projection: Lambert Conformal Conic SA
 Compiled: 30/05/2019 2:44:29 PM GIS ID: LC1856ZV
 Renewal SA does not guarantee the accuracy of any information or data portrayed on this map
 N:\GIS\Project\Licences\Mxd\

APPENDIX E

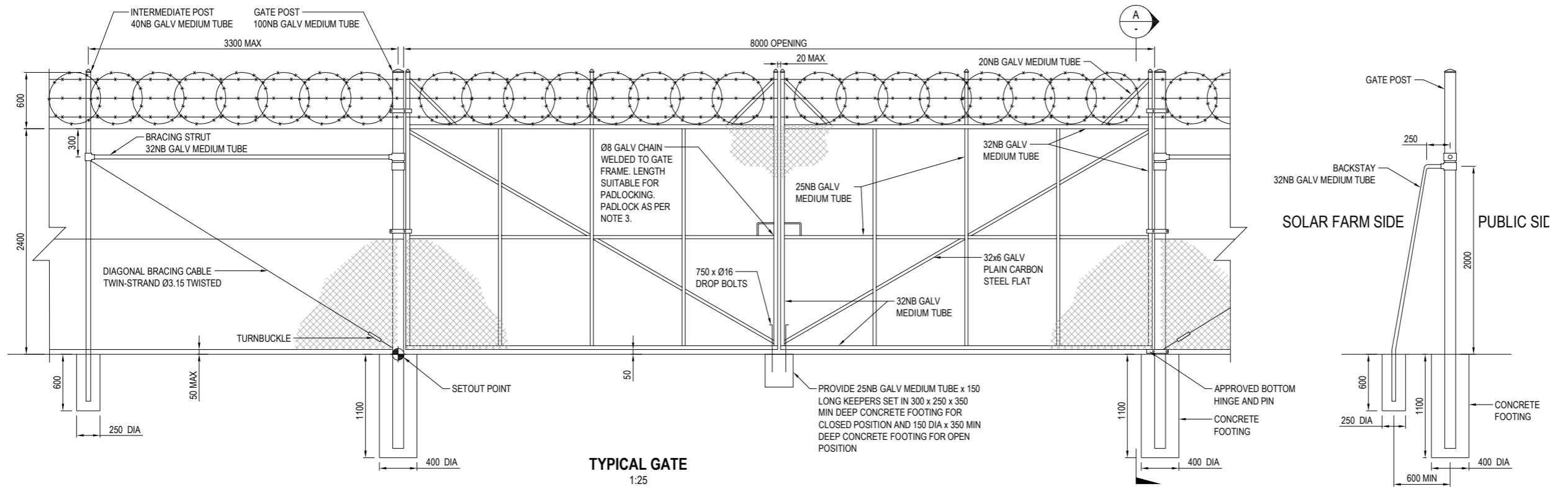
PRELIMINARY DRAWINGS





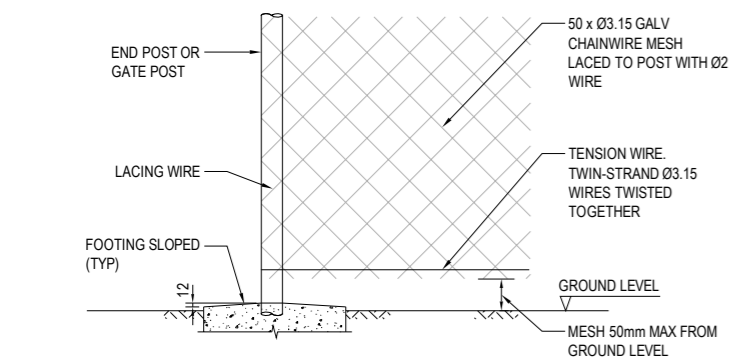
(AT ALL CHANGES IN DIRECTION AND ADJACENT ALL GATES)
TYPICAL END & CORNER BRACED PANEL

(LOCATED AT 150m MAXIMUM INTERVALS ON STRAIGHT LENGTHS)
TYPICAL INTERMEDIATE BRACED PANEL

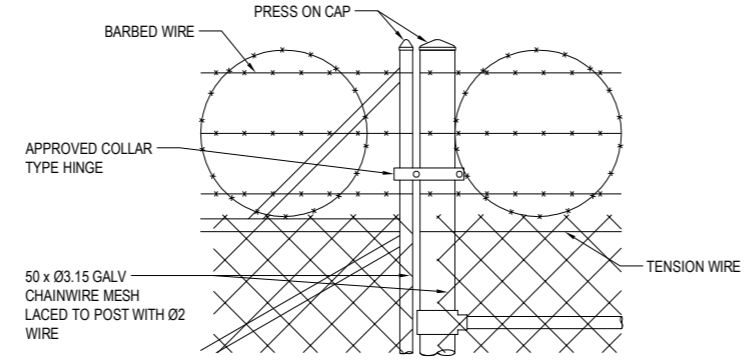


TYPICAL GATE
1:25

SECTION A
1:25



END POST OR GATE POST DETAIL



GATE DETAIL



PRELIMINARY ONLY
NOT FOR CONSTRUCTION

GENERAL NOTES

- DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.
- PROVIDE SL2 RATED PADLOCK, WITH A RESTRICTED KEYING SYSTEM, FOR ALL VEHICLE GATES.

DOC. REF. NO.	TITLE
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REFERENCE DOCUMENT	
REV	DESCRIPTION

REVISION		
DRAWN BY	DESIGNED BY	ENGINEERING MGR
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CHECKED BY	CHECKED BY	PROJECT MGR
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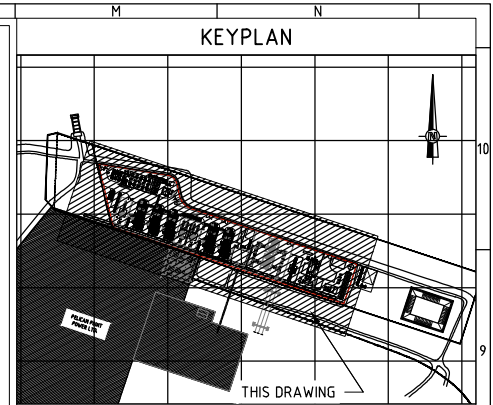
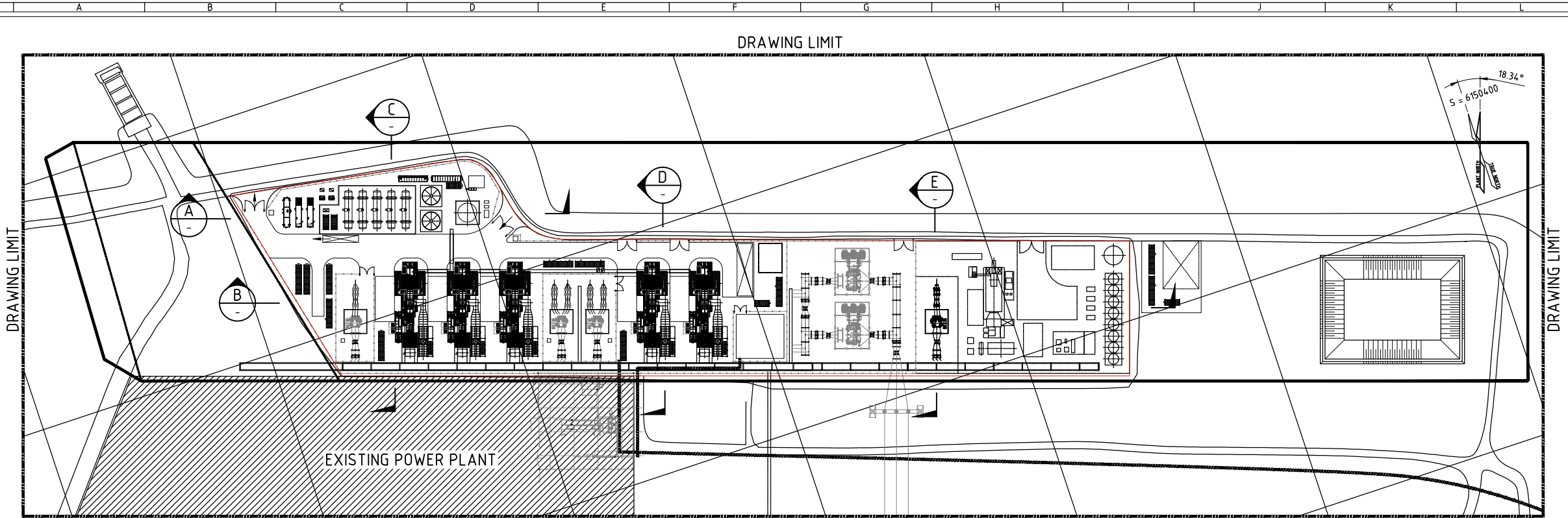
Emanden Technical Solutions Pty Ltd RESINDO RESOURCES & ENERGY

NEXIF TM2500 PEAKER PROJEC
(5) GAS TURBINE, 66kV, 50Hz
FENCE DETAIL
STANDARD DRAWING

APPROVALS	DATE	SCALE	SIZE
Eng Appr.		AS SHOWN	A1
Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-C-XXXX_X	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-C-XXXX		A
CLIENT DWG NO	XXXX-XX-XXX-XX-XXX		

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\02 Civil\5053-DWG-C-000X_X_FENCE.dwg Sep 20, 2019 - 9:08am SZakaria PCCAD-0008

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\02 Civil\5053-DWG-C-0001_F_CUT and FILL.dwg Oct 11, 2019 - 7:24am YTejama PCCAD-0037



- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 3. STRIPPING SOIL FOR REMOVING ORGANICS
 - AT DRY SURFACE = 30-40cm
 - AT SWAMPY AREA / WET LAND = 1.5m
 4. DATUM BASED ON DOC. PRELIMINARY HYDROLOGY AND FLOOD RISK ASSESSMENT

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

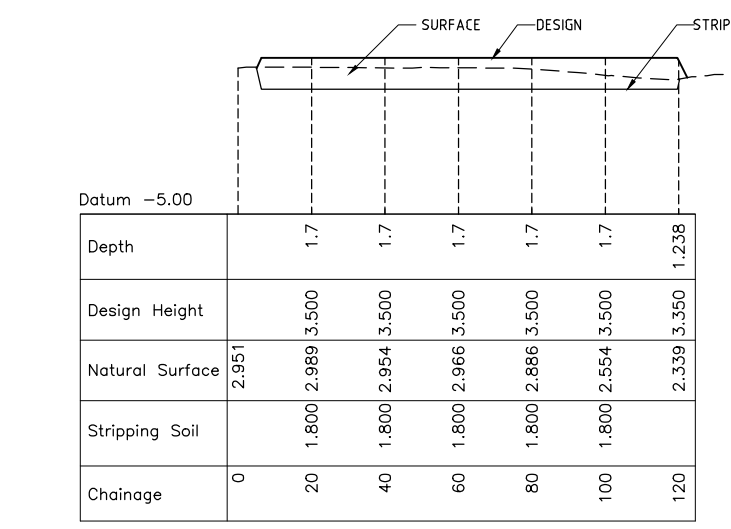
DOC. REF. NO.	TITLE
80759-1	PRELIMINARY HYDROLOGY AND FLOOD RISK ASSESSMENT
66753-1-1-SV-T001-R01	CONTOUR MAP
P0007-05-CEW-61-003	DRAINAGE LAYOUT
P0007-05-GGA-00-002	DETAIL LAYOUT
P0007-05-GGA-00-001	OVERALL LAYOUT

REFERENCE DOCUMENT		
REV	DATE	DESCRIPTION
F	11/10/19	ISSUED FOR APPROVAL - GENERAL REVISION
E	19/09/19	RE-ISSUED FOR APPROVAL
D	13/09/19	ISSUED FOR APPROVAL
C	29/08/19	ISSUED FOR APPROVAL
B	19/08/19	ISSUED FOR CLIENT REVIEW
A	16/08/19	ISSUED FOR INTERNAL REVIEW

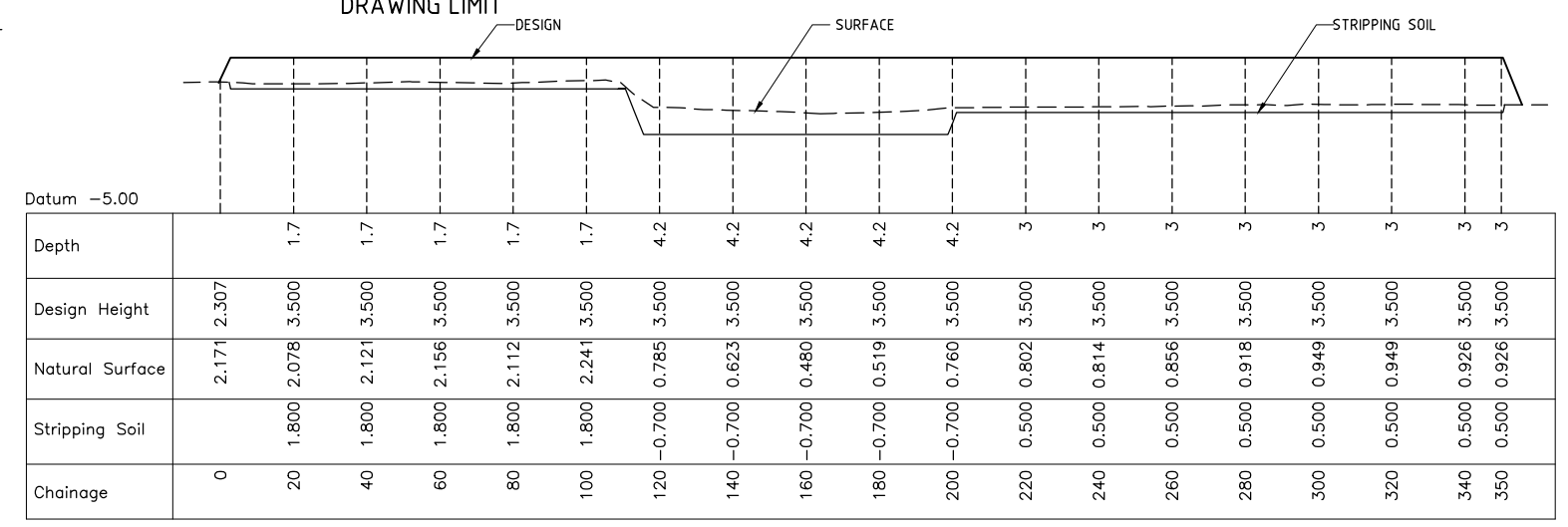
REVISION		
DRAWN BY	DESIGNED BY	ENGINEERING MGR
FTH	ARN	TAS
CHECKED BY	CHECKED BY	PROJECT MGR
RPO	TAS	SBI



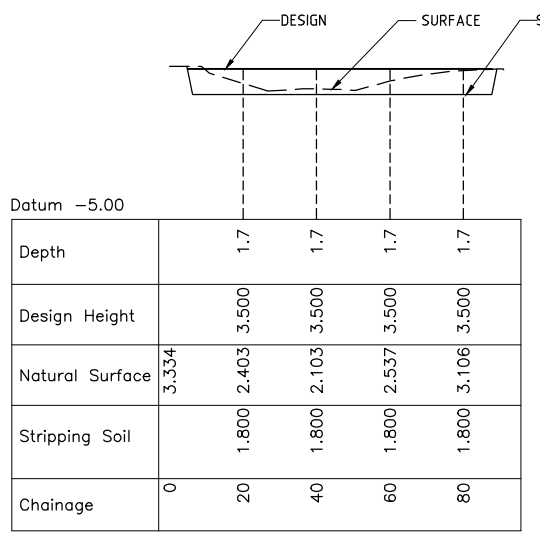
Emanden Technical Solutions Pty Ltd RESINDO RESOURCES & ENERGY



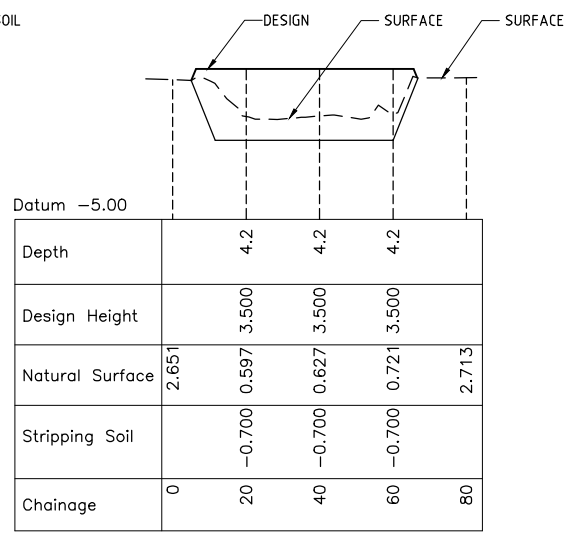
SECTION A
Horiz. 1:1000
Vert. 1:200



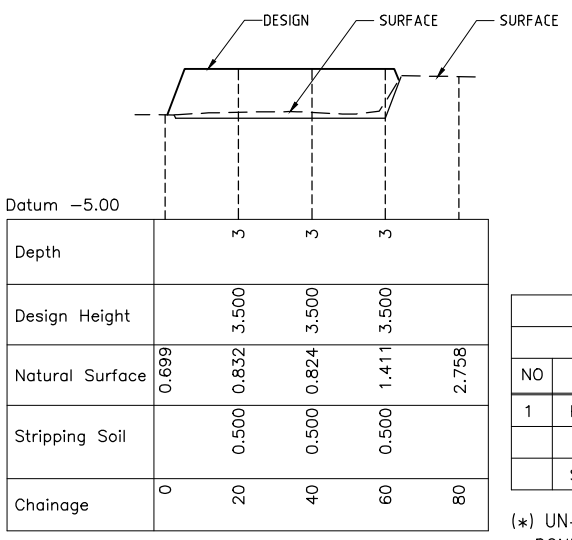
SECTION B
Horiz. 1:1000
Vert. 1:200



SECTION C
Horiz. 1:1000
Vert. 1:200



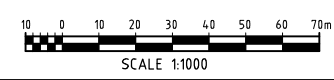
SECTION D
Horiz. 1:1000
Vert. 1:200



SECTION E
Horiz. 1:1000
Vert. 1:200

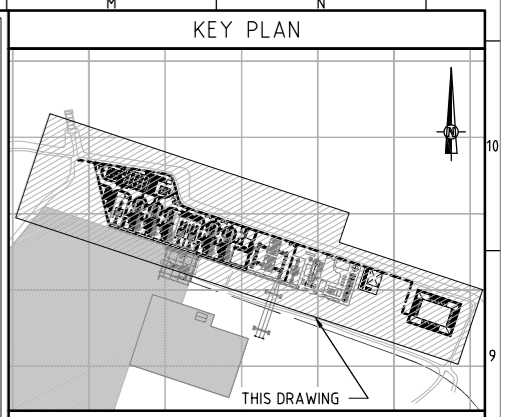
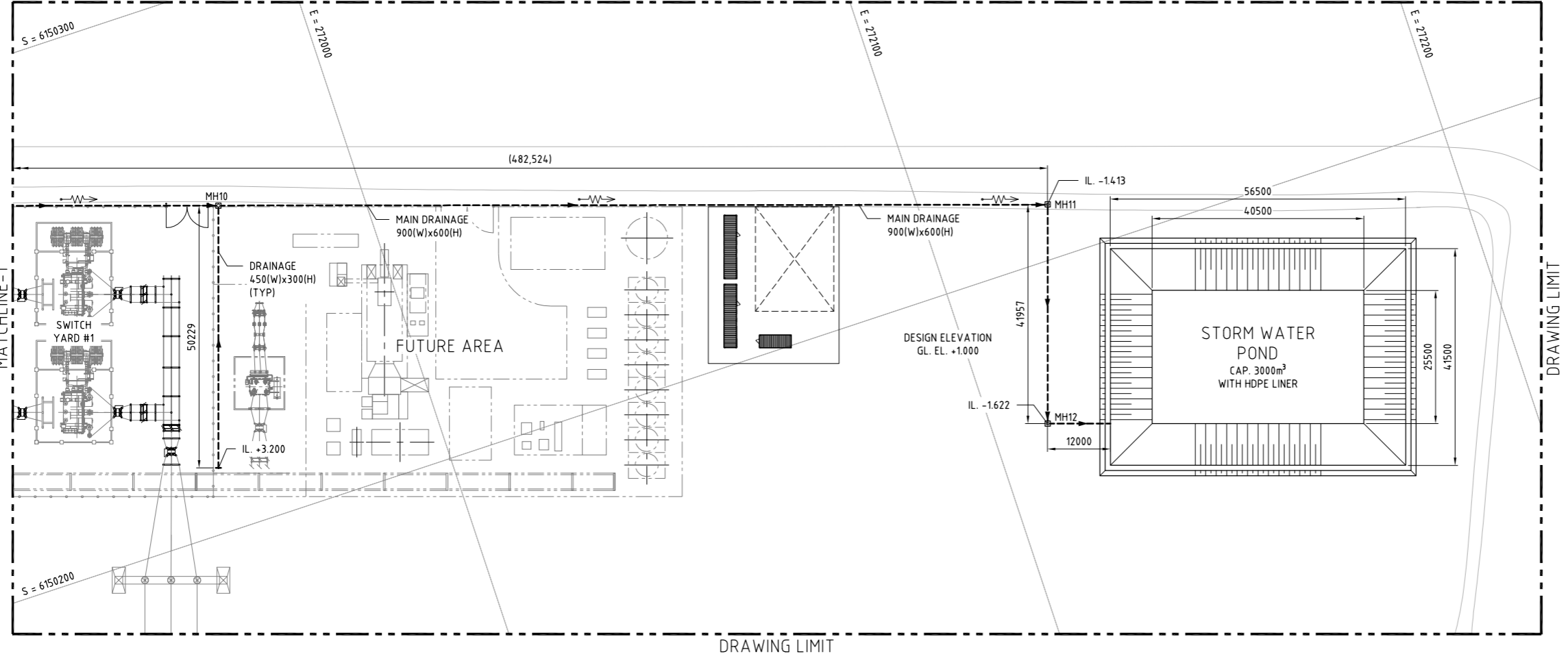
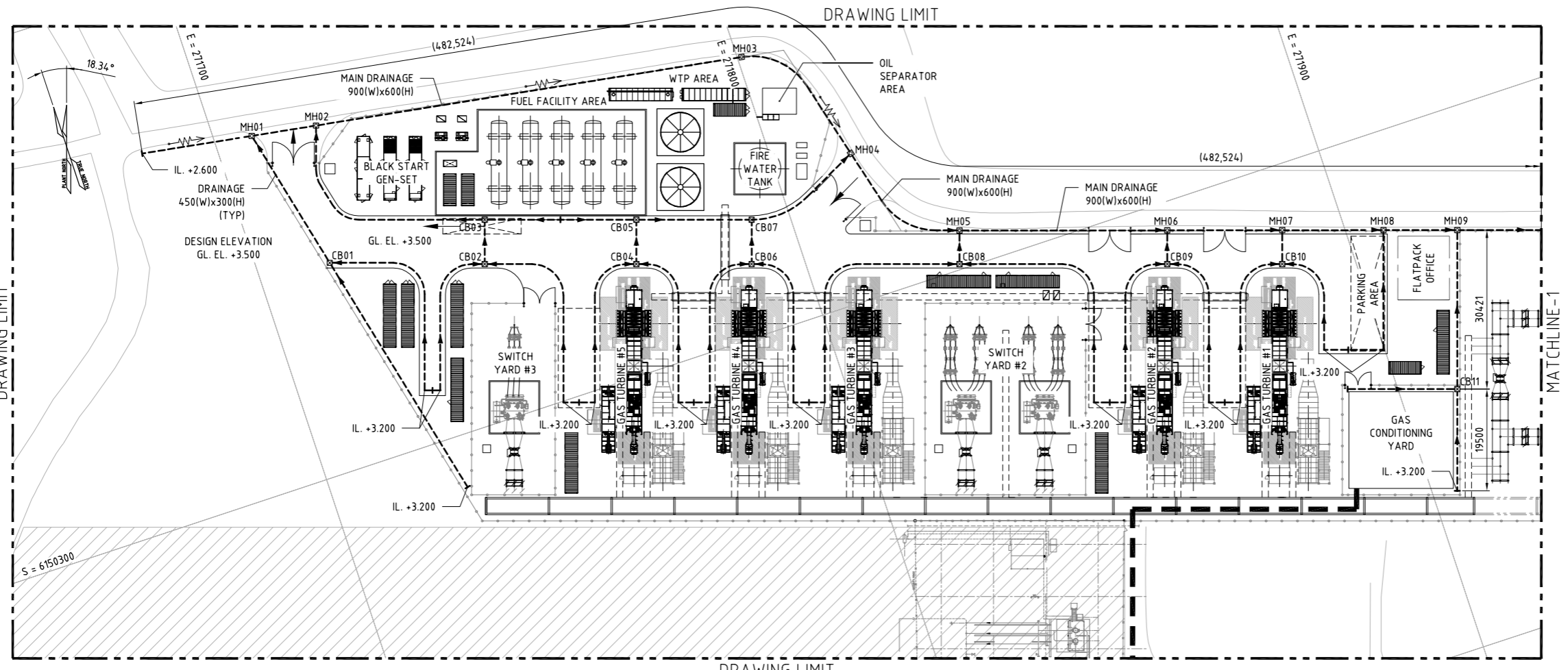
EARTH WORK SUMMARY					
VOLUME (m3)					
NO	DESCRIPTION	AREA (m2)	CUT (m3)	FILL (m3)	NET BALANCE (m3)
1	PLANT AREA	22,871	20,524 (*)	64,074	64,074
SUB TOTAL				64,074	64,074

(*) UN-USED SOIL (ORGANICS CONTENT)
- POND CUT AND FILL IS NOT INCLUDED IN THE ABOVE CALCULATION



NEXIF TM2500 PEAKER PROJEC (5) GAS TURBINE, 66kV, 50Hz EARTH WORKS CUT AND FILL			
APPROVALS	DATE	SCALE	SIZE
Eng Appr.		1 : 1000	A1
Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-C-0001_F	
PROJECT NUMBER	5053	REV	
RESINDO DWG NO	5053-DWG-C-0001		
CLIENT DWG NO	P0007-05-CEW-61-001		

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\02 Civil\5053-DWG-C-0002-E_DRAINAGE_LAYOUT.dwg Oct 10, 2019 - 3:50pm KToho PC-0009



- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
 2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 3. MAIN DRAINAGE USE PRECAST U-DITCH.
 4. OPEN DITCH DEEPER THAN 500mm SHALL BE COVERED WITH GRATING.
 5. HEAVY DUTY U-DITCH WITH CONCRETE COVER SHALL BE USED FOR CROSSING.
 6. DRAINAGE SLOPE 0.5% U.N.O.

- LEGEND :**
- - - = DRAINAGE LINE
 - IL. = INVERT LEVEL
 - ☒ CB01 = CONTROL BOX
 - ☒ MH01 = MANHOLE BOX

DOC. REF. NO.	TITLE
P0007-05-GGA-00-002	DETAIL LAYOUT
P0007-05-GGA-00-001	OVERALL LAYOUT

REFERENCE DOCUMENT

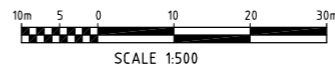
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E	10/10/19	ISSUED FOR APPROVAL - GENERAL REVISION
D	19/09/19	RE-ISSUED FOR APPROVAL
C	13/09/19	ISSUED FOR APPROVAL
B	29/08/19	ISSUED FOR CLIENT REVIEW
A	13/08/19	ISSUED FOR INTERNAL REVIEW

REVISION

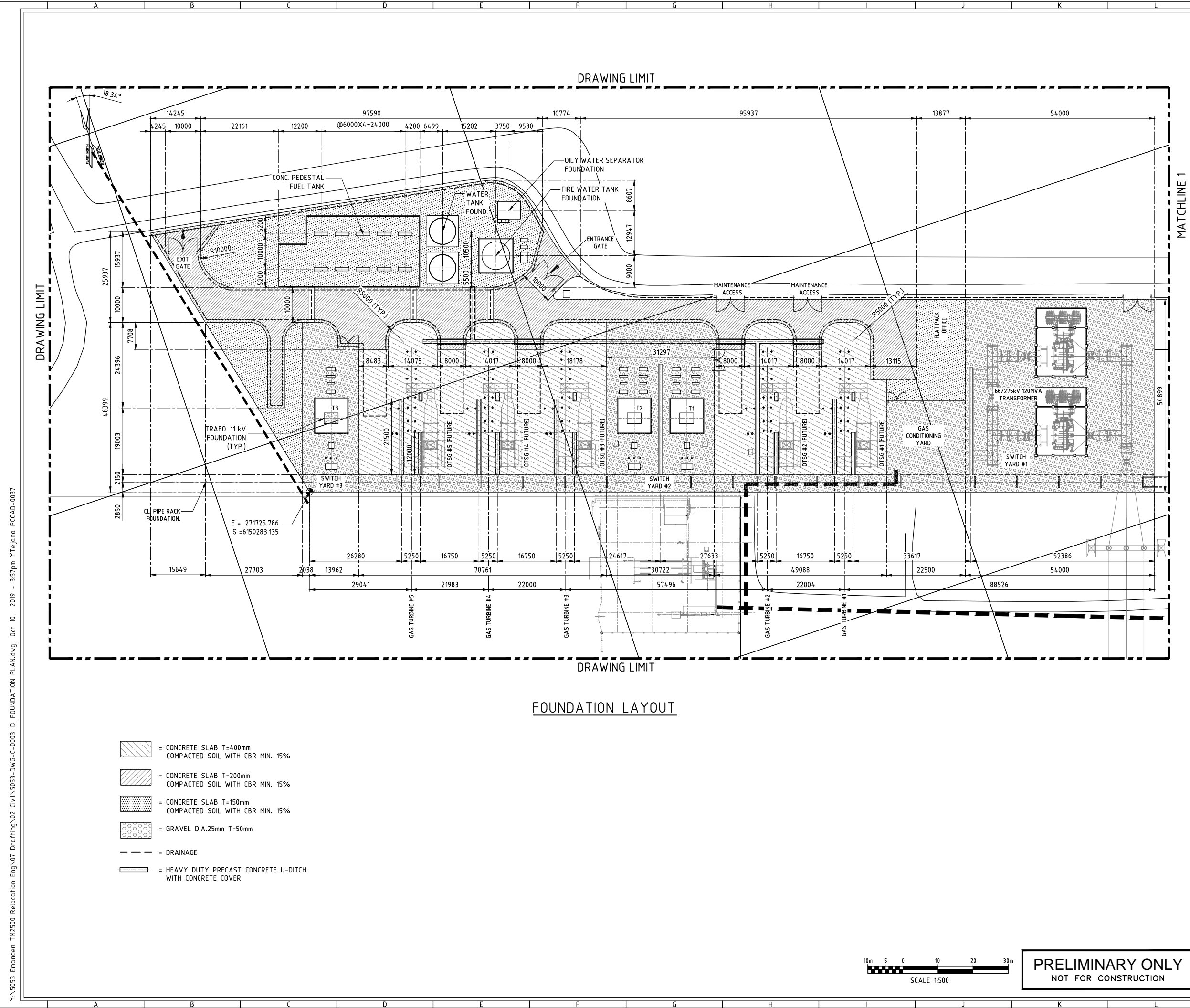
DRAWN BY	DESIGNED BY	ENGINEERING MGR
KTO	ARN	TAS
CHECKED BY	CHECKED BY	PROJECT MGR
RPO	TAS	SBI

**NEXIF TM2500 PEAKER PROJEC
(5) GAS TURBINE, 66kV, 50Hz
DRAINAGE LAYOUT
PLAN**

APPROVALS	DATE	SCALE	SIZE
Eng Appr.		1 : 500	A1
Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-C-0002_E	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-C-0002		E
CLIENT DWG NO	P0007-05-CEW-61-002		



PRELIMINARY ONLY
NOT FOR CONSTRUCTION



- GENERAL NOTES**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
 - ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 - CONCRETE MATERIAL :
 - INSITU CONCRETE = $f_c'28$ Mpa FOR STRUCTURE
 - $f_c'30$ Mpa FOR ROAD
 - MASS CONCRETE = $f_c'22.5$ Mpa
 - LEAN CONCRETE = $f_c'10$ Mpa
 - REINFORCEMENT BAR (AS/NZS 4671) :
 - DEFORM REBAR : GRADE D500N (*)
 - PLAIN REBAR : GRADE R250N (*)
 - CONCRETE COVER :
 - EXPOSED TO WEATHER = 50 mm
 - IN CONTACT WITH EARTH = 75 mm

NOTE : (*) TO BE ADVISED

DOC. REF. NO.	TITLE
P0007-05-CEW-61-003	DRAINAGE LAYOUT
P0007-05-GGA-00-002	DETAIL LAYOUT
P0007-05-GGA-00-001	OVERALL LAYOUT

REFERENCE DOCUMENT

REV	DATE	DESCRIPTION
D	10/10/19	ISSUED FOR APPROVAL-GENERAL REVISION
C	12/09/19	ISSUED FOR APPROVAL
B	29/08/19	ISSUED FOR CLIENT REVIEW
A	13/08/19	ISSUED FOR INTERNAL REVIEW

REVISION

DRAWN BY	DESIGNED BY	ENGINEERING MGR
YTE	ARN	TAS
CHECKED BY	CHECKED BY	PROJECT MGR
RPO	TAS	SBI

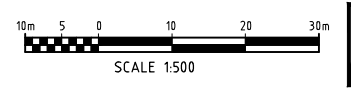


Emanden Technical Solutions Pty Ltd RESINDO RESOURCES & ENERGY

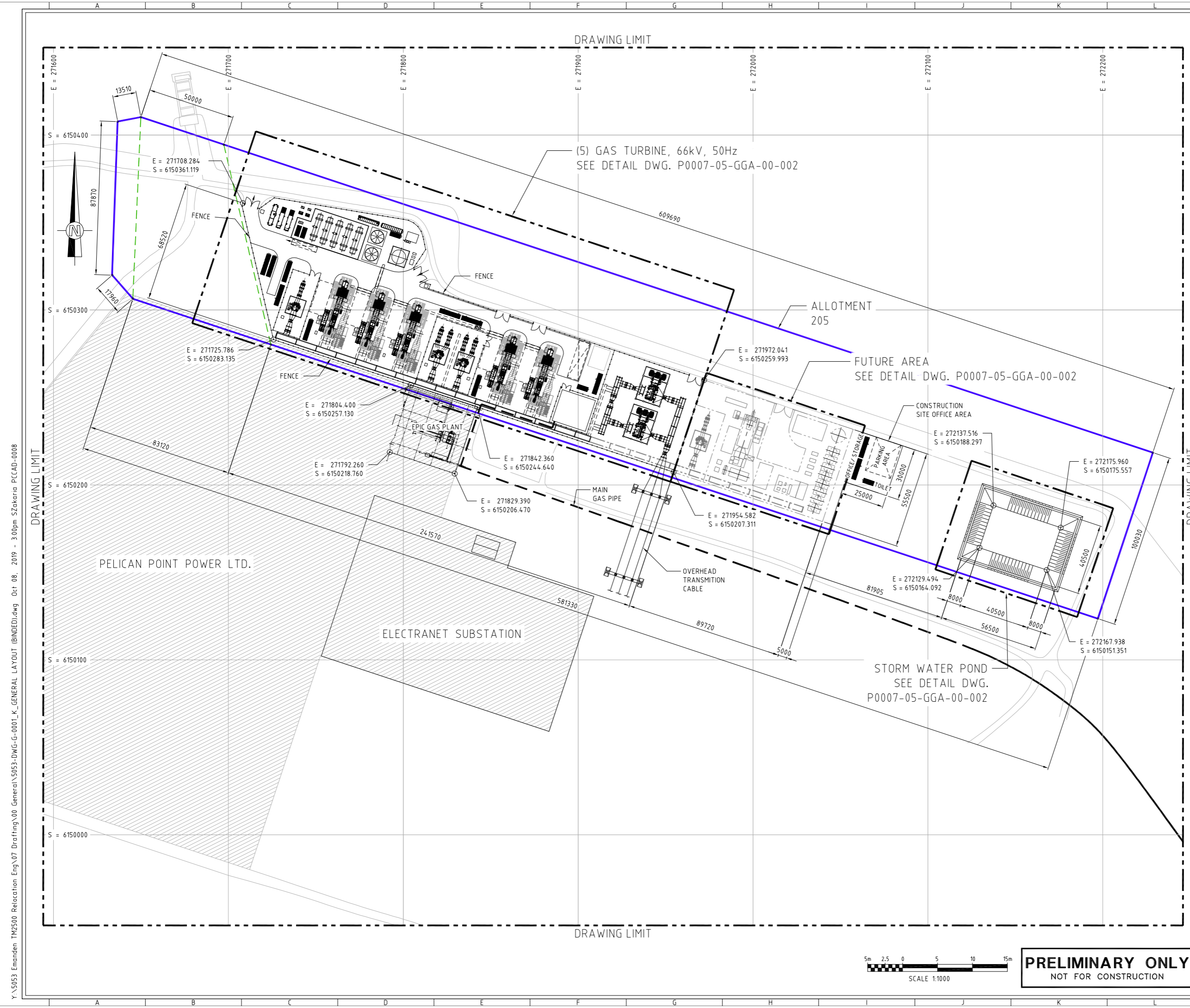
**NEXIF TM2500 PEAKER PROJEC
(5) GAS TURBINE, 66kV, 50Hz
FOUNDATION LAYOUT
PLAN**

APPROVALS	DATE	SCALE	SIZE
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Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-C-0003_D	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-C-0003		D
CLIENT DWG NO	P0007-05-CEW-61-003		

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\02 Civil\5053-DWG-C-0003-D_FOUNDATION PLAN.dwg Oct 10, 2019 - 3:57pm YTejano PCCAD-0037



**PRELIMINARY ONLY
NOT FOR CONSTRUCTION**



GENERAL NOTES

DOC. REF. NO.	TITLE

REFERENCE DOCUMENT	
REV	DESCRIPTION
K	08/10/19 ISSUED FOR APPROVAL - GENERAL REVISION
J	01/10/19 ISSUED FOR APPROVAL - 66kV BUSCOUPLER SYSTEM UPDATE
I	30/09/19 ISSUED FOR APPROVAL - 66kV BUSCOUPLER SYSTEM UPDATE
H	27/09/19 RE-ISSUED FOR APPROVAL
G	13/09/19 RE-ISSUED FOR APPROVAL
F	29/08/19 ISSUED FOR APPROVAL
E	12/08/19 ISSUED FOR APPROVAL
D	31/07/19 RE-ISSUED FOR CLIENT REVIEW

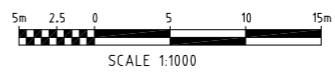
REVISION		
DRAWN BY	DESIGNED BY	ENGINEERING MGR
SZA	SZA	TAS
CHECKED BY	CHECKED BY	PROJECT MGR
LEK	FCH	SBI



NEXIF TM2500 PEAKER PROJECT
(5) GAS TURBINE, 66kV, 50Hz
GENERAL LAYOUT

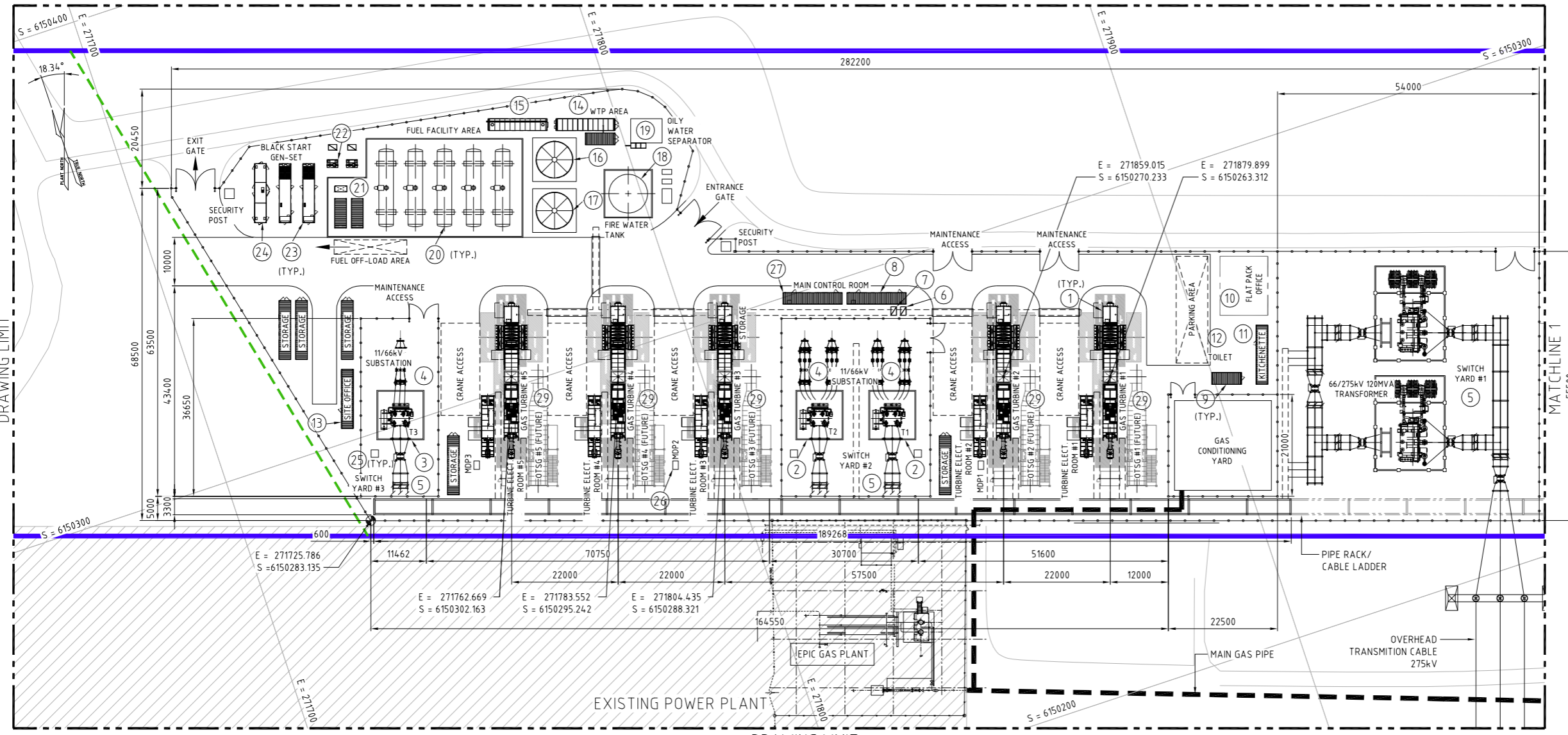
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Eng Appr.		1:1000	A1
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Client Appr.		5053-DWG-G-0001_K	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-G-0001		K
CLIENT DWG NO	P0007-05-GGA-00-001		

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\00 General\5053-DWG-G-0001_K_GENERAL_LAYOUT (BINDED).dwg Oct 08, 2019 - 3:00pm Szakaria PCCAD-0008



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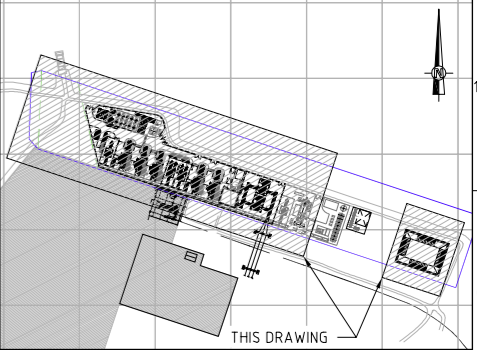
DRAWING LIMIT



DRAWING LIMIT

(5) GAS TURBINE, 66kV, 50Hz DETAIL

KEY PLAN



GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.

DOC. REF. NO.	TITLE
P0007-05-GGA-00-002	(5) GAS TURBINE, 66kV, 50Hz GENERAL LAYOUT

REV	DATE	DESCRIPTION
G	08/10/19	ISSUED FOR APPROVAL - GENERAL REVISION
F	01/10/19	ISSUED FOR APPROVAL - 66kV BUSCOUPLER SYSTEM UPDATE
E	30/09/19	ISSUED FOR APPROVAL - 66kV BUSCOUPLER SYSTEM UPDATE
D	27/09/19	RE-ISSUED FOR APPROVAL
C	11/09/19	ISSUED FOR APPROVAL
B	29/08/19	ISSUED FOR CLIENT REVIEW
A	20/08/19	ISSUED FOR INTERNAL REVIEW

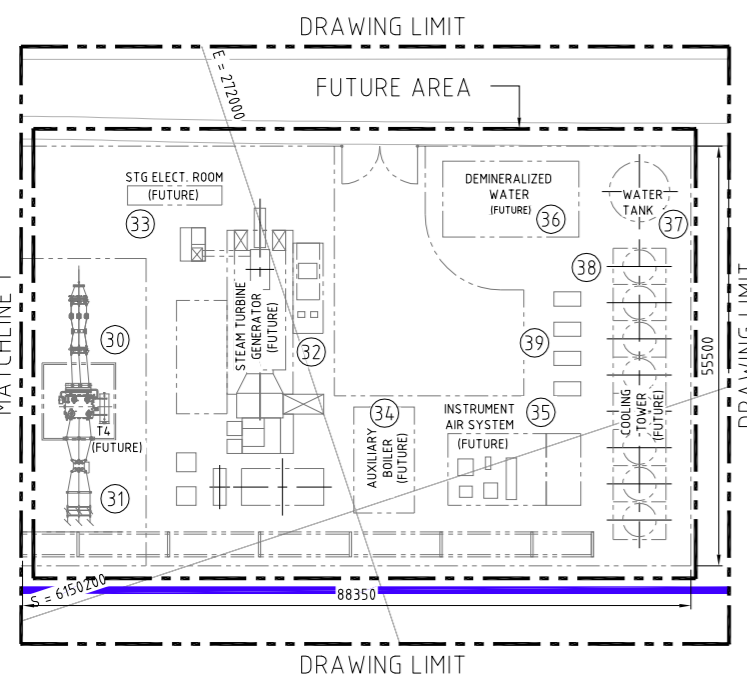
REVISION		
DRAWN BY	DESIGNED BY	ENGINEERING MGR
SZA	SZA	TAS
CHECKED BY	CHECKED BY	PROJECT MGR
LEK	FCH	SBI



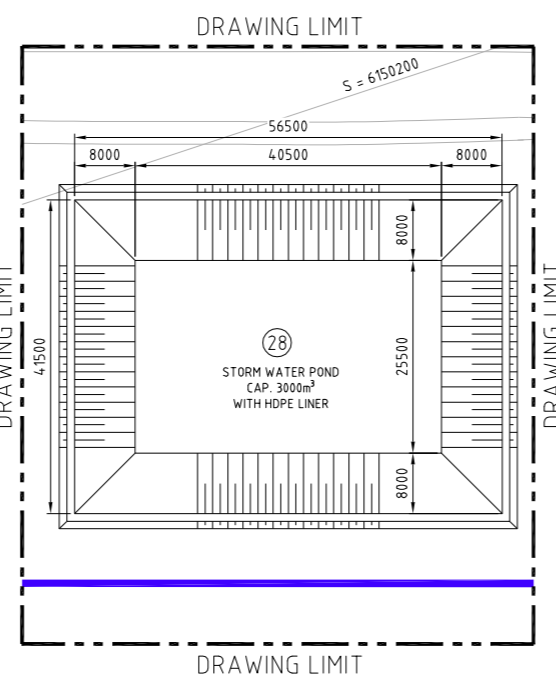
Emanden Technical Solutions Pty Ltd RESINDO RESOURCES & ENERGY

NEXIF TM2500 PEAKER PROJECT
(5) GAS TURBINE, 66kV, 50Hz
DETAIL LAYOUT

APPROVALS	DATE	SCALE	SIZE
Eng Appr.		1:500	A1
Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-G-0002_G	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-G-0002		G
CLIENT DWG NO	P0007-05-GGA-00-002		



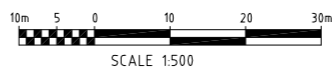
FUTURE AREA DETAIL



STORM WATER POND DETAIL

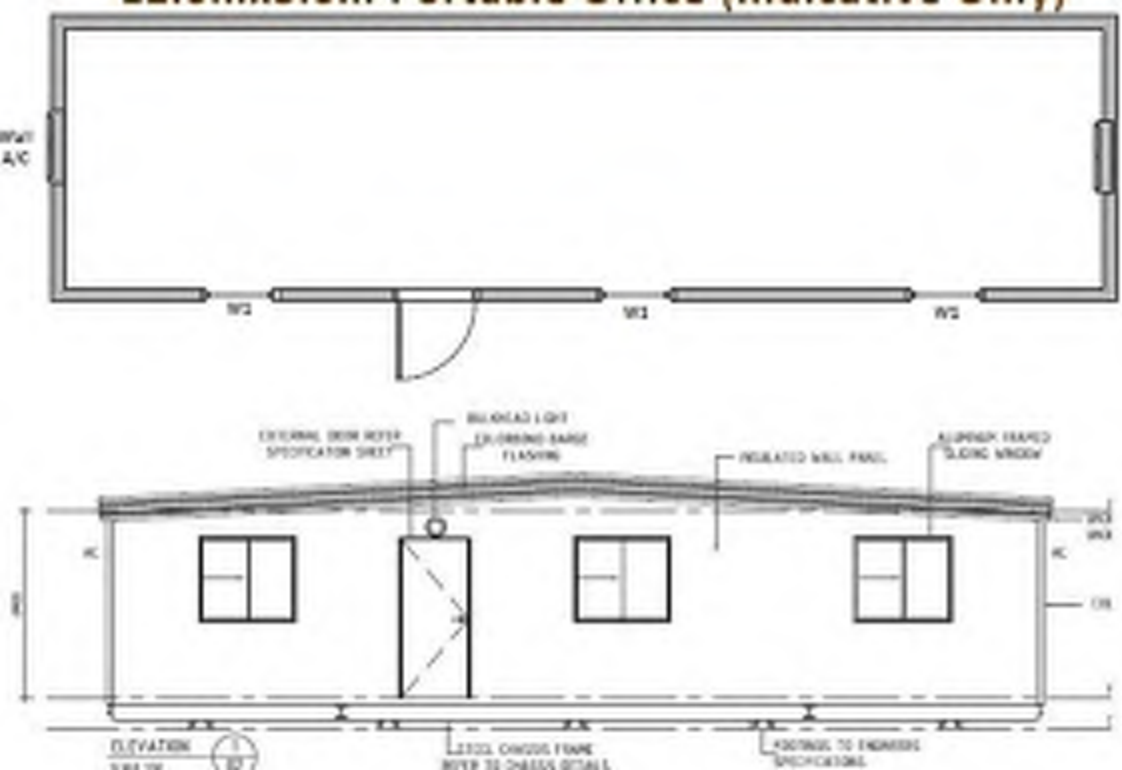
NO.	DESCRIPTION	QTY.
1	GE TM2500+ (GEN8) TURBINES W/ CONTROL ROOM	5
2	100MVA 3PH STEP-UP TRANSFORMER	2
3	40MVA 3PH STEP-UP TRANSFORMER	1
4	MEDIUM VOLTAGE SWITCHYARD AREA W/ REACTORS	5
5	HIGH VOLTAGE SWITCHYARD AREA	3
6	50kVA STANDBY DIESEL GENERATOR	1
7	150kVA AUXILIARY TRANSFORMER	1
8	40' ISO MAIN CONTROL ROOM	2
9	40' ISO STORAGE	5
10	OFFICE (MODULAR/FLAT PAD)	2
11	40' ISO KITCHENETTE	1
12	20' ISO WC	1
13	40' ISO PLANT/ SITE OFFICE	1
14	40' RD-RO-EDI SKID W/ WATER PRE TREAT	2
15	ISO REJECT WATER TANK	1
16	350kL RAW WATER TANK	1
17	350kL PROCESSED WATER TANK	1
18	500kL FIRE WATER TANK	1
19	OILY WATER SEPARATOR W/ SEDIMENTATION POND	1
20	110kL FUEL STORAGE TANK	5

NO.	DESCRIPTION	QTY.
21	20' ISO FUEL PUMP SKIDS	2
22	DFS-3 FILTER SKIDS	2
23	40' ISO STANDBY GENERATOR	2
24	40' ISO 8MVA TRANSFORMER MODULE	1
25	NEUTRAL GROUNDING TRANSFORMER	3
26	MAIN DISTRIBUTION PANEL	4
27	40' ISO FOR UPGRADING CENTRALIZED CONTROL & MONITORING SYSTEM	1
28	STORM WATER POND CAP. 3000m3	2
29	OTSG (FUTURE)	5
30	MEDIUM VOLTAGE SWITCHYARD AREA (FUTURE)	1
31	HIGH VOLTAGE SWITCHYARD AREA (FUTURE)	1
32	STEAM TURBINE GENERATOR (FUTURE)	1
33	STG ELECT. ROOM (FUTURE)	1
34	AUXILIARY BOILER (FUTURE)	1
35	INSTRUMENT AIR SYSTEM (FUTURE)	1
36	DEMINERALIZED WATER SYSTEM (FUTURE)	1
37	WATER TANK (FUTURE)	1
38	COOLING TOWER (FUTURE)	1
39	PUMP SKIDS (FUTURE)	1



PRELIMINARY ONLY
NOT FOR CONSTRUCTION

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\00 General\5053-DWG-G-0002_G_DETAIL LAYOUT.dwg Oct 10, 2019 - 7:47am SZakaria PCCAD-0008







APPENDIX F

EPBC ACT SELF-ASSESSMENT





Snapper Point Power Station
EPBC Act Self-Assessment

Snapper Point Power Station EPBC Act Self-Assessment

25 September 2019

Version 3

Prepared by EBS Ecology for WSP/Nexif

Document Control					
Revision No.	Date issued	Authors	Reviewed by	Date Reviewed	Revision type
1	20/06/19	EBS Ecology	Dr Marina Louter	19/06/2019	Draft
2	13/08/2019	EBS Ecology	Gareth Oerman	13/08/2019	Final
3	25/09/2019	EBS Ecology	Dr Marina Louter	25/09/2019	Final

Distribution of Copies			
Revision No.	Date issued	Media	Issued to
1	20/06/19	Electronic	Bronte Nixon, WSP
2	13/08/2019	Electronic	Bronte Nixon, WSP
3	25/09/2019	Electronic	Bronte Nixon, WSP

EBS Ecology Project Number: E90205

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CITATION: EBS Ecology (2019) Snapper Point Power Station EPBC Act Self-Assessment. Report to WSP/Nexif. EBS Ecology, Adelaide.

Cover photograph: *Tecticornia halocnemoides* (Grey Samphire) / *Tecticornia pergranulata* (Blackseed Samphire) low closed shrubland +/- *Melaleuca halmaturorum* (Swamp Paperbark), *Suaeda australis* (Austral Seablite), *Sarcocornia* sp. (Glasswort) and *Myoporum insulare* (Boobialla) in the Study Area.

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email: info@ebsecology.com.au



GLOSSARY AND ABBREVIATION OF TERMS

AMLR NRM	Adelaide Mount Lofty Ranges Natural Resource Management Region
Aus	Australia
BDBSA	Biological Databases of South Australia
CE	Critically Endangered
DotE	Department of the Environment (changed to DotEE in 2016)
DotEE	Department of the Environment and Energy (2016 to current, prior 2016 DotE)
EBS	EBS Ecology
EN	Endangered
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act, 1999</i>
EPBC Referral	Name of approval process for actions triggering the EPBC Act
Ha	Hectares
Mi	Migratory
MNES	Matters of National Environmental Significance
PMST	Protected Matters Search Tool (EPBC Act, DotEE)
SA	South Australia/South Australian
TEC	Threatened Ecological Community (EPBC Act)
VA	Vegetation associations
VU	Vulnerable listing under the EPBC Act.
WoNS	Weed of National Significance

EXECUTIVE SUMMARY

Nexif Energy propose to install five gas turbines and associated infrastructure (the Project) at Snapper Point Power Station on the Lefevre Peninsula, South Australia (the Study Area). EBS Ecology were sub-contracted by WSP to investigate Matters of National Environmental Significance (MNES), protected under the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* that may be associated with the Study Area. It has been identified during previous surveys that MNES may occur in the Study Area. The objectives of this targeted study included:

- Determine the presence (or suitability of habitat) for nationally threatened species:
 - *Tecticornia flabelliformis* (Bead Samphire) (Aus: VU)
 - *Acanthiza iredalei rosinae* (Slender-billed Thornbill Gulf St Vincent) (Aus: VU);
- Determine presence of nationally Threatened Ecological Community *Subtropical and Temperate Coastal Saltmarsh* (Aus: VU);
- Determine the presence or habitat availability for any other species listed under the EPBC Act;
- Assess potential affected MNES based on the Significant Impact Guidelines (DotEE 2013), against the Significant Impact Criterion for their respective conservation status or migratory rating; and
- Determine if the proposed works would have a significant impact on any MNES based on the Significant Impact Guidelines, and if necessary, prepare an EPBC Referral.

A desktop assessment was conducted to determine the MNES that may occur within the Study Area. The desktop assessment used data derived from the Biological Databases of South Australia (BDBSA) and the Protected Matters Search Tool (PMST). The likelihood of occurrence of each MNES identified from the desktop assessment was deliberated based on habitat availability in the Study Area, date of last record and the conspicuousness of the species.

The field assessment was conducted by two ecologists over a six-hour period on 3 June 2019. The field assessment included a bird survey, targeting Slender-billed Thornbills (St Vincent Gulf), a targeted search for *T. flabelliformis*, and an assessment of the coastal saltmarsh to determine whether it met the diagnostics characteristics of the *Subtropical and Temperate Coastal Saltmarsh* threatened ecological community (TEC). Furthermore, a visual inspection of the habitats within and adjacent to the Study Area was conducted to determine the potential for occurrence of other MNES.

Flora: One nationally threatened flora species; *T. flabelliformis* was determined via the desktop assessment to possibly have suitable habitat within the Study Area. However, no individuals were found following the targeted search during the field assessment. Furthermore, the habitat suitability was assessed as 'not preferable' for the species. Therefore, it is considered unlikely that *T. flabelliformis* is present within the Study Area. The Significant Impact Assessment determined that no threatened flora species would be significantly impacted by the Project and therefore a Referral under the EPBC Act is not recommended.

Fauna: One nationally threatened fauna species; the Curlew Sandpiper (*Calidris ferruginea*) was considered to possibly occur within the Study Area following the desktop and field assessments. The Slender-billed Thornbill (St Vincent Gulf) was considered unlikely to occur in the Study Area due to its failed detection and the absence of suitable habitat in *T. arbuscula* (Shrubby Samphire) shrublands. However, seven nationally threatened fauna species were considered to possibly occur on the tidal mudflat adjacent to the Study Area. No nationally threatened fauna species were observed during the field assessment. The Significant Impact Assessment determined that no threatened fauna species would be significantly impacted by the Project and therefore a Referral under the EPBC Act is not recommended.

Eleven (11) migratory species were considered to potentially occur within the Study Area following the desktop and field assessments, which consisted of nine species of migratory shorebird and two species of migratory aerial passerines. A further 17 species (28 species in total) were considered to possibly occur on the tidal mudflat adjacent to the Study Area. All the migratory species that could occur on the tidal mudflats may fly-over the Study Area. One migratory species; the Caspian Tern (*Hydropogone caspia*) was recorded flying over the Port River adjacent to the Study Area during the field assessment. The Significant Impact Assessment determined that no migratory species would be significantly impacted by the Project and therefore a Referral under the EPBC Act is not recommended.

TEC: The coastal saltmarsh community was recorded in the desktop assessment within the Study Area and during a prior EBS field assessment in 2018. The community was determined to meet all key diagnostic characteristics of the nationally threatened community *Subtropical and Temperate Coastal Saltmarsh* when examined during the field assessment. The patch of saltmarsh was disconnected from natural tidal processes due to the construction of a sea wall. However, the site is influenced by seawater by three processes; (1) seawater spilling from a vent connected to an underground seawater pipe; (2) suspected tidal seepage; and (3) possible storm surge wave action. Therefore, based upon a precautionary principle, the saltmarsh present within the Study Area comprises a nationally Threatened Ecological Community. The Significant Impact Assessment determined that this TEC would be not significantly impacted by the Project and therefore a Referral under the EPBC Act is not recommended.

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1 INTRODUCTION

1.1 Objectives

Nexif Energy propose to install five gas turbines and associated infrastructure (the Project) at Snapper Point Power Station on the Lefevre Peninsula, South Australia (Figure 1, Figure 2). EBS Ecology were sub-contracted by WSP to investigate Matters of National Environmental Significance (MNES), protected under the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* that may be associated with the Study Area. It has been identified during previous surveys that there may be potential MNES associated with the proposed Project. The objectives of this targeted study included:

- Determine the presence (or suitability of habitat) for nationally threatened species:
 - *Tecticornia flabelliformis* (Bead Samphire) (Aus: VU)
 - *Acanthiza iredalei rosinae* (Slender-billed Thornbill Gulf St Vincent) (Aus: VU);
- Determine presence of nationally threatened community *Subtropical and Temperate Coastal Saltmarsh* (Aus: VU);
- Determine the presence or habitat availability for any other species listed under the EPBC Act; and
- Determine if the proposed works would have a significant impact on any MNES based on the Significant Impact Guidelines (DotEE 2013), and if necessary, prepare an EPBC Referral.

1.2 Study Area

The Study Area is located between the Engie power plant at the end of Snapper Point Power Station Road and the Seawall and track adjacent the Port River (Figure 1). The Project layout extends across the foreshore then down an eastern track to join Mersey Road as indicated in Figure 2.

A field assessment was previously conducted over the Study Area in February 2018 which described the flora, vegetation associations and fauna habitat present within the Study Area (EBS Ecology 2018).



Figure 1. Location of the Study Area for proposed Snapper Point Power Station Project.

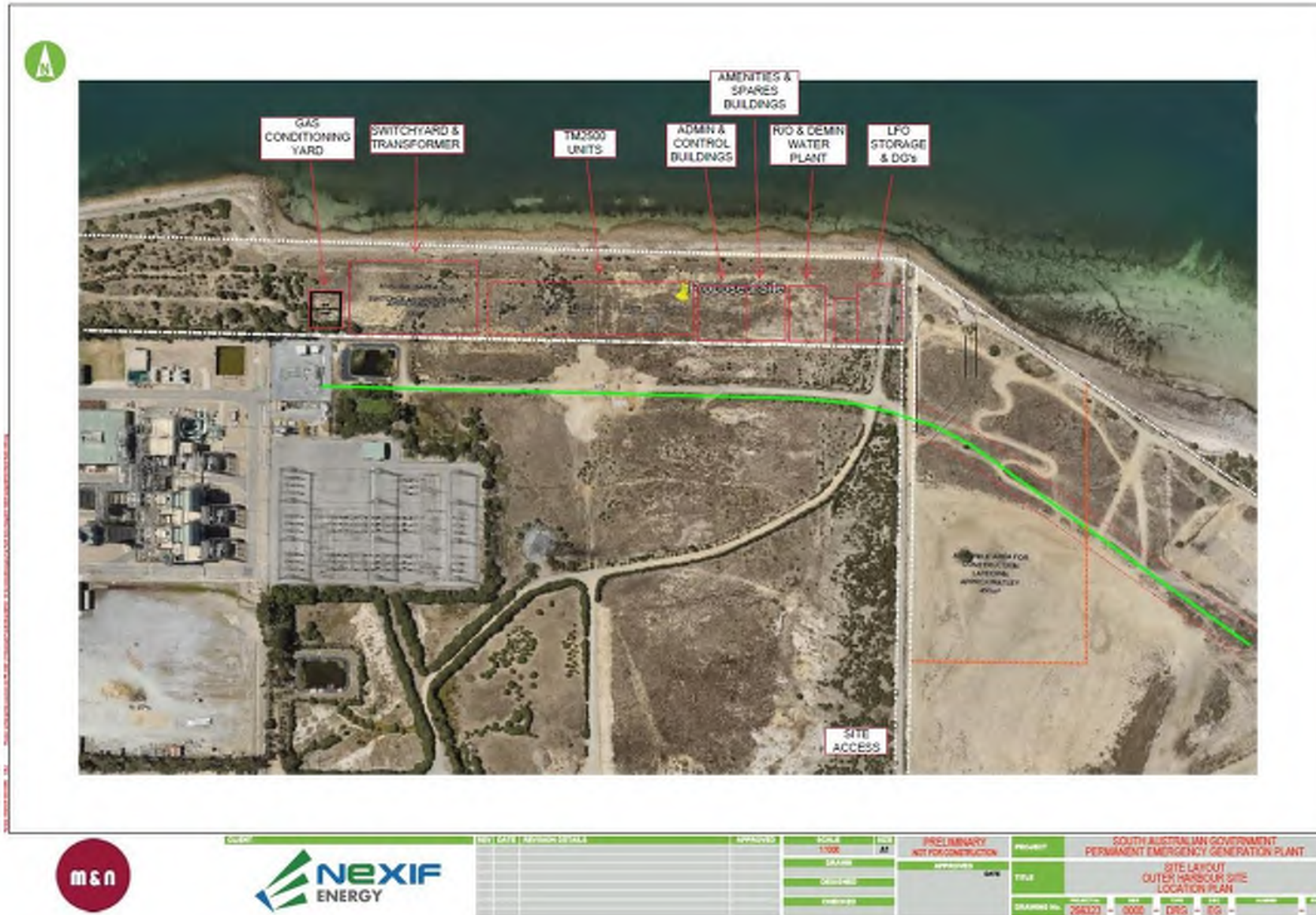


Figure 2. Preliminary design layout for the Project (image provided by Nexif).

2 METHODS

2.1 Desktop Assessment

Database searches using a 5 km buffer from the Study Area were undertaken using the Biological Databases of South Australia (BDBSA) and the Protected Matters Search Tool (PMST) for determining MNES that may occur in the area (DEW 2019; DotEE 2019).

2.2 Field Assessment

The field assessment was conducted by two ecologists over a six-hour period on 3 June 2019.

2.2.1 Bird Survey

Birds were surveyed over four sites (PP1 – PP4) within the Study Area (Figure 3). Site PP1 was surveyed in the morning and afternoon for a total survey duration of 1 hr, while the three other sites were surveyed for a minimum of 30 minutes. During each survey, the observer recorded all birds observed or heard within a 2-ha search area. If birds were observed or heard outside the search area, they were recorded as opportunistic observations. Bird activity (e.g. flying overhead, flying over circling, resting or foraging on tree/shrub/ground), number of individuals and any other notable observations were recorded. In addition, call-playback was used to target Slender-billed Thornbills (St Vincent Gulf) at each site.

2.2.2 *Tecticornia flabelliformis* (Bead Samphire) survey

Transects were walked at 20 m intervals across the two areas of Coastal Saltmarsh (Figure 4), actively searching for *Tecticornia flabelliformis* (Bead Samphire). *T. flabelliformis* is a deciduous samphire and therefore loses its leaves in the colder months. Therefore, leaves may not have been visible at the time of survey. To account for this, a habitat suitability assessment and search for *T. flabelliformis* skeletons (i.e. stalks of the plant) was conducted during the survey.

2.2.3 Coastal Saltmarsh

A coastal saltmarsh community was previously recorded as occurring on site by EBS (2018) (Figure 4), but it was unknown whether this community was subject to tidal influence. If a tidal connection could be determined, then the saltmarsh community would qualify as a Threatened Ecological Community (*Subtropical and Temperate Coastal Saltmarsh*) under the EPBC Act. A tidal connection could be inferred from the presence of culverts, pipelines or seepages or from the potential for wave action and/or storm surges into the Study Area. As such, the extent of the coastal saltmarsh in the Study Area was searched for the presence of a tidal connection (Figure 4).



Figure 3. Location of bird survey sites over the Study Area.



Figure 4. Coastal saltmarsh area searched for *Tecticornia flabelliformis* (Bead Samphire) and the presence of a tidal connection.

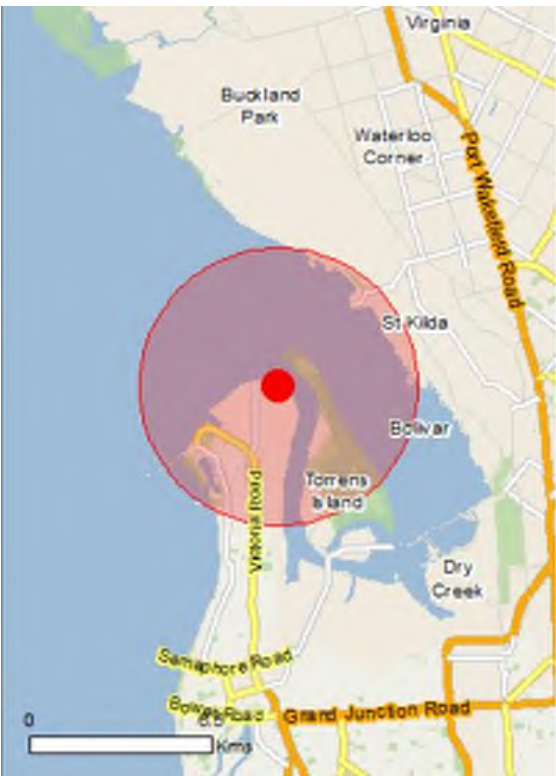
3 RESULTS

3.1 Desktop Assessment

3.1.1 Matters of National Significance

The Protected Matters Search Tool (PMST) identified 40 threatened fauna species and 62 listed migratory species, protected under the EPBC Act that may be relevant to the Study Area (DotEE 2019). Any action that has, will have or is likely to have a significant impact on matters of National environmental significance requires referral under the EPBC Act. Table 1 summarises the results of the EPBC Protected Matters Report and the relevant matters of National environmental significance discussed further below. Marine listed species under the EPBC Act, which are not also listed as threatened or migratory, have been excluded for this desktop assessment as they only trigger the need for an EPBC Referral if they have been significantly impacted within a Commonwealth Marine Area. As Commonwealth Marine Areas commence three nautical miles from shore, marine species are not relevant to the Project. Furthermore, fauna that complete their life cycle in marine habitats, such as sharks and whales, have not been discussed due to their irrelevance to the Project, which is located on terrestrial land.

Table 1. Summary of the results of the Sanderson EPBC Act Protected Matters Search (DotEE 2019).

Search area (5 km buffer)	Matters of National Environment Significance under the EPBC Act 1999	Identified within the search area
 <p>Coordinate: -34.76486, 138.50902</p>	World Heritage Properties	None
	National Heritage Properties	None
	Wetlands of International Significance	None
	Great Barrier Reef Marine Park	None
	Commonwealth Marine Areas	None
	Threatened Ecological Communities	1
	Threatened Species	40
	Migratory Species	62
	Commonwealth Lands	4
	Commonwealth Heritage Places	None
	Listed Marine Species	100
	Whales and other Cetaceans	8
	Critical Habitats	None
	Commonwealth Reserves Terrestrial	None
	Australian Marine Parks	None
	State and Territory Reserves	1
	Regional Forest Agreements	None
	Invasive Species	35
	Nationally Important Wetlands	2
Key Ecological Features (Marine)	None	

3.1.2 Threatened Ecological Communities

One Threatened Ecological Community (TEC) was identified as potentially occurring within the PMST search area (Table 2): *Subtropical and Temperate Coastal Saltmarsh*, rated as Vulnerable under the EPBC Act. A saltmarsh community (VA 2; Figure 5) was recorded during the field assessment and qualified as the TEC (see Section 3.2.3 and Section 4.1.2 for further details).

Table 2. Threatened Ecological Communities potentially occurring within the Study Area (DotEE 2019).

Threatened Ecological Community	Conservation Status	Likelihood of occurrence in the Study Area
	Aus	
Subtropical and Temperate Coastal Saltmarsh	VU	Known

Conservation status

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). Conservation Codes: CE: Critically Endangered. EN: Endangered. VU: Vulnerable.

Source of Information

1. EPBC Act Protected Matters Report (DotEE 2019) – 5 km buffer applied to Survey Area.

3.1.3 Threatened Flora

Four nationally threatened species were recorded in the desktop assessment (Table 3) including three identified in the PMST search and two identified in the 5km BDBSA search. All flora species were considered unlikely to occur within the Study Area. Suitable habitat was recorded for one nationally threatened flora species; *Tecticornia flabelliformis* (Bead Glasswort). However, the species was not recorded during the targeted search for the species, therefore is deemed unlikely to occur (see Section 3.2.2 and Section 4.1.1).

Table 3. Threatened flora species potentially occurring within the Study Area (DEW 2019; DotEE 2019).

Scientific name	Common name	Conservation Status	Source	Last Record (year)	Likelihood of occurrence in the Study Area
		Aus			
<i>Caladenia tensa</i>	Greencomb Spider-orchid	EN	1		Unlikely
<i>Euphrasia collina</i> ssp. <i>osbornii</i>	Osborn's Eyebright	EN	2	1943	Unlikely
<i>Prasophyllum validum</i>	Sturdy Leek-orchid	VU	1		Unlikely
<i>Tecticornia flabelliformis</i>	Bead Glasswort	VU	1, 2	2001	Unlikely

Conservation status

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Ma: listed as marine under the EPBC Act.

Source of Information

1. EPBC Act Protected Matters Report (DotEE 2019) – 5 km buffer applied to Survey Area.
2. Biological Database of South Australia data extract (DEW 2019) - 5 km buffer applied to Survey Area.

3.1.4 Threatened Fauna

Twenty-seven (27) threatened fauna species excluding sharks, whales, turtles and sea-lions were identified within the PMST search area (Table 4). There were no additional nationally threatened species identified by the BDBSA search. Following the field assessment, one nationally threatened fauna species; the Curlew Sandpiper (*Calidris ferruginea*) was considered to possibly occur within the Study Area. However, seven nationally threatened fauna species were considered to possibly occur on the tidal mudflat adjacent to the Study Area.

3.1.5 Migratory Fauna

Sixty-four (64) migratory fauna species, excluding sharks, whales and turtles were identified by the PMST and BDBSA search (Table 4). The PMST identified 52 migratory fauna species, while the BDBSA search identified an additional 12 migratory fauna species. Following the field assessment, nine species of migratory shorebird and two species of migratory aerial passerines were the only species identified to use the Study Area. However, a further 17 species (28 species in total) were considered to possibly occur on the tidal mudflat adjacent to the Study Area. All the migratory species that could occur on the tidal mudflats may fly-over the Study Area.

Table 4. Threatened and migratory fauna species potentially occurring within the Study Area (DEW 2019; DotEE 2019).

Scientific name	Common name	Conservation status	Source	Last Record (year)	Likelihood of occurrence	
		Aus			Study Area	Coast
AVES	BIRDS					
<i>Acanthiza iredalei rosinae</i>	Slender-billed Thornbill (Gulf St Vincent)	VU	1	2014	Unlikely	Unlikely
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi	1, 2	2005	Possible	Possible
<i>Apus pacificus</i>	Fork-tailed Swift	Mi	1, 2	1995	Possible (Aerial)	Possible
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	Mi	1, 2		Unlikely	Unlikely
<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	Mi	2	1998	Unlikely	Unlikely
<i>Arenaria interpres</i>	Ruddy Turnstone	Mi	1, 2	2003	Unlikely	Possible
<i>Botaurus poiciloptilus</i>	Australian Bittern	EN	1, 2	1996	Unlikely	Unlikely
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Mi	1, 2	2014	Possible	Possible
<i>Calidris alba</i>	Sanderling	Mi	1, 2	2003	Unlikely	Possible
<i>Calidris canutus</i>	Red Knot	EN, Mi	1, 2	1996	Unlikely	Possible
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR, Mi	1, 2	2005	Possible	Possible
<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi	1, 2	2015	Possible	Possible
<i>Calidris ruficollis</i>	Red-necked Stint	Mi	1, 2	2014	Possible	Likely

Snapper Point Power Station EPBC Act Self-Assessment

Scientific name	Common name	Conservation status	Source	Last Record (year)	Likelihood of occurrence	
		Aus			Study Area	Coast
<i>Calidris subminuta</i>	Long-toed Stint	Mi	1, 2	2006	Unlikely	Unlikely
<i>Calidris tenuirostris</i>	Great Knot	CE, Mi	1, 2	1996	Unlikely	Possible
<i>Charadrius bicinctus</i>	Double-banded Plover	Mi	1, 2	1997	Unlikely	Possible
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU, Mi	1, 2	1988	Unlikely	Unlikely
<i>Charadrius mongolus</i>	Lesser Sand Plover	EN, Mi	1, 2	1999	Unlikely	Possible
<i>Charadrius veredus</i>	Oriental Plover	Mi	1		Unlikely	Unlikely
<i>Chlidonias leucopterus</i>	White-winged Tern	Mi	2	2000	Unlikely	Possible
<i>Daption capense</i>	Cape Petrel	Mi	2	1984	Unlikely	Unlikely
<i>Diomedea antipodensis</i>	Antipodean Albatross	VU, Mi	1		Unlikely	Unlikely
<i>Diomedea epomophora</i>	Southern Royal Albatross	VU, Mi	1		Unlikely	Unlikely
<i>Diomedea exulans</i>	Wandering Albatross	VU, Mi	1		Unlikely	Unlikely
<i>Diomedea sanfordi</i>	Northern Royal Albatross	EN, Mi	1		Unlikely	Unlikely
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi	1		Unlikely	Unlikely
<i>Gallinago megala</i>	Swinhoe's Snipe	Mi	1		Unlikely	Unlikely
<i>Gallinago stenura</i>	Pin-tailed Snipe	Mi	1		Unlikely	Unlikely
<i>Grantiella picta</i>	Painted Honeyeater	VU	1		Unlikely	Unlikely
<i>Hirundapus caudacutus</i>	White-throated Needletail	Mi	2	1995	Possible	Possible
<i>Hydroprogne caspia</i>	Caspian Tern	Mi	2	2005	Unlikely	Observed
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	Mi	1,2,3	2019	Unlikely	Possible
<i>Limosa haemastica</i>	Hudsonian Godwit	Mi	2	2003	Unlikely	Unlikely
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	VU, Mi	1, 2	2005	Unlikely	Possible
<i>Limosa lapponica menzbieri</i>	Bar-tailed Godwit	CE, Mi	1, 2		Unlikely	Unlikely
<i>Limosa limosa</i>	Black-tailed Godwit	Mi	1, 2	2005	Unlikely	Possible
<i>Macronectes giganteus</i>	Southern Giant Petrel	EN, Mi	1, 2	1983	Unlikely	Unlikely
<i>Macronectes halli</i>	Northern Giant Petrel	VU, Mi	1		Unlikely	Unlikely
<i>Motacilla cinerea</i>	Grey Wagtail	Mi	1		Unlikely	Unlikely

Snapper Point Power Station EPBC Act Self-Assessment

Scientific name	Common name	Conservation status	Source	Last Record (year)	Likelihood of occurrence	
		Aus			Study Area	Coast
<i>Motacilla flava</i>	Yellow Wagtail	Mi	1		Unlikely	Unlikely
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi	1		Unlikely	Unlikely
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	CE	1		Unlikely	Unlikely
<i>Numenius madagascariensis</i>	Far Eastern Curlew	CR, Mi	1, 2	2006	Unlikely	Possible
<i>Numenius minutus</i>	Little Curlew	Mi	1, 2	1995	Unlikely	Unlikely
<i>Numenius phaeopus</i>	Whimbrel	Mi	1, 2	2006	Unlikely	Possible
<i>Oceanites oceanicus</i>	Wilson's Storm Petrel	Mi	2	1968	Unlikely	Unlikely
<i>Pachyptila turtur subantarctica</i>	Fairy Prion	VU	1		Unlikely	Unlikely
<i>Pandion haliaetus</i>	Osprey	Mi	1, 2	2000	Unlikely	Unlikely
<i>Pedionomus torquatus</i>	Plains-wanderer	CE	1		Unlikely	Unlikely
<i>Pezoporus occidentalis</i>	Night Parrot	EN	1		Unlikely	Unlikely
<i>Phalaropus lobatus</i>	Red-necked Phalarope	Mi	1, 2	2001	Unlikely	Unlikely
<i>Philomachus pugnax</i>	Ruff (Reeve)	Mi	1	1998	Unlikely	Unlikely
<i>Pluvialis fulva</i>	Pacific Golden Plover	Mi	1, 2	2005	Possible	Possible
<i>Pluvialis squatarola</i>	Grey Plover	Mi	1, 2	2005	Unlikely	Possible
<i>Pterodroma lessonii</i>	White-headed Petrel	Mi	2	1969	Unlikely	Unlikely
<i>Stercorarius parasiticus</i>	Parasitic Jaeger (Arctic Jaeger)	Mi		2001	Unlikely	Possible
<i>Sterna hirundo</i>	Common Tern	Mi	2	1984	Unlikely	Unlikely
<i>Sterna paradisaea</i>	Arctic Tern	Mi	2	2000	Unlikely	Unlikely
<i>Sternula albifrons</i>	Little Tern	Mi	1		Unlikely	Unlikely
<i>Sternula nereis</i>	Fairy Tern	VU	2	2012	Unlikely	Possible
<i>Thalassarche cauta cauta</i>	Shy Albatross	VU, Mi	1, 2		Unlikely	Unlikely
<i>Thalassarche cauta steadi</i>	White-capped Albatross	VU, Mi	1		Unlikely	Unlikely
<i>Thalassarche chlororhynchos</i>	Atlantic Yellow-nosed Albatross	Mi		1994	Unlikely	Unlikely
<i>Thalassarche impavida</i>	Campbell Albatross	VU, Mi	1		Unlikely	Unlikely

Scientific name	Common name	Conservation status	Source	Last Record (year)	Likelihood of occurrence	
		Aus			Study Area	Coast
<i>Thalassarche melanophris</i>	Black-browed Albatross	VU, Mi	1		Unlikely	Unlikely
<i>Thalasseus bergii</i>	Crested Tern	Mi	1, 2	2005	Unlikely	Highly Likely
<i>Thinornis rubricollis rubricollis</i>	Hooded Plover (eastern)	VU	1		Unlikely	Unlikely
<i>Tringa brevipes</i>	Grey-tailed Tattler	Mi	1		Unlikely	Possible
<i>Tringa glaerola</i>	Wood Sandpiper	Mi	1, 2	2005	Possible	Unlikely
<i>Tringa nebularia</i>	Common Greenshank	Mi	1, 2	2015	Possible	Possible
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Mi	1, 2	2005	Possible	Possible
<i>Tringa tetanus</i>	Common Redshank	Mi	1		Unlikely	Unlikely
<i>Xenus cinereus</i>	Terek Sandpiper	Mi	1	2005	Unlikely	Unlikely
MAMMALIA	MAMMALS					
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	1		Unlikely	Unlikely

Conservation status

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Ma: listed as marine under the EPBC Act.

Source of Information

1. EPBC Act Protected Matters Report (DotE 2019) - 5 km buffer applied to Survey Area.
2. Biological Database of South Australia data extract (DEW 2019) - 5 km buffer applied to Survey Area.
3. The Birder Winter 2019 No. 250 (Birds SA 2019).

3.2 Field Assessment

3.2.1 Vegetation Associations

Four Vegetation Associations (VA) were recorded over the Study Area (Table 5) across 6.57 hectares (ha) with a flora list provided in Appendix 1. The dominant vegetation associations over the Study Area were VA 2 and VA 4, which covered 2.16 ha and 2.22 ha, respectively. VA 1 and VA 3 were less widely spread covering 1.60 ha and 0.59 ha, respectively. A map illustrating the location and extent of each vegetation association is provided in Figure 5.

Table 5. Vegetation associations recorded over the Study Area.

ID	Vegetation Association	Area (ha)
1	<i>Melaleuca halmaturorum</i> (Swamp Paperbark) / <i>Melaleuca lanceolata</i> (Dryland Tea-tree) planted woodland +/- native <i>Carpobrotus rossii</i> (Native Pigface), <i>Suaeda australis</i> (Austral Seablite)	1.60
2	<i>Tecticornia halocnemoides</i> (Grey Samphire) / <i>Tecticornia pergranulata</i> (Blackseed Samphire) low closed shrubland +/- <i>Melaleuca halmaturorum</i> (Swamp Paperbark), <i>Suaeda australis</i> (Austral Seablite), <i>Sarcocornia</i> sp. (Glasswort), <i>Myoporum insulare</i> (Boobialla)	2.16
3	<i>Maireana brevifolia</i> (Small-leaf Bluebush) / <i>Nitraria billardiarei</i> (Nitre Bush) low very open shrubland	0.59
4	<i>Dianella brevicaulis</i> (Short-stem Flax-lily) / <i>Ficinia nodosa</i> (Knobby Club-rush) low very open shrubland	2.22
Total		6.57

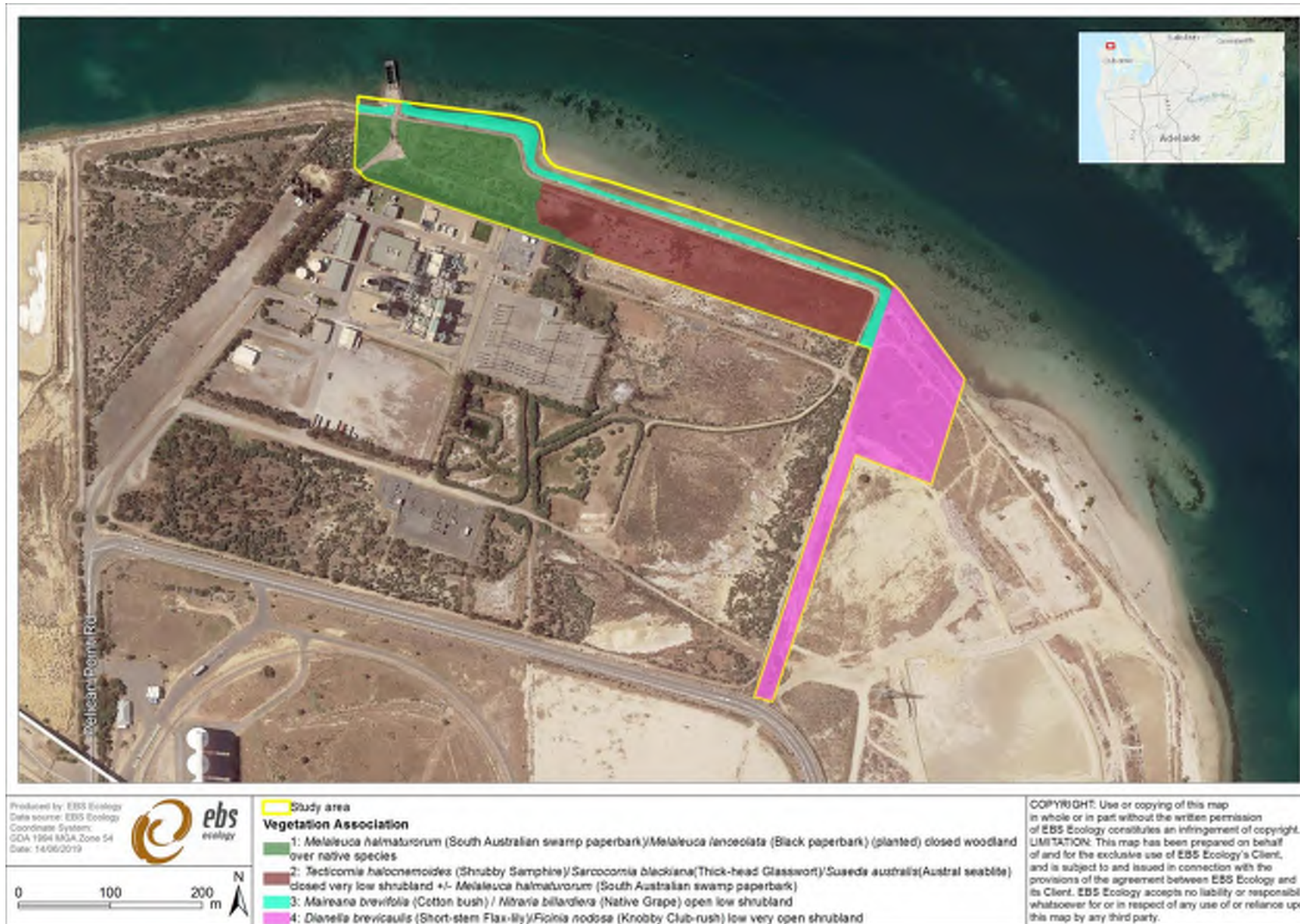


Figure 5. Vegetation Associations mapped over the Study Area.

Vegetation Association 1

The overstorey species in VA 1 were planted *Melaleuca halmaturorum* (Swamp Paperbark) and *Melaleuca lanceolata* (Dryland Tea-teatree) (Table 6; Figure 6). The understorey stratum was dominated by native *Carpobrotus rossii* (Native Pigface) and *Suaeda australis* (Austral Seablite), while *Sarcocornia quinqueflora* (Beaded Samphire) occurred in drainage channels with *S. australis*. Overall, 25 native flora species were recorded during the current field assessment and the assessment conducted by EBS in 2018. Ten of the 25 native flora species were remnant (naturally growing), while the remaining 15 species were planted. Five exotic flora species were also recorded in VA 1. No MNES occur or have suitable habitat within VA 1.

Table 6. Summary of the attributes of Vegetation Association 1.

Attribute	Description	
Vegetation	<i>Melaleuca halmaturorum</i> (Swamp Paperbark) / <i>Melaleuca lanceolata</i> (Dryland Tea-teatree) planted woodland +/- native <i>Carpobrotus rossii</i> (Native Pigface), <i>Suaeda australis</i> (Austral Seablite). Few weeds include * <i>Asphodelus fistulosus</i> (Onion Weed) and * <i>Avena barbata</i> (Wild Oats)	
Other features	Planted overstorey, native understorey scattered throughout. <i>Sarcocornia quinqueflora</i> (Beaded Samphire) and <i>Suaeda australis</i> (Austral Seablite) in drainage lines. The species composition of the revegetation is suitable for a coastal shrubland community and provides habitat for common bird species.	
Species diversity	25 native species (at least 10 remnant species)	Five exotic species
Coastal saltmarsh	Not present	
Slender-billed Thornbill	Not present / not suitable	
<i>Tecticornia flabelliformis</i>	Not present / not suitable	
Other MNES	The migratory Fork-tailed Swift (<i>Apus pacificus</i>) and White-throated Needletail (<i>Hirundapus caudacutus</i>) may occur aerially over VA 1.	



Figure 6. A representative photo of Vegetation Association 1.

Vegetation Association 2

Vegetation Association 2 was a coastal saltmarsh community dominated by *Tecticornia halocnemoides* (Grey Samphire) and *Tecticornia pergranulata* (Black-seed Samphire), while scattered *Melaleuca halmaturorum* (Swamp Paperbark) and *Myoporum insulare* (Boobialla) were the most common mid- and over-storey species (Table 7). Overall, 17 native and six exotic flora species were recorded in VA 2.

The coastal saltmarsh (VA 2) was dry during the current assessment, however, appeared to receive seawater from seepages through the levee bank on the northern edge of the extent of VA 2. Furthermore, VA 2 may receive seawater during storm surges. Freshwater is expected to pool in VA 2 following heavy rainfall and it was noted that the shrubland was waterlogged during the 2018 survey. If extensive water pooling occurs within the VA2 area then the area may be suitable for migratory shorebirds, including the Curlew Sandpiper (*Calidris ferruginea*) (Aus: CE) to forage. The migratory Fork-tailed Swift (*Apus pacificus*) and White-throated Needletail (*Hirundapus caudacutus*) may occur aerially over VA 2.

Table 7. Summary of the attributes of Vegetation Association 2.

Attribute	Description
Vegetation	<i>Tecticornia halocnemoides</i> (Grey Samphire) / <i>Tecticornia pergranulata</i> (Black-seed Samphire) low closed shrubland +/- <i>Sarcocornia</i> sp. (Glasswort) and <i>Melaleuca halmaturorum</i> (Swamp Paperbark), <i>Suaeda australis</i> (Austral Seablite) on edges and particularly at eastern end of site.
Other features	VA 2 occurred in a basin that was predominantly dry during the current field assessment but was largely waterlogged during the 2018 survey. However, tidal seepage appeared to occur on the northern edge of the basin. Wave activity resulting in the reception of seawater into VA 2 may occur during storm surges.
Species diversity	17 native species. Six exotic species.
Coastal saltmarsh	Present.
Slender-billed Thornbill	Not present / not suitable.
<i>Tecticornia flabelliformis</i>	Not present / not suitable.
Other MNES	Potential occurrence of migratory shorebirds following excessive water pooling, including the Curlew Sandpiper (<i>Calidris ferruginea</i>) (Aus: CE). The migratory Fork-tailed Swift (<i>Apus pacificus</i>) and White-throated Needletail (<i>Hirundapus caudacutus</i>) may occur aerially over VA 2.



Figure 7. A representative photo of Vegetation Association 2.

Vegetation Association 3

Vegetation Association 3 was comprised of chenopod shrubland community dominated by *Maireana brevifolia* (Short-leaf Bluebush) and *Nitraria billardiera* (Nitre Bush), while the sedge *Ficinia nodosa* (Knobby Club Rush) and *Atriplex paludosa* (Marsh Saltbush) were subdominant species (Table 8; Figure 8). The vegetation association had been degraded from creation of a vehicle track, which had disturbed the soil and provided favourable conditions for weeds that included *Asphodelus fistulosus* (Onion Weed), *Limonium companyonis* (Sea-lavender), *Galenia pubescens* var. *pubescens* (Coastal Galenia), *Avena barbata* (Wild Oats). A total of 38 flora species were recorded in VA 3, which included 18 native and 20 exotic species. The migratory Fork-tailed Swift (*Apus pacificus*) and White-throated Needletail (*Hirundapus caudacutus*) may occur aurally over VA 3.

Table 8. Summary of the attributes of Vegetation Association 3.

