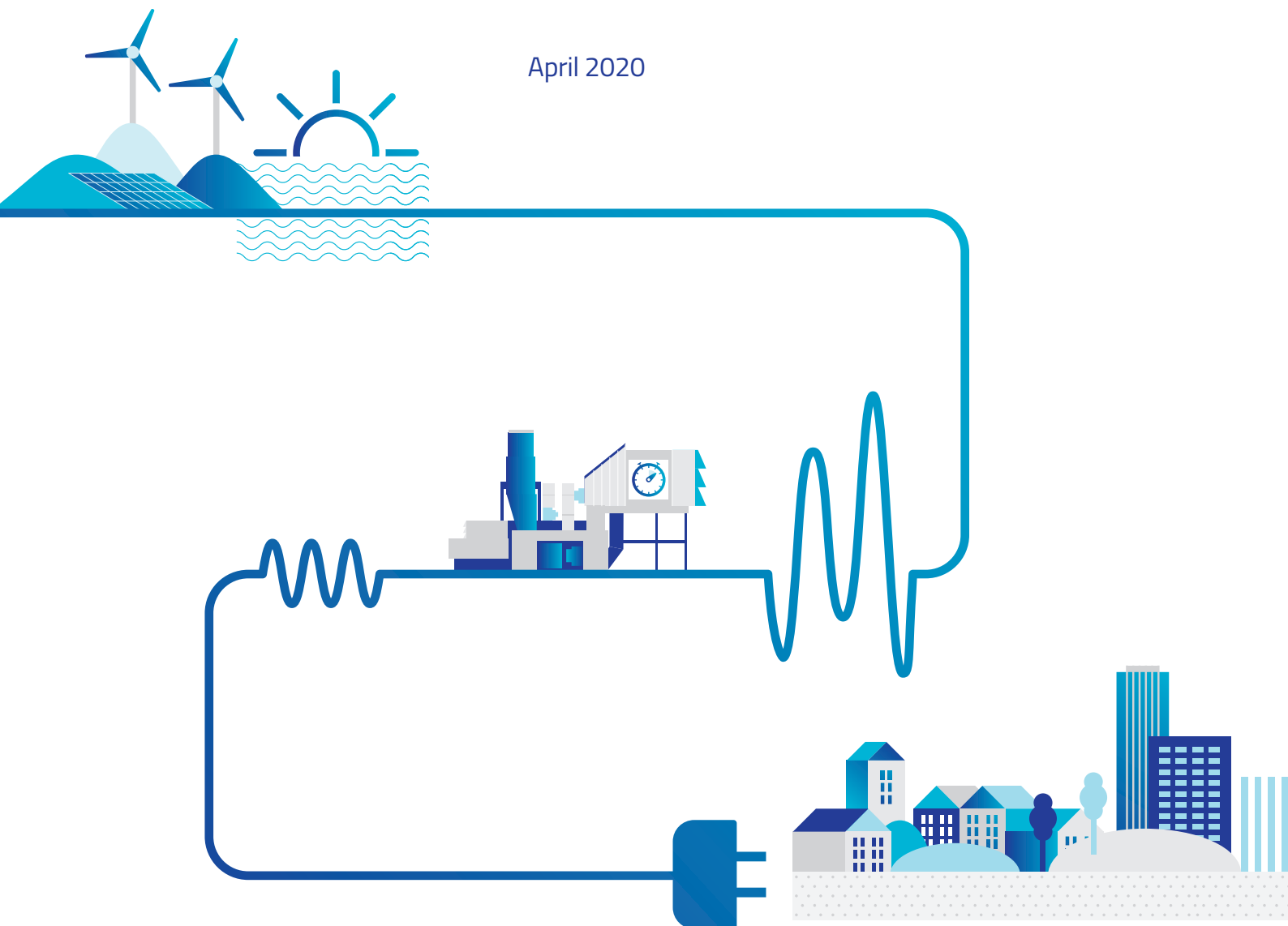




# Newcastle Power Station Project

## Environmental Impact Statement Submissions Report

April 2020



# Preface

This Submissions Report has been prepared to address submissions made on the Environmental Impact Statement (EIS) prepared for the Newcastle Power Station (NPS), the Proposal. AGL's response to submissions and associated additional assessments and mitigation measures to minimise the Proposal's environmental impact have been summarised in this Submissions Report. The Submissions Report also addresses clarifications from the EIS and outlines the community and stakeholder involvement and consultation completed since the EIS was exhibited.