Attribute	Description
Vegetation	<i>Maireana brevifolia</i> (Short-leaf Bluebush) / <i>Nitraria billardiera</i> (Nitre Bush) open low shrubland +/- <i>Ficinia nodosa</i> (Knobby Club Rush) / <i>Atriplex paludosa</i> (Marsh Saltbush). Dominant weeds species were: <i>Asphodelus fistulosus</i> (Onion Weed), <i>Limonium companyonis</i> (Sea-lavender), <i>Galenia pubescens</i> var. <i>pubescens</i> (Coastal Galenia), <i>Avena barbata</i> (Wild Oats).
Other features	May support roosting of waterbird species at high tide, such as Australian White Ibis (<i>Threskiornis moluccus</i>) and White-faced Heron (<i>Egretta novaehollandiae</i>).
Species diversity	18 native species
	20 exotic species
Coastal saltmarsh	Not present
Slender-billed Thornbill	Not present / not suitable
<i>Tecticornia flabelliformis</i>	Not present / not suitable
Other MNES	The migratory Fork-tailed Swift (<i>Apus pacificus</i>) and White-throated Needletail (<i>Hirundapus caudacutus</i>) may occur aurally over VA 3.



Figure 8. A representative photo of Vegetation Association 3.

Vegetation Association 4

Vegetation Association 4 was highly degraded and comprised predominantly of weed species with only scattered native flora species remaining (Table 9; Figure 9). The most common native species were *Dianella brevicaulis* (Short-stem Flax-lily) and *Ficinia nodosa* (Knobby Club-rush), while *Enchylaena tomentosa* (Ruby Saltbush), *Atriplex semibaccata* (Creeping Saltbush), *Atriplex paludosa* (Swamp Saltbush) and *Acacia ligulata* (Umbrella Wattle) were scattered throughout. The dominant weed species in VA 4 were **Cynara cardunculus* ssp. *flavescens* (Artichoke Thistle), **Gomphocephala cancellatus* (Cotton Bush), **Lycium ferocissimum* (African Boxthorn), **Limonium companyonis* (Sea-lavender), **Galenia pubescens* var. *pubescens* (Coastal Galenia) and **Avena barbata* (Wild Oats). *Lycium ferocissimum* is listed as a Weed of National Significance (WoNS) under the EPBC Act. The migratory Fork-tailed Swift (*Apus pacificus*) and White-throated Needletail (*Hirundapus caudacutus*) may occur aerially over VA 4.

Table 9. Summary of the attributes of Vegetation Association 4.

Attribute	Description	
Vegetation	<i>Dianella brevicaulis</i> (Short-stem Flax-lily)/ <i>Ficinia nodosa</i> (Knobby Club-rush) low very open shrubland dominated by weeds. Scattered <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Atriplex semibaccata</i> (Creeping Saltbush), <i>Atriplex paludosa</i> (Swamp Saltbush) and <i>Acacia ligulata</i> (Umbrella Wattle). Dominant weeds * <i>Cynara cardunculus</i> ssp. <i>flavescens</i> (Artichoke Thistle), * <i>Gomphocephala cancellatus</i> (Cotton Bush), * <i>Lycium ferocissimum</i> (African Boxthorn) (WoNS), * <i>Limonium companyonis</i> (Sea-lavender), * <i>Galenia pubescens</i> var. <i>pubescens</i> (Coastal Galenia) and * <i>Avena barbata</i> (Wild Oats).	
Features/value	Highly degraded vegetation east of fence line and down the fence line to Mersey Road. The extent of VA 4 surpasses the eastern edge of the Study Area.	
Species diversity	Ten native species	15 exotic species
Coastal saltmarsh	Not present	
Slender-billed Thornbill	Not present / not suitable	
<i>Tecticornia flabelliformis</i>	Not present / not suitable	
Other MNES	The migratory Fork-tailed Swift (<i>Apus pacificus</i>) and White-throated Needletail (<i>Hirundapus caudacutus</i>) may occur aerially over VA 4.	



Figure 9. A representative photo of Vegetation Association 4.

3.2.2 Threatened Flora

There were no flora species threatened at National or State level observed during the current (2019) field assessment or during assessments conducted by EBS in 2018. A targeted search was conducted for the nationally threatened; *Tecticornia flabelliformis* (Bead Samphire), but no individuals were recorded.

Flora species threatened at the regional level (Adelaide and Mount Lofty Ranges) were recorded within the saltmarsh community (VA 2).

3.2.3 Subtropical and Temperate Coastal Saltmarsh

The coastal saltmarsh community (VA 2) found in the Study Area was determined to represent Subtropical and Temperate Coastal Saltmarsh TEC, listed as Vulnerable under the EPBC Act (Figure 11). VA 2 satisfied all the key diagnostic characteristics for the TEC (Table 10) and did not meet any of the exclusion criteria (Table 11). One of the key diagnostic characteristics for listing is some form of tidal connection. Although not directly connected to the Port River (ocean) the site is influenced by seawater to some degree by three processes:

1. seawater spilling from a vent connected to an underground seawater pipe (Figure 10);
2. suspected tidal seepage (Figure 12); and
3. possible storm surge wave action (Figure 13).

Further discussion is provided in Section 4.1.2.

Table 10. Vegetation Association 2 assessed against the key diagnostic characteristics of the Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community.

ID	Key Diagnostic Characteristics	Result	Rationale
1	Occurs south of 23° 37' S latitude - from the central Mackay coast on the east coast of Australia, southerly around to Shark Bay on the west coast of Australia (26° latitude), and including the Tasmanian coast and islands within the above range	Yes	The location of the Study Area falls within the latitude limits (Figure 1).
2	Occurs on the coastal margin, along estuaries and coastal embankments and on low wave energy coast	Yes	The location of the Study Area falls along the coastal margin on a low wave energy coast (Figure 1).
3	Occurs on places with at least some tidal connection, including rarely-inundated supratidal areas, intermittently opened or closed lagoons, and groundwater tidal influences, but not areas receiving only aerosol spray. Also includes culverts and artificial connections.	Yes	The patch has been disconnected from natural tidal processes due to the construction of a sea wall. However, the site is subject to seawater influence through (1) seawater spilling from a vent connected to an underground seawater pipe, (2) suspected tidal seepage and (3) possible storm surge wave action.
4	Occurs on sandy or muddy substrate and may include coastal clay pans (and the like)	Yes	The community occurs in a muddy basin.
5	Consists of dense to patchy areas of characteristic coastal saltmarsh plant species (i.e. salt tolerant herbs, succulent shrubs or grasses, that may also include bare sediment as part of the mosaic).	Yes	Characteristic saltmarsh species were dominant in the community, i.e. <i>Tecticornia halcnemoides</i> (Grey Samphire) and <i>Tecticornia pergranulata</i> (Black Seed Samphire) (Figure 11).
6	Proportional cover by tree canopy such as mangroves, Melaleucas or Casuarinas is not greater	Yes	Scattered <i>M. halmaturorum</i> was present on saltmarsh edges but comprised <5% of the total cover.

ID	Key Diagnostic Characteristics	Result	Rationale
	than 50%, nor is proportional ground cover by seagrass greater than 50%		

Table 11. Vegetation Association 2 assessed against the exclusion criteria for a coastal saltmarsh to qualify as the Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community.

ID	Exclusion Criteria	Result	Rationale
1	saltmarsh occurring in seepage zones on sea cliffs and elevated rock platforms above the tidal limit and on elevated headlands subject only to aerosol spray.	No	The community occurs in a basin and therefore is not elevated above the tidal limit.
2	saltmarsh occurring on inland saline soils with no tidal connection.	No	The community is present on the coastline rather than inland.
3	isolated patches of saltmarsh < 0.1 ha.	No	The patch is 2.16 ha.
4	patches or areas of saltmarsh that contain > 50% weeds (i.e. patches must be dominated by native saltmarsh plant species to be the ecological community)	No	Weeds represent less than 50% of the plants present.
5	Patches of saltmarsh (possibly senescent) within the coastal margin that are disconnected (either naturally or artificially) from a tidal regime but were once connected. However, should the patch be reconnected to the tidal regime (e.g. via removal of an artificial barrier, or constructing a pipeline under a roadway), then the patch can become part of the ecological community (i.e. if it meets other key diagnostics and condition thresholds).	No	The patch has been disconnected from natural tidal processes due to the construction of a sea wall. However, a tidal influence through seepage occurs (see Figure 12) and potential wave activity during storm surges is expected (see Figure 13).



Figure 10. Seawater spilling from a vent connected to an underground seawater pipe. Water runs east along a drainage line into the Coastal Saltmarsh.



Figure 11. Coastal Saltmarsh indicating typical salt-tolerant species and trees restricted to edges of swamp.



Figure 12. Evidence of tidal seepage to coastal saltmarsh (Port River behind Seawall).



Figure 13. Evidence of storm surges potentially overflowing to coastal saltmarsh.

3.2.4 Fauna

Thirteen (13) terrestrial bird species were recorded over the four survey sites and opportunistically over the Study Area (Table 12). The 13 bird species were comprised of ten native and three introduced species. The most widespread species was the Singing Honeyeater (*Gavicalis virescens*), which was recorded at all four sites, whilst the Willie Wagtail (*Rhipidura leucophrys*) and Magpielark (*Grallina cyanoleuca*) were recorded at two sites.

Nine waterbird species were recorded on the coastline adjacent to the Study Area (Table 13). Two species of conservation significance at National and State level were recorded. One Caspian Tern (*Hydroprogne caspia*), listed as Migratory under the EPBC Act, was recorded flying adjacent to the Study Area. In addition to this, one Sooty Oystercatcher (*Haematopus fuliginosus*), listed as Rare under the NPW Act, was observed foraging on the mudflat at low tide.

Table 12. Terrestrial bird species observed at point count sites and opportunistically over the Study Area.

Common Name	Scientific Name	Conservation Status						
		Aus	SA	PP1	PP2	PP3	PP4	OPP
Australian Hobby	<i>Falco longipennis</i>			1				
Common Blackbird*	<i>Turdus merula</i> *					1		
Common Starling*	<i>Sturnus vulgaris</i> *						5	
Crested Pigeon	<i>Ocyphaps lophotes</i>							✓
Grey Shrike-thrush	<i>Colluricincla harmonica</i>					1		
Magpielark	<i>Grallina cyanoleuca</i>					1	2	
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>							✓
Singing Honeyeater	<i>Gavicalis virescens</i>			1	1	1	3	
Spotted Dove*	<i>Spilopelia chinensis</i> *						1	
Whistling Kite	<i>Haliastur sphenurus</i>			1				
White-faced Heron	<i>Egretta novaehollandiae</i>						2	
White-fronted Chat	<i>Epthianura albifrons</i>						1	
Willie Wagtail	<i>Rhipidura leucophrys</i>			2		1		

*: Introduced species

Conservation status

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). **SA:** South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Ma: listed as marine under the EPBC Act.

Table 13. Waterbird species opportunistically observed on the water's edge and flying over the Study Area.

Common Name	Scientific Name	Conservation Status	
		Aus	SA
Australian Pelican	<i>Pelecanus conspicillatus</i>		
Australian White Ibis	<i>Threskiornis molucca</i>		
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>		
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>		
Pied Cormorant	<i>Phalacrocorax varius</i>		
Silver Gull	<i>Chroicocephalus novaehollandiae</i>		
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>		R
White-faced Heron	<i>Egretta novaehollandiae</i>		
Caspian Tern	<i>Hydroprogne caspia</i>	Mi	

Conservation status

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Ma: listed as marine under the EPBC Act.

4 SIGNIFICANT IMPACT ASSESSMENT

Under the EPBC Act an action will require approval from the minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance (DotEE 2013). MNES are those species or communities listed under the EPBC Act. A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts (DotEE 2013).

An action requires approval if the action has, will have, or is likely to have a significant impact on a species listed as extinct in the wild, Critically Endangered, Endangered or Vulnerable. An action also requires approval if the action has, will have, or is likely to have a significant impact on an ecological community listed as critically endangered or endangered.

A summary of EPBC assessment outcomes is provided in Table 14, whilst individual assessments against significant impact criteria (DotEE 2013) are provided in Sections 4.1 to Section 4.1.2.

Table 14 Summary of impact on matters of National Environmental Significance (MNES), based on Significant Impact Guidelines (DotEE 2013).

Criteria	<i>Tecticornia flabelliformis</i>	Subtropical and Temperate Coastal Saltmarsh	Slender-billed Thornbill (Gulf St-Vincent)	Threatened Migratory Shorebirds	Fairy Tern	Migratory Shorebirds	Migratory terns	Migratory Aerial Passerines	Arctic Jaegar
Are there any matters of national environmental significance located in the area of the proposed action?	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.
Is it possible that MNES occurs at the site following desktop assessment and general (broad site) visit?	Possible. Nearby records and suitable flora community present in the Study Area.	Likely. Coastal saltmarsh occurs within the Study Area (EBS 2018).	Possible. Recent records on Torrens Island. Saltmarsh habitat available in the Study Area.	Possible. Curlew Sandpipers may occur within the saltmarsh of the Study Area after water pooling. Likely. Six threatened migratory shorebird species may use the tidal mudflat adjacent to the Study Area.	Possible. May use the tidal mudflat adjacent to the Study Area. Numerous records on Torrens Island.	Possible. Nine migratory shorebird species may occur within the Study Area after water pooling. Likely. Twenty-one (21) migratory shorebird species may use the tidal mudflat adjacent to the Study Area.	Possible. May use the tidal mudflat adjacent to the Study Area.	Possible. May occur above the Study Area and forage aerially.	Possible. May use the tidal mudflat adjacent to the Study Area. However, very few records of the species exist in the St Vincent Gulf, though habitat adjacent to the Study Area is suitable for the species.
Is the potential MNES applicable to the site following targeted survey?	Unlikely. Plant not located after targeted search.	Likely. It appears there is some tidal connection through seepage, high storm surges and underground seawater pipe	Unlikely. No birds observed on site. Site is dominated by lower samphire species <i>T. halocnemoides</i> and <i>T. pergranulata</i> rather than taller species <i>T. arbuscula</i> , which comprises suitable habitat	Possible. Curlew Sandpipers may occur within the saltmarsh of the Study Area after water pooling. Likely. Six threatened migratory shorebird species may use the tidal mudflat adjacent to the Study Area.	Possible. May use the tidal mudflat adjacent to the Study Area.	Possible. Nine migratory shorebird species may occur within the Study Area after water pooling. Likely. Twenty-one (21) migratory shorebird species may use the tidal mudflat adjacent to the Study Area.	Possible. May use the tidal mudflat adjacent to the Study Area.	Possible. May occur above the Study Area and forage aerially.	Possible. May use the tidal mudflat adjacent to the Study Area. However, very few records of the species exist in the St Vincent Gulf, though habitat adjacent to the Study Area is suitable for the species.
Considering the proposed action at its broadest scope (that is, considering all stages and components of the action, and all related activities and infrastructure), is there potential for impacts, including indirect impacts, on MNES?	Unlikely. Plant not located after targeted search.	Likely. The Project Footprint falls upon the coastal saltmarsh community (VA 2).	Unlikely. Suitable habitat is absent from the Study Area.	Likely. Clearance of saltmarsh within the Study Area, would result in a negligible reduction in foraging habitat for the Curlew Sandpiper. Possible. Threatened shorebirds roosting and foraging on the tidal mudflat may suffer increased disturbance during the construction and operation of the Project.	Possible. Fairy Terns resting on the tidal mudflat may suffer increased disturbance during the construction and operation of the Project.	Likely. Clearance of saltmarsh within the Study Area, would result in a negligible reduction in foraging habitat for the Curlew Sandpiper. Possible. Threatened shorebirds roosting and foraging on the tidal mudflat may suffer increased disturbance during the construction and operation of the Project.	Possible. Migratory terns resting on the tidal mudflat may suffer increased disturbance during the construction and operation of the Project.	Unlikely. No migratory aerial passerine species would use the terrestrial habitats in the Study Area, rather these species would forage aerially above the Study Area.	Possible. Arctic Jaegers resting on the tidal mudflat may suffer increased disturbance during the construction and operation of the Project.
Are there any proposed measures to avoid or reduce impacts on matters of national environmental significance (and if so, is the effectiveness of these measures certain enough to reduce the level of impact below the 'significant impact' threshold)?	Not applicable.	Unknown. Proposed mitigation measures are detailed in Section 6.2.	Unknown. Proposed mitigation measures are detailed in Section 6.2.	Unknown within Study Area. Proposed mitigation measures are detailed in Section 6.2. Tidal mudflat adjacent to the Study Area is to be avoided following the recommendations in EBS (2018).	Tidal mudflat adjacent to the Study Area is to be avoided following the recommendations in EBS (2018).	Unknown within Study Area. Proposed mitigation measures are detailed in Section 6.2. Tidal mudflat adjacent to the Study Area is to be avoided following the recommendations in EBS (2018).	Tidal mudflat adjacent to the Study Area is to be avoided following the recommendations in EBS (2018).	Not applicable.	Tidal mudflat adjacent to the Study Area is to be avoided following the recommendations in EBS (2018).

Criteria	<i>Tecticornia flabelliformis</i>	Subtropical and Temperate Coastal Saltmarsh	Slender-billed Thornbill (Gulf St-Vincent)	Threatened Migratory Shorebirds	Fairy Tern	Migratory Shorebirds	Migratory terns	Migratory Aerial Passerines	Arctic Jaegar
Are any impacts of the proposed action on matters of national environmental significance likely to be significant impacts (important, notable, or of consequence, having regard to their context or intensity)?	No.	No.	No.	No.	No.	No.	No.	No.	No.
Is an EPBC referral recommended based on current project proposal?	No.	No.	No.	No.	No.	No.	No.	No.	No.

4.1 Matters of National Environmental Significance

Due to the presence of 29 fauna species that are MNES, closely related species with similar ecological niches have been grouped as the impacts associated with the Project on each of the species within the defined group will be comparable. The following fauna species groups have been devised:

- Threatened migratory shorebirds;
- Migratory shorebirds (those without a threatened conservation status under the EPBC Act);
- Migratory terns; and
- Migratory aerial passerines.

The species present within each of these groups are presented in Appendix 2.

4.1.1 Nationally threatened species

Slender-billed Thornbill (Gulf St Vincent) (Acanthiza iredalei rosinae)

A survey of the habitats used by the Slender-billed Thornbill (St Vincent Gulf) was conducted by Carpenter (2015). This survey found that 77% of sites with Slender-billed Thornbill (St Vincent Gulf) occurred in *Tecticornia abruscula* shrublands. While Slender-billed Thornbills were also recorded in mangrove channels (23% of sites) and other samphire shrublands (15% of sites), these records predominantly located within 100 m of *T. abruscula* shrublands, demonstrating the importance of *T. abruscula* shrublands as habitat.

The samphire habitat present within the Study Area was comprised predominantly of *Tecticornia halocnemoides* / *Tecticornia pergranulata* ssp. *pergranulata* / *Suaeda australis* closed very low shrubland +/- *Melaleuca halmaturorum*. As Slender-billed Thornbills were not observed to occur in *T. halocnemoides* low shrublands that are less than 30 cm in height (Carpenter 2015), the habitat present within the Study Area is unsuitable for the species.

Habitat more suitable for the Slender-billed Thornbills occurs at Mutton Conservation Park due to the presence of tidal channels, mangroves and taller samphire cover. While *T. abruscula* occurs at Mutton CP (ALA 2019), it did not feature as a dominant species within the samphire communities present, and therefore only marginal habitat may occur (G. Oerman, *Pers. Obs.* 2019). This is supported by the observations of Carpenter (2015) whom described the area as less suitable for the presence of Slender-billed Thornbills, however, it may become suitable habitat as the condition of the Conservation Park improves.

The closest known recent (post 2010) records of the Slender-billed Thornbill (St Vincent Gulf) occurred on Torrens Island approximately 2 km from the Study Area (Carpenter 2015). Despite the relative proximity of Slender-billed Thornbills (St Vincent Gulf) to the Study Area, they are unlikely to occur as the species is expected to be locally extinct as only historic records exist. The most recent potential record of the species on LeFevre Peninsula occurred in 1961 (ALA 2019).

Movement of Slender-billed Thornbill (St Vincent Gulf) in to the Study Area is considered unlikely as the largest known movement of a Slender-billed Thornbill (St Vincent Gulf) is 650 m and while the species can move across gaps of unsuitable habitat (Higgins and Peter 2002), the 600 m span of the Port River from

Torrens Island to Lefevre Peninsula is expected to be insurmountable due to the absence of vegetative protection from predators.

The Project will not significantly impact the Slender-billed Thornbill (St Vincent Gulf). As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 15).



Figure 14. Records of the Slender-billed Thornbill (St Vincent Gulf) and areas of Level 1 (known habitat), Level 2 (Suitable areas adjacent to known habitat) and Level 3 (Less suitable areas surrounding Level 2 habitat) habitat on and adjacent to Torrens Island (Carpenter 2015).

Table 15. Slender-billed Thornbill (St Vincent Gulf) (*Acanthiza iredalei rosinae*) assessed against the Significant Impact Criteria for a Vulnerable Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Lead to a long-term decrease in the size of an important population	No	The Study Area falls outside the distribution of extant populations of Slender-billed Thornbills (St Vincent Gulf), and therefore no populations will be impacted.
2	Reduce the area of occupancy of an important population	No	The Study Area falls outside the distribution of extant populations of Slender-billed Thornbills (St Vincent Gulf), and therefore the area of occupancy of the species cannot be reduced.
3	Fragment an existing important population into two or more populations	No	The Study Area falls outside the distribution of extant populations of Slender-billed Thornbills (St Vincent Gulf), and therefore the Project cannot cause the fragmentation of any population(s).
4	Adversely affect habitat critical to the survival of a species	No	Habitat critical to the Slender-billed Thornbill (St Vincent Gulf) is comprised of samphire shrubland dominated by <i>Tecticornia arbuscula</i> within 20 m of a tidal channel or salt lake.
5	Disrupt the breeding cycle of an important population	No	As per Criterion 1.

ID	Significant Impact Criterion	Significant Impact?	Rationale
6	Modify, destroy, remove and isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No	As per Criterion 1.
7	Result in an invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No	No suitable habitat for the Slender-billed Thornbill (St Vincent Gulf) occurs in the Study Area (see Criterion 4).

Threatened Migratory Shorebirds

One threatened migratory shorebird; the Curlew Sandpiper (*Calidris ferruginea*) (Aus: CE) may occur within the saltmarsh habitat inside the Study Area, while a further five threatened shorebird species may occur on the tidal mudflat adjacent to the Study Area: Red Knot (*Calidris canutus*) (Aus: EN), Great Knot (*Calidris tenuirostris*) (Aus: CE), Lesser Sand Plover (*Charadrius mongolus*) (Aus: EN), Bar-tailed Godwit (*Limosa lapponica baueri*) (Aus: VU) and Far Eastern Curlew (*Numenius madagascariensis*) (Aus: CE) (Figure 15).

The saltmarsh habitat within the Study Area may support a foraging medium for the Curlew Sandpiper when significant water pooling occurs within the basins from tidal inflows, energy plant water overflow and rainfall. However, due to the small extent of saltmarsh and the expected rarity of water pooling between September and March (when migratory shorebirds are present in Australia), the importance of habitat within the Study Area for the Curlew Sandpiper (and non-threatened migratory shorebirds) would be negligible.

Threatened migratory shorebirds (and those not listed as threatened) are expected to utilise the tidal mudflat adjacent to the Study Area for foraging at low tide. The extent of tidal mudflat increases from west to east over the edge of the Study Area, as the bank of the Port River becomes more gently sloped. As the Port River falls within an internationally significant area for shorebirds, a series of recommendations have been made to reduce disturbance associated with the Project that could degrade the value of the foraging habitat adjacent to the Study Area (see Section 6.2).

The Project will not significantly impact threatened migratory shorebirds. As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 16).

Table 16. Threatened migratory shorebird species assessed against the Significant Impact Criteria for a Critically Endangered Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Lead to a long-term decrease in the size of a population	No	The Project will not cause the clearance of any preferred habitat for migratory shorebirds (mudflat). Furthermore, the mudflat immediately adjacent to the Study Area would only support a negligible proportion of the total population of any threatened migratory shorebird species.
2	Reduce the area of occupancy of the species	No	The Project will not cause the clearance of any preferred habitat for migratory shorebirds (mudflat). While there may be temporal avoidance of these feeding habitats during construction and operation, it is expected that they will still be used for foraging. As such, the areas of occupancy will not be

ID	Significant Impact Criterion	Significant Impact?	Rationale
			reduced for any threatened migratory shorebird species.
3	Fragment an existing population into two or more populations	No	Migratory shorebirds are highly mobile and therefore the Project cannot fragment an existing population of any threatened migratory shorebird species.
4	Adversely affect habitat critical to the survival of a species	No	The Project will not cause the clearance of any preferred habitat for migratory shorebirds (mudflat). Furthermore, given its small extent and presence only at low tide, the mudflat adjacent to the Study Area is not critical habitat.
5	Disrupt the breeding cycle of a population	No	None of the threatened migratory shorebird species breed in Australia.
6	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No	See Criterion 1 and 2.
7	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No	Exotic flora and fauna species can degrade the habitats or predate migratory shorebirds. However, no invasive species will be benefited from the Project that would adversely impact migratory shorebirds.
8	Introduce disease that may cause the species to decline	No	No diseases are known to threaten migratory shorebird species and none will be introduced by the Project.
9	Interfere with the recovery of the species	No	See Criterion 1 and 2



Figure 15. Saltmarsh and tidal mudflat habitats for migratory shorebirds within and adjacent to the Study Area.

Fairy Tern (*Sternula nereis nereis*)

The Fairy Tern (*Sternula nereis nereis*) is listed as Vulnerable under the EPBC Act. Habitat suitable for the Fairy Tern is absent from the Study Area, however, individuals may be recorded on occasion from the adjacent coastline. As the Fairy Tern is generally restricted to shallow coastal wetlands and estuaries (Paton and Rogers 2009), the Port River is unlikely to comprise suitable foraging habitat due to its deep waters. While it is possible that Fairy Terns could rest on the tidal mudflats adjacent to the Study Area, roosting in the local area is most likely to occur on the sandbars at the northern tip of Torrens Island, where shallow coastal waters suitable for foraging are present. This is supported by numerous records of Fairy Terns at the northern tip of Torrens Island, where breeding also occurs (ALA 2019). Therefore, if this species were to be observed within or adjacent to the Study Area, Fairy Terns would be most likely to fly-over rather than use the habitats available.

None of the habitats outside the Study Area will be directly impacted by development, however, sporadic disturbance of Fairy Terns roosting on the tidal mudflat (if present) may occur during the construction and operational phases of the Project due to human activity and loud noises.

The Project will not significantly impact the Fairy Tern. As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 17).

Table 17. Fairy Tern (*Sternula nereis nereis*) assessed against the Significant Impact Criteria for a Vulnerable Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Lead to a long-term decrease in the size of an important population	No	The Project will not impact upon any Fairy Tern breeding colonies, roosting colonies or foraging habitat, and therefore, will not lead to a long-term decrease in the size of an important population.
2	Reduce the area of occupancy of an important population	No	Whilst the Fairy Tern has been recorded on numerous occasions near the Study Area, the habitats in which they have been recorded (protected bays of shallow water) do not correlate with those present in the Study Area (ALA 2019; G. Oerman, Pers. Obs. 2019). As such, the Fairy Tern would not occupy the Study Area, and therefore the species area of occupancy would not reduce as a result of the Project.
3	Fragment an existing important population into two or more populations	No	The Fairy Tern is a highly mobile species that is well distributed over the South Australia coastline. Due to this species ability to make long range movements (>180 km) (Paton and Rogers 2009), the Project will not fragment an existing population.
4	Adversely affect habitat critical to the survival of a species	No	See Criterion 2.
5	Disrupt the breeding cycle of an important population	No	See Criterion 1.
6	Modify, destroy, remove and isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No	See Criterion 1 and 2.
7	Result in an invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No	Introduced predators, including foxes (<i>Vulpes vulpes</i>), dogs (<i>Canis familiaris</i>), cats (<i>Felis catus</i>), Black Rats (<i>Rattus rattus</i>) are known threats to the Fairy Tern. These species are also established in the local area, and therefore, a significant impact cannot be triggered. Furthermore, these threats

ID	Significant Impact Criterion	Significant Impact?	Rationale
			would be most severe at breeding sites, which are protected by the Port River from the Study Area. As such, the Project will not cause these threats to be exacerbated.

***Tecticornia flabelliformis* (Bead Samphire)**

Tecticornia flabelliformis (Bead Samphire) listed as Vulnerable under the EPBC Act is known to occur on the east coast of Gulf St Vincent from Port Wakefield to St Kilda, as well as on Torrens Island which is located on the eastern side of the Port River (ALA 2019) as indicated in Figure 16. Based on database searches (ALA, BDBSA, SA Flora census) and literature review, there appears to be no records of the species from the LeFevre Peninsula. Furthermore, targeted searches for the species did not locate any specimens in the Study Area. It is acknowledged that the plant is deciduous and that given the survey occurred in early June, the plant may not have retained its foliage making it harder to detect. However, the survey included searching of plant skeletons which were not observed.



Figure 16. *Tecticornia flabelliformis* (Bead Samphire) records in the St. Vincent Gulf region (Sourced from Atlas of Living Australia, 2019)

It is somewhat difficult to make an accurate description of habitat for *T. flabelliformis* as it grows in varying environments across different parts of Australia, but always in Coastal Saltmarsh. *T. flabelliformis* is known from saltmarshes associated with sabkhas (commonly referred to as claypans or salt flats) (COOE 2012). Studies of soil samples from within and surrounding stands of Bead Glassworts near Gulf St Vincent, South Australia (Coleman and Cook, 2009) showed that the species occurs on clay pans with an underlying fragipan that is usually gypsum based.

Specimens on Torrens Island have been observed in Coastal Saltmarsh comprised of *Tecticornia arbuscula*, *Sarcocornia quinqueflora* Low shrubland +/- *T. halocnemoides* +/- *T. indica* ssp. +/- *T. pergranulata* (EAC 2013). The population of *T. flabelliformis* on Torrens Island was surveyed in 2012 and was found to occur as two disjunct populations comprising 58 patches that contained approximately 111,000 plants (EAC 2013). On the east coast of Gulf St Vincent near St Kilda, specimens have been observed in Sabkas within mineral soils with a pH of 7.9–8.1 and high chlorinate levels (Coleman and Cook 2005 in Carter 2012). It was also found in a 2009 study that *T. flabelliformis* occurs on soils that have, on average, a higher pH (= 8.02) than that found in the soils underlying the edging sapphires (= 7.85) (Coleman and Cook 2009). The species also tolerates higher salinity and wetter conditions than the neighbouring species (Cooe 2012). The soil pH and salinity in those parts of the Study Area supporting Coastal Saltmarsh flora communities is currently unknown, but it appears likely that the main water source of water is rainfall and overflow of seawater from the Pump adjacent the Seawall, with limited (but some) influence from ocean groundwater. *T. halocnemoides*, which dominates the site, tolerates a wide range of seasonally inundated soils and extended periods of dryness and very high salinity (Coleman, (hand book) date unknown). However, *T. pergranulata* is less tolerant of salinity compared with *T. halocnemoides* (Coleman, date unknown) and this species was found throughout the Coastal Saltmarsh in the Study Area, perhaps indicating the site did not have high salinity. An assessment against the Significant Impact Criteria (DotEE 2013) is provided in Table 18. Overall it is considered unlikely that *T. flabelliformis* occurs within the Study Area and an EPBC referral for this species is not recommended.

Table 18. *Tecticornia flabelliformis* assessed against the Significant Impact Criteria for species listed as Vulnerable under the EPBC Act (DotEE 2013).

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Lead to a long-term decrease in the size of an important population.	No	The Study Area falls outside the distribution of extant populations of <i>Tecticornia flabelliformis</i> and therefore no populations will be impacted.
2	Reduce the area of occupancy of an important population.	No	The Study Area falls outside the distribution of extant populations of <i>Tecticornia flabelliformis</i> and therefore the area of occupancy of the species cannot be reduced.
3	Fragment an existing important population into two or more populations.	No	The Study Area falls outside the distribution of extant populations of <i>Tecticornia flabelliformis</i> and therefore the Project cannot cause the fragmentation of any population(s).
4	Adversely affect habitat critical to the survival of a species.	No	It is unlikely there is suitable habitat for <i>Tecticornia flabelliformis</i> in the Study Area.
5	Disrupt the breeding cycle of an important population.	No	As per Criterion 1.
6	Modify, destroy, remove and isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No	As per Criterion 1.
7	Result in an invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	No	As per Criterion 1.
	Introduce disease that may cause the species to decline.	No	As per Criterion 1.

ID	Significant Impact Criterion	Significant Impact?	Rationale
	Interfere substantially with the recovery of the species.	No	As per Criterion 1.

4.1.2 *Nationally Threatened Ecological Communities*

Subtropical and Temperate Coastal Saltmarsh

Using the precautionary Principle, VA2 Coastal Saltmarsh is considered to represent the Nationally Vulnerable *Subtropical and Temperate Coastal Saltmarsh*. An assessment against key diagnostic features of the listed community is provided in Table 10, whilst Table 11 provides an assessment against criteria that exclude the saltmarsh community from being considered to represent the listed community.

Although it is considered that Coastal Saltmarsh in the Study Area qualifies as the listed community under the EPBC Act, it is understood that an EPBC Referral is not required for ecological communities allocated a Vulnerable Listing as per the Significant Impact Guidelines (DotEE 2013) as follows:

An action will require approval if the action has, will have, or is likely to have a significant impact on an ecological community listed in any of the following categories:

- *critically endangered, or*
- *endangered.*

Listed ecological communities in the vulnerable category of ecological communities listed under the EPBC Act, are not matters of national environmental significance for the purposes of Part 3 of the EPBC Act (requirements for environmental approvals) (DotEE 2013).

However, a key feature of the listing and recovery planning process for Coastal Saltmarsh is raising awareness that an ecological community exists and is threatened (DotEE 2019b). *Coastal Saltmarsh*, due to its appearance as low scrubby or grassy marsh systems, has a low public profile which somewhat belies its importance in providing key ecosystem services and havens for biodiversity (DotEE 2019b).

Regardless of a Referral not being required in this instance, Coastal Saltmarsh is considered a valuable and threatened ecological community and impact to this area should be minimised or avoided, where possible. Areas of Coastal Saltmarsh remaining on LeFevre Peninsula are largely restricted to degraded relics, the majority of which are earmarked for, or may possibly be developed. Furthermore, Coastal Saltmarsh in the study area is connected to more extensive saltmarsh communities bounded to the south by Snapper Point Power Station Road and extending west to the Engie Power Plant and east to the Study Area boundary (Figure 1). These areas could not be accessed, however, appeared to comprise similar (and perhaps taller) saltmarsh communities bounded by planted *M. halmaturorum*. It is perhaps less likely that these areas are subject to any tidal influence, but the value of Coastal Saltmarsh in the Study area is somewhat enhanced given its connectivity to much larger saltmarsh areas.

Mutton Cove Conservation Park south east of the site supports some of the only remaining intact Coastal Saltmarsh on the Le fevre Peninsula. Larger areas of Coastal Saltmarsh occur on Torrens Island and east of the Barker Inlet and Gulf St Vincent, and are known habitat for *T. flabelliformis*, the Slender-billed Thornbill and other threatened species.

Although it is considered that coastal Saltmarsh qualifies as the listed community under the EPBC Act, it is understood that a Referral is not required for ecological communities allocated a Vulnerable Listing as per the Significant Impact Guidelines (DotEE 2013).

4.1.3 Migratory Species

Migratory Shorebirds

Nine migratory shorebird species may use the saltmarsh habitat in the Study Area, while 21 species may use the tidal mudflat adjacent to the Study Area (Figure 15; Table 4; Appendix 2). The use and importance of these areas for migratory shorebirds is detailed in Section 4.1.1 (*Threatened Migratory Shorebirds*).

The Project will not significantly impact any migratory shorebird species. As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 19).

Table 19. Migratory shorebird species assessed against the Significant Impact Criteria for a Migratory Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	No	There will be no clearance or degradation of tidal mudflats adjacent to the Study Area, as the Project Footprint lies solely upon terrestrial land.
2	Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	No	Exotic flora and fauna species can degrade the habitats or predate migratory shorebirds. However, no invasive species will be benefited from the Project that would adversely impact migratory shorebirds.
3	Seriously disrupt the lifestyle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	No	Migratory shorebirds may leave the tidal mudflats adjacent to the Study Area following disturbance, i.e. human activity or loud episodic sounds. Despite this, the tidal mudflats adjacent to the Study Area would not support an ecologically significant proportion of the population of any migratory species, and therefore, this significant impact criterion cannot be triggered.

Migratory Terns

Three species of migratory terns were identified in the desktop assessment as relevant to the Project. The Caspian Tern (*Hydropogone caspia*) was observed during the field assessment, the Crested Tern (*Thalasseus bergii*) is highly likely to occur and the White-winged Tern (*Chlidonias leucopterus*) may potentially occur on the coastline of the Study Area.

None of the three migratory tern species will use the habitats within the Study Area, however, they may forage in the waters or shoals of fish and roost on the tidal mudflat adjacent to the Study Area. None of the habitats outside the Study Area will be directly impacted by development, however, sporadic disturbance of birds using these areas may occur during the construction and operational phases of the Project due to human activity and loud noises.

The Project will not significantly impact any migratory shorebird species. As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 20).

Table 20. Migratory tern species assessed against the Significant Impact Criteria for a Migratory Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	No	There will be no clearance or degradation of tidal mudflats adjacent to the Study Area, as the Project Footprint lies solely upon terrestrial land.
2	Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	No	Exotic flora and fauna species can degrade the habitats or predate terns. However, no invasive species will be benefited from the Project that would adversely impact terns.
3	Seriously disrupt the lifestyle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	No	Terns may leave the tidal mudflats adjacent to the Study Area following disturbance, i.e. human activity or loud episodic sounds. Despite this, the tidal mudflats adjacent to the Study Area would not support an ecologically significant proportion of the population of any migratory tern species, and therefore, this significant impact criterion cannot be triggered.

Migratory Aerial passerines

Two aerial passerines; the Fork-tailed Swift and White-throated Needletail were considered to potentially occur within the Study Area. The Study Area does not support any suitable trees for roosting for the Fork-tailed Swift and White-throated Needletail, however, both of these species may forage aerially above the Study Area.

The Project will not significantly impact any migratory shorebird species. As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 21).

Table 21. Migratory aerial passerine species assessed against the Significant Impact Criteria for a Migratory Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	No	The Study Area does not support important habitat for the Fork-tailed Swift and White-throated Needletail, which are expected to occur rarely occur.
2	Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	No	The Study Area does not support important habitat for the Fork-tailed Swift and White-throated Needletail, which are expected to occur rarely occur. Regardless, the Fork-tailed Swift and White-throated Needletail forage aerially and perch in trees solely for roosting. As such, the lifestyles of these species mean that are out of harm's way from ground dwelling introduced predators. Given that the Fork-tailed Swift and White-throated Needletail forage aerially exotic weeds will have a negligible impact.
3	Seriously disrupt the lifestyle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	No	An ecologically significant proportion of the populations of The Fork-tailed Swift or White-throated Needletail will not occur aerially above the Study Area due to its small extent. Furthermore, both species are expected to rarely occur.

ID	Significant Impact Criterion	Significant Impact?	Rationale
			The Fork-tailed Swift and White-throated Needletail are known to forage over cities, and therefore the Project is unlikely to affect their aerial foraging habitat. Furthermore, there are no suitable trees for roosting within the Study Area for these species.

Arctic Jaegar

The Artic (Parasitic) Jaegar (*Stercorarius parasiticus*) is listed as Migratory under the EPBC Act. The species inhabits offshore waters, bays, harbours and is rarely recorded ashore. Therefore, no habitat suitable for the Arctic Jaegar occurs within the Study Area, however, the individuals could roost on the tidal mudflat or rock wall adjacent to the Study Area. The value of roosting habitat adjacent to the Study Area is expected to be negligible, as individuals prefer to rest on debris floating in the water (Pizzey and Knight 2014). The lack of importance of the Study Area for Arctic Jaegers is further demonstrated by the absence of records of the species within a 5 km buffer of the Study Area since 2001 (DEW 2019).

The Project will not significantly impact the Arctic Jaegar. As none of the Significant Impact Criteria will be triggered, a referral under the EPBC Act is not recommended (Table 22).

Table 22. Migratory shorebird species assessed against the Significant Impact Criteria for a Migratory Species.

ID	Significant Impact Criterion	Significant Impact?	Rationale
1	Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	No	The Study Area does not support important habitat for the Arctic Jaegar, which are expected to rarely occur.
2	Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	No	See Criterion 1.
3	Seriously disrupt the lifestyle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	No	An ecologically significant proportion of the populations of the Arctic Jaegar will not occur adjacent to the Study Area due to the infrequency of records of the species (last recorded in 2001) in the Outer Harbour/Torrens Island area.

5 Environmental value of the Study Area

The environmental value over the Study Area was variable as shown in Figure 17. The areas of High environmental value (red polygon) are restricted to the basin containing VA 2 and include the following MNES that will or may be impacted by construction within this area:

- Clearance of *Subtropical and Temperate Coastal Saltmarsh* TEC (Aus: VU); and
- Clearance of potential foraging habitat for the Curlew Sandpiper (Aus: CE) and a further eight migratory shorebird species (Aus: Mi). *Note: this habitat would be of negligible importance for this suite of migratory shorebird species.*

The area of Moderate environmental value (orange polygon) include the following MNES that may be impacted by construction within this area:

- Construction close to the tidal mudflat may increase the frequency of disturbance events on migratory shorebird and tern species (Aus: Mi).

Construction within areas of Low environmental value (green polygon) will not adversely impact any MNES except for loud noises during construction and operations that could disturb migratory shorebird and tern species (Aus: Mi).

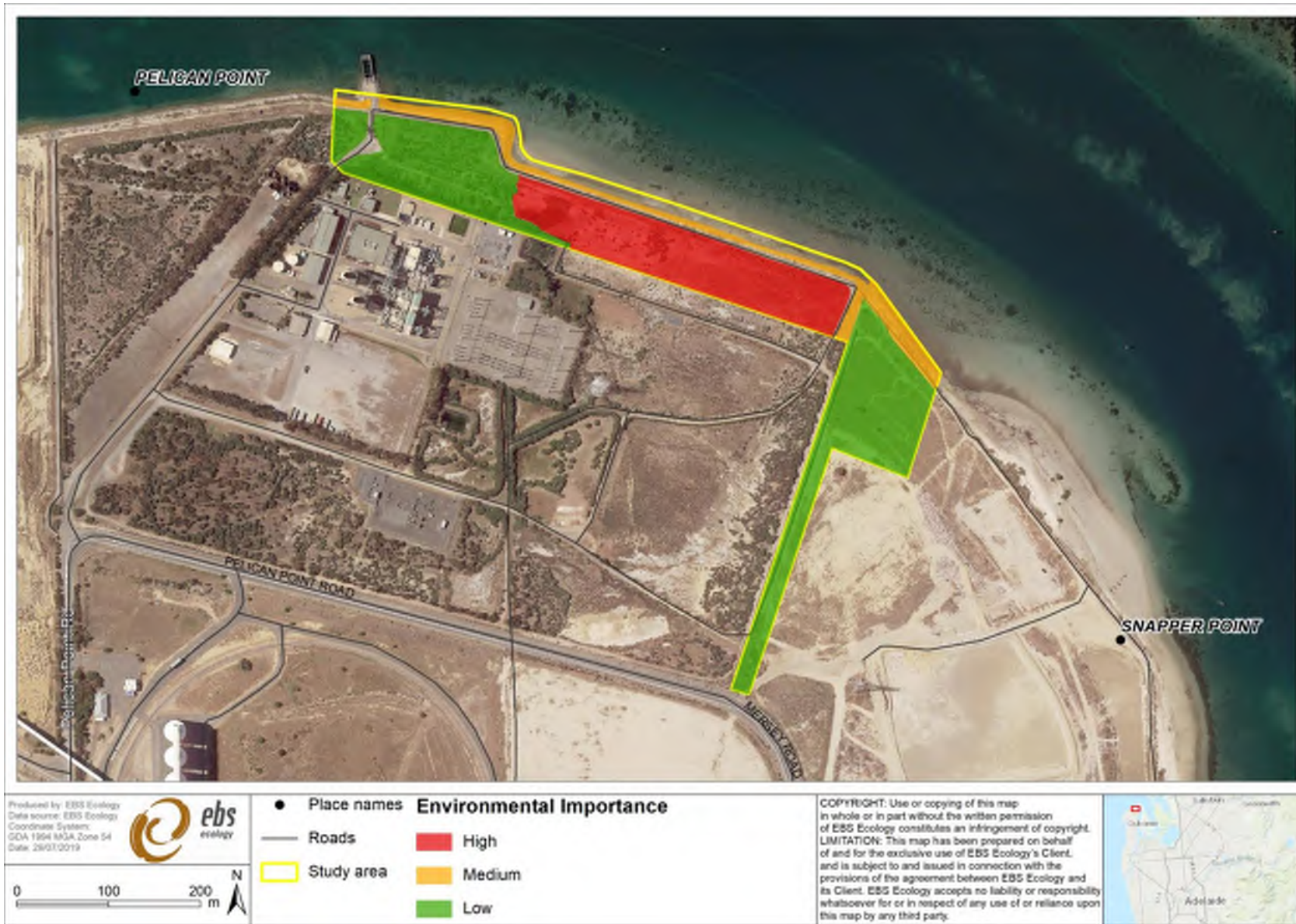


Figure 17. Map showing areas of high, medium and low environmental importance over the Study Area.

6 RECOMMENDATIONS

6.1 EPBC Act Recommendations

The Significant Impact Assessment determined that no threatened species or communities would be significantly impacted by the Project and therefore a Referral under the EPBC Act is not recommended.

6.2 General Management Recommendations

The general management recommendations are as follows:

- Clearance of native vegetation should be avoided as much as possible;
- Weed hygiene measures should be employed during construction works (including vegetation removal) to ensure that no new weeds are introduced to existing native vegetation;
- Construction activities should be minimised near tidal mudflats during the migratory shorebird season (September to April), especially their peak season (December to February), if feasible, to reduce disturbance to foraging migratory shorebird and tern species; and
- If movement of personnel near the tidal mudflat is required during the migratory shorebird season then personnel should remain within vehicles, as much as possible, as movement on foot is more disruptive to migratory shorebirds.

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8 APPENDICES

Appendix 1. Flora species observed within the Study Area during the field assessment and their regional (AMLR) conservation status.

*	Scientific name	Common name	AMLR	Vegetation association Snapper Point Power Station			
				1	2	3	4
	<i>Acacia ligulata</i>	Umbrella Bush	RA	✓		✓	✓
	<i>Acacia paradoxa</i>	Kangaroo Thorn		✓			
	<i>Acacia salicina</i>	Willow Wattle	LC	✓			
	<i>Allocasuarina verticillata</i>	Drooping Sheoak	LC	✓			
	<i>Atriplex nummularia ssp.</i>	Old-man Saltbush		✓			
	<i>Atriplex paludosa ssp.</i>	Marsh Saltbush	RA	✓		✓	
	<i>Atriplex semibaccata</i>	Creeping Saltbush	LC				✓
	<i>Austrostipa sp.</i>	Spear-grass		✓	✓	✓	
	<i>Avicennia marina ssp. marina</i>	Grey Mangrove				✓	
	<i>Callitris gracilis</i>	Southern Cypress Pine	LC	✓			
	<i>Carpobrotus rossii</i>	Native Pigface	LC	✓	✓		
	<i>Chloris truncata</i>	Windmill Grass	LC	✓		✓	
	<i>Dianella brevicaulis</i>	Short-stem Flax-lily	NT	✓		✓	✓
	<i>Enchylaena tomentosa var.</i>	Ruby Saltbush	LC	✓	✓	✓	✓
	<i>Enteropogon acicularis</i>	Umbrella Grass	LC			✓	
	<i>Eucalyptus sp.</i>	Eucalypt sp.		✓			
	<i>Gramineae sp.</i>	Grass Family		✓		✓	✓
	<i>Ficinia nodosa</i>	Knobby Club-rush	LC				✓
	<i>Frankenia pauciflora</i>	Southern Sea-Heath			✓		
	<i>Maireana brevifolia</i>	Short-leaf Bluebush	LC	✓	✓	✓	✓
	<i>Maireana oppositifolia</i>	Salt Bluebush	LC		✓	✓	
	<i>Melaleuca halmaturorum</i>	Swamp Paper-bark	EN	✓	✓	✓	
	<i>Melaleuca lanceolata</i>	Dryland Tea-tree	RA	✓	✓		
	<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum	LC				
	<i>Myoporum insulare</i>	Common Boobialla	NT	✓	✓	✓	
	<i>Nitraria billardierei</i>	Nitre-bush	RA		✓	✓	✓
	<i>Olearia axillaris</i>	Coast Daisy-bush	NT	✓			
new	<i>Rhagodia candolleana</i>	Sea-berry Saltbush		✓			
	<i>Rhagodia spinescens</i>	Spiny Saltbush	VU				
	<i>Rytidosperma sp.</i>	Wallaby-grass		✓	✓	✓	✓
	<i>Salsola australis</i>	Buckbush	LC	✓		✓	
	<i>Sarcocornia blackiana (?)</i>	Thick-head Glasswort	RA		✓		
	<i>Sarcocornia quinqueflora</i>	Beaded Samphire	NT	✓	✓		
	<i>Suaeda australis</i>	Austral Seablite	NT	✓	✓		
	<i>Tecticornia halocnemoides ssp. halocnemoides</i>	Grey Samphire	VU	✓	✓		
	<i>Tecticornia pergranulata ssp.</i>	Black-seed Samphire	RA	✓	✓	✓	
	<i>Threlkeldia diffusa</i>	Coast Bonefruit	NT	✓	✓	✓	✓
*	<i>Acacia cyclops</i>	Western Coastal Wattle		✓			
*	<i>Acacia saligna</i>	Golden Wreath-Wattle					✓
*	<i>Asparagus asparagoides</i>	Bridal Creeper				✓	✓

*	Scientific name	Common name	AMLR	Vegetation association Snapper Point Power Station			
				1	2	3	4
*	<i>Asphodelus fistulosus</i>	Onion Weed		✓	✓	✓	✓
*	<i>Avena barbata</i>	Bearded Oat		✓	✓	✓	✓
*	<i>Bromus diandrus</i>	Great Brome				✓	✓
*	<i>Bromus sp.</i>	Brome		✓			
*	<i>Conyza bonariensis</i>	Flax-leaf Fleabane		✓		✓	✓
*	<i>Cynara cardunculus ssp. flavescens</i>	Artichoke Thistle				✓	✓
*	<i>Cynodon dactylon var. dactylon</i>	Couch				✓	
*	<i>Erodium cicutarium</i>	<i>Common storks bill</i>					✓
*	<i>Galenia pubescens var. pubescens</i>	Coastal Galenia		✓	✓	✓	✓
*	<i>Gomphocephala cancellatus</i>						✓
*	<i>Gazania sp.</i>	Gazania				✓	
*	<i>Hordeum sp.</i>	Barley-grass		✓	✓	✓	✓
*	<i>Hypochaeris radicata</i>						✓
*	<i>Lactuca serriola f.</i>	Prickly Lettuce				✓	✓
*	<i>Lagurus ovatus</i>	Hare's Tail Grass		✓	✓	✓	✓
*	<i>Limonium companyonis</i>	Sea-lavender		✓	✓	✓	✓
*	<i>Lycium ferocissimum</i>	African Boxthorn				✓	✓
*	<i>Medicago polymorpha var. polymorpha</i>	Burr-medic		✓	✓	✓	✓
*	<i>Olea europaea ssp.</i>	Olive				✓	✓
*	<i>Oenothera biennis</i>	Evening Primrose					✓
*	<i>Oxalis pes-caprae</i>	Soursob		✓	✓	✓	✓
*	<i>Piptatherum miliaceum</i>	Rice Millet		✓	✓	✓	✓
*	<i>Plantago coronopus ssp.</i>	Bucks-horn Plantain		✓		✓	✓
*	<i>Reichardia tingitana</i>	False Sowthistle				✓	
*	<i>Sonchus oleraceus</i>	Common Sow-thistle				✓	✓

Aus: Australia (*Environment Protection and Biodiversity Conservation Act 1999*). SA: South Australia (*National Parks and Wildlife Act 1972*). Conservation codes: CE: Critically Endangered. ENE: Endangered. VUV: Vulnerable. R: Rare. *: Introduced.

Note that no species threatened under the *NPW* or *EPBC* Act were observed

Appendix 2. Bird species within groups: threatened migratory shorebirds, migratory shorebirds, migratory terns, migratory aerial passerines.

Scientific name	Common name	Threatened Migratory Shorebird	Migratory Shorebird	Migratory Tern	Migratory Aerial Passerine
<i>Actitis hypoleucos</i>	Common Sandpiper	No	Yes	No	No
<i>Apus pacificus</i>	Fork-tailed Swift	No	No	No	Yes
<i>Arenaria interpres</i>	Ruddy Turnstone	No	Yes	No	No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	No	Yes	No	No
<i>Calidris alba</i>	Sanderling	No	Yes	No	No
<i>Calidris canutus</i>	Red Knot	Yes	Yes	No	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	Yes	Yes	No	No
<i>Calidris melanotos</i>	Pectoral Sandpiper	No	Yes	No	No
<i>Calidris ruficollis</i>	Red-necked Stint	No	Yes	No	No
<i>Calidris tenuirostris</i>	Great Knot	Yes	Yes	No	No
<i>Charadrius bicinctus</i>	Double-banded Plover	No	Yes	No	No
<i>Charadrius mongolus</i>	Lesser Sand Plover	Yes	Yes	No	No
<i>Chlidonias leucopterus</i>	White-winged Tern	No	No	Yes	No
<i>Hirundapus caudacutus</i>	White-throated Needletail	No	No	No	Yes
<i>Hydroprogne caspia</i>	Caspian Tern	No	No	No	Yes
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	No	Yes	No	No
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	Yes	Yes	No	No
<i>Limosa limosa</i>	Black-tailed Godwit	No	Yes	No	No
<i>Numenius madagascariensis</i>	Far Eastern Curlew	Yes	Yes	No	No
<i>Numenius phaeopus</i>	Whimbrel	No	Yes	No	No
<i>Pluvialis fulva</i>	Pacific Golden Plover	No	Yes	No	No
<i>Pluvialis squatarola</i>	Grey Plover	No	Yes	No	No
<i>Stercorarius parasiticus</i>	Parasitic Jaeger (Arctic Jaeger)	No	No	No	No
<i>Sternula albifrons</i>	Little Tern	No	No	Yes	No
<i>Sternula nereis</i>	Fairy Tern	No	No	No	No
<i>Thalasseus bergii</i>	Crested Tern	No	No	Yes	No
<i>Tringa brevipes</i>	Grey-tailed Tattler	No	Yes	No	No
<i>Tringa nebularia</i>	Common Greenshank	No	Yes	No	No
<i>Tringa stagnatilis</i>	Marsh Sandpiper	No	Yes	No	No



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APPENDIX G

ACOUSTIC OVERVIEW



PORT ADELAIDE ENERGY PTY LTD

OCTOBER 2019

SNAPPER POINT POWER STATION

ENVIRONMENTAL NOISE ASSESSMENT



Question today Imagine tomorrow Create for the future

Snapper Point Power Station Environmental Noise Assessment




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ABBREVIATIONS

A-weighting	Frequency filter applied to measured noise levels to represent how humans hear sounds.
dB(A)	A-weighted decibels. A single number descriptor of the overall sound pressure level.
$L_{eq,T}$	Equivalent (energy averaged) noise level, for a measurement period, T. A noise descriptor used to represent a time varying sound level as a single number representation.
L_{max}	Maximum A-weighted noise level recorded over a measurement period.

EXECUTIVE SUMMARY

The Snapper Point Power Station (the Project) involves the relocation of five (5) trailer mounted turbine generators, and ancillary infrastructure, from an existing site at Elizabeth to a new site adjacent to the Pelican Point Power Station, at Outer Harbor.

The turbines are currently operated by the South Australian Government (SA Government) for emergency electricity generation. Port Adelaide Energy Pty Ltd (P A Energy P/L) propose to lease the turbines from the SA Government, and operate them for a permanent commercial use.

This environmental noise assessment has predicted future noise impacts from the relocated turbines, and compared them to the relevant noise criteria from the *Environmental Protection (Noise) Policy 2007*.

Noise modelling indicates that the site is predicted to exceed the applicable night-time noise criteria levels at the nearest noise-sensitive receiver locations without the provision of noise mitigation.

Based upon manufacturer's noise data, compliance with the noise criteria can be achieved with the installation of noise mitigation. This noise mitigation is likely to take the form of exhaust silencers for the gas turbine units.

To mitigate risk of over or under specification of noise mitigation, it is suggested that further testing of the TM2500 gas turbine units is undertaken. The intent of this testing is to confirm the sound power levels of the specific turbines to be used on site, and ensure that noise mitigation is designed optimally for the units to be installed at Outer Harbor.

1 INTRODUCTION

1.1 THE SNAPPER POINT POWER STATION

The Snapper Point Power Station (the Project) involves the de-commissioning, relocation and re-commissioning of five (5) trailer-mounted GE TM2500 Gen 8 aero-derivative turbine generators, and ancillary infrastructure, from an existing site at Elizabeth in Adelaide's northern suburbs, to a new site adjacent to the Pelican Point Power Station at Outer Harbor. The turbines are currently operated by APR Energy on behalf of the Government of South Australia (SA Government or the State) for emergency electricity generation, as part of South Australia's emergency power plant project.

Port Adelaide Energy Pty Ltd (P A Energy P/L), an affiliate of Nexif Energy Australia Pty Ltd (Nexif Energy) has entered into an agreement with the SA Government to lease the turbines from the SA Government, and operate them for commercial use for a period of 25 years. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up fuel. It is proposed that the Project will connect into the nearby Pelican Point Power Station fuel gas yard (owned by Epic Energy) and Pelican Point Power Station switchyard (owned by ElectraNet).

1.2 PROJECT AREA

The Project site (the Site) will be located adjacent to the Pelican Point Power Station at Outer Harbor, approximately 20 km north of Adelaide. The land is owned by Renewal SA, and will be leased by P A Energy P/L for this Project. The Site is situated between the coastal waters of the Port River and the Pelican Point Power Station, and is located within the City of Port Adelaide Enfield under the Industry Zone. The Site will be comprised of the following land parcels:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – Title reference CT 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of Allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6012/888.

It is anticipated that an additional, existing site access road will be utilised for the Project. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.
-

1.3 OBJECTIVES

The objective of the Environmental Noise Assessment is to ascertain if operational noise from the Project is compliant with relevant noise criteria and the legislated duty of care for the environment.

1.4 LEGISLATIVE AND POLICY REQUIREMENTS

In South Australia, environmental noise management is legislated under the South Australian *Environment Protection Act 1993*.

Section 25(3) of the *Environment Protection Act 1993* provides the following General Environmental Duty:

“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.”

Compliance with the *Environment Protection Act 1993*, and subsequently the General Environmental Duty, is administered by the South Australian Environment Protection Authority (EPA). For industrial sources of noise such as gas turbine power plants, compliance is assessed in accordance with the Environmental Protection (Noise) Policy (2007).

1.5 ASSESSMENT METHODOLOGY

This Environmental Noise Assessment for the Project:

- defines noise-sensitive receivers (Receivers) surrounding the proposed Site
 - determines the relevant operational noise criteria at the Receiver locations for the Project
 - predicts future noise emission levels for the Project
 - compares predicted operational noise levels to the criteria; and
 - outlines what, if any, noise mitigation is required for compliance with the noise criteria.
-

1.6 ASSUMPTIONS AND CONSTRAINTS

The following assumptions have been made in this assessment:

- Noise data for the turbines was sourced from Nexif Energy (being a parent company of P A Energy P/L), and provided by Emaden Technical Solutions Pty Ltd. It is understood that the sound power level data is sourced from testing undertaken by the turbine manufacturer (General Electric).
- Noise sensitive receptors were identified based on a review of aerial photography for the site.
- The modelled site layout was based upon high level concept drawings by WSP.
- The Site is to be located on fill with a design ground surface RL of 3.4 metres.
- Noise emissions from the Project, in any 15-minute assessment period observed at noise-sensitive receiver locations, are assumed to be free from annoying characteristics defined in the Noise EPP (tonality, impulsivity, amplitude modulation, low frequency).

The following constraints and limitations apply to this assessment:

- Assessment of construction noise and vibration impacts is not within the scope of this assessment.
- Assessment of underwater noise impacts on marine fauna or other receptors from Project construction or operation are not within the scope of this assessment.
- Operational vibration is not within the scope of this assessment.
- Assessment is limited to the representative residential receiver locations identified. Assessment of noise and vibration impacts to adjacent industrial or commercial sites is not within the scope of this assessment.

2 EXISTING CONDITIONS

2.1 NOISE SENSITIVE RECEIVERS

The closest residential noise sensitive receivers to the site are in North Haven, and located in a Residential Zone to the Southwest of the Site. These are located approximately 2.1 km from the proposed location of the turbines.

The next closest receptors are in St Kilda, approximately 3.5 km to the Northeast of the proposed Site.

For brevity, we have used representative receiver locations to present noise modelling results for established medium density residential areas. The representative locations were selected such that noise levels for the surrounding residential properties would be equal to or less than levels at the representative locations.

The location of the representative receivers, the proposed site, and the relevant Development Plan Zones are shown in Figure 2.1.



Figure 2.1 Noise sensitive receivers (yellow circles), site boundary (red dashed line), and Development Plan Zones

3 ASSESSMENT CRITERIA

3.1 ENVIRONMENT PROTECTION (NOISE) POLICY (2007)

The EPA provides noise goals for noise sources to achieve the General Environmental Duty.

Noise goals are set in accordance with the *Environment Protection (Noise) Policy 2007* (Noise EPP) and are determined based on the land uses principally promoted by the relevant Development Plan.

Both receptor localities (North Haven and St Kilda) are separated from the noise source locality by buffer areas/zones. In accordance with the Noise EPP, assuming the project is subject to Development Assessment approval, the noise criteria are therefore the Indicative Noise Factor for the receiver zone, less 5 dB(A).

Both receiver localities relevant to the project are residential land uses. Noise criteria applicable for nearest residential receivers to the Site are therefore:

- 47 dB(A) $L_{eq,15min}$ during day time periods (7 am – 10 pm)
- 40 dB(A) $L_{eq,15min}$ during night time periods (10 pm – 7 am)
- 60 dB(A) L_{max} during night time periods (10 pm – 7 am).

We understand that the nature of a peaking power plant is that site operation is anticipated during times of peak electricity demand. In South Australia, these are typically between 6 am – 9 am and 5 pm – 10 pm¹. As these potential operating time periods span both the ‘day time’ and ‘night time’ criteria, we have assessed Project operation for both time periods.

Note that in accordance with the Noise EPP, the measured source noise level must be adjusted by the following amounts if the noise source contains modulation, tonal, impulsive, or low-frequency characteristics:

- +5 dB(A) if the noise source contains 1 characteristics
- +8 dB(A) if the noise source contains 2 characteristics
- +10 dB(A) if the noise source contains 3 or 4 characteristics.

¹ Demand Profiles from AEMO document *South Australian Electricity Report – Insights for Demand Management*. 3 December 2018 - http://www.energymining.sa.gov.au/__data/assets/pdf_file/0005/336344/AEMO_-_South_Australian_Electricity_Report.pdf

4 PROJECT IMPACTS

4.1 OPERATIONAL NOISE

4.1.1 NOISE MODELLING METHODOLOGY

Noise levels from the Project were predicted using SoundPLAN 8.1 environmental noise modelling software. Noise models were developed which considered the site layout and turbine source locations, natural and future ground surface surrounding the Project, ground absorption and receiver locations.

In accordance with the requirements of the Noise EPP, noise levels were predicted for outdoor, free-field receiver locations in areas which would be frequented by occupants. Noise levels were predicted at a height of 1.5 metres above the local terrain height.

A ground absorption factor of 0.6 was utilised for land areas, corresponding to built-up residential land use. It is noted that there are large areas of unoccupied industrial land between source and receiver which would likely have slightly higher ground absorption, so the above is considered a conservative estimate. Areas of open water (such as the Barker Inlet) were modelled as reflective/hard ground (absorption factor of 0.0).

The SA EPA have produced a document “*Guidelines for Use of the Environment Protection (Noise) Policy 2007*” (EPP Guidelines), which provides recommended methodology for predicting noise levels for assessment against the Noise EPP.

The EPP Guidelines provide the following guidance regarding algorithms used for predicting environmental noise:

“Predictions of the source noise levels for distances greater than 100 metres should be made using default weather conditions that are equivalent to CONCAWE meteorological category 6 at night, and CONCAWE meteorological category 5 for the day period.”

It is noted that the CONCAWE algorithm has been verified for calculation distances up to 2000 metres. As noted in Section 2.1, all the noise-sensitive receptors to the Project are located at a greater distance than this. As an alternative, it was elected to undertake the assessment with calculations based on the ISO9613:1996 noise propagation algorithm, which is valid for these source-receiver distances. These results are supplemented with results calculated using CONCAWE for information, noting the limitations of their validity.

4.1.2 TURBINE SOUND POWER DATA

Sound power data for the TM2500 turbines was provided through Nexif, by Emanden Technical Solutions Pty Ltd.

It is understood that the turbines to be installed at the Outer Harbor site are not fitted with any additional noise mitigation when compared to the turbine which was subject to the sound power testing.

Other ancillary equipment such as transformers, backup generators and standby generators were also included in the model as noise sources. The arrangement of the noise sources for a TM2500 unit is shown in Figure 4.1.

The sound power data utilised is summarised in Table 4.1.

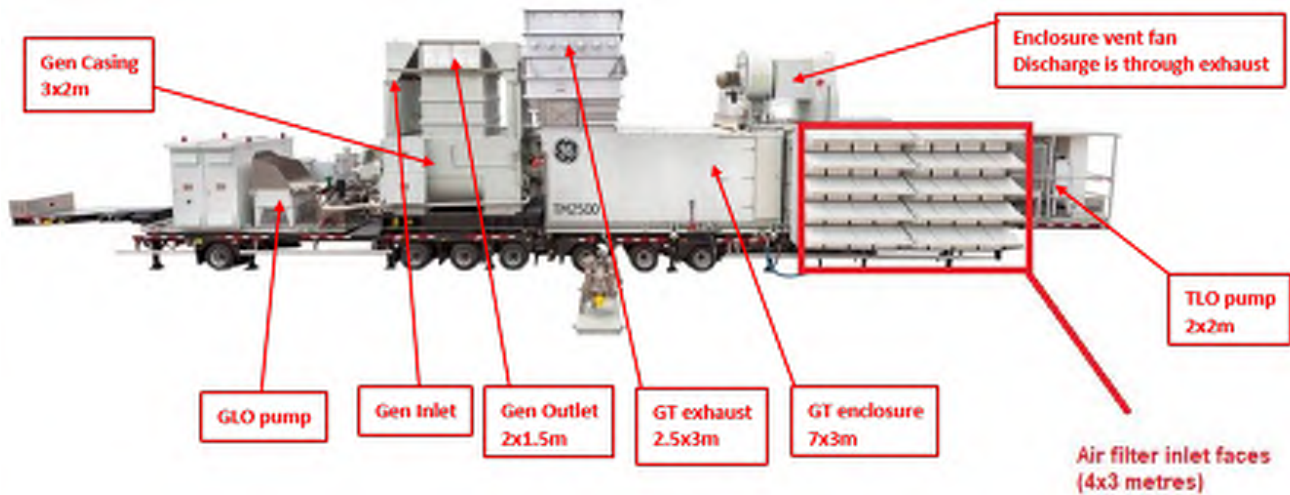


Figure 4.1 Arrangement of TM2500 for sound power data noise sources (Emanden Technical Solutions Pty Ltd)

Table 4.1 GE TM2500 sound power data

ITEM	OCTAVE-BAND SOUND POWER LEVEL [dB(A)]									
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall
TM2500 Liquid Fuel Boost Pump	44	65	85	86	91	95	94	88	78	99
TM2500 GLO	70	82	101	99	94	90	90	86	78	104
TM2500 Exhaust Stack	84	101	110	115	115	113	113	109	102	121
TM2500 Turbine Vent Fan	71	81	99	89	80	80	78	77	72	99
TM2500 Turbine Enclosure	75	91	96	98	94	92	91	87	74	102
TM2500 Air filter chasis	64	74	82	83	100	100	103	94	80	106
TM2500 Air filter inlet	69	83	89	85	84	83	86	84	80	94
TM2500 Generator vent outlet	72	86	85	83	84	83	83	79	70	92
TM2500 Generator vent inlet	80	85	90	90	90	88	90	87	77	98
TM2500 Generator casing	73	87	90	90	100	98	94	91	79	103
100 MVA Transformer	43	62	74	76	82	79	75	70	61	85

ITEM	OCTAVE-BAND SOUND POWER LEVEL [dB(A)]									
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall
40 MVA Transformer	43	62	74	76	82	79	75	70	61	80
Standby Generator	55	65	74	82	87	93	96	98	101	104
Backup generator	46	56	65	72	78	83	86	89	92	95

4.1.3 SITE LAYOUT

For the purposes of noise modelling, a site layout was developed based upon the WSP General Layout (OPT-1) for the site. This site layout is shown in Appendix A.

4.1.4 PREDICTED NOISE LEVELS

Predicted operational noise levels for the Project, at the noise sensitive receiver locations, are provided in Table 4.2.

These levels are based upon steady state running of the turbines continuously over the 15-minute assessment period.

L_{max} data was not available for the TM2500 turbines, however the steady state nature of gas turbine operation is such that any noise criteria exceedance will likely be controlled by the L_{eq} criterion.

Table 4.2 Predicted future noise levels (ISO 9613:1996)

RECEIVER LOCATION	PREDICTED NOISE LEVEL [dB(A)]	NIGHT TIME NOISE CRITERIA [dB(A)]	COMPLIANT WITH NIGHT NOISE CRITERIA
NH01	44	40	No
NH02	44	40	No
NH03	44	40	No
NH04	43	40	No
SK01	37	40	Yes
SK02	37	40	Yes

The results provided in Table 4.2 indicate that noise mitigation will be required for the Site to comply with the night time noise criteria. Noise mitigation requirements are discussed further in Section 5.1. Noise contour plots for the site operation are provided in Appendix B.

For reference, noise levels from the Project predicted using CONCAWE (as required by the EPP Guidelines) are provided in Table 4.3. Note that, as discussed in Section 4.1.1, due to the uncertainty in the validity of the CONCAWE algorithm at the relevant source-receiver distances, these noise levels have not been compared to the assessment criteria.

Table 4.3 Predicted future noise levels (CONCAWE)

RECEIVER LOCATION	PREDICTED NOISE LEVEL [dB(A)]	PREDICTED NOISE LEVEL [dB(A)]
	CONCAWE day	CONCAWE night
NH01	45	45
NH02	46	46
NH03	46	46
NH04	45	45
SK01	46	45
SK02	45	44

5 MANAGEMENT AND MITIGATION MEASURES

5.1 CONCEPTUAL OPERATIONAL NOISE MITIGATION

Noise mitigation will be required for the Site to operate during the night-time period. The noise modelling has been used to determine the requirements for such mitigation, based upon the contribution of the noise sources to noise levels at the receiver locations.

The controlling source at all the noise-sensitive receivers was found to be the TM2500 exhaust stacks, followed by the TM2500 GLO pumps.

To mitigate noise from the turbines to acceptable levels, the noise contribution from the exhaust stacks needs to be reduced by the levels indicated in Table 5.1. These levels can be considered indicative of the minimum additional Insertion Loss performance requirements for the exhaust stack to achieve noise criteria compliance (i.e. in addition to any existing exhaust noise reduction already in place on the standard TM2500 packages).

Table 5.1 Noise reduction requirements

ITEM	OCTAVE-BAND NOISE REDUCTION REQUIRED (SILENCER INSERTION LOSS) [dB]								
	31.5 HZ	63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ
TM2500 Exhaust Stack	4	4	6	9	7	4	1	0	0

5.2 RISK-BASED NOISE MITIGATION APPROACH

The design, fabrication and installation of gas turbine exhaust silencers is a costly and time consuming exercise. A risk-based approach to the implementation of noise mitigation is suggested to ensure that noise mitigation is optimised to achieve the required noise reduction at minimum capital cost.

We have documented risks associated with noise mitigation implementation in Table 5.2.

Table 5.2 Noise mitigation risk analysis

RISK ITEM	CAUSE(S)	CONSEQUENCE
Residual exceedance of noise criteria with suggested additional exhaust noise mitigation in place.	<ul style="list-style-type: none"> — Incorrect sound power data provided for modelling. — Additional noise sources present on site which are not included in noise modelling. — Over prediction of atmospheric noise attenuation effects (for example under atmospheric temperature inversion conditions). 	Redesign of noise mitigation or requirements for further noise attenuation.
Over specification of noise mitigation.	<ul style="list-style-type: none"> — Incorrect sound power data provided for modelling. — Underprediction of atmospheric noise attenuation effects. 	Installation of expensive noise mitigation when not required.

The sound power data input into the model is a common potential cause for both under and over prediction by the noise modelling.

The noise data received from Nexif Energy was supplied by the distributor on behalf of General Electric (turbine manufacturer) and is generic for new TM2500 turbines. Noise measurements of the specific turbines, operational on their existing site were undertaken after installation by Vipac in November 2017. We are not aware of more recent test data for either the site, or specific in-situ sound power data for the five turbines to be installed at Outer Harbor.

To reduce the risk of under or over specification of turbine exhaust silencers, it is suggested one of two approaches is taken:

- 1 undertake in-situ sound power testing of the TM2500 turbines as currently installed at Elizabeth, and design noise mitigation based upon the outcome of this testing; or
- 2 install the TM2500 turbines on site at Outer Harbor without additional noise mitigation (e.g. exhaust silencers). During commissioning undertake sound power level testing of the units, and undertake measurements of noise at the nearest noise sensitive receiver locations. Based upon the outcomes of this investigation determine the exact requirements for noise mitigation based on the specific turbines installed on site.

It is noted that while Approach 2 will provide optimal noise mitigation based on the most accurate representation of the Site. The lead times associated with manufacture and installation of the silences (if required) may lead to additional delays in obtaining operational approvals and licensing, or may restrict operation to the day time period only until noise mitigation is installed and tested.

6 SUMMARY AND RECOMMENDATIONS

A noise assessment has been undertaken of the proposed Snapper Point Power Station at Outer Harbor.

Noise modelling indicates that the site is predicted to exceed the applicable night-time noise criteria levels at the nearest noise-sensitive receiver locations without the provision of additional noise mitigation.

Based upon the manufacturer's noise data compliance with the noise criteria can be achieved with the installation of additional noise mitigation. This noise mitigation is likely to take the form of additional or replacement exhaust silencers for the gas turbine units.

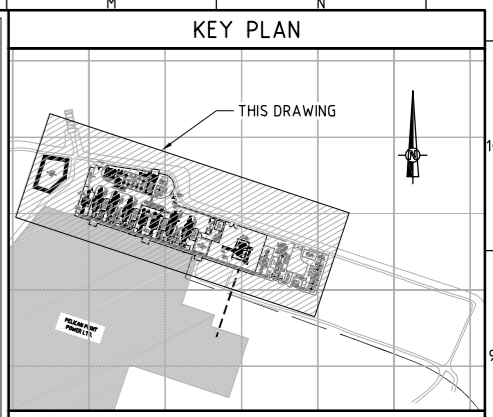
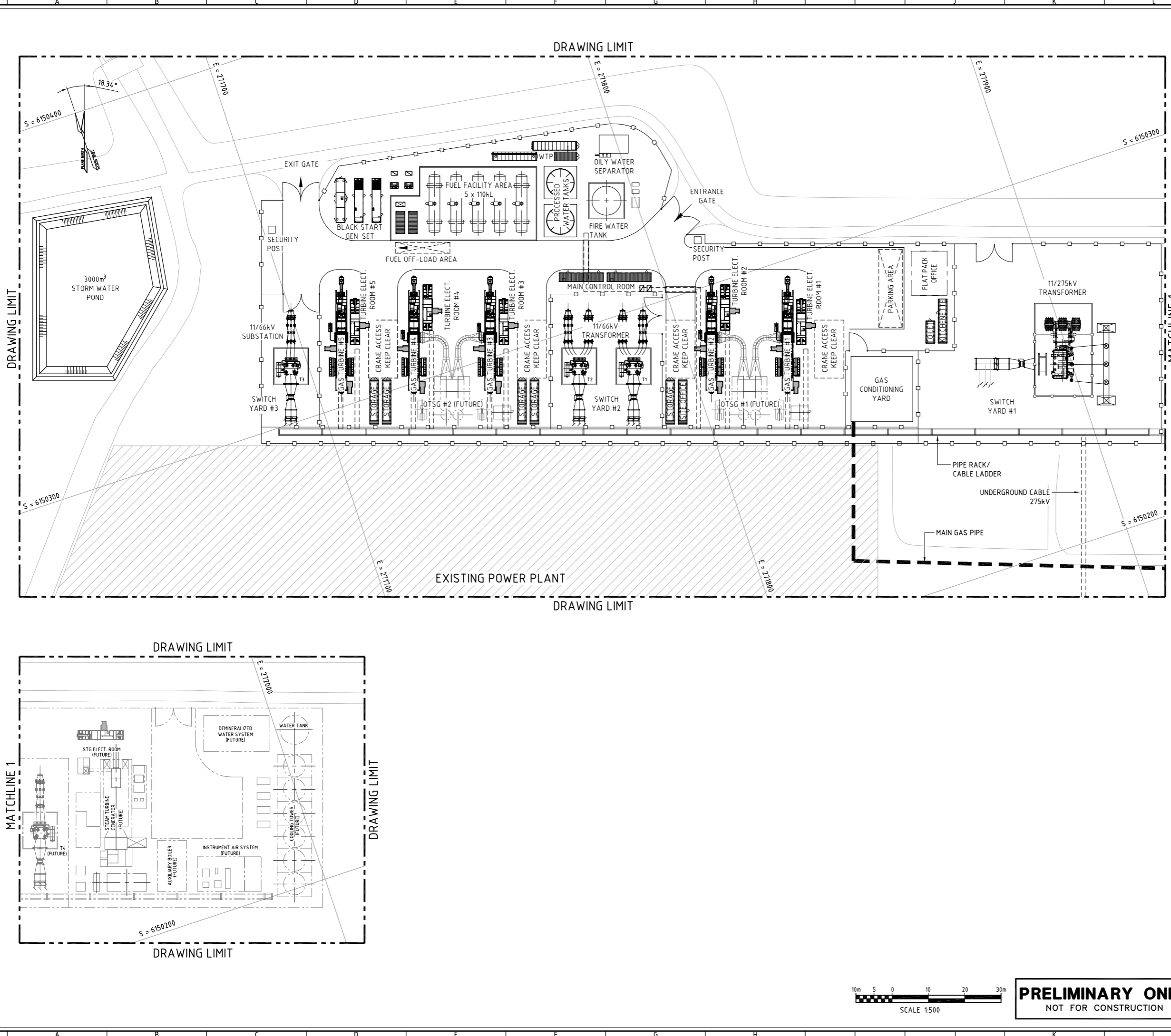
It is suggested that further testing of the TM2500 gas turbine units is undertaken to confirm the sound power levels of the specific turbines, and ensure that noise mitigation is designed specific to the units to be installed at Outer Harbor.

APPENDIX A

SITE LAYOUT



Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\00 General\5053-DWG-G-0001_RD_GENERAL_LAYOUT (OPT-1).dwg Jul 31, 2019 - 8:28am SZakaria_PCCAD-0008



GENERAL NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.

DWG. REF. NO.	TITLE
3174-0000-DWG-G-0001	OVERALL LAYOUT

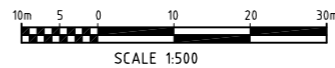
REV	DATE	DESCRIPTION
D		RE-ISSUED FOR CLIENT REVIEW
C	29/07/19	RE-ISSUED FOR CLIENT REVIEW
B	26/07/19	ISSUED FOR CLIENT REVIEW
A	25/07/19	ISSUED FOR INTERNAL REVIEW

REVISION		
DRAWN BY	DESIGNED BY	ENGINEERING MGR
-	-	-
CHECKED BY	CHECKED BY	PROJECT MGR
-	-	-

Emanden Technical Solutions Pty Ltd
RESINDO RESOURCES & ENERGY

NEXIF TM2500 PEAKER PROJECT
 (5) GAS TURBINE, 66kV, 50Hz
 GENERAL LAYOUT (OPT-1)

APPROVALS	DATE	SCALE	SIZE
Eng Appr.		1 : 500	A1
Proj Appr.		5053-DWG-M-0001	
Client Appr.			
PROJECT NUMBER	3174		REV
RESINDO DWG NO	5053-DWG-M-0001		D
CLIENT DWG NO	-		

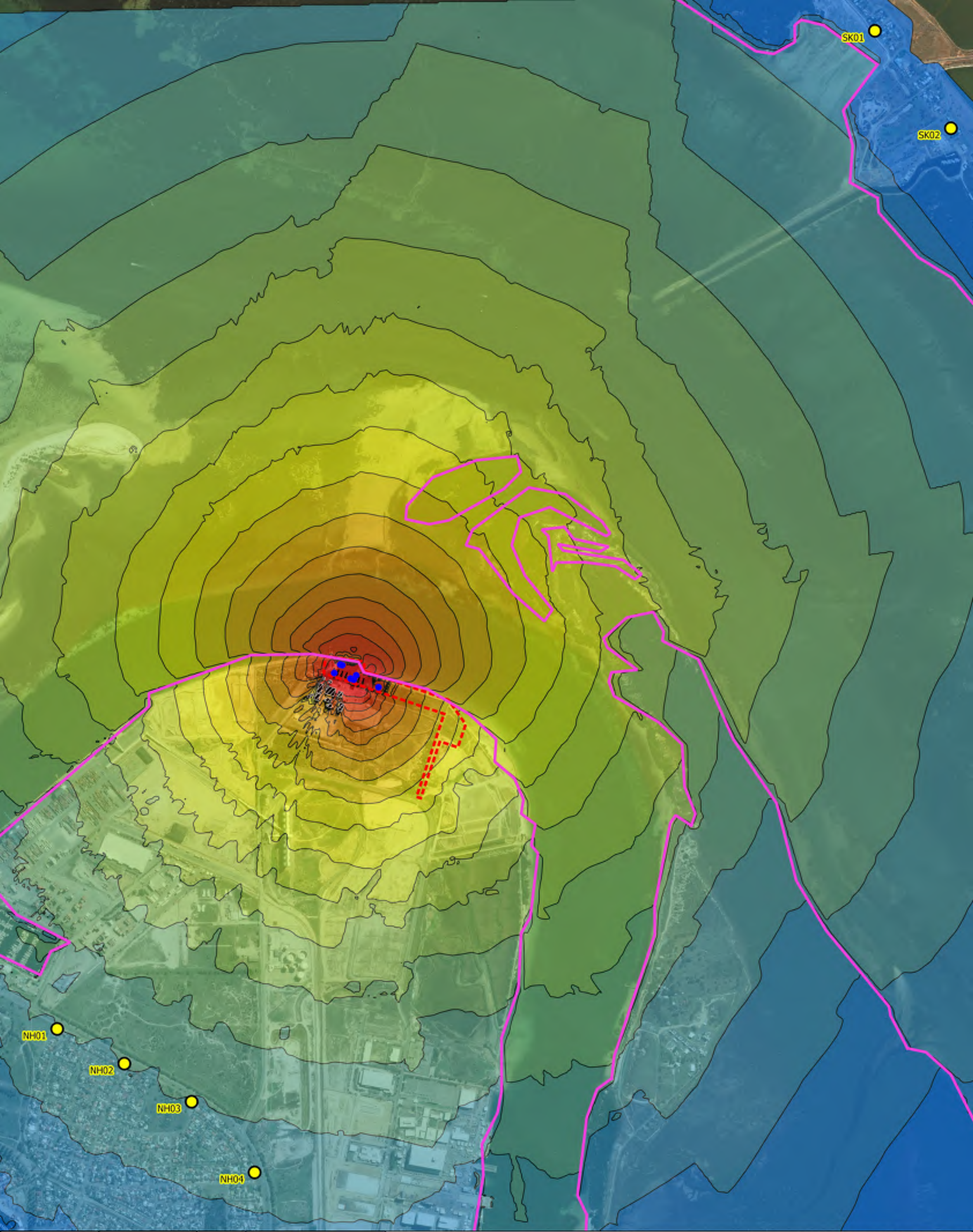





PRELIMINARY ONLY
NOT FOR CONSTRUCTION

APPENDIX B

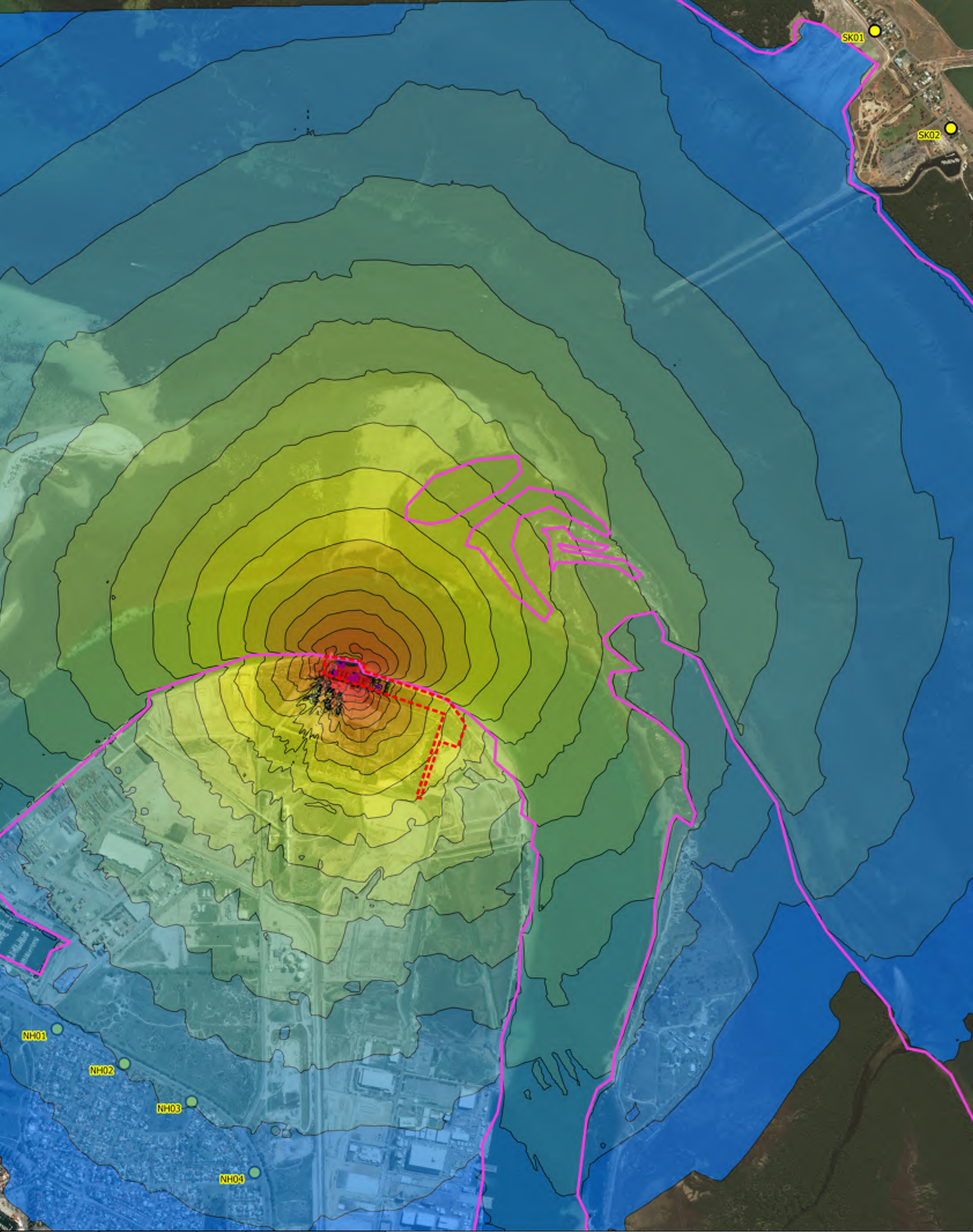
NOISE CONTOUR PLOTS

































Map: A1-F1	Author: LF		 1:15,000 at A3	Legend <ul style="list-style-type: none"> ● Noise source — Elevation line — Coastline ● Receivers Site boundary 	Leq noise contours <table border="0"> <tr> <td> 36</td> <td> 44</td> <td> 56</td> <td> 68</td> </tr> <tr> <td> 38</td> <td> 46</td> <td> 58</td> <td> 70</td> </tr> <tr> <td> 40</td> <td> 48</td> <td> 60</td> <td> 72</td> </tr> <tr> <td> 42</td> <td> 50</td> <td> 62</td> <td> 74</td> </tr> <tr> <td></td> <td> 52</td> <td> 64</td> <td></td> </tr> <tr> <td></td> <td> 54</td> <td> 66</td> <td></td> </tr> </table>	 36	 44	 56	 68	 38	 46	 58	 70	 40	 48	 60	 72	 42	 50	 62	 74		 52	 64			 54	 66		Pelican Point Peaker Power Station Noise contours - No mitigation 
 36	 44					 56	 68																							
 38	 46	 58	 70																											
 40	 48	 60	 72																											
 42	 50	 62	 74																											
	 52	 64																												
	 54	 66																												
Date: 12/09/2019	Approved by: AC	Coordinate system: GDA94, MGA zone 54 Aerial imagery source: Google Satellite																												

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Map: A-2	Author: LF		 1:15,000 at A3	Legend <ul style="list-style-type: none">  Noise source  Elevation line  Coastline  Receivers  Site boundary 	Leq noise contours <ul style="list-style-type: none">  36  38  40  42  44  46  48  50  52  54  56  58  60  62  64  66  68  70  72  74 	Pelican Point Peaker Power Station Noise contours - With mitigation 
Date: 12/09/2019	Approved by: AC					

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APPENDIX H

PRELIMINARY SITE INVESTIGATION



Design
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PORT ADELAIDE ENERGY PTY LTD

**GAS TURBINE PEAKER
PROJECT AT OUTER
HARBOR**

PRELIMINARY SITE
INVESTIGATION (PSI)

wsp

OCTOBER 2019

Question today Imagine tomorrow Create for the future

Gas Turbine Peaker Project at Outer Harbor Preliminary Site Investigation (PSI)

Port Adelaide Energy Pty Ltd

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REV	DATE	DETAILS
00	20/09/2019	Draft
01	16/10/2019	Final

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Reviewed by:	Shya Jackson	16/10/2019	
Approved by:	Bronte Nixon	16/10/2019	

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APPENDIX C	CERTIFICATES OF TITLE
APPENDIX D	SA EPA SECTION 7 SEARCH

ABBREVIATIONS

ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASRIS	Australian Soil Resource Information System
AS	Australian Standard
ASS	Acid sulfate soil
BGL	Below ground level
CEMP	Construction and Environmental Management Plan
CT	Certificate of Title
DEW	Department for Environment and Water
NEPC	National Environment Protection Council
PSI	Preliminary Site Investigation
SA EPA	South Australian Environment Protection Authority
SAWMC	South Australian Waste Management Commission
WHS	Work, Health and Safety

EXECUTIVE SUMMARY

The Gas Turbine Peaker Project at Outer Harbor (the Project) involves the relocation of five (5) trailer mounted turbine generators, and ancillary infrastructure, from an existing site at Elizabeth to a new site adjacent to the Pelican Point Power Station, at Outer Harbor. The turbines are currently operated by the South Australian Government (SA Government) for emergency electricity generation, as part of South Australia's emergency back-up power station.

Port Adelaide Energy Pty Ltd, an affiliate Nexif Energy Australia Pty Ltd (Nexif Energy) propose to lease the turbines from the SA Government, and operate them for a permanent commercial use. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up. It is proposed that the Project will connect into the nearby Pelican Point Power Station fuel gas yard (owned by Epic Energy) and Pelican Point Power Station switchyard (owned by ElectraNet).

The Site is situated between the coastal waters of the Port River and the Pelican Point Power Station, and is located within the City of Port Adelaide Enfield under the Industry Zone. The Site will be comprised of the following land parcels:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – Certificate of Title (CT) 5920/564 (Parcel 1)
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – CT 6088/191 (Parcel 2)
- a portion of allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – CT 6012/888 (Parcel 3).

It is anticipated that an additional, existing site access road will be utilised for the Project. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – CT 6103/374 (Parcel 4).

A desktop preliminary site investigation (PSI) is one of several specialist or technical studies required to be undertaken for the site to support the planning approval process. The main objective of the PSI was to identify site contamination issues which may have resulted from past and/or current site use(s) and which may significantly impact the proposed use of the site for commercial/industrial use and/or represent potential public health or environmental risks.

The main findings of the PSI are as follows:

- The site is located in an industrial area of Outer Harbor and Osborne, and immediately surrounding land uses included Port Adelaide River and Pelican Point Power Station, with the areas west and east being vacant, undeveloped land. Sensitive ecological receptors include Mutton Cove Conservation Reserve approximately 300 m south-east and Torrens Island Conservation Park approximately 600 m north and north-east of the site at its closest point.
- Review of historical aerial images generally indicated all four parcels were vacant and undeveloped from at least 1959. Construction within the site boundary has generally been limited to unsealed roads and filling, as well as construction of a jetty or berth in the north-west corner of Parcel 1 from at least 2004.
- From 1991–1992 the site was licensed as a solid waste landfill depot for the disposal of limestone grits from Penrice Soda Products Pty Ltd. Based on a historical title image search for the stated piece of land, it appeared that the location of the depot was off-site, adjoining Parcel 2 (CT 6088/191) to the east.
- A section 83A site contamination notification (May 2019) exists for CT 6088/191 relating to a portion of the CT located off-site approximately 50 m east/south-east at its closest point. The potentially contaminating activity was described as 'placement of dredge material'. The concentration of metals and cyanide in groundwater exceeded the adopted ecological assessment criteria (marine waters).

- The following potentially contaminating activities were *confirmed* to have occurred at the site:
 - landfill operations/disposal of waste
 - use of imported, and potentially impacted fill materials.
- The following potentially contaminating activity was *confirmed* to have occurred *adjacent* the site:
 - placement of dredge material
 - stockpiling of waste and soil.
- It is considered possible that the following potentially contaminating activities *may* have occurred at the site:
 - placement of dredge material
 - port activities, including cleaning or maintenance of vessels - corrosion of metal structures and use of metal based anti-fouling paints.
- The extent and contamination status of fill material and landfill waste has not been investigated. However, given that the licence was issued for disposal of limestone grit only, this activity and the use of fill material which appears to be confined to roadways, have been considered to represent a relatively minor risk with respect to site contamination.
- The extent and contamination status of the stockpiles has not been investigated but appear to be outside the site boundary (adjacent Parcel 2). The location and extent of this material, along with the dumped pieces of concrete, should be investigated to confirm it does not extend into the site. Based on photographs the stockpiled material appears to comprise sand which may be from the local area. Therefore, the risk has been considered to be minor due to the general localised nature and confinement of any potential contamination to shallow soils.
- The placement of dredge material has not been confirmed at the site and therefore the possible significance is unknown. It has however been confirmed at an adjacent site and contamination of groundwater has been reported. It is therefore possible that contaminants may migrate in groundwater and extend beneath the site.
- The use of anti-fouling paints or occurrence of cleaning or maintenance activities associated with vessels has not been confirmed at the site. However, based on the activity and associated potential contaminants the risk has generally been considered to be minor due to the general localised nature and confinement of the potential contamination to shallow soils.

The following recommendations are made:

- Consideration should be given to the occurrence of acid sulfate soils (ASS) at the site, during excavation works. Although the site was classified as low probability of occurrence, Mutton Cove approximately 300 m south-east of the site had a high probability of ASS occurring. This may have implications for buried structures or management of excavated soil during construction phase of the project.
- Given the sites' proximity to the marine environment of Port River, it is recommended that a Construction and Environmental Management Plan (CEMP) be developed for implementation during construction phase of the project. The CEMP is designed to provide a framework to effectively manage all significant work, health and safety (WHS) and environmental risks associated with the project.

1 INTRODUCTION

1.1 THE GAS TURBINE PEAKER PROJECT AT OUTER HARBOR

The Gas Turbine Peaker Project (the Project) involves the relocation of five (5) trailer mounted turbine generators, and ancillary infrastructure, from an existing site at Elizabeth to a new site adjacent to the Pelican Point Power Station, at Outer Harbor. The turbines are currently operated by the South Australian Government (SA Government) for emergency electricity generation, as part of South Australia's emergency back-up power station; developed in response to state-wide blackouts in 2017.

Nexif Energy Australia Pty Ltd (Nexif Energy) propose to lease the turbines from the SA Government, and operate them for a permanent commercial use. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up. It is proposed that the Project will connect into the nearby Pelican Point Power Station fuel gas yard (owned by Epic Energy) and Pelican Point Power Station switchyard (owned by ElectraNet).

1.2 PROJECT AREA

The Project site (the Site) will be located adjacent to the Pelican Point Power Station at Outer Harbor, approximately 20 km north of Adelaide. The land is owned by Renewal SA, and will be leased by Nexif Energy for this Project. The Site is situated between the coastal waters of the Port River and the Pelican Point Power Station, and is located within the City of Port Adelaide Enfield under the Industry Zone. The Site will be comprised of the following land parcels:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – title reference CT 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6012/888.

It is anticipated that an additional, existing site access road will be utilised for the Project. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.

A desktop preliminary site investigation (PSI) is one of several specialist or technical studies required to be undertaken for the site to support the planning approval process.

1.3 OBJECTIVES

The main objective of the PSI was to identify site contamination issues which may have resulted from past and/or current site use(s) and which may significantly impact the proposed use of the site for commercial/industrial use and/or represent potential public health or environmental risks.

1.4 LEGISLATIVE AND POLICY REQUIREMENTS

This report has been prepared in accordance with the guidance provided in the following documents:

- National Environment Protection Council (NEPC 2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended in 2013 (ASC NEPM).
- Planning SA (2001) *Site Contamination*. Planning Advisory Notice 20¹.
- Standards Australia (2005) *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds*. AS4482.1-2005 Homebush NSW.

1.5 ASSESSMENT METHODOLOGY

The research components of the report are detailed in Table 1.1.

Table 1.1 Summary of PSI research components

COMPONENT	SECTION OF REPORT
Site Characterisation	Section 2
Site identification	Section 2.1
Site features	Section 2.2
Adjacent land uses and sensitive receptors	Section 2.3
Regional geology	Section 2.4
Regional hydrogeology	Section 2.5
Zoning	Section 2.6
Historical information	Section 3
History of Certificates of Title	Section 3.1
Aerial photographs	Section 3.2
EPA Section 7 search	Section 3.3
EPA Public Register search	Section 3.4
Historical business directories	Section 3.5

A report was produced by Lotsearch (provided in Appendix A) to provide an overview of some of the site history, environmental risk and planning information, referred to herein:

Lotsearch (2019) *Lotsearch Enviro Professional, Pelican Point Road, Outer Harbour, SA 5018*, dated 6 August 2019, Reference LS007805 EP.

Searches undertaken by Lotsearch utilised the four certificates of title outlined in Section 1.2.

¹ The SA Government is in the process of amending and updating the procedures and regulations regarding site contamination and its connection to the planning system. The Draft Site Contamination Framework for the South Australian Planning System (2015) is yet to be finalised.

2 EXISTING CONDITIONS

2.1 SITE IDENTIFICATION

Site information details are provided in Table 2.1 below. Figures showing the site location and boundaries are included as Figures 1 and 2 in Appendix B.

Table 2.1 Site information

SITE ADDRESS	Pelican Point Road, Outer Harbor, SA, 5018 (Parcel 1, 3 and Parcel 4) Mersey Road, Osborne, SA, 5017 (Parcel 2)
TITLE REFERENCE	CT Volume 5920 Folio 564 (Parcel 1) CT Volume 6088 Folio 191 (Parcel 2) CT Volume 6012 Folio 888 (Parcel 3) CT Volume 6103 Folio 374 (Parcel 4)
PROPERTY DESCRIPTION	Portion of Allotment 205 in Deposited Plan 64682 In the Area named Outer Harbor (Parcel 1) Portion of Allotment 502 in Deposited Plan 87145 In the Area named Osborne (Parcel 2) Portion of Allotment 27 in Deposited Plan 76309 In the Area named Outer Harbor (Parcel 3) Piece 152 in Deposited Plan 88633 In the Area named Outer Harbor (Parcel 4) Hundred of Port Adelaide
PROPERTY OWNER	Urban Renewal Authority
COUNCIL ZONING	Industry (In)
CURRENT SITE USE	Vacant/undeveloped (Parcel 1 & 2) and road (Parcel 3 & 4)
PROPOSED SITE USE	Commercial/Industrial
LAND AREA	Approximately 8.6 hectares (leased area only)

2.2 SITE FEATURES

A site inspection was not undertaken for the specific purpose of the PSI; however a brief description of some site features is provided below based on photographs provided by others:

- A pile of concrete (possibly over an area up to 15 m²) is present on CT 6088/191 however may be outside the site boundary of Parcel 2.
- Small (estimated to be < 3 m³), possibly sand, stockpiles are present on CT 6088/191, but as with the concrete appear to be outside the site boundary.
- Parcel 3 is generally a dirt road which has been built up compared to the surrounds, and a dirt road and sea wall is present adjacent the coastline of Parcel 1. Immediately south of this is low-lying vacant land with grasses and sparse coastal shrubs, likely prone to tidal seepage and possibly seawater inundation during extreme weather conditions.
- No photos were provided of Parcel 4.

2.3 ADJACENT LAND USES AND SENSITIVE RECEPTORS

At the time of the inspection, the observed immediately surrounding land uses were as detailed in Table 2.2 below:

Table 2.2 Surrounding land uses

NORTH	Port Adelaide River
SOUTH	Pelican Point Power Station
EAST	Vacant, undeveloped land then Port Adelaide River
WEST	Vacant, undeveloped land then cleared land further west

The site is located in an industrial area of Outer Harbor and Osborne. Port Adelaide River surrounds the site to the north and a wetland/waterbody associated with Mutton Cove Conservation Reserve is located approximately 300 m south-east of the site. Two dams or reservoirs are located in the adjacent Pelican Point Power Station, immediately south of the site.

Sensitive human and environmental receptors located within the vicinity of the site are considered likely to include the following:

- Mutton Cove Conservation Reserve approximately 300 m south-east and Torrens Island Conservation Park approximately 600 m north and north-east of the site at its closest point
- future users of and maintenance workers on the site
- adjacent site users
- workers who may undertake excavation, maintenance or construction work within the surrounding area (i.e. to the site developments, underground services).

2.4 REGIONAL GEOLOGY

The 1:100,000 surface geology indicates that the region is underlain by the Saint Kilda Formation (Lotsearch, 2019). This formation is characterised by coastal marine sediment: calcareous, fossiliferous sand and mud of intertidal sand flats, beaches and tidal marshes; organic, gypseous clay of supratidal flats.

According to the Australian Soil Resource Information System (ASRIS) website (<http://www.asris.csiro.au/mapping/viewer.htm>), the area of Outer Harbor and Osborne that includes the site has a low probability of acid sulfate soils (ASS) occurring. Mutton Cove Conservation Reserve approximately 300 m south-east of the site however, has a high probability of ASS occurring.

2.5 REGIONAL HYDROGEOLOGY

A summary of the Department for Environment and Water (DEW, 2019) WaterConnect bore database for the area (Lotsearch, 2019) indicates that one registered bore is located on the site. It was drilled to 35.8 m depth in 1970 for exploration purposes, however the status is abandoned. Outside the site boundary, there are 107 registered bores within a 2 km radius of the site, of which, 83 were listed as groundwater bores. A summary of the registered bores including status, purpose, maximum drill depth, salinity and standing water level is included in the Lotsearch report. The majority of bores are located south of the site and are for investigation purposes.

2.6 ZONING

According to the Port Adelaide Enfield Council Development Plan (consolidated 6 February 2018), the site is currently zoned Industry. The main objectives of this zone are as follows:

- industrial, warehouse, storage, commercial and transport distribution development on appropriately located land, integrated with transport networks and designed to minimise potential impact on these networks
- industrially zoned allotments and uses protected from encroachment by adjoining uses that would reduce industrial development or expansion
- industrial, warehouse, storage, commercial and transport distribution development occurring without adverse effects on the health and amenity of occupiers of land in adjoining zones
- compatibility between industrial, warehouse, storage, commercial and transport distribution uses within industrial zones
- the improved amenity of industrial areas
- no expansion and/or intensification of existing special industries unless it will result in a significant net benefit to the amenity, environmental impacts or the generation of renewable energy.

3 HISTORICAL INFORMATION

3.1 HISTORY OF CERTIFICATES OF TITLE

The site is currently described by CTs Volume 5920 Folio 564, Volume 6012 Folio 888, Volume 6088 Folio 191 and Volume 6103 Folio 374. Copies of the current CTs are included in Appendix C. A search of historical CTs relating to the site was undertaken and found a very large number relate to portions of the various current CTs. The succession of parent titles came back to four land grants (outlined below) and a brief outline of previous owners is also provided below:

- The original land grant for the property described as Block 10, Hundred of Port Adelaide (comprising a portion of the site), was issued to **The South Australian Harbors Board** on 18 April 1923.
- The original land grant for the property described as Section number 2113, Hundred of Port Adelaide (comprising a portion of the site), was issued to **Minister of Marine** on 23 November 1976.
- The original land grant for the property described as Blocks 1, 2, 3, 4, 5 and Sections 338 and 339, Hundred of Port Adelaide (comprising a portion of the site), was issued to **The South Australian Harbors Board** on 22 May 1920.
- The original land grant for the property described as Blocks 33, 34, 35 and 36, Hundred of Port Adelaide (comprising a portion of the site), was issued to **The South Australian Harbors Board** on 22 November 1923.

Listed owners on the various Certificates of Title (oldest to newest) were as follows:

- The South Australian Harbors Board, Minister of Marine, Minister for Transport Development of Port Adelaide, MFP Development Corporation, Minister for Environment and Conservation, Minister for Economic Development, South Australian Ports Corporation, Treasurer of Adelaide, Minister for Infrastructure, Land Management Corporation and Urban Renewal Authority.

3.2 AERIAL PHOTOGRAPH REVIEW

Copies of relevant portions of aerial photographs of the site and surrounds are included in the Lotsearch report (Appendix A). A summary of the features identified within each of the aerial photographs is provided in Table 3.1.

Table 3.1 Aerial photograph review

YEAR	DESCRIPTION
1959	The site was vacant and undeveloped. An estuary was present in Parcel 1, with a creek extending off-site in a general south-west/north-east orientation and vegetation was present across much of Parcel 1 and northern portion of Parcels 2 and 3.
1969	A fenceline and/or dirt track was present through the western portion of Parcel 1 in a general north-south orientation, extending off-site to the south. The remainder of the site appeared unchanged.
1979	Additional unsealed roads had been constructed along the shoreline and vegetation appeared to be largely cleared from the site and the immediately surrounding area. The estuary and creek had been filled.
1989	The site and surrounds appeared relatively unchanged although additional unsealed roads had been constructed throughout the surrounding area.

YEAR	DESCRIPTION
1999	<p>Additional roads had been constructed and the road in Parcel 4 was grey, potentially indicating importation of roadbase or covering. Some re-growth of vegetation had occurred in the east of the site and immediately surrounding area.</p> <p>Construction had occurred at Pelican Point Power Station with a large building, some vehicles or shipping containers, and clearing of sections of land adjacent Parcel 4. Pelican Point Road appeared bituminised.</p>
2004	<p>The site appeared relatively unchanged with the exception of a jetty or berth in the north-west corner of Parcel 1.</p> <p>Additional development of the Pelican Point Power Station had occurred and numerous buildings and infrastructure were present immediately east of Parcel 4 and south of Parcel 1.</p>
2010	<p>The site appeared relatively unchanged with the exception of some earthmoving in the southern portion of Parcel 2 (including outside the site boundary).</p> <p>A large reservoir had been constructed west of the site and additional development and construction had occurred south of Pelican Point Road associated with the Viterra site, including silos and railway line, and earthmoving east of the railway line.</p>
2017	<p>The site appeared relatively unchanged.</p> <p>Pelican Point Road (east-west orientation) and Mersey Road North were bituminised. A reservoir was present south-east of Parcel 2 and the earthworks associated with areas south and south-east of the site previously had been completed and the land levelled.</p>

3.3 EPA SECTION 7 SEARCH

A Section 7 search was conducted by the South Australian Environment Protection Authority (SA EPA) for the land described in the three Certificates of Title – Volume 5920 Folio 564, Volume 6088 Folio 191, and Volume 6102 Folio 888.

The Section 7 Search results note that historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete.

A copy of the search results is included in Appendix D and indicated the following:

VOLUME 5920 FOLIO 564 (PARCEL 1)

- There are no mortgages, charges or prescribed encumbrances affecting Parcel 1 under the relevant sections of the *Environment Protection Act 1993*.
- No licences recorded by EPA in the public register have been issued under the Part 6 of the *Environment Protection Act 1993*. An exemption no longer in force has been issued under Part 6 of the *Environment Protection Act 1993* in relation to an activity carried out at the land.
 - The exemption related to Licence 38242 issued to Pelican Point Power Limited for Allotment 205 (DP 64682) and Allotments 26, 28 and 29 (DP 52266), Pelican Point Road, Outer Harbor, 5018, SA. The prescribed activity being ‘discharges to marine or inland waters’.
- A licence has been issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land.
- No licences to produce prescribed or listed waste have been issued or repealed for the site under the *South Australian Waste Management Commission Act 1979*, the *Waste Management Act 1987* or the *Environment Protection Act 1993*.

- The EPA does hold details of records, held by the former *South Australian Waste Management Commission* under the repealed *Waste Management Act 1987*, of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995.
- The parcel of land was licenced as a solid waste landfill depot by the South Australian Waste Management Commission (SAWMC) for the disposal of waste; the type of waste received was industrial wastes.
- Other relevant information for the parcel included:
 - lime grits from Penrice Soda Products Pty Limited was deposited on this parcel of land
 - type of waste received: acids and acidic solutions, alkalis and alkaline solutions, and grease trap wastes.
- The EPA does not hold any of the following information:
 - reports, environmental assessments or site contamination audits of the land or any part of the land
 - details of serious or material harm, or notifications of site contamination, under Section 83A of the *Environment Protection Act 1993*
 - details of an agreement for the exclusion or limitation of liability for site contamination
 - details of any agreements relating to approved voluntary site contamination assessment or remediation proposals; or
 - details of notification of the commencement or termination of a site contamination audit

VOLUME 6088 FOLIO 191 (PARCEL 2)

- There are no mortgages, charges or prescribed encumbrances affecting Parcel 2 under the relevant sections of the *Environment Protection Act 1993*.
- No licences and exemptions recorded by EPA in public register have been issued under the Part 6 of the *Environment Protection Act 1993*.
- A licence has been issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land.
- No licences to produce prescribed or listed waste have been issued or repealed for the site under the *South Australian Waste Management Commission Act 1979*, the *Waste Management Act 1987* or the *Environment Protection Act 1993*.
- The EPA does hold details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*.
 - the notification relates to a portion of the CT located off-site approximately 50 m east/south-east at its closest point, and the potentially contaminating activity was described as ‘placement of dredge material’
 - the following chemical groups were identified as being responsible for site contamination that affects or threatens groundwater: metals and metalloids, petroleum hydrocarbons, non-metallic inorganics, and organic alcohols/other organics
 - contamination has been identified in groundwater and the depth to groundwater ranges from 0.7 to 2.5 m below ground level (mBGL).
- The EPA does hold details of records, held by the former *South Australian Waste Management Commission* under the repealed *Waste Management Act 1987*, of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995.
- The parcel of land was licenced as a solid waste landfill depot by the SAWMC for the disposal of waste; the type of waste received was industrial wastes.
- Other relevant information for the parcel included:
 - the parcel of land was used for the deposition of waste without being licenced by the SAWMC. Lime grits from Penrice Soda Products Pty Limited was deposited on this parcel of land
 - type of waste received: acids and acidic solutions, alkalis and alkaline solutions, and grease trap wastes.

- The EPA does not hold any of the following information:
 - reports, environmental assessments or site contamination audits of the land or any part of the land
 - details of serious or material harm under Section 83A of the *Environment Protection Act 1993*
 - details of an agreement for the exclusion or limitation of liability for site contamination
 - details of any agreements relating to approved voluntary site contamination assessment or remediation proposals; or
 - details of notification of the commencement or termination of a site contamination audit

VOLUME 6012 FOLIO 888 (PARCEL 3)

- There are no mortgages, charges or prescribed encumbrances affecting Parcel 3 under the relevant sections of the *Environment Protection Act 1993*.
- No licences and exemptions recorded by EPA in public register have been issued under the Part 6 of the *Environment Protection Act 1993*.
- A licence has been issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land.
- No licences to produce prescribed or listed waste have been issued or repealed for the site under the *South Australian Waste Management Commission Act 1979*, the *Waste Management Act 1987* or the *Environment Protection Act 1993*.
- The EPA does hold details of records, held by the former *South Australian Waste Management Commission* under the repealed *Waste Management Act 1987*, of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995.
- The parcel of land was licenced as a solid waste landfill depot by the SAWMC for the disposal of waste; the type of waste received was industrial wastes.
- Other relevant information for the parcel included:
 - the parcel of land was used for the deposition of waste without being licenced by the SAWMC. Lime grits from Penrice Soda Products Pty Limited was deposited on this parcel of land
 - type of waste received: acids and acidic solutions, alkalis and alkaline solutions, and grease trap wastes.
- The EPA does not hold any of the following information:
 - reports, environmental assessments or site contamination audits of the land or any part of the land
 - details of serious or material harm, or notifications of site contamination, under Section 83A of the *Environment Protection Act 1993*
 - details of an agreement for the exclusion or limitation of liability for site contamination
 - details of any agreements relating to approved voluntary site contamination assessment or remediation proposals; or
 - details of notification of the commencement or termination of a site contamination audit.

A copy of the Waste Depot Licence (as referred to in Parcels 1-3) was provided by SA EPA (and is included in Appendix D), with details of the licence provided below:

- Licensee: Penrice Soda Products Pty Ltd.
- Depot address: Portion of Lot 8, Hundred of Port Adelaide, Pelican Point, Outer Harbor.

The location of the waste depot refers to a historical CT (portion of 1276/200) which was 157 hectares in size and included Parcels 1-3. A handwritten note within the document refers to CT 5216/528 and D28523 (cancelled title) and based on a historical title image search for this piece of land, it was located off-site, east of Parcel 2 (adjoining) comprising a narrow piece of land along the coast line.

- Date: 12 December 1991 to 26 November 1992.

- The depot was solely for the reception, storage or disposal of waste limestone sands arising from Penrice Soda Products Pty Ltd operations.

An exemption was granted to Penrice Soda Products Pty Ltd by the SAWMC on 23 June 1992 to deposit waste on the Le Fevre Peninsula. This was following a proposal by Department of Environment and Planning to rehabilitate low-lying areas of the Le Fevre Peninsula by filling holes and covering with shell, grit and sea grasses. DEP considered limestone grit waste from Penrice as suitable. Based on the hand drawn figure provided, the areas designated as part of the exemption were located off-site, approximately 1.4 km south at its closest point.

3.4 EPA PUBLIC REGISTER SEARCH

The following summarises information obtained from the SA EPA public register to assess whether any Section 83A notifications or environmental authorisations (licences, exemptions and works approvals) had been recorded for the site and in the surrounding area.

3.4.1 *SITE CONTAMINATION INDEX*

Seven records listed within a 1 km radius of the site: one for pre-1 July 2009 Audit notification, one for pre-1 July 2009 Audit termination, one for Audit notification, one for Audit report, one 109 Notification, and two Section 83A Notifications. The records related to two parcels of land located approximately 700 m south-west of the site and one parcel approximately 1 km south of the site.

Where available the contaminating activities included fill or soil importation and listed substances (storage).

3.4.2 *AUTHORISATIONS AND APPLICATIONS*

Three records relate to a licence for Pelican Point Power Limited and is located on part of the site. The prescribed activities listed include: chemical works (inorganic), activity producing listed wastes, fuel burning not coal or wood, and discharges to marine or inland waters.

An additional sixteen records are listed for EPA authorisations or applications relating to off-site properties within a 1 km radius of the site. Details relating to these records are summarised in Lotsearch (2019) in Appendix A.

3.5 HISTORICAL BUSINESS DIRECTORIES

To determine the activities of businesses that may be listed on historical Certificates of Title, the 1991 and 1984 UBD Business to Business Directory, and the 1910, 1920, 1930, 1940, 1950, 1955, 1965, and 1973 Sands & McDougall's Directory were searched but no records relating to the four Certificates of Title were recorded.

Outside the site boundary (150 m buffer) several records existed in the 1991 UBD Business to Business Directory mapped to a road or area (when a building number is not supplied). The business activities (all approximately 10 m south of the site) included: electrical engineers, electric manufacturers and/or importers and/or distributors, constructional engineers, heavy engineers, and spray painting services.

Records for dry cleaners, motor garages and service stations from UBD Business Directories and Sands & McDougall's Directories were searched but no records were found for the site or surrounds (150 m buffer).

4 DISCUSSION

4.1 HISTORICAL OVERVIEW

The findings of the PSI assessment indicated that the original four land grants which cover the parcels making up the site were issued to The South Australian Harbors Board in 1920 and 1923 (three grants) and the Minister of Marine in 1976. Listed owners have generally comprised government departments.

The site was vacant and undeveloped up until at least 1959. Construction within the site boundary has generally been limited to unsealed roads and filling, as well as construction of a jetty or berth in the north-west corner of Parcel 1 from at least 2004.

The site was licenced as a solid waste landfill depot by SAWMC (from 1991 to 1992) for the disposal of industrial waste. Limestone grits from Penrice Soda Products Pty Ltd was deposited within the broader CT boundaries, but it appeared that the location of the depot was off-site, adjoining Parcel 2 (CT 6088/191) to the east.

A section 83A site contamination notification (May 2019) exists for CT 6088/191 relating to a portion of the CT located off-site approximately 50 m east/south-east at its closest point, and the potentially contaminating activity was described as 'placement of dredge material'. The concentration of several contaminants (including metals and cyanide) in groundwater exceeded the adopted assessment criteria.

Three records for environmental authorisations (licences, exemptions and works approvals) were located on part of the site and relate to a licence for Pelican Point Power Limited. The prescribed activities listed include: chemical works (inorganic), activity producing listed wastes, fuel burning not coal or wood, and discharges to marine or inland waters.

4.2 POTENTIALLY CONTAMINATING ACTIVITIES

The following potentially contaminating activities were *confirmed* to have occurred at the site:

- landfill operations/disposal of waste
- use of imported, and potentially impacted fill materials.

The following potentially contaminating activity was *confirmed* to have occurred *adjacent* the site:

- placement of dredge material
- stockpiling of waste and soil.

It is considered possible that the following potentially contaminating activities *may* have occurred at the site:

- placement of dredge material
- port activities, including cleaning or maintenance of vessels - corrosion of metal structures and use of metal based anti-fouling paints.

A more detailed summary of the potentially contaminating activities, including potential contaminants, likely locations and possible significance, is provided in Table 4.1.

Table 4.1 Summary of potentially contaminating activities

POTENTIALLY CONTAMINATING ACTIVITY	POTENTIAL CONTAMINANTS	LIKELY LOCATIONS	POSSIBLE SIGNIFICANCE/RISK
Confirmed activities:			
Landfill operations/disposal of waste	Limestone grit (calcium carbonate)	Unknown, but may be off-site	Unknown but probably minor: Based on the provided Waste Depot Licence, the landfill appeared to be located off-site and was only licensed for disposal of limestone grit. This comprises calcium carbonate which is non-hazardous and not considered to represent a risk for contamination.
Use of imported, and potentially impacted, fill materials	Metals, polycyclic aromatic hydrocarbons, petroleum hydrocarbons, solvents, asbestos, pesticides and/or polychlorinated biphenyls	Dirt roads through site	Unknown but probably minor: Based on supplied photographs, imported fill material appears to be present to raise and construct the dirt roads through the site. Such materials have the potential to contain concentrations of chemicals which may preclude the site for certain future land uses (i.e. depending on possible human exposure scenarios) or aesthetically and/or geotechnically unsuitable, without further assessment and/or remediation.
Confirmed activities (adjacent the site) & unconfirmed activities (on-site)			
Placement of dredge material	Metals, petroleum hydrocarbons	Unknown	Moderate: Groundwater data from a site adjacent Parcel 2 (and part of CT 6088/191) found concentrations of metals and cyanide exceeded adopted ecological (marine) assessment criteria. It is not known if dredge material was placed across the site, however it is possible that contaminants in groundwater may extend beyond the off-site source.
Stockpiling of waste	Concrete, metals, polycyclic aromatic hydrocarbons, petroleum hydrocarbons, solvents, asbestos, pesticides and/or polychlorinated biphenyls	Adjacent Parcel 2 (within CT 6088/191)	Unknown but probably minor: Based on supplied photographs, small stockpiles of (possibly) sand and concrete is present. Such materials have the potential to contain concentrations of chemicals which may preclude the site for certain future land uses (i.e. depending on possible human exposure scenarios) or aesthetically and/or geotechnically unsuitable, without further assessment and/or remediation. Confirmation of the location and extent is required with respect to the site boundary.

POTENTIALLY CONTAMINATING ACTIVITY	POTENTIAL CONTAMINANTS	LIKELY LOCATIONS	POSSIBLE SIGNIFICANCE/RISK
Unconfirmed activities			
Port activities, including cleaning or maintenance of vessels	Metals, tributyl tin, petroleum hydrocarbons, polycyclic aromatic hydrocarbons	Northern portion, along coastline	Unknown but probably minor: Use of anti-fouling paints or occurrence of cleaning or maintenance activities associated with vessels has not been confirmed at the site. Should this have occurred, contamination is likely to be localised and confined to surface soils.

5 SUMMARY AND RECOMMENDATIONS

The following conclusions are made following the Preliminary Site Investigation for a site identified as CTs Volume 5920 Folio 564, Volume 6012 Folio 888, Volume 6088 Folio 191 and Volume 6103 Folio 374:

- The site is located in an industrial area of Outer Harbor and Osborne, and immediately surrounding land uses included Port Adelaide River and Pelican Point Power Station, with the areas west and east being vacant, undeveloped land.
- Sensitive ecological receptors include Mutton Cove Conservation Reserve approximately 300 m south-east and Torrens Island Conservation Park approximately 600 m north and north-east of the site at its closest point.
- The area of Outer Harbor and Osborne that includes the site has a low probability of acid sulfate soils occurring. Mutton Cove Conservation Reserve approximately 300 m south-east of the site however, has a high probability of acid sulfate soils occurring.
- Review of historical aerial images generally indicated all four parcels were vacant and undeveloped from at least 1959. Construction within the site boundary has generally been limited to unsealed roads and filling, as well as construction of a jetty or berth in the north-west corner of Parcel 1 from at least 2004.
- The original four land grants which cover the parcels making up the site were issued to The South Australian Harbors Board in 1920 and 1923 (three grants) and the Minister of Marine in 1976. Listed owners have generally comprised government departments.
- The site was licenced as a solid waste landfill depot from 1991-1992 for the disposal of limestone grits from Penrice Soda Products Pty Ltd. Based on a historical title image search for the stated piece of land, it appeared that the location of the depot was off-site, adjoining Parcel 2 (CT 6088/191) to the east.
- A section 83A site contamination notification (May 2019) exists for CT 6088/191 relating to a portion of the CT located off-site approximately 50 m east/south-east at its closest point, and the potentially contaminating activity was described as 'placement of dredge material'. The concentration of metals and cyanide in groundwater exceeded the adopted ecological assessment criteria (marine waters).
- The following potentially contaminating activities were *confirmed* to have occurred at the site:
 - landfill operations/disposal of waste
 - use of imported, and potentially impacted fill materials.
- The following potentially contaminating activity was *confirmed* to have occurred *adjacent* the site:
 - placement of dredge material
 - stockpiling of waste and soil.
- It is considered possible that the following potentially contaminating activities *may* have occurred at the site:
 - placement of dredge material
 - port activities, including cleaning or maintenance of vessels - corrosion of metal structures and use of metal based anti-fouling paints.
- The extent and contamination status of fill material and landfill waste has not been investigated. However, given that the licence was issued for disposal of limestone grit only, this activity and the use of fill material which appears to be confined to roadways, have been considered to represent a relatively minor risk with respect to site contamination.

- The extent and contamination status of the stockpiles has not been investigated but appear to be outside the site boundary (adjacent Parcel 2). The location and extent of this material, along with the dumped pieces of concrete, should be investigated to confirm it does not extend into the site. Based on photographs the stockpiled material appears to comprise sand which may be from the local area. Therefore, the risk has been considered to be minor due to the general localised nature and confinement of any potential contamination to shallow soils.
- The placement of dredge material has not been confirmed at the site and therefore the possible significance is unknown. It has however been confirmed at an adjacent site and contamination of groundwater has been reported. It is therefore possible that contaminants may migrate in groundwater and extend beneath the site.
- The use of anti-fouling paints or occurrence of cleaning or maintenance activities associated with vessels has not been confirmed at the site. However, based on the activity and associated potential contaminants the risk has generally been considered to be minor due to the general localised nature and confinement of the potential contamination to shallow soils.

The following recommendations are made:

- Consideration should be given to the occurrence of ASS at the site, during excavation works. Although the site was classified as low probability of occurrence, Mutton Cove approximately 300 m south-east of the site had a high probability of ASS occurring. This may have implications for buried structures or management of excavated soil during construction phase of the project.
- Given the sites' proximity to the marine environment of Port River, it is recommended that a Construction and Environmental Management Plan (CEMP) be developed for implementation during construction phase of the project. The CEMP is designed to provide a framework to effectively manage all significant work, health and safety (WHS) and environmental risks associated with the project.

6 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (*WSP*) for Nexif Energy Australia Pty Ltd (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 23 May 2019 and agreement with the Client dated 7 June 2019 (*Agreement*).

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This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

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REFERENCES

- Australian Soil Resource Information System website: <http://www.asris.csiro.au/mapping/viewer.htm>
- Department for Environment and Water (DEW, 2019) *WaterConnect Groundwater Data* (<https://www.waterconnect.sa.gov.au/Systems/GD/Pages/Default.aspx>). Primary Industries and Resources South Australia.
- *Environment Protection Act 1993*.
- Lotsearch (2019) *Lotsearch Enviro Professional, Pelican Point Road, Outer Harbour, SA 5018*, dated 6 August 2019, Reference LS007805 EP.
- National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended in 2013 (ASC NEPM).
- Planning SA (2001) *Site Contamination*. Planning Advisory Notice 20.
- South Australian Environment Protection Authority (SA EPA, 2019) *Public register* http://www.epa.sa.gov.au/what_we_do/public_register_directory/site_contamination_index and https://www.epa.sa.gov.au/data_and_publications/environmental_authorisations_licences/search-authorisations#/search?location=area&type=A
- Standards Australia (2005) *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds*. AS4482.1-2005 Homebush NSW.

APPENDIX A

LOTSEARCH REPORT





LOTSEARCH
LOTSEARCH ENVIRO PROFESSIONAL

Address: Pelican Point Road, Outer Harbour, SA 5018

Date: 06 Aug 2019 15:29:42

Reference: LS007805 EP

Disclaimer:

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.

You should obtain independent advice before you make any decision based on the information within the report.

The detailed terms applicable to use of this report are set out at the end of this report.

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Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a confidence is given under the field heading “LocConf” or “Location Confidence”.

Location Confidence	Description
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced with the confidence of the general/approximate area
Road Match	Georeferenced to the road or rail
Road Intersection	Georeferenced to the road intersection
Buffered Point	Feature is a buffered point
Network of Features	Georeferenced to a network of features

Dataset Listing

Datasets contained within this report, detailing their source and data currency:

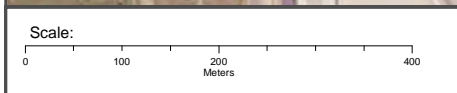
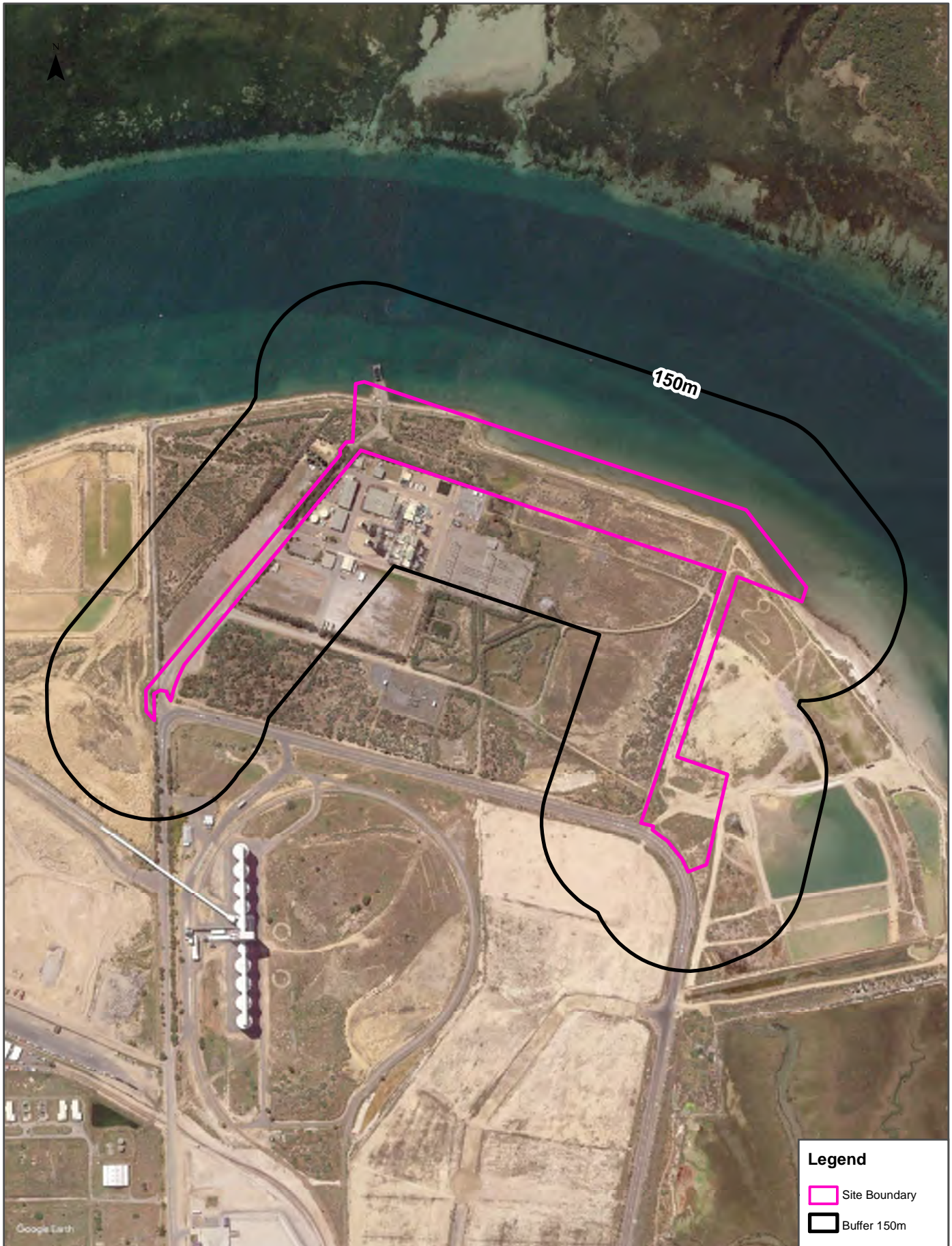
Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
EPA Site Contamination Index	EPA South Australia	15/07/2019	15/07/2019	Monthly	1000	0	0	7
EPA Environmental Protection Orders	EPA South Australia	02/08/2019	02/08/2019	Monthly	1000	0	0	2
EPA Environmental Authorisations	EPA South Australia	02/08/2019	02/08/2019	Monthly	1000	1	4	19
EPA Assessment Areas	EPA South Australia	10/07/2019	10/07/2019	Quarterly	1000	0	0	0
Defence PFAS Investigation & Management Program	Department of Defence	02/08/2019	02/08/2019	Monthly	2000	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	02/08/2019	02/08/2019	Monthly	2000	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	02/08/2019	02/08/2019	Monthly	2000	0	0	0
National Waste Management Facilities Database	Geoscience Australia	06/08/2019	07/03/2017	Quarterly	1000	0	0	0
EPA Collection Depots	EPA South Australia	06/08/2019	06/08/2019	Quarterly	1000	0	0	0
UBD Business Directory 1991 (Premise & Intersection Matches)	Hardie Grant			Not Required	150	0	0	0
UBD Business Directory 1991 (Road & Area Matches)	Hardie Grant			Not Required	150	-	5	5
UBD Business Directory 1984 (Premise & Intersection Matches)	Hardie Grant			Not Required	150	0	0	0
UBD Business Directory 1984 (Road & Area Matches)	Hardie Grant			Not Required	150	-	0	0
Sands & McDougall's Directory 1973 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1973 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0
Sands & McDougall's Directory 1965 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1965 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0
Sands & McDougall's Directory 1955 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1955 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0
UBD Business Directory 1950 (Premise & Intersection Matches)	Hardie Grant			Not Required	150	0	0	0
UBD Business Directory 1950 (Road & Area Matches)	Hardie Grant			Not Required	150	-	0	0
Sands & McDougall's Directory 1940 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1940 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Sands & McDougall's Directory 1930 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1930 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0
Sands & McDougall's Directory 1920 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1920 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0
Sands & McDougall's Directory 1910 (Premise & Intersection Matches)	Sands & McDougall			Not Required	150	0	0	0
Sands & McDougall's Directory 1910 (Road & Area Matches)	Sands & McDougall			Not Required	150	-	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant, Sands & McDougall			Not required	500	0	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant, Sands & McDougall			Not required	500	-	0	0
Mines and Mineral Deposits	Department for Energy and Mining	03/06/2019	03/06/2019	Quarterly	1000	0	0	0
Groundwater Aquifers	Department for Environment and Water	09/04/2018	01/01/2008	As required	1000	2	2	2
Drillholes	Department for Environment and Water	16/07/2019	05/07/2019	Quarterly	2000	1	2	224
Surface Geology 1:100,000	Department for Energy and Mining	12/07/2018	01/07/2018	As required	1000	2	2	3
Geological Linear Structures 1:100,000	Department for Energy and Mining	12/07/2018	01/07/2018	As required	1000	0	0	0
Atlas of Australian Soils	CSIRO	19/05/2017	17/02/2011	As required	1000	0	0	1
Soil Types	Department for Environment and Water	12/07/2018	01/07/2009	As required	1000	1	1	1
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	2	2	2
Acid Sulfate Soil Potential	Department for Environment and Water	09/04/2018	03/06/2016	As required	1000	1	1	1
Soil Salinity - Watertable Induced	Department for Environment and Water	12/07/2018	01/07/2009	As required	1000	1	1	1
Soil Salinity - Non-watertable	Department for Environment and Water	12/07/2018	01/07/2009	As required	1000	1	1	1
Soil Salinity - Non-watertable (magnesia patches)	Department for Environment and Water	12/07/2018	01/07/2009	As required	1000	1	1	1
Land Development Zones	Department of Planning, Transport and Infrastructure	03/06/2019	03/06/2019	Quarterly	1000	1	3	9
Land Use Generalised 2018	Department of Planning, Transport and Infrastructure	19/06/2019	15/06/2019	Annually	1000	3	8	10
Commonwealth Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	16/01/2019	31/07/2018	Unknown	1000	0	0	0
National Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	16/01/2019	28/09/2018	Unknown	1000	0	0	0
State Heritage Areas	Department for Environment and Water	12/07/2018	10/11/2004	As required	1000	0	0	0
SA Heritage Places	Department for Environment and Water	31/05/2019	22/11/2018	Quarterly	1000	0	0	0
Aboriginal Land	Department for Energy and Mining	09/04/2018	08/04/2018	As required	1000	0	0	0
Bushfire Protection Areas	Department of Planning, Transport and Infrastructure	04/09/2018	20/02/2018	As required	1000	0	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Bushfires and Prescribed Burns History	Department for Environment and Water	04/09/2018	26/05/2018	As required	1000	0	0	0
Groundwater Dependent Ecosystems Atlas	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	3
Ramsar Wetland Areas	Department for Environment and Water	30/01/2017	30/01/2013	As required	1000	0	0	0

Aerial Imagery 2017

Pelican Point Road, Outer Harbour, SA 5018



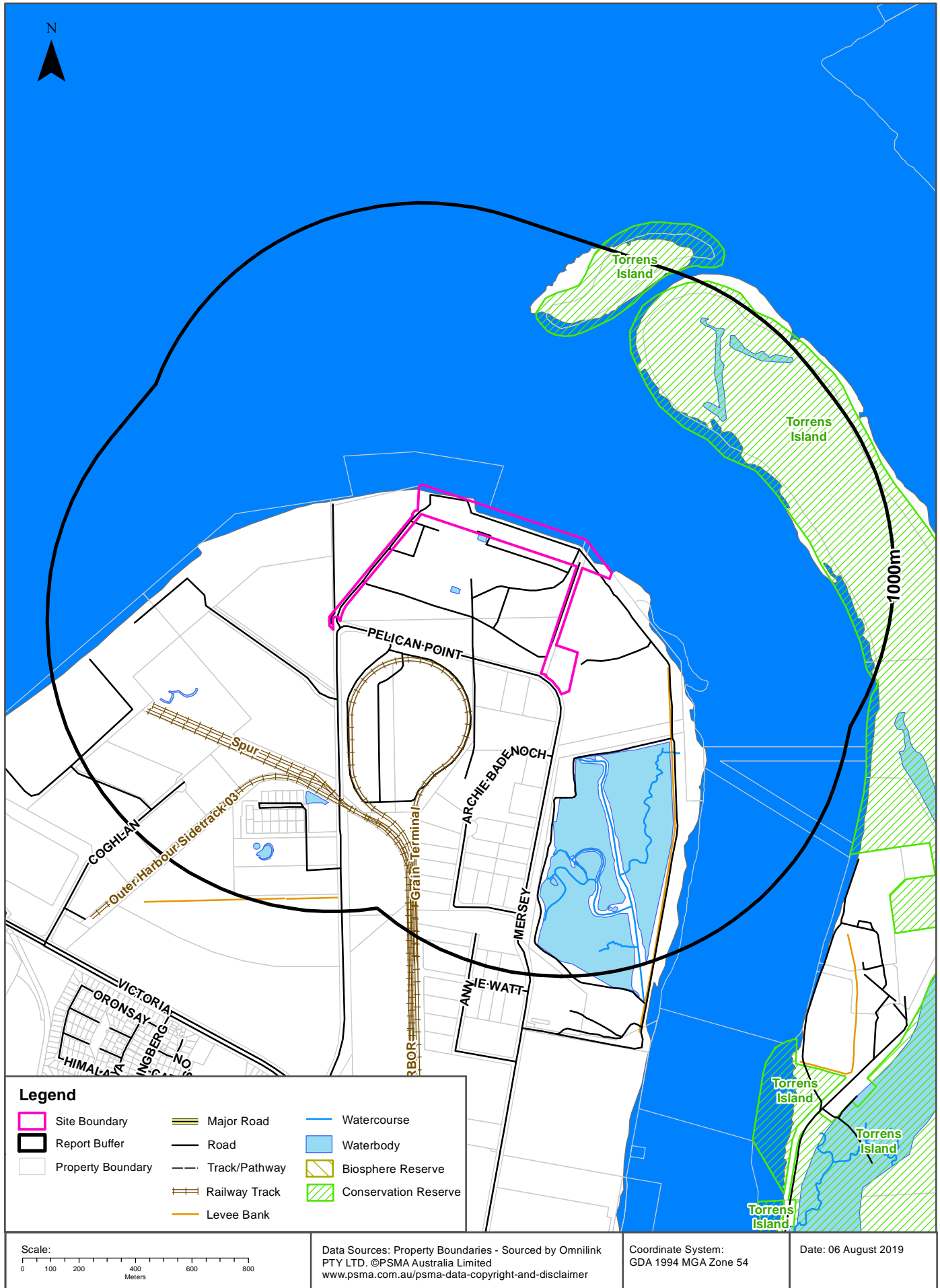
Data Source Aerial Imagery: © 2019 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

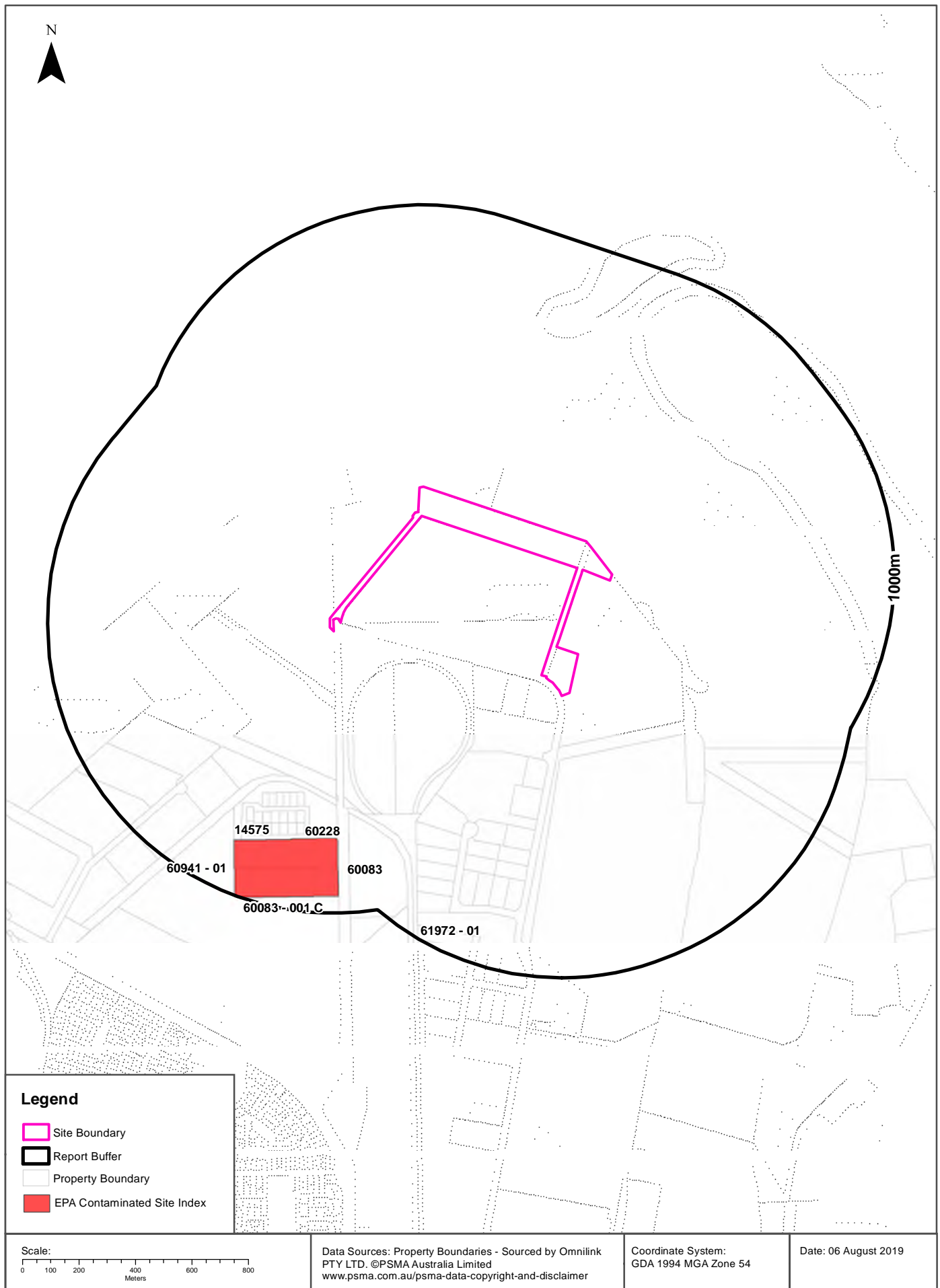
Coordinate System:
GDA 1994 MGA Zone 54

Date: 05 August 2019

Topographic Features

Pelican Point Road, Outer Harbour, SA 5018





EPA Contaminated Land

Pelican Point Road, Outer Harbour, SA 5018

EPA Site Contamination Index

Sites on the EPA Contamination Index within the dataset buffer:

Notification No	Type	Address	Activity	Status	Location Confidence	Distance	Direction
14575	Pre 1 July 2009 Audit Notification	Lot 4 DP65566 & Lot 22 CP20006 Pelican Point Road OUTER HARBOR SA 5018	Not recorded	Current EPA List	Premise Match	734m	South West
14575	Pre 1 July 2009 Audit Termination	Lot 4 DP65566 & Lot 22 CP20006 Pelican Point Road OUTER HARBOR SA 5018	Not recorded	Current EPA List	Premise Match	734m	South West
60083	Audit Notification	Lots 4 & 5 Pelican Point Road OUTER HARBOR SA 5018	Not recorded	Current EPA List	Premise Match	734m	South West
60083 - 001 C	Audit Report	Lots 4 & 5 Pelican Point Road OUTER HARBOR SA 5018	Fill or soil importation; Listed Substances (storage)	Current EPA List	Premise Match	734m	South West
60228	109 Notification	Lots 4 & 5 Pelican Point Road OUTER HARBOR SA 5018	Listed Substances (storage)	Current EPA List	Premise Match	734m	South West
60941 - 01	S83A Notification	Lot 4 Pelican Point Road OUTER HARBOR SA 5018	Listed Substances (storage)	Current EPA List	Premise Match	734m	South West
61972 - 01	S83A Notification	667-679 Mersey Road OSBORNE SA 5017	Not recorded	Current EPA List	Premise Match	995m	South

Site Contamination Index Data Source: EPA South Australia

EPA Public Register

Pelican Point Road, Outer Harbour, SA 5018

EPA Environment Protection and Clean Up Orders

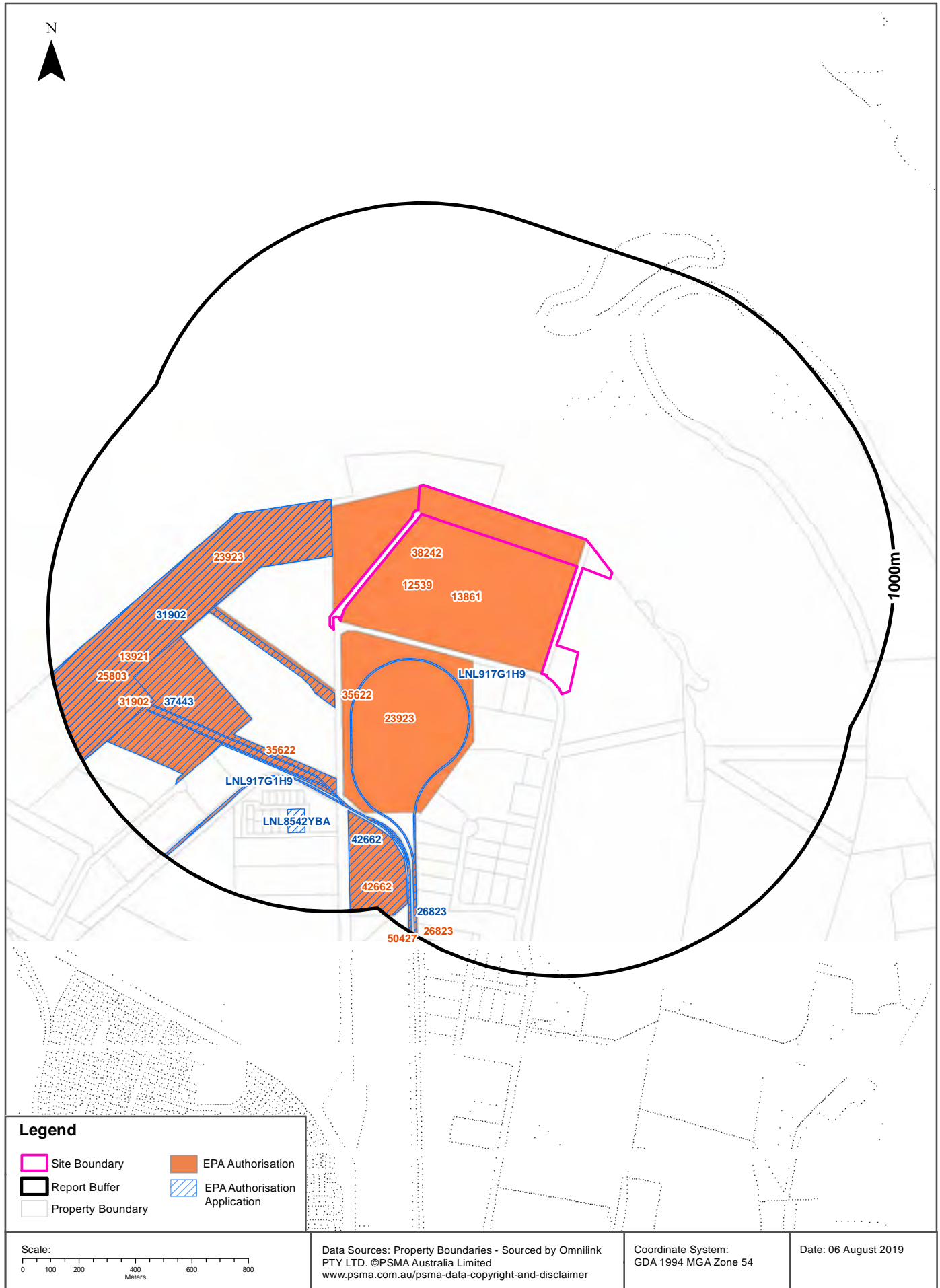
EPA Environment Protection and Clean Up Orders, within the dataset buffer:

Record No.	Record Type	Record Status	Entity	Site Address	Activity	EPA Register Status	Location Confidence	Distance	Direction
19390	ENVIRONMENT PROTECTION ORDER	ISSUED	South Australian Farmers Fuel Pty Ltd	Osborne SA 5017 and various locations throughout SA	Purchased unleaded petrol from a fuel supplier and then added ethanol to the fuel in the tanker at Osborne. This fuel was then delivered to various SAFF service stations located within in SA.	Current EPA Register	General Area/ Suburb / Hundred Match	-	-
19391	ENVIRONMENT PROTECTION ORDER	ISSUED	United Petroleum Pty Ltd	Osborne SA 5017 and various locations throughout SA	Purchased unleaded petrol from a fuel supplier and then added ethanol to the fuel in the tanker at Osborne. This fuel was then delivered to various SAFF service stations located within in SA.	Current EPA Register	General Area/ Suburb / Hundred Match	-	-

Authorisations Data Source: EPA South Australia

EPA Authorisations and Applications

Pelican Point Road, Outer Harbour, SA 5018



EPA Public Register

Pelican Point Road, Outer Harbour, SA 5018

EPA Authorisations and Applications

EPA Authorisations and Authorisation Applications within the dataset buffer:

Record No.	Record Type	Record Status	Entity	Site Address	Activity	EPA Register Status	Location Confidence	Distance	Direction
38242	EXEMPTION	Cancelled	PELICAN POINT POWER LIMITED		Discharges to Marine or Inland Waters	Current EPA Register	Premise Match	0m	Onsite
12539	LICENCE	Issued	PELICAN POINT POWER LIMITED	Allotment 28, Pelican Point Road, OUTER HARBOR SA 5018	or antibiotic or chemical water treatments) -,Activities producing listed wastes,Chemical works (inorganic),Discharges to marine or inland waters (heat,Fuel burning not coal or wood	Current EPA Register	Premise Match	0m	South West
13861	EXEMPTION	Cancelled	PELICAN POINT POWER LIMITED		Fuel Burning: rate of heat release exceeding 5 megawatts	Current EPA Register	Premise Match	0m	South West
23923	LICENCE	Issued	VITERRA OPERATIONS PTY LTD	Pelican Point Road, OUTER HARBOR SA 5018	Bulk shipping facilities,Railway operations	Current EPA Register	Premise Match	33m	South West
13921	LICENCE	Issued	PERILYA BROKEN HILL LIMITED	Ellen Street, PORT PIRIE SA 5540	Bulk shipping facilities	Current EPA Register	Premise Match	130m	North West
37443	WORKS APPROVAL APPLICATION	Proceed To Authorisation	Flinders Logistics Pty Ltd	See description	Bulk shipping facilities	Current EPA Register	Premise Match	130m	South West
31902	LICENCE	Issued	FLINDERS LOGISTICS PTY LTD	Various Wharf Side Facilities Throughout Port Adelaide, Osborne & Outer Harbor, Port Pirie, Wallaroo and Port Lincoln SA	Bulk shipping facilities	Current EPA Register	Premise Match	130m	North West
31902	LICENCE APPLICATION	Proceed To Authorisation	Flinders Logistics Pty Ltd	see description	Bulk shipping facilities	Current EPA Register	Premise Match	130m	North
LNL917 G1H9	LICENCE APPLICATION	Authorisation Updated	BOWMANS RAIL PTY LTD	Various Locations across Inner and Outer Harbour of the Port of Adelaide	Railway operations	Current EPA Register	Network of Features	203m	South East
35622	LICENCE	Issued	LAING O'ROURKE AUSTRALIA CONSTRUCTION PTY LTD	Various Locations Along The Adelaide Metropolitan Rail Network, SA	Railway operations	Current EPA Register	Network of Features	203m	South East
25803	LICENCE	Issued	FLINDERS ADELAIDE CONTAINER TERMINAL PTY LTD	Allotment 1 (D73109), Coghlan Road, OUTER HARBOR, 5018, SA	Bulk shipping facilities	Current EPA Register	Premise Match	531m	West
42662	LICENCE	Issued	TERMINALS PTY LTD	Allotment 104 (DP 82690) Pelican Point Road, OUTER HARBOR, 5018, SA	Activities producing listed wastes,Petroleum storage	Current EPA Register	Premise Match	644m	South West
42662	LICENCE APPLICATION	Proceed To Authorisation	Terminals Pty Ltd	Pelican Point Road, Outer Harbor SA 5018	Activities producing listed wastes	Current EPA Register	Premise Match	644m	South West
LNL854 2YBA	LICENCE APPLICATION	Processing	SA PREMIUM CEMENT & CONCRETE PTY LTD	Lots 12, 13, 19 & 20 Pelican Point Road, OUTER HARBOR SA 5018	Concrete batching works	Current EPA Register	Premise Match	644m	South West

Record No.	Record Type	Record Status	Entity	Site Address	Activity	EPA Register Status	Location Confidence	Distance	Direction
26823	LICENCE	Transferred	MINISTER FOR DEFENCE INDUSTRIES	61 Veitch Road, OSBORNE SA 5017	Marinas and boating facilities,Maritime construction works	Current EPA Register	Premise Match	996m	South
26823	LICENCE APPLICATION	Proceed To Authorisation	Minister for Defence Industries	Allotment 1001 (DP 82082) Veitch Rd, Osborne SA 5017	Marinas and boating facilities,Maritime construction works	Current EPA Register	Premise Match	996m	South
50427	LICENCE	Issued	AUSTRALIAN NAVAL INFRASTRUCTURE PTY LTD	61 Veitch Road, OSBORNE SA 5017	Marinas and boating facilities,Maritime construction works	Current EPA Register	Premise Match	996m	South
25322	LICENCE	Issued	CITY OF PORT ADELAIDE ENFIELD	Various Locations Within City of Port Adelaide Enfield, PORT ADELAIDE, SA	Earthworks drainage - for each day on which earthworks drainage takes place during the licence period	Current EPA Register	General Area/ Suburb Match	-	-
13755	LICENCE	Issued	FLINDERS PORTS PTY LIMITED	Various Berths Along Port River & Various Berths At Outer Harbor, PORT ADELAIDE, 5015, SA	Earthworks drainage - for each day on which earthworks drainage takes place during the licence period	Current EPA Register	General Area/ Suburb Match	-	-

Authorisations Data Source: EPA South Australia

EPA Assessment Areas

Pelican Point Road, Outer Harbour, SA 5018

EPA Assessment Areas

EPA Assessment Areas within the dataset buffer:

Map Id	Supplied Ref	Area Name	Map Link	Status	Location Confidence	Distance	Direction
N/A	No records in buffer						

Assessment Areas Data Source: EPA South Australia

PFAS Investigation Sites

Pelican Point Road, Outer Harbour, SA 5018

Defence PFAS Investigation & Management Program

Sites being investigated or managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation & Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

Pelican Point Road, Outer Harbour, SA 5018

Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

Waste Management Facilities

Pelican Point Road, Outer Harbour, SA 5018

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Revised Date	Location Confidence	Distance	Direction
N/A	No records in buffer								

Waste Management Facilities Data Source: Australian Government Geoscience Australia
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EPA Approved Container Collection Depots

EPA approved container collection depots within the dataset buffer:

MapId	Name	Address	Suburb	Loc Conf	Distance	Direction
N/A	No records in buffer					

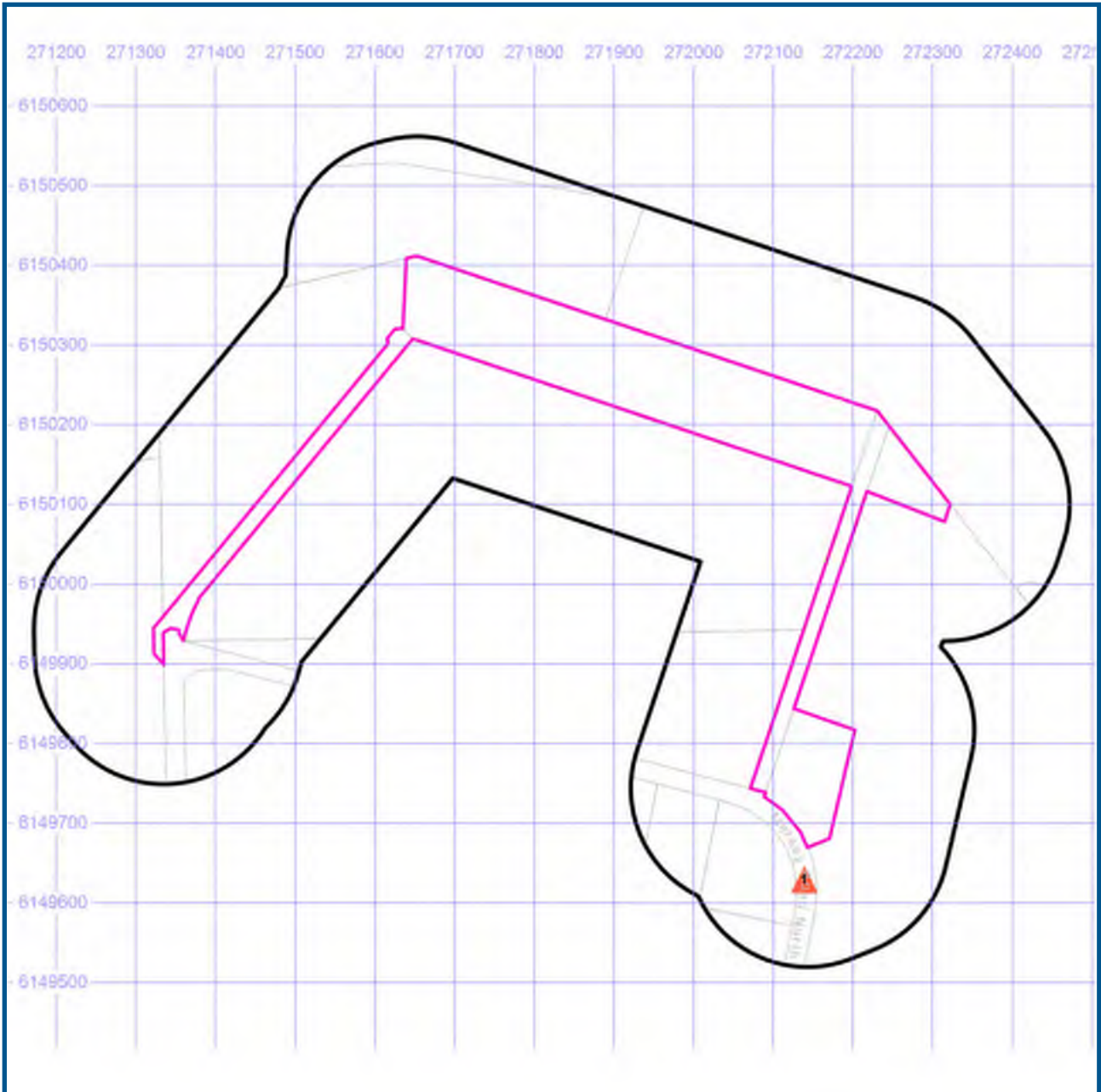
Collection Depot Data Source: EPA South Australia


Historical Business Directories




Pelican Point Road, Outer Harbour, SA 5018



1991 Business Directory Records



-  Site Boundary
-  Buffer 150m
-  Property Boundaries

-  Business directory records mapped to a specific premise
-  Business directory records mapped to a road intersection
-  Business directory records mapped to a road corridor
-  Business directory records mapped to a general area

Projected Coordinate System:
GDA94 MGA Zone 54

Data Sources: Universal Business Directories (UBD), derived data, licensed from Hardie Grant Property Boundaries - Sourced by Omnilink PTY LTD. ©PSMA Australia Limited 2019
www.psm.com.au/psma-data-copyright-and-disclaimer

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1991 Business Directory Records Premise or Road Intersection Matches

Records from the 1991 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1991 Business Directory Records Road or Area Matches

Records from the 1991 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
1	Engineers - Electrical	Bhei Australia Pty Ltd, Mersey Rd, Extension, Osborne 5017	20182	Road Match	10m	South
	Instrument - Electric - Mfrs &/or Imps &/or Dists	Bhei Australia Pty. Ltd, Mersey Rd, Extension, Osborne, 5017	24085	Road Match	10m	South
	Engineers - Constructional	Eglo Engineering Pty Ltd, Mersey Road Extension, Osborne 5017	20060	Road Match	10m	South
	Engineers - Heavy	Eglo Engineering Pty. Ltd., Mersey Road Extension, Osborne. 5017.	20521	Road Match	10m	South
	Spray Painting Services	Place A V, Mersey Road Extension, Osborne 5017	34027	Road Match	10m	South

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1984 Business Directory Records Premise or Road Intersection Matches

Records from the 1984 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1984 Business Directory Records Road or Area Matches

Records from the 1984 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1973 Business Directory Records Premise or Road Intersection Matches

Records from the 1973 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1973 Business Directory Records Road or Area Matches

Records from the 1973 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1965 Business Directory Records Premise or Road Intersection Matches

Records from the 1965 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1965 Business Directory Records Road or Area Matches

Records from the 1965 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1955 Business Directory Records Premise or Road Intersection Matches

Records from the 1955 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1955 Business Directory Records Road or Area Matches

Records from the 1955 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1950 Business Directory Records Premise or Road Intersection Matches

Records from the 1950 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Business Directory Records Road or Area Matches

Records from the 1950 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1940 Business Directory Records Premise or Road Intersection Matches

Records from the 1940 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1940 Business Directory Records Road or Area Matches

Records from the 1940 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1930 Business Directory Records Premise or Road Intersection Matches

Records from the 1930 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1930 Business Directory Records Road or Area Matches

Records from the 1930 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1920 Business Directory Records Premise or Road Intersection Matches

Records from the 1920 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1920 Business Directory Records Road or Area Matches

Records from the 1920 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

1910 Business Directory Records Premise or Road Intersection Matches

Records from the 1910 Sands & McDougall's Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

1910 Business Directory Records Road or Area Matches

Records from the 1910 Sands & McDougall's Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer					

Business Directory Content Derived from Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's Directories, mapped to a premise or road intersection, within the dataset buffer.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer						

Business Directory Content Derived from Universal Business Directories (Licensed from Hardie Grant) and Sands & McDougall's Directory of South Australia

Historical Business Directories

Pelican Point Road, Outer Harbour, SA 5018

Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Approx. Dist. to Road Corridor or Area	Direction
	No records in buffer						



Business Directory Content Derived from Universal Business Directories (Licensed from Hardie Grant) and Sands & McDougall's Directory of South Australia

Aerial Imagery 2010

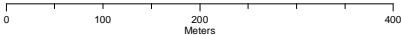
Pelican Point Road, Outer Harbour, SA 5018



Legend

-  Site Boundary
-  Buffer 150m

Scale:



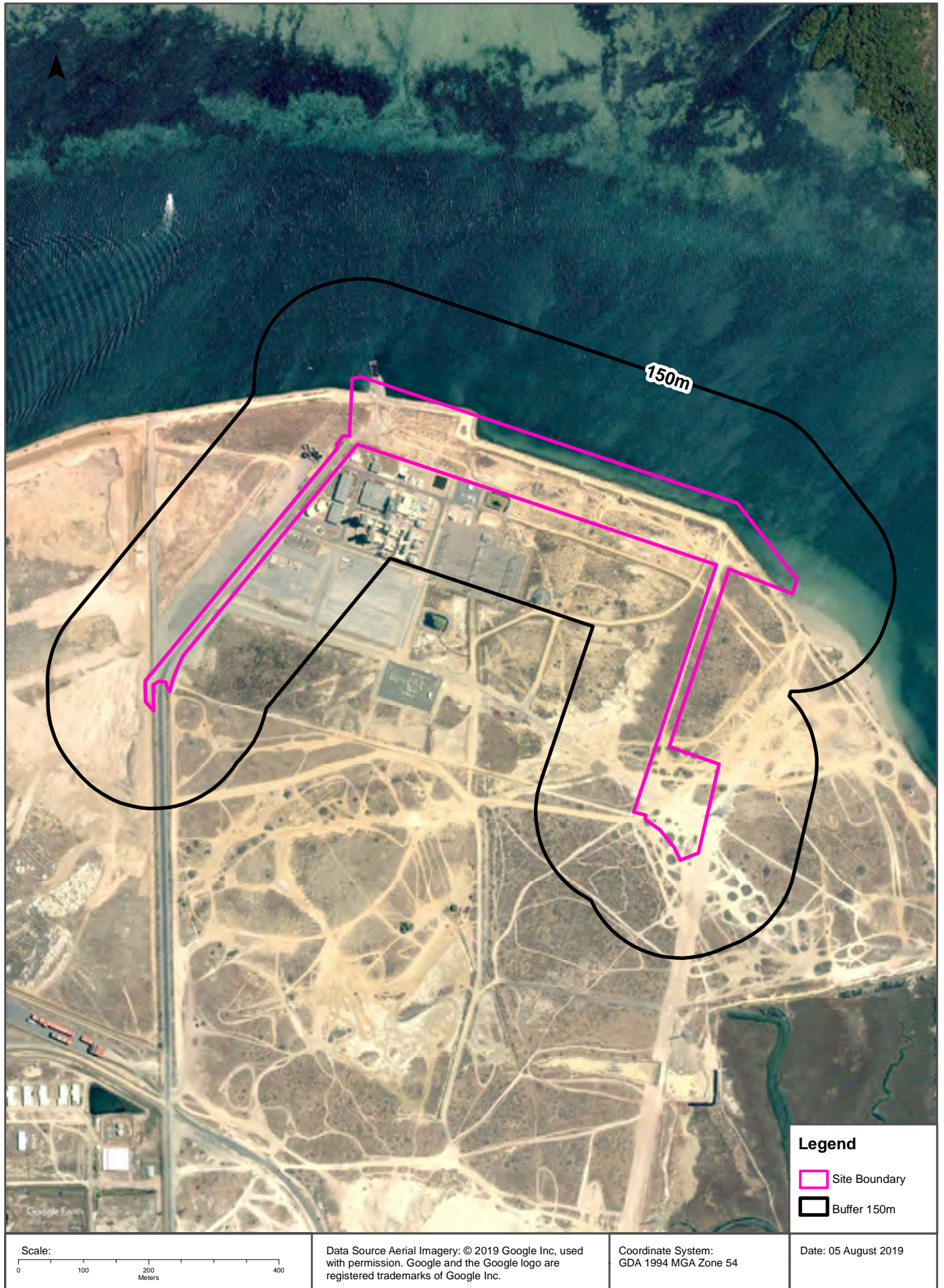
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Coordinate System:
GDA 1994 MGA Zone 54

Date: 05 August 2019

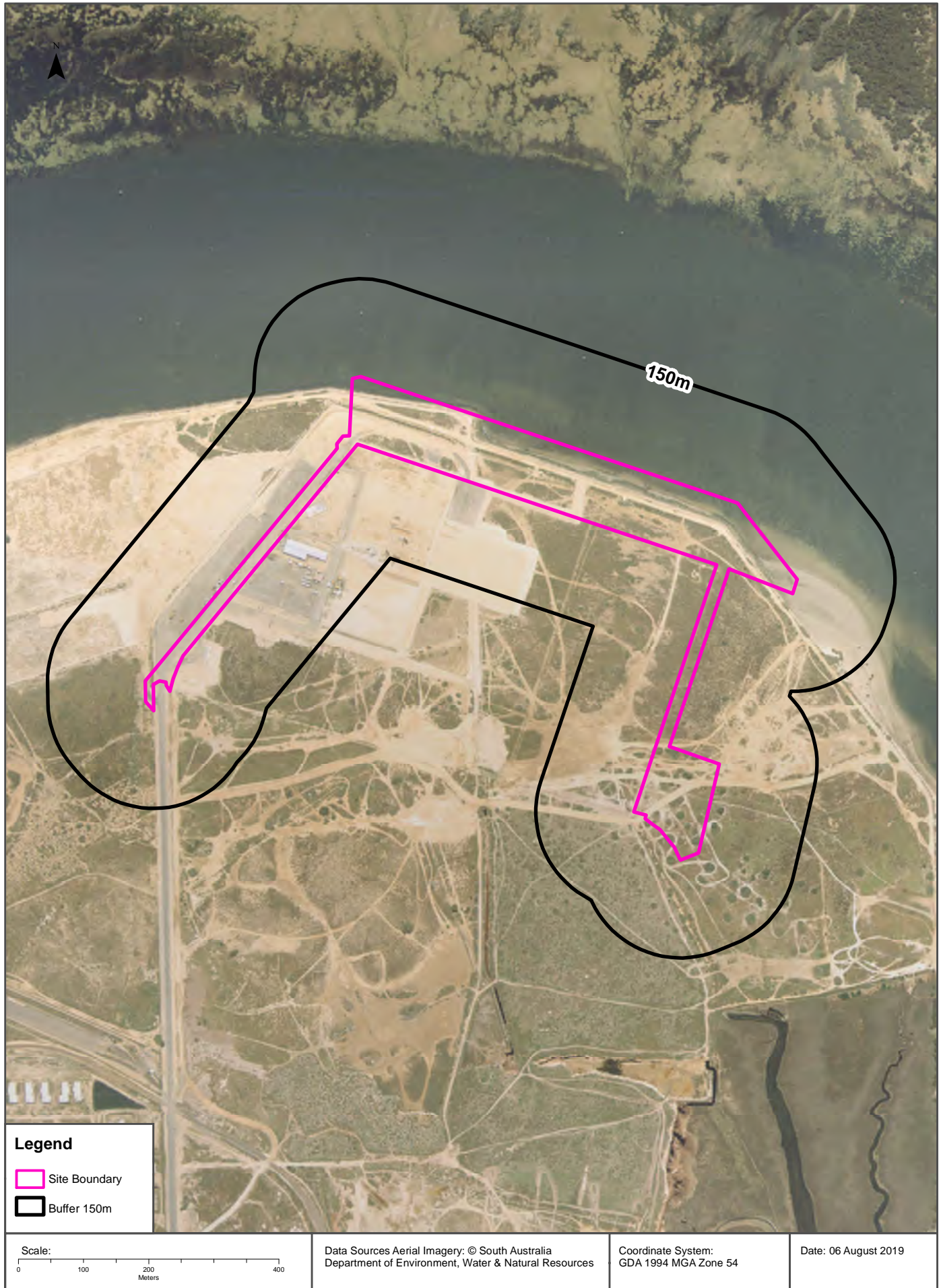
Aerial Imagery 2004

Pelican Point Road, Outer Harbour, SA 5018



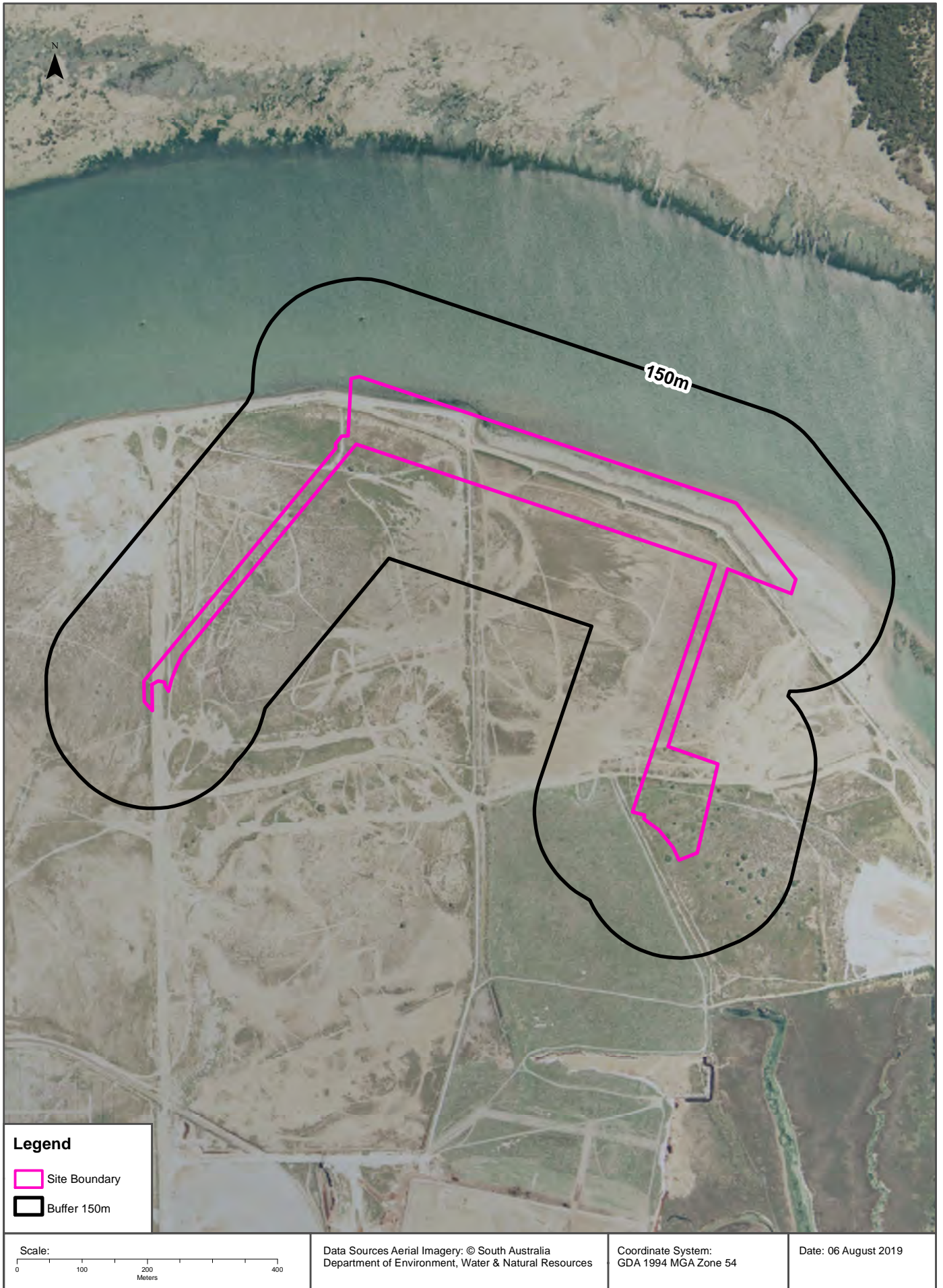
Aerial Imagery 1999

Pelican Point Road, Outer Harbour, SA 5018



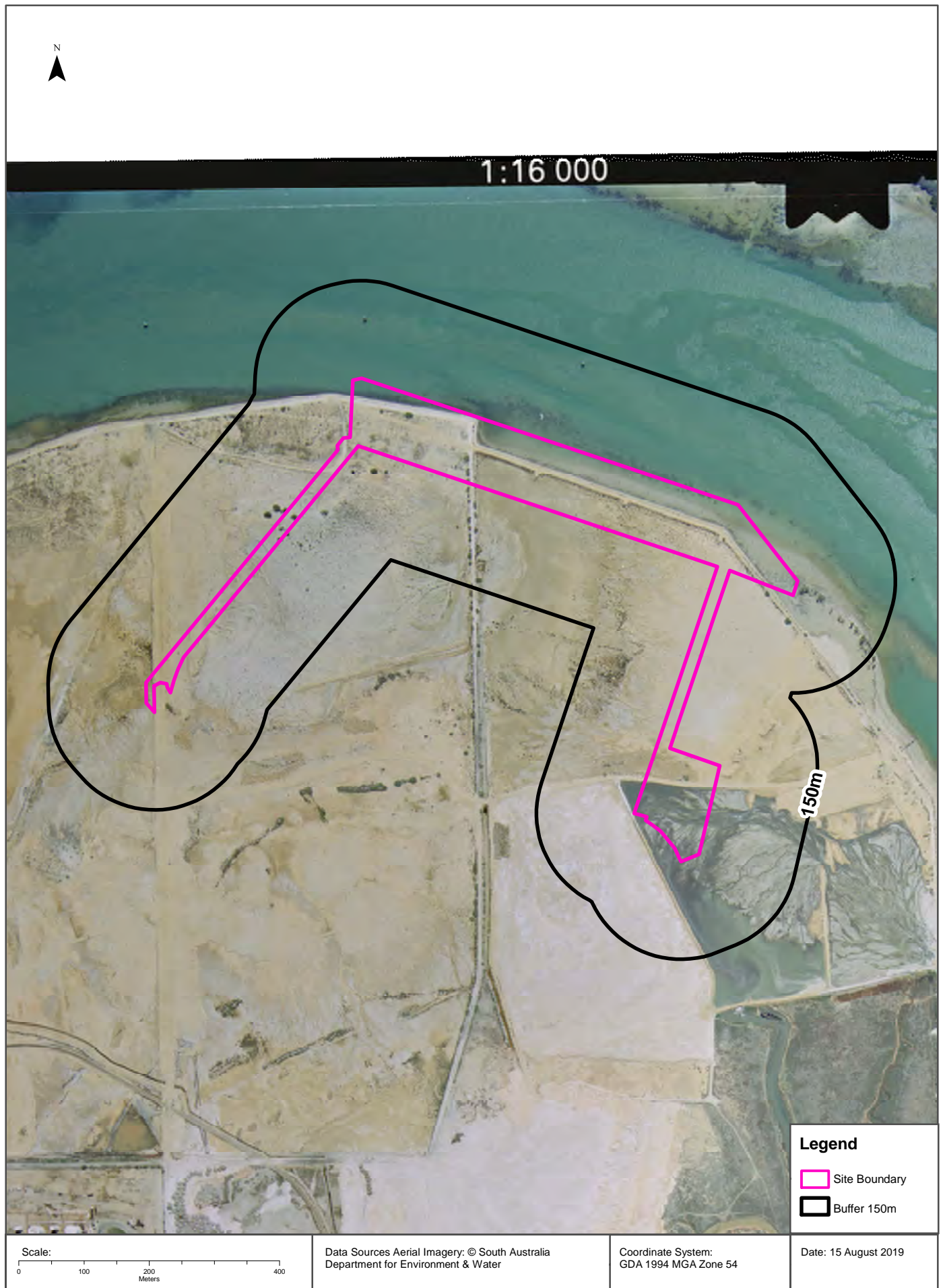
Aerial Imagery 1989

Pelican Point Road, Outer Harbour, SA 5018



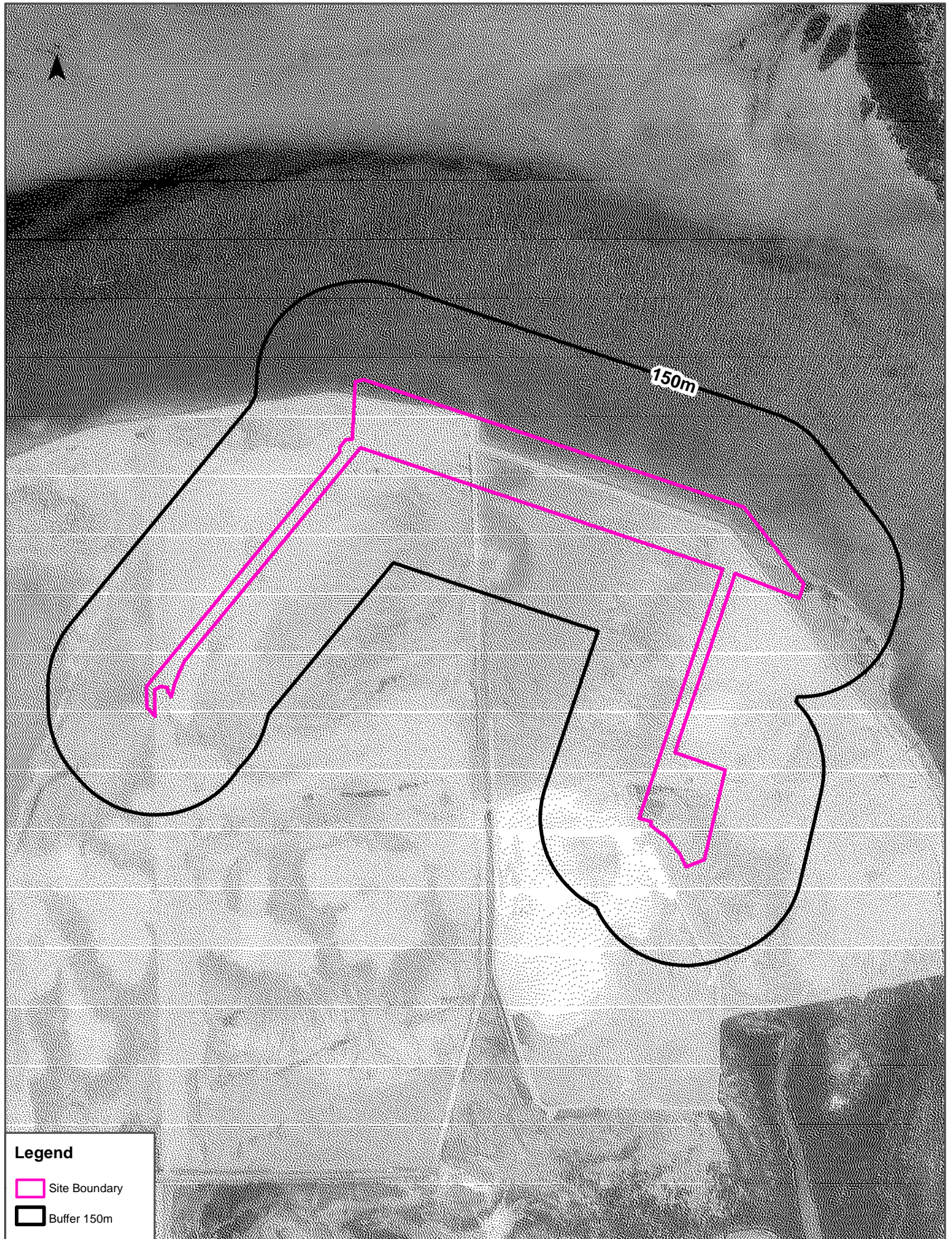
Aerial Imagery 1979

Pelican Point Road, Outer Harbour, SA 5018





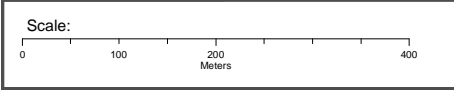
Aerial Imagery 1974

Pelican Point Road, Outer Harbour, SA 5018



Legend

-  Site Boundary
-  Buffer 150m



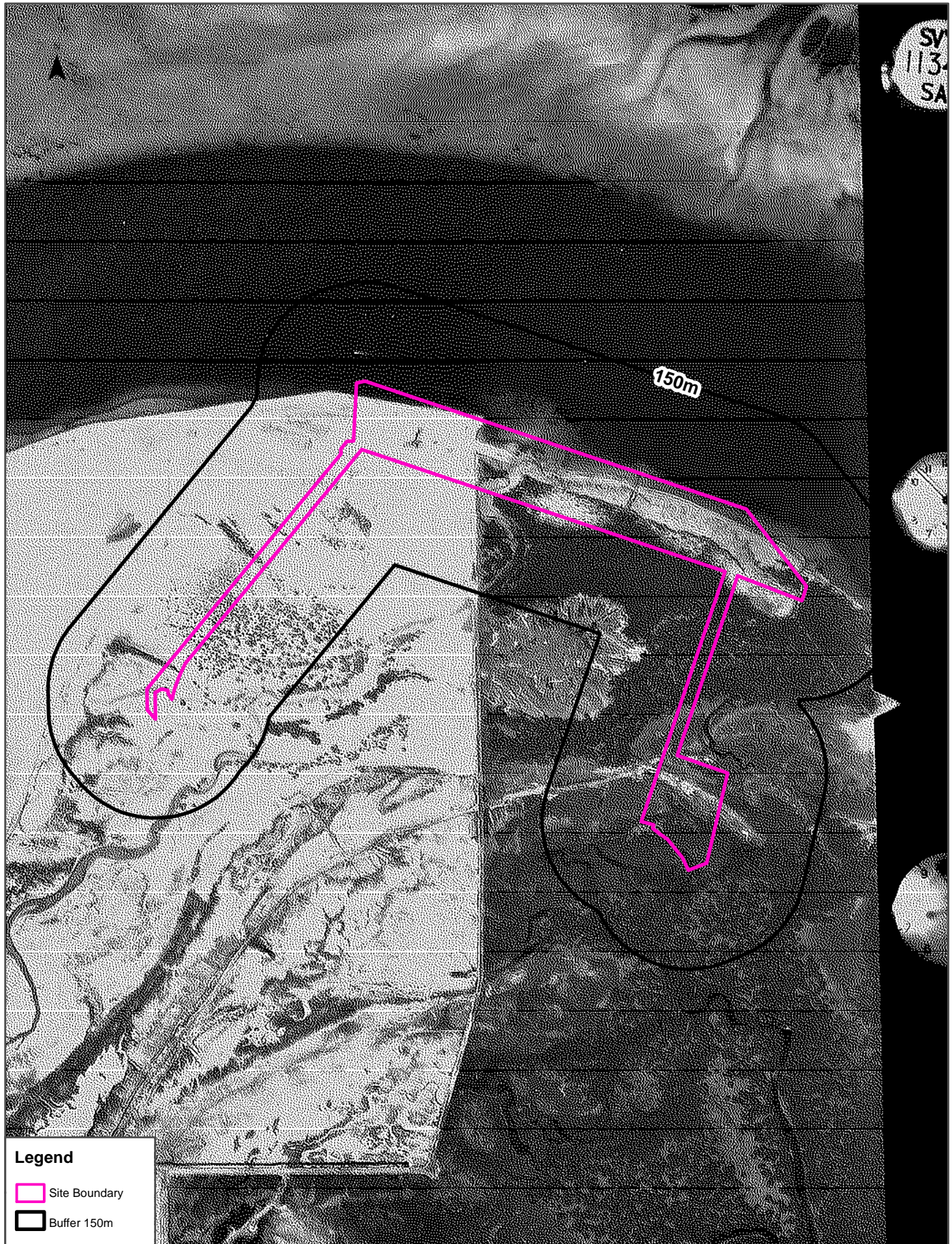
Data Sources Aerial Imagery:
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Coordinate System:
GDA 1994 MGA Zone 54