The clarifications from the EIS which are provided in this Submissions Report, include:

- Updated table of consistency with the objectives of the EP&A Act
- Clarification that the gas storage pipeline falls under the NSW *Pipeline Regulation 2013* and is not considered to be a Major Hazard Facility
- Clarification of the meaning of nominal capacity, in relation to generation technology and operation of the NPS
- Detail on emissions profiles at start-up for each technology type
- Correction of typographical error relating to operational water use
- Minor editorial updates to the mitigation measures, which do not change their intent

A total of 30 submissions are addressed in this report comprising 27 submissions that were received in response to the exhibition of the EIS, and an additional 3 submissions received outside of the exhibition period. Submissions were received from:

- 15 public authorities
- 9 organisations and agencies
- 6 members of the community

Additional and ongoing consultation has been undertaken by AGL with many of these public authorities and agencies, as well as adjacent infrastructure operators, to ensure the concerns raised in their submissions have been properly understood and adequately addressed in this Submissions Report. This liaison has been held via a series of face-to-face meetings, teleconferences, emails, letters and phone calls.

The key issues raised and addressed in this Submissions Report relate to:

- The relationship of the Proposal to other infrastructure in the area
- Assessment and comparison of reciprocating engine and gas turbine generating technology, and progressing the Proposal with both technology options
- Questions regarding the design and location of proposed infrastructure, and the interaction between the Proposal and adjacent or planned infrastructure, including TransGrid easements, the M12RT project, and Old Punt Road
- A request to update the Biodiversity Development Assessment Report (BDAR), with clarifications around EEC, ecosystem credit species and candidate species, survey effort and impact minimisation
- Impacts on hydrology, water quality and flooding, including construction and operational surface water discharges, and management of wastewater
- Proposal proximity to the Tomago Sandbeds Catchment Area and the Hunter Estuary Wetlands (Ramsar)
- Additional air quality impact information regarding air emissions, exceedances of pollutants, emissions variability, emissions controls, and impact on human health

- Use of fossil fuels as an energy source for the NPS contributing greenhouse emissions and contributing to climate change
- Further clarification of impact to Aboriginal heritage items, including updated AHIMS status, and recommendations for inclusions in a management plan
- Assessment of traffic impact at the intersection of the Pacific Highway and Old Punt Road
- The need to maintain site access, particularly for oversize/overmass (OSOM) vehicles
- Pipeline construction including the need for a Water Access Licence due to groundwater intersection and trenching across Old Punt Road
- Additional noise data, impact assessment and clarifications required, and confirmation of compliance with EPA noise criteria
- Questions regarding plume rise from operation of the NPS and impacts on aviation flight paths and airspace safety
- Questions regarding potential hazards related to the Proposal including bushfires, hazardous materials, ignition, pipeline failures, flash fires and gas propagation

Some of these issues are the subject of ongoing and cooperative consultation between AGL and other parties. These include:

- TransGrid regarding the interaction of the Proposal with TransGrid easements
- Transport for NSW (Transport) regarding the interaction of the Proposal with the M12RT proposal and local and State roads
- Department of Defence and CASA regarding the assessment of plume rise impacts on aviation

Additional studies were commissioned by AGL to support the responses to submissions, including addressing gaps identified in the environmental assessments completed for the EIS. The additional studies include:

- Updated Biodiversity Development Assessment Report considering vegetation classification, ecosystem credit species, mitigation measures, offsetting and Ramsar impacts
- Updated Surface Water and Hydrology Specialist Study, considering residual impacts, NorBE for water releases, and a revised Water Quality Assessment with MUSIC modelling of future stormwater discharge rates, volumes and quantities
- Groundwater intersection volume estimations during pipeline construction, to determine need for a Water Access Licence
- Updated Air Quality Impact Assessment with assessments of ground-level ozone, sulfur dioxide (SO<sub>2</sub>) and acrolein, and review of controls to minimise emissions of air pollutants
- Minor amendments to the Aboriginal Cultural Heritage Assessment Report including clarifications in the impact assessment and more specific management measures for these, including the involvement of Registered Aboriginal Parties (RAPs)
- Additional traffic assessment considering traffic impact at the intersection of Pacific Highway and Old Punt Road (intersection modelling) and confirmation OSOM vehicles can safely turn onto Pacific Highway
- Updated Noise and Vibration Impact Assessment clarifying data including influences of noise sources, amenity levels, evening intrusiveness, noise attenuation levels, low-frequency and/or tonal noise, and prevailing winds
- Updated Preliminary Hazard Assessment including a comparative review of ignition probabilities, updated assessment to address propagation risk, and new mapping including concept layout and process flow diagram and risk contour map with land uses