Date: 05 August 2019

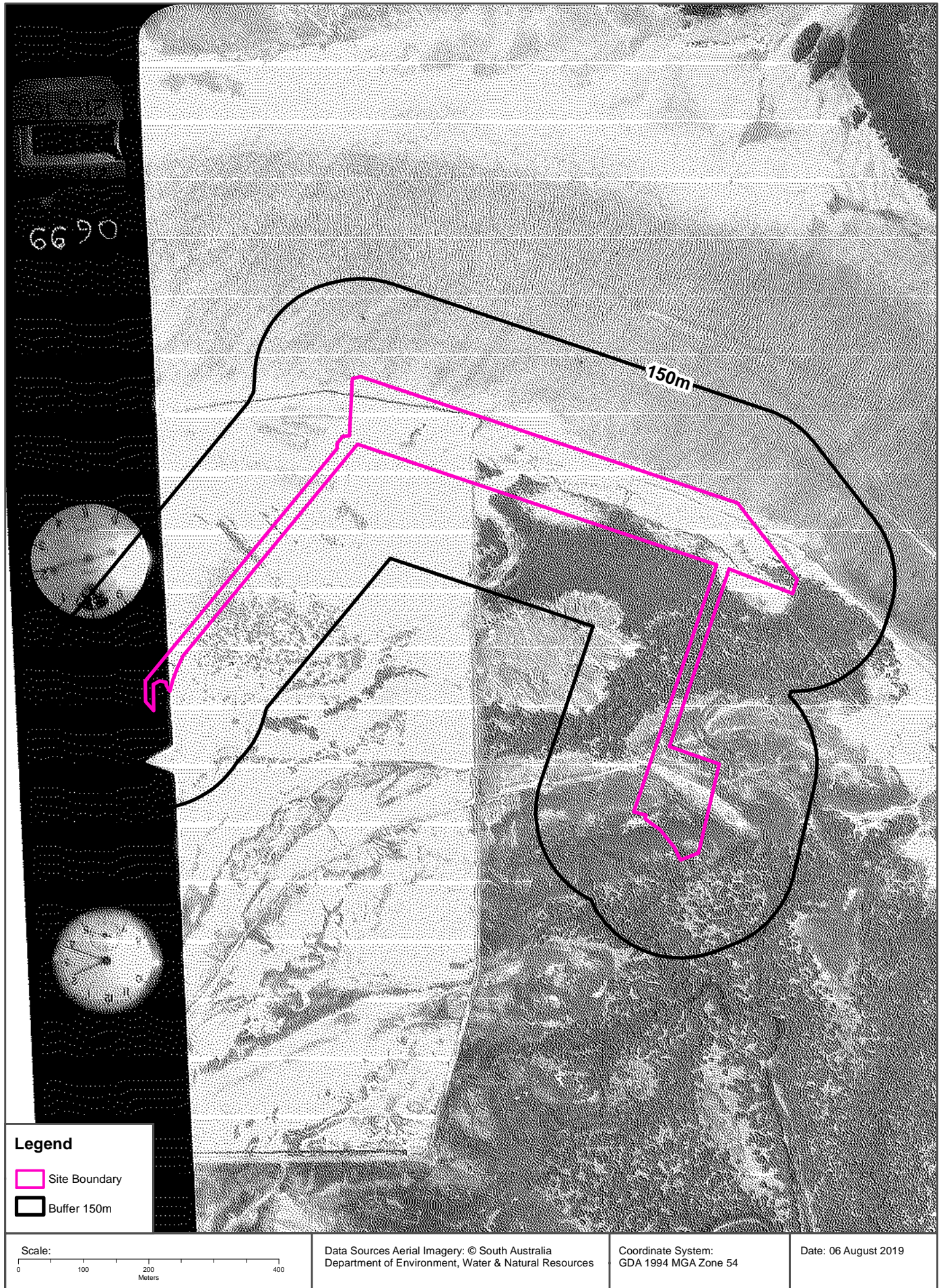
Aerial Imagery 1969

Pelican Point Road, Outer Harbour, SA 5018



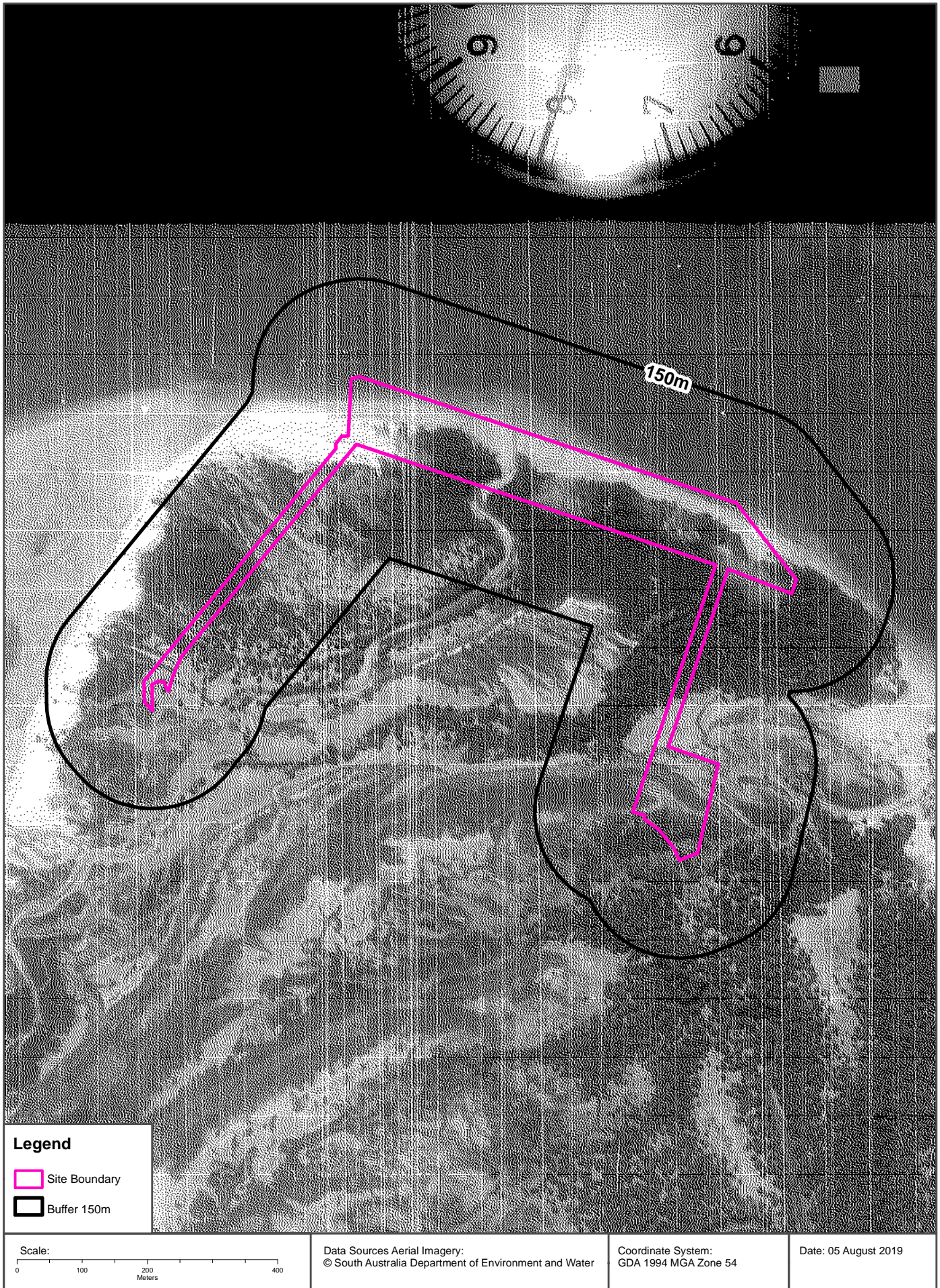
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Pelican Point Road, Outer Harbour, SA 5018



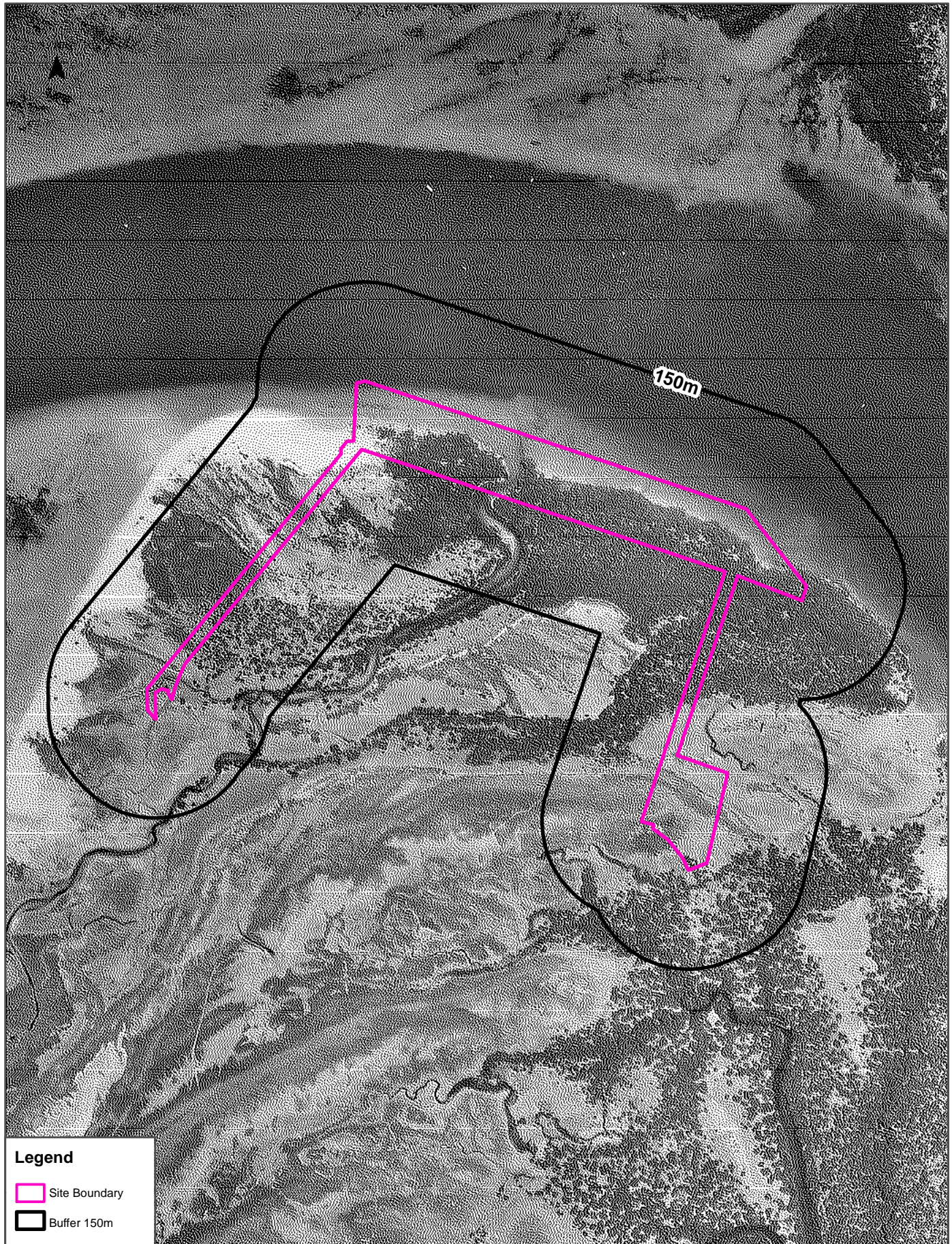
Aerial Imagery 1963

Pelican Point Road, Outer Harbour, SA 5018





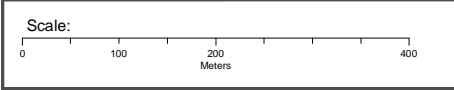
Aerial Imagery 1959

Pelican Point Road, Outer Harbour, SA 5018



Legend

-  Site Boundary
-  Buffer 150m



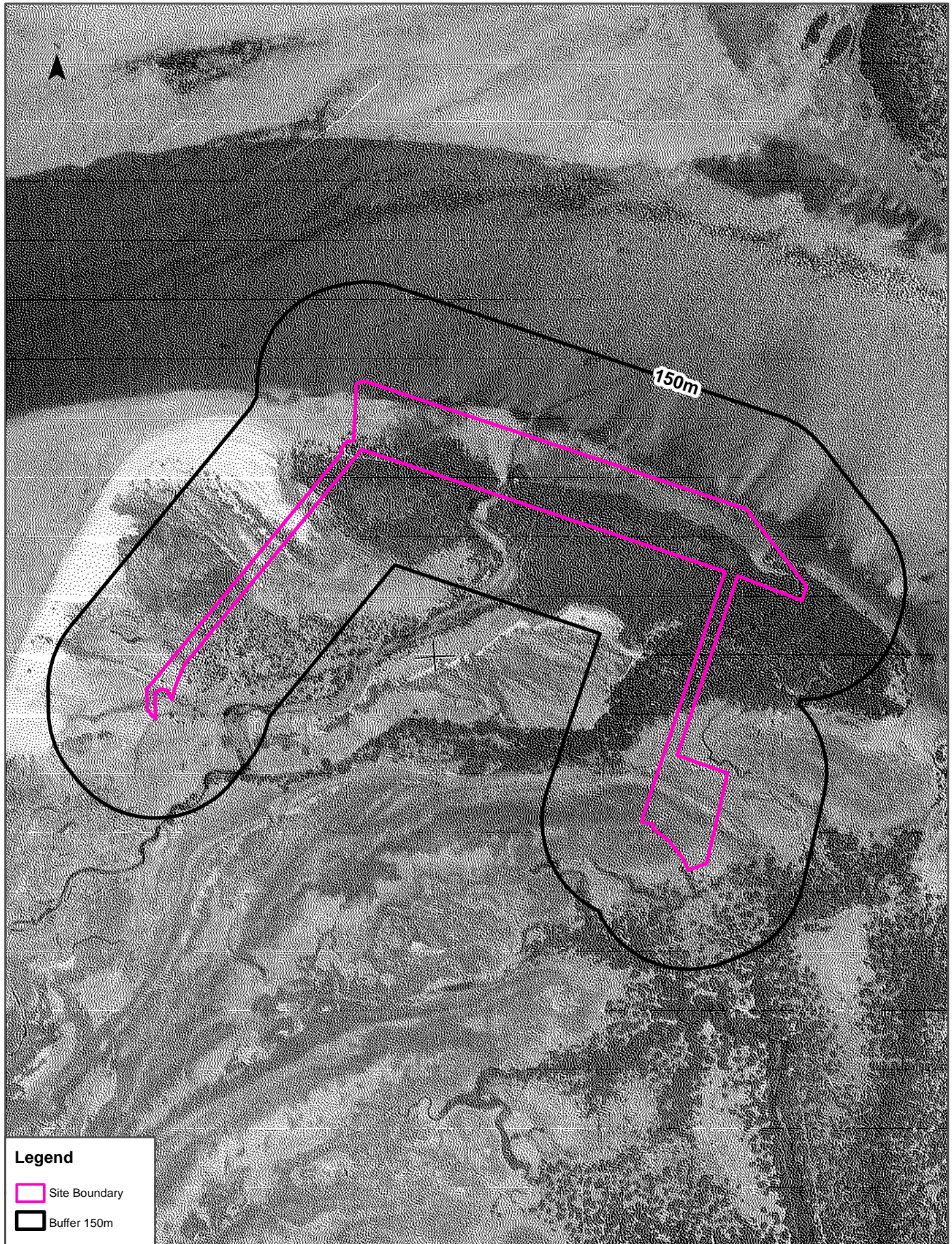
Data Sources Aerial Imagery: © South Australia
Department of Environment, Water & Natural Resources

Coordinate System:
GDA 1994 MGA Zone 54



Date: 06 August 2019

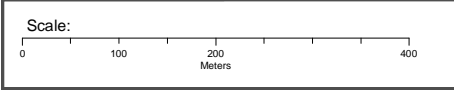
Aerial Imagery 1949

Pelican Point Road, Outer Harbour, SA 5018



Legend

-  Site Boundary
-  Buffer 150m



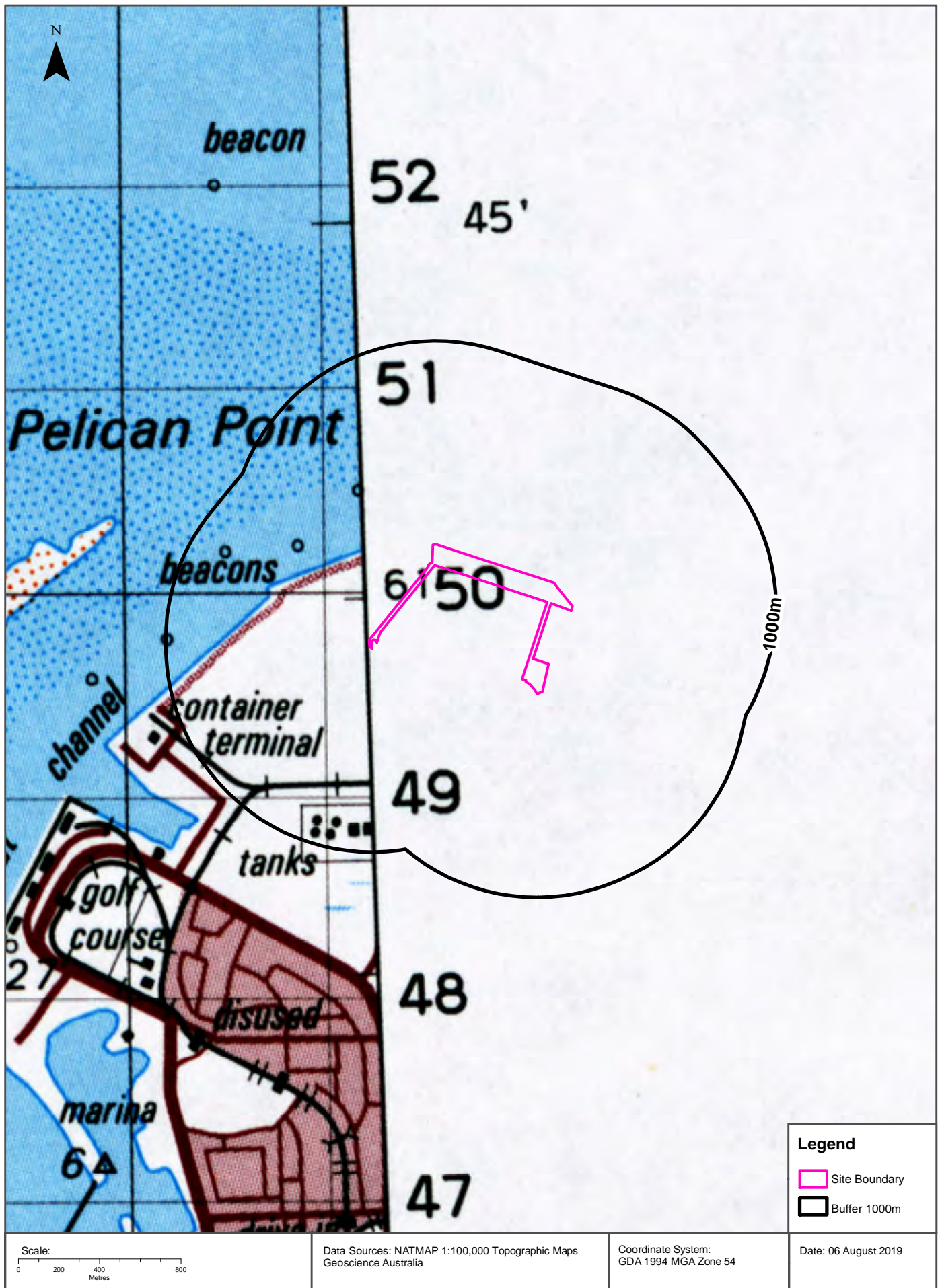
Data Sources Aerial Imagery: © South Australia
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Coordinate System:
GDA 1994 MGA Zone 54

Date: 06 August 2019

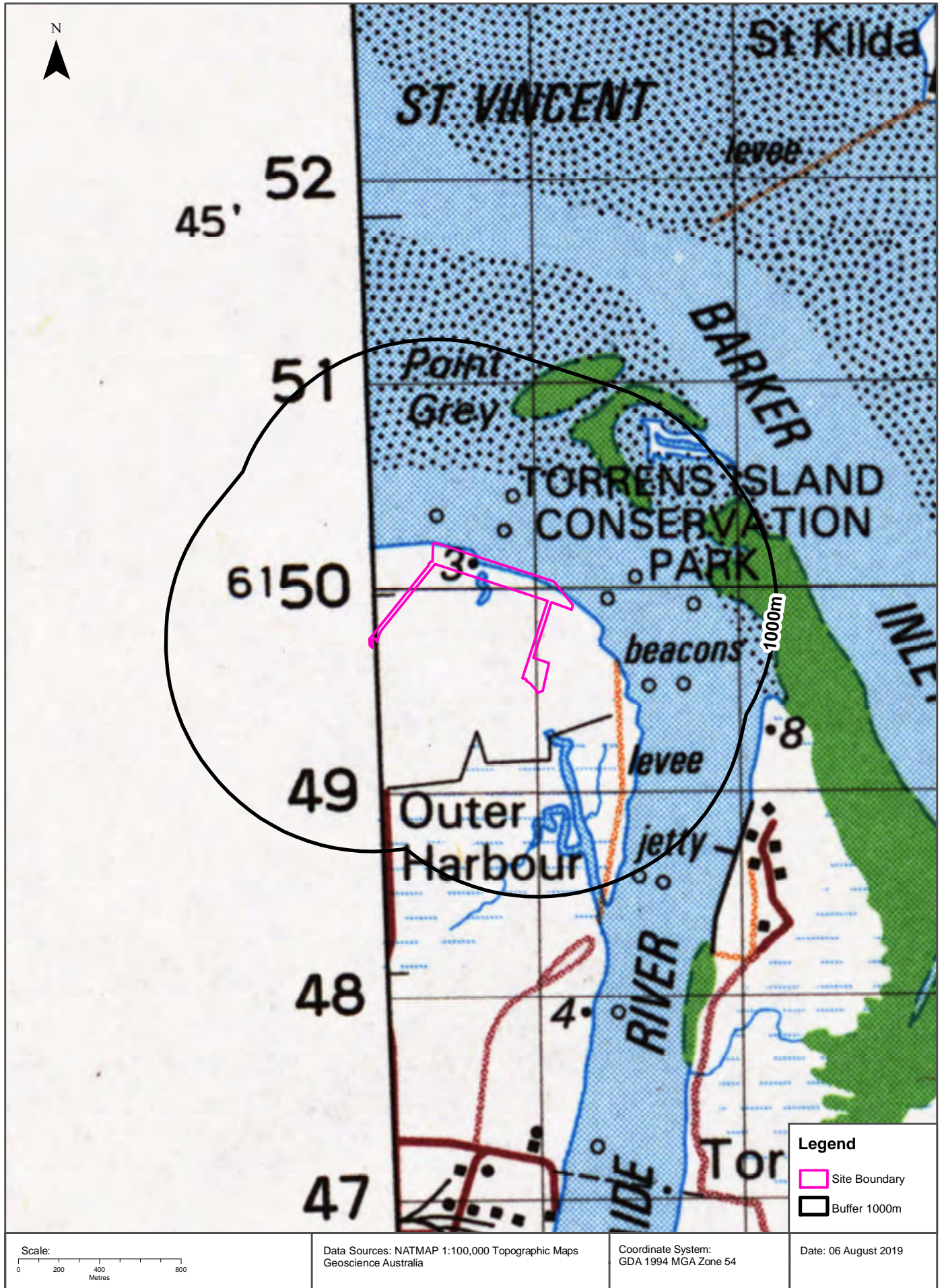
Historical Map 1982

Pelican Point Road, Outer Harbour, SA 5018



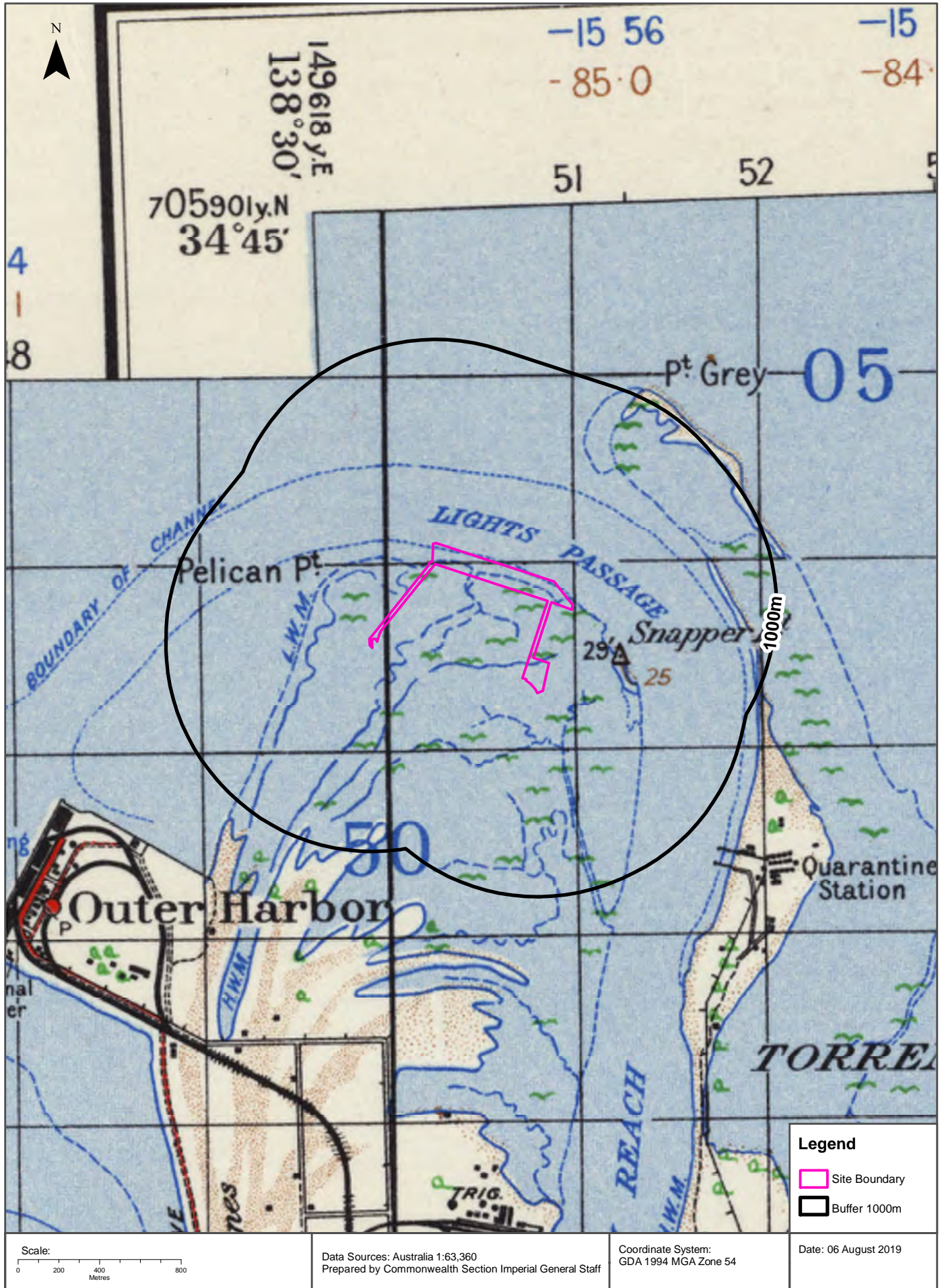
Historical Map 1982

Pelican Point Road, Outer Harbour, SA 5018



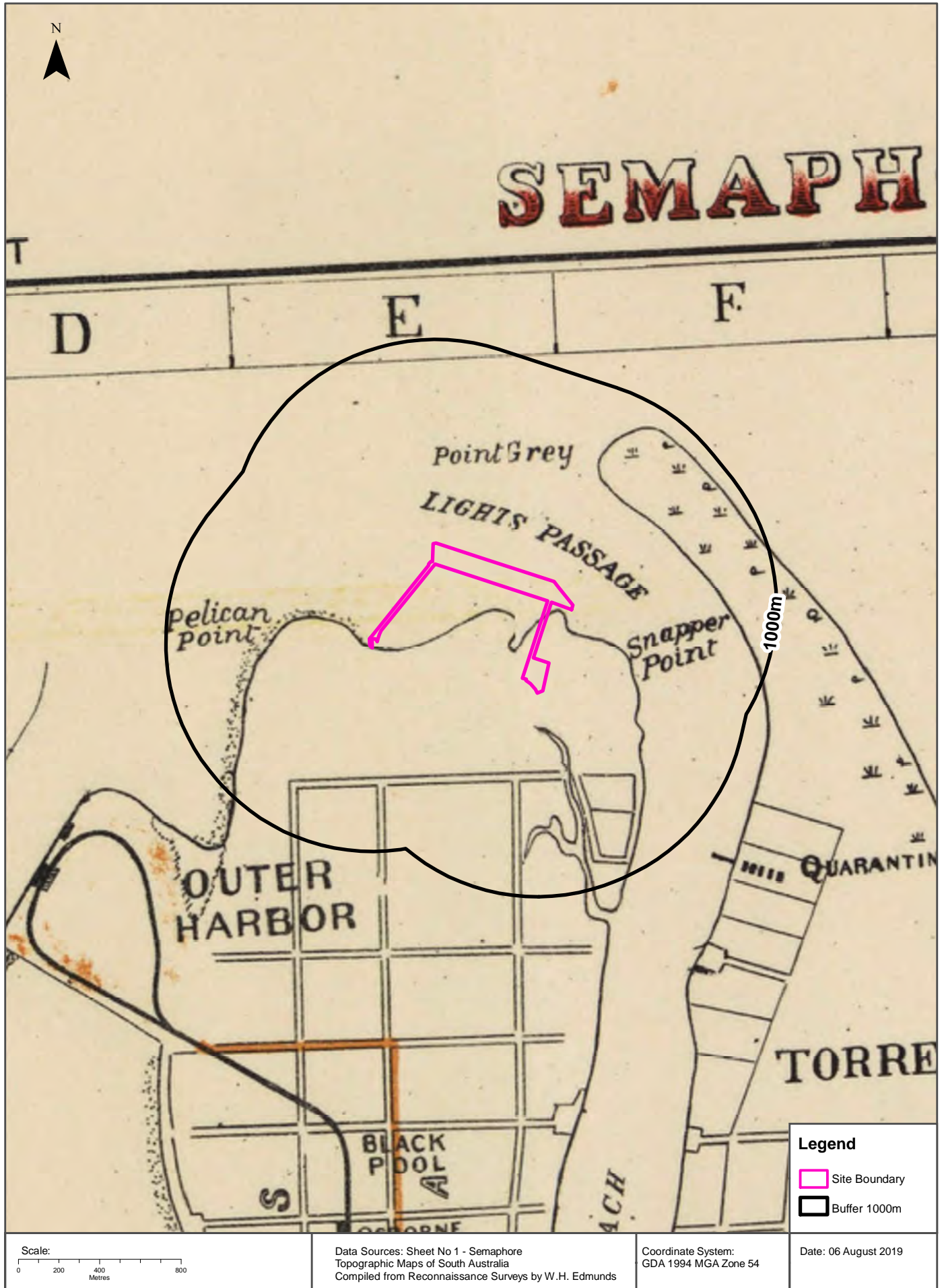
Historical Map 1937

Pelican Point Road, Outer Harbour, SA 5018



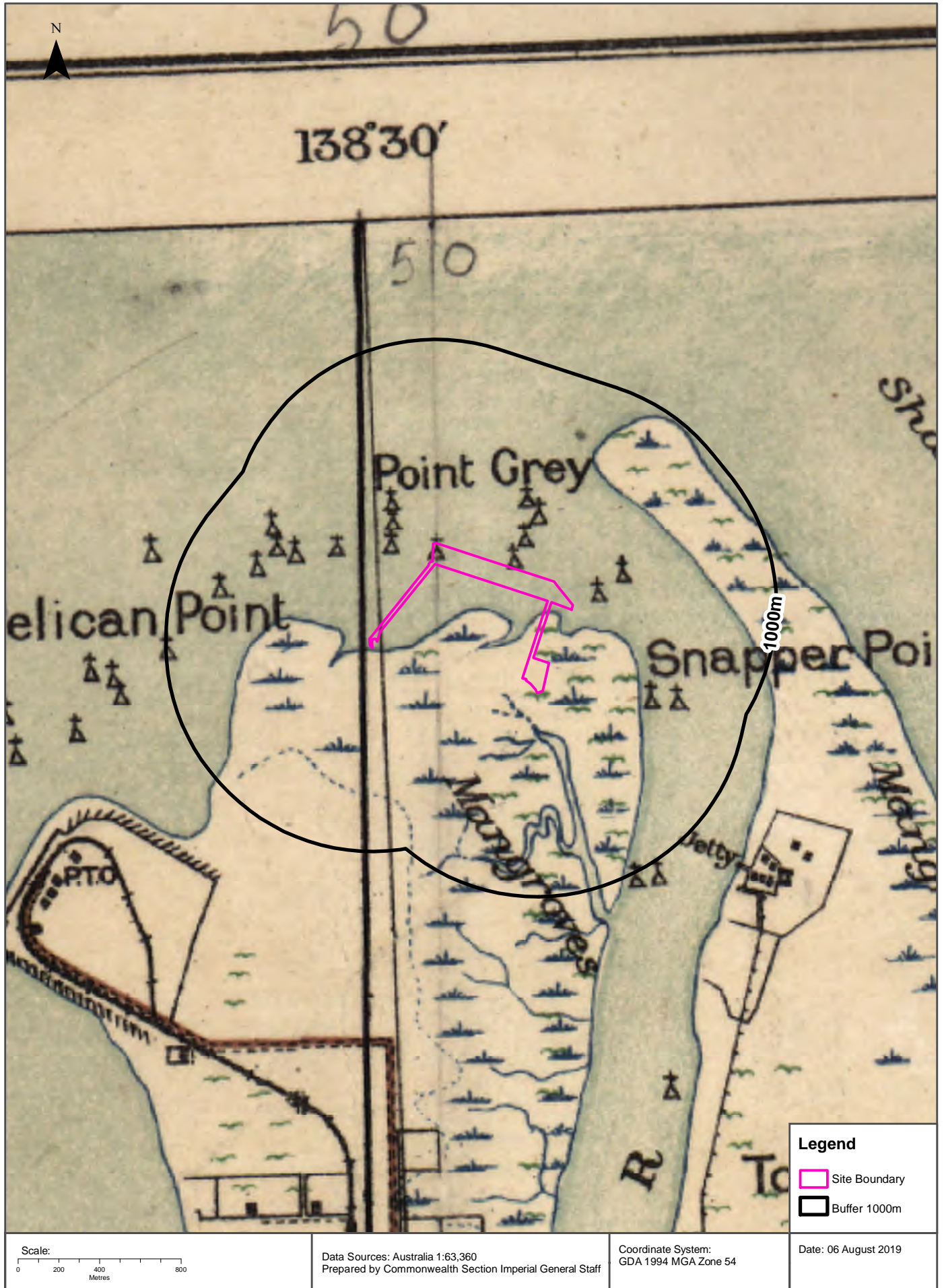
Historical Map 1926

Pelican Point Road, Outer Harbour, SA 5018



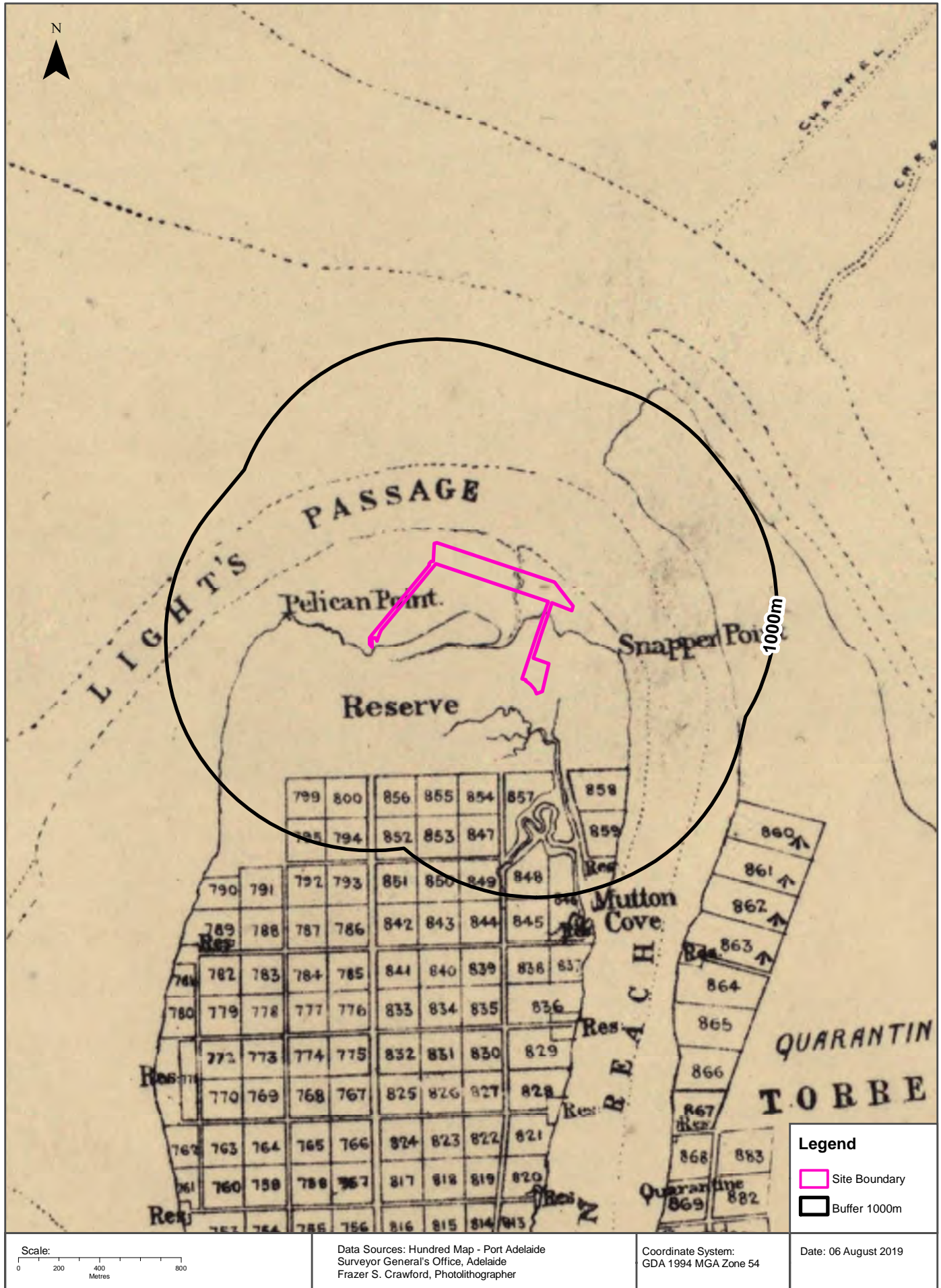
Historical Map 1914

Pelican Point Road, Outer Harbour, SA 5018



Historical Map 1884

Pelican Point Road, Outer Harbour, SA 5018



Legend

- Site Boundary
- Buffer 1000m

Scale: 0 200 400 800 Metres

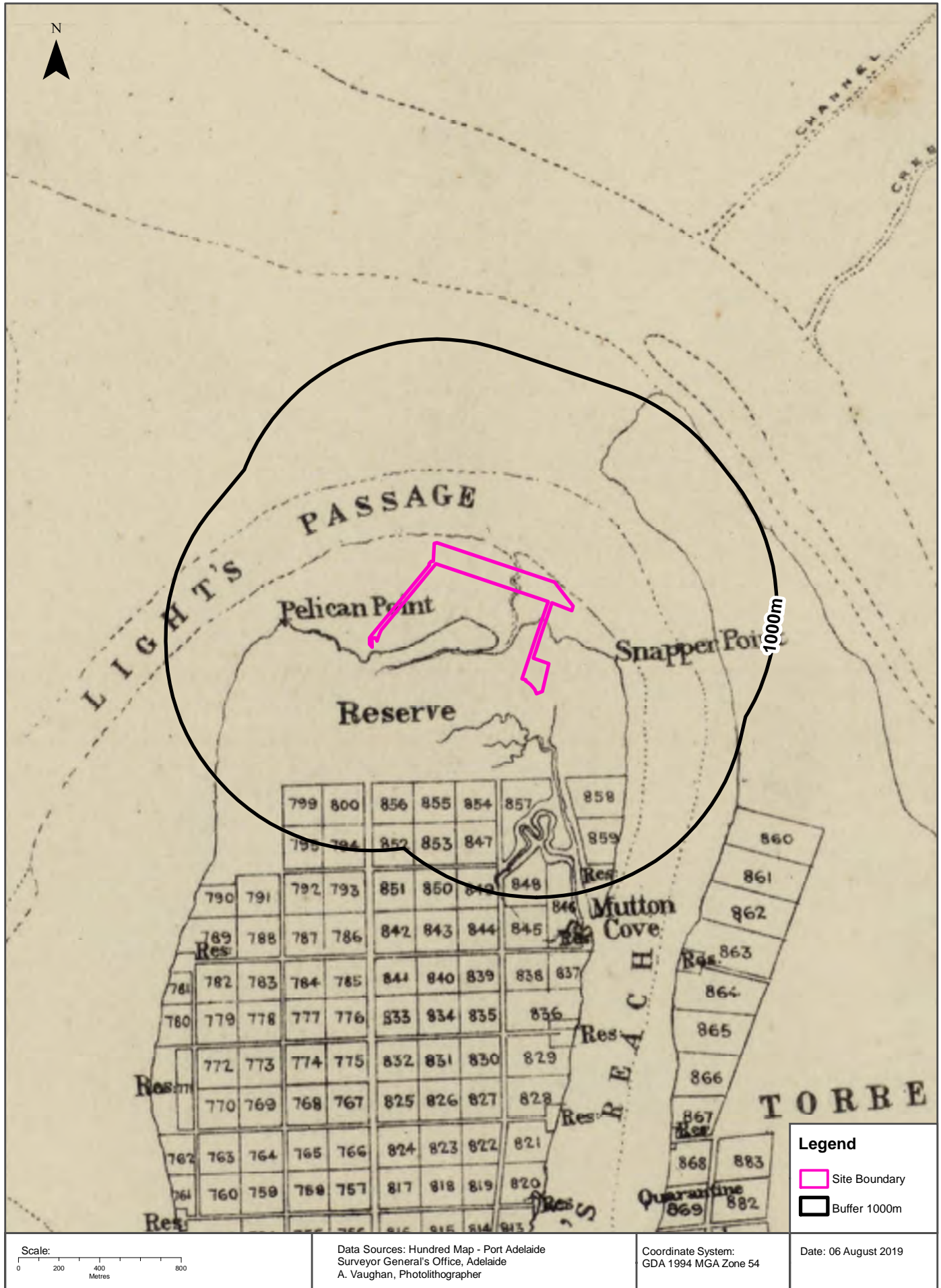
Data Sources: Hundred Map - Port Adelaide
 Surveyor General's Office, Adelaide
 Frazer S. Crawford, Photolithographer

Coordinate System:
 GDA 1994 MGA Zone 54

Date: 06 August 2019

Historical Map 1876

Pelican Point Road, Outer Harbour, SA 5018



Mining

Pelican Point Road, Outer Harbour, SA 5018

Mines and Mineral Deposits

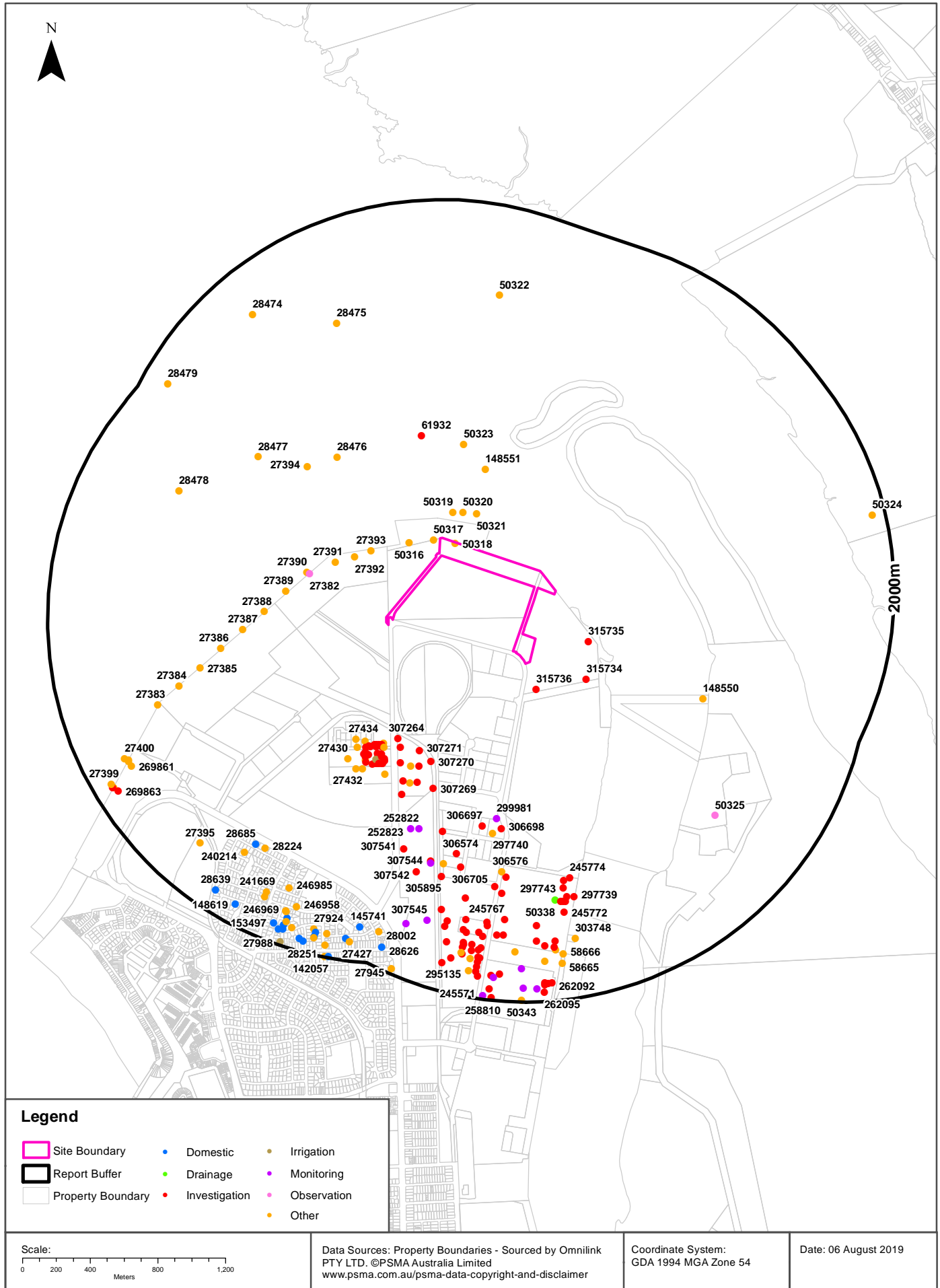
Mines and mineral deposits within the dataset buffer:

Deposit No.	Name	Class	Status	Commodity	Year	Description	Dist	Dir'n
N/A	No records in buffer							

All Mines and Mineral Deposits Data Source: Dept. of State Development, Resources and Energy - South Australia
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Drillholes

Pelican Point Road, Outer Harbour, SA 5018



Groundwater and Drillholes

Pelican Point Road, Outer Harbour, SA 5018

Groundwater Aquifers

Groundwater aquifers within the dataset buffer:

Aquifer Code	Description	Distance	Direction
100	ocean	0m	Onsite
20	Sedimentary Rocks - basins include limestone, often cavernous, sandstone, sand shale and clay	0m	Onsite

Groundwater Aquifers Data Source: Dept. of Environment, Water and Natural Resources - South Australia
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Drillholes

Drillholes within the dataset buffer:

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
50318	FOUNDATION TESTI	Abandoned	Exploration	1970-11-09	35.81		4.14								0m	Onsite
50317	FOUNDATION TESTI	Abandoned	Exploration	1970-11-17	35.66		3.62								37m	North West
50319	FOUNDATION TESTI	Abandoned	Exploration	1972-06-27	28.95		0.00								161m	North West
315736		Dry	Investigation	2019-03-18	3.60		4.65								167m	South
50316	FOUNDATION TESTI	Abandoned	Exploration	1970-11-25	35.36		2.86	8.60	3252					5800	173m	North West
50320	FOUNDATION TESTI	Abandoned	Exploration	1972-06-20	28.04		0.00								180m	North West
50321	FOUNDATION TESTI	Abandoned	Exploration	1972-06-05	28.65		0.00								200m	North
315735		Dry	Investigation	2019-03-18	4.50		0.00								315m	South East
27393	DEPT MAR & HARB	Abandoned		1970-12-03	35.36		3.62								317m	West
315734		Dry	Investigation	2019-03-18	4.00		3.30								350m	South East
27392	DEPT MAR & HARB	Abandoned		1970-12-10	35.36		1.81								371m	West
27391	DEPT MAR & HARB	Abandoned		1970-12-18	35.36		2.56								438m	West
148551	VC 159	Unknown		1985-01-21	4.22	-1.45	0.00								466m	North
27382	PELICAN POINT	Operational	Observation	1968-02-07	225.55	4.60	3.54	8.00	3620	2.0000	6.19	5.13	-1.59	6440	520m	West
27390	DEPT MAR & HARB	Abandoned		1970-09-25	32.16		9.51								537m	West

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
50323	BS 12	Unknown	Exploration	1972-07-24	8.10		0.00								568m	North
27389	DEPT MAR & HARB	Abandoned		1971-01-07	35.05		5.96								612m	West
61932	SV 60	Backfilled	Investigation	1988-06-01	4.51	-0.39	0.00								616m	North West
307264	MW 1		Investigation	2014-02-18	10.00		2.95		5054 0	1.200 0	2.00	2.00		722 00	674m	South West
164406			Industrial	1997-03-12	162.00		2.04	7.4 0	2802	14.00 00	4.61	4.61	-2.57	501 0	702m	South West
27434	AMOCO 8	Unknown		1961-11-09	13.72	3.21	6.46								703m	South West
27435	AMOCO 3	Unknown		1962-10-19	13.72	3.51	6.55								704m	South West
235899	MW 57		Investigation	2007-11-12	3.00		2.93				1.50	1.50	1.43		708m	South West
252907	MW 86			2009-09-02	13.40		6.55				1.10	1.10			709m	South West
235902	MW 60		Investigation	2007-11-12	3.00		3.19				1.50	1.50	1.69		710m	South West
235901	MW 59		Investigation	2007-11-12	2.90		3.41				1.50	1.50	1.91		711m	South West
235900	MW 58		Investigation	2007-11-12	3.00		3.58				1.50	1.50	2.08		713m	South West
164403		Flowing	Industrial	1997-03-12	462.00		1.82		2434 4	0.100 0				386 00	717m	South West
27388	DEPT MAR & HARB	Abandoned		1971-01-15	35.36		4.00								721m	West
235898	MW 56		Investigation	2007-11-12	3.00		2.81				1.50	1.50	1.31		723m	South West
235903	MW 61		Investigation	2007-11-12	3.00		3.30				1.50	1.50	1.80		723m	South West
307265	MW 2		Investigation	2014-02-18	10.00		2.58		3114 5	0.400 0	2.00	2.00		480 00	725m	South West
235905	MW 63		Investigation	2007-11-12	3.00		3.80				1.50	1.50	2.30		726m	South West
27436	AMOCO 5	Unknown		1961-10-17	13.72	3.10	7.97								727m	South West
235904	MW 62		Investigation	2007-11-12	3.00		3.67				1.50	1.50	2.17		730m	South West
235906	MW 64		Investigation	2007-11-12	3.00		3.74				1.50	1.50	2.24		738m	South West
27433	AMOCO 4	Unknown		1961-10-24	13.72	3.54	7.18								745m	South West
235922	MW 80		Investigation	2007-11-14	3.00		3.35				1.50	1.50	1.85		763m	South West
235909	MW 67		Investigation	2007-11-13	2.90		2.39				1.50	1.50	0.89		764m	South West
235910	MW 68		Investigation	2007-11-13	3.00		2.64				1.50	1.50	1.14		765m	South West
307271	MW 8		Investigation	2014-02-19	10.00		5.01		4704 0	1.200 0	2.00	2.00		672 00	765m	South West
28476	SV 61	Unknown		1988-06-01	3.20	-0.62	0.00								772m	North West
235908	MW 66		Investigation	2007-11-12	2.90		2.33				1.50	1.50	0.83		775m	South West
235907	MW 65		Investigation		3.00		2.47				1.50	1.50	0.97		777m	South West
235921			Investigation	2007-11-14	3.00		3.18				1.50	1.50	1.68		777m	South West
235920	MW 78		Investigation	2007-11-14	3.00		3.10				1.50	1.50	1.60		777m	South West
235919	MW 77		Investigation	2007-11-14	3.00		2.97				1.50	1.50	1.47		779m	South West
252908	MW 87		Investigation	2009-09-02	13.00		8.40								779m	South West

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
235911	MW 69		Investigation	2007-11-13	3.00		1.92				1.50	1.50	0.42		792m	South West
235923	MW 81		Investigation	2007-11-14	3.00		2.82				1.50	1.50	1.32		793m	South West
132682			Irrigation	1993-01-29	124.00		2.28			10.00 00					799m	South West
307270	MW 7		Investigation	2014-02-19	10.00		3.74		5453 0	1.200 0	2.00	2.00		779 00	803m	South
235913	MW 71		Investigation	2007-11-13	3.00		1.83				1.50	1.50	0.33		806m	South West
235912	MW 70		Investigation	2007-11-13	2.90		1.83				1.50	1.50	0.33		806m	South West
235924	MW 82			2007-11-14	3.00		2.56				1.50	1.50	1.06		810m	South West
307266	MW 3		Investigation	2014-02-18	10.00		6.44		3943	0.200 0	2.00	2.00		700 0	818m	South West
235914	MW 72		Investigation	2007-11-13	2.90		1.80				1.50	1.50	0.30		819m	South West
235917	MW 75		Investigation	2007-11-13	2.90		1.84				1.50	1.50	0.34		821m	South West
235916	MW 74		Investigation	2007-11-13	2.90		2.00				1.50	1.50	0.50		822m	South West
235915	MW 73		Investigation	2007-11-13	3.00		2.02				1.50	1.50	0.52		823m	South West
252909	MW 88		Investigation	2009-09-01	14.80		7.70								823m	South West
235925	MW 83		Investigation	2007-11-14	3.00		2.34								824m	South West
27430	AMOCO 7	Unknown		1961-11-06	13.72	3.36	8.26								827m	South West
235918	MW 76		Investigation	2007-11-14	3.00		2.06				1.50	1.50	0.56		831m	South West
258602	BH 3			2010-03-30	30.00		2.00								846m	South West
27387	DEPT MAR & HARB	Abandoned		1971-02-09	35.97		7.33								850m	West
258600	BH 1		Investigation	2010-03-31	20.00		1.43								853m	South
27432	AMOCO 2	Unknown		1961-10-30	13.72	3.66	5.66								863m	South West
27431	AMOCO 1	Unknown		1961-10-26	13.72	3.63	6.38								871m	South West
27429	AMOCO 6	Unknown		1961-11-02	13.72	3.81	8.75								884m	South West
27394	BS 13	Unknown		1972-07-25	7.00		0.00								889m	North West
307269	MW 6		Investigation	2014-02-19	10.00		4.55		9333 0	0.600 0	2.00	2.00		109 800	916m	South
307267	MW 4		Investigation	2014-02-19	10.00		4.23		7952 0	1.200 0	2.00	2.00		994 00	929m	South West
299981			Monitoring	2017-09-05	8.00		4.38								932m	South
258603	BH 4			2010-04-06	21.00		5.56								945m	South
258601	BH 2		Investigation	2010-04-07	20.00		7.00								946m	South
306698	MW 10		Investigation	2017-08-01	4.50		5.81				2.50	2.50			988m	South
27386	DEPT MAR & HARB	Abandoned		1970-09-18	29.26		13.30								989m	West
306697	MW 9		Investigation	2017-08-01	4.50		4.96				2.60	2.60			992m	South
307268	MW 5		Investigation	2014-02-19	10.00		3.72		4613 0	0.500 0	2.00	2.00		659 00	1005 m	South West
297740	BH 1	Backfilled		2017-07-25	30.00		5.95								1020 m	South
148550	VC 158	Unknown		1985-01-21	4.00	-1.60	0.00								1045 m	South East

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
306574	MW 1		Investigation	2017-08-01	4.80		6.50				1.50	1.50			1106 m	South
27385	DEPT MAR & HARB	Abandoned		1970-09-11	22.25		4.28								1133 m	West
252822	NLP PROD		Monitoring	2009-08-12	164.00		-0.75			12.0000	14.02	14.02			1160 m	South
28477	SV 62	Unknown		1988-06-01	3.84	-0.62	0.00								1176 m	North West
252823	NLP OBS		Monitoring	2009-07-28	176.00		2.81			8.0000					1186 m	South
297747	BH 8	Backfilled	Investigation	2017-07-31	30.00		5.25								1197 m	South
306576	MW 3			2017-08-02	4.50		2.01				2.50	2.50			1237 m	South
306705	MW 8		Investigation	2017-08-02	5.00		3.98				3.00	3.00			1263 m	South
297745	BH 6	Backfilled	Investigation	2017-08-05	30.00		2.60								1267 m	South
306575	MW 2			2017-08-01	4.50		2.60				1.50	1.50			1279 m	South
27384	DEPT MAR & HARB	Abandoned		1970-09-04	31.70		4.50								1283 m	West
307543			Investigation	2018-05-18	30.00		0.74								1293 m	South
245774	MW 9		Investigation	2008-02-27	4.80		3.98				3.50	3.50	0.48		1294 m	South
306699	MW 11		Investigation	2017-07-31	4.50		6.58				2.50	2.50			1302 m	South
307544			Monitoring	2018-05-22	5.00		0.28								1304 m	South
307541			Investigation	2018-05-15	30.00		6.69								1308 m	South
305894			Investigation	2018-02-20	5.00		7.19								1332 m	South
297743	BH 4	Backfilled	Investigation	2017-08-02	29.50		7.11								1347 m	South
305895			Investigation	2018-02-20	5.00		4.51								1351 m	South
245768	MW 3		Investigation	2008-02-26	4.50		4.17				3.40	3.40	0.77		1366 m	South
307542		Dry	Investigation	2018-05-16	30.00		4.21								1386 m	South
245773	MW 8		Investigation	2008-02-27	4.80		4.00				3.10	3.10	0.90		1401 m	South
28475	SV 59	Unknown		1988-05-17	4.32	-0.82	0.00								1410 m	North West
50338		Operational	Drainage			4.00	6.44		24967		4.27	4.27	-0.27	39524	1410 m	South
297739			Investigation	2017-07-31	20.00		13.01								1411 m	South
306700	MW 14		Investigation	2017-07-31	4.50		5.15				2.50	2.50			1419 m	South
50325	TORRENS ISLAND QUARANTINE - DEPTW	Rehabilitated	Observation	1954-04-22	111.56	2.17	2.01	8.30	517	4.0000	5.39	5.23	-3.22	946	1422 m	South East
306707	MW 13		Investigation	2017-07-31	5.00		4.61				2.60	2.60			1424 m	South
306706	MW 12		Investigation	2017-07-31	5.00		4.17				2.80	2.80			1427 m	South
297742	BH 3		Investigation	2017-08-09	30.00		6.06								1429 m	South
28478	SV 63	Unknown		1988-06-01	3.04	-0.52	0.00								1433 m	West
27383	DEPT MAR & HARB	Abandoned		1970-08-29	35.36		0.00								1435 m	West

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
50322	BS 15	Unknown	Exploration	1972-07-27	5.10		0.00								1472 m	North
245772	MW 7		Investigation	2008-02-28	4.80		4.02				2.80	2.80	1.22		1488 m	South
28224				1986-05-05	4.30		3.87	7.70	556	0.5000	2.40	2.40	1.47	1010	1509 m	South West
28685		Operational	Domestic	1992-02-10	5.00		3.95	7.80	12417		3.50	3.50	0.45	20929	1517 m	South West
245767	MW 2		Investigation	2008-02-28	4.50		4.20				3.30	3.30	0.90		1518 m	South
305896			Investigation	2018-02-20	5.00		6.29								1538 m	South
297746	BH 7	Backfilled	Investigation	2017-08-08	30.00		8.21								1545 m	South
245770	MW 5		Investigation	2008-02-28	4.50		4.11				3.20	3.20	0.91		1549 m	South
306693	MW 7		Investigation	2017-08-02	4.50		8.54				2.40	2.40			1553 m	South
274563	GW 2		Investigation	2012-08-15	4.50		8.11				2.00	2.00			1565 m	South
297741	BH 2		Investigation	2017-07-28	30.00		4.31								1589 m	South
240214				2007-06-27	6.00		4.17		3827					6800	1593 m	South West
245766	MW 1		Investigation	2008-02-29	4.50		4.22				3.24	3.24	0.98		1609 m	South
306578	MW 5		Investigation	2017-08-02	4.50		8.55				2.40	2.40			1612 m	South
274542			Investigation	2012-08-15	4.50		10.84				2.00	2.00			1615 m	South
274544	GW 3		Investigation	2012-08-15	4.50		10.82								1615 m	South
306577	MW 4		Investigation	2017-08-02	4.50		3.00				2.10	2.10			1624 m	South
306579	MW 6		Investigation	2017-08-02	4.50		11.33				2.40	2.40			1625 m	South
307545			Monitoring	2018-05-24	5.00		9.69								1625 m	South
304156			Investigation	2017-12-14	4.50		8.24								1630 m	South
245769	MW 4		Investigation	2008-02-27	4.30		4.12				3.20	3.20	0.92		1640 m	South
245771	MW 6		Investigation	2008-02-26	4.50		4.07			4.0000	3.40	3.40	0.67		1651 m	South
303748		Rehabilitated					1.75								1654 m	South
246985				2007-11-11	6.50		3.83		1434		3.50	3.50	0.33	2590	1662 m	South West
297744	BH 5	Backfilled	Investigation	2017-08-04	30.00		6.02								1674 m	South
60053		Abandoned	Investigation	1984-06-13	24.99		4.07								1687 m	South
295124	BH 8	Backfilled	Investigation	2017-03-12	25.00		6.51								1688 m	South
295123	BH 9	Backfilled	Investigation	2017-03-10	25.00		3.63								1688 m	South
307546			Monitoring	2018-05-28	5.00		10.41								1691 m	South
285606			Investigation	2015-08-11	25.00		4.81								1701 m	South
285605			Investigation	2015-08-12	25.00		2.05								1701 m	South
148165	COF 10			1987-09-21	18.00	4.00	5.71								1701 m	South
27395		Backfilled			94.49	4.00	6.99		1693		0.00	0.00	4.00	3052	1705 m	South West
50344	ETSA OSBORNE 4	Unknown	Exploration	1958-03-07	45.72		4.21				2.29	2.29	1.92		1706 m	South

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
285600			Investigation	2015-08-18	25.00		4.00								1708 m	South
295136	BH 6	Backfilled	Investigation	2017-03-06	25.00		2.01								1714 m	South
295125		Backfilled	Investigation	2017-03-14	25.00		2.86								1716 m	South
28474	SV 58	Unknown		1988-05-17	5.14	-0.87	0.00								1725 m	North West
295122	BH 7	Backfilled	Investigation	2017-03-09	25.00		0.67								1726 m	South
27405	SA HARBOR S BOARD	Abandoned		1962-11-26	21.34		19.20								1727 m	South West
269861				2012-01-31	35.00		14.34								1728 m	South West
269860				2012-01-21	31.00		19.19								1731 m	South West
58666	MARINE & HARBOR S	Abandoned	Exploration	1981-05-29	21.34		4.05								1732 m	South
241669				2007-12-26	6.20		4.38		2716					4860	1734 m	South West
27400	SA HARBOR S BOARD	Abandoned		1962-11-16	30.50		20.06								1742 m	South West
295126	BH 11	Backfilled		2017-03-15	25.00		1.01								1752 m	South
246958				2008-01-16	6.20		3.99		1759		4.20	4.20	-0.21	3170	1754 m	South West
285603			Investigation	2015-08-14	25.00		1.12								1758 m	South
295489	BH 2	Backfilled	Investigation	2017-03-03	25.00		1.52								1758 m	South
285604			Investigation	2015-08-13	25.00		2.13								1761 m	South
50342	ETSA OSBORN E 2	Unknown	Exploration	1958-02-02	40.84		4.12				4.57	4.57	-0.45		1766 m	South
241672				2007-05-10	6.20		4.45								1767 m	South West
295121	BH 5	Backfilled		2017-03-08	25.00		1.27								1774 m	South
58665	MARINE & HARBOR S	Abandoned	Exploration	1981-05-25	21.95		4.06								1785 m	South
295490	BH 1	Backfilled	Investigation	2017-01-02	25.00		1.93								1786 m	South
285602			Investigation	2015-08-17	25.00		8.55								1793 m	South
145741			Domestic	1992-12-12	5.50		4.57	7.80	888		4.00	4.00	0.57	1610	1794 m	South
246976				2007-12-06	6.10		4.26		446		3.60	3.60	0.66	811	1797 m	South West
246969				2007-10-28	6.00		4.26		581		3.50	3.50	0.76	1057	1800 m	South West
245577	MW 3	Backfilled	Monitoring	2008-10-30	4.00		4.20				2.00	2.00	2.20		1802 m	South
28002		Backfilled		1984-08-27	6.00	4.00	6.08	7.30	16004	1.2000	2.10	2.10	1.90	26459	1806 m	South
295491	BH 4	Backfilled	Investigation	2017-03-01	25.00		2.48								1814 m	South
304153			Investigation	2017-12-13	4.50		4.28								1835 m	South
147760			Domestic	1994-10-27	6.70		4.30	7.10	3052	0.9000				5450	1836 m	South West
295492	BH 3	Backfilled	Investigation	2017-02-28	25.00		1.06								1843 m	South

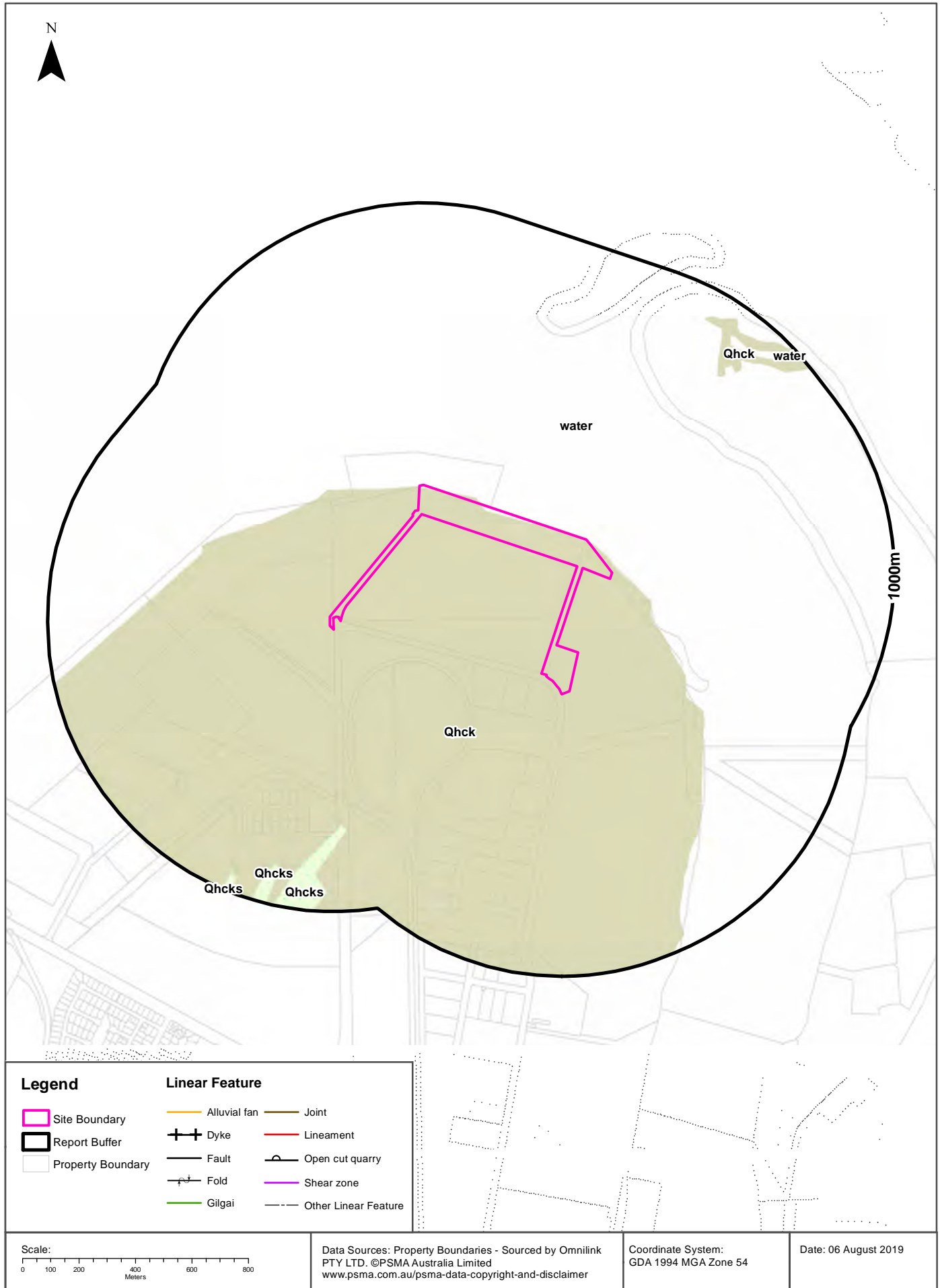
Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
259633	ASC 4		Investigation	2010-03-25	4.00		4.80				2.10	2.10			1844 m	South
295135	BH 10	Backfilled		2017-03-07	25.00		1.09								1845 m	South
28479	SV 64	Unknown		1988-05-31	5.29	-0.80	0.00								1848 m	North West
27924				1984-01-19	3.90		4.31	7.30	1367	0.6000	2.40	2.40	1.91	2470	1853 m	South West
259632			Investigation	2010-03-25	4.00		2.81				1.60	1.60			1857 m	South
246980				2007-09-10	6.00		4.35		780		3.50	3.50	0.85	1415	1857 m	South West
27783				1982-09-30	5.40	4.00	8.00	8.00	694	0.7000	2.70	2.70	1.30	1260	1864 m	South West
245572	MW 2	Backfilled	Monitoring	2008-10-30	4.00		4.31				2.00	2.00	2.31		1865 m	South
304155			Investigation	2017-12-14	4.50		0.31								1869 m	South
28143		Operational	Domestic	1985-09-08	6.00		4.36	7.20	688	0.5000	3.00	3.00	1.36	1250	1870 m	South West
28639		Operational	Domestic	1992-02-11	6.00		4.51	7.30	5611	0.8900	4.30	4.30	0.21	9851	1871 m	South West
195352			Domestic	2002-12-16	6.00		4.62		3178		2.50	2.50	2.12	5670	1872 m	South
269863			Investigation	2012-01-18	25.00		4.52								1872 m	South West
28024		Operational	Domestic	1984-08-19	3.60		4.43	7.50	1105	0.7000	2.10	2.10	2.33	2000	1879 m	South West
28626		Operational	Domestic	1992-02-16	4.50		4.60	8.10	2881		3.00	3.00	1.60	5150	1880 m	South
28153				1985-10-08	6.00		4.30	7.60	1384	0.5000	3.00	3.00	1.30	2500	1881 m	South West
148619			Domestic	1994-12-18	5.00		4.45	8.40	2086		3.00	3.00	1.45	3750	1882 m	South West
27404	SA HARBOR S BOARD	Abandoned		1962-10-20	21.95		4.27								1884 m	South West
27399	SA HARBOR S BOARD	Abandoned		1962-11-09	30.78		5.52								1886 m	South West
153497			Domestic	1994-09-11	5.00		4.62	7.80	628					1140	1887 m	South West
27427					1.22		4.64		543					987	1888 m	South
259635	ASC 6		Investigation	2010-03-24	4.00		4.33				2.50	2.50			1889 m	South
269862			Investigation	2012-01-17	26.95		3.08								1890 m	South West
262092	ASC 8		Investigation	2010-12-07	4.50		2.13				2.30	2.30			1892 m	South
190258			Domestic	2002-05-04	6.00		4.39		783	0.6000	4.50	4.50	-0.11	1420	1894 m	South West
262093	ASC 9		Investigation	2010-12-10	3.70		3.24				2.40	2.40			1895 m	South
262094	ASC 10		Investigation	2010-12-10	4.00		3.91								1903 m	South
27864		Operational	Domestic	1983-03-01	4.20		4.48	7.00	1188	0.6000	2.70	2.70	1.78	2150	1903 m	South West
27428					2.13		4.39		643		1.93	1.93	2.46	1169	1903 m	South West
28549		Operational	Domestic	1991-09-12	5.50		4.56	7.80	799		3.00	3.00	1.56	1449	1913 m	South West
245578	MW 4	Backfilled	Monitoring	2008-10-30	4.00		4.21				2.00	2.00	2.21		1919 m	South
50324	BS 10	Unknown	Exploration	1972-07-19	5.40		0.00								1923 m	East
245581	MW 7	Backfilled	Monitoring	2008-10-30	4.00		4.16								1924 m	South

Drillhole No	Name	Status	Purpose	Drill Date	Max Depth	Ref Elev	Ground Elev	PH	TDS	Yield	DTW	SWL	RSWL	EC	Dist	Dir'n
178270			Domestic	1998-11-27	6.50		4.34		932	0.7200	3.00	3.00	1.34	1690	1926 m	South West
236834				2007-02-10	5.00		4.55		1541					2780	1931 m	South West
259631	ASC 2		Investigation	2010-03-25	4.00		1.70				3.00	3.00			1933 m	South
156361			Domestic	1995-07-21	5.30		4.36	7.60	876		3.30	3.30	1.06	1590	1937 m	South West
262095	ASC 11		Investigation	2010-12-10	4.00		4.02				2.30	2.30			1948 m	South
27945		Backfilled		1983-08-01	6.00		4.63								1969 m	South
245571	MW 1	Backfilled	Monitoring		4.00		4.36				2.00	2.00	2.36		1978 m	South
27988		Operational	Irrigation	1984-06-21	4.20	14.96	5.30	7.70	925	0.7000	2.70	2.70	12.26	1676	1983 m	South West
258810	ASC 1		Investigation	2010-03-25	4.00		2.34				2.60	2.60			1986 m	South
50343	ETSA OSBORNE 3	Unknown	Exploration	1958-02-24	42.67		4.22				2.01	2.01	2.21		1989 m	South
142057			Domestic	1994-02-28	7.00		4.66	7.60	1895	0.7500				3410	1992 m	South West
28251				1983-01-01	5.30		4.63	8.00	1620	0.3000	3.00	3.00	1.63	2920	1997 m	South West

Drillholes Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Geology 1:100,000

Pelican Point Road, Outer Harbour, SA 5018

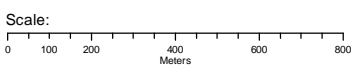


Legend

- Site Boundary
- Report Buffer
- Property Boundary

Linear Feature

- Alluvial fan
- Joint
- Dyke
- Lineament
- Fault
- Open cut quarry
- Fold
- Shear zone
- Gilgai
- Other Linear Feature



Data Sources: Property Boundaries - Sourced by Omnilink PTY LTD. ©PSMA Australia Limited
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Coordinate System:
 GDA 1994 MGA Zone 54

Date: 06 August 2019

Geology

Pelican Point Road, Outer Harbour, SA 5018

Surface Geology 1:100,000

Surface Geology Units within the dataset buffer:

Map Unit Code	Name	Description	Parent Name	Province	Age	Min Age	Max Age	Distance
water								0m
Qhck	Saint Kilda Formation	Coastal marine sediment: calcareous, fossiliferous sand and mud of intertidal sand flats, beaches and tidal marshes; organic, gypseous clay of supratidal flats.	Unnamed GIS Unit - see description	ST VINCENT BASIN	HOLOCENE	Holocene	Holocene	0m
Qhcks	Semaphore Sand Member	Unconsolidated white bioclastic quartz-carbonate sand of modern beaches and transgressive dune fields.	Saint Kilda Formation	ST VINCENT BASIN	HOLOCENE	Holocene	Holocene	697m

Geology Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Linear Structures 1:100,000

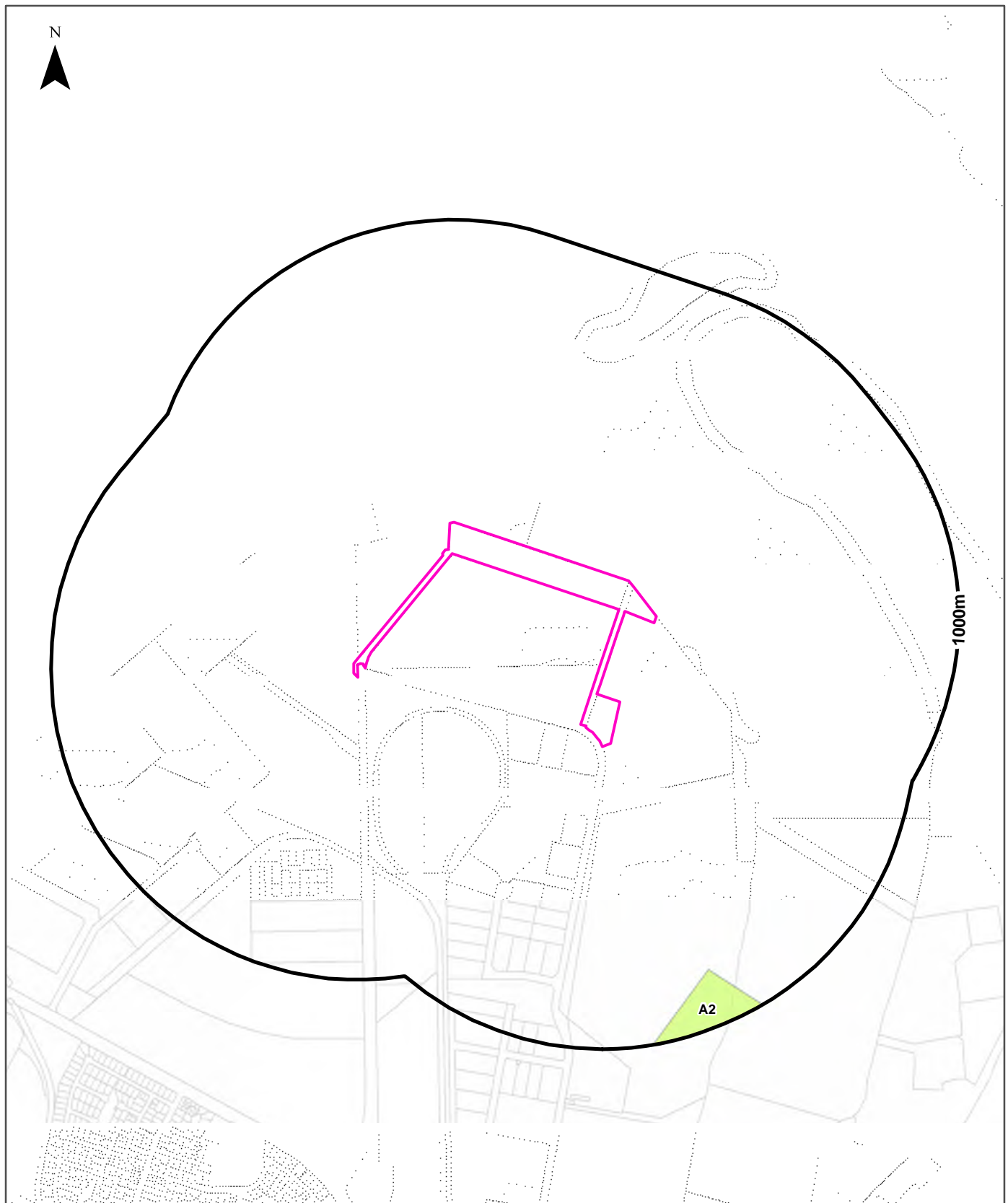
Linear geological structures within the dataset buffer:

Map Code	Description	Distance
N/A	No features in buffer	

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Atlas of Australian Soils

Pelican Point Road, Outer Harbour, SA 5018



Legend Site Boundary Report Buffer Property Boundary		Australian Soil Classification Orders <table border="0"> <tr> <td> Anthrosol</td> <td> Dermosol</td> <td> Kandosol</td> <td> Podosol</td> <td> Tenosol</td> <td> No Data</td> </tr> <tr> <td> Calcarosol</td> <td> Ferrosol</td> <td> Kurosol</td> <td> Rudosol</td> <td> Vertosol</td> <td></td> </tr> <tr> <td> Chromosol</td> <td> Hydrosol</td> <td> Organosol</td> <td> Sodosol</td> <td> Lake</td> <td></td> </tr> </table>						Anthrosol	Dermosol	Kandosol	Podosol	Tenosol	No Data	Calcarosol	Ferrosol	Kurosol	Rudosol	Vertosol		Chromosol	Hydrosol	Organosol	Sodosol	Lake	
Anthrosol	Dermosol	Kandosol	Podosol	Tenosol	No Data																				
Calcarosol	Ferrosol	Kurosol	Rudosol	Vertosol																					
Chromosol	Hydrosol	Organosol	Sodosol	Lake																					
Scale: 		Data Sources: Property Boundaries - Sourced by Omnilink PTY LTD. ©PSMA Australia Limited www.pasma.com.au/psma-data-copyright-and-disclaimer		Coordinate System: GDA 1994 MGA Zone 54		Date: 06 August 2019																			

Soils

Pelican Point Road, Outer Harbour, SA 5018

Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
A2	Rudosol	Coastal dunes and plains with some swamps: dunes of calcareous sands (Uc1.11) and also siliceous sands (Uc1.22); plains of various saline soils (unclassified) and lesser areas of brown calcareous earths (Gc1.1 and Gc1.2).	814m

Atlas of Australian Soils Data Source: CSIRO

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Soils

Pelican Point Road, Outer Harbour, SA 5018

Soil Types

Soil types within the dataset buffer:

Map category code	Soil type description	Distance
XX	Not applicable - No assessment/analysis undertaken	0m

Soil Types Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Atlas of Australian Acid Sulfate Soils

Pelican Point Road, Outer Harbour, SA 5018



Acid Sulfate Soils

Pelican Point Road, Outer Harbour, SA 5018

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance
A	High Probability of occurrence. >70% chance of occurrence.	0m
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Acid Sulfate Soils

Pelican Point Road, Outer Harbour, SA 5018

Acid Sulfate Soil Potential

Acid sulfate soil potential within the dataset buffer:

Map category code	Proportion of land susceptible to the development of acid sulfate soils	Distance
X	Not applicable - No assessment/analysis undertaken	0m

Acid Sulfate Soils Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Soil Salinity

Pelican Point Road, Outer Harbour, SA 5018

Soil Salinity - Watertable Induced

Watertable induced soil salinity within the dataset buffer:

Map category code	Severity description	Distance
X	Not applicable - No assessment/analysis undertaken	0m

Salinity Watertable Induced Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Soil Salinity - Non-Watertable

Non-watertable soil salinity within the dataset buffer:

Map category code	Severity description	Surface ECe (dS/m)	Subsoil ECe (dS/m)	Distance
X	Not applicable - No assessment/analysis undertaken			0m

Salinity Non-Watertable Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Soil Salinity - Non-Watertable (Magnesia Patches)

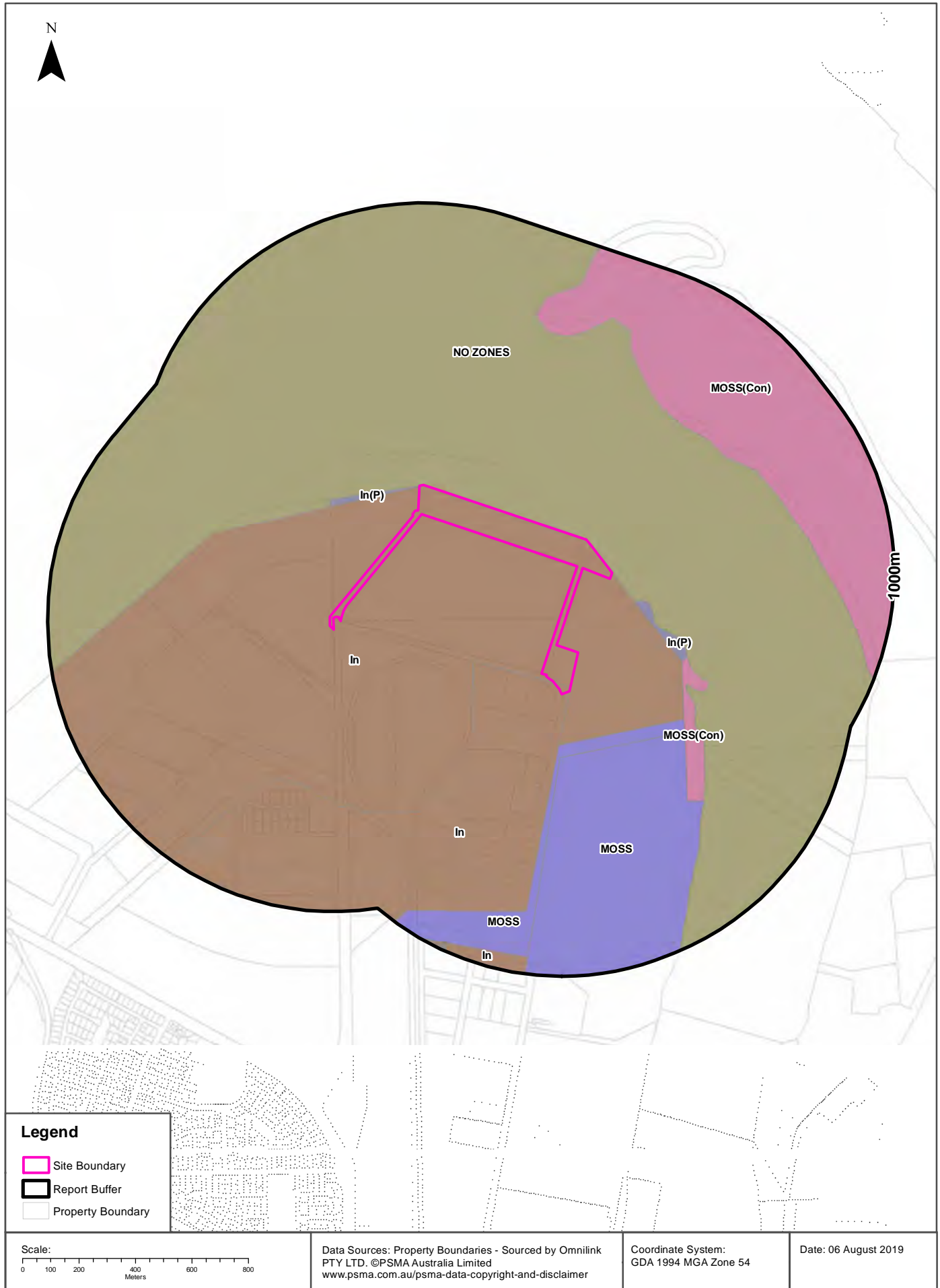
Magnesia patches within the dataset buffer:

Map category code	Proportion of land affected by magnesia patches	Distance
X	Not applicable - No assessment/analysis undertaken	0m

Salinity Non-Watertable (Magnesia Patches) Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Land Development Zones

Pelican Point Road, Outer Harbour, SA 5018



Planning

Pelican Point Road, Outer Harbour, SA 5018

Land Development Zones

Land development zoning within the dataset buffer:

Zone Code	Development Plan Code	Zone Description	Development Category	Distance	Direction
In	PADE	Industry	INDUSTRIAL	0m	Onsite
In(P)	LNWCA_MA	Industry (Port)	INDUSTRIAL	0m	North West
NO ZONES	LNWCA_MA	NO ZONES	NO ZONES	0m	South
In(P)	LNWCA_MA	Industry (Port)	INDUSTRIAL	123m	South East
MOSS	PADE	Metropolitan Open Space System	OPEN SPACE	175m	South West
MOSS	PADE	Metropolitan Open Space System	OPEN SPACE	220m	South
MOSS (Con)	LNWCA_MA	Metropolitan Open Space System (Conservation)	CONSERVATION	367m	South East
MOSS (Con)	LNWCA_MA	Metropolitan Open Space System (Conservation)	CONSERVATION	529m	South East
In	PADE	Industry	INDUSTRIAL	939m	South

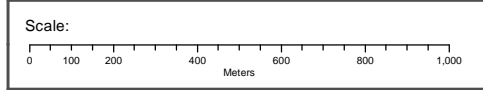
Land Development Zones Data Source: Dept of Planning, Transport and Infrastructure - South Australia
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Land Use Generalised 2018

Pelican Point Road, Outer Harbour, SA 5018



Legend			
	No Description		Forestry
	Agriculture		Golf
	Site Boundary		Retail Commercial
	Report Buffer		Public Institution
	Property Boundary		Rural Residential
	Food Industry		Horticulture
	Education		Recreation
	Utilities or Industry		Reserves
	Vacant		Livestock
	Vacant Urban Land		Mining or Quarrying
			Residential



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Coordinate System:
GDA 1994 MGA Zone 54

Date: 06 August 2019

Land Use

Pelican Point Road, Outer Harbour, SA 5018

Land Use Generalised 2018

Land use classes within the dataset buffer:

Description	Distance	Direction
Vacant Urban Land	0m	Onsite
Vacant	0m	Onsite
Vacant Urban Land	0m	Onsite
Vacant Urban Land	0m	West
Utilities or Industry	0m	South West
Utilities or Industry	0m	West
Vacant	0m	North West
Food Industry	33m	South West
Reserves	175m	South
Commercial	557m	South West

Land Use Generalised Data Source: Dept of Planning, Transport and Infrastructure - South Australia
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Heritage

Pelican Point Road, Outer Harbour, SA 5018

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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National Heritage List

What are the National Heritage List Items located within the dataset buffer?

Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

State Heritage Areas

State Heritage Areas within the dataset buffer:

Heritage Id	Name	Distance	Direction
N/A	No records in buffer		

Heritage Areas Data Source: Dept of Environment, Water and Natural Resources - South Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

SA Heritage Places

SA Heritage Places within the dataset buffer:

Heritage No	Location	Heritage Class	Australian Class	Details	Auth Date	Distance	Direction
N/A	No records in buffer						

Heritage Places Data Source: Dept of Environment, Water and Natural Resources - South Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Aboriginal Land

Aboriginal Land within the dataset buffer:

Map Id	Grant Date	Address	Locality	Description	Title	Distance	Direction
N/A	No records in buffer						

Aboriginal Land Data Source: Department of State Development, Resources and Energy - South Australia

Natural Hazards

Pelican Point Road, Outer Harbour, SA 5018

Bushfire Protection Areas

Bushfire Protection Areas within the dataset buffer:

Map Id	Bushfire Risk Code	Development Plan Code	Additional Development Criteria	Distance	Direction
N/A	No records in buffer				

Bushfire Protection Areas Data Source: Dept of Planning, Transport and Infrastructure - South Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Bushfires and Prescribed Burns History

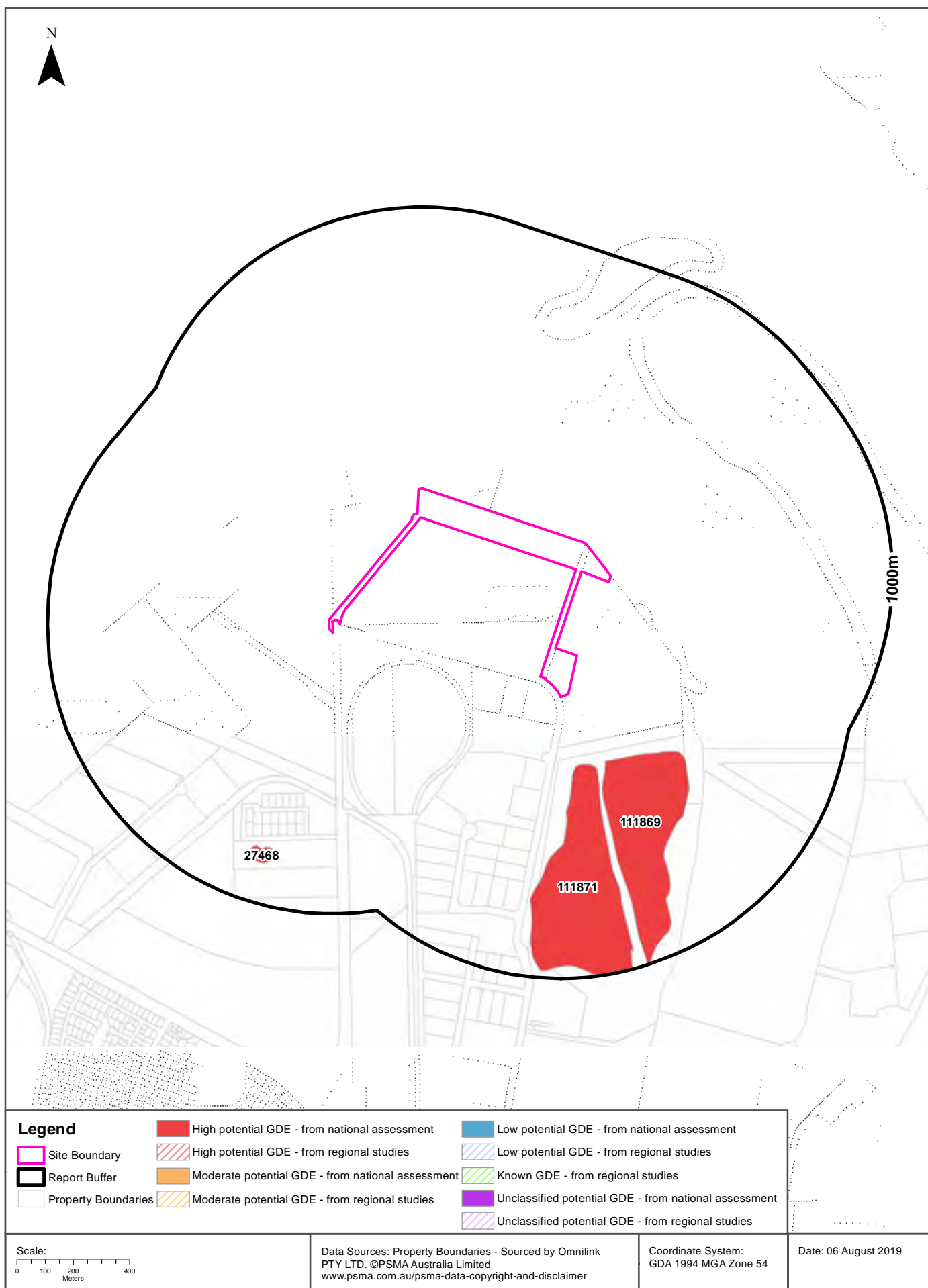
Bushfires and prescribed burns within the dataset buffer:

Map Id	Incident No.	Incident Name	Incident Type	Date of Fire	Area of Fire	Distance	Direction
N/A	No records in buffer						

Bushfires and Prescribed Burns History Data Source: Dept of Environment, Water and Natural Resources - South Australia
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Ecological Constraints - Groundwater Dependent Ecosystems Atlas

Pelican Point Road, Outer Harbour, SA 5018



Ecological Constraints

Pelican Point Road, Outer Harbour, SA 5018

Groundwater Dependent Ecosystems Atlas

GDEs within the dataset buffer:

MapID	Type	Name	GDE Potential	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
111871	Terrestrial		High potential GDE - from national assessment	10	Salt lake and bahadas in north; alluvial and littoral plains in south; north-west/south-east longitudinal dunes, mainly stabilized.	Vegetation		251m
111869	Terrestrial		High potential GDE - from national assessment	10	Salt lake and bahadas in north; alluvial and littoral plains in south; north-west/south-east longitudinal dunes, mainly stabilized.	Vegetation		272m
27468	Aquatic		High potential GDE - from national assessment	10	Salt lake and bahadas in north; alluvial and littoral plains in south; north-west/south-east longitudinal dunes, mainly stabilized.	Wetland		797m

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology
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Ecological Constraints

Pelican Point Road, Outer Harbour, SA 5018

Ramsar Wetlands

Ramsar Wetlands within the dataset buffer:

Wetland	Distance	Direction
No records in buffer		

Ramsar Wetlands Data Source: Dept of Environment, Water and Natural Resources - South Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

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 - (b) any loss of profit, loss of revenue, loss of interest, loss of data, loss of goodwill or loss of business opportunities, business interruption arising directly or indirectly out of or in relation to the Report or these Terms,irrespective of how that liability arises including in contract or tort, liability under indemnity or for any other common law, equitable or statutory cause of action or otherwise.
 12. These Terms are subject to New South Wales law.

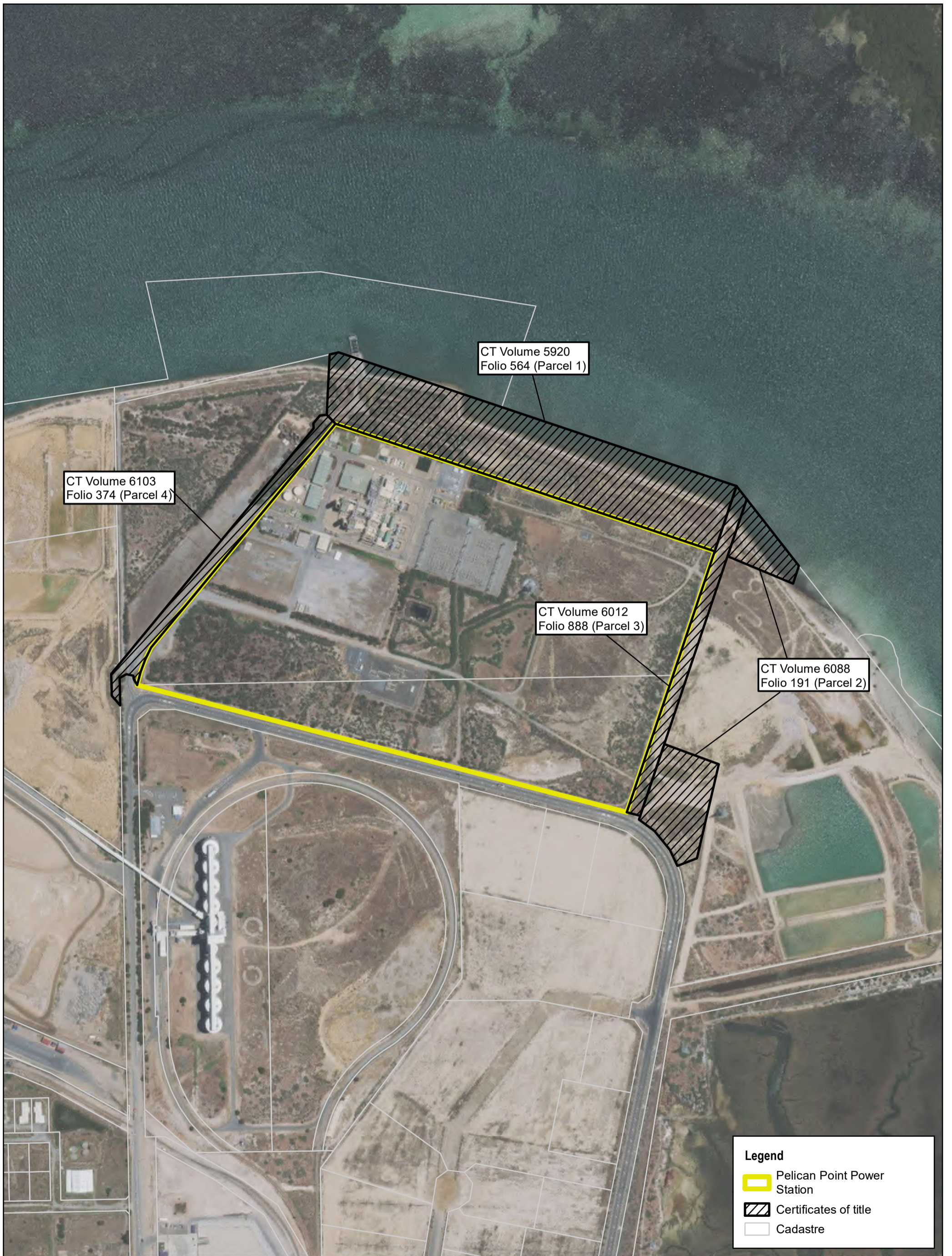
APPENDIX B


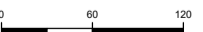
FIGURES





Map: PS114349_GIS_007_A1	Author: MO		 1:15,000 Coordinate system: GDA 1994 MGA Zone 54 Scale ratio correct when printed at A3	 PRELIMINARY WSP	Pelican Point Gas Turbine Peaker Project Figure 1 Locality Plan
Date: 27/08/2019	Approved by:				
<small>Data source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</small>			<small>© WSP Australia Pty Ltd ("WSP") Copyright in the drawings, information and data recorded ("the information") is the property of WSP. This document and the information are solely for the use of the authorized recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that which it was supplied by WSP. WSP makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information. NCSI Certified Quality System to ISO 9001. © APPROVED FOR AND ON BEHALF OF WSP Australia Pty Ltd.</small>		
<small>\\corp.pbwan.net\ANZI\Projects\PS114349_SA_Peaker_Plant\5_Shared\GIS\54_Production\Maps\PS114349_GIS_007_A1.mxd</small>			<small>NEXIF</small>		



Map: PS114349_GIS_006_A1	Author: MO		 1:5,000		Pelican Point Gas Turbine Peaker Project
Date: 27/08/2019	Approved by:				
<small>Data source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</small>		<small>Coordinate system: GDA 1994 MGA Zone 54 Scale ratio correct when printed at A3</small>		PRELIMINARY Figure 2 Certificates of Title	

APPENDIX C

CERTIFICATES OF TITLE





The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 5920 Folio 564

Parent Title(s) CT 5651/59, CT 5858/212, CT 5904/106, CT 5913/343
Creating Dealing(s) RTC 10026663
Title Issued 20/07/2004 Edition 4 Edition Issued 26/07/2012

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 205 DEPOSITED PLAN 64682
IN THE AREA NAMED OUTER HARBOR
OUT OF HUNDREDS (ADELAIDE) AND HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B AND E (RTC 8674520)
SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED E (RTC 8674520)
TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER ALLOTMENT 213
TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED T.U.AA AND AB
TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED V (RTC 10026663)

Schedule of Dealings

NIL

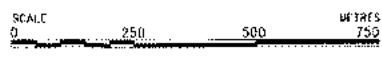
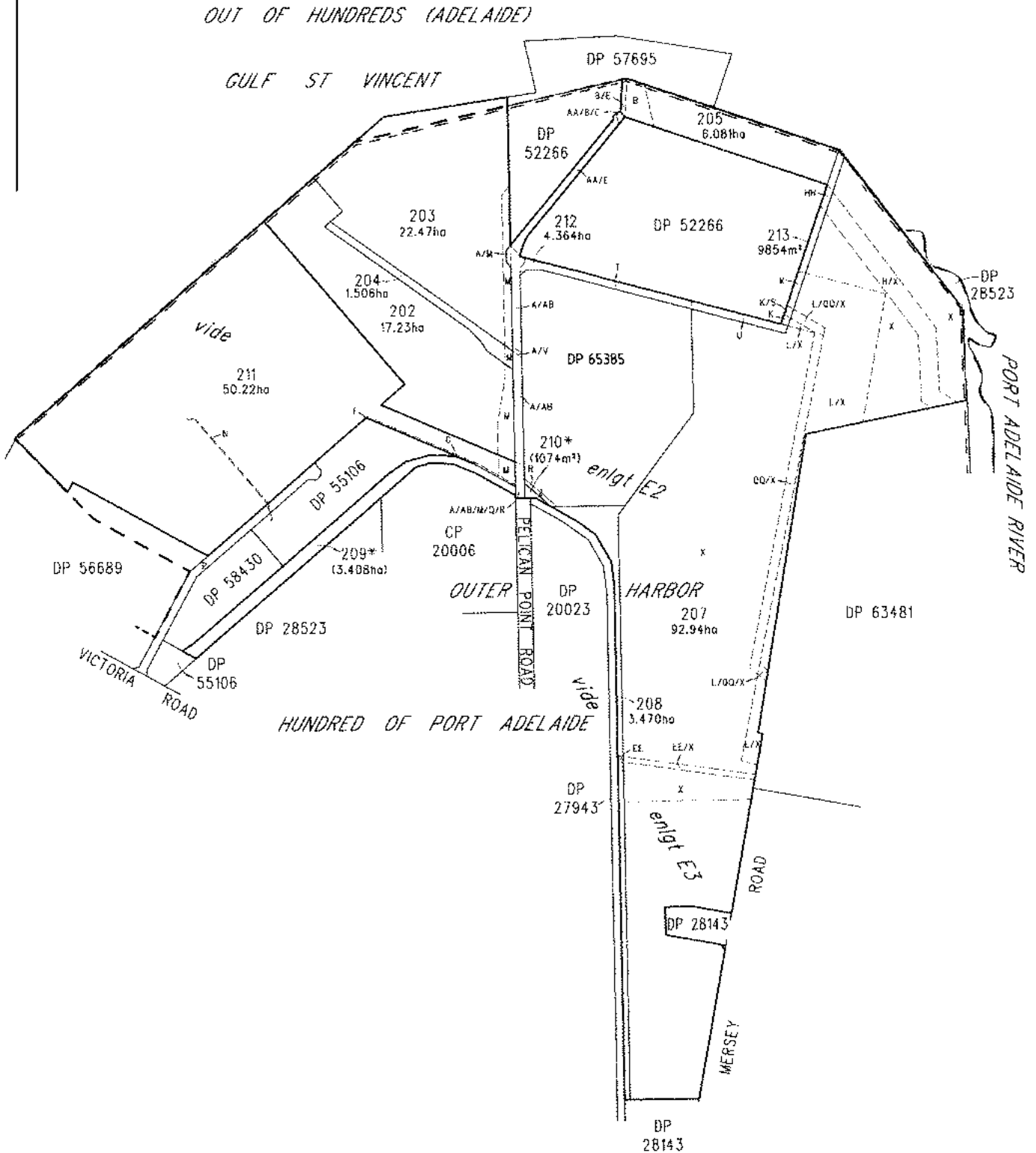
Notations

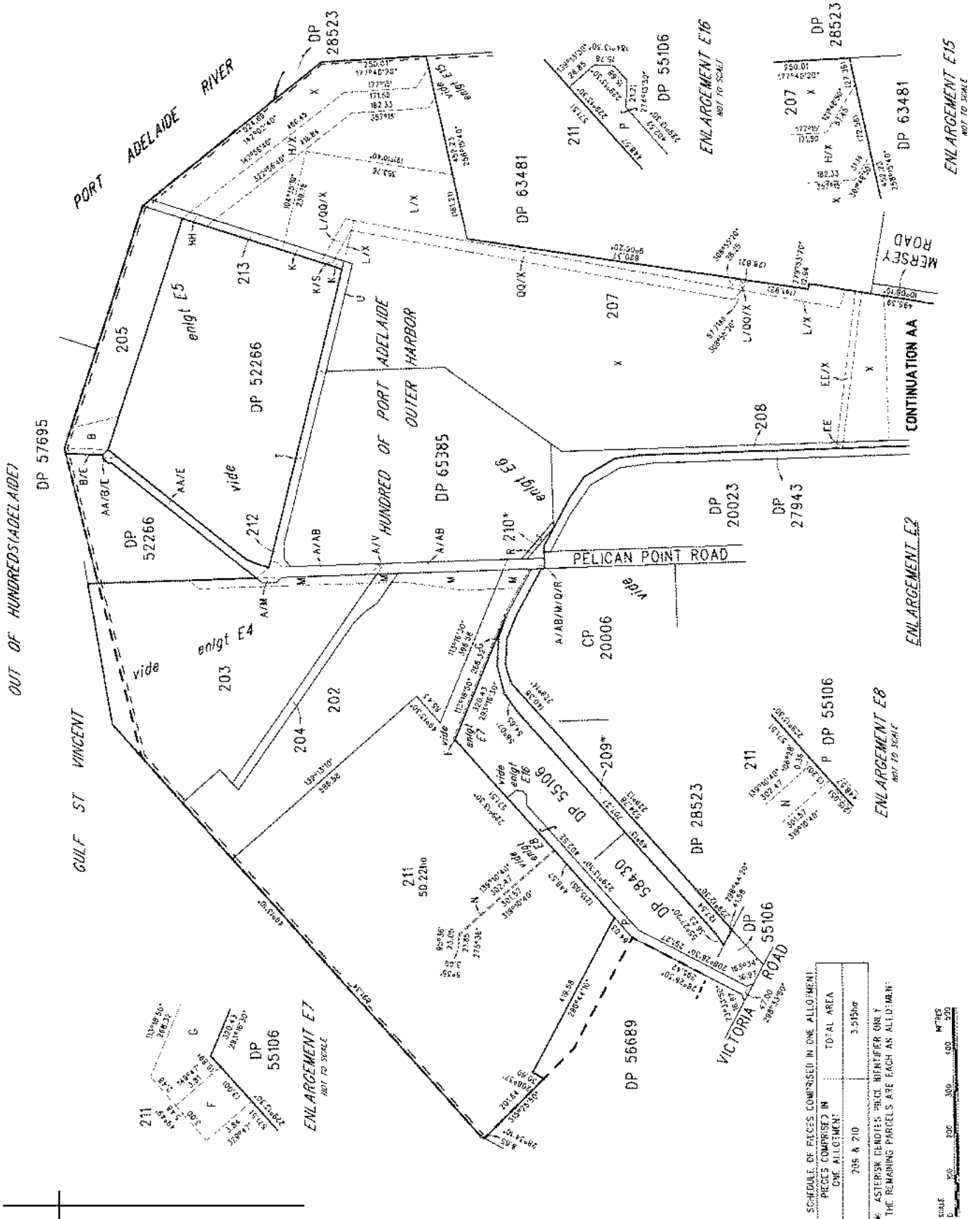
Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

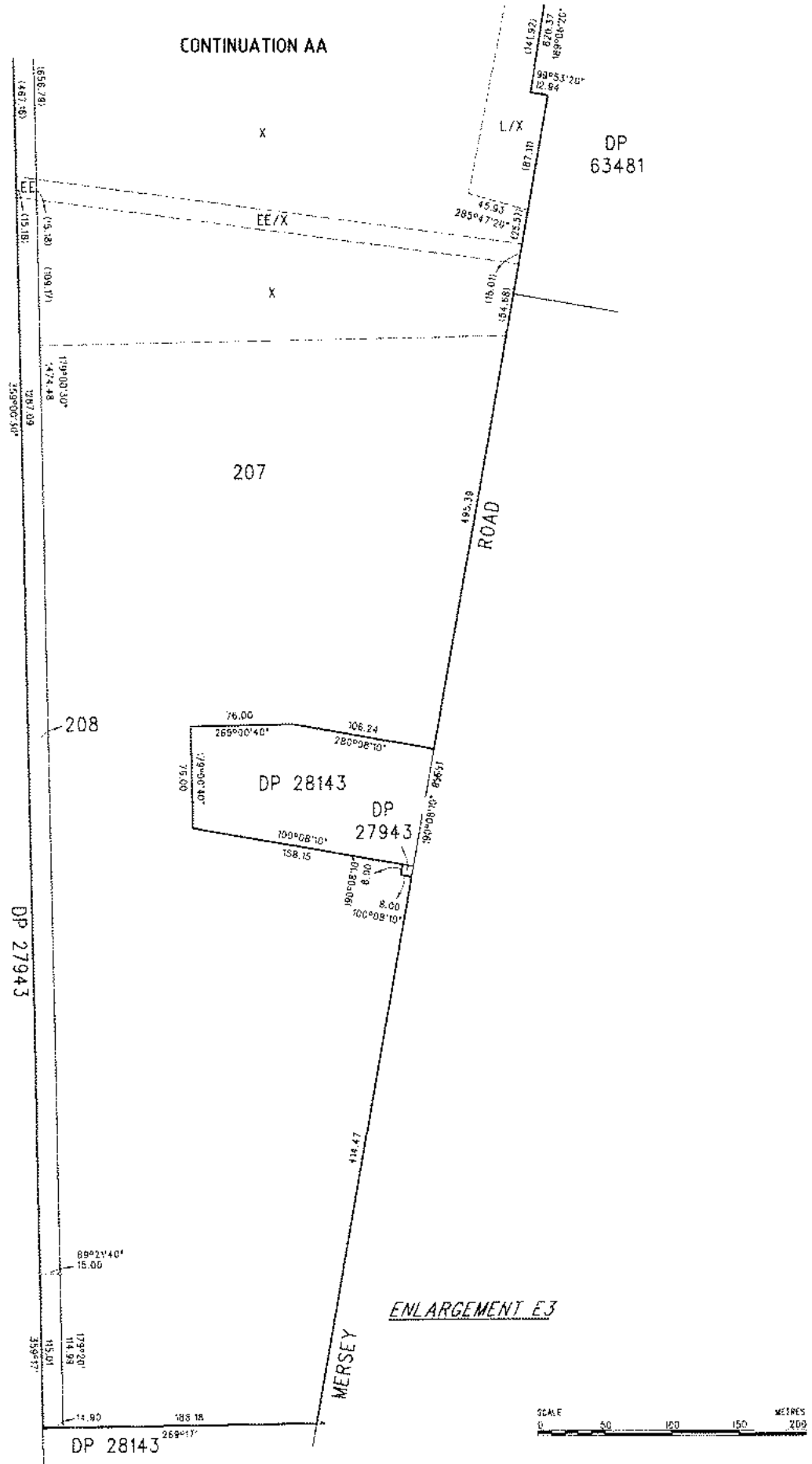
SCHEDULE OF PIECES COMPRISED IN ONE ALLOTMENT

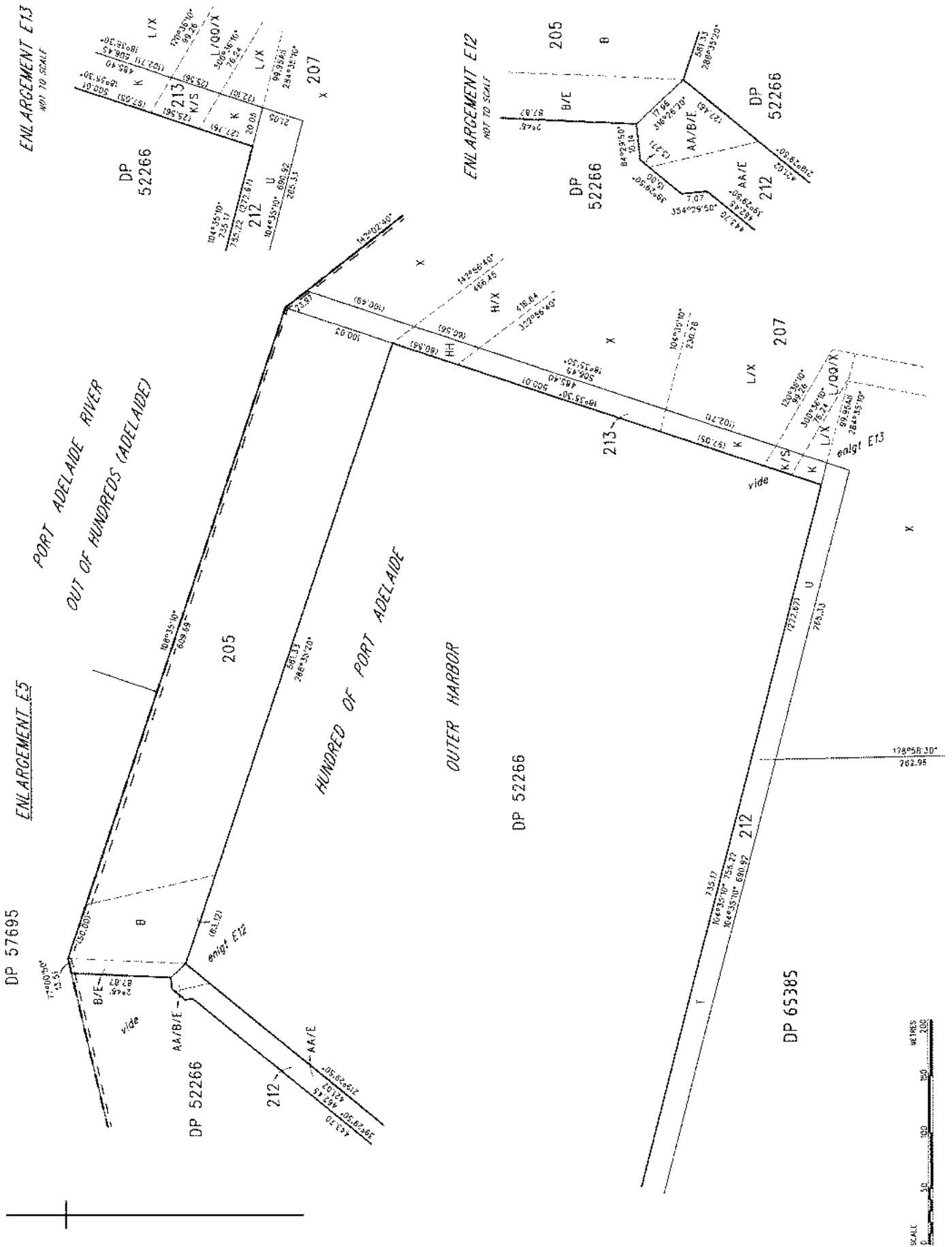
PIECES COMPRISED IN ONE ALLOTMENT	TOTAL AREA
205 & 210	3.515ha

* ASTERISK DENOTES PIECE IDENTIFIER ONLY
THE REMAINING PARCELS ARE EACH AN ALLOTMENT





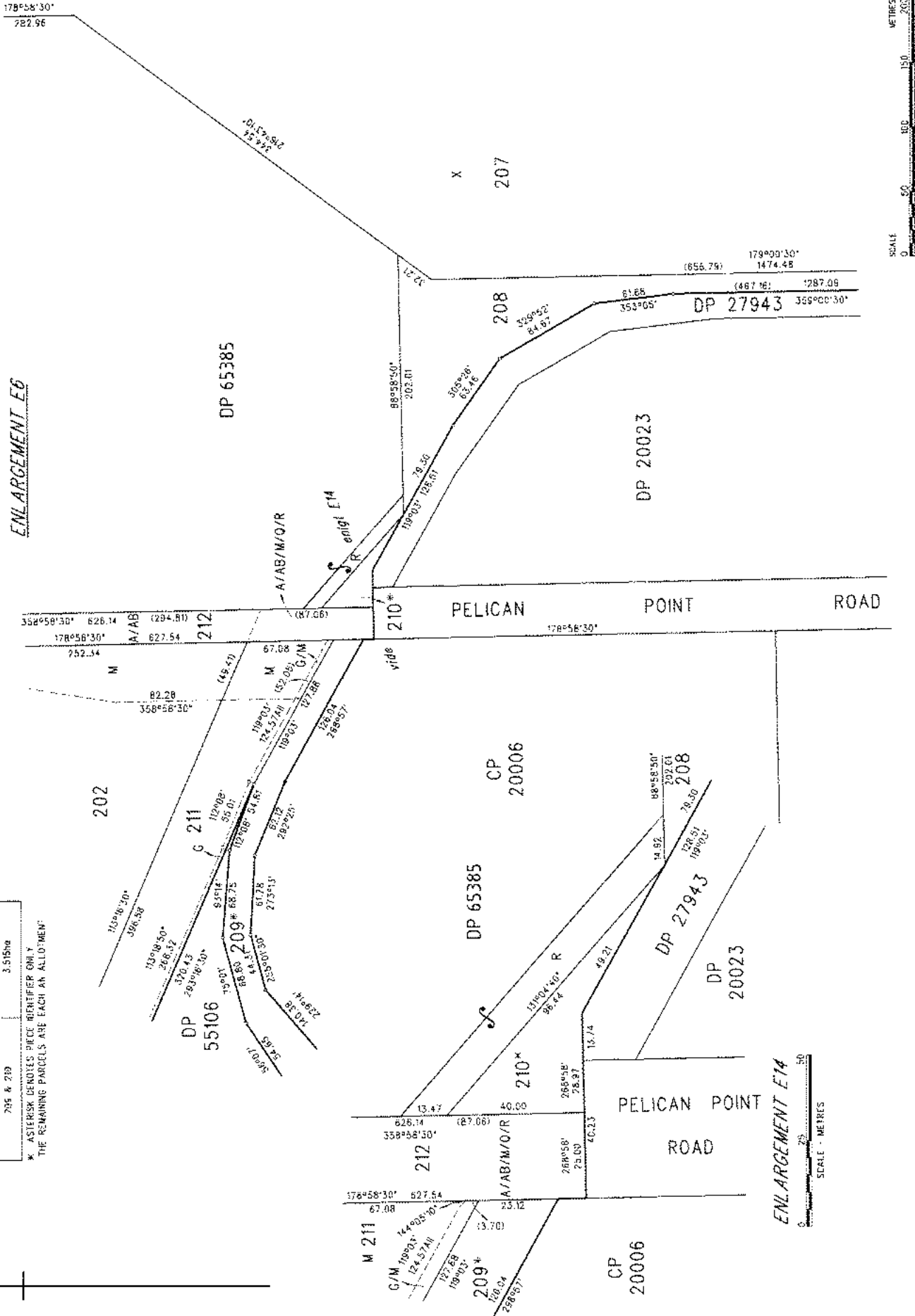




SCHEDULE OF PIECES COMPRISED IN OUR ALLOTMENT:

PIECES COMPRISED IN OUR ALLOTMENT	TOTAL AREA
705 & 209	3.55ha

* ASTERISK DENOTES PIECE IDENTIFIER ONLY
 THE REMAINING PARCELS ARE EACH AN ALLOTMENT





The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 6088 Folio 191

Parent Title(s) CT 6067/114
Creating Dealing(s) RTC 11667107
Title Issued 16/12/2011 Edition 3 Edition Issued 26/07/2012

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 502 DEPOSITED PLAN 87145
IN THE AREA NAMED OSBORNE
HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED T TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8684000)

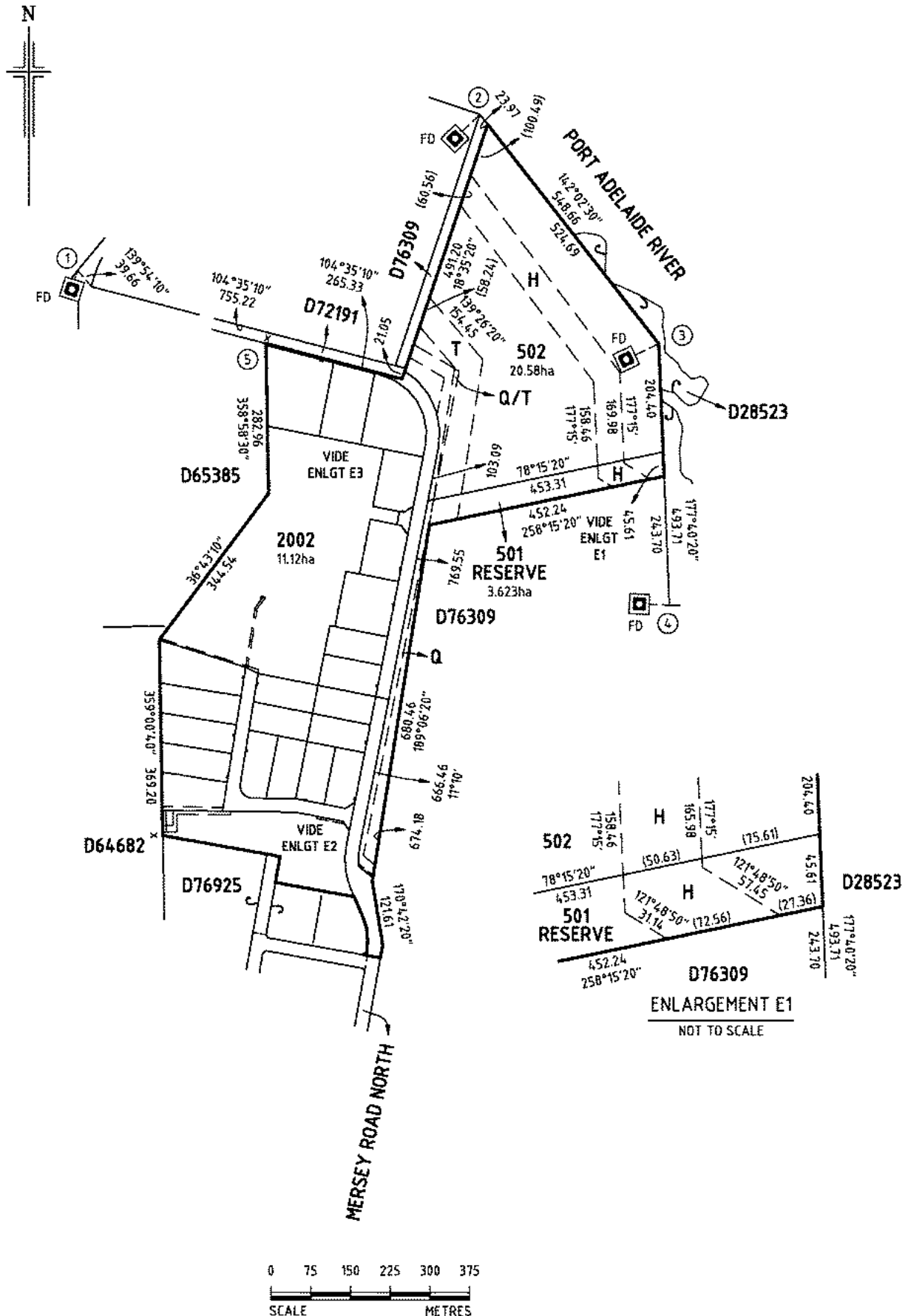
SUBJECT TO EASEMENT(S) OVER THE LAND MARKED H AND Q (TG 8683998 AND TG 9574990 RESPECTIVELY)

Schedule of Dealings

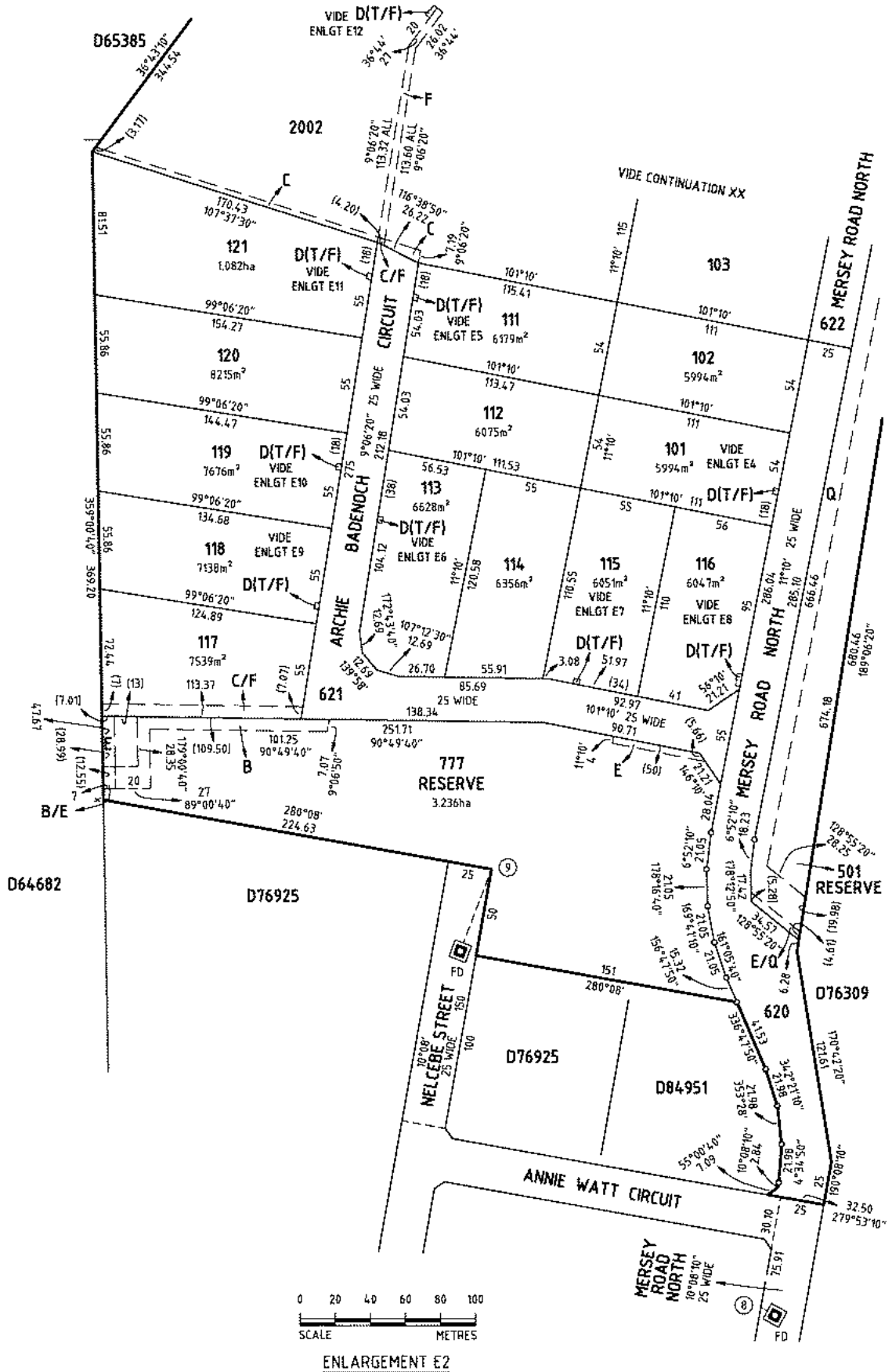
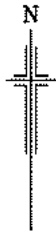
NIL

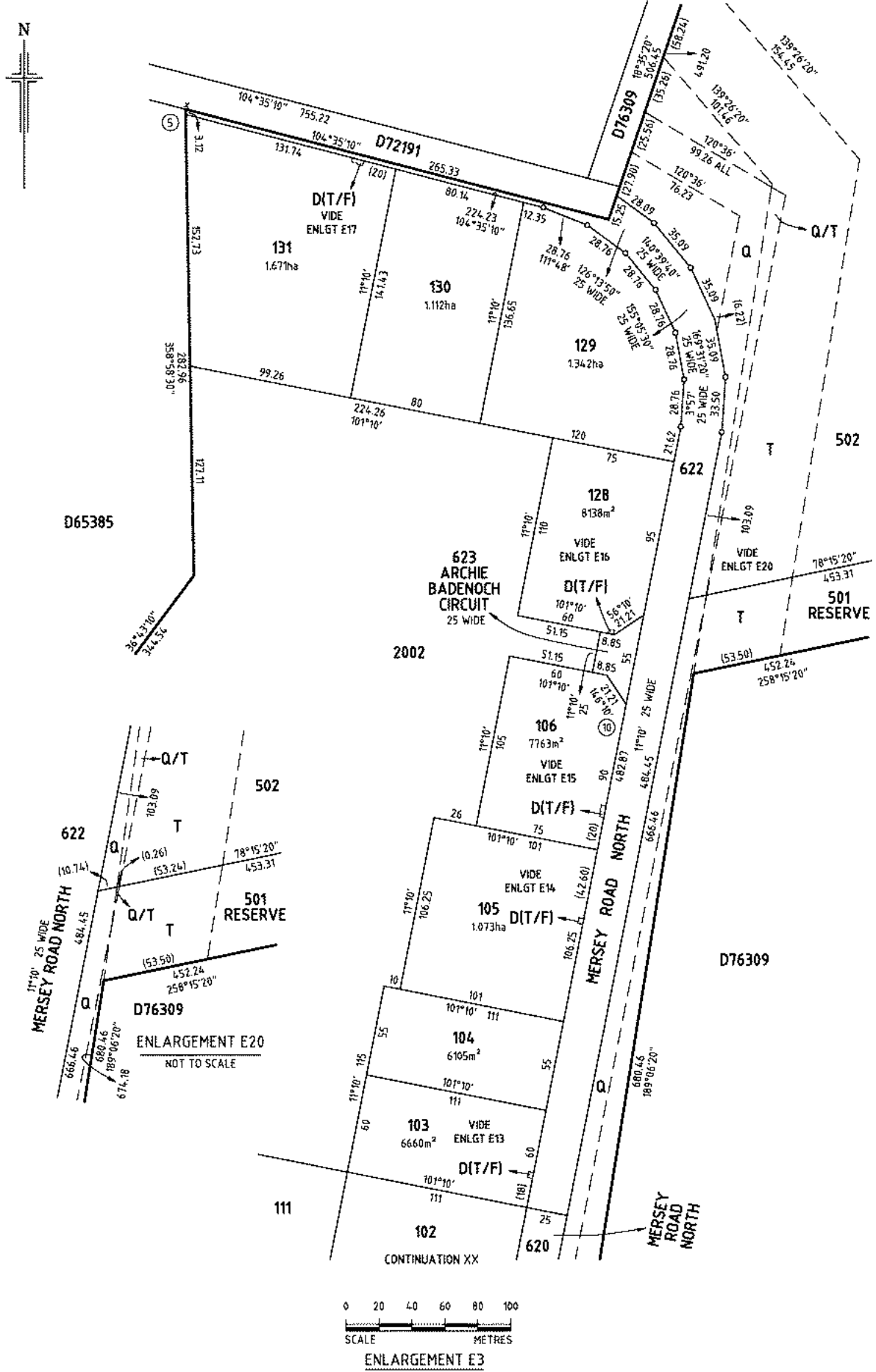
Notations

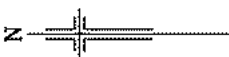
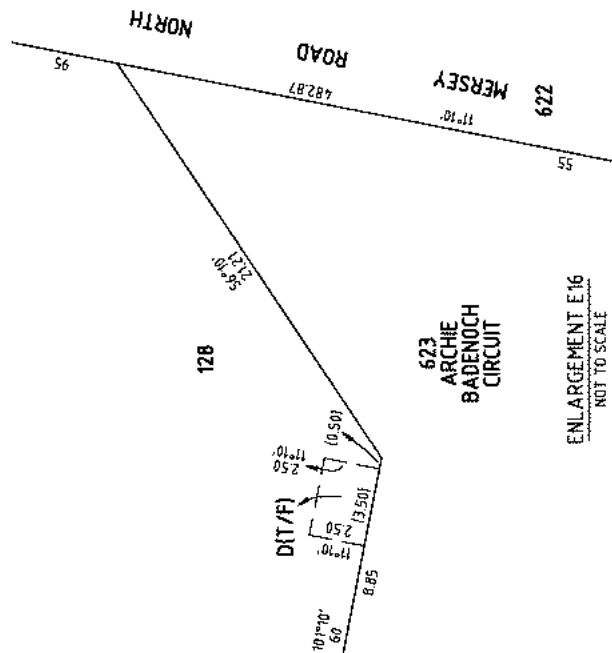
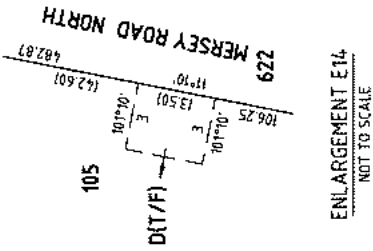
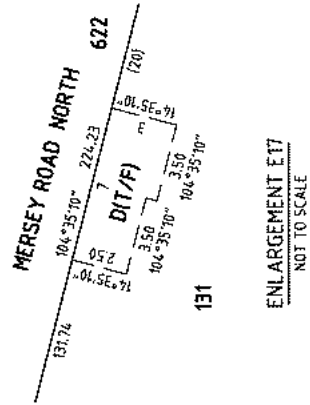
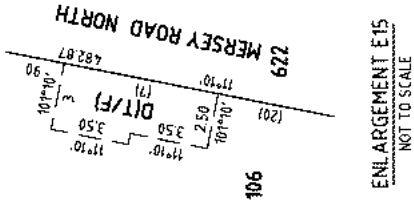
Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL



SURVEY INFORMATION IS DERIVED FROM DEPOSITED PLAN 87145









The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.



Certificate of Title - Volume 6012 Folio 888

Parent Title(s) CT 6011/465, CT 6011/471
Creating Dealing(s) RTC 10984627
Title Issued 07/07/2008 Edition 2 Edition Issued 26/07/2012

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 27 DEPOSITED PLAN 76309
IN THE AREA NAMED OUTER HARBOR
HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE WITHIN LAND

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED TT TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8683997)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED HH AND Z (TG 8683996 AND TG 9618968 RESPECTIVELY)

TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED V (RTC 10026663)

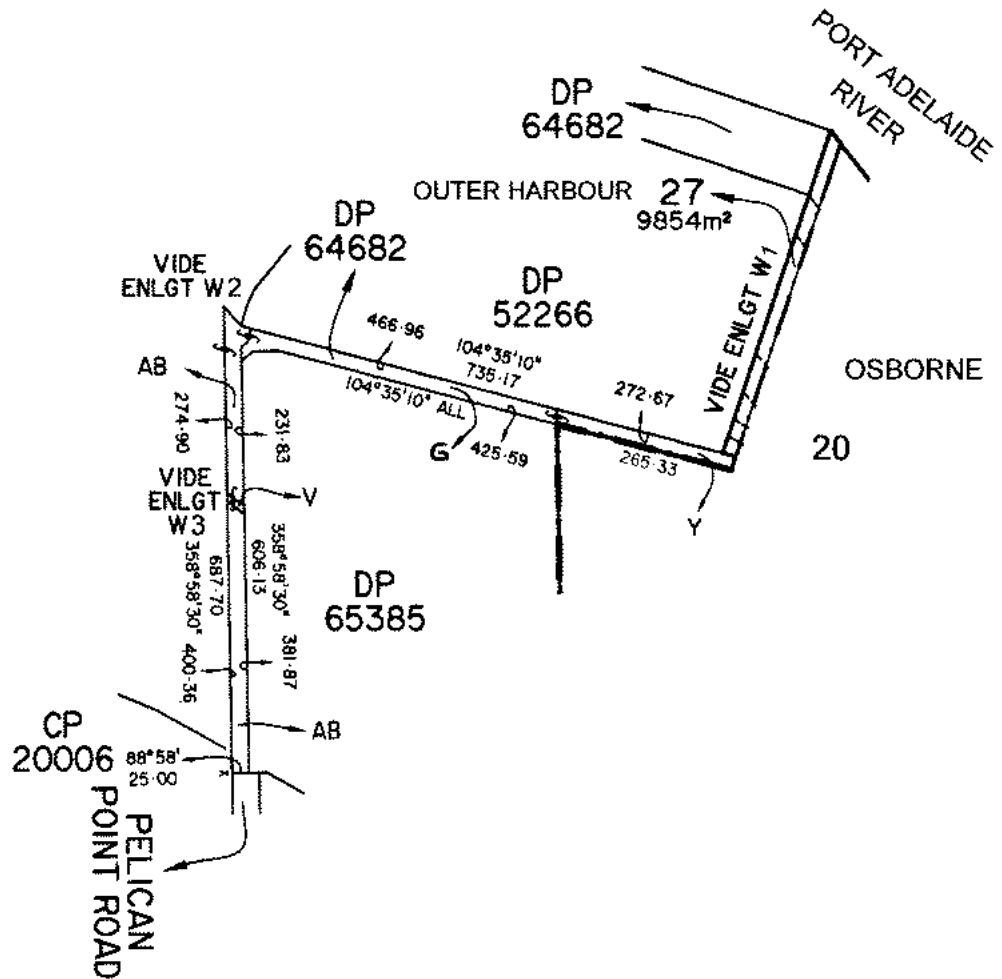
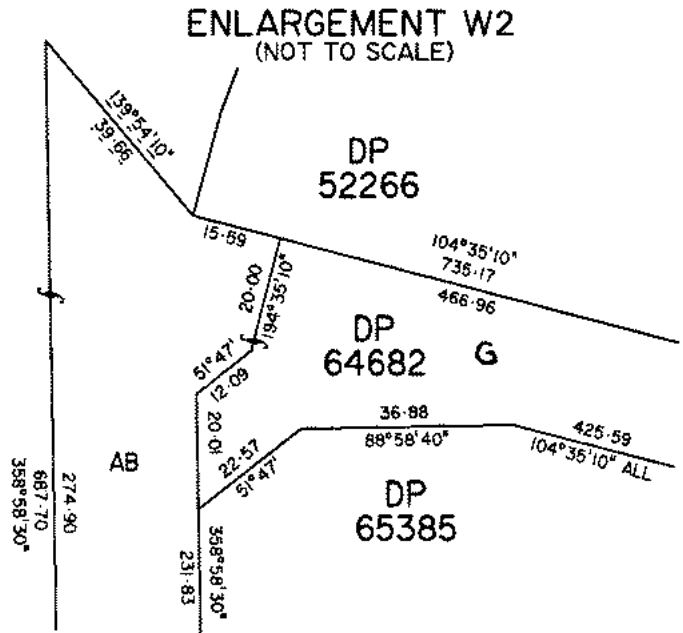
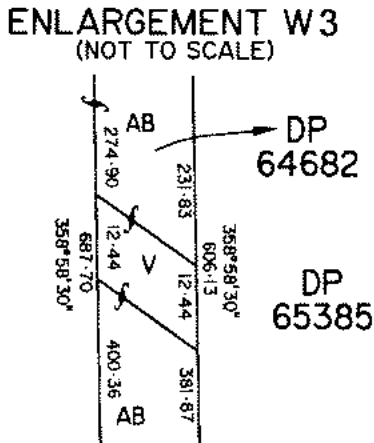
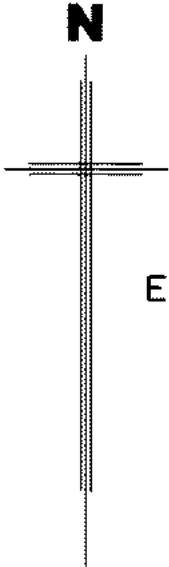
TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED AB.G AND Y

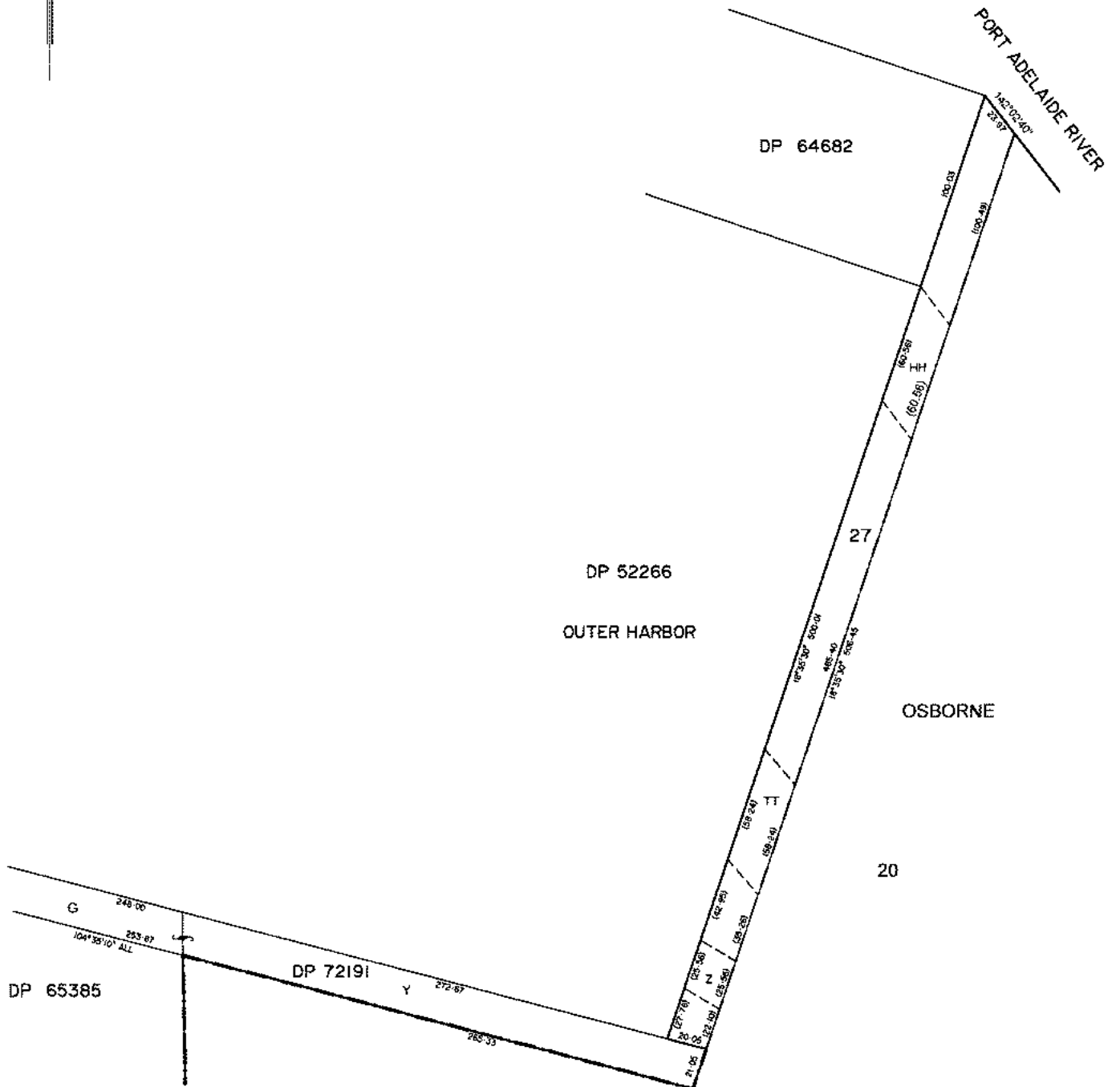
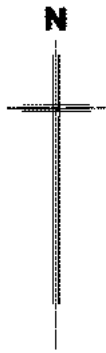
Schedule of Dealings

NIL

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL





ENLARGEMENT W 1



APPENDIX D

SA EPA SECTION 7 SEARCH





Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

Receipt No :
Admin No : 26873 (54658)

WSP Australia Pty Limited
Level 1
1 King William Street
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@sa.gov.au

07 August, 2019

EPA STATEMENT TO FORM 1 - CONTRACTS FOR SALE OF LAND OR BUSINESS

The EPA provides this statement to assist the vendor meet its obligations under section 7(1)(b) of the *Land and Business (Sale and Conveyancing) Act 1994*. A response to the questions prescribed in Schedule 1-Contracts for sale of land or business-forms (Divisions 1 and 2) of the *Land and Business (Sale and Conveyancing) Act 1994* is provided in relation to the land.

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 5920 Folio 564
Address Allotment 205, Pelican Point Road, OUTER HARBOR SA 5018

Summary of land use:
Solid Waste Landfill

Schedule – Division 1 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS OF MORTGAGES, CHARGES AND PRESCRIBED ENCUMBRANCES AFFECTING THE LAND

7. *Environment Protection Act 1993*

Does the EPA hold any of the following details relating to the *Environment Protection Act 1993*:

7.1	Section 59 - Environment performance agreement that is registered in relation to the land.	NO
7.2	Section 93 - Environment protection order that is registered in relation to the land.	NO
7.3	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
7.4	Section 99 - Clean-up order that is registered in relation to the land.	NO
7.5	Section 100 - Clean-up authorisation that is registered in relation to the land.	NO
7.6	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

7.7	Section 103J - Site remediation order that is registered in relation to the land.	NO
7.8	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
7.9	Section 103P - Notation of site contamination audit report in relation to the land.	NO
7.10	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

Schedule – Division 2 – Land and Business (Sale and Conveyancing) Regulations 2010

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

3-Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

a)	details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or ¹	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or ¹	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
b)	details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or ¹	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or ¹	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
c)	details of a current exemption issued under Part 6 of the <i>Environment Protection Act 1993</i> from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
d)	details of an exemption no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> from the application of a specified provision of that Act in relation to an activity carried on at the land?	YES
e)	details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to operate a waste depot at the land?	NO

¹Note Schedule 1 Part A of the Environment Protection Act 1993 changed on 1 June 2019. Land and Business (Sale and Conveyancing) Regulations 2010 references to a 'waste or recycling depot' under 'clause 3(3)' are out of date and are to be read instead as clause 3(1), 3(2), 3(3)(a), 3(3)(b), 3(5)(b) or 3(5)(c) or a combination of them from 1 June 2019. Similarly, references to 'activities producing listed wastes' under 'clause 3(4)' are out of date and are to be read instead as clause 3(5)(a) from 1 June 2019.

- | | | |
|----|---|------------|
| f) | details of a licence issued under the repealed <i>Waste Management Act 1987</i> to operate a waste depot at the land? | YES |
| g) | details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to produce waste of a prescribed kind (within the meaning of that Act) at the land? | NO |
| h) | details of a licence issued under the repealed <i>Waste Management Act 1987</i> to produce prescribed waste (within the meaning of that Act) at the land? | NO |

4-Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- | | | |
|----|--|------------|
| a) | details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the <i>Environment Protection Act 1993</i>)? | NO |
| b) | details of site contamination notified to the EPA under section 83A of the <i>Environment Protection Act 1993</i> ? | NO |
| c) | a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? | NO |
| d) | a copy of a site contamination audit report? | NO |
| e) | details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the <i>Environment Protection Act 1993</i> applies? | NO |
| f) | details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) | details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) | details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) | details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) | details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | YES |

5-Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | | |
|----|--|----|
| a) | a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
|----|--|----|

- | | | |
|----|--|----|
| b) | details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) | details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) | a copy of a pre-1 July 2009 site audit report? | NO |
| e) | details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

Details and/or copies of environmental assessments, licences, exemptions and records on the Public Register may be obtained from the Environment Protection Authority.

Prior to arranging an examination and/or copies of the required above information please telephone (08) 8204 9128 to contact the Public Register Administrator to ensure the required details are available upon arrival.

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

File Reference: EPA/38242; D0443; W2024

NOTE

This parcel of land was licensed as a solid waste landfill depot by the South Australian Waste Management Commission for the disposal of waste.

Type Of Waste Received

Industrial Wastes

NOTE

Lime Grits from Penrice Soda Products Pty Limited was deposited on this parcel of land.

Type Of Waste Received

Acids And Acidic Solutions

Alkalis And Alkaline Solutions

Grease Trap Wastes



Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

Receipt No :
Admin No : 56761 (54659)

WSP Australia Pty Limited
Level 1
1 King William Street
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@sa.gov.au

07 August, 2019

EPA STATEMENT TO FORM 1 - CONTRACTS FOR SALE OF LAND OR BUSINESS

The EPA provides this statement to assist the vendor meet its obligations under section 7(1)(b) of the *Land and Business (Sale and Conveyancing) Act 1994*. A response to the questions prescribed in Schedule 1-Contracts for sale of land or business-forms (Divisions 1 and 2) of the *Land and Business (Sale and Conveyancing) Act 1994* is provided in relation to the land.

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6088 Folio 191
Address Allotment 502, Mersey Road, OSBORNE SA 5017

Summary of land use:
Solid Waste Landfill

Schedule – Division 1 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS OF MORTGAGES, CHARGES AND PRESCRIBED ENCUMBRANCES AFFECTING THE LAND

7. *Environment Protection Act 1993*

Does the EPA hold any of the following details relating to the *Environment Protection Act 1993*:

7.1	Section 59 - Environment performance agreement that is registered in relation to the land.	NO
7.2	Section 93 - Environment protection order that is registered in relation to the land.	NO
7.3	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
7.4	Section 99 - Clean-up order that is registered in relation to the land.	NO
7.5	Section 100 - Clean-up authorisation that is registered in relation to the land.	NO
7.6	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

7.7	Section 103J - Site remediation order that is registered in relation to the land.	NO
7.8	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
7.9	Section 103P - Notation of site contamination audit report in relation to the land.	NO
7.10	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

Schedule – Division 2 – Land and Business (Sale and Conveyancing) Regulations 2010

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

3-Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

a)	details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or ¹	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or ¹	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
b)	details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or ¹	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or ¹	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
c)	details of a current exemption issued under Part 6 of the <i>Environment Protection Act 1993</i> from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
d)	details of an exemption no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
e)	details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to operate a waste depot at the land?	NO

¹Note Schedule 1 Part A of the Environment Protection Act 1993 changed on 1 June 2019. Land and Business (Sale and Conveyancing) Regulations 2010 references to a 'waste or recycling depot' under 'clause 3(3)' are out of date and are to be read instead as clause 3(1), 3(2), 3(3)(a), 3(3)(b), 3(5)(b) or 3(5)(c) or a combination of them from 1 June 2019. Similarly, references to 'activities producing listed wastes' under 'clause 3(4)' are out of date and are to be read instead as clause 3(5)(a) from 1 June 2019.

- | | | |
|----|---|------------|
| f) | details of a licence issued under the repealed <i>Waste Management Act 1987</i> to operate a waste depot at the land? | YES |
| g) | details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to produce waste of a prescribed kind (within the meaning of that Act) at the land? | NO |
| h) | details of a licence issued under the repealed <i>Waste Management Act 1987</i> to produce prescribed waste (within the meaning of that Act) at the land? | NO |

4-Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- | | | |
|----|--|------------|
| a) | details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the <i>Environment Protection Act 1993</i>)? | NO |
| b) | details of site contamination notified to the EPA under section 83A of the <i>Environment Protection Act 1993</i> ? | YES |
| c) | a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? | NO |
| d) | a copy of a site contamination audit report? | NO |
| e) | details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the <i>Environment Protection Act 1993</i> applies? | NO |
| f) | details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) | details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) | details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) | details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) | details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | YES |

5-Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | | |
|----|--|----|
| a) | a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
|----|--|----|

- | | | |
|----|--|----|
| b) | details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) | details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) | a copy of a pre-1 July 2009 site audit report? | NO |
| e) | details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

Details and/or copies of environmental assessments, licences, exemptions and records on the Public Register may be obtained from the Environment Protection Authority.

Prior to arranging an examination and/or copies of the required above information please telephone (08) 8204 9128 to contact the Public Register Administrator to ensure the required details are available upon arrival.

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

File Reference: D0443; W2024; SC62154-01

NOTE

This parcel of land was licensed as a solid waste landfill depot by the South Australian Waste Management Commission for the disposal of waste.

Type Of Waste Received

Industrial Wastes

NOTE

This parcel of land was used for the deposition of waste without being licenced by the SAWMC. Lime Grits from Penrice Soda Products Pty Ltd were deposited on this parcel of land.

Type Of Waste Deposited

Acids And Acidic Solutions

Alkalis And Alkaline Solutions

Grease Trap Wastes



Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

Receipt No :
Admin No : 38764 (54693)

WSP Australia Pty Limited
Level 1
1 King William Street
ADELAIDE SA 5000

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@sa.gov.au

07 August, 2019

EPA STATEMENT TO FORM 1 - CONTRACTS FOR SALE OF LAND OR BUSINESS

The EPA provides this statement to assist the vendor meet its obligations under section 7(1)(b) of the *Land and Business (Sale and Conveyancing) Act 1994*. A response to the questions prescribed in Schedule 1-Contracts for sale of land or business-forms (Divisions 1 and 2) of the *Land and Business (Sale and Conveyancing) Act 1994* is provided in relation to the land.

I refer to your enquiry concerning the parcel of land comprised in

Title Reference CT Volume 6012 Folio 888
Address Allotment 27, Pelican Point Road, OUTER HARBOR SA 5018

Summary of land use:
Solid Waste Landfill

Schedule – Division 1 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS OF MORTGAGES, CHARGES AND PRESCRIBED ENCUMBRANCES AFFECTING THE LAND

7. *Environment Protection Act 1993*

Does the EPA hold any of the following details relating to the *Environment Protection Act 1993*:

7.1	Section 59 - Environment performance agreement that is registered in relation to the land.	NO
7.2	Section 93 - Environment protection order that is registered in relation to the land.	NO
7.3	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
7.4	Section 99 - Clean-up order that is registered in relation to the land.	NO
7.5	Section 100 - Clean-up authorisation that is registered in relation to the land.	NO
7.6	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO

7.7	Section 103J - Site remediation order that is registered in relation to the land.	NO
7.8	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
7.9	Section 103P - Notation of site contamination audit report in relation to the land.	NO
7.10	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

Schedule – Division 2 – Land and Business (Sale and Conveyancing) Regulations 2010

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

3-Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

a)	details of a current licence issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or ¹	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or ¹	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
b)	details of a licence no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or ¹	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or ¹	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
c)	details of a current exemption issued under Part 6 of the <i>Environment Protection Act 1993</i> from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
d)	details of an exemption no longer in force issued under Part 6 of the <i>Environment Protection Act 1993</i> from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
e)	details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to operate a waste depot at the land?	NO

¹Note Schedule 1 Part A of the Environment Protection Act 1993 changed on 1 June 2019. Land and Business (Sale and Conveyancing) Regulations 2010 references to a 'waste or recycling depot' under 'clause 3(3)' are out of date and are to be read instead as clause 3(1), 3(2), 3(3)(a), 3(3)(b), 3(5)(b) or 3(5)(c) or a combination of them from 1 June 2019. Similarly, references to 'activities producing listed wastes' under 'clause 3(4)' are out of date and are to be read instead as clause 3(5)(a) from 1 June 2019.

- | | | |
|----|---|------------|
| f) | details of a licence issued under the repealed <i>Waste Management Act 1987</i> to operate a waste depot at the land? | YES |
| g) | details of a licence issued under the repealed <i>South Australian Waste Management Commission Act 1979</i> to produce waste of a prescribed kind (within the meaning of that Act) at the land? | NO |
| h) | details of a licence issued under the repealed <i>Waste Management Act 1987</i> to produce prescribed waste (within the meaning of that Act) at the land? | NO |

4-Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

- | | | |
|----|--|------------|
| a) | details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the <i>Environment Protection Act 1993</i>)? | NO |
| b) | details of site contamination notified to the EPA under section 83A of the <i>Environment Protection Act 1993</i> ? | NO |
| c) | a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register? | NO |
| d) | a copy of a site contamination audit report? | NO |
| e) | details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the <i>Environment Protection Act 1993</i> applies? | NO |
| f) | details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| g) | details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| h) | details of a notification under section 103Z(1) of the <i>Environment Protection Act 1993</i> relating to the commencement of a site contamination audit? | NO |
| i) | details of a notification under section 103Z(2) of the <i>Environment Protection Act 1993</i> relating to the termination before completion of a site contamination audit? | NO |
| j) | details of records, held by the former <i>South Australian Waste Management Commission</i> under the repealed <i>Waste Management Act 1987</i> , of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995? | YES |

5-Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

- | | | |
|----|--|----|
| a) | a copy of a report known as a "Health Commission Report" prepared by or on behalf of the <i>South Australian Health Commission</i> (under the repealed <i>South Australian Health Commission Act 1976</i>)? | NO |
|----|--|----|

- | | | |
|----|--|----|
| b) | details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the <i>Environment Protection Act 1993</i> ? | NO |
| c) | details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the <i>Environment Protection Act 1993</i> ? | NO |
| d) | a copy of a pre-1 July 2009 site audit report? | NO |
| e) | details relating to the termination before completion of a pre-1 July 2009 site audit? | NO |

Details and/or copies of environmental assessments, licences, exemptions and records on the Public Register may be obtained from the Environment Protection Authority.

Prior to arranging an examination and/or copies of the required above information please telephone (08) 8204 9128 to contact the Public Register Administrator to ensure the required details are available upon arrival.

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File Reference: D0443; W2024

NOTE

This parcel of land was licensed as a solid waste landfill depot by the South Australian Waste Management Commission for the disposal of waste.

Type Of Waste Received

Industrial Wastes

NOTE

This parcel of land was used for the deposition of waste without being licenced by the SAWMC. Lime Grits from Penrice Soda Products Pty Ltd were deposited on this parcel of land.

Type Of Waste Deposited

Acids And Acidic Solutions

Alkalis And Alkaline Solutions

Grease Trap Wastes

Section 83A – Notification of site contamination that affects or threatens underground water

Site contamination that affects or threatens underground water notification form pursuant to section 83A of the *Environment Protection Act 1993*

Notifier details

Name:

Telephone:

Company:

Email:

Address:

- the site owner
- the site occupier
- the site contamination consultant
- the site contamination auditor

Site details

Site or establishment name (if appropriate):

Owner(s) (please include contact details where known):

Occupier(s) (where different to owner):

Street address(es) (include lot or street number):

Certificate(s) of title (current):

Location, nature and extent

Has a potentially contaminating activity been undertaken at the site, please describe.....

Does this notification relate to a change in the location, nature or extent of site contamination that has previously been notified to the EPA? Yes No

If yes, please provide the date(s) of previous notification(s):.....

Which group(s) do the chemical substance(s), identified as site contamination that affects or threatens groundwater, belong to?

- | | | |
|--|--|---|
| <input type="checkbox"/> Metals & metalloids | <input type="checkbox"/> Non-metallic inorganics | <input type="checkbox"/> Organic alcohols/other organics |
| <input type="checkbox"/> Petroleum hydrocarbons | <input type="checkbox"/> Anilines | <input type="checkbox"/> Chlorinated alkanes |
| <input type="checkbox"/> Chlorinated alkenes | <input type="checkbox"/> Chlorinated benzenes | <input type="checkbox"/> Polychlorinated biphenyls |
| <input type="checkbox"/> Other chlorinated compounds | <input type="checkbox"/> Monocyclic aromatic compounds | <input type="checkbox"/> Polycyclic aromatic compounds |
| <input type="checkbox"/> Phenols | <input type="checkbox"/> Phthalates | <input type="checkbox"/> Pesticides/herbicides/fungicides |
| <input type="checkbox"/> Surfactants | <input type="checkbox"/> Other (please specify):..... | |

Has an assessment of the environmental values of groundwater been undertaken? Yes No

If yes, what is the TDS range in mg/L (lowest concentration for the site)?

What are the environmental values of groundwater for the site?

- Drinking water
- Recreation and aesthetics
- Aquatic ecosystems (marine)
- Aquatic ecosystems (fresh)
- Primary industries (aquaculture)
- Primary industries (agriculture)

Where has the site contamination that affects or threatens groundwater been identified?

- Soil/soil vapour
- Groundwater

Maximum depth:.....m bgl Targeted aquifer(s):.....

What is the depth to groundwater (where known)?metres bgl

Has a non-aqueous phase liquid been identified or inferred? Yes No

If yes, please provide details of measured thickness (in metres):.....

Has site contamination that affects or threatens groundwater been identified¹ offsite? Yes No

If yes, please specify offsite certificate(s) of title or address(es):
.....

Has an accurate scaled site plan showing sampling locations been included? Yes No

¹ Using direct evidence and not inferred information

This notification provides the following information to determine the existence of site contamination and the support notification of site contamination that affects or threatens groundwater at the site?

Monitoring well data ²	<input type="checkbox"/> Yes <input type="checkbox"/> No	Soil lithological data	<input type="checkbox"/> Yes <input type="checkbox"/> No
Groundwater field data	<input type="checkbox"/> Yes <input type="checkbox"/> No	Soil vapour bore data	<input type="checkbox"/> Yes <input type="checkbox"/> No
Analytical laboratory data	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Quality assurance data	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Has the electronic data been assessed as reliable in meeting the objectives of the assessment? Yes No

Further assessment details

Have chemical substances been identified that may represent background concentrations? Yes No

If yes, will a background concentration³ assessment be undertaken within the next 3 months? Yes No

Is any further assessment being undertaken?

Preliminary site investigation

Detailed site investigation

Groundwater monitoring event

Other:

Is the site subject to a current site contamination audit?

Yes


No

If yes, please specify the EPA reference number for the audit:

Declaration

It is an offence to provide false or misleading information to the Authority. Maximum penalties range from \$30,000 for a natural person, to \$60,000 for a body corporate, pursuant to section 119 of the Environment Protection Act 1993.

I/We declare that the information provided in this form and any accompanying documents is not false or misleading in any material particular:

Name:	Name:
Position:	Position:
Signature: 	Signature:
Date:	Date:

² Not required where electronic information has previously been provided to the EPA and the data has not changed

³ Carried out in accordance with the EPA Guideline for the assessment of background concentrations (2018)



Legend:

- ▭ Investigation Area
- ▭ Western Dredge Pond (Pond 1, Pond 2 and Pond 3)
- ▭ Eastern Dredge Pond (Pond 4)
- + Groundwater Well Location



Job No: 55432

Client: Australian Naval Infrastructure

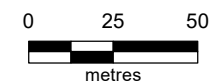
Version: Rev 4

Date: 01-May-2019

Drawn By: PN

Checked By: AJ

Scale at A4 1:2,250



Coor. Sys. GDA 1994 MGA Zone 54

**ANI Dredge Ponds - Lot 502
Mersey Rd N, Osborne, SA**

**GROUNDWATER SAMPLING
LOCATIONS**

FIGURE 3



	Metals & Metalloids													Non-Metallic Inorganics		Solvents		TRHs (NEPC 2013)										BTEXN									
	Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Cr VI)	Chromium (Total) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Inorganic) (Filtered)	Molybdenum (Filtered)	Nickel (Filtered)	Selenium (Total) (Filtered)	Silver (Filtered)	Tin (Inorganic, Sn IV) (Filtered)	Zinc (Filtered)	Cyanide	Fluoride	2-Propanone (Acetone)	C6-C10 Fraction	C6-C10 less BTEX (F1)	>C10-C16 Fraction	>C10-C16 less Naphthalene (F2)	C16-C34 Fraction	>C34-C40 Fraction	>C40-C40 Fraction (Total)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene		
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
EQL	0.001	0.0002	0.005	0.001	0.001	0.001	0.0001	0.005	0.001	0.001	0.005	0.005	0.005	0.005	0.5	1	0.02	0.02	0.05	0.05	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
NEPM 2013 GIL - Marine Waters		0.0007 ^{#1}	0.0044		0.0013 ^{#2}	0.0044 ^{#2}	0.0001 ^{#3}		0.007 ^{#2}		0.0014	0.015 ^{#4}	0.004 ^{#5}											0.5 ^{#5}						0.05 ^{#5}							
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m																	6 ^{#9}		NL ^{#8}					5	NL	NL			NL	NL							
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Health x10	0.1	0.02	0.5		20	0.1	0.01	0.5	0.2	0.1	1		0.8 ^{#13}	15	140000 ^{#12}		0.9 ^{#10}	0.9 ^{#10}	0.9 ^{#10}	0.9 ^{#10}	0.9 ^{#10}	0.9 ^{#10}	0.01	3	8			6						0.0001			
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Aesthetics					1							3													0.003	0.025			0.02								
2(b). Recreation / Aesthetics - WHO (2017) Health x10				0.5 ^{#14}																															0.007 ^{#15}		
3(a). Aquatic Ecosystems - ANZECC (2000) Marine Water, 95% species protection		0.0055	0.0044	0.0274 ^{#13}	0.0013	0.0044	0.0004		0.07		0.0014	0.015	0.004										0.7						0.07								
Field_ID	Sampled_Date-Time	Lab_Report_Number																																			
GW01	15-Apr-19	651270	0.002	<0.0002	<0.005	<0.001	<0.001	<0.001	0.0003	<0.005	0.002	0.008	<0.005	<0.005	0.015	0.01	1.2	<1	<0.02	<0.02	<0.05	<0.05	<0.1	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	
GW02	15-Apr-19	651270	0.02	<0.0002	<0.005	<0.001	<0.001	<0.001	<0.0001	0.006	0.003	<0.001	<0.005	<0.005	<0.005	0.012	1.5	1	<0.02	<0.02	0.19	0.19	<0.1	<0.1	0.19	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	
GW03	15-Apr-19	651270	0.21	<0.0002	0.048	0.003	<0.001	<0.001	<0.0001	0.008	0.003	0.02	<0.005	<0.005	0.005	0.037	1.5	<1	<0.8	<0.8	<0.05	<0.05	<0.1	<0.1	<0.1	<0.04	<0.04	<0.04	<0.04	<0.08	<0.12	<0.001	<0.001	<0.001	<0.001	<0.001	

Env Stds Comments

#1:TV Calculated using hardness of 30mg/L CaCO3, possible bioaccumulation & secondary poisoning. Refer to ANZECC & ARMCANZ (2000) for site specific hardness and further guidance.

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#8:To obtain F2 subtract naphthalene from >C10-C16.

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#12:Adopted from US EPA RSL - Tapwater (November 2015) - THQ = 0.1

#13:TV adopted from Cn. Exceedance may warrant further testing.

#14:Provisional guideline value because of uncertainties in the health database

#15:Considered carcinogenic, trigger value associated with an upper-bound excess lifetime cancer risk of 10⁻⁵

#16:Combined aldrin plus dieldrin

#17:DDT and metabolites

#18:Adopted from ANZECC 2000 MW 95% (Cr III) screening level



	Polycyclic Aromatic Hydrocarbons												Organochlorine Pesticides																								
	Benzo(a)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	PAHs (Total)	Pyrene	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	beta-BHC	Chlordane	DDD	DDT	Dieldrin	DDT+DDE+DDD (Sum of Total)	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Pentachlorophenol	Toxaphene			
EQL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
NEPM 2013 GIL - Marine Waters																																					
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m																																					
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Health x10													0.003			0.02			0.09																		
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Aesthetics																																					
2(b). Recreation / Aesthetics - WHO (2017) Health x10													0.0003 ^{#16}								0.01 ^{#17}					0.006											
3(a). Aquatic Ecosystems - ANZECC (2000) Marine Water, 95% species protection																										0.000008											0.022
Field_ID	Sampled_Date-Time		Lab_Report_Number																																		
GW01	15-Apr-19		651270		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
GW02	15-Apr-19		651270		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
GW03	15-Apr-19		651270		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Env Stds Comments

#1:TV Calculated using hardness of 30mg/L CaCO3, possible bioaccumulation & secondary poisoning. Refer to ANZECC & ARMCANZ (2000) for site specific hardness and further guidance.

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#16:Combined aldrin plus dieldrin

#17:DDT and metabolites

#18:Adopted from ANZECC 2000 MW 95% (Cr III) screening level



	Phenols										Monocyclic Aromatic Hydrocarbons						Miscellaneous Hydrocarbons						Chlorinated Benzenes						Trihalomethanes								
	2,4-dimethylphenol	2,4-dinitrophenol	2,6-dichlorophenol	2-chlorophenol	2-Methylphenol	2-nitrophenol	3- & 4-Methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-Chloro-3-Methylphenol	4-nitrophenol	Phenol	Total Halogenated Phenol	Total Non-Halogenated Phenol	Total Tetrachlorophenols	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	
EQL	0.003	0.03	0.003	0.003	0.003	0.01	0.006	0.03	0.1	0.01	0.03	0.003	0.01	0.03	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
NEPM 2013 GIL - Marine Waters												0.4																									
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m																																					
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Health x10					3													0.3	0.01			0.01					15		0.4	3		2.5	2.5	2.5	2.5		
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Aesthetics				0.0001														0.004									0.001	0.02	0.003	0.01							
2(b). Recreation / Aesthetics - WHO (2017) Health x10																																					
3(a). Aquatic Ecosystems - ANZECC (2000) Marine Water, 95% species protection												0.4															0.08										

Field_ID	Sampled_Date-Time	Lab_Report_Number	<0.003	<0.03	<0.003	<0.003	<0.003	<0.01	<0.006	<0.03	<0.1	<0.01	<0.03	<0.003	<0.01	<0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
GW01	15-Apr-19	651270	<0.003	<0.03	<0.003	<0.003	<0.003	<0.01	<0.006	<0.03	<0.1	<0.01	<0.03	<0.003	<0.01	<0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
GW02	15-Apr-19	651270	<0.003	<0.03	<0.003	<0.003	<0.003	<0.01	<0.006	<0.03	<0.1	<0.01	<0.03	<0.003	<0.01	<0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
GW03	15-Apr-19	651270	<0.003	<0.03	<0.003	<0.003	<0.003	<0.01	<0.006	<0.03	<0.1	<0.01	<0.03	<0.003	<0.01	<0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Env Stds Comments

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#17:DDT and metabolites

#18:Adopted from ANZECC 2000 MW 95% (Cr III) screening level



Miscellaneous Industrial Chemicals	Herbicides & Fungicides	Organic Sulfur Compounds
Hexachlorobutadiene	Dinoseb	Carbon disulfide
mg/L	mg/L	mg/L
0.001	0.1	0.001
0.007		

EQI			
NEPM 2013 GIL - Marine Waters			
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m			
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Health x10			
2(a). Recreation / Aesthetics - NHMRC (2011 updated 2018) ADWG: Aesthetics			
2(b). Recreation / Aesthetics - WHO (2017) Health x10			
3(a). Aquatic Ecosystems - ANZECC (2000) Marine Water, 95% species protection			

Field_ID	Sampled_Date-Time	Lab_Report_Number			
GW01	15-Apr-19	651270	<0.001	<0.1	<0.001
GW02	15-Apr-19	651270	<0.001	<0.1	<0.001
GW03	15-Apr-19	651270	<0.001	<0.1	<0.001

Env Stds Comments

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- #12:Adopted from US EPA RSL - Tapwater (November 2015) - THQ = 0.1
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- #18:Adopted from ANZECC 2000 MW 95% (Cr III) screening level



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Waste Management Act, 1987



WASTE DEPOT LICENCE

The person named hereunder is licensed to operate a waste depot under Division I of the Waste Management Act

LICENSEE: PENRICE SODA PRODUCTS PTY LTD

LICENCE NUMBER: D0443

DEPOT ADDRESS: FELICAN POINT, OUTER HARBOUR

TYPE(S) OF DEPOT: SOLID WASTE LANDFILL.

M. D. MADIGAN
DIRECTOR

Penrice Soda Products Pty Ltd
Solvay Road
Osborne SA 5017



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

G.P.O. BOX 2607 ADELAIDE 5001



APPLICATION/ANNUAL RETURN FOR A WASTE DEPOT LICENCE

Penrice Soda Products Pty Ltd
 Solvay Road
 Osborne SA 5017

OFFICE USE ONLY

CHEQUE \$
 RECEIVED
 TECH. OFF.
 SECT. 90

I wish to advise that the annual fee for the licence referred to above is now due. Please complete and sign the form and return it to this office with the prescribed fee.

In the event of a variation in licence details, please amend the form before it is returned.

LICENCE NUMBER
(OFFICE USE ONLY)

00443

PAYMENT OF FEE DUE BY

31/05/93

LICENSEE

Penrice Soda Products Pty Ltd

PERSON TO BE CONTACTED
FOR ENQUIRIES

NAME

TEL. NO.

NAME OF OWNER
(IF DIFFERENT TO LICENSEE)

POSTAL ADDRESS OF OWNER

Solvay Road, Osborne

TYPE(S) OF DEPOT

Solid Waste Landfill

LOCATION OF DEPOT
(LOT/SECTION/HUNDRED)

Portion of Lot B, Hundred of Port Adelaide

ADDRESS OF DEPOT

Pelican Point Outer Harbour

CERTIFICATE(S) OF TITLE
REFERENCE

PRESCRIBED FEE

\$

73

SIGNATURE

NAME

M. D. MADIGAN
DIRECTOR

DATE

SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Conditions of Licence Applicable to
Penrice Soda Products Pty Ltd

1. The licensee shall submit for approval a management plan for the depot to the Commission prior to 15 November 1991. The management plan shall address but not be limited to the following topics:

- *Plans and specifications.
- *The proposed method of managing the waste.
- *Details regarding rehabilitation of the depot.

2. The licensee shall operate the depot in accordance with the approved management plan.

3. The licensee shall not vary the approved plan, specification and method of operation without the approval of the Commission.

4. The licensee shall use the depot solely for the reception, storage or disposal of waste limestone sands arising from Penrice Soda products Pty Ltd.

5. The licensee shall ensure that the depot is operated and maintained in a manner that does not cause or is likely to cause;

- a) a nuisance or offensive condition; or
- b) a risk to health or safety; or
- c) damage to the environment.

6. The level of the depot at which waste has been deposited shall not exceed 3.0 metres above the datum level including 500mm of soil.

7. The licensee shall operate the depot in such a fashion so that no dust results.

8. So as to comply with condition 7 the licensee shall take action that shall include, but not be limited to,

- 8.1 the application of an approved dust suppressant and/or
- 8.2 apply water,

to the roads, waste stockpiles, soil stockpiles and soil replaced after waste deposition.

9. The licensee shall ensure that a water taker full of water with a capacity of no less than 5000 litres shall be present at the depot during the times that waste is being deposited or other activities are being undertaken.

10. Waste shall not be stockpiled higher than 4.5 metres A.H.D.

11. The level of the waste and stockpiles shall be measured by a licensed surveyor at least once each week to ensure that the levels specified in conditions of licence 6 and 10 are complied with. The levels so obtained shall be supplied to the Commission.

12. All ^{excavation} holes at the depot which contain water shall be enclosed by a fence at least 2 metres high which is topped by two strands of barbed wire. The fence shall be constructed and maintained in a condition that will not permit access to the hole.



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Waste Management Act, 1987



WASTE DEPOT LICENCE

The person named hereunder is licensed to operate a waste depot under Division I of the Waste Management Act

LICENSEE: PENRICE SODA PRODUCTS PTY LTD

LICENCE NUMBER: D0443

DEPOT ADDRESS: Pelican Point, Outer Harbour

TYPE(S) OF DEPOT: SOLID WASTE LANDFILL

M. D. MADIGAN
DIRECTOR

PENRICE SODA PRODUCTS PTY LTD
Solvay Road
Osborne 5017

DSPENRICE



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

G.P.O. BOX 2607 ADELAIDE 5001



APPLICATION/ANNUAL RETURN FOR A WASTE DEPOT LICENCE

OFFICE USE ONLY

CHEQUE \$ 73.00

RECEIVED 26/11/92

TECH. OFF.

SECT. 90

I wish to advise that the annual fee for the licence referred to above is now due. Please complete and sign the form and return it to this office with the prescribed fee.

In the event of a variation in licence details, please amend the form before it is returned.

LICENCE NUMBER
(OFFICE USE ONLY)

LICENSEE

PERSON TO BE CONTACTED
FOR ENQUIRIES

NAME OF OWNER
(IF DIFFERENT TO LICENSEE)

POSTAL ADDRESS OF OWNER

TYPE(S) OF DEPOT

LOCATION OF DEPOT
(LOT/SECTION/HUNDRED)

ADDRESS OF DEPOT

CERTIFICATE(S) OF TITLE
REFERENCE

	PAYMENT OF FEE DUE BY		
	PENRICE SODA PRODUCTS PTY LTD		
	NAME	TEL. NO.	
	AINSLIE B. JUST	08 2488211	
	SOLVAY ROAD, OSBORNE, SOUTH AUSTRALIA 5017		
	LANDFILL		
	PORTION OF LOT 8, HUNDRED OF PORT ADELAIDE		
	PELICAN POINT, OUTER HARBOUR		
	PT. CT. 1276/200 D28523 S216/S28		

PRESCRIBED FEE

\$

73.00

A. B. JUST
NAME

SIGNATURE

M. D. MADIGAN
DIRECTOR

DATE 23 11 92



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

G.P.O. BOX 2607 ADELAIDE 5001



APPLICATION/ANNUAL RETURN FOR A WASTE DEPOT LICENCE

OFFICE USE ONLY

CHEQUE \$	70.00
RECEIVED	12/12/91
TECH. OFF.	✓
SECT. 90	

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LICENCE NUMBER
(OFFICE USE ONLY)

D0443

PAYMENT OF FEE DUE BY

LICENSEE

PENRICE SODA PRODUCTS PTY LTD

PERSON TO BE CONTACTED
FOR ENQUIRIES

NAME
AINSLIE B. JUST

TEL. NO.
08 2488211

NAME OF OWNER
(IF DIFFERENT TO LICENSEE)

POSTAL ADDRESS OF OWNER

SOLVAY ROAD, OSBORNE, SOUTH AUSTRALIA 5017

TYPE(S) OF DEPOT

LANDFILL

LOCATION OF DEPOT
(LOT/SECTION/HUNDRED)

PORTION OF LOT 8, HUNDRED OF PORT ADELAIDE

ADDRESS OF DEPOT

PELICAN POINT, OUTER HARBOUR

CERTIFICATE(S) OF TITLE
REFERENCE

PT. CT. 1276/200

PRESCRIBED FEE

\$ 70.00

SIGNATURE

A B JUST
NAME

DATE 10.12.91

M. D. MADIGAN
DIRECTOR

DSPENRICE

CONDITIONS OF LICENCE APPLICABLE
TO PENRICE SODA PRODUCTS PTY LTD

1. The licensee shall submit a management plan for the depot to the Commission for approval. The management plan shall address, but not necessarily be limited to the following:
 - * Plans and specifications
 - * Waste type and quantities
 - * Mode of operation of the depot
 - * Fencing/Security
 - * Measures to minimize dust emissions
 - * Rehabilitation of the depot.
2. The licensee shall operate and maintain the depot in accordance with the approved management plan.
3. The licensee shall not vary the depot operations as approved in the management plan without prior written approval of the Commission.
4. The licensee shall ensure that the depot is operated and maintained in a manner that does not cause or is likely to cause:
 - (i) a nuisance or offensive condition;
 - (ii) a risk to health or safety;
 - (iii) damage to the environment.
5. The licensee shall use the depot solely for the reception and disposal of waste limestone materials sands arising from the operations of Penrice Soda Products Pty Ltd.
6. The final level of the depot upon which waste has been deposited shall not exceed 4.0 metres above the datum level including a covering of 500 mm of soil.
7. The licensee shall ensure that work on heaped stockpiles is only undertaken when the wind has a southerly component.
8. The licensee shall ensure that the production of dust associated with the operation of the depot is minimized by undertaking either of the following procedures on trafficable areas:

- (i) application of a commercial dust suppressant,
- (ii) regular application of water.

9. The licensee shall ensure that if water is used as a dust suppressant, and operable and properly maintained water tanker shall be accessible to the depot throughout its hours of operation, unless deemed to be unnecessary by the Commission in writing.
10. The licensee shall ensure that access by motor vehicles to the depot is barred when the depot is not supervised.
11. The licensee shall ensure that all excavations at the depot are cut and maintained in a manner which allows easy egress.
12. The licensee shall ensure that soils used as a final cover for the waste material are mulched with a thin layer of a suitable coarse - textured material in a manner which minimizes dust arisings and which allows for revegetation of the depot.
13. The licensee shall take action to ensure that completed areas are revegetated with suitable species to ensure long term stability of the area.
14. The licensee shall ensure that all operating personnel are aware of these conditions of licence.

12th December, 1991

SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

GENERAL CONDITIONS OF LICENCE APPLYING TO
SOLID WASTE LANDFILL DEPOTS

1. The licensee shall not use the depot for the purpose of reception, storage, treatment or disposal of waste until,
 - a) the depot has been constructed in accordance with the management plan approved by the Commission when granting the licence,
 - b) the Director has issued a Notice certifying the satisfactory completion of works,
 - c) the Commission has received a copy of a Public Risk Insurance Policy indemnifying the Commission and covering the licensed depot and its operation. The Policy shall apply for the duration of the licensing of the depot, and
 - d) the Commission has received a copy of the recommendations of the Chief Officer of the South Australian Metropolitan Fire Service or the Director of the Country Fire Services for the depot.
2. The licensee shall construct, operate and maintain the depot in accordance with the management plan approved by the Commission.
3. The licensee shall not vary the depot operations as approved in the management plan without the prior written approval of the Commission.
4. The licensee shall ensure that the depot is operated and maintained in a manner that does not cause or be likely to cause:
 - a) a nuisance or offensive condition;
 - b) a risk to health or safety; or
 - c) damage to the environment.
5. The licensee shall take appropriate measures to prevent the spread of litter within the boundaries of the depot.
6. The licensee shall ensure that litter is collected and disposed of as often as necessary to maintain a tidy appearance within the depot.
7. All litter in public places or private property surrounding the depot which arises from waste delivered to and deposited in the depot, shall be removed by the licensee as necessary to keep such public places and private property free of litter arising from the depot.

8. The licensee shall take such measures as are necessary to prevent or control:
 - a) the escape of gas or leachate from the depot;
 - b) pests within the depot;
 - c) the production of dust or mud within the depot;
 - d) the escape of odours from the depot.
9. The licensee shall fence, mark, or otherwise suitably define all hazards within the depot so as to provide adequate protection to all persons or property.
10. The licensee shall safeguard the stability of buildings and structures in or adjacent to the depot.
11. The licensee shall ensure no prescribed waste, as listed in the Second Schedule to the Waste Management Regulations is deposited at the depot unless otherwise approved in writing by the Commission.
12. The licensee shall not permit salvaging or the removal of waste material from the depot unless otherwise approved in writing by the Commission.
13. The licensee shall not cause or permit the lighting of fires or burning of materials within the depot unless otherwise approved in writing by the Commission.
14. The licensee shall take all reasonable and immediate steps to extinguish any unauthorized fire which may occur.
15. The licensee shall effect all fire prevention measures and maintain within or adjacent to the depot, fire control equipment as recommended by the Chief Officer of the South Australian Metropolitan Fire Service or the Director of the Country Fire Services.
16. The licensee shall ensure that all fire control equipment is maintained in good working order at all times.

23rd March, 1989



Licence No. 38242

**PELICAN POINT POWER
LIMITED**

Allotment 205 (DP 64682) & Allotments 26,28 and 29 (DP 52266) Pelican Point Road, OUTER HARBOR, 5018, SA

ISSUED:

19 Sep 2012

EXPIRY:

30 Apr 2018

ACN:

086 411 814

Environmental Authorisation
under Part 6 of the
*Environment Protection
Act 1993*

**South Australian
Environment
Protection Authority**
GPO Box 2607
Adelaide SA 5001
Tel: 08 8204 2004

EPA

Environment Protection Authority



LICENCE NUMBER 38242

LICENSEE DETAILS

Licence Holder: PELICAN POINT POWER LIMITED

ACN: 086 411 814

Registered Address: Level 37, Rialto North Tower, 525 Collins Street,
MELBOURNE VIC 3000

Premises Address(es): Allotment 205 (DP 64682) & Allotments 26,28 and 29 (DP 52266)
Pelican Point Road, OUTER HARBOR, 5018, SA

LICENSED ACTIVITIES

The Licensee is authorised to undertake, at the location(s) shown above, the following prescribed activities of environmental significance under Schedule 1 Part A of the Act, subject to the conditions in this Licence.

TERMS OF LICENCE

Commencement Date: 19 Sep 2012

Expiry Date: 30 Apr 2018

Amended Date: 12 May 2016

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Licence Explanatory Notes – Do Not Form Part of the Licence

Compliance with this licence

The EPA seeks to ensure that all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment according to the principles of ecologically sustainable development. To achieve this objective, the EPA uses a number of regulatory decision making principles and actions outlined in the 'Compliance and enforcement regulatory options and tools' document available on the EPA website.

Notification – serious or material environmental harm caused or threatened

If serious or material environmental harm from pollution is caused or threatened in the course of an activity, the licence holder must, as soon as reasonably practicable after becoming aware of the harm or threatened harm, notify the EPA (preferably on EPA emergency phone number 1800 100 833) of the harm or threatened harm, its nature, the circumstances in which it occurred and the action taken to deal with it in accordance with section 83 of the [Environment Protection Act 1993](#) (the Act). In the event that the primary emergency phone number is out of order, the licence holder should phone (08) 8204 2004.

Variations, transfers and surrender of a licence

The EPA may impose or vary the conditions of a licence by notice in writing to the licence holder in accordance with sections 45 and 46 of the Act. Public notice may be required where the variation of licence conditions results in a relaxation of the requirements imposed for the protection or restoration of the environment and results in an adverse effect on any adjoining land or its amenity.

If a licence holder wishes to vary the conditions of a licence, transfer a licence to another entity, or surrender a licence, the licence holder must submit an application to the EPA in accordance with the applicable provisions of the Act (sections 45, 49 and 56, respectively). A licence remains in effect and in its original form until such time as any proposed variation, application for surrender, or transfer has been made and approved in writing by the EPA.

Suspension or cancellation of a licence

The EPA may suspend or cancel a licence by notice in writing to the licence holder in accordance with section 55 of the Act if satisfied the licence holder has either obtained the licence improperly, contravened a requirement under the Act or if the holder is a body corporate, a director of the body corporate has been guilty of misconduct of a prescribed kind (whether in this State or elsewhere).

Responsibilities under Environment Protection legislation

In addition to the conditions of any licence, a licence holder must comply with their obligations under all State and Federal legislation (as amended from time to time) including: the [Environment Protection Act 1993](#); the [Environment Protection Regulations 2009](#); all Environment Protection Policies made under the [Environment Protection Act 1993](#); and any National Environment Protection Measures not operating as an Environment Protection Policy under the [Environment Protection Act 1993](#)

Public Register Information

The EPA maintains and makes available a Public Register of details related to its determinations and other information it considers appropriate (i.e. excluding trade processes or financial information) in accordance with section 109 of the Act. These details include, but are not limited to:

- licensing and beverage container applications and approvals
- enforcement actions
- site contamination
- serious or material environmental harm caused or threatened in the course of an activity
- environment improvement programmes and environment performance agreements
- environment assessment reports; results of testing, monitoring or evaluation required by a licence
- EPA advice or direction regarding development approvals referred to the EPA by a planning authority

Definitions

Unless the contrary intention appears, terms used in this licence that are defined in the Act (including any regulations or environment protection policies made pursuant to the Act) have the respective meanings assigned to those terms by the Act.

THE ACT: The *Environment Protection Act 1993*

PREMISES: The whole of the land comprised in Titles Register - Certificate of Title, Crown Lease and Crown Record.

CT5920/564

CT6068/994

CT6150/100

CT6150/101

CT6150/102

AUTHORISATION FEE PAYMENT DATE: means the anniversary of the grant or renewal of this authorisation.

Acronyms

EPA: means Environment Protection Authority

Conditions of Licence

The Licensee is authorised to conduct the prescribed activities as described in this Licence at the Premises nominated, subject to the following conditions:

1 MONITORING AND REPORTING

1.1 DOSE RATE MONITORING (305 - 714)

The Exemptee must continuously monitor the Sodium Hypochlorite dose rate and record the calculated concentration of Chlorine supplied to the cooling water intake.

1.2 MONITORING PLAN (305 - 716)

The Exemptee must:

- 1.2.1 Develop and submit a Monitoring Plan to the satisfaction of the EPA by no later than the date indicated in the Compliance Date column. The Monitoring Plan must include, but not be limited to, measuring Chlorine concentrations under differing tide conditions at the following areas:
 - a Dosing Point;
 - b Seal Pit; and
 - c edge of the approved 'mixing zone'.
- 1.2.2 Implement the Monitoring Plan approved in writing by the EPA (or any revised Monitoring Plan approved in writing by the EPA).

2 ADMINISTRATION

2.1 ANNUAL RETURN AND PAYMENT OF ANNUAL FEES (E - 4)

For the purposes of section 48(2)(a) of the Act, the date for the submission of the Annual Return is 90 days before the anniversary of the grant or renewal of the exemption.

- 2.1.1 For the purposes of section 48(2)(b) of the Act, the date for the payment of the annual authorisation fee is the anniversary of the grant or renewal of the exemption.

2.2 EXEMPTION HOLDER CHANGE OF DETAILS (E - 2)

if the Exemption Holder's name or postal address (or both) changes, the Exemption Holder must inform the EPA within 28 days of the change occurring.

2.3 EXEMPTION HOLDER OBLIGATIONS TO EMPLOYEES, AGENTS AND CONTRACTORS (E - 1)

The Exemption Holder must ensure that every employee, agent or contractor responsible for undertaking any activity regulated by this Exemption is informed as to the conditions of this Exemption.

2.4 EXEMPTION RENEWAL (E - 3)

An application for renewal of the Exemption must be made at least 90 days before the expiry date of the Exemption.

Attachments

There are no documents attached to this licence.



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Telephone 239 0535

Toll Free (008) 18 2041

Fax (08) 239 0632

2nd Floor, Norwich Centre
55 King William Road
NORTH ADELAIDE 5006

Postal Address
G.P.O. Box 2607
ADELAIDE 5001

Our Ref:

WMC 12/91
04MRHL10

31st January 1991

Mr D Toohey
Director - Safety and Services
Solvay Road
OSBORNE SA 5017

Dear Mr Toohey,

Disposal of Limestone Sands

Following your meeting on 21st January 1991 with officers of the Commission and other relevant Government departments, I am writing to confirm agreements which were made in relation to the deposition of limestone sands from Penrice upon Le Fevre Peninsular.

It was agreed as follows:

1. The soil at Site 1 will be pushed back into previously excavated holes and the land levelled by 5 February 1991.
2. The stockpile at Site 2 will be removed in the normal course of events as the waste is sold. Notwithstanding Piber will use their best endeavours to remove the waste by 31 August 1991.
3. Site 3 will be prepared so that waste may be received by 11 February 1991.
4. Every effort will be made by Piber to ensure that no further waste will be deposited at Site 2 after 11 February 1991.

A copy of minutes of the meeting are attached for your consideration.

As you are aware, the Commission now proposes to licence the disposal operation under the provisions of Section 16 of the Waste Management Act, 1987.

Given the time constraints upon establishment of the new operation, action has been taken to exempt temporarily Penrice from the provisions of Section 16.

At its meeting on 24th January 1991 the Commission resolved to grant an exemption to Penrice Soda Products from the provisions of Section 16 for land described as Port Harbors Board Block 10 (CT Vol. 1276 Folio 200) until 31st March 1991, subject to the following conditions:


→ File

1. The exemptee shall use the land solely for the receipt, storage or disposal of waste limestone sands arising from Penrice Soda Products.
2. The exemptee shall ensure that waste is managed in a way that does not cause or be likely to cause:
 - (a) a nuisance or offensive conditions;
 - (b) a risk to health or safety; or
 - (c) damage to the environment.
3. The exemptee shall take such measures as are necessary to prevent the production of dust.
4. The exemptee shall fence, mark or otherwise suitably define all hazards so as to provide adequate protection to all persons or property.

You will be contacted in the near future with regard to an application for a licence and the preparation of a management plan for the proposed depot.

Should you have any queries please contact Max Harvey at this office.

Yours sincerely,


M.D. Madigan
DIRECTOR

Enc.

MRH-JKH



27th March, 1991

South Australian Waste Management Commission
GPO Box 2607
ADELAIDE SA 5001

Attention: Mr Max Harvey

Dear Sir,

Exemption - Waste Management Disposal Licence

I draw your attention to the imminent expiry date of 31st March, 1991 for the temporary exemption from the Commission's proposal to licence Penrice's landfill disposal operation at Pelican Point and the need therefore for an extension.

It was intended that a management plan for the site would have been prepared by this time. Discussions involving officers from the Department of Lands, Waste Management Commission and MFP were held on Monday 25th March at our request to formalise a management plan. While some aspects were clarified, there are still some outstanding matters resting with the Department of Lands. We are keen to work to an agreed plan.

I also seek some revision of the terminology used in the conditions accompanying the advice of temporary exemption in the letter of 31st January, 1991. My suggestions are listed in italics below with reasons for these also given.

1. The exemptee shall use the land solely for the receipt, storage or disposal of alkaline by-products arising from Penrice Soda Products.

While limestone sands are the predominant quantity deposited, there are lesser amounts of "backstone" (incompletely burnt limestone) and drain sludge (mostly calcium carbonate) also buried at Pelican Point.

.../2

Penrice Soda Products Pty Ltd

Incorporated in South Australia

World Headquarters
Solway Road, Osborne
South Australia 5017 Australia
Telephone: (08) 248 8200
Facsimile: (08) 248 8266
Telex: 621128
International 61 8 248 8200

Quarry
P.O. Box 234, Angaston
South Australia 5263 Australia
Telephone: (085) 64 2198
Facsimile: (085) 64 2703

Saltfields
Magazine Road, Dry Creek
South Australia 5094 Australia
Telephone: (08) 262 2405
Facsimile: (08) 262 3807

Globe Island
Penrice Soda Ash Bulk Terminal
No. 8 Wharf, Globe Island
P.O. Box 182, Balmain,
New South Wales 2041 Australia
Telephone: (02) 855 7500
Facsimile: (02) 818 2426

Yarraville Wharf
Whitehall Street, Yarraville
Victoria 3013 Australia
Telephone: (03) 687 2731
Facsimile: (03) 687 2731

2. *The exemptee shall ensure that waste is managed in a prescribed manner so as not to cause or be likely to cause:*

- (a) a nuisance or offensive conditions;*
- (b) a risk to health and safety; or*
- (c) damage to the environment.*

We can work to an agreed reasonable manner prescribed by the Department of Lands and/or the Waste Management Commission but the clause as previously described is too open-ended to be practicable.

3. *The exemptee shall take such reasonable measures as are necessary to prevent the production of dust.*

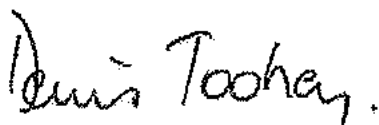
The issue here really should be the effects of dust rather than dust itself and any likely effects would already be covered under 2. above. However, I appreciate that there is a particular sensitivity about dust (and this sensitivity should not be directed solely at or limited to Penrice's operation). In view of this, I accept that there should be *reasonable* measures taken; it is not practicable to prevent the production of dust.

4. *The exemptee shall mark or otherwise suitably define the area of its operations so as to provide adequate warning to all persons.*

Previous history at Pelican Point has shown that fencing of any areas quickly results in theft of the fence itself. I am unclear how it is intended Penrice that could "define all hazards"; it is accepted that sufficient signage should be present to warn of danger. *Warning* is more appropriate than *protection* for a site which is mostly unmanned.

I trust this comments assists in the formulation of a set of conditions within which Penrice can carry out its operations in a manner acceptable to all parties.

Yours sincerely,



D M Toohey
Director - Safety & Services

DEPARTMENT OF LANDS



Regional Operations Division
Port Adelaide Office

Telephone enquiries :

(08) 47 8722

Anne Burton
In reply please quote :

D.L. 5349/89

1 May, 1991

Director - Safety & Services
Penrice Soda Products Pty Ltd
Solvay Road
OSBORNE 5017

Attention Mr. Dennis Toohey

Dear Sir

I refer to recent discussions concerning the leasing of land at Outer Harbour for the purpose of dumping waste material.

You are advised that Penrice Soda Products is to be offered an annual licence over that parcel described as Part Lot 8 Hundred of Port Adelaide on the attached plan, area 25.46 hectares.

Enclosed also is a plan showing the contours of the area as taken from an aerial photograph in January 1991.

The purpose of the licence will be for the dumping of waste material only. The current practice of stockpiling the waste for sale is to cease, so that dust problems are avoided.

The licence fee will be \$52 500-00 per annum, and rates and taxes will be the responsibility of the licensee.

A requirement of the licence will be that 0.5 metre topsoil is to be pushed back and stockpiled. The waste material is not to exceed 2 metres AHD, and the topsoil is to be replaced, so that the final level of the area is 2.5 metres AHD.

.. 2

- 2 -


The licence will include a condition that a diagram with a 50 metre grid be produced every 6 months showing the depth where waste material begins and the height where it ends (bottom and top), the diagram to include the areas completed and covered.

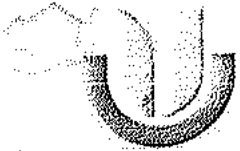
The Waste Management Commission will oversee the operation to ensure that the dumping practices are in accordance with the guidelines set down for the disposal of waste.

Upon your acceptance of the terms and conditions, and receipt of payment of the licence fee, a licence will issue.

Yours faithfully

J.A. Darley
Director of Lands


per A. Burton
PROJECT OFFICER



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Telephone 239 0535

Toll Free (008) 18 2041

Fax (08) 239 1241

2nd Floor, Norwich Centre
55 King William Road
NORTH ADELAIDE 5006

Postal Address
G.P.O. Box 2607
ADELAIDE 5001

Our Ref:

WMC 12/91
08PO

11 June, 1991

Mr. D M Toohey
Director - Safety & Services
Penrice Soda Products
Solvay Road
OSBORNE SA 5017

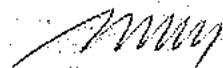
Dear Mr Toohey,

Re: Extension of Exemption from Depot Licence

I wish to advise that the Commission, at its meeting held on 23 May, 1991, resolved to exempt Penrice Soda Products under Section 35 of the Act from the provisions of Section 16 for the land described as Port Harbors Board Block 10 (CT Volume 1276 Folio 200) until 31 August, 1991 subject to the conditions specified in Attachment A (copy enclosed)

Should you have any queries, please feel free to contact this office on 239 0535.

Yours sincerely,


M.D. Madigan
DIRECTOR

Enc.

PO-JKH

*NOTED
17/6*

Agenda Item 7.5
WMC 12/91
(23.5.91)

SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

TO THE CHAIRMAN AND MEMBERS

Extension of exemption from Depot Licence
Penrice Soda Products

At the January 1991 meeting the Commission issued an exemption to Penrice Soda from Section 16 of the Waste Management Act to deposit waste at Pelican Point up until 31 March 1991. Discussions are still under way between Penrice, the Commission and the Department of Lands (the land owner) regarding a contract and management plan. So as to provide extra time for a satisfactory agreement between the parties an extension of the exemption up to 31 August 1991 would seem appropriate.

IT IS RECOMMENDED THAT the Commission resolve to exempt Penrice Soda Products under Section 35 of the Act from the provisions of Section 16 for the land described as Part Harbors Board Block 10 (CT VOL 1276 Folio 200) until 31 August 1991 subject to conditions (attached) specified in attachment A.

fo
M.D. Madigan
DIRECTOR

14.5.91
A-MAY17
GCS-JKH

Ed
Garff / Peter
① Letter 11.0.1986
② Revoked in
Exemptions' dossier
RESOLUTION PASSED PER RECOMMENDATION *11.0.121*

T
26.5.91

ATTACHMENT A

1. The exemptee shall use the land solely for the receipt, storage or disposal of waste limestone sands arising from Penrice Soda Products.
2. The exemptee shall ensure that waste is managed in a way that does not cause or be likely to cause:
 - (a) a nuisance or offensive conditions;
 - (b) a risk to health or safety; or
 - (c) damage to the environment.
3. The exemptee shall take such measures as are necessary to prevent the production of dust.
4. The exemptee shall fence, mark or otherwise suitably define all hazards so as to provide adequate protection to all persons or property.



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Telephone 239 0535

Toll Free (008) 18 2041

Fax (08) 239 0632

2nd Floor, Norwich Centre
55 King William Road
NORTH ADELAIDE 5006

Postal Address
G.P.O. Box 2607
ADELAIDE 5001

Our Ref: WMC 12/91
07MRHL26

14th May, 1991

Mr. D.M. Toohey
Director - Safety & Services
Penrice Soda Products
Solvay Road
OSBORNE SA 5017

Dear Mr. Toohey,

DISPOSAL OF ALKALINE WASTES

Thank you for your letter dated 27th March, 1991 drawing our attention to the expiry of the exemption for Penrice's landfill operation at Pelican Point.

I will be recommending to the Waste Management Commission that your exemption be extended until 31st August, 1991.

In the meantime, as you indicate there will be a need to prepare a management plan for approval by the Commission which incorporates the requirements of the Department of Lands. Those requirements primarily relate to:-


- * replacement of top soil
- * final level
- * areal extent of fill
- * stockpiling of material

With regard to stockpiling, the Commission is currently of the view that its contribution to dust in the area is only minor and that it should be able to proceed.

To assist with the preparation of a management plan I have enclosed guidelines which indicate the types of issues which need to be addressed.

Commission staff would be pleased to discuss these with you at any time.

Yours sincerely,


M.D. Madigan
DIRECTOR
MRH:JMH

DEPARTMENT OF LANDS



WMC 12/A
→ file

Regional Operations Division

Port Adelaide Office

30 October 1991

Telephone enquiries:

Anne ^{(08) 47 8722} ~~Burton~~

Directly please quote:
D.L. 9329/89

The Managing Director
Penrice Soda Products Pty Ltd
Solvay Road
OSBORNE 5017

Dear Sir

re Licence to deposit waste at Pelican Point

I refer to the Agreement which commenced 1st July 1982 between the Minister of Marine and ICI Australia Operations Limited - now Penrice Soda Products Pty Ltd - for a licence to deposit waste at Pelican Point.

Since the advent of the Multi Function Polis, the Government has reassessed its requirements for the development of Lefevre Peninsula, including the landfill and dredging operations currently being carried out on the peninsula. It would now appear that the general area has almost reached capacity with regard to landfill.

You are hereby given twelve months notice from the date of this letter of termination of the abovementioned licence.

You are permitted to continue the dumping of waste as agreed at the current site, lot A of part lot 8, in accordance with the terms of a Waste Management Commission licence, currently being drafted by the Commission.

Your attention is drawn to paragraph 12 of the licence concerning your liability to prevent erosion, and paragraph 16 concerning environmental nuisance. Should preventative action need to be taken as a result of the dumping of Penrice waste, your company will be responsible for any such costs.

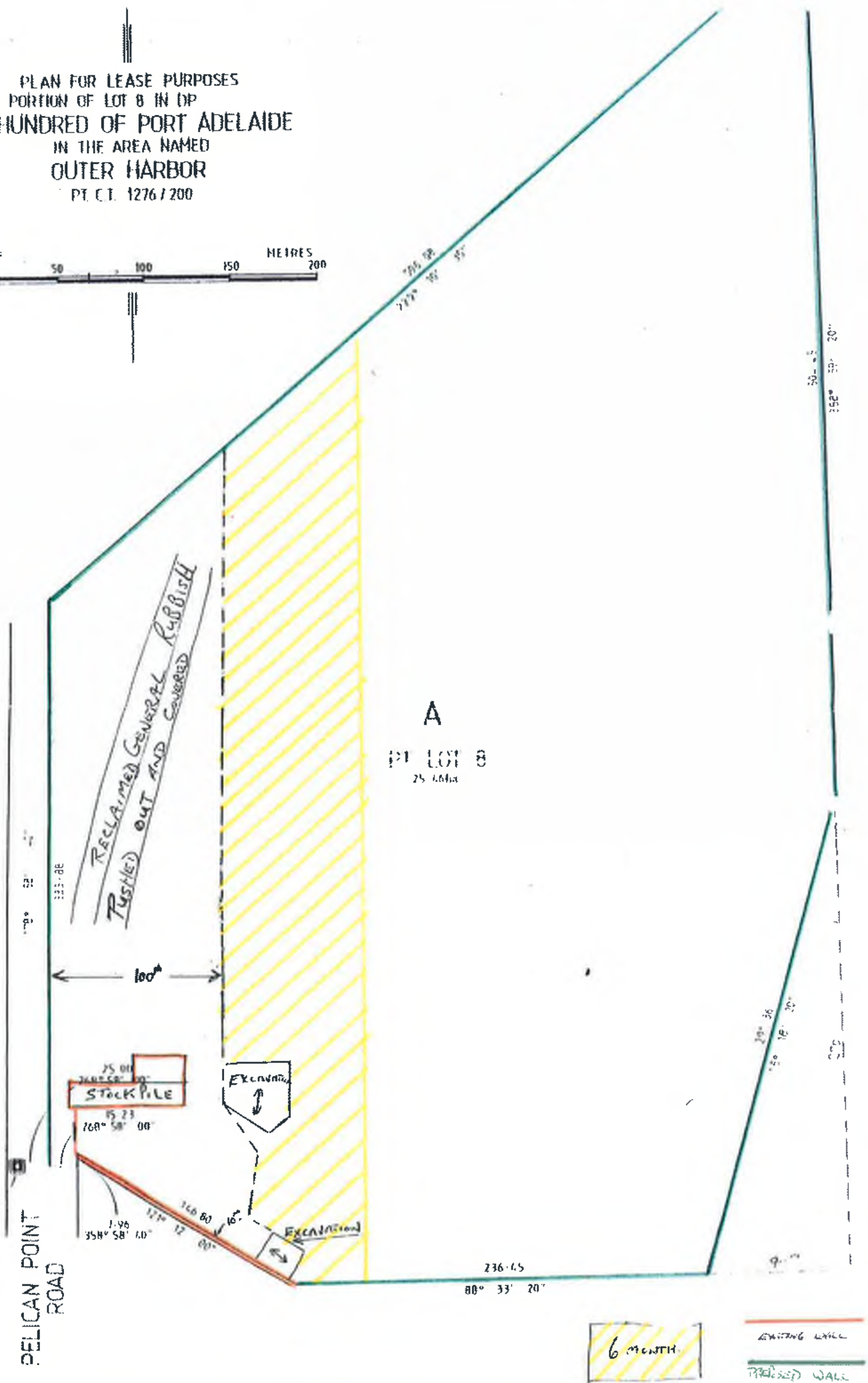
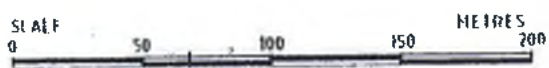
Yours faithfully

J.A. Darley
Director of Lands

AB
per A. Burton
Project Officer
12 Todd Street Port Adelaide 5015

Facsimile (08) 341 1412

PLAN FOR LEASE PURPOSES
 PORTION OF LOT 8 IN DP
 HUNDRED OF PORT ADELAIDE
 IN THE AREA NAMED
 OUTER HARBOR
 PT. C.T. 1276 / 200



66201 24601
 AND 2 C34m

PELICAN POINT
 ROAD

A
 PT LOT 8
 25.66ha

6 MONTH

EXISTING WALL
 PROPOSED WALL



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Telephone 239 0535

Toll Free (008) 18 2041

Fax (08) 239 1241

2nd Floor, Norwich Centre
55 King William Road
NORTH ADELAIDE 5006

Postal Address
G.P.O. Box 2607
ADELAIDE 5001

Our Ref:

WMC12/91
02MRH/JAH

3rd December, 1991

Mr. Ainslie Just,
Penrice Soda Products Pty Ltd.,
Solvay Road,
OSBORNE SA 5017

Dear Mr. Just,

LICENCE TO OPERATE A WASTE DEPOT

As you are aware, for the past twelve months a number of Government departments have expressed concerns regarding dust arising from disposal of Penrice's limestone sands at Pelican Point. An additional concern has been the potential incompatibility of land filled with the waste material with the development of an MFP.

With Penrice's co-operation, the disposal operation was shifted to a more remote northern site and has since been operating under an exemption from the Commission. As a consequence, a depot licence has not been required for the operation.

The exemption from the licensing provisions of Section 16 of the Waste Management Act lapses on 12th December, 1991.

The Waste Management Commission is now keen to formalise the arrangements with the granting of a licence.

In order to progress this matter, I have enclosed a depot application form. This form should be completed and forwarded to the Commission with the scheduled fee of \$70 as soon as possible.

I have also enclosed draft conditions which, it is proposed, would be attached to the licence. Of course, the Commission would be pleased to discuss these prior to them being finally adopted.

The draft conditions address a number of issues, including:

- (a) A restraint on the height of stockpiled waste which would require future stockpiling to be undertaken on an unfilled area.
- (b) The use of dust suppressants on trafficable areas, waste stockpiles, etc.
- (c) The use of a coarse textured material as final cover. Shell grit which is apparently plentiful in the area has been suggested.
- (d) The need to ensure that excavations are made safe.

Should you have any enquiries, please contact Max Harvey at this office.

Yours sincerely,


M.D. Madigan
DIRECTOR

SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

TO THE CHAIRMAN AND MEMBERS

Penrice Soda Products Pty Ltd - Conditions of Licence

Members have been advised on a number of occasions of concerns arising from the disposal at Pelican Point of limestone sands from Penrice Soda Products Pty Ltd.

The material has been used over many years to fill low lying land to be used for portside industrial development. In the past year some problems have been arisen including:

- * dust emissions from storage and disposal of limestone sands have allegedly threatened the operations of the Australian Submarine Corporation and Pacific Marine Batteries.
- * dust rising from soils used to cover the waste have been of similar concern.
- * the use of limestone sands for filling is incompatible with plans being developed for the MFP which include a marina in that area.
- * excavations being dug by the contractor to recover top soil are steep sided, filled with water and unfenced, presenting a significant risk to anyone who happened to fall in.

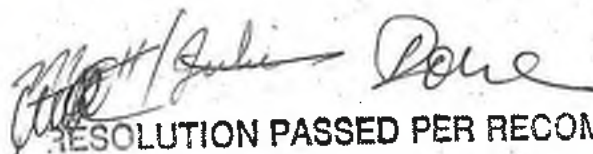
Over some time discussions have been held with officers from Department of Industry, Trade & Technology and Department of Lands to establish the most appropriate controls.

The disposal depot has been operating under an exemption which has expired.

On 30th October 1991, the Department of Lands gave Penrice twelve months notice to cease the operation.


IT IS THEREFORE RECOMMENDED THAT the Commission resolve to:

- (a) Exempt Penrice Soda Products Pty Ltd under Section 35 of the Act from the provisions of Section 16 for the land described at Port Harbors Board Block 10 (CF VOL 1276 Folio 200) until 12th December 1991 subject to the following conditions:


RESOLUTION PASSED PER RECOMMENDATION

T
4.12

1. The exemptee shall use the land solely for the receipt, storage or disposal of waste limestone sands arising from Penrice Soda Products Pty Ltd.
 2. The exemptee shall ensure that waste is managed in a way that does not cause or be likely to cause:
 - * a nuisance or offensive condition;
 - * a risk to health or safety; or
 - * damage to the environment.
 3. The exemptee shall take such measures as are necessary to prevent the production of dust.
 4. The exemptee shall fence, mark or otherwise suitably define all hazards so as to provide adequate protection to all persons or property.
- (b) Approve, in principle, the adaption of the attached draft Conditions of Licence as a basis for further consultation with Penrice and for formal consideration at the meeting on 12th December 1991.


M.D. Madigan
DIRECTOR
A-NOVEMBER/35
MRH:DSF
27.11.91

- ① Recorded in exemption docket. ✓
- ② All correspondence placed in appropriate docket. ✓
- ③ Copy of conditions placed in conditions folder. ✓

5/12/91 JCS



2 November, 1991

Director Of Lands
Regional Operations Division
12 Todd St
PORT ADELAIDE SA 5015

Attention: Ms Anne Burton

Dear Sir,

DISPOSAL OF SOLIDS AT PELICAN POINT
YOUR REF: DL 5349/89

Further to our recent telephone conversations, I am enclosing a plan of the Pelican Point lease showing areas already reclaimed with pre-existing rubbish or filled with our limestone grit, the current area of operation, and the proposed area of operation over the next 6 months.

I trust that this information will be of assistance to you in preparing for our inspection of the area on Friday of this week (8th November).

Yours faithfully

Ainslie Just

Manager-Environment and Process Engineering

CC

Penrice Soda Products Pty Ltd

Incorporated in South Australia

World Headquarters

Solvay Road, Osborne
South Australia 5017 Australia
Telephone: (08) 248 8200
Facsimile: (08) 248 8266
Telex: 82128
International 61 8 248 8200

Quarry

P.O. Box 234, Angaston
South Australia 5353 Australia
Telephone: (085) 64 2198
Facsimile: (085) 64 2703

Saltfields

Magazine Road, Dry Creek
South Australia 5094 Australia
Telephone: (08) 262 2405
Facsimile: (08) 262 3807

Glebe Island

Penrice Soda Ash Bulk Terminal
No. 8 Wharf, Glebe Island
P.O. Box 132, Balmain,
New South Wales 2041 Australia
Telephone: (02) 555 7500
Facsimile: (02) 818 2526

Yarraville Wharf

Whitehall Street, Yarraville
Victoria 3013 Australia
Telephone: (03) 887 2731
Facsimile: (03) 887 2734

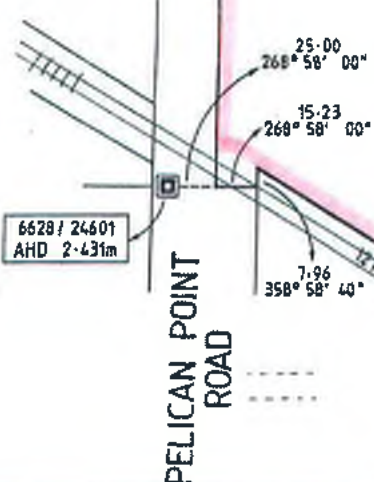
PLAN FOR LEASE PURPOSES
 PORTION OF LOT 8 IN DP
 HUNDRED OF PORT ADELAIDE
 IN THE AREA NAMED
 OUTER HARBOR
 PT. C.T. 1276 / 200



A
 PT LOT 8
 25.46ha

RECLAIMED:
 GENERAL RUBBISH
 PUSHED OUT
 AND COVERED

↑
 PLANNED
 FILL AREA
 FOR
 NEXT 6
 MONTHS
 OF
 OPERATION.
 ↑



PELICAN POINT
 ROAD

PREVIOUS ROAD

FILL → EXCAVATION →

STRAIGHTENING OF
 SOUTHERLY BOUNDARY
 &
 PREPARING BASE
 FOR STOCKPILES

↑
 MAIN N-S ALIGNMENT
 OF RAIL LINE

01/11/91

98.88E

25.00
 268° 58' 00"
 15.23
 268° 58' 00"

14.80

586.88
 229° 18' 35"

291.36
 15° 18' 20"

504.45
 358° 59' 20"

WASTE MANAGEMENT ACT, 1987

(SECTION 35)

APPLICATION FOR EXEMPTION

TO: The Director
South Australian Waste Management Commission
GPO Box 2607
ADELAIDE SA 5001

Phone: 239 0535

I hereby apply for exemption from provision/s of the Waste Management Act, 1987, details of which appear below.

APPLICANT: Name: PENRICE SODA PRODUCTS PTY LTD
Postal Address: SOLVAY RD
OSBORNE Postcode 5017

CONTACT PERSON: Name: MR. A. B. JUST
Postal Address: As Above
Postcode

TELEPHONE NUMBER: Business: (08) 248 8211 After Hours: (08) 49 3268

Specify provisions of the Section 16
Act for which exemption
sought:

Particulars of Exemption: To deposit waste limestone
grits near Pelican Point in
low-lying areas up to
30 September 1992

Application for Exemption Fee \$ 20 is enclosed.
I hereby certify that to the best of my knowledge the information provided
in this application is correct.

Applicant's Signature: 29/89 [Signature] Date: 10/06/92
15 JUN 1992
\$20 00 OK



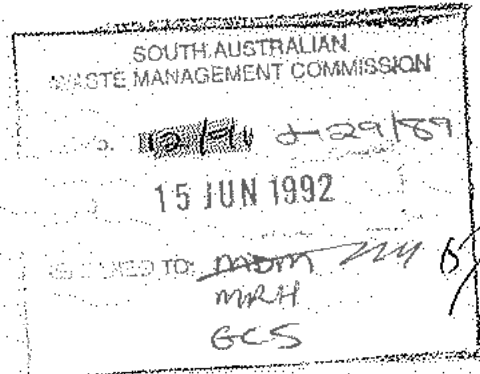
Penrice Soda Products Pty Ltd

A.C.N. 008 206 942

12 June, 1992

The Director
South Australian Waste Management Commission
GPO Box 2607
ADELAIDE SA 5001

Attn: Mr Geoff Sclare



Dear Sir,

APPLICATION FOR EXEMPTION FROM PROVISIONS OF WASTE MANAGEMENT ACT 1987

I refer to the request by the Department of Lands and/or Dept of Environment and Planning for supply of limestone grit to fill low-lying land at Pelican Point, and to your fax of 5th June 1992 requesting Penrice to apply for exemption from Section 16 of the Waste Management Act for this activity.

The application is enclosed, together with the specified fee of \$20.

It is not clear what this exemption will cover, specifically, other than the requirement to licence the site for operation as a depot. Prior to proceeding with the proposed rehabilitation of the subject areas, Penrice will of course need specific direction from SAWMC as to the conditions under which it is undertaken. In addition, we will expect to be provided with clear written approvals from the Department of Environment and Planning and/or the current and future land-owners (assumed to be Department of Lands and MFP Australia) as appropriate.

For many years Penrice has followed what we considered best available economic practice for grit disposal, that being to cover all grit deposited in landfills with a substantial layer of excavated soil to minimise any hazard or nuisance and to promote rapid re-establishment of vegetation. Although we have no reason to doubt that the alternative method now proposed will not prove totally adequate, we must re-iterate that we can take no responsibility for any consequential problems, nuisances or liabilities created by this new method and not under our direct control. Indemnities against any future actions or liabilities which may result from this project are therefore sought by Penrice prior to proceeding.

Penrice wishes to continue to support the Commission and various interested Departments in their objectives, but can not afford to do so at the expense of any long term risk which might more than negate any short term gains in reduced disposal cost.

World Headquarters
Soivay Road, Osborne
South Australia 5017 Australia
Telephone: (08) 248 8200
Facsimile: (08) 248 8266
Telex: 62128
International 61 8 248 8200

Quarry
P.O. Box 234, Angaston
South Australia 5353 Australia
Telephone: (085) 64 2198
Facsimile: (085) 64 2703

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Magazine Road, Dry Creek
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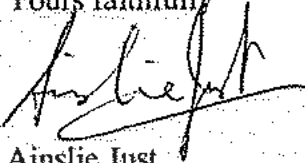
Yarraville Wharf
Whitehall Street, Yarraville
Victoria 3013 Australia
Telephone: (03) 687 2731
Facsimile: (03) 687 2734

I have had further discussions with Brendan Lay and walked over the site with him. We are now able to commence negotiations with our contractor to establish variations to current operating costs which will apply during the project.

We are of course anxious that this project should succeed, and that we will have the opportunity to continue our operations, beyond our current licence period, filling further areas at Pelican Point.

We will be pleased to receive details of the conditions under which the project is to proceed, together with the above-mentioned undertakings by the relevant Government agencies and departments, at your earliest convenience.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Ainslie Just', written over a dotted grid background.

Ainslie Just
Manager-Environment and Process Engineering

attach.



SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

Telephone 239 0535

Toll Free (008) 18 2041

Fax (08) 239 1241

2nd Floor, Norwich Centre
55 King William Road
NORTH ADELAIDE 5006

Postal Address
G.P.O. Box 2607
ADELAIDE 5001

Our Ref:

WMC ~~12/91~~
WMC 29/89
09JKH

7th July, 1992

Penrice Soda Products Pty Ltd
Solvay Road
OSBORNE SA 5017


Dear Sir/Madam,

I wish to advise that at its meeting held on 23rd June, 1992, the Commission resolved to grant an exemption to Penrice Soda Products Pty Ltd from the provisions of Section 16 of the Waste Management Act to deposit waste on the Le Fevre Peninsular subject to conditions of exemption ESPEN dated 23rd June 1992.

Enclosed is a copy of the conditions of exemption which you are asked to read carefully and comply with at all times.

If you have any queries, please feel free to contact this office on 239-0535.

Yours sincerely,


M.D. Madigan
DIRECTOR

Enc.

Agenda Item 6.4
WMC 12/91
(23.6.92)

SOUTH AUSTRALIAN WASTE MANAGEMENT COMMISSION

TO THE CHAIRMAN AND MEMBERS

Penrice Soda Products Pty Ltd
Application for exemption from S.16 of the Act

A proposal has been submitted by Department of Environment and Planning to rehabilitate low-lying areas of the Le Fevre Peninsula by filling holes and covering with shell, grit and sea grasses. DEP consider that the limestone grit waste from Penrice would be suitable for the purpose. The shell grit and sea grasses will encourage vegetation and will result in less dust in summer and removal of wet areas in winter.

Discussions have been held with interested parties and a plan has been submitted by DEP.

So that the waste may be deposited in those areas Penrice Soda Products Pty Ltd have submitted an application for exemption from provision of Section 16 of the Waste Management Act and paid the prescribed fee.

Should the filling of low-lying areas go ahead it will be limited in extent both vertically and horizontally and only be permitted over winter months so as to prevent dust.

IT IS RECOMMENDED THAT the Commission resolve to grant an exemption to Penrice Soda Products Pty Ltd from the provisions of Section 16 of the Waste Management Act to deposit waste on the Le Fevre Peninsular subject to conditions of exemption ESPEN dated 23 June 1992.

for
M.D. Madigan
DIRECTOR
A-JUNE/17
GCS:DSF
19.6.92

Geoff
RESOLUTION PASSED PER RECOMMENDATION

T
25.6.

ESPEN

CONDITIONS OF EXEMPTION APPLICABLE TO
PENRICE SODA PRODUCTS PTY LTD

1. The exemptee shall use the land referred to in these conditions solely for the reception and disposal of waste limestone materials arising from Penrice Soda Products Pty Ltd.
2. The exemptee shall ensure that no waste is left in stockpiles at the close of operations for each day.
3. The exemptee shall ensure that the production of dust associated with the deposition of waste is minimised.
4. Waste may only be deposited in areas designated on plan A.
5. The final level of waste shall not be higher than the following levels in the areas marked on plan A above AHD.

A7	1.3
A8	1.75
B7	1.3
B8	1.5
C8	1.5
A9	2.0
B9	1.25
C9	1.5
B10	2.0
C10	1.5
C11	2.0
B11	2.0
A10	2.0

6. Waste shall be covered with shell grit and seagrass progressively.
7. The waste shall be covered with no less than 100mm of shell grit and no less than than 100mm of sea grass.
8. No waste shall be deposited after 30 September, 1992.
9. No waste shall be left without shell grit and seagrass cover as specified in Condition 7 after 16 October, 1992.

23rd June, 1992

(D 21-23)
etc

OUTER HARBOUR
RAILWAY

(FRESH POND)

LOCATION OF AREAS
FOR DUMPING OF PEARCE GALT
(MINIMUM)


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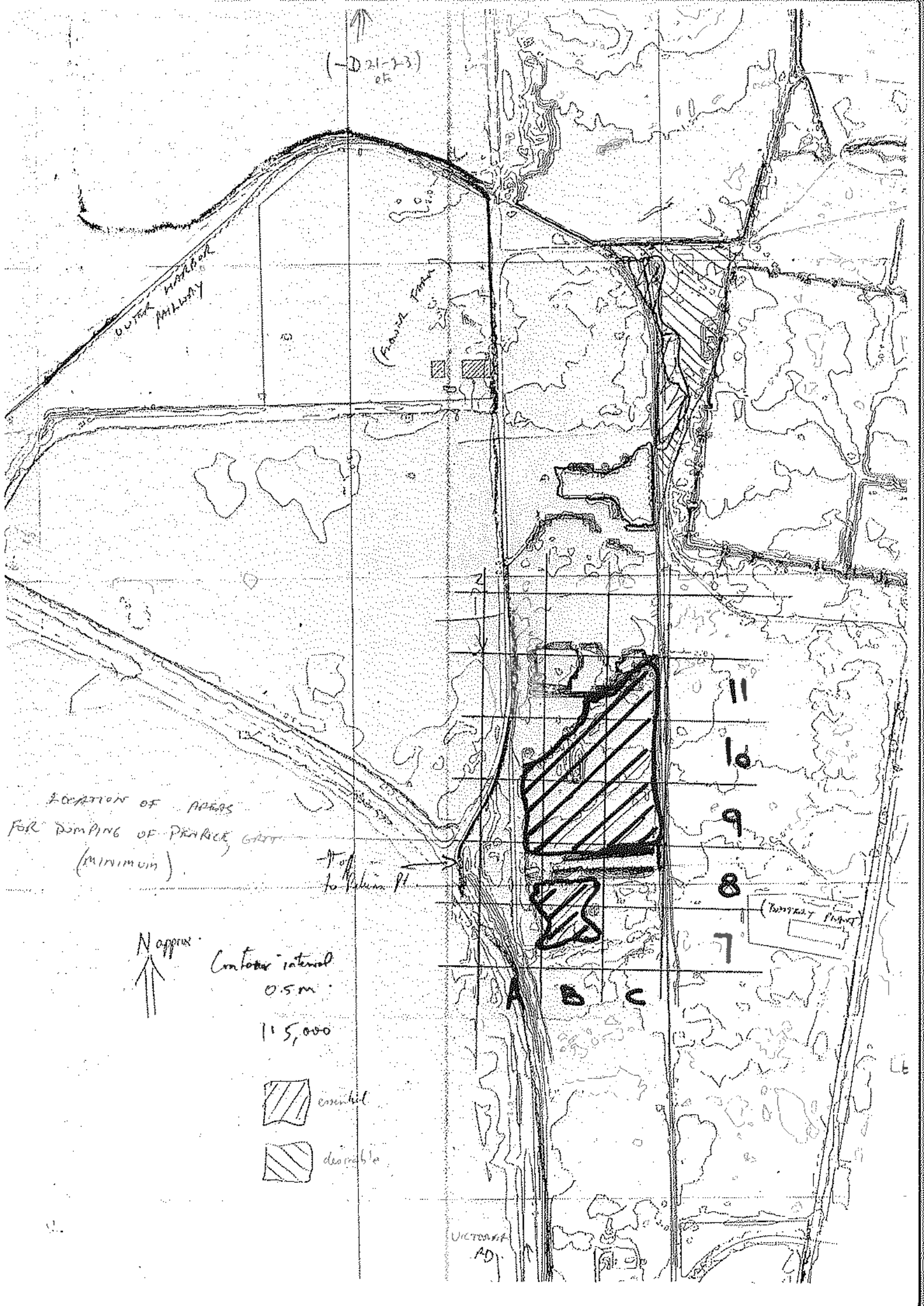
 desirable

A B C

11
10
9
8
7

(DUMPING POINT)

VICTORIA
AD.



ABOUT US

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APPENDIX I

FLOODING, EROSION AND DRAINAGE ASSESSMENT



**Design
for a better
future /**

PORT ADELAIDE ENERGY PTY LTD

**SNAPPER POINT POWER
STATION**

FLOODING, EROSION,
DRAINAGE AND
SERVICES

wsp

OCTOBER 2019

Question today Imagine tomorrow Create for the future

Snapper Point Power Station Flooding, Erosion, Drainage and Services




Port Adelaide Energy Pty Ltd

WSP

Level 1, 1 King William Street
Adelaide SA 5000
GPO Box 398
Adelaide SA 5001

Tel: +61 8 8405 4300
Fax: +61 8 8405 4301
wsp.com

REV	DATE	DETAILS
00	30/09/2019	Draft
01	11/10/2019	Final

	NAME	DATE	SIGNATURE
Prepared by:	Brad Bown	30/09/2019	 pp
Reviewed by:	Homer Milanes	11/10/2019	
Approved by:	Bronte Nixon	11/10/2019	

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ABBREVIATIONS

AEP	Annual Exceedance Probability
AHD	Australian Height Datum
SEDMP	Soil Erosion and Drainage Management Plan

EXECUTIVE SUMMARY

This report outlines the Civil Development aspects for the Snapper Point Power Station development.

Key areas reviewed across the project site include:

- 1 flooding, drainage aspects noting tidal influences and low lying land
- 2 services that exist within the development boundaries.

The report shall be read in conjunction with referenced material.

Planning and Design phases shall take into account environmental protection measures outlined in this report, noting the sensitive coastal region and low lying land proposed to be developed.

1 INTRODUCTION

1.1 THE SNAPPER POINT POWER STATION PROJECT

The Snapper Point Power Station (the Project) involves the de-commissioning, relocation and re-commissioning of five (5) trailer-mounted GE TM2500 Gen 8 aero-derivative turbine generators, and ancillary infrastructure, from an existing site at Elizabeth in Adelaide's northern suburbs, to a new site adjacent to the Pelican Point Power Station at Outer Harbor. The turbines are currently operated by APR Energy on behalf of the Government of South Australia (SA Government or the State) for emergency electricity generation, as part of South Australia's emergency power plant project.

Port Adelaide Energy Pty Ltd (P A Energy P/L), an affiliate of Nexif Energy Australia Pty Ltd (Nexif Energy) has entered into an agreement with the SA Government to lease the turbines from the SA Government, and operate them for commercial use for a period of 25 years. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up fuel. It is proposed that the Project will connect into the nearby Pelican Point Power Station fuel gas yard (owned by Epic Energy) and Pelican Point Power Station switchyard (owned by ElectraNet).

1.2 PROJECT AREA

The Project site (the Site) will be located adjacent to the Pelican Point Power Station at Outer Harbor, approximately 20 km north of Adelaide. The land is owned by Renewal SA, and will be leased by Nexif Energy for this Project. The Site is situated between the coastal waters of the Port River and the Pelican Point Power Station, and is located within the City of Port Adelaide Enfield under the Industry Zone. The Site will be comprised of the following land parcels:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – Title reference CT 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of Allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6102/888.

It is anticipated that an additional, existing site access road will be utilized for the Project. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.



Figure 1.1 Aerial photograph of Project site, outlined in red

A preliminary site plan is included for reference in Appendix A.

1.3 OBJECTIVES

The objective of this assessment is the review the flooding, drainage and erosion of the proposed works.

Existing services across the Project Site has also been reviewed.

1.4 LEGISLATIVE AND POLICY REQUIREMENTS

Legislation and policy guidance relevant to stormwater and flooding requirements for the Project are detailed in the following documents:

- 1 Coastal Protection Board's Policy Document – 29 July 2016.
- 2 *Environment Protection Act 1993*.
- 3 The Environment Protection (Water Quality) Policy 2015 (under the *Environment Protection Act 1993*).
- 4 Environmental Protection Agency Government of South Australia (EPA) 1999, Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry 1999.
- 5 Environmental Protection Authority Government of South Australia 1999, EPA Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry 1999.
- 6 Port Adelaide Enfield Council Development Plan – Flooding and Hazard protection measure requirements.

1.5 ASSESSMENT METHODOLOGY

The main objective of the Flooding, Erosion and Stormwater Assessment is to assess the topography and drainage characteristics of the Site, and to then identify any flooding and drainage issues which may result from the proposed development. The secondary objective is to determine the existing services across the Site.

The assessment is comprised of the following components:

- review Dial before you Dig information and note key constraints
- review all available mapping of Project Site
- review available geotechnical information regarding soil types, refer Appendix B – CMW Geosciences Geotechnical Investigation Report
- review the layout of the site infrastructure and access road against topography
- identify any road drainage crossings and propose likely crossing types (floodway, culvert/pipe crossing)
- prepare typical stormwater requirement details
- identify potential detention basins and sediment control measures
- recommend high-level SEDMP requirements.

1.5.1 ASSUMPTIONS

In preparing this assessment, the following assumptions have been made:

- Design of access tracks and other engineering works are in accordance with the relevant design codes, guides and standards.
- The critical Road Design Vehicle(s) are to be confirmed during future design and construction development phases.
- Council requirements regarding site development shall be that the site is protected against the standard sea-flood risk level, plus a land subsidence allowance to the year 2100. As such site level to be 0.3 m minimum above standard sea-flood risk level. Building floor levels 0.55 m minimum above standard sea-flood risk level.
- Further to above, the Coast Protection Board’s policy in relation to coastal flooding hazard at this location, confirms the site and finished floor levels are to be at least 3.30 and 3.55 mAHD respectively.
- The extent of **existing services** is based on available data as outlined in section 2 of this report.

1.5.2 AREA COVERED BY STUDY

The area covered in this study extends to the proposed Site and access roads as outlined in Appendix A.

1.5.3 CONSTRAINTS

No survey data of the Project Site was available at time of preparing this report.

Coastal Protection Board advice in regard to site development levels:

- To meet the Coast Protection Board’s policy in relation to coastal flooding hazard in this location, site and finished floor levels of 3.30 and 3.55 mAHD would be required respectively for any development.
- Any mechanical and electrical equipment should be safe from flooding and should therefore be raised in accordance with the Boards’ recommended floor level of 3.55 mAHD. Bunding for equipment that utilises chemicals may also be required to meet this level.

Coastal Protection Board advice in regard to importing of fill to site (to raise the site to an appropriate level):

- Any imported material or engineered fill to be used within the area which is subject to coastal processes would need to be free of weeds and pathogens to ensure that noxious weed or contamination sources are not introduced into the coastal environment.
- Fill should also be compacted to reduce the risk of scour and contain less than 1% of fines. Compaction levels are outlined further in Appendix B.

2 EXISTING CONDITIONS

2.1 GENERAL

The Project Site is an undeveloped site, featuring low-lying coastal lands, with raised access tracks constructed on materials imported or won from site.

CMW Geosciences Geotechnical Investigation Report (Appendix B) confirms soil types vary across the site, and primarily feature underlying sands to 3m plus, with a layer near the surface of sandy clay, and overlaying sand top soil.

The Geotechnical report recommends raising of the site for development, the extent of raising, however, is not specified.

2.2 SERVICES

All Site hazards must be appropriately managed by the Consultant, Designers, Construction Contractor and Operating Parties.

A combination of publicly available sources was used in locating existing utility services and constraints on Site. Information source are listed below.

- Dial before you dig search
- Location SA Map Viewer and
- Google Earth and Google Maps.



Figure 2.1 Location SA screenshot, outlining known services adjacent the Project site (HV power in purple, Watermain in blue)

Identified service utilities which may be affected by the works are shown in Table 2.1 below.

Table 2.1 Affected utilities

SERVICE UTILITY	PELICAN POINT ROAD	PROJECT SITE
Epic Energy (liquid gas)	✘	✓ (under access road)
SEAGAS (liquid gas)	✘	✓ (under access road)
Telstra	✓ (P100 services both sides)	✘
Water	✓ (250 PVC)	✘
Sewer	✓ (low pressure)	✘
Electricity LV – UG	✓	✘
Electricity HV – OH	✓	✘

3 PROJECT IMPACTS

3.1 CONSTRUCTION

Construction of the proposed power plant will include earthmoving activities to formalise the existing access track and create raised hardstands for the plant infrastructure.

Civil works will include the stripping of topsoil and localised regrading to ensure the access road is trafficable and drains stormwater away from the access track. Any localised regrading across the site will need to be considered in terms of drainage outlets, and the potential impacts to the existing coastal region.

Trenching (to link power, telemetry, water mains, sewer) will include the stripping of topsoil, excavation, backfill (and possible reinstatement of topsoil). Excess excavated material shall be utilised in fill zones elsewhere on the site or transferred offsite to an appropriate facility for reuse. Materials removed from site may be subject to testing for contamination.

Storm events during construction may result in sediment damaging downstream watercourses. Appropriate sediment control practices during construction will need to be adhered to; ensuring the coast is protected from soil runoff during storm events. All contractors onsite will need to abide by the Soil Erosion and Drainage Management Plan (SEDMP) prepared by the Construction Contractor.

Pollutants used during construction have the potential to enter the sea and waterways, and seriously damage the wider stormwater network. Pollutants are listed under the *Environment Protection (Water Quality) Policy 2015*, which explicitly states that a person must not discharge these pollutants into waterways or onto land from which it is likely they will enter a waterway. Significant financial penalties apply where the policy is not abided by.

Safe operating procedures are to be adopted for earthworks including transport and placement onsite, in addition to importing of any new pavement materials to site.

Any excess water used in construction cannot be dumped directly to Council drains or the sea, without appropriate approvals in place.

3.2 OPERATION

Maintenance and inspection activities shall be undertaken in accordance with a 'site maintenance specification' guideline for the site. Vehicles used onsite shall be appropriately maintained.

The development of the power plant will increase the quantity of impervious surfaces across the site, due to the construction of hardstand zones and buildings; which will in turn will increase stormwater runoff.

Increased runoff will need to be detained to predevelopment levels by means of detention basins located downstream from the plant site. A slow release outlet shall be incorporated into the basin, noting the lower elevations and proximity to tidal events need to be taken into account for the design of the stormwater management system onsite.

Appropriate spill kits for vehicles and plant shall be required for the facility to operate.

Appropriate scour protection shall be required at the basin's inlet, outlet, and any spillways designed.

3.3 DECOMMISSIONING

Removal of plant is to be reviewed for potential contamination upon decommissioning and transporting from site.

Maintenance of the stormwater network for the site may still be required once site is decommissioned, given the likelihood that the hardstands and access road will remain in place after plant is removed.

4 MANAGEMENT AND MITIGATION MEASURES

4.1 PLANNING AND DESIGN

Construction and operation access is to cater for largest vehicle swept paths of construction, transport and maintenance vehicles. The vehicle type is to be confirmed during the detailed design phase of the project.

4.1.1 DRAINAGE

In the event of road drainage crossings being required, a RCBC (reinforced concrete box culvert) will be required at such locations.

Figure 4.1 below outlines a typical road crossing culvert treatment. Stormwater network sizing shall be reviewed during the detailed design phase.

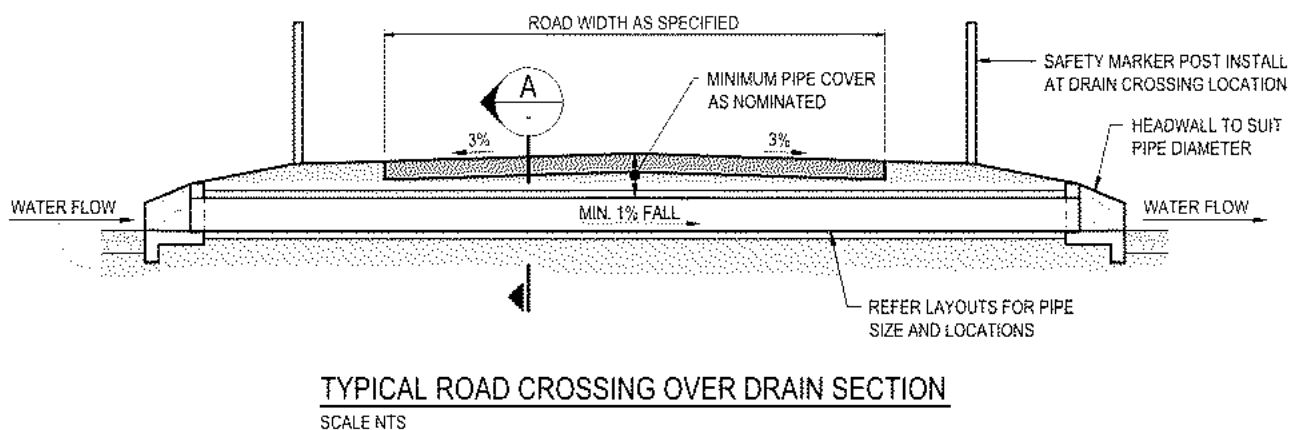


Figure 4.1 Typical culvert crossing detail

During the detailed design phase of the project, major and minor storm average exceedance probabilities (AEP's) shall be reviewed on a risk-based approach, to identify critical events, in consultation with the asset owner who will maintain the project sites including the access track.

4.1.2 DRAINAGE DETENTION AND SEDIMENT CONTROL

The Power Plant hardstands shall be designed with appropriate stormwater and tidal protection. It is anticipated a detention basin will be required to capture the additional runoff given the increased impermeable areas of roof and pavement associated with the development.

The outlet of the basin shall need to accommodate tidal effects and may require flap gates (or similar structures) at outlets directed into the sea.

4.2 CONSTRUCTION

The following measures should be put in place to manage and mitigate impacts during the construction phase:

- Sediment and erosion controls should be implemented. These may include:
 - preserving existing vegetation where feasible/possible
 - construction vehicles should enter and leave the site by a construction access driveway to limit the tracking of mud and/or soil onto roads
 - a large gravel or aggregate should be used to establish the entry/exit point, and should only require periodic maintenance by topping up the rock when required
 - a guide to the design and operation of a wash area should be outlined in the construction management plan documents
 - a guide to waste management should be outlined in the documents
 - all areas disturbed by construction should be promptly stabilised—for example, re-vegetated—so they can no longer act as a sediment source
 - all construction vehicles on-site are to be fitted with a suitable oil/fuel spill kit.
- If a significant rainfall event has been forecasted, all work may need to be temporarily halted until the storm has passed. It is also advisable to secure loose materials including construction waste and equipment, or to alternatively remove them from the site. Any washing of site vehicles and equipment should also be prohibited on-site to prevent stormwater contamination, unless an appropriate facility is provided.
- The Environment Protection (Water Quality) Policy 2015 must be complied with, in protecting waters and land from listed pollutants.
- If there is a risk that contaminants have entered the sea/waterways, it is recommended that water quality tests be undertaken immediately. If there is any trace of contamination, works should be suspended until an appropriate treatment is implemented.
- All exposed soil batters should be top dressed with topsoil and re-seeded with native grasses following completion of construction works, providing benefits to stormwater runoff quality. In locations of rock, no further surface works are required.
- Development boundaries within the tidal zones may require protection from tidal flow and wave actions.

4.3 OPERATION

The following measures should be put in place to manage and mitigate impacts during the operation phase.

- Stormwater runoff from developed zones across the site should to be addressed in accordance with planning conditions, limiting flows from the site to pre-development peak flow levels (subject to further detailed investigation), and the provision of suitable erosion control for new earthwork zones. The location, siting, design and operation of renewable energy facilities should be completed such that the ‘adverse impacts to the natural environment and other land uses’ are minimised. Any development must also be ‘located and designed to minimise the risks to safety and property from flooding’ during a 1% AEP (1 in 100-year ARI equivalent event). The Project should not result in any of the following items (based on proposed alignments these items are addressed):
 - impede the flow of floodwaters through the land or other surrounding land
 - increase the potential hazard risk to public safety of persons during a flood event
 - aggravate the potential for erosion or siltation or lead to the destruction of vegetation during a flood
 - increase the risk of flooding of other land.

- It is likely detention basins will be necessary to ensure post-development flows match pre-development flows from the Site (subject to further detailed investigation).
 - A SEDMP shall be lodged for approval with local Council, along with the engineering design drawings.
 - Maintenance of drainage crossings will be required, inspection to be undertaken at regular intervals and after storm events.
-

4.4 DECOMMISSIONING

The following measures should be put in place to manage and mitigate impacts during the decommissioning phase:

- Sediment and erosion controls should be maintained. These may include:
 - vehicles should enter and leave the site by a construction access driveway to limit the tracking of mud and/or soil onto roads
 - a guide to the design and operation of a wash area should be outlined in the construction management plan documents
 - all areas disturbed by decommissioning should be promptly stabilised—for example, re-vegetated—so they can no longer act as a sediment source
 - all construction vehicles on-site are to be fitted with a suitable oil/fuel spill kit.
- The potential for contamination from decommissioning and transporting of plant from site is to be reviewed and documented with mitigation measures in place, prior to decommissioning works commencing onsite.
- Stormwater network may require ongoing inspection and maintenance once the site is decommissioned (given the likelihood that the hardstands and access road will remain in place after plant is removed).

5 SUMMARY AND RECOMMENDATIONS

The assessment confirms that the existing site will be impacted by the proposed development. Impacts will be the result of the development of access roads, hardstand zones, plant equipment, buildings and service connections. The following key recommendations are provided:

- Council must review and approve a Soil Erosion and Drainage Management Plan prior to the commencement of any construction.
- Stormwater detention requirements are to be investigated during concept design phase.
- Coastal Protection Board development levels are to be adhered to as outlined in section 1.5 of this report.
- New earth batters (in cut or fill) should be reseeded following construction works. Exposed rock batters do not require revegetation works.
- Work should be temporarily halted if a significant storm is forecast; making sure to secure any loose materials, including construction waste and equipment, or alternatively removing them from the site.
- The washing of vehicles and equipment should be prohibited onsite (other than where an appropriate facility can be provided).
- Erosion and sediment controls should be implemented.
- Development boundaries within the tidal zones may require erosion protection from tidal flow/wave actions.
- It should be ensured that civil works are designed with appropriate consideration of all drainage requirements across the site.

BIBLIOGRAPHY

The following documents were referenced for the preparation of this report:

- 1 Port Adelaide Enfield Council's Development Objectives for 'Hazards' and 'Coastal Areas'.
- 2 Coastal Protection Board's Policy Document – 29 July 2016.
- 3 CMW Geosciences Geotechnical Investigation Report – 7 June 2019.
- 4 Safe Work Australia, March 2015, Excavation Work, Code of Practice.
- 5 Technical data as outlined in Section 3 of this memo.

APPENDIX A

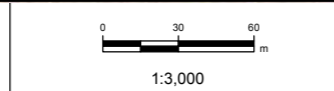
PRELIMINARY SITE PLAN





Map: PS114349_GIS_001_A1

Author: MO



Date: 15/07/2019

Approved by:

Data source: -
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate system: GDA 1994 MGA Zone 54
Scale ratio correct when printed at A3Snapper

PRELIMINARY

WSP

Legend

- Site Features
- Pelican Point Power Station
- Site Boundary

Snapper Point Power Station

Figure 1
Preliminary Site Plan

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APPENDIX B

CMW GEOSCIENCES GEOTECHNICAL
INVESTIGATION REPORT



7 June 2019

**GAS TURBINE PEAKER PROJECT, PELICAN POINT,
SA**

GEOTECHNICAL INVESTIGATION REPORT

Fyfe

ADL2019-0047AB Rev1

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Drawing 1 – Site Investigation Plan

Appendices

Appendix A – BH Logs with DCP results

Appendix B – Site Photographs

Appendix C – CBR Laboratory test results

Appendix D – DCP to CBR Correlation

Appendix E – Environmental Laboratory Test Result

1 INTRODUCTION

CMW Geosciences (East Coast) (CMW) was authorised by Fyfe to carry out a geotechnical investigation for the proposed Gas Turbine Peaker Project.

The proposed site is located north of the existing Pelican Point Power Station, SA. The proposed development involves mobilisation of trailer mounted portable gas turbine power generation units.

The scope of work was detailed in our services proposal letter referenced ADL2019-0047AA Rev0 dated 21 February 2019.

2 SITE DESCRIPTION

The proposed site location is approximately 20 km north of Adelaide at Pelican Point Power Station, SA. The site of the proposed trailer mounted portable gas turbine power generation units is approximately 450m in length and 55m in width. The site appeared to be covered with Semaphore Sand and low height vegetation. Driving was difficult over the site due to swampy and soft ground conditions encountered at the time of site works. The site is relatively flat. Photo 1 presents a photograph showing the site at the time of the field work.



Photo 1 – Gas Turbine Peaker Project site at Pelican Point

3 PROPOSED DEVELOPMENT

This project involves relocation of 9 trailer mounted gas turbine power stations (TM2500) to a location adjacent to the Pelican Point which are currently sitting in Lonsdale and Elizabeth. This facility will include Gas conditioning yard, water treatment plant, fire pumps, 11kV switch room, control building

and an admin building. Associated primary site access and unloading site access also proposed for the development. This plant is proposed to work as an emergency generation plant.

4 FIELD INVESTIGATION

Following a dial before you dig search, and onsite service location, the field investigation was carried out on 24 May 2019. All fieldwork was carried out under the direction of CMW in general accordance with AS1726 (2017), Geotechnical Site Investigations. Due to the soft ground conditions encountered, the middle section of the site was not accessible to our 4WD vehicles at the time of site investigation. The scope of fieldwork completed was as follows:

- Completed a dial before you dig to find out the existing underground services and prepare a SWMS to inform the safe planning and execution of the site investigation;
- Undertake a walkover survey of the site to assess the general landform, site conditions and adjacent structures / infrastructure;
- 4 boreholes denoted BH01, BH02, BH03 And BH08 to depth of up to 3m and 1 borehole denoted BH07 to depth of up to 6m. The boreholes were drilled using push tube and solid auger techniques. Upon completion, boreholes were backfilled with the excavated spoil tamped in place using hand tools. Pocket Penetrometer (PP) tests were carried out on recovered clay samples. Borehole logs are presented in Appendix A;
- Conduct Dynamic Cone Penetrometer (DCP) tests adjacent to all borehole locations and additional 2 DCP tests, to depths of up to 3.0m below ground level or shallower upon refusal;
- Collect a bulk soil sample from BH07 during the investigation for laboratory testing of:
 - 1 x Soaked CBR tests
- Collect disturbed soil samples from BH02, BH03, BH07 and BH08 during the investigation for laboratory testing of:
 - 4 x Concrete Aggressivity tests (pH, Cl, SO₄, EC).

The approximate locations of the respective investigation sites referred to above are shown on the attached Site Plan (Drawing 1). Test locations were measured using hand held GPS to its inherent accuracy (generally +/-5m).

5 LABORATORY TESTING

Laboratory testing was carried out by SMS Geotechnical and ALS, NATA accredited Testing Authorities.

The extent of testing carried out for this project is presented in Table 1. Laboratory test certificates will be presented in a subsequent revision of this report.

Table 1: Laboratory Test Schedule Summary	
Type of Test	Quantity
Soaked CBR Tests – 98% Standard, 4-day soak, 4.5kg Surcharge	1
pH, Cl, SO ₄ and Resistivity Testing	4

6 GROUND MODEL

6.1 Geology

Published geological maps (1:100,000 Adelaide Sheet) indicates that the site is likely to be a Holocene age Saint Kilda formation. The ground consists of coastal marine sediment: calcareous, fossiliferous sand and mud of intertidal sand flats; beaches and tidal marshes; organic, gypseous clay of supratidal flats. Based on previous investigations at this site we would anticipate the following formations to be encountered:

- St Kilda Formation: Grey, shelly and organic sand. Typically in a loose to medium dense state and up to 6- 8m thick;
- Glanville Formation: Characterised by a thin calcrete cap overlying variably cemented, calcareous, shelly sand and sandy clay of stiff consistency. Encountered below a depth of around 8m and typically 2 – 4m thick;
- Hindmarsh Clay: Encountered below a depth of about 10m. Typically comprises clay and sandy clay of high plasticity and very stiff to hard consistency. Some sandier interbeds. Fissured in places.

6.2 Subsurface Conditions

The ground conditions encountered and inferred from the investigation were generally consistent with the published geology for the area and can be generalised according to the following subsurface sequence:

SP: SAND (Semaphore Sand)

Surface layers generally contained fine to medium grained.

Interbedded SANDY CLAY and SAND layers (St Kilda Formation)

SANDY CLAY layers contained soft to firm, of medium plasticity clay and fine to medium grained sand;

SAND layers generally contained fine to medium grained loose to medium dense sand, trace shells and shell fragments, trace organics.

The distribution of these units as observed in our site investigation is summarised in Table2.

Table 2: Summary of Subsurface Conditions					
Description	Depth to base of layer (m)				
	BH01	BH02	BH03	BH07	BH08
Surface layer (Semaphore Sand)	0.4	0.2	0.1	0.9	1.4
Sandy Clay	0.8	0.9	1.0	-	2.1
Sand	>3.0*	>3.0*	>3.0*	>6.0*	>3.0*
Note: “-“ not encountered, * limit of investigation					

6.3 Groundwater

During the investigation, which was completed in May 2019, groundwater was encountered within the investigation depth of 3-6m. Ground water levels observed during the time of investigation at BHs are tabulated in Table 3.

Test ID	Ground water level (mbgl)
BH01	1.1
BH02	1.0
BH03	0.8
BH07	1.8
BH08	1.1

The South Australia Resource Information Gateway (SARIG 2019) database suggests minimum depth to Standing Water Level (SWL) is 2 metres and maximum depth to SWL is 5m below ground level. The result of the investigation was generally consistent with the database information.

Seasonal variations in groundwater must be anticipated. Perched groundwater is possible within the upper granular materials.

6.4 Laboratory Test Results

Laboratory test results are summarised in Table 4 and presented in Appendix C and E.

Test Location	Depth (mbgl)	pH	Cl (ppm)	SO ₄ (ppm)	Res (Ω·m)	MC (%)	OMC (%)	SMDD (t/m ³)	CBR (%)
BH07	0.5 – 0.8	-	-	-	-	15.2	15.0	1.84	9
BH02	0.6 – 0.8	8.4	12,400	2410	1.67	32.2	-	-	-
BH03	0.6 – 0.8	8.3	16,400	2670	1.6	36.8	-	-	-
BH07	0.6 – 0.8	9.0	3290	720	5.26	17.2	-	-	-
BH08	0.6 – 0.8	9.2	3200	440	5.4	10.3	-	-	-
BH01	0.6 – 0.8	8.5	10,200	2560	2.06	28.3	-	-	-

Note: Cl – Chloride, SO₄ – Sulphate, Res – Resistivity, MC = Moisture Content, OMC = Optimum Moisture Content, MMDD = Standard Maximum Dry Density, CBR = California Bearing Ratio.

7 GEOTECHNICAL ASSESSMENT AND RECOMMENDATIONS

7.1 General

At the time of reporting, the foundation loadings and sensitivity of structures and facilities to differential settlement had not been finalised. It is envisaged that site levels will need to be raised to provide site access. It is envisaged that near surface spread footings would be suitable for lightly loaded, settlement tolerant structures. Heavily loaded or settlement sensitive structures would typically be supported on piles or ground improvement.

7.2 Site Preparation

It is recommended that all organic topsoil, non-engineered fill, and softened/disturbed natural materials be stripped from the proposed building and pavement areas. The extent of unsuitable

materials to be removed would need to be assessed during site earthworks. In places, a bridging layer comprising geofabric wrapped rock fill may be required to provide sufficient trafficability for construction plant.

Following stripping, it is recommended that the exposed natural surface be proof-rolled with a vibrating pad foot roller of a least 8 tonne static weight to identify any soft or weak areas which may require remedial works. Such areas would need to be treated with over excavation and replacement with a coarse grained compacted select fill.

Following proof rolling, where ground levels need to be raised using engineered fill, the engineered fill should be spread and compacted in layers not exceeding 250mm in loose thickness to achieve a dry density ratio of at least 95% based on Standard Compaction (AS1289.5.1.1) or a density index of 65% for clean sand (less than 5% fines). The engineered fill should be tested to meet the technical and control requirements outlined in AS3798. A maximum loose layer thickness of around 250mm is envisaged, although this would need to be assessed based on the compaction methodology and materials used.

Trafficability of the subgrade is expected to be poor when wet for rubber-tyre vehicles. This may be improved with the provision of a working platform consisting of coarse granular fill.

7.3 Site Characteristics

7.3.1 Site Classification – AS2870

Based on a combination of visual-tactile assessment and laboratory test results the following instability indexes have been assessed for the material encountered on site:

- The sand layers are assessed as non-reactive; and
- The medium plasticity clay layers above the water table are assessed as moderate reactivity, with an instability index of 2.0% assessed as appropriate.

Based upon the design suction soil profile and recommendations in AS2870-2011 “Residential Slabs and Footings” a characteristic surface movement (y_s) has been assessed for the soil profile encountered in the boreholes at the current surface level. The effect of an adjacent tree on the characteristic surface movement has not been considered. A summary of predicted y_s values is given in 4.

Table 4: Summary of Predicted Characteristic Surface Movements					
	BH01	BH02	BH03	BH04	BH05
Surface movement (y_s) - mm	15	15	20	5	15
Site Classification Class	S	S	S	S	S

A site classification of Class S (slightly reactive) is considered appropriate based on reactive soil movements.

7.3.2 Subsoil Classification

Based on recommendations from AS1170.4-2007, a site subsoil class of D_e (deep or soft soil site) to Section 4.2 of AS1170.4 is recommended for seismic design purposes. The Hindmarsh Clay formation is likely to be present in excess of 70m below surface level.

7.4 Footing Design

7.4.1 Shallow Foundations

Shallow spread footings are assessed as being suitable for the proposed development. The major factors for determining the suitability of shallow foundation systems are the bearing capacity of the soils, the total and differential movements and the flexibility of the structure to accommodate differential movements.

Suitable shallow foundation systems include;

- Conventional spread footings for columns, or walls;
- Grid foundations with columns tied together with ground beams and an integral concrete floor; or
- Stiffened concrete raft with the floor slab cast integrally with a grid of footing beams and the combined slab-beam.

The design of available foundation bearing pressures for strip and pad footings at this site has been carried out using the Meyerhof bearing capacity equation. Subject to completing the earthworks and foundation preparation recommendations provided herein, shallow strip or pad footings founded within either loose to medium dense natural sand or engineered fill may be designed based on the maximum allowable bearing pressures provided in Table 5.

Table 5: Summary of Shallow Footing Design Bearing Pressure			
Embedment Depth (m)	Footing Width (m)	Footing Length (m)	Allowable Bearing Pressure (kPa)
0.6	0.5 strip		150
	2.0	2.0	120
	3.0	3.0	100
1.2	0.5 strip		200
	1.0 strip		150
	2.0	2.0	140
	3.0	3.0	110

These values are based on a geotechnical strength reduction factor of 0.5 and an average load factor of 1.5 (Factor of Safety = 3.0). It should be noted that these bearing pressures assume vertical, non-eccentric loads.

The elastic settlement of spread footings is unlikely to exceed 25 mm at the maximum allowable bearing pressures presented above. Significantly larger movements may occur if the foundation soils are inundated. In addition to elastic settlement, shrink-swell movements must also be taken into consideration.

Differential settlement due to soil variability beneath similarly sized and loaded footings are typically about one half the total settlement predicted above. Where lower bearing pressures are used, the elastic settlements would be expected to be reduced in proportion to the ratio of the applied load and the maximum allowable bearing pressure.

The design of footing systems would also need to consider the settlement caused by the placement of any fill. The placement of 1m of engineered fill is likely to result in elastic settlements ranging from 10 to 20mm depending on the compressibility of the St Kilda Formation. Given the dominance of

relatively clean sands beneath the site, the majority of the settlement associated with filling is expected to occur within a short time after application (i.e. within 1 week). Creep movements may occur in the long-term due to compression and degradation of organic lenses in the St Kilda Formation. Such movements are unlikely to result in sharp differential settlements.

7.5 Pavements and Floor Slabs

7.5.1 Insitu CBR

The correlated insitu CBR values have been assessed based on Dynamic Cone Penetrometer (DCP) testing. This correlation is based on Austroads Guide to Pavement Design (2012) and is applicable to fine grained cohesive soils only. A graphical representation of this correlation is presented in Appendix D.

7.5.2 Design CBR

A design subgrade CBR of 5% is considered suitable for the natural soils. The pavement design may be governed by the properties of imported fill should site levels be raised.

7.6 Durability

It should be noted that the assessment of durability has been based on limited chemical testing.

Insitu resistivity is highly affected by the moisture content of the soil. Where the moisture content of the soil is high, the resistivity is lower. It should be noted that the field testing was conducted in winter.

A reproduction of Table 6.5.2(C) from AS2159-2009 is provided in Table 6.

Exposure Conditions				Exposure classification	
pH	Chlorides Cl		Resistivity Ω -cm	Soil Condition A*	Soil Condition B#
	In soil ppm	In groundwater ppm			
>5	<5,000	<1,000	>5,000	Non-aggressive	Non-aggressive
4 – 5	5,000 – 20,000	1,000 – 10,000	2,000 – 5,000	Mild	Non-aggressive
3 – 4	20,000 – 50,000	10,000 – 20,000	1,000 – 2,000	Moderate	Mild
<3	>50,000	>20,000	<1,000	Severe	Moderate
* Soil conditions A – high permeability soils (e.g., sands and gravels) that are in groundwater					
# Soil conditions B – low permeability soils (e.g. silts and clays) or all soils above groundwater					

Available soil aggressivity test results indicate that the soil pH, sulphate and chloride content were defined as providing a moderate risk to concrete and steel, in accordance with the criteria provided in AS2159.

7.7 Liquefaction

Historical liquefaction assessments carried out for the Pelican Point Power Station by others with a similar soil profile (i.e. saturated St Kilda Formation sands) suggest a high risk of liquefaction exists if the peak ground acceleration exceeds about 0.15g. This acceleration corresponds to an earthquake return period of between 1,000 to 1,500 years.

Should the risk of liquefaction be considered intolerable either insitu ground improvement (dynamic compaction, stone columns, vibroflotation or a structural solution (i.e. deep foundations) could be considered.

Further analyses and site investigation would be required to assess the site-specific liquefaction potential and the likely ground surface settlements.

7.8 Construction Issues

7.8.1 Excavatability

The assessment of likely excavation characteristics has been based mainly on the observation of drilling resistance experienced by push tube drilling and the recovered soil samples.

Soil strength materials were encountered at the tested locations and are assessed to be excavatable using conventional earthmoving equipment such as backhoes, excavators and scrapers. Suitable dewatering mechanisms will be required for any excavations below the ground water level.

7.8.2 Batter Slopes

Excavations will typically encounter sandy soils in a loose condition. These materials are unlikely to stand vertically even for short periods. It is recommended to use temporary cut batter slopes of 1V:2H, or flatter, with exposed batter slopes to be protected from scour and erosion. Excavations below the water table would likely require dewatering and temporary shoring / sheet pile wall.

7.8.3 Trafficability

Trafficability of the loose to medium dense sand is expected to be very poor when saturated.

7.8.4 Water Management

Care should be taken during construction to prevent water from ponding in the base of any footing excavation. The ponding of water could result in softening of the foundation soils and additional post construction settlement and/or heave. It would be desirable to place proper dewatering systems to lower the ground water table at footing excavations during construction.

7.8.5 Footing Observations

It is recommended that the base of all footing excavations be observed by a suitably experienced engineer to check that the conditions exposed are consistent with the design assumptions. Footings must not be founded in non-engineered fill, organic topsoil or softened natural soils.

8 CLOSURE

The findings contained within this report are the result of limited discrete investigations conducted in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, can it be considered that these findings represent the actual state of the ground conditions away from our investigation locations.

If the ground conditions encountered during construction are significantly different from those described in this report and on which the conclusions and recommendations were based, then we must be notified immediately.

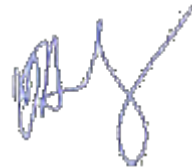
This report has been prepared for use by Fyfe in relation to the Gas Turbine Peaker Project, Pelican Point, SA in accordance with generally accepted consulting practice. No other warranty, expressed or implied, is made as to the professional advice included in this report. Use of this report by parties

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**For and on behalf of
CMW Geosciences (East Coast)**



Chamal Randeniya
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Distribution: 1 copy to Fyfe (electronic)
Original held by CMW Geosciences (East Coast)

Drawings

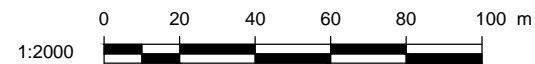


LEGEND:

-  **BH01** BOREHOLE LOCATION
-  **DCP01** DCP TEST LOCATION

NOTES:

1. IMAGE FROM NEARMAP 19.04.19



CLIENT:	FYFE	DRAWN:	DE	PROJECT:	ADL2019-0047
PROJECT:	GAS TURBINE PEAKER PROJECT PELICAN POINT, SA	CHECKED:	DA	DRAWING:	01
TITLE:	SITE INVESTIGATION PLAN	REVISION:	A	SCALE:	1:2000
		DATE:	28.05.19	SHEET:	A3 L

Appendix A

Borehole Logs

Explanatory Notes – Soil Description

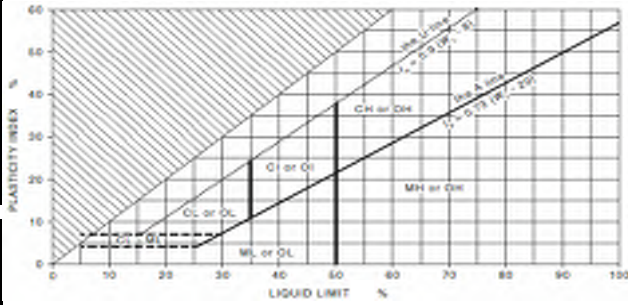


	GRAVEL		Gravelly SAND		Sandy CLAY		FILL
	SILTY GRAVEL		SILTY SAND		SILT		TOPSOIL
	CLAYEY GRAVEL		CLAYEY SAND		Gravelly SILT		COBBLES & BOULDERS
	Sandy GRAVEL		CLAY		Sandy SILT		CONCRETE
	SAND		Gravelly CLAY		PEAT		NO CORE

GP	Poorly Graded Gravel	ML	Low Plasticity Silt
GW	Well Graded Gravel	MH	High Plasticity Silt
GM	Silty Gravel	CL	Low Plasticity Clay
GC	Clayey Gravel	CI	Medium Plasticity Clay
SP	Poorly Graded Sand	CH	High Plasticity Clay
SW	Well Graded Sand	OL	Organic Soils (LP)
SM	Silty Sand	OH	Organic Soils (HP)
SC	Clayey Sand	PT	Peat
	Fill		Cobbles & Boulders

Soil colours based on BGS Internal report IR/05/123 "A Revised scheme for coding unutilised deposits", 2006.

WATER	
	Groundwater (Strike)
	Groundwater (rise)



CLASSIFICATION AND INFERRED STRATIGRAPHY

Particle Size		
Major Division	Sub Division	Particle Size
Boulders		> 200 mm
Cobbles		63 to 200 mm
Gravel	Coarse	19 to 63 mm
	Medium	6.7 to 19 mm
	Fine	2.36 to 6.7 mm
Sand	Coarse	0.6 to 2.36 mm
	Medium	0.21 to 0.6 mm
	Fine	0.075 to 0.21 mm
Silt		0.002 to 0.075 mm
Clay		< 0.002 mm

SECONDARY/MINOR COMPONENTS	
TERMS FOR SANDS/GRAVELS (Less than 35% Particles < 0.075mm)	TERMS FOR CLAYS/SILTS (More than 35% Particles < 0.075mm)
trace... sand/gravel = <15% clay/silt = <5%	trace... sand/gravel = <15%
with... sand/gravel = >15%, <30% clay/silt = >5%, <12%	with... sand/gravel = >15%, <30%
Sandy... / Gravelly... >30%	Sandy... / Gravelly... >30%
Clayey... / Silty ... >12%	

MOISTURE CONDITION (Cohesionless Soils)

Symbol	Term	Description
D	Dry	Looks and feels dry. Cohesionless and free-running.
M	Moist	No free water on remoulding. Soil feels cool, darkened in colour. Soil tends to cohere.
W	Wet	Free water on remoulding. Soil feels cool, darkened in colour. Soil tends to cohere.

MOISTURE CONDITION (Cohesive Soils)

Symbol	Term	Description
<PL	Dry	Looks and feels dry. Hard and friable or powdery, well dry of the plastic limit
=PL	Moist	Soil feels cool, darkened in colour. Soil can be moulded. Near plastic limit.
>PL	Wet	Soils feels cool, darkened in colour. Usually weakened and free water forms when remoulding. Wet of plastic limit.

DENSITY (Cohesionless Soils)

Sym.	Term	Density Index (%)	SPT 'N'
VL	Very Loose	Less than 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Dense	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

STIFFNESS (Cohesive Soils)

Sym.	Term	Undrained Shear Strength
VS	Very Soft	0 to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa

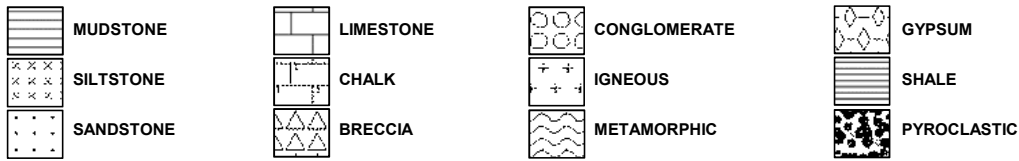
SAMPLING AND LABORATORY / INSITU TESTING RESULTS

B	Bulk Disturbed Sample	U	Undisturbed Push-in Sample	CBR	California Bearing Ratio
BLK	Block Sample	W	Water Sample	UCS	Unconfined Compressive Strength
C	Core Sample	LL	Liquid Limit	PLI	Point Load Index
ES	Environmental Soil Sample	PI	Plasticity Index	N	SPT-N Value
P	Piston Sample	LS	Linear Shrinkage		

DRILLING/EXCAVATION METHOD

AC	Air Core	HA	Hand Auger	RC	Rotary Cored
ADH	Hollow Auger Drilling	HQ	Rotary Core 63.5mm	RO	Rotary Open Hole
AD/V	Auger with V-Bit	HQ3	Rotary Core 61.1mm	SPT	Standard Penetration Test
AD/T	Auger with TC-Bit	PQ3	Rotary Drill 83mm	TP	Test Pit
DPP	Direct Push Probe	PT	Push Tube	W	Wash Bore

Explanatory Notes – Rock Description



ROCK MATERIAL STRENGTH				
Symbol	Term	Uniaxial Compressive Strength - UCS (MPa)	Point Load Index - $I_{s(50)}$ (MPa) - GUIDE ONLY	Field Guide
EL	Extremely Low	Less than 0.6	Less than 0.03	Easily remoulded by hand to a material with soil properties (logged as soil).
VL	Very Low	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 3 cm thick can be broken by finger pressure.
L	Low	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150 mm long 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	6 to 20	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	20 to 60	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
VH	Very High	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	More than 200	More than 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

WEATHERING CLASSIFICATION		
Symbol	Term	Definition
RS	Residual Soil	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
XW	Extremely weathered rock	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
HW (or DW)	Highly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
MW (or DW)	Moderately Weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.
SW	Slightly weathered rock	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
FR	Fresh rock	Rock shows no sign of decomposition or staining.

CEMENTATION CLASSIFICATION		
Symbol	Term	Definition
Uc	Uncemented	Clean grains, exhibiting soil properties.
VWc	Very weakly cemented	Marginal soil-rock strengths, collapsing feel under light finger pressure, cement seen on some washed grains.
Wc	Weakly Cemented	Collapsing feel under light soil pressure, breaks down to individual grains or with some grains cemented together, cement seen on many washed grains.
MWk	Moderately Weakly Cemented	Cement on nearly all grains, breaks down to lumps and some individual grains under finger pressure, can crush to individual grains under knife blade.
Mo	Moderately Cemented	Cement on most grains, can break fragments off by hand and crush to small lumps under knife blade.
We	Well Cemented	Practically all grains cemented together, cannot break fragments off by hand, dull sound under hammer.
VWe	Very Well Cemented	Most Primary Pores filled with cement, requires firm blow with hammer to break off fragments, rings when struck

ROCK CORE RECOVERY		
Symbol	Term	Definition
TCR	Total Core Recovery (%)	The ratio of total length of core recovered to length of core run drilled, expressed as a percentage.
SCR	Solid Core Recovery (%)	The ratio of the total length of solid cylindrical pieces of core recovered to length of core run drilled, expressed as a percentage.
RQD	Rock Quality Designation (%)	The ratio of the total length of solid cylindrical pieces of core over 100mm in length recovered to length of core run drilled, expressed as a percentage.

Explanatory Notes – Defect Description



Defect Type			
ABBREVIATION	TERM	DEFINITION	DIAGRAM
PT	Parting	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
JT	Joint	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed.	
SS	Sheared Surface	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.	
SZ	Sheared Zone	Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.	
CS	Crushed Zone / Seam	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.	
SM	Seam	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1 mm thick may be described as a veneer or coating on a joint surface.	

Surface Roughness		
ABBREVIATION	TERM	Description
VR	Very Rough	Many large irregularities generally > 1 mm
RO	Rough	Many small irregularities generally > 1 mm
SM	Smooth	Few or no surface irregularities
PO	Polished	Shiny smooth surface
SI	Slickensided/Striated	Grooved/striated surface, usually polished

Surface Shape		
ABBREVIATION	TERM	Description
PL	Planar	Does not vary in orientation
CU	Curved	gradual change in orientation
UN	Undulating	wavy surface
ST	Stepped	one or more well defined steps
IR	Irregular	many sharp changes in orientation

Coatings		
ABBREVIATION	TERM	Description
CN	Clean	No visible coating
SN	Stained	No coating but surface discoloured
VN	Veneer	visible coating too thin to measure
CT	Coating	visible coating up to 1mm thick
IF	Infilled	Over 1mm thick of soil present

Orientation	
ABBREVIATION	TERM
SH	Sub Vertical
SV	Sub Horizontal
10°	Angle from horizontal

Aperture	
ABBREVIATION	TERM
DIS	Discontinuous
CL	Closed
5mm	Measured width between joint surfaces

Block Shape	
Term	Description
Blocky	Roughly equidimensional blocks.
Tabular	thickness of blocks much less than length or width.
Columnar	lengths much greater than other dimensions
Irregular	Irregular discontinuities without arrangement into distinct sets,

BOREHOLE LOG - BH1

Client: FYFE
 Project: Gas Turbine Peaker Project
 Location: Pelican Point, SA
 Project ID: ADL2019-0047
 Date: 24/05/2019



1:15 Sheet 1 of 1

Logged by: JSC Position: E.272173m N.6150167m Plant used: Portable
 Checked by: DBA Elevation: Angle from horizontal: 90° Contractor: JR Soil Sampling

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)			Structure & other observations
		Depth	Type & Results							5	10	15	
		0.0-0.1	ES			SP	SP: SAND: fine to medium grained, yellow brown.	D to M	L	3			0.00-0.40m: Semaphore Sand
		0.5-0.6	ES			CI	CI: SANDY CLAY: medium plasticity, yellow grey, fine to medium grained, hydrogen sulphide odour	≈PL	F	5			0.40-3.00m: St Kilda Formation
		1.0-1.1	ES		1	SP	SP: SAND: fine to medium grained, grey brown.			4			
		2.0-2.1	ES		2	SP		W	L to MD	4			
					3	SP				4			

Borehole terminated at 3.0 m

Termination Reason: Target depth reached

Remarks:

This report must be read in conjunction with accompanying notes and abbreviations.

BOREHOLE LOG - BH3

Client: FYFE
 Project: Gas Turbine Peaker Project
 Location: Pelican Point, SA
 Project ID: ADL2019-0047
 Date: 24/05/2019



1:15 Sheet 1 of 1

Logged by: JSC Position: E.272037m N.6150204m Plant used: Portable
 Checked by: DBA Elevation: Angle from horizontal: 90° Contractor: JR Soil Sampling

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)			Structure & other observations
		Depth	Type & Results							5	10	15	
		0.0-0.1	ES				SP: SAND: fine to medium grained, yellow brown.	D	L to MD	3			0.00-0.10m: Semaphore Sand 0.10-3.00m: St Kilda Formation
							CH: SANDY CLAY: high plasticity, yellow-grey, fine to medium grained sand	<PL	F	3			
										3			
		0.5-0.6	ES							4			
		0.6-0.8	B							3			
							4						
							4						
							4						
							4						
		1.0-1.1	ES		1		SP: SAND: fine to medium grained, grey brown, trace organics			4			
										4			
										4			
										3			
										3			
										5			
										4			
										4			
										4			
										4			
										4			
		2.0-2.1	ES		2			W	L to MD	5			
										3			
										3			
										3			
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										4			
										4			
										3			
										4			
										4			
					3								

Termination Reason: Target depth reached
 Remarks:
 Borehole terminated at 3.0 m
 This report must be read in conjunction with accompanying notes and abbreviations.

BOREHOLE LOG - BH7

Client: FYFE
 Project: Gas Turbine Peaker Project
 Location: Pelican Point, SA
 Project ID: ADL2019-0047
 Date: 24/05/2019



1:15 Sheet 1 of 2

Logged by: JSC Position: E.271799m N.6150285m Plant used: Rockmaster
 Checked by: DBA Elevation: Angle from horizontal: 90° Contractor: JR Soil Sampling

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)			Structure & other observations
		Depth	Type & Results							5	10	15	
		0.0-0.1	ES				SP: SAND: fine to medium grained, yellow, trace organics.	L	4	5	10	15	0.00-0.90m: Semaphore Sand
		0.5-0.6	ES				3						
		0.5-0.8	CBR				4						
		0.6-0.8	B					D	5	10	15		
		1.0-1.1	ES			3							
		1.0-1.1	ES		1		SP: SAND: fine to medium grained, grey, with organics, hydrogen sulfide odour.	D to M	4	5	10	15	0.90-6.00m: St Kilda Formation
		1.0-1.1	ES				3						
		1.0-1.1	ES				3						
		2.0-2.1	ES		2				4	5	10	15	
		2.0-2.1	ES			3							
		2.0-2.1	ES						4	5	10	15	
		2.0-2.1	ES			3							
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		2.0-2.1	ES						4	5	10	15	
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		2.0-2.1	ES						4	5	10	15	
		2.0-2.1	ES			3							
		2.0-2.1	ES						4				

BOREHOLE LOG - BH7

Client: FYFE
 Project: Gas Turbine Peaker Project
 Location: Pelican Point, SA
 Project ID: ADL2019-0047
 Date: 24/05/2019



1:15 Sheet 2 of 2

Logged by: JSC Position: E.271799m N.6150285m Plant used: Rockmaster
 Checked by: DBA Elevation: Angle from horizontal: 90° Contractor: JR Soil Sampling

Well	Groundwater	Samples & In situ Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)			Structure & other observations
		Depth	Type & Results							5	10	15	
		4.0-4.1	ES		4		SP: SAND: fine to medium grained, grey, trace shells and shell fragments	W	L to MD				
		5.0-5.1	ES		5								
					6								

Borehole terminated at 6.0 m

Termination Reason: Target depth reached
 Remarks:

This report must be read in conjunction with accompanying notes and abbreviations.

BOREHOLE LOG - BH8

Client: FYFE
 Project: Gas Turbine Peaker Project
 Location: Pelican Point, SA
 Project ID: ADL2019-0047
 Date: 24/05/2019



1:15 Sheet 1 of 1

Logged by: JSC Position: E.271722m N.6150310m Plant used: Rockmaster
 Checked by: DBA Elevation: Angle from horizontal: 90° Contractor: JR Soil Sampling

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)			Structure & other observations	
		Depth	Type & Results							5	10	15		
		0.0-0.1	ES				SP: SAND: fine grained, yellow.			5			0.00-1.40m: Semaphore Sand	
										4				
										4				
										5				
										4				
		0.5-0.6	ES						M					
		0.6-0.8	B							2				
										2				
									L					
										3				
		1.0-1.1	ES		1				2					
	▼								2					
									3					
								W						
									3					
									3					
									3					
									4					
							CI: SANDY CLAY: medium plasticity, yellow, fine to medium grained sand						1.40-3.00m: St Kilda Formation	
									3					
									4					
									4					
									5					
								>PL		S to F				
		1.90	PP=50.0kPa						4					
		2.0-2.1	ES		2				4					
									3					
							SP: SAND: fine to medium grained, grey, trace shells and shell fragments							
									3					
									4					
									3					
							SP: SAND: fine to medium grained, grey.							
								W		L to MD				
									3					
									4					
									4					
									3					
									3					
									4					
					3									

Borehole terminated at 3.0 m

Termination Reason: Target depth reached

Remarks:

This report must be read in conjunction with accompanying notes and abbreviations.

BOREHOLE LOG - DCP4

Client: FYFE
 Project: Gas Turbine Peaker Project
 Location: Pelican Point, SA
 Project ID: ADL2019-0047
 Date: 24/05/2019



1:15

Sheet 1 of 1

Checked by: DBA Position: E.272146m N.6150173m
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Dynamic Cone Penetrometer (Blows/100mm)			Structure & other observations
		Depth	Type & Results							5	10	15	
					0								
					0.1								
					0.2								
					0.3								
					0.4								
					0.5								
					0.6								
					0.7								
					0.8								
					0.9								
					1.0								
					1.1								
					1.2								
					1.3								
					1.4								
					1.5								
					1.6								
					1.7								
					1.8								
					1.9								
					2.0								
					2.1								
					2.2								
					2.3								
					2.4								
					2.5								
					2.6								
					2.7								
					2.8								
					2.9								
					3.0								

Termination Reason: Target depth reached

Remarks:

This report must be read in conjunction with accompanying notes and abbreviations.

Appendix B

Site Photograph

SITE PHOTOGRAPHS

Client: Fyfe
Project: Gas Turbine Peaker Project
Location: Pelican Point, SA
Project ID: ADL2019-0047
Date: 24/05/2019



Taken by: CR

Page 1 of 3

Checked by:



Photo 1: Site View from xxxxxxx



Photo 2: Site View from xxxxxxx

This report must be read in conjunction with accompanying notes and abbreviations.

SITE PHOTOGRAPHS

Client: Fyfe
Project: Gas Turbine Peaker Project
Location: Pelican Point, SA
Project ID: ADL2019-0047
Date: 24/05/2019



Taken by: CR			Page 2 of 3
Checked by:			



Photo 3: Access Road **xxxx**



Photo 4: Road section with soft ground condition

This report must be read in conjunction with accompanying notes and abbreviations.

SITE PHOTOGRAPHS

Client: Fyfe
Project: Gas Turbine Peaker Project
Location: Pelican Point, SA
Project ID: ADL2019-0047
Date: 24/05/2019



Taken by: CR			Page 3 of 3
Checked by:			



Photo 5: BH03 Core



Photo 5: BH07 Core

Appendix C

CBR Laboratory Test Results

California Bearing Ratio Test Report

Client: CMW Geosciences
 1284 South Road, Clovelly Park SA 5042

Project No: SMS1.19010

Project: Geotechnical Testing

Location: Submitted Samples - ADL2019-0047

Accredited for compliance with ISO/IEC 17025-Testing




NATA Accredited Laboratory
 Number: 19225

Approved Signatory: Damien Mashford
 (Director)
 Date of Issue: 6/06/2019

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

Sample Details

Sample ID: 1-1902730

Sample Location: Pelican Point Power Station
 BH07

Depth: 0.5m - 0.8m

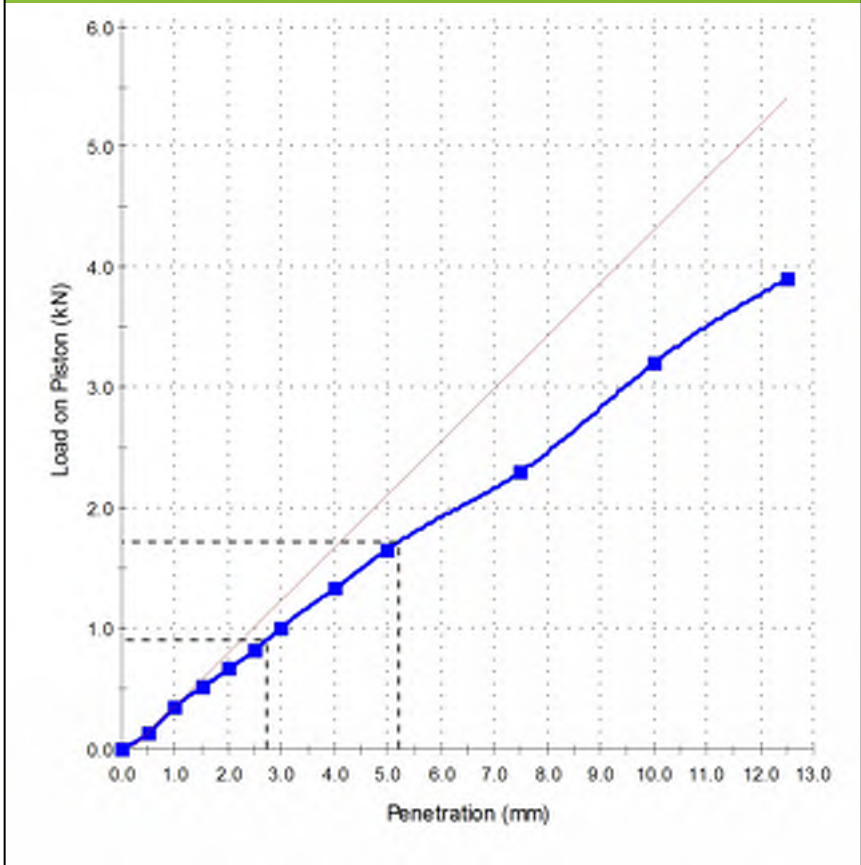
Material: Gravelly Sandy CLAY

Material Description: brown

Sampling Method: Submitted by client

Date Tested: 30/05/2019

Load vs Penetration



Test Results

AS 1289.6.1.1

CBR at 5.0mm (%): **9**

Dry Density before Soaking (t/m^3): 1.80
 Density Ratio before Soaking (%): 97.5
 Moisture Content before Soaking (%): 15.2
 Moisture Ratio before Soaking (%): 101.5
 Dry Density after Soaking (t/m^3): 1.79
 Density Ratio after Soaking (%): 97.5
 Swell (%): 0.0
 Moisture Content of Top 30mm (%): 15.9
 Compaction Hammer Used: Standard
 AS 1289.5.1.1

MDD (t/m^3): 1.84
 OMC (%): 15.0
 Surcharge Mass (kg): 4.50
 Period of Soaking (Days): 4
 Retained on 19 mm Sieve (%): 0
 CBR Moisture Content Method: AS 1289.2.1.1
 Sample Curing Time (h): 72
 Plasticity Determination Method: Visual/Tactile

Comments

Appendix D

DCP to CBR Correlation

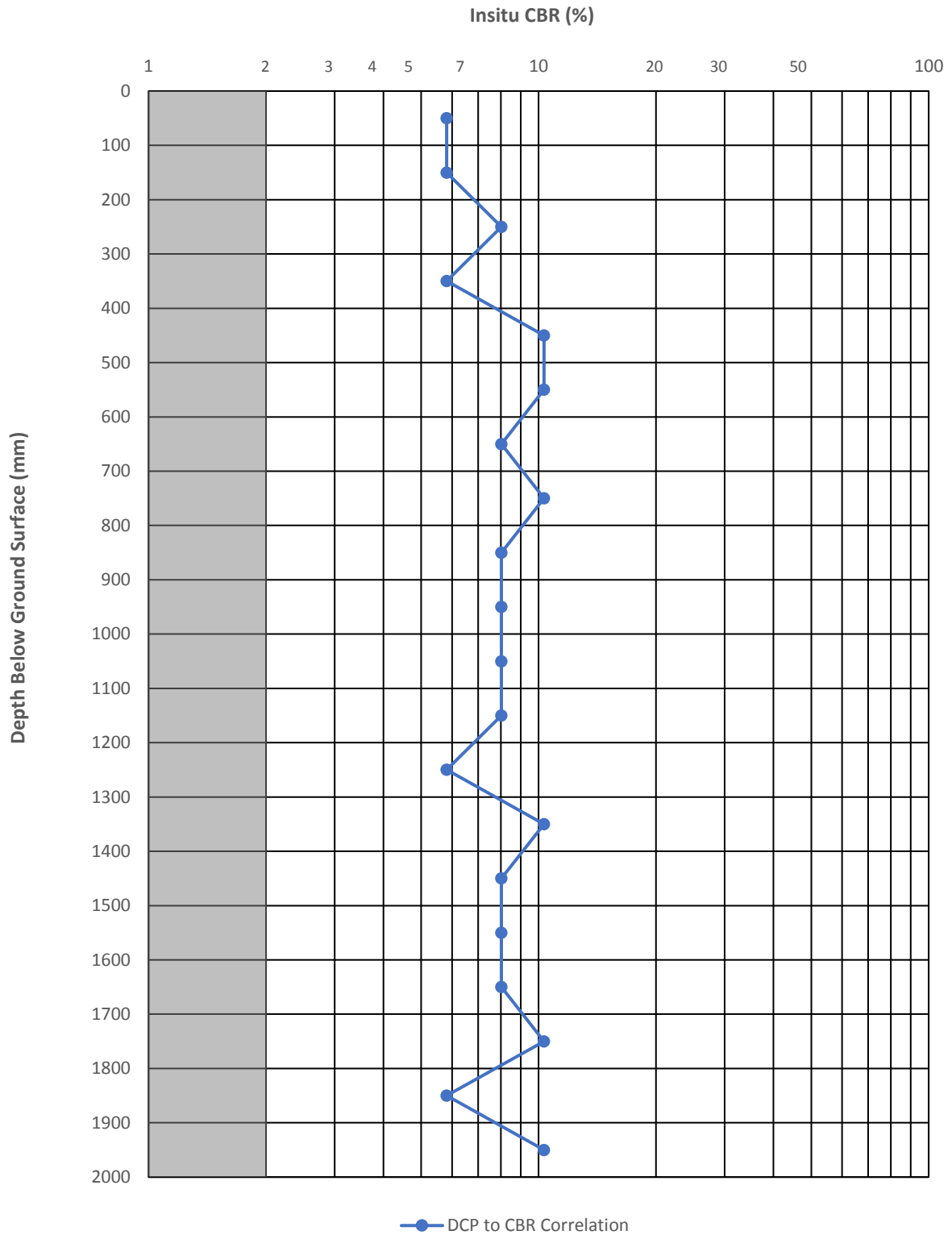


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	BH01 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

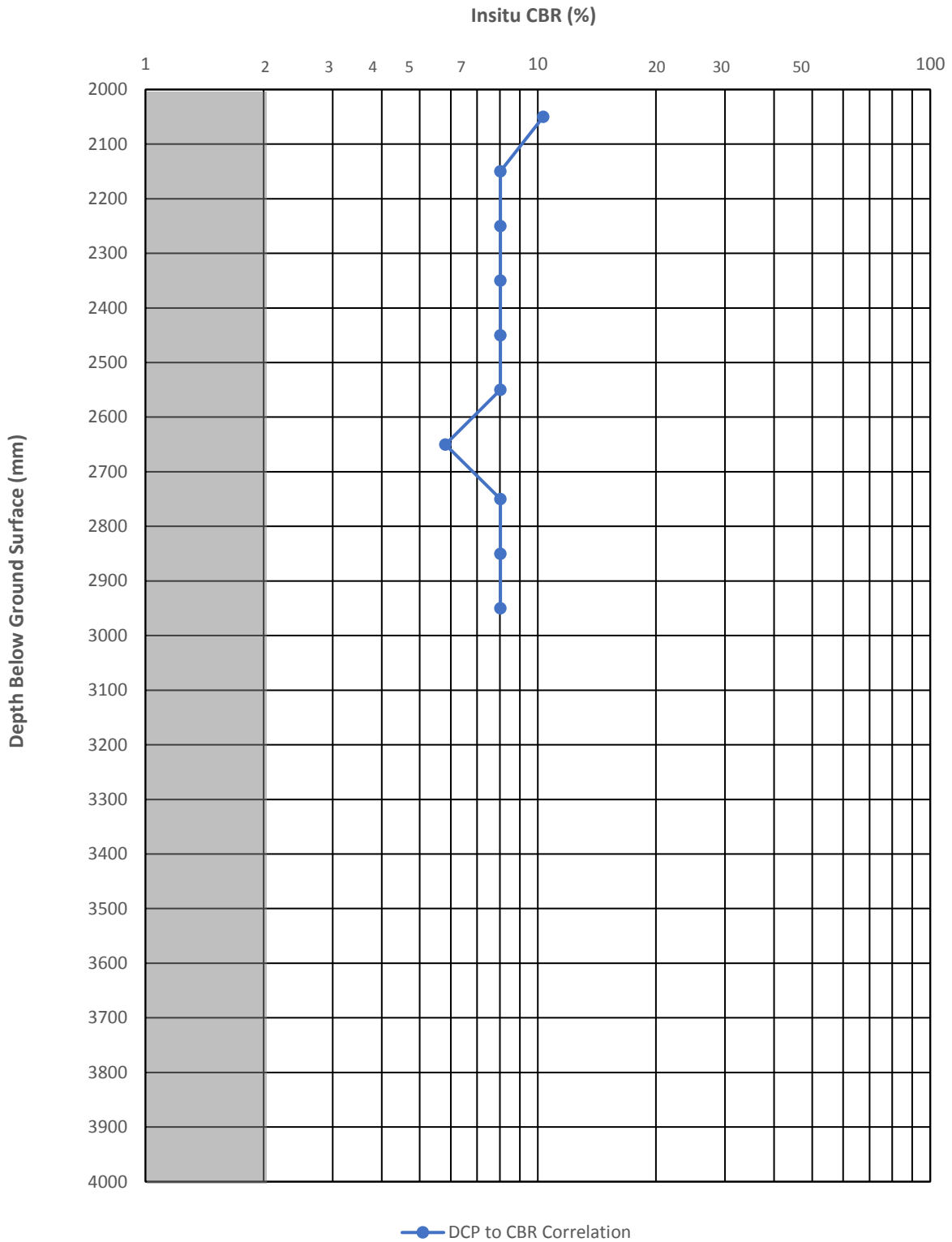
Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	3	33.33	5.8
100 - 200	3	33.33	5.8
200 - 300	4	25.00	8.0
300 - 400	3	33.33	5.8
400 - 500	5	20.00	10.3
500 - 600	5	20.00	10.3
600 - 700	4	25.00	8.0
700 - 800	5	20.00	10.3
800 - 900	4	25.00	8.0
900 - 1000	4	25.00	8.0
1000 - 1100	4	25.00	8.0
1100 - 1200	4	25.00	8.0
1200 - 1300	3	33.33	5.8
1300 - 1400	5	20.00	10.3
1400 - 1500	4	25.00	8.0
1500 - 1600	4	25.00	8.0
1600 - 1700	4	25.00	8.0
1700 - 1800	5	20.00	10.3
1800 - 1900	3	33.33	5.8
1900 - 2000	5	20.00	10.3

Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH01 (0 - 2000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH01 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

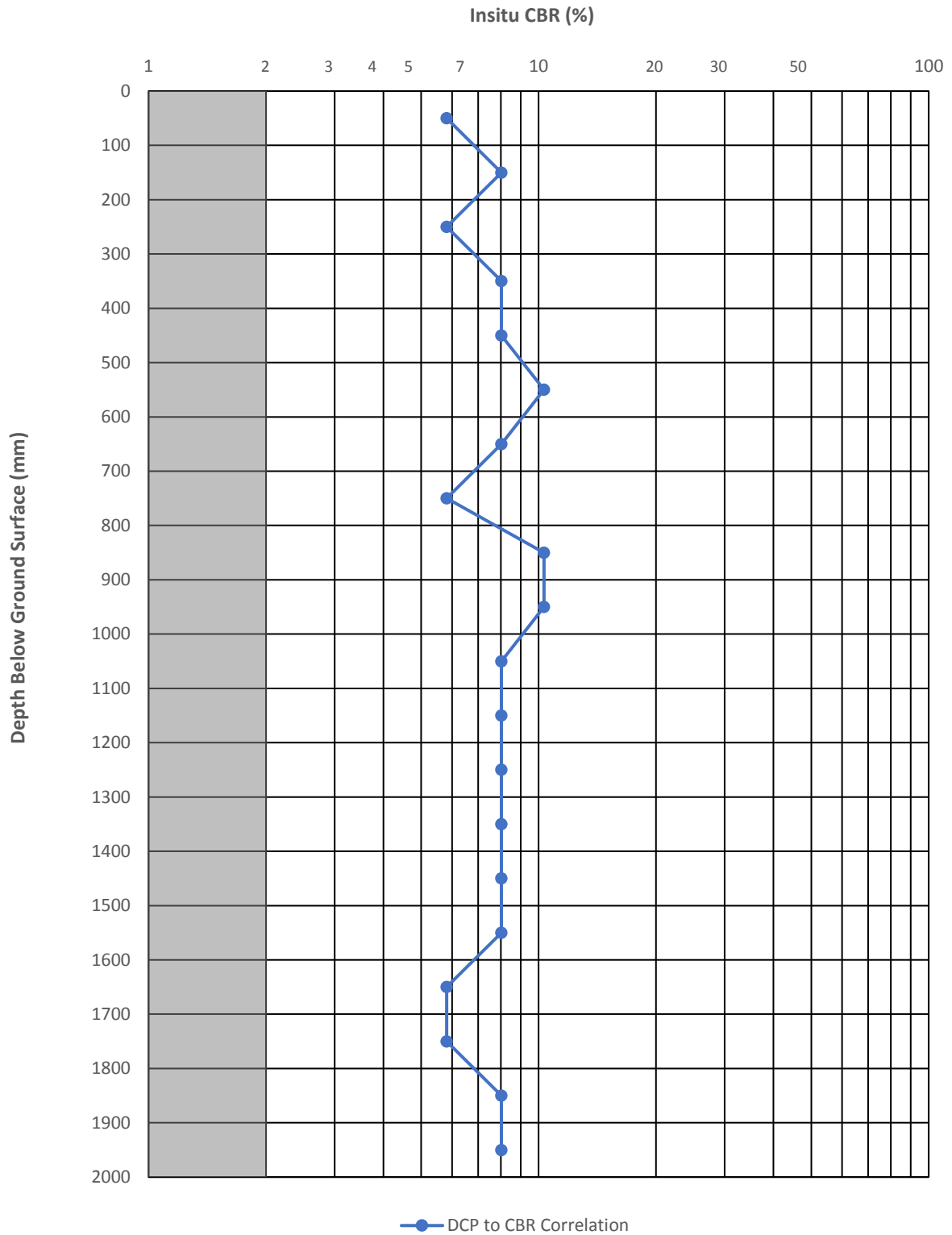


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	BH02 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

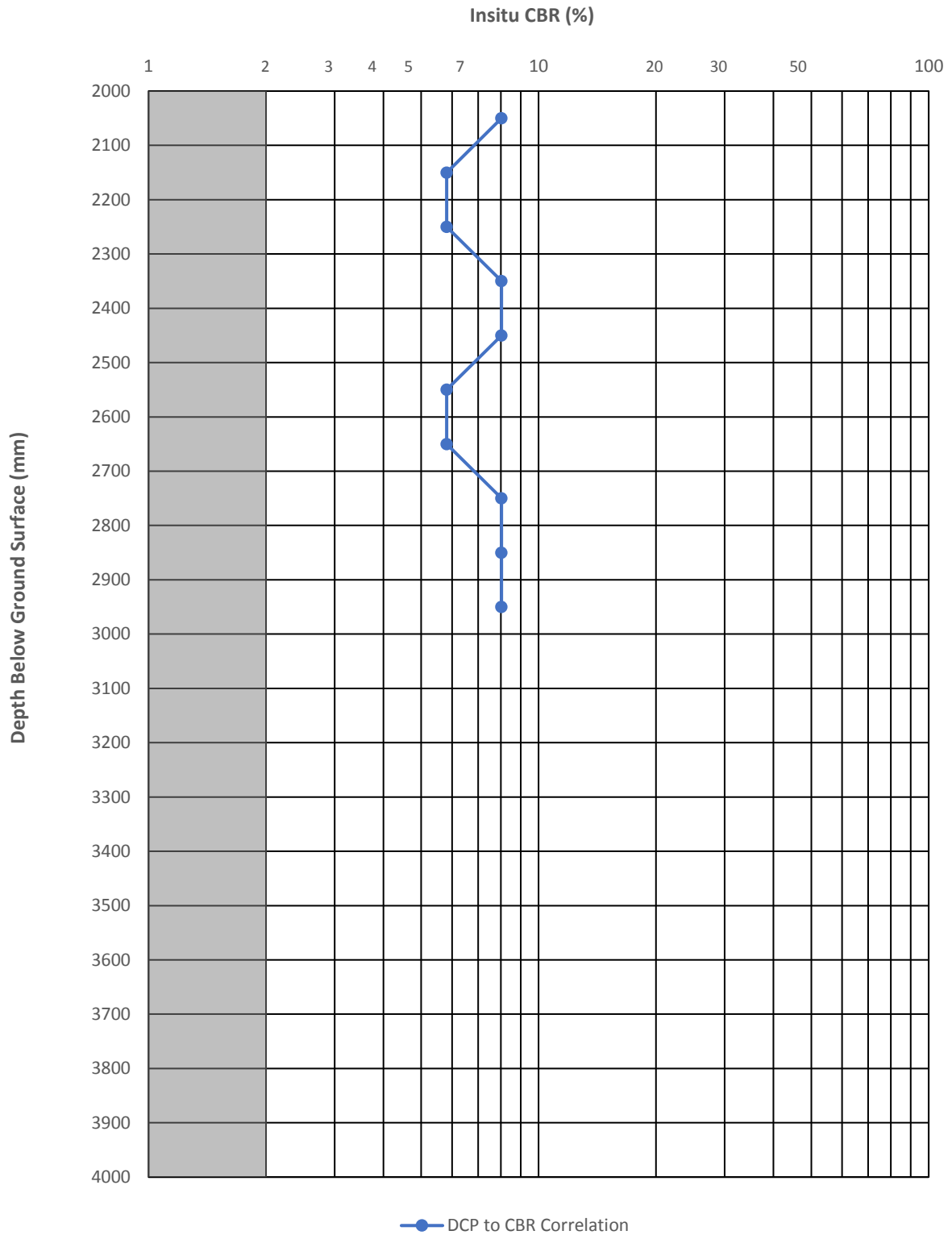
Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	3	33.33	5.8
100 - 200	4	25.00	8.0
200 - 300	3	33.33	5.8
300 - 400	4	25.00	8.0
400 - 500	4	25.00	8.0
500 - 600	5	20.00	10.3
600 - 700	4	25.00	8.0
700 - 800	3	33.33	5.8
800 - 900	5	20.00	10.3
900 - 1000	5	20.00	10.3
1000 - 1100	4	25.00	8.0
1100 - 1200	4	25.00	8.0
1200 - 1300	4	25.00	8.0
1300 - 1400	4	25.00	8.0
1400 - 1500	4	25.00	8.0
1500 - 1600	4	25.00	8.0
1600 - 1700	3	33.33	5.8
1700 - 1800	3	33.33	5.8
1800 - 1900	4	25.00	8.0
1900 - 2000	4	25.00	8.0

Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH02 (0 - 2000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH02 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

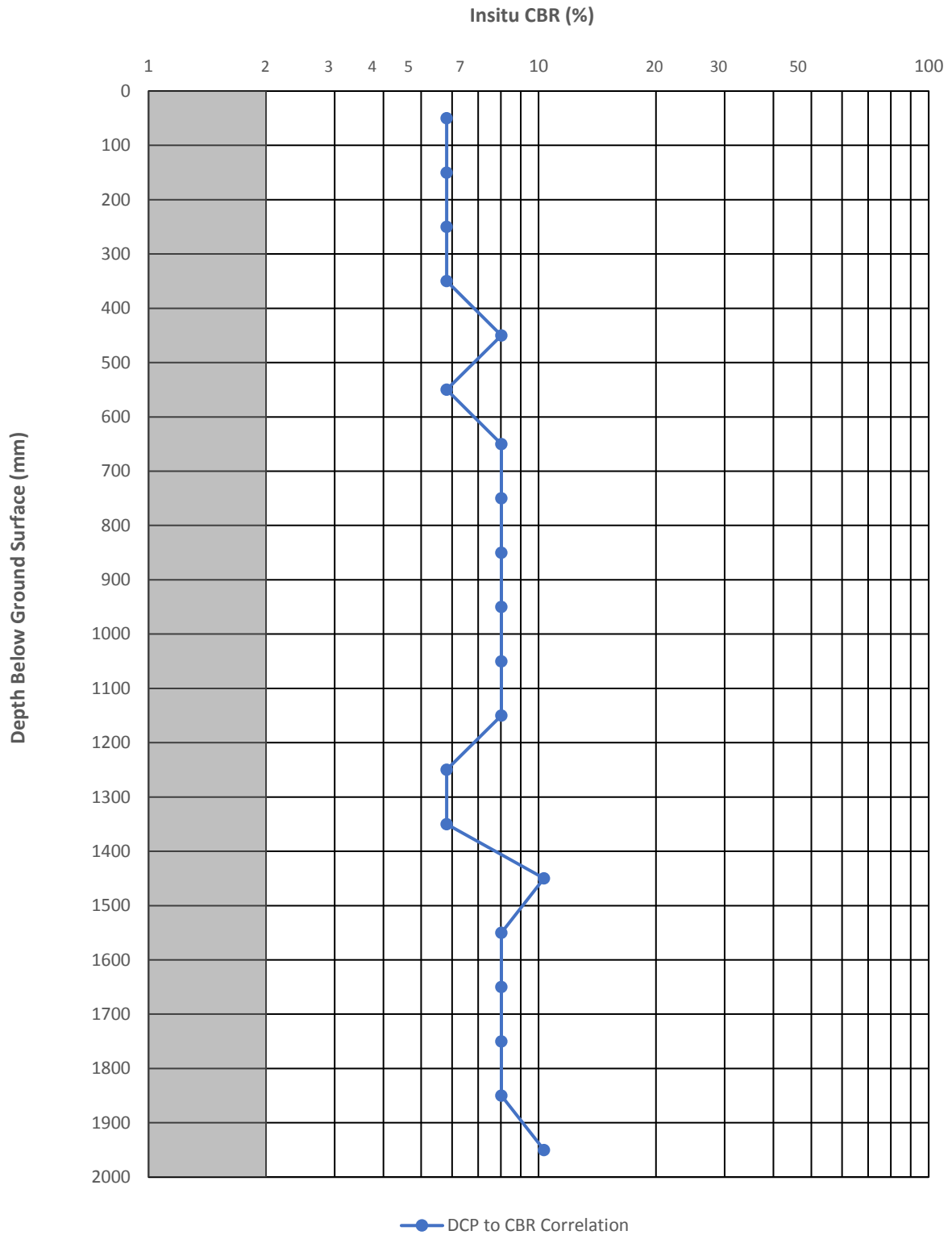


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	BH03 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

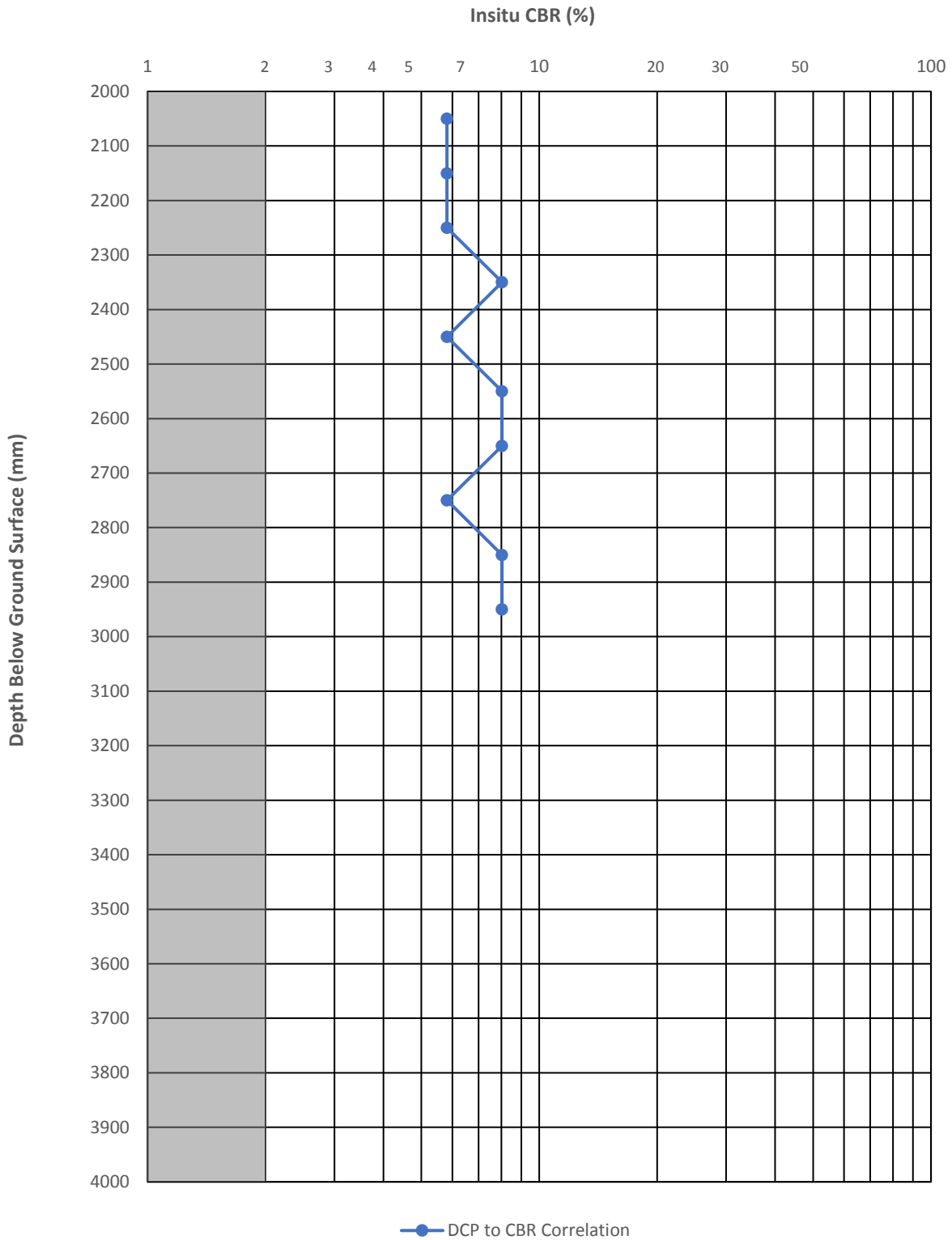
Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	3	33.33	5.8
100 - 200	3	33.33	5.8
200 - 300	3	33.33	5.8
300 - 400	3	33.33	5.8
400 - 500	4	25.00	8.0
500 - 600	3	33.33	5.8
600 - 700	4	25.00	8.0
700 - 800	4	25.00	8.0
800 - 900	4	25.00	8.0
900 - 1000	4	25.00	8.0
1000 - 1100	4	25.00	8.0
1100 - 1200	4	25.00	8.0
1200 - 1300	3	33.33	5.8
1300 - 1400	3	33.33	5.8
1400 - 1500	5	20.00	10.3
1500 - 1600	4	25.00	8.0
1600 - 1700	4	25.00	8.0
1700 - 1800	4	25.00	8.0
1800 - 1900	4	25.00	8.0
1900 - 2000	5	20.00	10.3

Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH03 (0 - 2000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH03 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

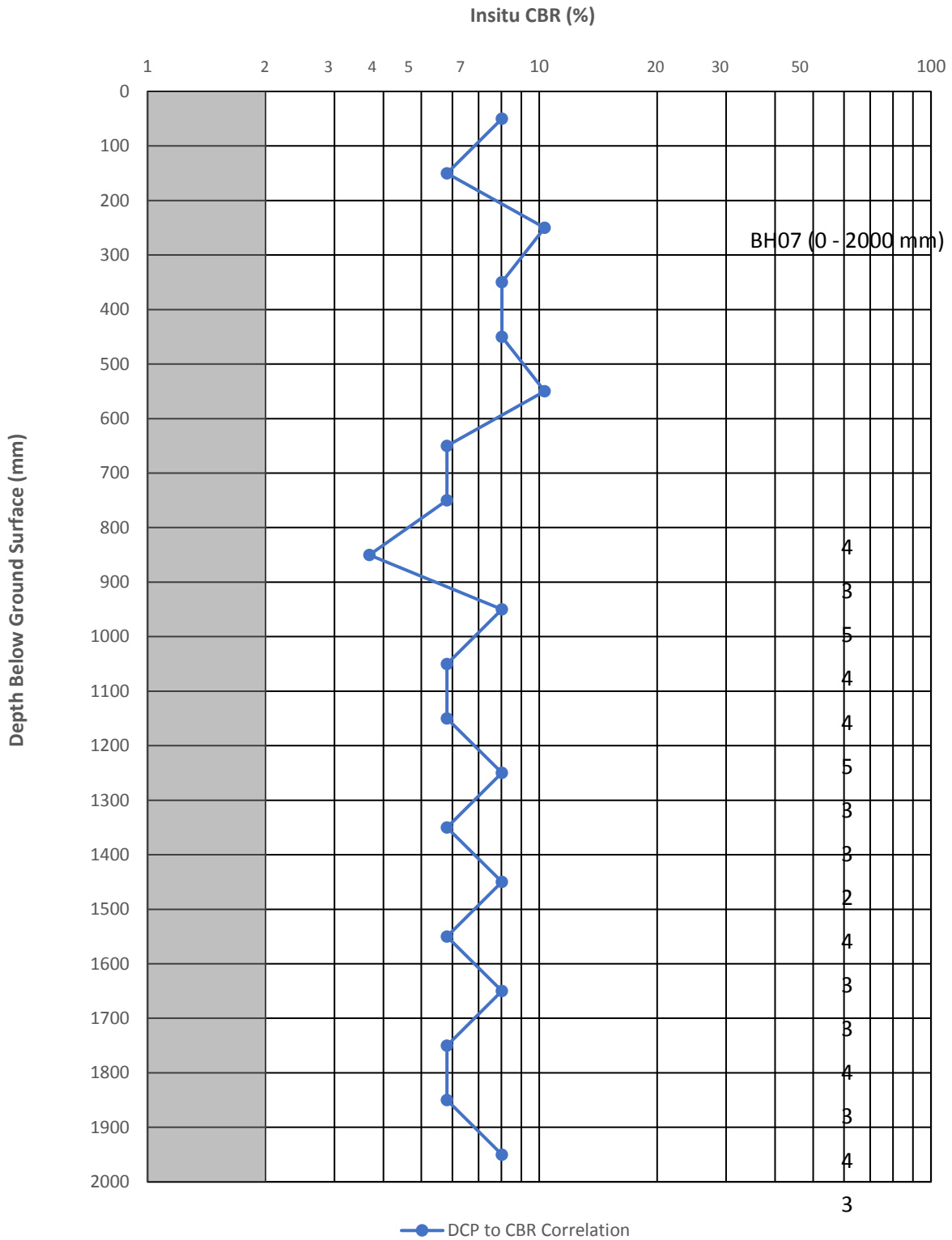


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	BH07 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	4	25.00	8.0
100 - 200	3	33.33	5.8
200 - 300	5	20.00	10.3
300 - 400	4	25.00	8.0
400 - 500	4	25.00	8.0
500 - 600	5	20.00	10.3
600 - 700	3	33.33	5.8
700 - 800	3	33.33	5.8
800 - 900	2	50.00	3.7
900 - 1000	4	25.00	8.0
1000 - 1100	3	33.33	5.8
1100 - 1200	3	33.33	5.8
1200 - 1300	4	25.00	8.0
1300 - 1400	3	33.33	5.8
1400 - 1500	4	25.00	8.0
1500 - 1600	3	33.33	5.8
1600 - 1700	4	25.00	8.0
1700 - 1800	3	33.33	5.8
1800 - 1900	3	33.33	5.8
1900 - 2000	4	25.00	8.0


Notes:

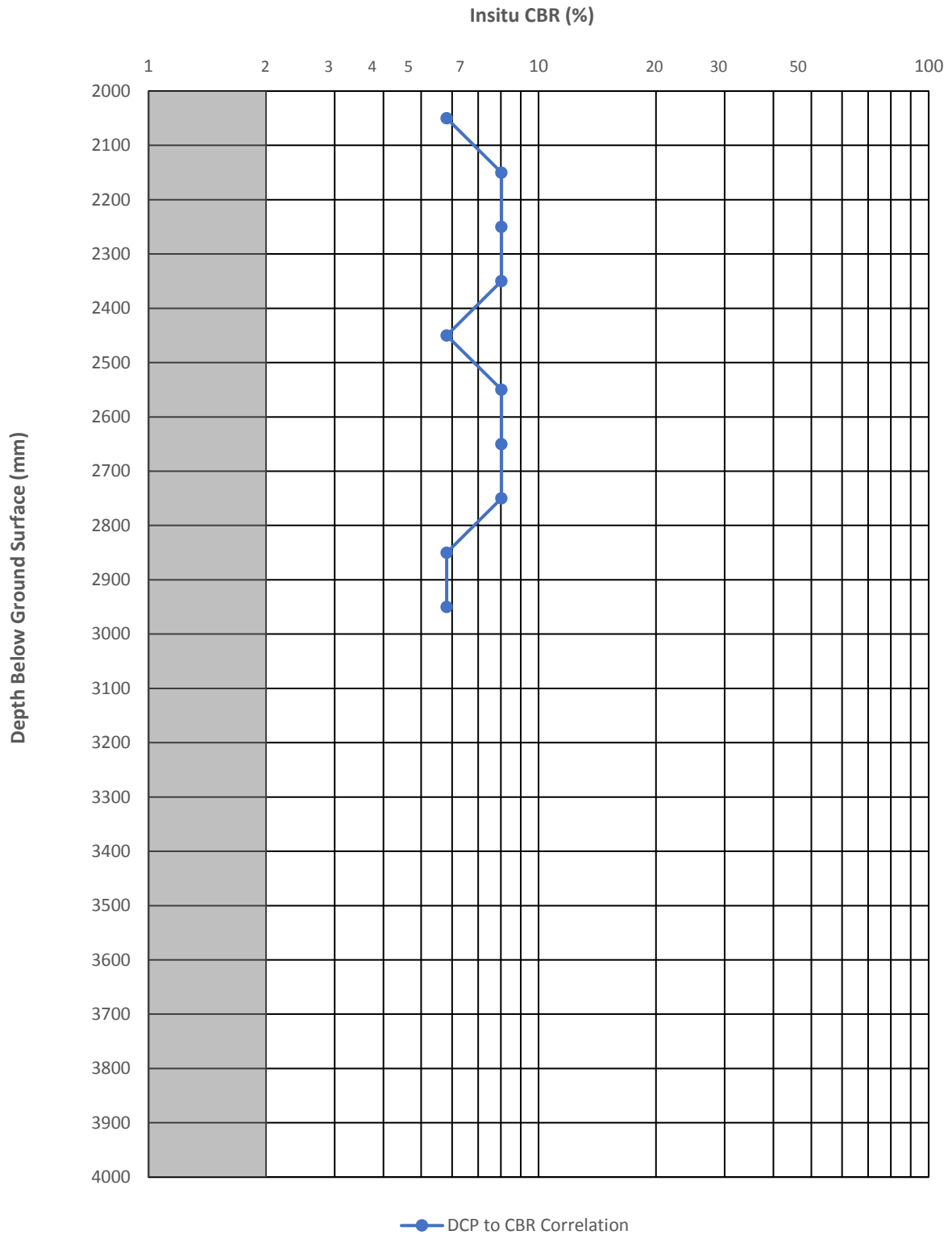
1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



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	CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
	PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
	TITLE:	BH07 (0 - 2000 mm)	REVISION:	0	SCALE:	AS SHOWN
			DATE:	18/03/2019	SHEET:	A4



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH07 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

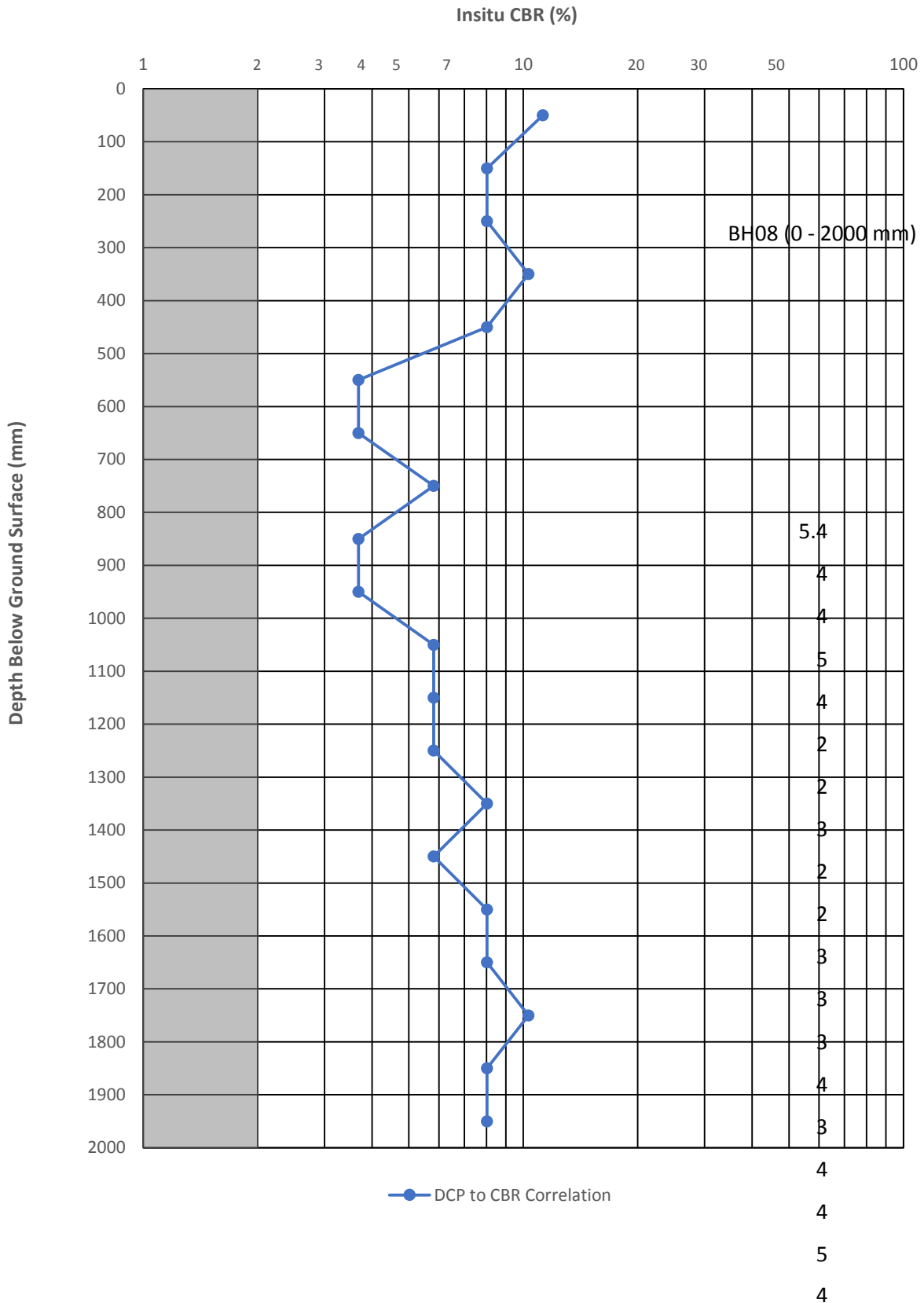


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	BH08 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

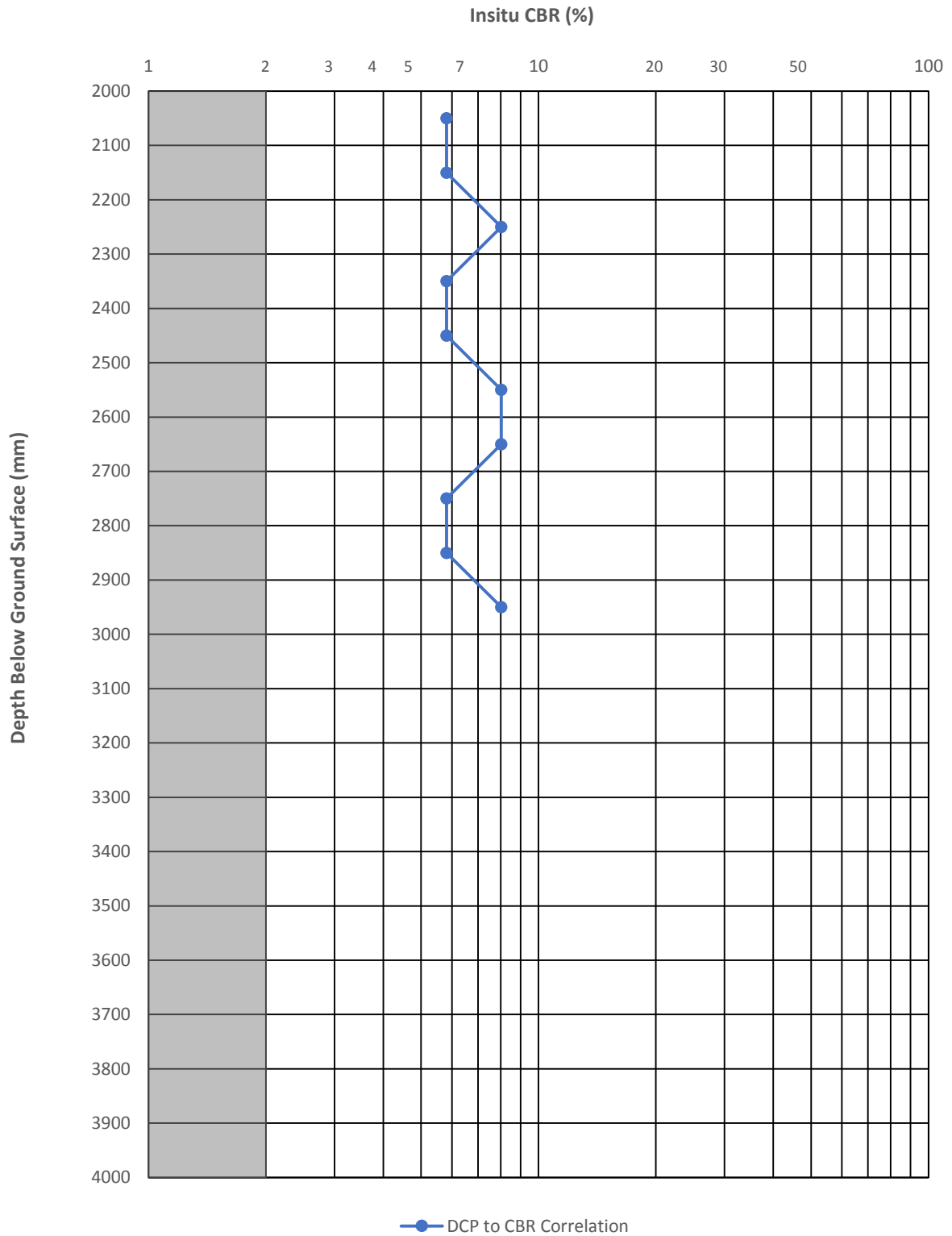
Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	5	18.52	11.3
100 - 200	4	25.00	8.0
200 - 300	4	25.00	8.0
300 - 400	5	20.00	10.3
400 - 500	4	25.00	8.0
500 - 600	2	50.00	3.7
600 - 700	2	50.00	3.7
700 - 800	3	33.33	5.8
800 - 900	2	50.00	3.7
900 - 1000	2	50.00	3.7
1000 - 1100	3	33.33	5.8
1100 - 1200	3	33.33	5.8
1200 - 1300	3	33.33	5.8
1300 - 1400	4	25.00	8.0
1400 - 1500	3	33.33	5.8
1500 - 1600	4	25.00	8.0
1600 - 1700	4	25.00	8.0
1700 - 1800	5	20.00	10.3
1800 - 1900	4	25.00	8.0
1900 - 2000	4	25.00	8.0

Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH08 (0 - 2000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	BH08 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

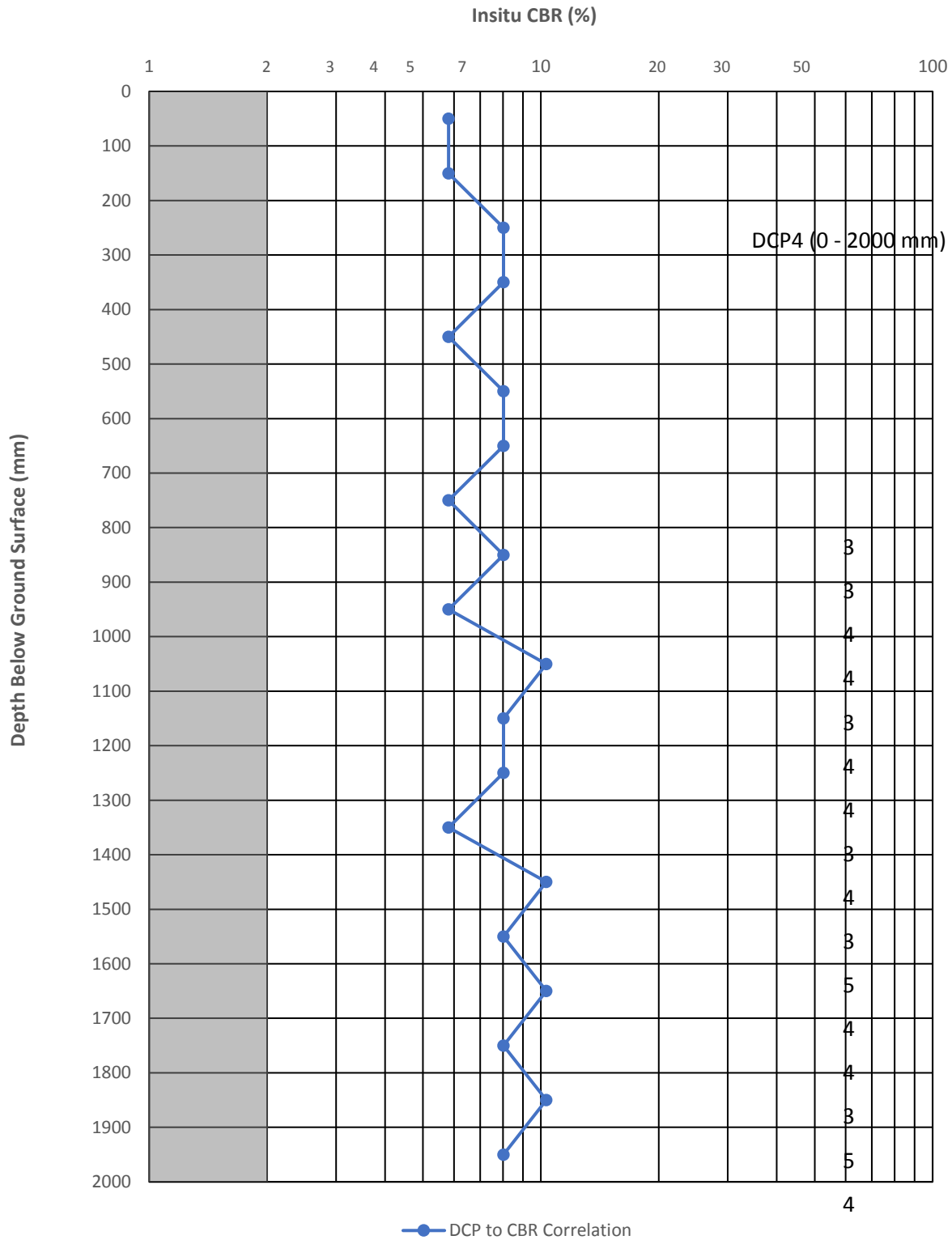


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	DCP4 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047


Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	3	33.33	5.8
100 - 200	3	33.33	5.8
200 - 300	4	25.00	8.0
300 - 400	4	25.00	8.0
400 - 500	3	33.33	5.8
500 - 600	4	25.00	8.0
600 - 700	4	25.00	8.0
700 - 800	3	33.33	5.8
800 - 900	4	25.00	8.0
900 - 1000	3	33.33	5.8
1000 - 1100	5	20.00	10.3
1100 - 1200	4	25.00	8.0
1200 - 1300	4	25.00	8.0
1300 - 1400	3	33.33	5.8
1400 - 1500	5	20.00	10.3
1500 - 1600	4	25.00	8.0
1600 - 1700	5	20.00	10.3
1700 - 1800	4	25.00	8.0
1800 - 1900	5	20.00	10.3
1900 - 2000	4	25.00	8.0

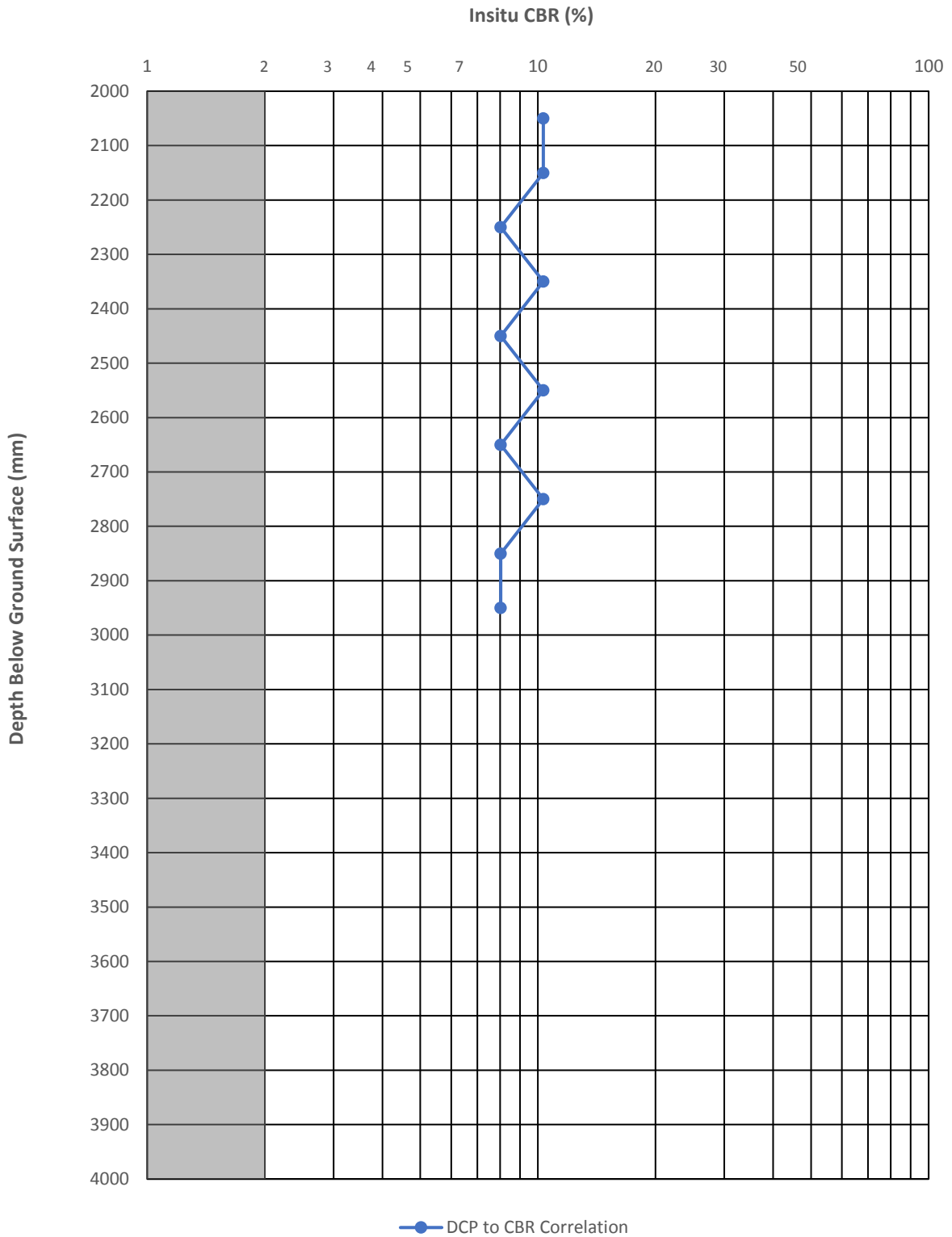
Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



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	CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
	PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
	TITLE:	DCP4 (0 - 2000 mm)	REVISION:	0	SCALE:	AS SHOWN
			DATE:	18/03/2019	SHEET:	A4



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	DCP4 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

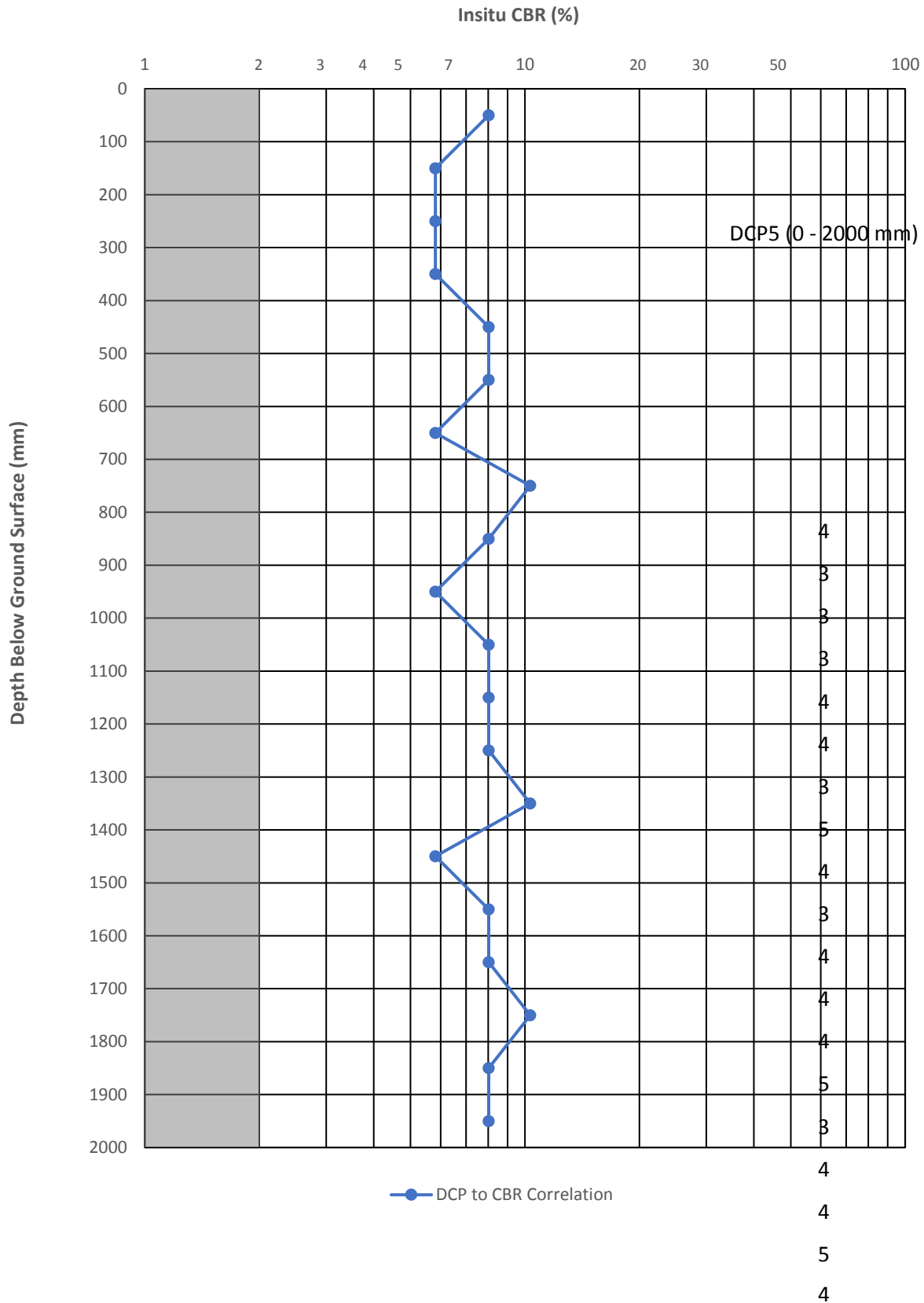


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	DCP5 (0 - 2000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
0-100	4	25.00	8.0
100 - 200	3	33.33	5.8
200 - 300	3	33.33	5.8
300 - 400	3	33.33	5.8
400 - 500	4	25.00	8.0
500 - 600	4	25.00	8.0
600 - 700	3	33.33	5.8
700 - 800	5	20.00	10.3
800 - 900	4	25.00	8.0
900 - 1000	3	33.33	5.8
1000 - 1100	4	25.00	8.0
1100 - 1200	4	25.00	8.0
1200 - 1300	4	25.00	8.0
1300 - 1400	5	20.00	10.3
1400 - 1500	3	33.33	5.8
1500 - 1600	4	25.00	8.0
1600 - 1700	4	25.00	8.0
1700 - 1800	5	20.00	10.3
1800 - 1900	4	25.00	8.0
1900 - 2000	4	25.00	8.0

Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



CLIENT:	Fyfe
PROJECT:	Gas Turbine Peaker Project
TITLE:	DCP5 (0 - 2000 mm)

DRAWN:	CR
CHECKED:	0
REVISION:	0
DATE:	18/03/2019

PROJECT:	ADL2019-0047
FIGURE:	1
SCALE:	AS SHOWN
SHEET:	A4

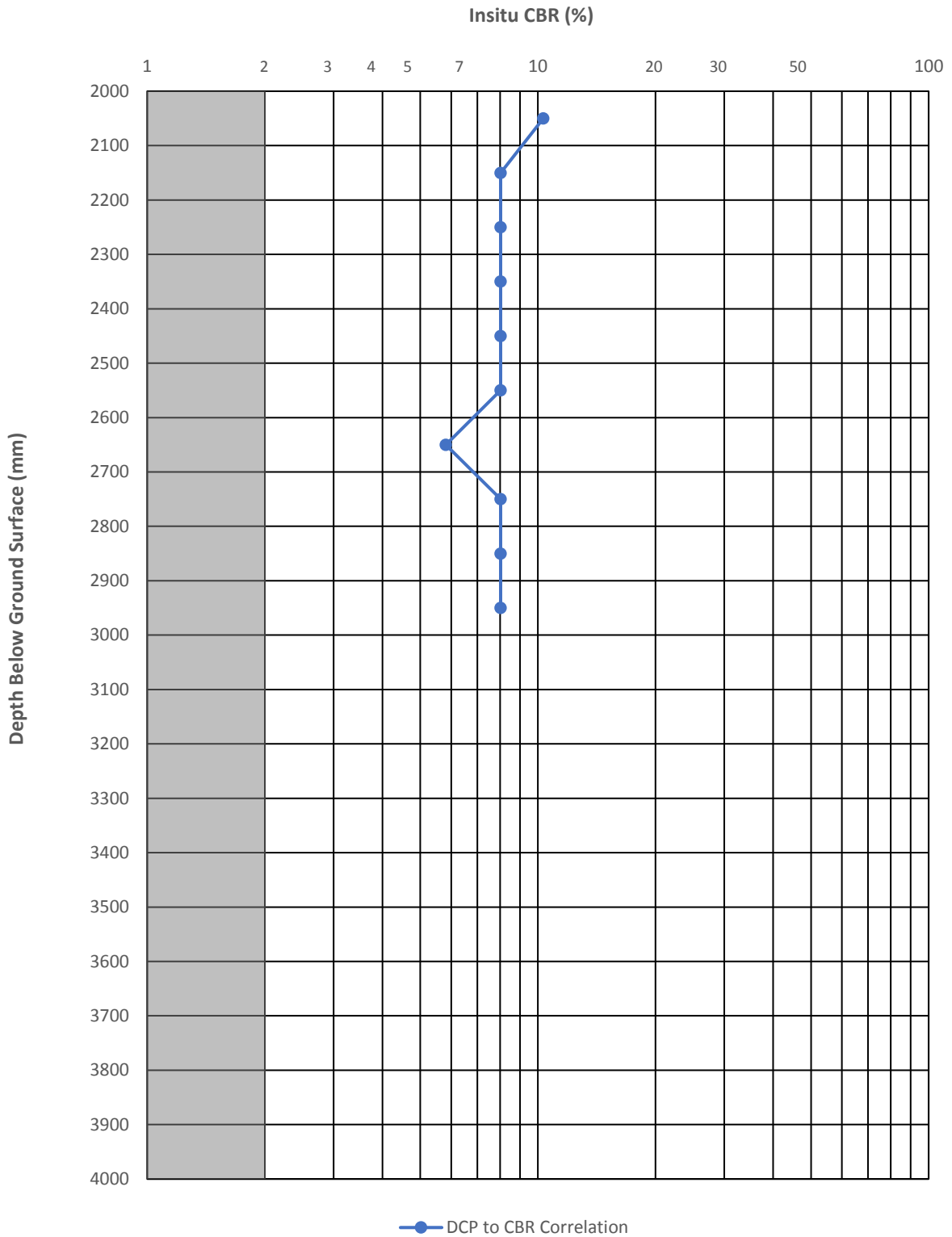


CLIENT:	Fyfe	DESIGNER:	CR
PROJECT:	Gas Turbine Peaker Project	CHECKED:	
TITLE:	DCP5 (2000 - 3000 mm)	REVISION:	0
		DATE:	29/05/2019
		PROJECT:	ADL2019-0047

Depth Range (mm)	blows / interval	mm / blow	ICBR (%)
2000 - 2100	5	20.00	10.3
2100 - 2200	4	25.00	8.0
2200 - 2300	4	25.00	8.0
2300 - 2400	4	25.00	8.0
2400 - 2500	4	25.00	8.0
2500 - 2600	4	25.00	8.0
2600 - 2700	3	33.33	5.8
2700 - 2800	4	25.00	8.0
2800 - 2900	4	25.00	8.0
2900 - 3000	4	25.00	8.0

Notes:

1) DCP tests were recorded as blows / 100 mm interval, so count averaged across 50 mm zone.



CLIENT:	Fyfe	DRAWN:	CR	PROJECT:	ADL2019-0047
PROJECT:	Gas Turbine Peaker Project	CHECKED:	0	FIGURE:	1
TITLE:	DCP5 (2000 - 3000 mm)	REVISION:	0	SCALE:	AS SHOWN
		DATE:	18/03/2019	SHEET:	A4

Appendix E

Environmental Laboratory Test Results

CERTIFICATE OF ANALYSIS

Work Order : **EM1908272**
Client : **CMW GEOSCIENCES**
Contact : **DAVID ARGENT**
Address :
Telephone : ----
Project : **ADL2019-0046, 0047**
Order number :
C-O-C number : ----
Sampler : ----
Site : **Gas Turbine Peaker Project, Pelican Point**
Quote number : **EN/222**
No. of samples received : **5**
No. of samples analysed : **5**

Page : 1 of 2
Laboratory : Environmental Division Melbourne
Contact : Customer Services EM
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9600
Date Samples Received : 28-May-2019 10:55
Date Analysis Commenced : 30-May-2019
Issue Date : 05-Jun-2019 16:44



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
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General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

- pH analysed in non stirring condition
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				BH2 0.6 0.8	BH3 0.6 0.8	BH7 0.6 0.8	BH8 0.6 0.8	BH1 0.6 0.8
Client sampling date / time				27-May-2019 00:00	27-May-2019 00:00	27-May-2019 00:00	27-May-2019 00:00	27-May-2019 00:00
Compound	CAS Number	LOR	Unit	EM1908272-001	EM1908272-002	EM1908272-003	EM1908272-004	EM1908272-005
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	8.4	8.3	9.0	9.2	8.5
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	32.2	36.8	17.2	10.3	28.3
EA080: Resistivity								
Resistivity at 25°C	----	1	ohm cm	167	160	526	540	206
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	2410	2670	720	440	2560
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	12400	16400	3290	3200	10200

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APPENDIX J

TRAFFIC IMPACT STATEMENT



**Design
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PORT ADELAIDE ENERGY PTY LTD

**SNAPPER POINT POWER
STATION**

TRAFFIC IMPACT
STATEMENT

wsp

OCTOBER 2019

Question today Imagine tomorrow Create for the future

Snapper Point Power Station Traffic Impact Statement

Port Adelaide Energy Pty Ltd

WSP

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REV	DATE	DETAILS
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01	11/10/2019	Final

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ABBREVIATIONS

AADT	Average Annual Daily Traffic
Vpd	Vehicles per day
Vph	Vehicles per hour
AM peak	One hour period in the morning between 7–9 am when traffic volumes is highest
PM peak	One hour period in the morning between 3.30–6 pm when traffic volumes is highest

1 INTRODUCTION

1.1 THE SNAPPER POINT POWER STATION PROJECT

The Snapper Point Power Station (the Project) involves the relocation of five (5) trailer mounted turbine generators, and ancillary infrastructure, from an existing site at Elizabeth to a new site adjacent to the Pelican Point Power Station, at Outer Harbor. The turbines are currently operated by the South Australian Government (SA Government) for emergency electricity generation, as part of South Australia's emergency back-up power station developed in response to state-wide blackouts in 2017.

Port Adelaide Energy Pty Ltd (P A Energy P/L), an affiliate of Nexif Energy Australia Pty Ltd (Nexif Energy), has proposed to lease the turbines from the SA Government, and operate them for a permanent commercial use. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up. It is proposed that the Project will connect into the nearby Pelican Point Power Station fuel gas yard (owned by Epic Energy) and Pelican Point Power Station switchyard (owned by ElectraNet).

1.2 PROJECT AREA

The Project site (the Site) will be located adjacent to the Pelican Point Power Station at Outer Harbor, approximately 20 km north of Adelaide. The land is owned by Renewal SA, and will be leased by P A Energy P/L for this Project. The Site is situated between the coastal waters of the Port River and the Pelican Point Power Station, and is located within the City of Port Adelaide Enfield under the Industry Zone. The Site will comprise the following land parcels:

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – Title reference CT 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of Allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6012/888.

It is anticipated that an additional, existing site access road will be utilized for the Project. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.
-

1.3 OBJECTIVES

The objective of the Traffic Impact Assessment (TIA) is to identify any key traffic operational and safety issues that may arise out of the project (during and after construction) and to suggest measures that may mitigate these.

This TIA report assesses the traffic related aspects of the proposed Snapper Point Power Station Project (the Project) and has been prepared in support of the Development Application for the project.

This assessment is based on a desktop assessment and detailed understanding of roads and traffic operations at, and surrounding, the proposed Project site. The assessment was informed by information on construction activities provided by P A Energy P/L.

1.4 ASSESSMENT METHODOLOGY

The assessment approach included:

- determining the existing (baseline) road and traffic conditions near the project that may be impacted by the proposed Project
- developing an understanding of the construction staging and traffic generating activities
- identifying and assessing options for access to the Project site
- estimating the volume, type, frequency and patterns of traffic movements associated with the construction and ongoing operations activities of the Project
- assessing the impacts of the traffic generated by the Project on the existing (baseline) road and traffic operations
- identifying and suggesting mitigation measures that may be implemented to minimise or eliminate identified potential impacts.

1.5 TIA REPORT STRUCTURE

The following sections of this TIA report describe:

- existing (baseline) road and traffic conditions (Section 2)
- the development proposal (Section 3)
- the impacts of the Project (Section 4)
- summary and recommendations (Section 5).

2 EXISTING CONDITIONS

2.1 LOCALITY

The proposed Snapper Point Power Station site is located at the northern tip of the Lefevre Peninsula.

The Project site comprises land to the north of the Pelican Point Power Station, located to the north of Pelican Point Road (refer Figure 2.1):

2.2 LOCATION AND LAND USE

The proposed development site abuts the Port River waterfront at the northern tip of the Lefevre Peninsula.

Surrounding land uses on the Lefevre Peninsula include a mix of industrial, commercial (port), Defence establishments (Naval shipyard), natural reserves and residential land uses.

2.3 ROADS

The proposed development site, as mentioned earlier, is located at the northern tip of the Lefevre Peninsula. Vehicular access to the Lefevre Peninsula is via arterial road network (Grand Junction Road/Port Road/Commercial Road, Military Road) and Port River Expressway approximately 8 km south of the project site.

2.3.1 DESCRIPTION OF ROADS

PORT RIVER EXPRESSWAY

The Port River Expressway is a multi-lane, divided motorway connecting into the South Road Superway (which is part of the North-South Corridor which is progressively developed from Gawler in the north to Noarlunga in the south), Salisbury Highway and Port Wakefield Road.

VICTORIA ROAD

Victoria Road is a four-lane, arterial road oriented north-south and serves as the main access route for the Lefevre Peninsula. The port of Adelaide is located at the northern end of Victoria Road. Mersey Road North connect into Victoria Road via Pelican Point Road. Veitch Road intersects (roundabout) with Mersey Road North thus providing alternative access to the project site.

A 60 km/hr posted speed limit applies on Victoria Road¹.

PELICAN POINT ROAD / MERSEY ROAD N

Pelican Point Road is a two-lane, undivided local access road. Mersey Road N is a two-lane, divided local access road oriented north-south. Pelican Point Road and Mersey Road N provide access to major industrial/commercial and Defence land uses along its length.

Channelised turn lanes are provided at accesses to key industries/properties along its length. A 70 km/hr speed limit applies to Pelican Point Road and the northern half of Mersey Road N (section north of Falie Reserve). A 50 km/hr speed limit applies to the southern half of Mersey Road N (section south of Falie Reserve).

A rail crossing is located on Pelican Point Road approximately 1 km north of Victoria Road. The subject rail line services Flinders Adelaide container terminal.

¹ Source Google Street View, May 2019

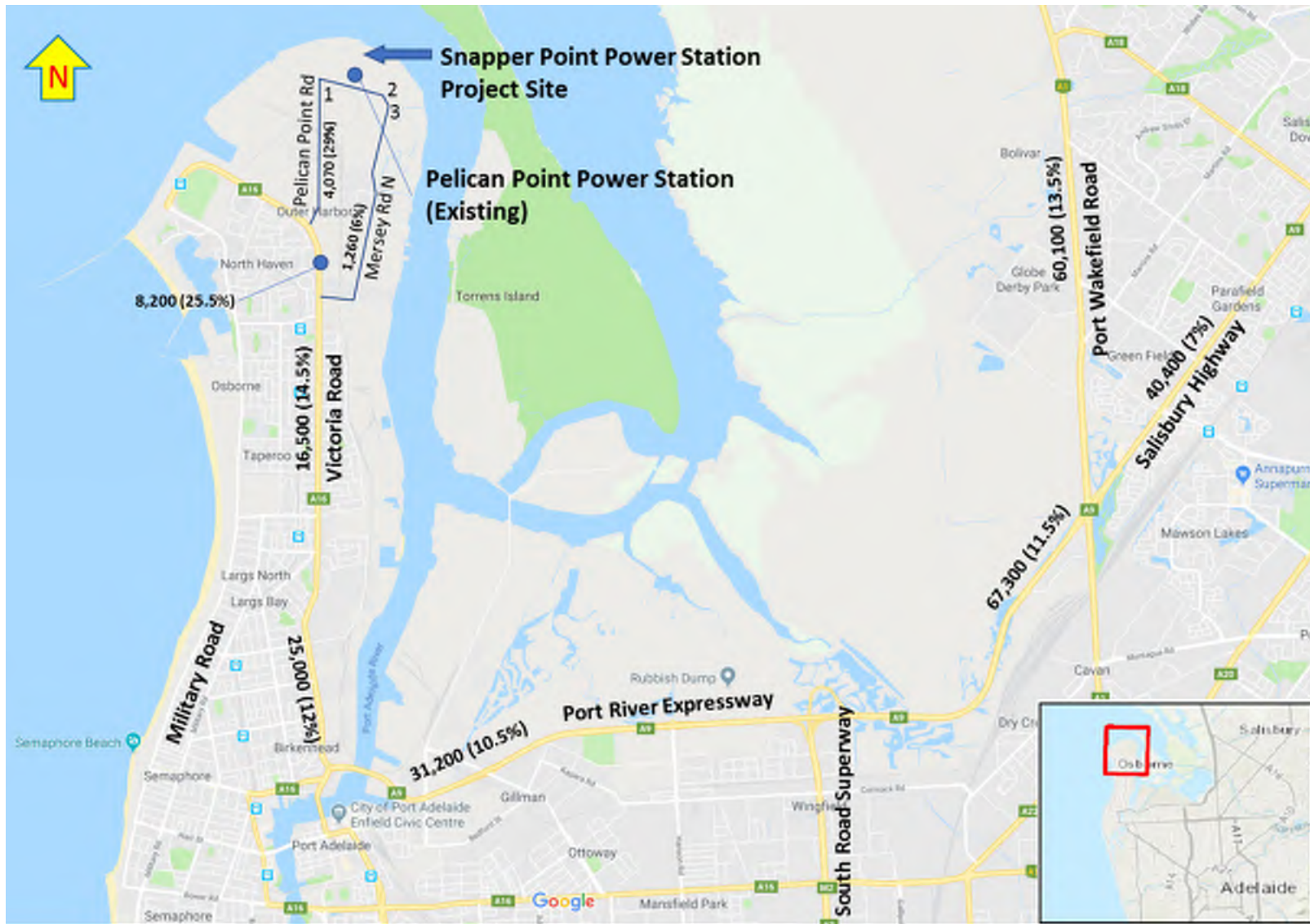


Figure 2.1 Site location and existing traffic volumes (AADT and % commercial vehicles)

2.4 TRAFFIC

Port River Expressway is estimated to carry between 22,500 (western end) and 68,000 (eastern end) vehicles per day².

Victoria Road is estimated to carry between 30,000 (southern end) to 8,000 (northern end near Pelican Point Road) vehicles per day.

Refer to Figure 2.1 for daily traffic volumes on the surrounding road network. Figure 2.2 below shows detailed traffic counts in the vicinity of the Project site.

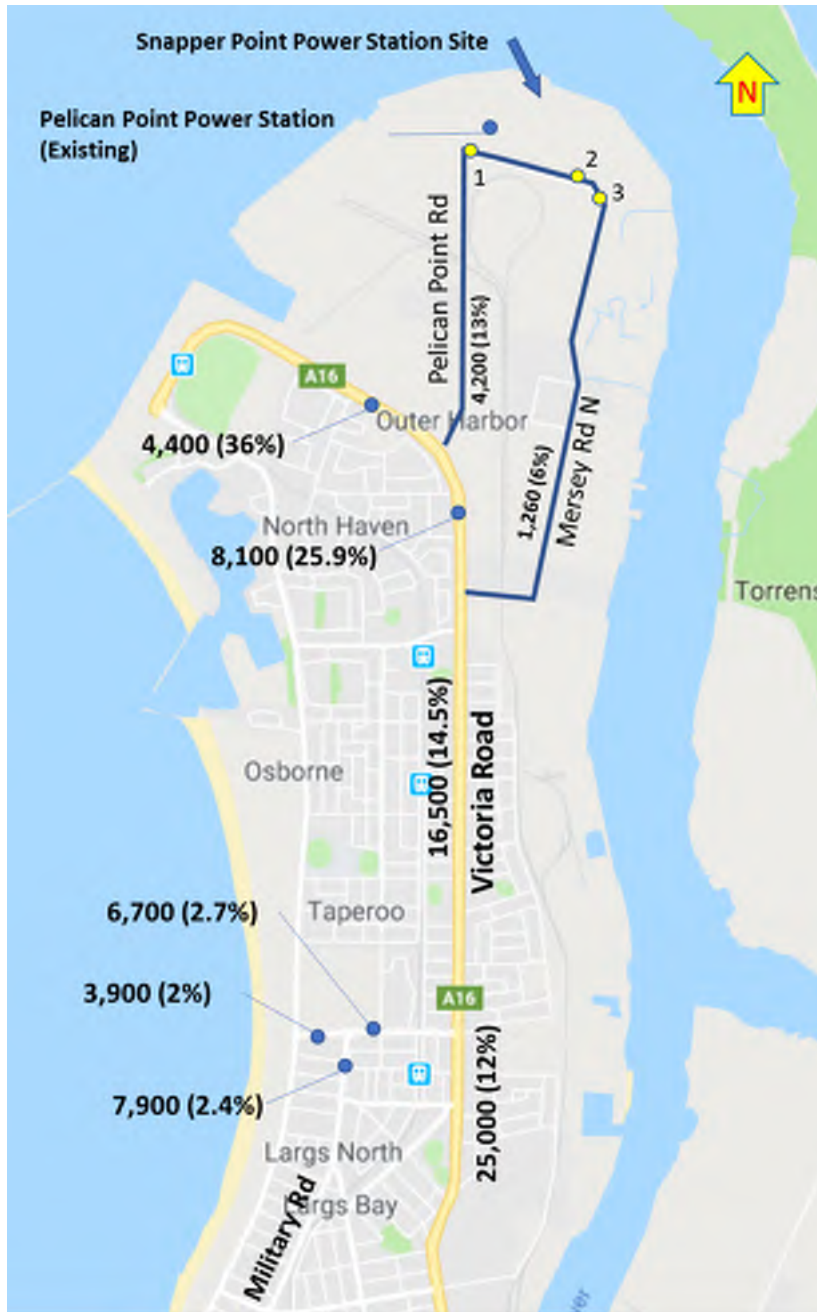


Figure 2.2 Traffic volumes (existing) near the Project site

² Source [Location SA Map Viewer](#)

Existing peak hour and daily traffic volumes are presented in Table 2.1 below.

Table 2.1 Existing peak hour and daily traffic volumes

	PELICAN POINT ROAD	VICTORIA ROAD	PORT RIVER EXPRESSWAY
Shift Start (vph) – Morning Peak	520	755	3,950
Shift End (vph) – Afternoon Peak	660	930	3,920
Daily (vpd)	4,200	8,100 – 25,000	38,800

Salisbury Highway, Port River Expressway and Victoria Road all are classified as oversize and overmass vehicle routes (OSM – 4.0 m wide, up to 93.5 t Low loader) (refer to Figure 2.3 below).



Figure 2.3 OSM routes – 4.0 m wide up to 93.5 t low loader route network

Current location refers to former Holden manufacturing plant in Elizabeth where the TM2500 turbines are currently located. The proposed location refers to the proposed Snapper Point Power Station location on Lefevre Peninsula.

2.5 CRASHES

Crashes reported over the five years between 2013 and 2017 were reviewed to identify any specific trends in crash events or locations where crashes are frequent. Crashes on roads in the vicinity of the Project site are summarised in Table 2.2, and discussed in detail below.

Table 2.2 Crash record summary (2013–17)

REF NO.	TOTAL CRASHES	PDO	INJURY	SERIOUS INJURY	FATALITY	HIT FIXED OBJECT	NIGHT TIME
1	1	–	✓	✓	–	1	1
2	1	✓	–	–	–	1	1
3	2	✓	✓	✓	–	2	1

A total four crashes were reported along Pelican Point Road and Mersey Road North near the Project site. Three of the four reported crashes occurred during night time, and two crashes resulting in serious injury.

3 DEVELOPMENT PROPOSAL

The Project involves the relocation of five (5) trailer mounted turbine generators, and ancillary infrastructure, from an existing site at Elizabeth (former Holden manufacturing site) to a new site adjacent to the Pelican Point Power Station, on Lefevre Peninsula.

The turbines are trailer mounted and can be disassembled, transported and assembled with relative ease. Transporting of the turbines from Elizabeth to Snapper Point location will utilize the existing OSM route network.

3.1 INFORMATION PROVIDED

P A Energy P/L has provided the following information in relation to the Project to assist in the traffic impact assessment:

- a general layout plan (refer Appendix A)
 - general advice on construction staging and duration
 - general advice on specifications of existing gas turbines (TM2500) information
 - estimates of staffing levels
 - estimates of traffic generation during and after construction.
-

3.2 SITE LAYOUT AND ACCESS

The general layout of the Project site includes:

- gas conditioning yard
- switchyard and transformer
- turbines (TM2500 units)
- admin and control building
- LFO storage.

The proposed development also includes utilising existing shared access off Pelican Point Road along the eastern boundary of the Pelican Point Power Station and upgrades to the internal access road from the access point to the proposed power station. Refer to Figure 3.1 for details.

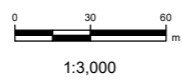


Legend

- Mean High Tide Water Line
- Pelican Point Power Station
- Site Layout
- Site Boundary

Map: PS114349_GIS_001_A6
 Date: 9/10/2019

Author: MO
 Approved by:



Data source: - Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
 Coordinate system: GDA 1994 MGA Zone 54
 Scale ratio correct when printed at A3



Snapper Point Power Station

Figure 3.1
 Preliminary Site Plan

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3.3 CONSTRUCTION PHASING AND RESOURCING

3.3.1 CONSTRUCTION ACTIVITY

P A Energy P/L has communicated that the construction activities will be undertaken over a period of 11 months commencing early 2020. Key construction activities will involve:

- site preparation works; including fencing, preliminary civil works and drainage, access road and internal track construction, construction of site offices and facilities
- installation of footings and infrastructure
- transportation and installation of the five (5) aero-derivative TM 2500 turbine generators and ancillary infrastructure
- removal of temporary construction facilities and rehabilitation of disturbed areas.

3.3.2 CONSTRUCTION SCHEDULE

Construction activities can be divided into three phases as described below:

- **Phase 1 – 1 to 3 months** – site preparation works + installation of footings and infrastructure.
- **Phase 2 – 4 to 8 months** – Relocation of BOP equipment + relocation of five TM2500 turbines.
- **Phase 3 – 9 to 11 months** – installation and commissioning of TM2500 turbines, removal of temporary construction facilities.

3.3.3 CONSTRUCTION WORKFORCE

It is understood that workforce present at the construction site will vary throughout the duration of construction; with up to 70 workers present at the Project site during peak construction activities (envisaged to be between months 3 and 9).

3.3.4 CONSTRUCTION EQUIPMENT AND MATERIALS

Refer to section 4.1 for details on construction equipment and material delivery.

4 PROJECT IMPACTS

4.1 CONSTRUCTION RELATED TRAFFIC

4.1.1 CRANE AND PLANT DELIVERY

Equipment required for construction would include earth moving equipment and cranes which will be transported to the site at the start and removed toward the end of construction.

4.1.2 CONSTRUCTION MATERIALS DELIVERY

Materials required will include gravel, concrete, steel, sand and other infrastructure components which will be transported consistent with the construction schedule.

4.1.3 STAFF MOVEMENTS

As mentioned in Section 3.3.2, during peak construction activity up to 70 construction workers may be present at the Project site. This assessment has assumed there will be one work shift between 7 am to 5 pm, resulting in construction workers:

- arriving between 6.30 am and 7.30 am
- leaving after 4.30 pm and 6 pm
- some trips around lunch and coffee/tea breaks.

While some level of ride sharing is anticipated, for the purpose of estimating vehicular trips related to staff movements, staff were considered to travel in individual vehicles (one return trip per day per staff).

Estimated trip generated for staff movements is presented in Table 4.1 below.

Table 4.1 Estimated vehicle movements and trip generation

ITEM	VEHICLE MOVEMENTS	DURATION (DAYS)	DAILY TRAFFIC GENERATION (TWO-WAY TRIPS)	NOTES
Plant Equipment				Phase 1 – Month 1
Initial site set up	5 truck loads	5	1	Temporary fencing, site office etc – delivered at the start of construction activity and removed at the end.
Crane, earth movers etc for site set up	5 truck loads	5	1	Delivered at the start of construction activity and removed at the end.
Earthworks				Phase 1 – Months 2-3
Grub/Level	500 loads	15	34	Feb-2020
Imported fill	5,000 loads	45	112	Mar-Apr 2020

ITEM	VEHICLE MOVEMENTS	DURATION (DAYS)	DAILY TRAFFIC GENERATION (TWO-WAY TRIPS)	NOTES
Construction Materials				Phase 2 – Month 4
Piling	18	3	6	Regular deliveries throughout construction duration – corresponding to construction schedule. Average daily deliveries over 1 month = 10
Concrete foundations/ Culverts	320	32	10	
Staff Movement				Phase 1 & 2 – Months 1-8
Employees (Light Vehicles)	70 cars/day		70 35	Daily movements at the start and end of work shift. Assumed movements during work shift – lunch/coffee breaks.
Turbine Relocation				Phase 2 – Months 6-7
Turbines (TM 2500)	17 loads	7	3	Relocation of turbines from Elizabeth to Snapper Point Location over 6 weeks.
Balance of Plant & transformer	22 loads	21	1	Average 3 daily delivery truck movements – spread over 6 weeks

As shown in Table 4.1 above, daily traffic generation during construction will vary between 106 (105 staff trips + 1 delivery) and 217 (105 staff trips + 112 delivery) two-way trips. This represents a conservative approach where all staff trips are considered to be travelling in individual vehicles. Ride sharing between staff would reduce overall traffic generation from the Project site during construction.

4.1.3.1 PUBLIC TRANSPORT

The nearest public transport connection to the Project site is the North Haven Railway Station, along the Outer Harbor rail line. The station is located 4.3 km away from the Project site. There are no bus services connecting North Haven to the Project site, nor any other Adelaide Metro bus services providing direct connectivity.

As such no public transport trips were considered when estimating traffic generation during and after construction of the proposed Snapper Point Power Station.

4.1.3.2 CYCLING AND WALKING TRIPS

Given the location of the Project site at the northern end of Lefevre Peninsula with no existing cycling or walking connections, estimated trip generation did not consider any cycling and walking trips during construction phase.

4.1.4 RELOCATING TURBINES

The five turbines currently located at Elizabeth (former Holder manufacturing site) will be transported to the Project site. This will be one off exercise and will be undertaken when the site is ready to house these turbines.

The TM2500 turbines are currently set up at a site in Elizabeth and are being used as emergency power back-up. It is understood that these turbines are trailer mounted and can be easily packed for transporting. A preliminary assessment including review of TM2500 turbine specifications (width, height, length, weight etc.) along with restricted access vehicle routes (RAV net) to identify route options for transporting these turbines. The preferred transport route for relocating turbines is shown in Figure 4.1 below.

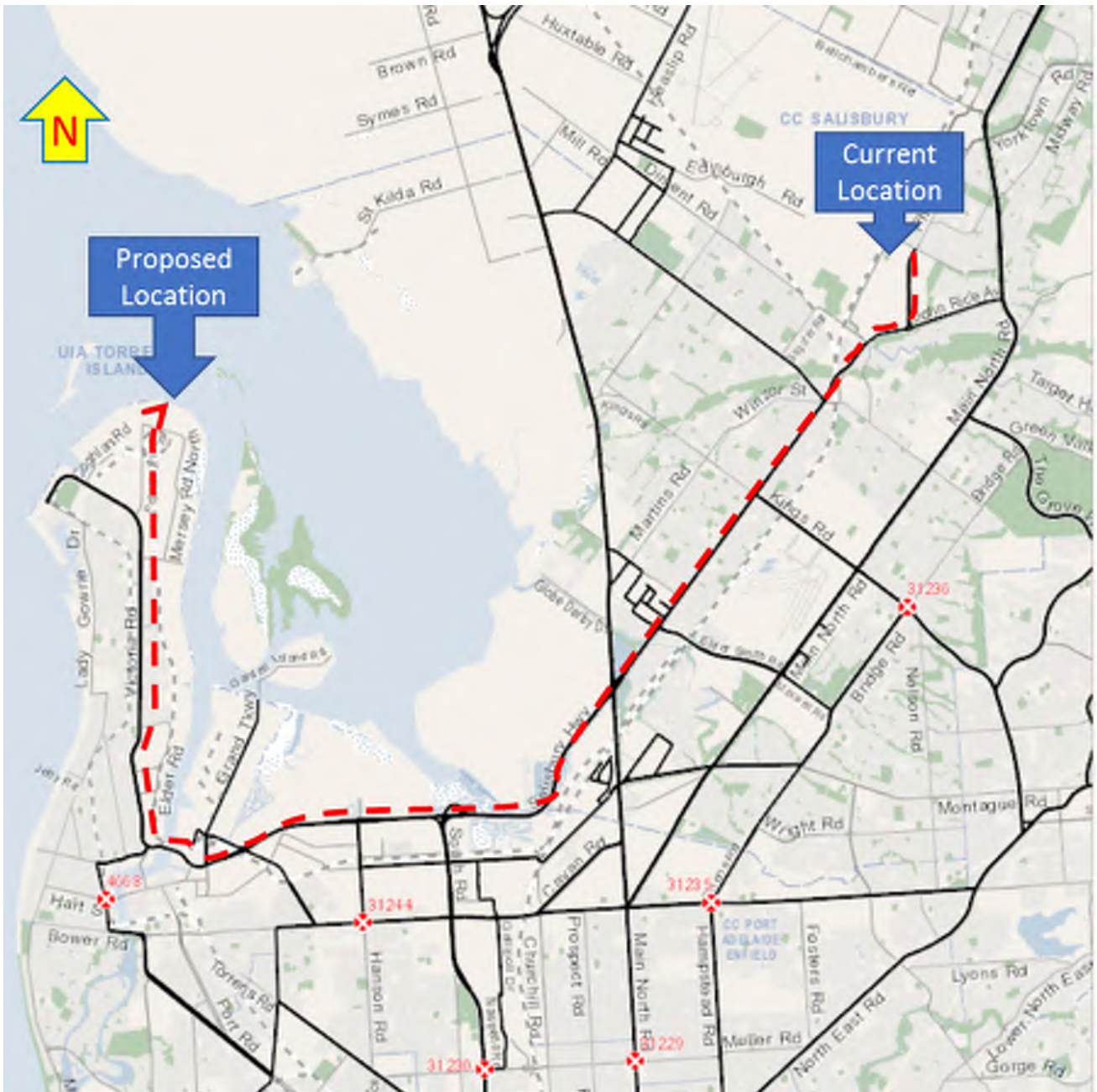


Figure 4.1 Preferred transport route for turbines from Elizabeth to Snapper Point

4.2 TRAFFIC DISTRIBUTION

Construction related traffic movement to and from the site is anticipated to primarily use Pelican Point Road via Victoria Road. The majority of traffic to and from the site is anticipated to use Port River Expressway, with some light vehicle trips (construction workers) using alternative routes (e.g. Military Road, Nelson Street, Commercial Street, Grand Junction Road etc).

Table 4.2 Trip distribution summary

	EXISTING TRAFFIC	CONSTRUCTION TRAFFIC ESTIMATE – PEAK MOVEMENT	EXITING + PEAK TRAFFIC MOVEMENT	% INCREASE
Pelican Point Road				
Shift Start (vph)	520	70	590	13.5%
Shift End (vph)	660	70	730	10.6%
During work shift – staff	–	70	70	–
During work shift – deliveries	–	225	112	–
Daily (vpd)	4,200	435	4,635	10.4%
Victoria Road				
Shift Start (vph)	755	70	825	9.3%
Shift End (vph)	930	70	1,000	7.5%
During work shift – staff	–	70	70	–
During work shift – deliveries	–	225	112	–
Daily (vpd)	8,100–25,000	435	8,535 to 25,435	5.4 to 1.7%
Port River Expressway				
Shift Start (vph)	3,950	70	4,020	1.8%
Shift End (vph)	3,920	70	3,050	1.8%
During work shift – staff	–	70	70	–
During work shift – deliveries	–	225	112	–
Daily (vpd)	38,800	435	39,135	1.1%

Existing traffic counts were sourced from DPTI and Port Adelaide Enfield council.

4.3 IMPACT ON SURROUNDING ROAD NETWORK

As shown in Table 4.2, the resultant increase in traffic due to construction related traffic movements in peak hour and daily traffic on Port River Expressway is just over 1%, and deemed negligible.

The increase in daily and peak hour traffic on Victoria Road due to construction activity at the proposed Project site was estimated to be less than 10%, which is not deemed to adversely impact on traffic movements on these roads. Victoria Road is a two-lane arterial road and was deemed to have sufficient spare capacity to cater for traffic from the proposed development during the construction phase.

Resultant increase in traffic using Pelican Point Road was estimated to be in the order of 10% to 15% during peak hours (morning and afternoon) corresponding to traffic generation around construction shift start and end times. Pelican Point Road was deemed to have sufficient capacity to cater for additional traffic during construction of Snapper Point Power Station.

While it is recommended that Pelican Point Road be used as a primary access to the project site, construction staff and other light commercial delivery vehicles may arrive via Mersey Road North. Under existing conditions, channelised right turn lane is not provided on Pelican Point Road at the project site access. There may be a need to create channelised right turn lane for traffic arriving from south on Mersey Road North seeking to enter the project site. It is recommended that at the time of detailed design, feasibility of introducing a channelised right turn lane on Pelican Point Road at the site access be assessed. Existing median in the road appears sufficiently wide to allow creation of a channelised right turn lane.

It should be noted that the heavy vehicle movements will be spread throughout the day, thus the overall impact on traffic movement along the surrounding road network during daytime is envisaged to be low.

4.4 POST CONSTRUCTION

It is understood that once operational, Snapper Point Power Station will be attended by three (3) staff permanently with regular maintenance/service activities attracting additional workers over a shorter duration.

Up to 5 two-way daily trips were estimated to be generated by the Snapper Point Power Station once operational. Which is deemed low, and not envisaged to impact adversely on the surrounding road network.

5 SUMMARY AND RECOMMENDATIONS

5.1 THE PROPOSAL

Port Adelaide Energy P/L has proposed to relocate five TM2500 turbines from a current location in Elizabeth to the Snapper Point Power Station site on Lefevre Peninsula.

5.2 ROAD AND TRAFFIC CONDITION

The proposed Project site is located to the north of Pelican Point Power Station; which is located to the north of Pelican Point Road.

Under existing conditions, Pelican Point Road is estimated to carry 4,070 vehicles per day; with 420 vehicles during morning peak hour and 360 vehicles during afternoon peak hour.

Victoria Road is estimated to carry between 8,200 vehicles per day (just south of Pelican Point junction) and 25,000 vehicles per day (southern end near Port River Expressway).

The proposed Snapper Point Power Station was estimated to generate up to 335 daily two-way trips during peak construction activity (Phase 1, Months 1 to 3).

The surrounding road network was deemed to have sufficient spare capacity to accommodate construction traffic generated by the proposed Project.

The relocation of the TM2500 turbines from Elizabeth to Snapper Point will require special permits from NHVR for transporting oversized/overmass goods along Salisbury Highway/Port River Expressway/Victoria Road and Pelican Point Road (preferred route for transporting TM2500 turbines).

5.3 ACCESS ROAD TO THE PROJECT SITE

The development proposal includes significant upgrades to existing internal access road, and will utilise an existing shared access off Pelican Point Road near its eastern end (where it connects into Mersey Road North).

Primary vehicle movement is recommended to be via Victoria Road and Pelican Point Road.

5.4 TRAFFIC IMPACTS

Trip generation estimates presented in Section 4.1 of this report are based on a conservative approach where construction workers were assumed to travel individually, resulting in higher trip generation. Realistically, some level of ride sharing is expected to occur, thereby reducing overall daily and peak hour traffic movement.

During peak construction activity, the Project site was estimated to generate up to 217 two-way daily trips (435 total vehicle movements). Construction traffic (during peak activity) represented between 1 to 15% increase in peak hourly or daily traffic on the surrounding road network and was not deemed to impact adversely on the surrounding road network.

5.5 RECOMMENDATIONS

The travel route to the construction site via Mersey Road North requires crossing rail track on Veitch Road before passing through a roundabout at Mersey Road North intersection with Veitch Road. It is recommended that preferred travel route for heavy vehicles be Victoria Road and then Pelican Point Road.

The proposed access to the Snapper Point Power Station is located along a curve in road alignment of Pelican Point Road/Mersey Road North. There may be a need to create a channelised right turn (CHR) lane for traffic arriving from the south on Mersey Road N to enter the project site. The median appears to be sufficiently wide to allow creation of such channelised right turn lane (CHR) and should be reviewed at the time of detailed design.

Transportation of TM2500 turbines from Elizabeth to the proposed project site will require special permits from NHVR for oversized/overmass goods movement. This should be undertaken before commencing relocation of TM2500 turbines.

Existing rail crossing on Pelican Point Road could potentially impact movement of delivery/construction vehicle movements. It is recommended that the deliveries be planned around train schedule to avoid any delays (in particular TM2500 turbine relocation) to the Site.

The assessment presented in this report is a desktop assessment, and is based on information provided by the client. It is recommended that a detailed route assessment be undertaken when planning relocation of TM2500 turbines from Elizabeth to the proposed Project site to minimise/eliminate any impacts due to road network deficiencies.

APPENDIX A

PRELIMINARY SITE PLAN – SNAPPER
POINT POWER STATION

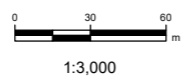




Pelican Point
Power Station

Map: PS114349_GIS_001_A6
Date: 9/10/2019

Author: MO
Approved by:



1:3,000

Data source: -
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate system: GDA 1994 MGA Zone 54
Scale ratio correct when printed at A3

PRELIMINARY



Snapper Point Power Station

Preliminary Site Plan

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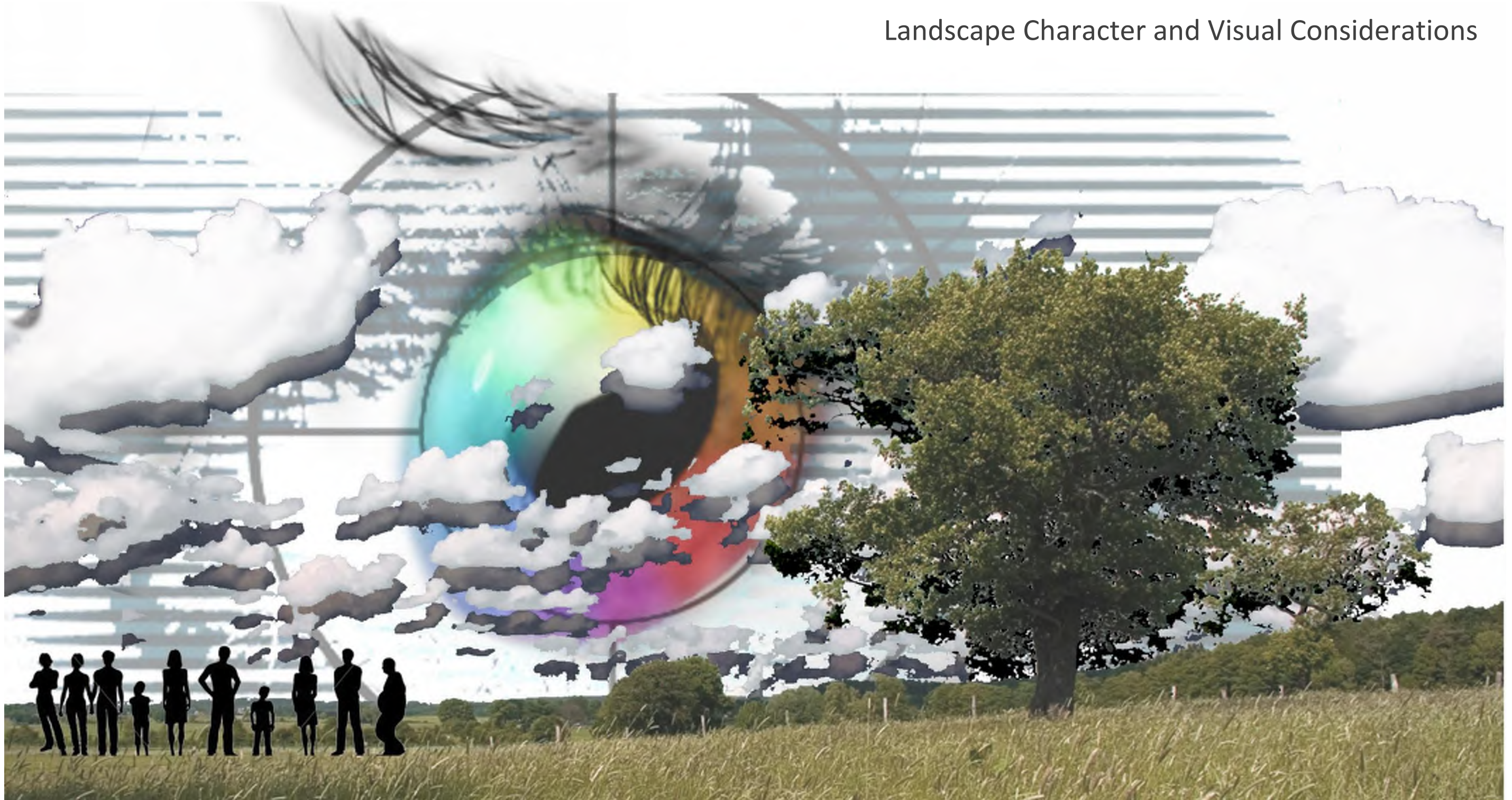
APPENDIX K

LANDSCAPE CHARACTER AND VISUAL CONSIDERATIONS REPORT



Snapper Point Power Station Outer Harbor SA

Landscape Character and Visual Considerations



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1. Introduction

This outline assessment has been prepared to support a Development Application for the Snapper Point Power Station Project, a proposal to locate five emergency generators to a site at Outer Harbor, SA.

The site is situated between the coastal waters of the Port River to the north and the existing Pelican Point Power Station to the south. Primary access to the site is from Pelican Point Road.

The subject land parcel constituting the 'licensed site' has a total area of approximately 6 ha. Proposed infrastructure will occupy only a portion of this being an area of approximately 2 ha; 400 m in length and 50 m in width. The actual infrastructure footprint will be significantly less than this 2 ha area.

The proximity and accessibility to existing infrastructure at the Pelican Point Power Station, including the ElectraNet switchyard, Sea Gas gas connection and Epic Energy gas connection were key factors in site selection.

1.1 Assumptions

The following assumptions have been made which will be subject to further detail design at a later stage;

- All infrastructure elements and generators will be finished in powder coated galvanised steel or a similar non –reflective finish
- The emergency generators are of a comparable size to typical shipping container
- No new transmission towers will be erected to facilitate the distribution of generated power via the transmission network

This assessment has considered;

- Aerial photographs of the site and wider locality
- The 'licensed area' plan which identifies the location of the proposed site

1.2 Summary of Activity

An on-site assessment was conducted to identify the landscape character of the locality and consider the likely visual implications of relocating the emergency generators at the 'licensed site' at Pelican Point, Outer Harbor, SA.

The consideration of the likely visual implications was based on an exercise which;

- Identified a Zone Theoretical of Visual Influence (ZTVI) and potential views within the ZTVI to the proposed 'licensed site'
- Conducted an on –site assessment to determine the character of the contextual landscape
- Prepared a high-level visual summary which broadly describes the prevailing landscape character and likely visual issues from within the ZTVI.

The summary has identified one potential sensitive receptor at Mutton Cove Conservation Park should a more detailed assessment and preparation of photomontage imagery be required.

2. Landscape Character Assessment

2.1 Site Visit and Photography

A site visit was undertaken on the 22nd of July 2019.

Photographs were taken at selected viewpoints to underpin the landscape character and visual impact assessment. Photographs have been taken using a Nikon 35mm Single Lens Reflex (SLR) camera with an approximate lens setting of 43mm.

2.2 Evaluation of the Existing Landscape Character

A qualitative landscape character assessment has been undertaken in a rigorous manner consistent with best practice, as prescribed by *the Guidelines for Landscape and Visual Impact Assessment* (Third Edition).

2.3 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 has encompassed 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. I apply the following guiding definitions to determine my assessments:

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

Further, the characterisation process defines the landscape 'sensitivity to change' of both the wider contextual landscape and the locality. This is categorised as either high, medium, low or negligible, where for example, a landscape that

displays a high 'sensitivity to change' would not be able to absorb a development of this nature without irreparable consequences and impacts on the inherent character and visual amenity.

2.4 Landscape Character of the Locality

The proposed 'licenced site' is located within a heavily industrialised section of Outer Harbor, adjacent the existing Pelican Point Power Station to the south and Port River to the immediate north. A 'restricted' location where casual visitors would be infrequent and, in most cases, unwelcome. The heavily developed area further south of the site contains key state infrastructure and transport assets including two other power stations, grain silos and berthing facilities for passenger cruise and container ships. Within this contextual landscape there are large pockets of undeveloped vacant land within tracts of extensive native scrub including the Mutton Cove Conservation Park to the more immediate south east where visitation is encouraged and facilitated with the designation of a public look out.

The windswept landscape is predominantly flat affording the eye of the occasional observer to meander the skyline until it reaches one of a number of visually dominating industrial buildings including the nearby prominent grain silos. A landscape where prominent electricity transmission towers march across the landscape in a linear procession drawing the eye of the observer to the distant horizons of the hills to the east and coastal skyline to the west. It is a landscape where the angular and imposing industrial built form jars the eye.

Mutton Cove Conservation Park, located approximately one km to the south east is a visually appealing, contemplative landscape. The expanse of native samphire and estuarine plantings and sinuous meandering of the Port River set against the panorama of the Adelaide hills provide the visitor with views to the significant stretches of mangroves along Torrens Island. These vistas provide a glimpse of the once more extensive pre settlement contextual landscape.

From the Mutton Cove lookout off Mersey Road the visual quality of the vistas north across the conservation park are distilled by the imposing transmission towers and nearby incongruous Viterra grain silos. However, with the exception of the higher aspects of the beige coloured chimneys, views of the Pelican Point

Power Station are largely precluded by fore and mid ground copses of native trees and large shrubs. It is unlikely the five emergency generators will be notable features within these vistas.

It is my opinion that the landscape character of one of a **low scenic quality** and has **a low sensitivity** to change.

3. Visual Considerations

Two viewpoints have been identified and visited to consider to the likely visual implications of the proposal.

(i) Pelican Point Road

A roadside location typical of any number of similar views obtained whilst travelling along Pelican Point Road.



(ii) Mutton Cove Conservation Park

A publically accessible lookout where views north to the 'licensed site' will be precluded due to the presence of fore and mid ground vegetation. The lookout location could be considered a potential (and only) sensitive receptor within the contextual landscape.

(Refer HD_V027 _ Sheet 1)



LEGEND

-  Viewpoint
-  Proposed site - licensed Area
- ZTVI Zone of Theoretical Visual Influence

TITLE LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT

PROJECT NEXIF POWER PLANT, PELICAN POINT SA

DWG NO	SCALE	SHEET NO	REVISION
HD_V027_AD01		1	

DRAWN	CHECKED	DATE
SW	SRH	07/19



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3.1. Viewpoint 01 Pelican Point Road

Views of the Pelican Point Power Station are mostly precluded by screen vegetation of native trees and larger shrubs that intermittently traverse the foreground in a west – east direction. Whilst the visually prominent power station chimneys puncture the skyline their visual impact is softened by existing foreground vegetation. To the immediate south the Viterra Grain Silos are incongruous visual elements.

The area of the 'licensed site' adjacent the Port River is located approximately 400m to the north of Pelican Point Road. Views of this portion of the proposed site are precluded by the expanse of foreground screening vegetation. The area of the licensed site to the east of the power station, which runs north south off Pelican Point Road is open and exposed, lacking vegetative screening at the intersection of Pelican Point Road and Mersey Road North. Despite the absence of vegetative screening, brief and glimpsed views only will be afforded to vehicle passengers across the eastern site boundary at the intersection of Mersey Road and Pelican Point Road.

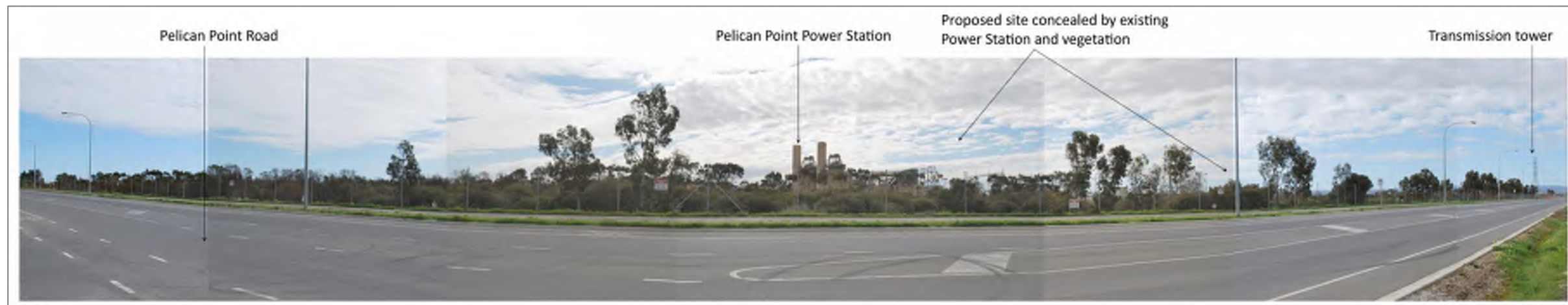


Image 01: Pelican Point Road, view north west – north east

3.2 Viewpoint 02 Mutton Cove Conservation Park

Views of the proposed location for the generators will be largely precluded by fore and mid ground copses of native trees and larger shrubs.

Where glimpsed views may be obtained of the 'roofline' of the generators they will likely appear as an extension of the existing power station built form and as a contiguous thin grey line only against the backdrop of expansive horizon. The presence of the generators within this expansive vista will be largely inconsequential.

The visually dominant surrounding infrastructure of streetlights, transmission towers and the neighbouring Viterra grain silos remain the prominent visual elements within the panorama.

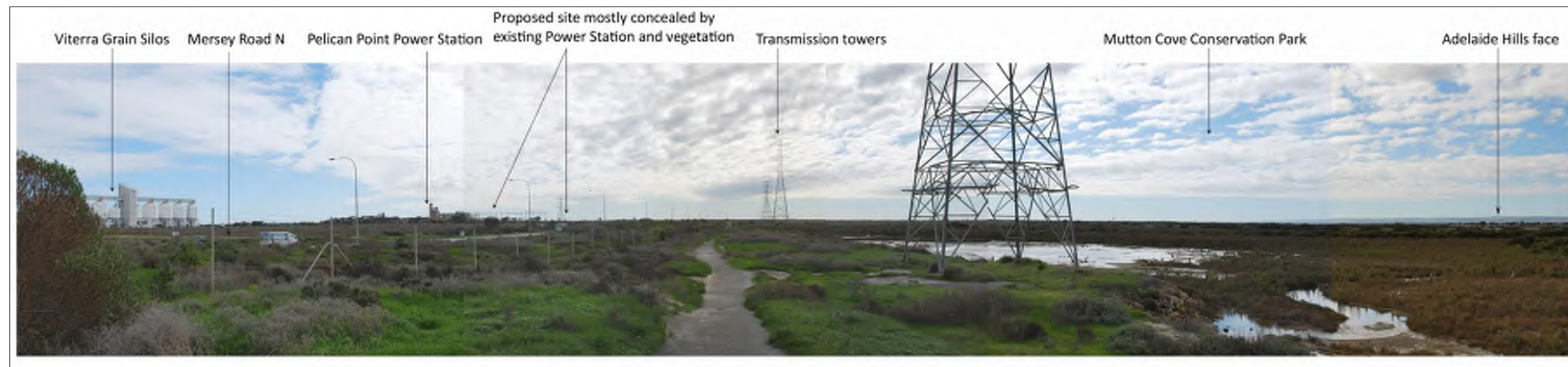


Image 2: Mutton Cove Conservation Park, view north west – north east

4. Summary and recommendations

It is my opinion that within a contextual landscape of **low scenic quality** and **low sensitively to change** the Snapper Point Power Station Project will not have irreparable consequences for the visual amenity of the locality and wider contextual landscape.

About the author

Stuart Heseltine, Registered Landscape Architect, Principal Hemisphere Design.

Stuart is acknowledged as one of South Australia’s leading practitioners 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 and Victoria which includes main road, high street and highway projects, the Adelaide Desalination Plant EIA, the Roseworthy Development Feasibility Study, the Palmer, Allendale and Barn Hill Windfarm Developments, numerous infrastructure developments undertaken by Electranet SA and visual assessment exercises pertaining to Development Applications lodged in a numerous Adelaide metropolitan and regional council areas.

Stuart’s particular expertise in undertaking visual assessments is highly sought after for the provision of expert evidence for the Environment, Resources and Development Court (SA).

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N/A	29.07.2019	Stuart Heseltine	Stuart Heseltine	29.07.2019	N/A	Bronte Nixon

APPENDIX L

PLANNING AND LAND USE ASSESSMENT



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**SNAPPER POINT
POWER STATION**

PLANNING AND LAND
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OCTOBER 2019

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Snapper Point Power Station Planning and Land Use Assessment

Port Adelaide Energy Pty Ltd

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02	16/10/2019	Revised final

	NAME	DATE	SIGNATURE
Prepared by:	Tenille Anderson	16/10/2019	
Reviewed by:	Bronte Nixon	16/10/2019	
Approved by:	Bronte Nixon	16/10/2019	

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ABBREVIATIONS

CT	Certificate of Title
DEM	Department for Energy and Mining
Development Act	<i>Development Act 1993</i>
Development Plan	Port Adelaide Enfield Council Development Plan
Development Regulations	Development Regulations 2008
Nexif	Nexif Energy Australia Pty Ltd
PDI Act	<i>Planning, Development and Infrastructure Act 2016</i>
SA Government	Government of South Australia
SCAP	State Commission Assessment Panel
The Project	Snapper Point Power Station

1 INTRODUCTION

1.1 SNAPPER POINT POWER STATION

The Snapper Point Power Station (the Project) involves the de-commissioning, relocation and re-commissioning of five (5) trailer-mounted GE TM2500 Gen 8 aero-derivative turbine generators, and ancillary infrastructure, from an existing site at Elizabeth in Adelaide's northern suburbs, to a new site adjacent to the Pelican Point Power Station at Outer Harbor. The turbines are currently operated by APR Energy on behalf of the Government of South Australia (SA Government or the State) for emergency electricity generation, as part of South Australia's emergency power plant project.

Port Adelaide Energy Pty Ltd (P A Energy P/L), an affiliate of Nexif Energy Australia Pty Ltd (Nexif Energy) has entered into an agreement with the SA Government to lease the turbines from the SA Government, and operate them for commercial use for a period of 25 years. As part of the Project, the turbines will be converted from diesel to natural gas as the primary fuel, with diesel to be used as back-up fuel.

1.1.1 PROPOSED INFRASTRUCTURE

This Development Application seeks Approval for the following key components:

- Five (5) GE TM2500 GEN8 generators, to be mounted on three (3) trailers, including; a generator trailer, control trailer, and turbine trailer.
- Three (3) 11.5 kV – 66 kV transformers.
- 275 kV overhead power line to ElectraNet switch yard including associated tower or gantry.
- One (1) 66 kV – 275 kV transformer.
- Associated 11 kV, 66 kV and 275 kV switchgear.
- Diesel fuel tanks with a storage capacity of up to 600 kL (final numbers to be finalised but is likely to be between 2-5 tanks).
- Water storage tanks with a storage capacity of up to 820 kL (final numbers to be finalised but is likely to be between 1-3 tanks).
- One (1) Osmoflo demineralised water systems and forwarding skids.
- Oily water tank with a storage capacity of up to 15 Kl (final numbers to be finalised).
- Storm Water Pond with a capacity of 3000m³.
- Control and Administration offices.
- Connecting pipes and cabling, racking and other storage, shipping containers (other than those that are hired), lifting frames, firefighting equipment, spill kits and eyewash stations.
- Terminal points including:
 - fuel supply, consisting of an inlet flange to the fuel storage system
 - telephone and internet connection to the closest Telstra node
 - water supply, consisting of an inlet flange to the off-loading system, and
 - power export, consisting of a connection point of the 66kV string bus to the termination gantry in the ElectraNet yard.
- Security fencing:
 - 3 m high security fence; consisting of 2.4 m high galvanized wire mesh fence topped with 0.6 m high razor wire
 - access gates; to be secured with padlocks.

- Earthworks:
 - 64,074 m³ of Waste Derived Fill will be imported from local resource companies, to raise the existing low ground level of site. This fill will be certified and in line with all EPA requirements
 - drainage for the facility will be installed to ensure there is no outflow into the Port Adelaide River. All process liquids will be contained. Containment will either be designed into equipment or equipment will be bunded in line with EPA guidelines
 - upgrades to existing access roads
 - a carparking area; suitable for 7–8 cars, with appropriate room for turnaround and reverse parking.

Accompanying preliminary drawings, including an Earthworks Plan; Drainage Layout Plan; Foundation Layout Plan; General Layout; Detail Layout; and Fence Detail are provided in Appendix A. Note that Nexif Energy request that that final detailed design for the Project is to be withheld as a reserved matter, to be satisfied prior to seeking assessment against the Building Rules.

1.2 PROJECT AREA

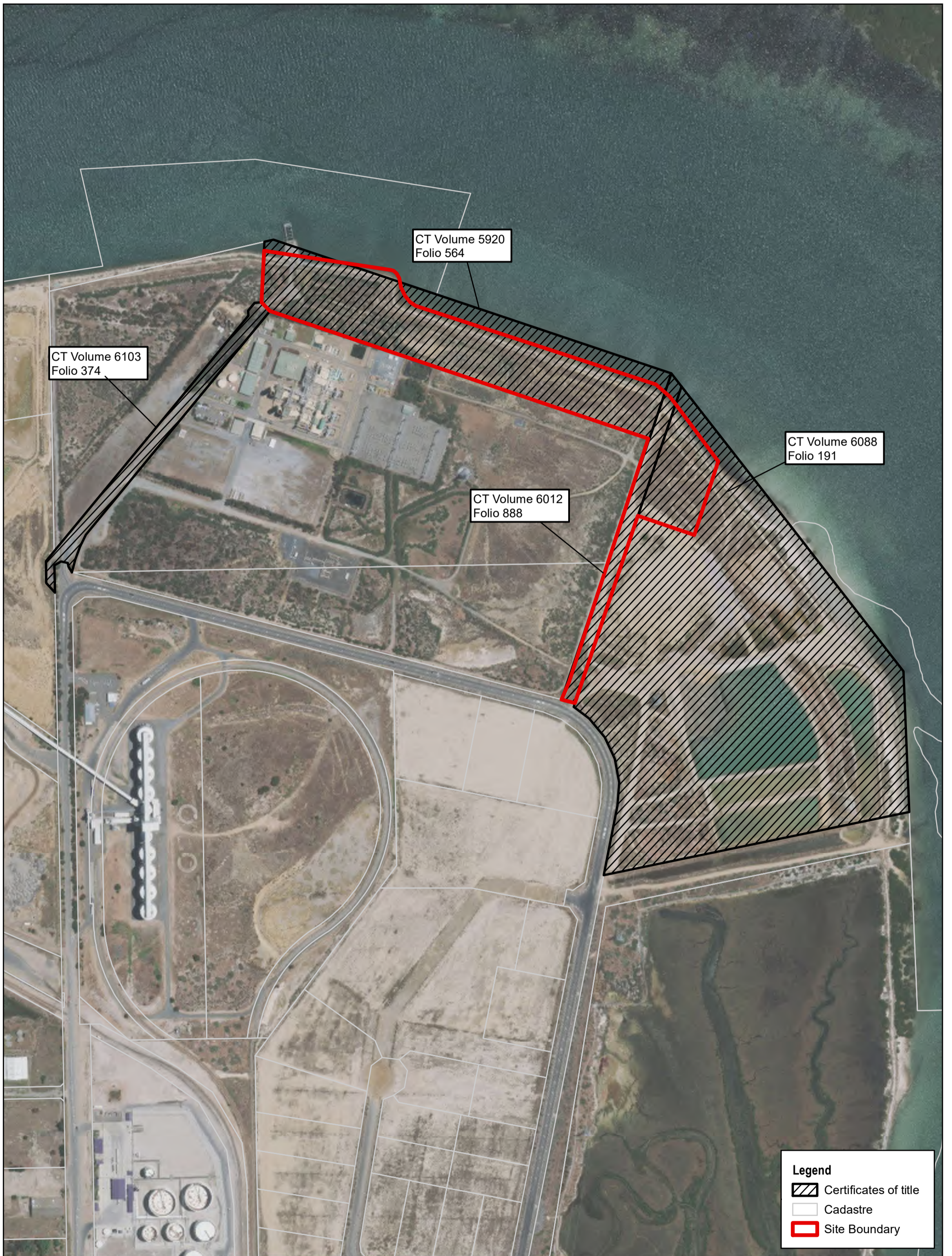
The Project site (the Site) will be located adjacent to the Pelican Point Power Station at Outer Harbor, approximately 20 km north of Adelaide. The land is owned by Renewal SA, and will be leased by Nexif Energy for this Project. The Site is situated between the coastal waters of the Port River and the Pelican Point Power Station, and is located within the City of Port Adelaide Enfield under the Industry Zone. The Site will be comprised of the following land parcels:


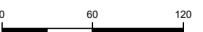

- a portion of allotment 205 of Deposited Plan 64682, in the Hundred of Port Adelaide – title reference Certificate of Title (CT) 5920/564
- a portion of allotment 502 of Deposited Plan 87145, in the Hundred of Port Adelaide – title reference CT 6088/191
- a portion of Allotment 27 of Deposited Plan 76309, in the Hundred of Port Adelaide – title reference CT 6012/888.

It is anticipated that an additional, existing site access road will be utilized for the Project. This is located on the following land parcel:

- Piece 152 of Deposited Plan 88633, in the Hundred of Port Adelaide – title reference CT 6103/374.

Connecting infrastructure, including a gas pipe line and 275 kV overhead cable, will connect the Project to an existing substation and gas yard located at the Pelican Point Power Station to the south of the Site.



Map: PS114349_GIS_008_A3	Author: MO		 1:5,000		Snapper Point Gas Turbine Peaker Project Figure 1.1 Certificates of Title
Date: 30/09/2019	Approved by:				
<small>Data source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</small>			<small>Coordinate system: GDA 1994 MGA Zone 54 Scale ratio correct when printed at A3</small>		
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1.3 OBJECTIVES

The key objectives of this technical assessment are to:

- assess the Project against the relevant provisions of the *Development Act 1993*, the Development Regulations 2008 and the Port Adelaide Enfield Council Development Plan
- support the development approval pathway for the Project. Nexif Energy are seeking Approval from the State Commission Assessment Panel (SCAP) under Section 49 of the Development Act; having secured crown sponsorship from the Department for Energy and Mining (DEM).

1.4 LEGISLATIVE AND POLICY REQUIREMENTS

The following legislation and policy will be relevant to the planning and land use assessment of the proposed Project:

- *Development Act 1993* (the Development Act). Note that the functions of the Development Act are currently transitioning to the new *Planning, Development and Infrastructure Act 2016* (PDI Act). The PDI Act is being introduced across the State in a staged approach, with assessment pathways in metropolitan council areas planned to be transitioned to the PDI Act in mid-2020. At the time of writing this report, the Development Act remains the relevant planning legislation for the assessment of this Project.
- Development Regulations 2008 (the Development Regulations).
- The Port Adelaide Enfield Council Development Plan (the Development Plan): Consolidated 6 February 2018 – current at the time of writing this report.

1.5 ASSESSMENT METHODOLOGY

This planning and land use assessment has been informed by the following:

- ongoing consultation with the Nexif Energy
- attending a meeting held between Simon Neldner of Department of Planning, Transport and Infrastructure (DPTI) and Bronte Nixon and Tenille Anderson of WSP; at the offices of DPTI on Flinders Street, Adelaide on Wednesday 24 July 2019
- review of project documentation and plans, as supplied by Nexif Energy
- review of impacts and mitigation measures raised in technical assessments undertaken to support the greater Development Application Report for the Project
- assessment of the Project against the relevant objectives and principles of development control of the Port Adelaide Enfield Council Development plan: consolidated 6 February 2018.

1.5.1 STUDY AREA

The study area of this assessment consists of the Project site, as described in Section 1.2.

In reference to the locality, the study area has considered the mid and northern portion of the Lefevre Peninsula between Taperoo and Outer Harbor, the Barker Inlet, and the northern bend of the Port River and eastern Torrens Island.

1.5.2 ASSUMPTIONS AND CONSTRAINTS

This assessment has been undertaken on the assumption of the relevance of the above mentioned legislation and policy at the time of completion of this report, and has relied on the accuracy of information provided by the Nexif Energy.

2 STRATEGIC CONTEXT

2.1 THE PLANNING STRATEGY FOR SOUTH AUSTRALIA

The Planning Strategy for South Australia (the Planning Strategy) guides land use and development across the State. The Planning Strategy is presented across eight volumes, each covering a distinct geographical region. The Planning Strategy has been developed to guide the formulation of Development Plans for local areas, and as such, can provide an indication of the envisaged land use and development for a region. The relevant volume of the Planning Strategy for this Project is the 30-Year Plan for Greater Adelaide (2017 update) (the 30-Year Plan).

The 30-Year Plan has a strong focus on creating liveable neighbourhoods, and protecting biodiversity and natural resources. Through providing a reliable, low emissions source of energy, in a responsible and efficient manner, the Project will support the following key policies of the 30-Year Plan:

- *Policy 82: Coordinate and link strategic infrastructure across Greater Adelaide to ensure it meets the needs of a growing population with a changing demographic profile and supports a more productive economy.*
 - *Policy 118: Minimise risk to people, property and the environment from exposure to hazards (including bushfire, terrestrial and coastal flooding, erosion, dune drift and acid sulphate soils) by designing and planning for development in accordance with a risk hierarchy of avoidance, adaptation and protection.*
-

2.2 SOUTH AUSTRALIA'S CLIMATE CHANGE STRATEGY 2015–2050

South Australia's Climate Change Strategy 2015–2050 (the Climate Change Strategy) sets out South Australia's framework and initiatives to meet the targets established under the *Climate Change and Greenhouse Emissions Reduction Act 2007 (SA)*. It is intended that the Project will operate primarily on natural gas. As discussed within this Climate Change Strategy, natural gas emits approximately half of the greenhouse gas emissions as coal, and has the capability to respond quickly to changes in energy demand. As such, the Project provides a low emissions complimentary energy source to support fully renewable technology, to provide a sustainable, reliable, and low emissions energy system.

This project will support two of the five targets set out in the document:

- *achieve net zero emissions by 2050*
- *generate 50% of our electricity from renewable sources by 2025.*

3 PLANNING ASSESSMENT

3.1 DEVELOPMENT APPROVAL PATHWAY

The Development Act requires that Development Approval must be sought and obtained prior to undertaking any activity constituting ‘development’ under the Act. Under Section 4 of the Act, the definition of ‘development’ includes, but is not limited to, ‘building work’ or ‘a change in land use’. As such, the Project requires development Approval under the act.

The Project will be connected to the State’s power system for the sale of electricity to the public and therefore falls under the definition of ‘public infrastructure’ as per Section 49(1)(a) of the Development Act:

‘the infrastructure, equipment, structures, works and other facilities used in or in connection with the supply of water or electricity, gas or other forms of energy, or the drainage or treatment of waste water or sewage’

The Project sought Crown Sponsorship from a State Agency, being DEM, in order to allow lodgement of the Development Application under Section 49(2)(c) of the Development Act:

Subject to this section, if... a person proposes to undertake development initiated or supported by a State agency for the purposes of the provision of public infrastructure and specifically endorsed by the State agency for the purposes of this section... the State agency must lodge an application for approval containing prescribed particulars with the Development Assessment Commission.

Crown Sponsorship was received on 10 September 2019. The sponsorship letter from DEM has been provide in Appendix B.

3.2 EXISTING CONDITIONS

The Project site is located within the Industry Zone and Ports Policy Area 12, under the Port Adelaide Enfield Council Development Plan. The land is currently vacant and mostly undeveloped.

At the time of undertaking this assessment, the relevant Development Plan is the Port Adelaide Enfield Council Development Plan – Consolidated 6 February 2018.

3.3 DEVELOPMENT PLAN ASSESSMENT

3.3.1 CATEGORY

Under the procedural matters of the Industry Zone, electricity generators and infrastructure are neither listed as complying or non-complying, therefore the project must be assessed on its merits against the relevant objectives and principles of development control under the Development Plan.

3.3.2 PUBLIC NOTIFICATION

It can be noted that under the procedural matters of the Industry Zone, all types development within the Ports Policy Area 12 that are not assigned a Category 1 public notification level, default to Category 2.

However, given that the Project is to be lodged under Section 49 of the Development Act, the public notification provisions relating to Crown development and public infrastructure, as prescribed under Section 49(7d) of the Development Act, are applicable to the project:

(7d) If an application is for a development that involves construction work where the total amount to be applied to the work will, when all stages are completed, exceed \$4 000 000, other than an application for a variation to an approved development that, in the opinion of the Development Assessment Commission, is of a minor nature, the Development Assessment Commission must—

(a) by public advertisement, invite interested persons to make written submissions to it on the proposal within a period of at least 15 business days; and

(b) allow a person who has made a written submission to it within that period and who, as part of that submission, has indicated an interest in appearing before it, a reasonable opportunity to appear personally or by representative before the Development Assessment Commission to be heard in support of his or her submission; and

(c) give due consideration in its assessment of the application to any submissions made by interested persons as referred to in paragraph (a) or (b).

3.3.3 POLICY ASSESSMENT

The Industry Zone seeks to accommodate primarily industrial, warehouse storage and transport land uses, while protecting development, both existing and future, from sea level rise and inundation by sea and storm water. The Project, consisting of electricity infrastructure, is not explicitly envisaged under the Zone nor is it listed as non-complying. With appropriate mitigation and management of environmental impacts, including protection from sea level rise and inundation, the Project will be compatible with the adjacent infrastructure land use and surrounding industrial development.

The Ports Policy Area 12 envisages that waterfront land will accommodate immediate and long term port activities, that will not adversely affect the ongoing strategic and economic function of the port area; being one of South Australia major import/export facilities. As such, it is specified that land uses that do not rely upon direct water frontage should be located inland. The allotment comprising the Project Site is located adjacent to the water front; however, project infrastructure is proposed to be oriented away from the water front towards the south boundary of the Site. It should also be noted that a barge mounted project was previously considered for the site, however site investigations determined that that site would be generally unsuitable for the project. While the siting of the Project is not explicitly supported by the relevant Policy Area, it is reasoned that the selected site for the Project is justified given the proximity and accessibility to electrical and gas connection, and that impacts to the water front will be managed by appropriately siting infrastructure in on Site away from the water front and managing environmental so as not to impact nearby port activities. Further, engagement with the City of Port Adelaide Enfield has been undertaken. The Council raised no issues regarding the location.

An analysis of the Project against the relevant provisions of the Port Adelaide Enfield Council Development Plan – consolidated 6 February 2018 is provided below in Table 3.1, Table 3.2 and Table 3.3.

Table 3.1 Assessment against the relevant provisions of the Ports Policy Area 12

PORTS POLICY AREA 12	COMMENT
<p>Land use Objectives 1-3 PDCs 1, 2</p>	<p>The Ports Policy Area 12 envisages land use that promotes the long-term growth of the port, and the accommodation of port dependent activities. Under the policy area, waterfront land should only be developed for activities that rely on direct waterfront access.</p> <p>The Project, consisting of an electricity generator, does not rely on waterfront access. However, the location of the Project is strategic in that the Site allows access to other resources that the Project is directly dependent on, and that are not readily available in other locations. Primarily, this relates to the ability to connect to the nearby gas yard and electricity substation.</p> <p>Furthermore, a barge mounted project was previously considered for the site, however site investigations determined that that site would be generally unsuitable for the project.</p>
<p>Form and character PDCs 5, 7</p>	<p>While the Project is not explicitly desired under the Policy Area, the Project will be consistent and compatible with land use activities in the immediate area. Furthermore, the project will be located on the terrestrial portion of the site, and will not interfere with any port activities. Environmental impacts that could potentially impact surrounding land uses will be investigated under a series of technical studies, to provide appropriate management and mitigation measures.</p>

Table 3.2 Assessment against the relevant provisions of the Industry Zone

INDUSTRY ZONE	COMMENT
<p>Land use Objective 1 PDC 1</p>	<p>The Industry Zone promotes a range of land uses, including industrial, warehouse, storage and transport. The Project, constituting infrastructure, is not explicitly envisaged under the Zone, however is consistent with adjacent and surrounding land uses; which include power stations, berths, and transmission lines. It is suggested that infrastructure is appropriately located within in the Industrial Zone, given that environmental impacts (such as noise and air emissions, and visual amenity impacts), are often similar to those exhibited by industrial land uses, and can be appropriately buffered from more sensitive zoning.</p>
<p>Form and character Objective 4 PDCs 3, 4, 6</p>	<p>The Project is consistent with surrounding land uses, and does not constitute a sensitive land use that would impact on industry in the area.</p> <p>The Site is low-lying and located adjacent to the coast. Consultation has been undertaken with the Coast Protection Board, who has advised on site levels required to protect infrastructure from inundation. Additionally, a stormwater investigation has been undertaken to provide recommendations for design. A study into acid sulfate soils has also been undertaken, to identify the likelihood of the presence of acid sulfate soils in the area, in order to protect the surrounding environment from possible disturbance during construction.</p> <p>The Project site is primarily located behind the existing Pelican Point Power Station, well away from the nearest publicly accessible road. Project infrastructure will predominantly be setback greater than 400 m from this road.</p> <p>The Project will involve fuel burning and will result in both noise and air emissions. Unless otherwise managed, these emissions have the potential to cause environmental nuisance. An acoustic assessment has been undertaken for the Project, and has identified that the Project has potential to exceed EPA requirements for noise at the nearest sensitive receivers (within the Residential Zone at North Haven), but that exceedances can be mitigated through the installation of silencers. Air emissions are being investigated through air modelling. Consultation has been undertaken with the EPA, and an EPA Licence for the Project will be sought.</p>

INDUSTRY ZONE	COMMENT
<p>Flooding and sea level rise Objectives 2, 3</p>	<p>Consultation has been undertaken with the Coast Protection Board (CPB) to discuss relevant impacts of the Project on the coastal environment, as well as potential impacts on the Project from inundation and sea level rise. The CPB provided the following policy requirements for site and floor levels:</p> <ul style="list-style-type: none"> — site level of 3.30 mAHD — finished floor level of 3.55 mAHD — mechanical and electrical equipment should be raised to a floor level of 3.55 mAHD. <p>Furthermore, it is understood that that Council requires a site level of 0.3 m minimum above standard sea-flood risk level and building floor levels 0.55 m minimum above standard sea-flood risk level; to protect against the standard sea-flood risk level and to allow a land subsidence to the year 2100.</p> <p>A stormwater, drainage and erosion assessment was undertaken for the Project, and has recommended that the CPB levels are to be adhered to. Furthermore, the assessment has recommended a number of management and mitigation measures that should be implemented throughout the design, construction, operation and decommissioning of the Project.</p>

Table 3.3 Assessment against the relevant provisions of the Council Wide section of the Development Plan

COUNCIL WIDE	COMMENT
<p>Coastal areas Objectives 2, 5, 6, PDCs 1-6, 8, 20, 21, 23, 25, 27, 33</p>	<p>The Project will be located on terrestrial land, within 100 m of the mean high water mark. As such, and as per Schedule 8 of the Development Regulation, the Project site is located on ‘coastal land’.</p> <p>Project infrastructure will be located greater than 10 m from the mean high water mark. Consultation has been undertaken with the CPB, who have recommended minimum floor levels to protect infrastructure from coastal hazards. A flooding, drainage and erosion assessment has been undertaken for the Project, and has made additional recommendations on management and mitigation measures that should be implemented.</p> <p>The Project site will be located in a highly industrialised area, which is highly modified from a natural coastal environment. The siting of the Project will be informed by a series of studies to ensure that impacts to the surrounding environment, including erosion and fauna and flora, can be minimised and managed.</p> <p>The Project site is within an enclosed, industrialised area to the north of Pelican Point Road. The Site is fenced off from public areas and does not promote public access to the waterfront. As such, it is considered that public access to the coast, in this particular location, is generally inappropriate.</p> <p>An existing breakwater is present along the north boundary of the Project site. Proposed infrastructure will be located greater than 10 m from this breakwater, and will not extend into the coastal environment. An existing unsealed track, approximately 8 m from this breakwater, will be upgraded.</p> <p>The Project site will be accessible from Pelican Point Road by two access roads; one being an existing sealed road to the west of the Site which is suitable for emergency services access, and the other being an unsealed road to the east of the site.</p>
<p>Crime prevention PDCs 5, 7</p>	<p>The Site will be located behind the existing Pelican Point Power Station, in an enclosed area that is fenced off from public access. Access to the Site will be clearly defined by fencing and signage.</p> <p>Lighting is proposed, and will be addressed in the detailed design stage.</p>

COUNCIL WIDE	COMMENT
<p>Hazards</p> <p>Objectives 2, 4, 7, 9, 10</p> <p>PDCs 1, 3, 4, 5, 6, 7, 8, 9, 17, 20, 21, 22, 24, 25, 26, 27, 28, 29</p>	<p>Project infrastructure will be located greater than 10 m from the mean high water mark, beyond an existing breakwater. Consultation has been undertaken with the CPB, who have provided recommendations for the minimum levels that should be complied with in order to protect Project infrastructure from coastal hazards.</p> <p>The Site is mapped as has having a low probability of Acid Sulfate Soils. However, given the proximity of the site to the coastal environment, a Preliminary Site Investigation undertaken for the Project recommended that consideration should be given to the potential occurrence during excavation works; particularly as a high probability area is mapped as occurring approximately 300 m away at Mutton Cove.</p> <p>The site is not located within a high bushfire risk area. Firefighting equipment will be kept on-site and suitable access for emergency services vehicles will be provided to the Site via an existing access road.</p> <p>Spill kits and eyewash stations will be provided on site, to minimise the risk from hazardous materials to people and property. Fuel storage tanks will be appropriately bunded.</p>
<p>Infrastructure</p> <p>Objectives 1, 4, 5</p> <p>PDC 8</p>	<p>The siting of the Project will allow for the utilisation of existing gas and electricity infrastructure, which will both ensure that the Project is developed in a cost-efficient manner, and promote efficiency whereby transmission losses over long distances of transmission lines are minimised.</p> <p>A Landscape Character and Visual Considerations assessment, undertaken for the Project, identified that when viewed from the nearby Pelican Point Road, or Mutton Cove Conservation Park (having been identified as a potential sensitive receptor), infrastructure associated with the Project would mostly be concealed behind existing vegetation.</p>
<p>Interface between land uses</p> <p>Objectives 1, 2, 3</p> <p>PDCs 1, 2, 7, 8, 11</p>	<p>The Project will be located within the Industrial Zone, away from conflicting, sensitive land uses. The Project is approximately 2 km from the nearest Residential Zone.</p> <p>Environmental impacts, which have the potential to cause adverse impact on community health, have been addressed under specialist technical assessments. An acoustic assessment identified that whilst the Project has the potential to exceed EPA requirements for noise at sensitive receivers in the area, noise requirements can be met through appropriate mitigation measures. An air quality overview was undertaken, and provided recommendation to manage potential air quality impact during construction. It was recommended that during operation, the turbines should be maintained in accordance with the manufacturers specifications with regular testing and scheduled regular maintenance. An air modelling will be undertaken.</p>
<p>Landscaping, fences and walls</p> <p>PDCs 4, 5, 9, 10</p>	<p>The Project design will aim to existing vegetation, where practical.</p> <p>The proposed wire mesh fence will be comparable to existing fencing on adjacent sites, and will allow cross ventilation.</p>

COUNCIL WIDE	COMMENT
<p>Natural resources Objectives 6, 10 PDCs 1, 5, 8, 9, 10, 11, 12</p>	<p>A portion of the Site is covered by native coastal saltmarsh, with additional areas covered by native woodland and scrubland species, as identified by an ecological assessment undertaken for the Site. The Project design will aim minimise clearance of existing vegetation, where practical.</p> <p>Key natural resources in proximity to the project include native fauna and flora and marine waterways. Furthermore, the Adelaide Dolphin Sanctuary is located adjacent to the site. Recommendations made during consultation with the CPB, and through the outcomes of technical studies, should be incorporated into the Project design, to ensure that potential impact to natural resources are mitigated and managed.</p>
<p>Siting and Visibility Objective 1 PDCs 1 and 6</p>	<p>The locality of the Site is a highly industrialised and modified from a natural coastal environment. A Landscape Character and Visual Considerations assessment was undertaken for the Site, and recommended that the Project would not have irreparable consequences for the visual amenity of the locality. It was recommended that Project infrastructure would mostly be obscured from view by existing vegetation.</p>
<p>Transportation and Access Council Wide Objective 2 PDCs 13, 30, 31, 37 and 38</p>	<p>The Site is located off Pelican Point Road, which is a two-lane, undivided local access road. The road provides access to major industrial/commercial and defence land uses in the area.</p> <p>The Site can be accessed via two access points along Pelican Point road. One being an all-weather access road to the west of the Site, and the other being an existing unsealed track to the east of the Site (which will be assessable for construction only). The fenced site area is accessible from an unsealed track to the north; which will be upgraded to minimum DRT standards. A road dilapidation report will be prepared for site assess north of the Pelican Point Power Station. Suitable site access for emergency services is provided via the western access road.</p> <p>The Project will provide off street car parking for 7-8 vehicles.</p> <p>A Traffic Impact Statement has been undertaken for the Project and has provided recommendations on minimising and eliminating potential traffic impacts that might arise during and after construction of the Project.</p>

4 SUMMARY AND RECOMMENDATIONS

In assessing the proposed Project against the relevant provisions of the Port Adelaide Enfield Council Development Plan (consolidated 6 February 2018), it is recommended that the Project is generally consistent with the relevant policy provisions of the Development Plan and that the Project warrants the granting of Development Approval.

BIBLIOGRAPHY

Department of Planning, Transport and Infrastructure (2017), *The 30-Year Plan for Greater Adelaide 2017 Update*, Government of South Australia, Adelaide.

Development Act 1993 (SA).

Development Regulations 2008.

Government of South Australia (n.d.), South Australia's Climate Change Strategy 2015 – 2050, Government of South Australia.

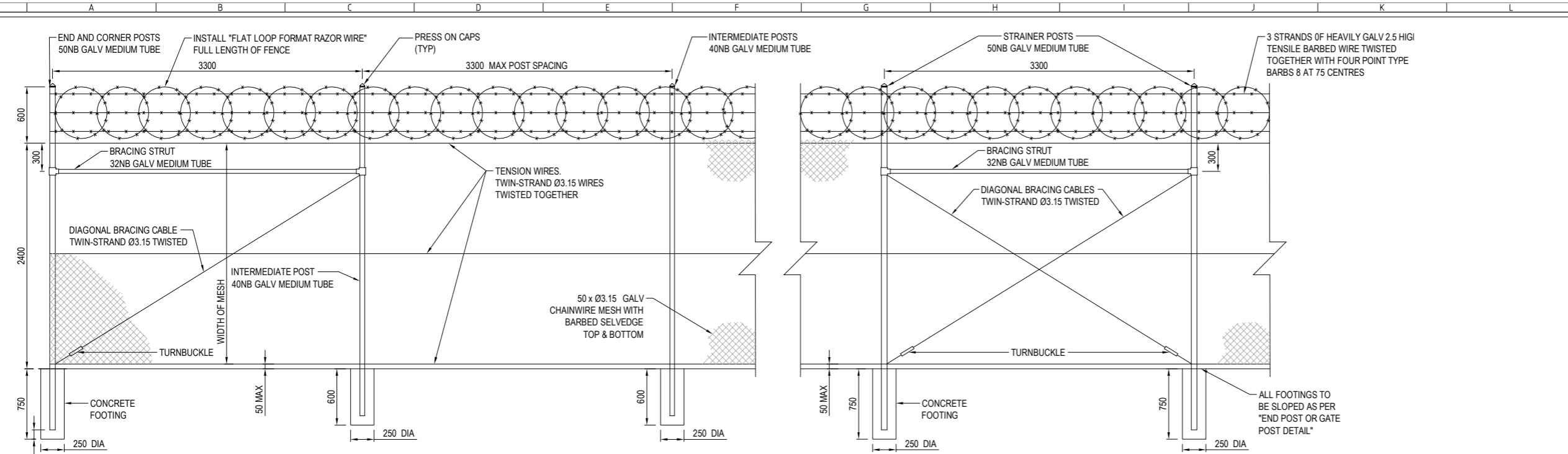
Planning, Development and Infrastructure Act 2016 (SA).

Port Adelaide Enfield Council Development Plan – Consolidated 6 February 2018.

APPENDIX A

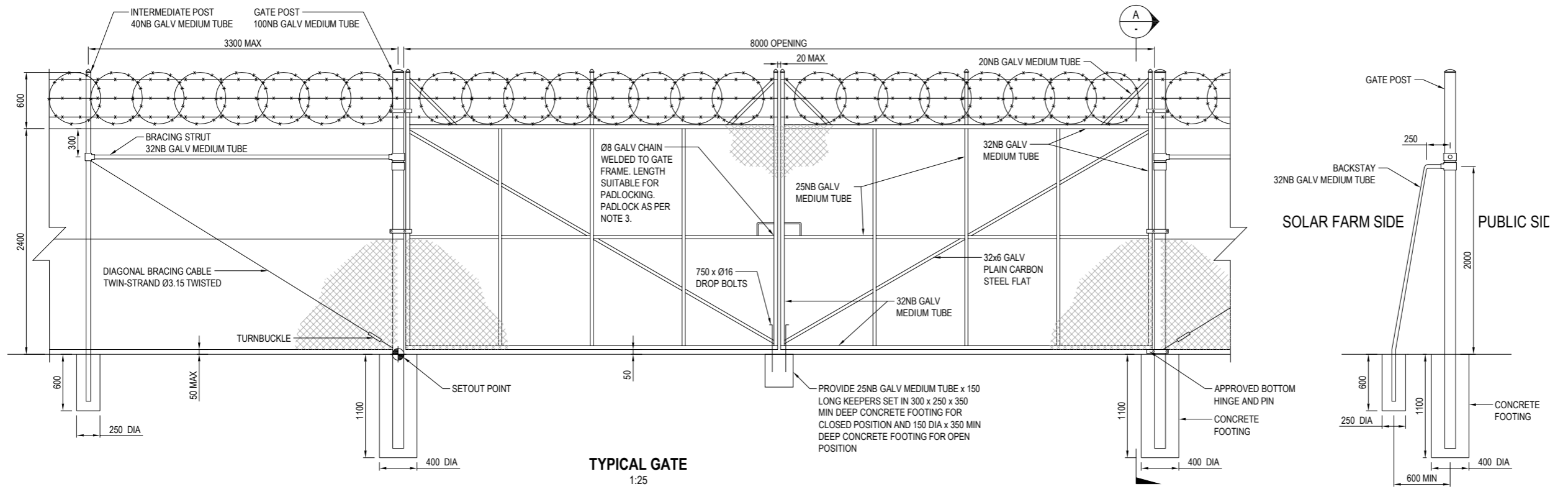
PRELIMINARY DESIGN DRAWINGS



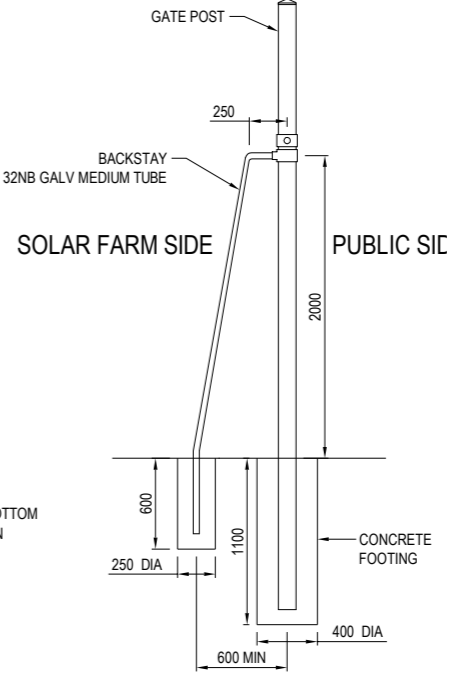


(AT ALL CHANGES IN DIRECTION AND ADJACENT ALL GATES)
TYPICAL END & CORNER BRACED PANEL

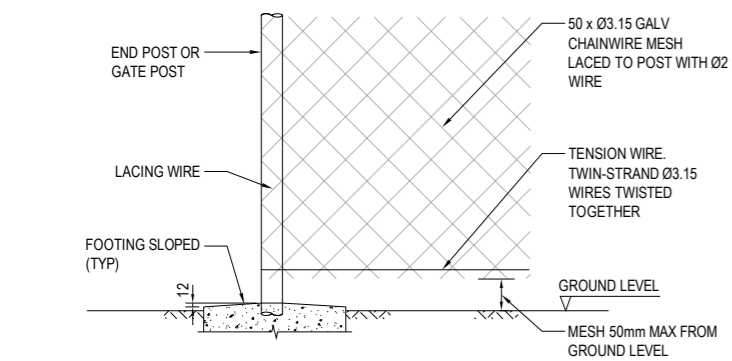
(LOCATED AT 150m MAXIMUM INTERVALS ON STRAIGHT LENGTHS)
TYPICAL INTERMEDIATE BRACED PANEL



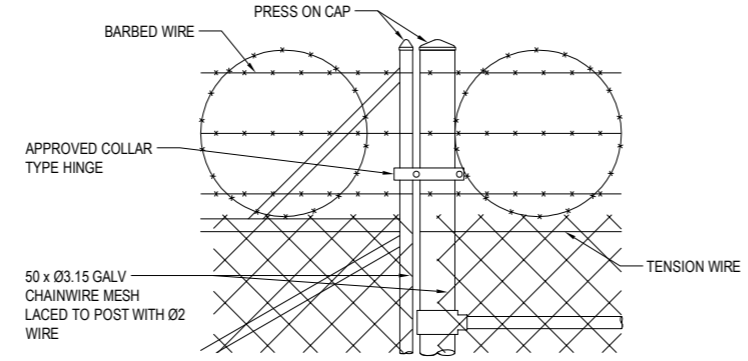
TYPICAL GATE
 1:25



SECTION A
 1:25



END POST OR GATE POST DETAIL



GATE DETAIL



PRELIMINARY ONLY
 NOT FOR CONSTRUCTION

GENERAL NOTES

- DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.
- PROVIDE SL2 RATED PADLOCK, WITH A RESTRICTED KEYING SYSTEM, FOR ALL VEHICLE GATES.

DOC. REF. NO.	TITLE
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REFERENCE DOCUMENT	
REV	DESCRIPTION

REVISION		
DATE	ISSUED FOR	DESCRIPTION

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CHECKED BY	CHECKED BY	PROJECT MGR
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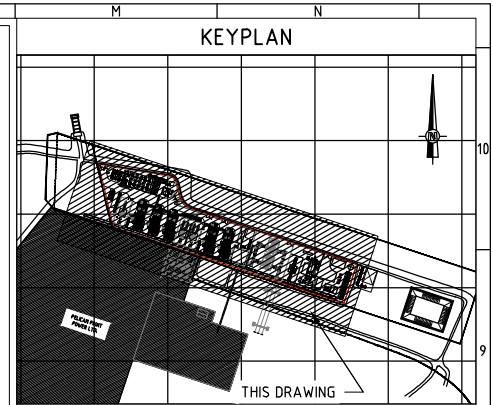
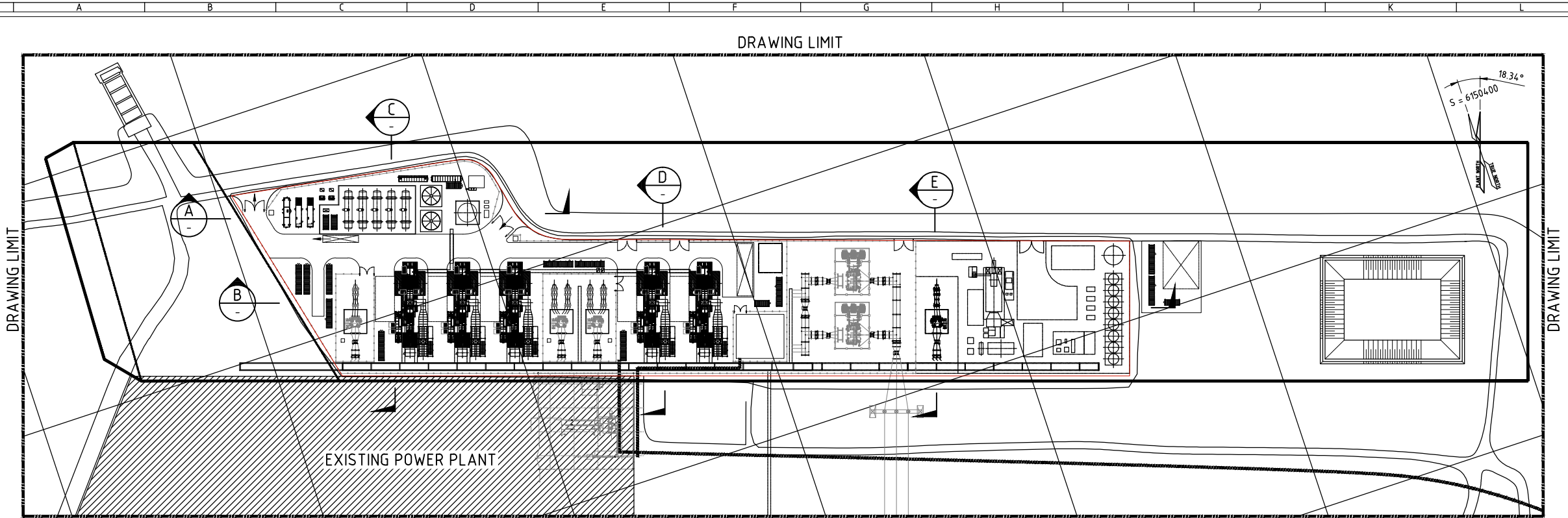
Emanden Technical Solutions Pty Ltd RESINDO RESOURCES & ENERGY

NEXIF TM2500 PEAKER PROJEC
 (5) GAS TURBINE, 66kV, 50Hz
 FENCE DETAIL
 STANDARD DRAWING

APPROVALS	DATE	SCALE	SIZE
Eng Appr.		AS SHOWN	A1
Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-C-XXXX_X	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-C-XXXX		A
CLIENT DWG NO	XXXX-XX-XX-XX-XXX		

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Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\02 Civil\5053-DWG-C-0001_F_CUT and FILL.dwg Oct 11, 2019 - 7:24am YTejama PCCAD-0037



- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 3. STRIPPING SOIL FOR REMOVING ORGANICS
 - AT DRY SURFACE = 30-40cm
 - AT SWAMPY AREA / WET LAND = 1.5m
 4. DATUM BASED ON DOC. PRELIMINARY HYDROLOGY AND FLOOD RISK ASSESSMENT

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

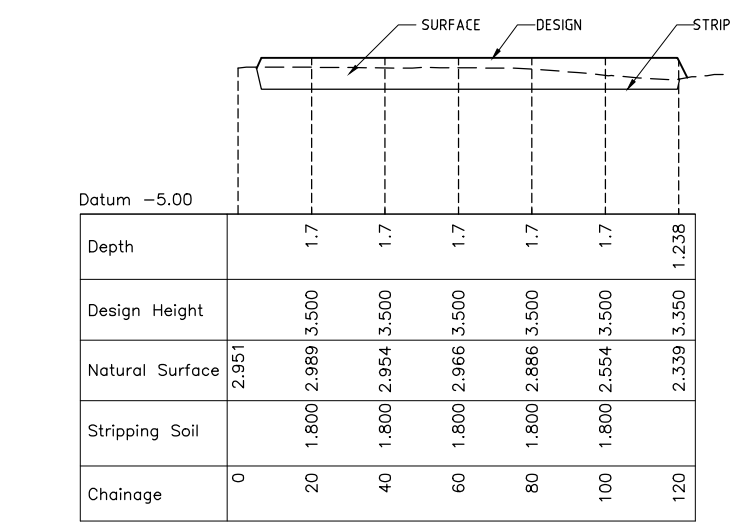
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P0007-05-CEW-61-003	DRAINAGE LAYOUT
P0007-05-GGA-00-002	DETAIL LAYOUT
P0007-05-GGA-00-001	OVERALL LAYOUT

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REV	DATE	DESCRIPTION
F	11/10/19	ISSUED FOR APPROVAL - GENERAL REVISION
E	19/09/19	RE-ISSUED FOR APPROVAL
D	13/09/19	ISSUED FOR APPROVAL
C	29/08/19	ISSUED FOR APPROVAL
B	19/08/19	ISSUED FOR CLIENT REVIEW
A	16/08/19	ISSUED FOR INTERNAL REVIEW

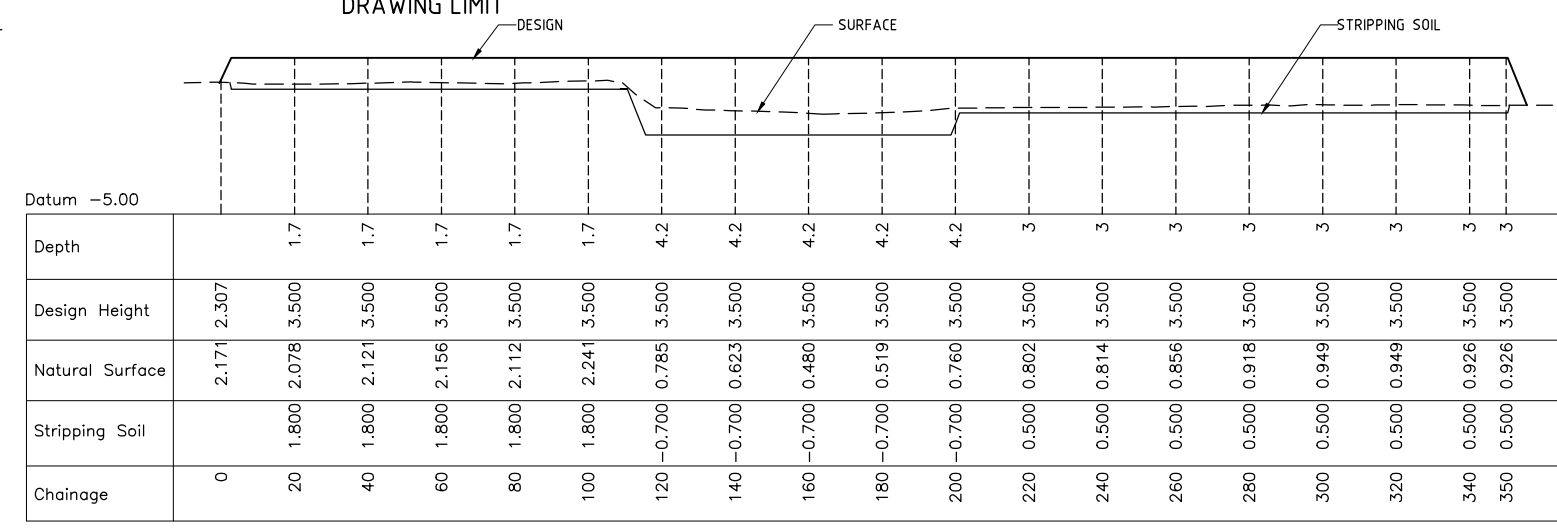
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CHECKED BY	CHECKED BY	PROJECT MGR
RPO	TAS	SBI



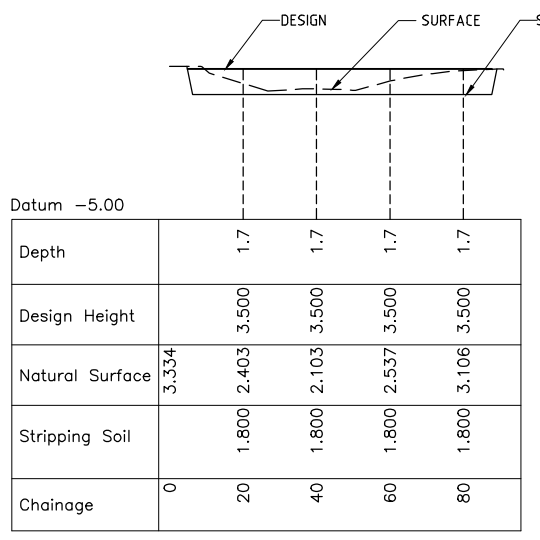
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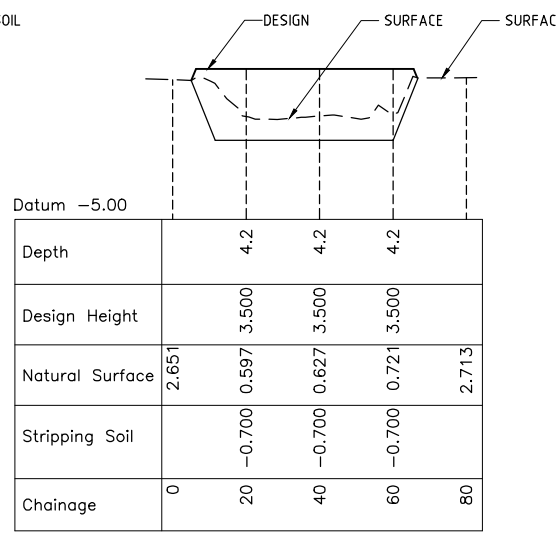
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Vert. 1:200



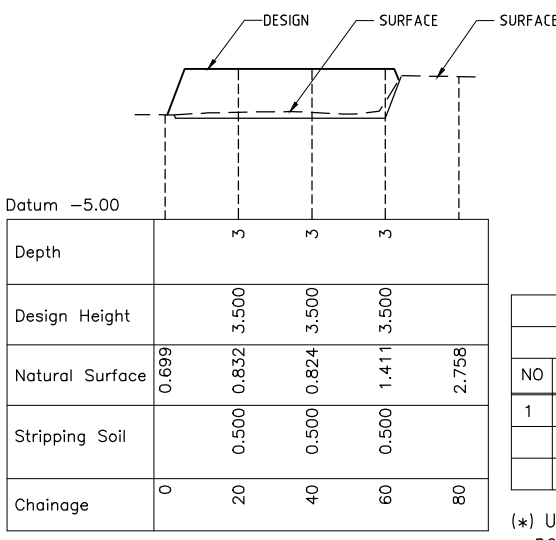
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Vert. 1:200



SECTION C
Horiz. 1:1000
Vert. 1:200



SECTION D
Horiz. 1:1000
Vert. 1:200



SECTION E
Horiz. 1:1000
Vert. 1:200

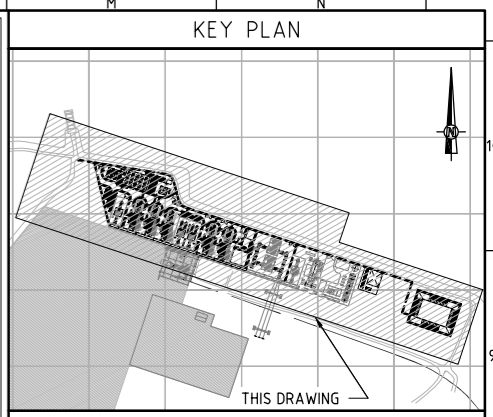
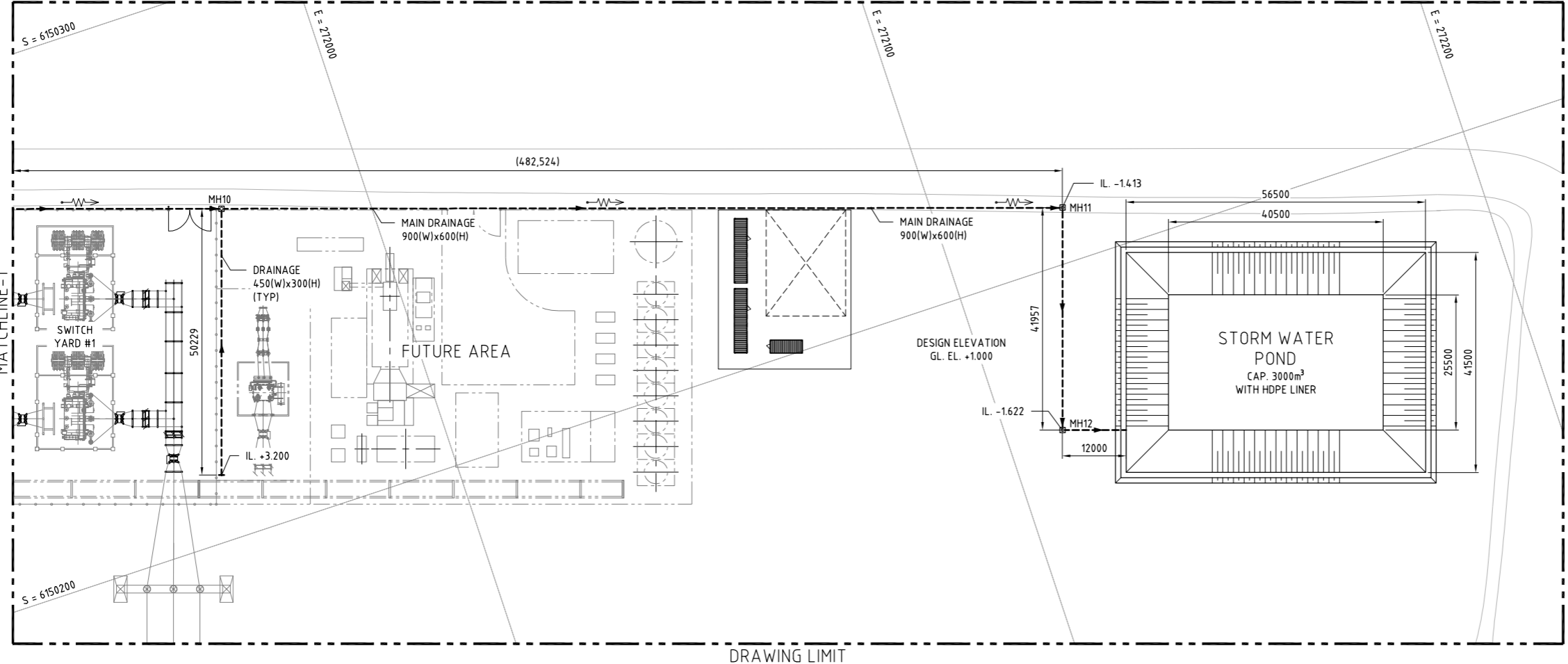
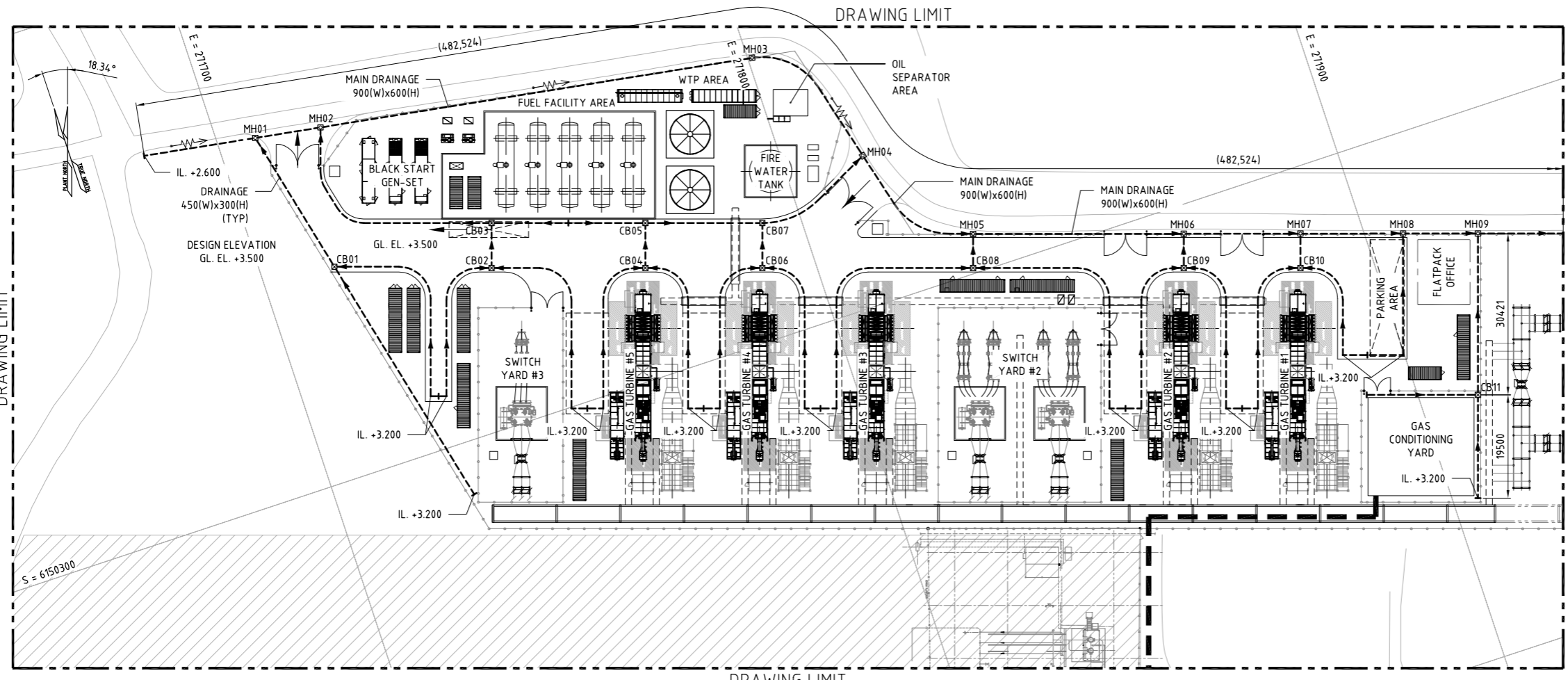
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1	PLANT AREA	22,871	20,524 (*)	64,074	64,074
SUB TOTAL				64,074	64,074

(*) UN-USED SOIL (ORGANICS CONTENT)
- POND CUT AND FILL IS NOT INCLUDED IN THE ABOVE CALCULATION



NEXIF TM2500 PEAKER PROJEC (5) GAS TURBINE, 66kV, 50Hz EARTH WORKS CUT AND FILL			
APPROVALS	DATE	SCALE	SIZE
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Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-C-0001_F	
PROJECT NUMBER	5053	REV	
RESINDO DWG NO	5053-DWG-C-0001		
CLIENT DWG NO	P0007-05-CEW-61-001		

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- GENERAL NOTES**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
 2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.
 3. MAIN DRAINAGE USE PRECAST U-DITCH.
 4. OPEN DITCH DEEPER THAN 500mm SHALL BE COVERED WITH GRATING.
 5. HEAVY DUTY U-DITCH WITH CONCRETE COVER SHALL BE USED FOR CROSSING.
 6. DRAINAGE SLOPE 0.5% U.N.O.

- LEGEND :**
- - - - - = DRAINAGE LINE
 - IL. = INVERT LEVEL
 - ☒ CB01 = CONTROL BOX
 - ☒ MH01 = MANHOLE BOX

DOC. REF. NO.	TITLE
P0007-05-GGA-00-002	DETAIL LAYOUT
P0007-05-GGA-00-001	OVERALL LAYOUT

REFERENCE DOCUMENT

REV	DATE	DESCRIPTION
E	10/10/19	ISSUED FOR APPROVAL - GENERAL REVISION
D	19/09/19	RE-ISSUED FOR APPROVAL
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A	13/08/19	ISSUED FOR INTERNAL REVIEW

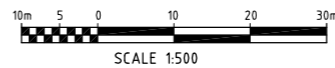
REVISION

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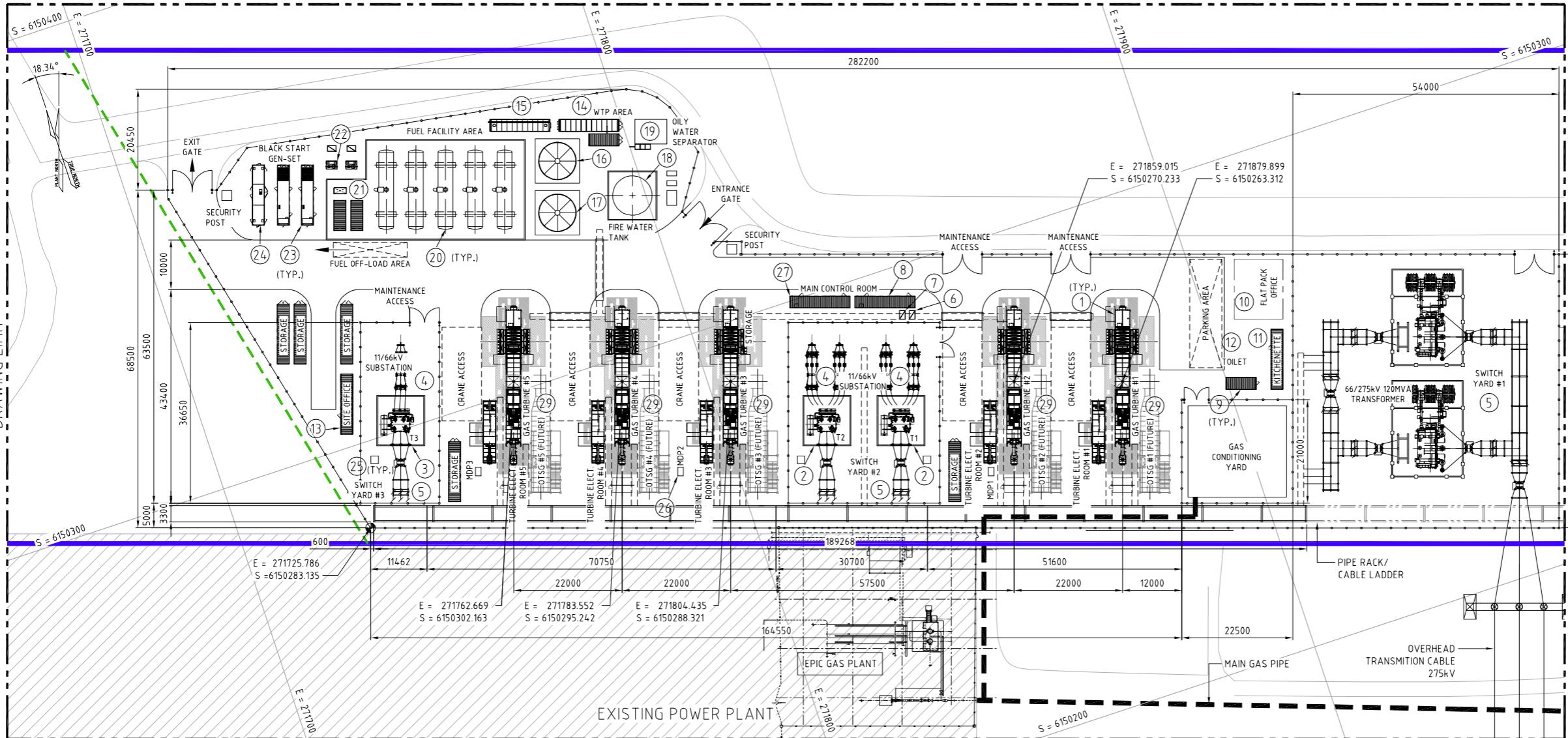
**NEXIF TM2500 PEAKER PROJEC
(5) GAS TURBINE, 66kV, 50Hz
DRAINAGE LAYOUT
PLAN**

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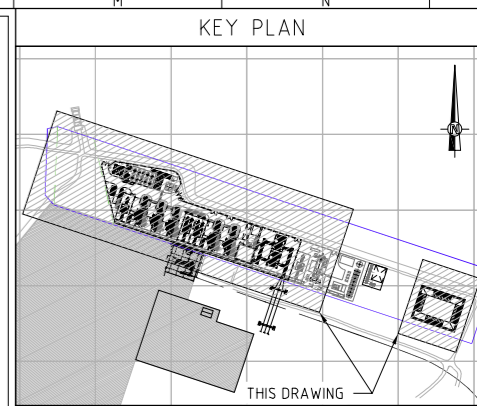
PRELIMINARY ONLY
NOT FOR CONSTRUCTION

DRAWING LIMIT



DRAWING LIMIT

(5) GAS TURBINE, 66kV, 50Hz DETAIL



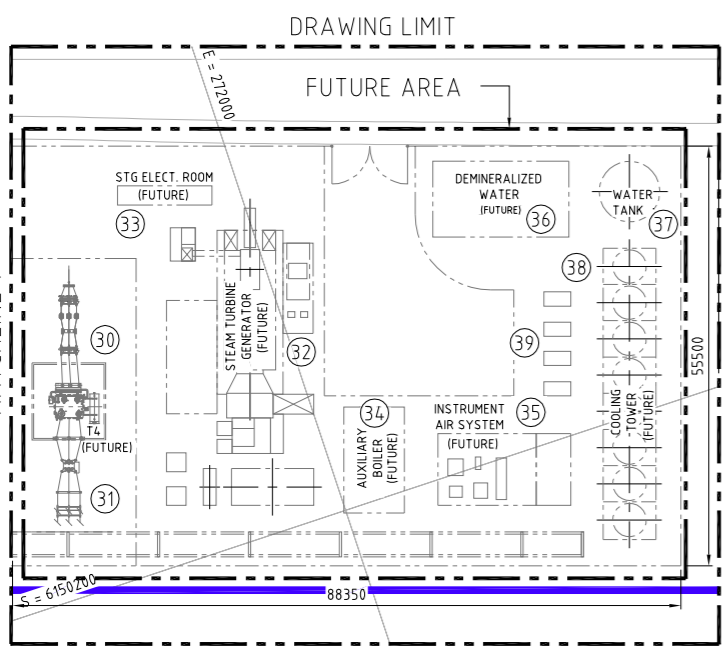
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2. ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE NOTED.

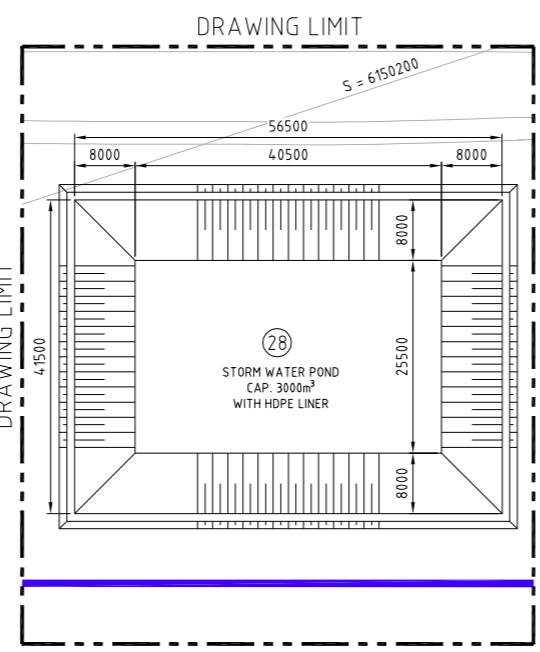
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E	30/09/19	ISSUED FOR APPROVAL - 66kV BUSCOUPLER SYSTEM UPDATE
D	27/09/19	RE-ISSUED FOR APPROVAL
C	11/09/19	ISSUED FOR APPROVAL
B	29/08/19	ISSUED FOR CLIENT REVIEW
A	20/08/19	ISSUED FOR INTERNAL REVIEW

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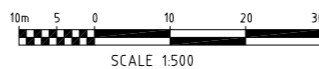
FUTURE AREA DETAIL



STORM WATER POND DETAIL

NO.	DESCRIPTION	QTY.
1	GE TM2500+ (GEN8) TURBINES W/ CONTROL ROOM	5
2	100MVA 3PH STEP-UP TRANSFORMER	2
3	40MVA 3PH STEP-UP TRANSFORMER	1
4	MEDIUM VOLTAGE SWITCHYARD AREA W/ REACTORS	5
5	HIGH VOLTAGE SWITCHYARD AREA	3
6	50kVA STANDBY DIESEL GENERATOR	1
7	150kVA AUXILIARY TRANSFORMER	1
8	40' ISO MAIN CONTROL ROOM	2
9	40' ISO STORAGE	5
10	OFFICE (MODULAR/FLAT PAD)	2
11	40' ISO KITCHENETTE	1
12	20' ISO WC	1
13	40' ISO PLANT/ SITE OFFICE	1
14	40' RD-RO-EDI SKID W/ WATER PRE TREAT	2
15	ISO REJECT WATER TANK	1
16	350kL RAW WATER TANK	1
17	350kL PROCESSED WATER TANK	1
18	500kL FIRE WATER TANK	1
19	OILY WATER SEPARATOR W/ SEDIMENTATION POND	1
20	110kL FUEL STORAGE TANK	5

NO.	DESCRIPTION	QTY.
21	20' ISO FUEL PUMP SKIDS	2
22	DFS-3 FILTER SKIDS	2
23	40' ISO STANDBY GENERATOR	2
24	40' ISO 8MVA TRANSFORMER MODULE	1
25	NEUTRAL GROUNDING TRANSFORMER	3
26	MAIN DISTRIBUTION PANEL	4
27	40' ISO FOR UPGRADING CENTRALIZED CONTROL & MONITORING SYSTEM	1
28	STORM WATER POND CAP. 3000m3	2
29	OTSG (FUTURE)	5
30	MEDIUM VOLTAGE SWITCHYARD AREA (FUTURE)	1
31	HIGH VOLTAGE SWITCHYARD AREA (FUTURE)	1
32	STEAM TURBINE GENERATOR (FUTURE)	1
33	STG ELECT. ROOM (FUTURE)	1
34	AUXILIARY BOILER (FUTURE)	1
35	INSTRUMENT AIR SYSTEM (FUTURE)	1
36	DEMINERALIZED WATER SYSTEM (FUTURE)	1
37	WATER TANK (FUTURE)	1
38	COOLING TOWER (FUTURE)	1
39	PUMP SKIDS (FUTURE)	1



PRELIMINARY ONLY
NOT FOR CONSTRUCTION



NEXIF TM2500 PEAKER PROJECT
(5) GAS TURBINE, 66kV, 50Hz
DETAIL LAYOUT

APPROVALS	DATE	SCALE	SIZE
Eng Appr.		1:500	A1
Proj Appr.		FILE NAME	
Client Appr.		5053-DWG-G-0002_G	
PROJECT NUMBER	5053		REV
RESINDO DWG NO	5053-DWG-G-0002		G
CLIENT DWG NO	P0007-05-GGA-00-002		

Y:\5053 Emanden TM2500 Relocation Eng\07 Drafting\00 General\5053-DWG-G-0002_G_DETAIL LAYOUT.dwg Oct 10, 2019 - 7:47am SZakaria PCCAD-0008

APPENDIX B

CROWN SPONSORSHIP LETTER





Government
of South Australia

Department for
Energy and Mining

Our Ref: D19100023

Ms Bronte Nixon
Principal Environmental Scientist and Planner
WSP Australia Pty Ltd
GPO Box 398
ADELAIDE SA 5001
Bronte.Nixon@wsp.com

Dear Ms Nixon

REQUEST FOR CROWN SPONSORSHIP FOR THE PELICAN POINT GAS TURBINE PEAKER PROJECT

I refer to your letter of 16 July 2019 and subsequent letter of 3 September 2019 regarding the request for support and endorsement pursuant to Section 49(2)(c) of the *Development Act 1993* (the Act) for the Pelican Point gas turbine peaking project (Project).

I note that WSP Australia Pty Ltd is requesting Crown Sponsorship for the Project on behalf of Port Adelaide Energy Pty Ltd, a special purposes entity for project delivery. Further, I note that Port Adelaide Energy Pty Ltd (Port Adelaide Energy) is a wholly owned subsidiary of Nexif Energy Australia Pty Ltd.

Given that the proposed works meet the definition of "public infrastructure" as outlined in Section 49(1)(a) of *Development Act 1993*, and that the project will provide dispatchable power to contribute to the security and reliability of the State's electricity network, I am prepared to support and specifically endorse, pursuant to Section 49(2)(c) of the *Development Act 1993* the:

- proposed Project which consists of the relocation of five trailer-mounted gas turbines and ancillary infrastructure, to a site adjacent to the Pelican Point Power Station at Outer Harbour.

The project would provide various benefits to the State including by assisting in improving the reliability of the power system as the gas peaking power plant will be able to respond quickly to variations in grid voltage and frequency, which in turn, is expected to improve grid stability.

The Department for Energy and Mining makes no representations or gives no warranties in relation to the outcome of the development application or time that it takes to secure a planning outcome for the project.

Chief Executive

Address Level 12, 11 Waymouth Street, Adelaide 5000 | GPO Box 320 Adelaide SA 5001 | DX452
Tel (+61) 08 8429 3216 | Email DEM.OCE@sa.gov.au | www.energymining.sa.gov.au | ABN 83 768 683 934





**Government
of South Australia**

Department for
Energy and Mining

It is Port Adelaide Energy's responsibility to obtain all other statutory approvals, licenses and permits from relevant authorities, manage community expectations and to fund the project. The State Government makes no commitment to provide any funding towards the project or to purchase any product or service related to the project.

A development application must be lodged by Port Adelaide Energy at its own cost with the Development Assessment Commission on or prior to 30 August 2020. If this is not achieved by that time, my support under Section 49(2)(c) of the Act for the project will lapse.

Should you have any questions regarding preparation of the material to support this Section 49 Development Application, please contact the nominated Case Manager, Mr Chris Lim on (08) 8303 2018 or mobile 0439 873 104.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Vince Duffy'.

Vince Duffy
ACTING CHIEF EXECUTIVE

10/9/2019



ABOUT US

WSP is one of the world's leading engineering professional services consulting firms. We are dedicated to our local communities and propelled by international brainpower. We are technical experts and strategic advisors including engineers, technicians, scientists, planners, surveyors, environmental specialists, as well as other design, program and construction management professionals. We design lasting Property & Buildings, Transportation & Infrastructure, Resources (including Mining and Industry), Water, Power and Environmental solutions, as well as provide project delivery and strategic consulting services. With approximately 48,000 talented people globally, we engineer projects that will help societies grow for lifetimes to come.



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