Management measures were proposed in the EIS to avoid or mitigate the environmental impacts of the Proposal during construction and operation. With the consideration of issues raised in the submissions and design refinements after the EIS, several environmental management measures have been revised and new measures prepared. These include:

- Minor wording updates to CU-1, B-6, GW-5, SC-3, AH-6, and SE-4 such as updated agency names or revised timing of the measures
- A new measure, B-11, to install fauna exclusion fencing around operational areas, where reasonable and feasible, to manage the risk of koalas entering the site and being injured or killed
- Clarification of SW-26 to ensure the evacuation routes and procedures consider the access road into the site
- A new measure GW-12 which commits to pursuing a WAL if over 3ML/year of groundwater will be intercepted during construction
- Update to AH-2 to specify the procedures, agreements, mapping and consultation required in the ACHMP
- Update to T-5 to ensure that the right turn access to the Proposal from Old Punt Road is designed to prevent queuing of vehicles and is designed to the satisfaction of Port Stephens Council (PSC) and Transport
- A new measure T-6, committing to sharing designs and collaboration with Transport prior to the construction of the Proposal, to ensure that there is no restriction to the development of the M12RT project and associated local or state roads
- A new measure T-7, confirming AGL will design proposed utilities to be adequately protected and/or have suitable vertical clearance so as not to limit the current operation of the road reserve.
- A new measure T-8, committing AGL to design the access from Old Punt Road to integrate appropriately with any development proposal designs for the upgrade of Old Punt Road that are exhibited prior to commencement of the construction of the Proposal
- Update to PR-2 to refine consultation with Department of Defence and include appropriate mitigation measures to manage aviation safety risks associated with the Proposal

Following provision of this Submissions Report to DPIE, the Proposal, as defined in the EIS, will be submitted for determination by the NSW Minister of Planning and Public Spaces.

Should the Proposal be approved by the NSW Department of Planning, Industry and Environment, AGL will continue to consult with stakeholders, government agencies, non-government organisations and the public community during the detailed design and construction of the Proposal.

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# Terms and abbreviations

Acronym	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHMP	Aboriginal Cultural Heritage Management Plan
AEP	Annual Exceedance Probability
AGL	AGL Energy Limited
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
AQIA	Air Quality Impact Assessment
ARR	Australian Rainfall and Runoff
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BAT	Best Available Techniques
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BCD	Biodiversity Conservation Division of the DPIE
BDAR	Biodiversity Development Assessment Report
CASA	Civil Aviation Safety Authority
CEMP	Construction Environmental Management Plan
CHR	Channelised right turn
CO <sub>2</sub>	Carbon dioxide
CSSI	Critical state significant infrastructure
CTMP	Construction Traffic Management Plan
CWMP	Construction Waste Management Plan
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EP&A Act	<i>Environment Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
EPL	Environment Protection Licence
FSS	Fire Safety Study
GDE	Groundwater dependent ecosystem



GHG	Greenhouse Gas
GPT	Gross pollutant trap
HDD	Horizontal directional drilling
HNE Health	Hunter New England Population Health
HWC	Hunter Water Corporation
IR	Individual risk
JGN	Jemena Gas Network
LEP	Local Environment Plan
LNG	Liquified natural gas
MHF	Major hazard facility
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
M12RT	M1 to Raymond Terrace
NAPL	Newcastle Airport Pty Limited
NEM	National Electricity Market
NGER	National Greenhouse and Energy Reporting
NGSF	Newcastle Gas Storage Facility
NO <sub>x</sub>	Oxides of nitrogen
NorBE	Neutral or Beneficial Effect
NPS	Newcastle Power Station
NRAR	Natural Resources Access Regulator
NSW	New South Wales
NVA	Noise and Vibration Assessment
OEMP	Operation Environmental Management Plan
OLS	Obstacle Limitation Surface
OSOM	Oversize/Overmass
OWMP	Operational Waste Management Plan
RBL	Rating background level
PCT	Plant Community Type
PFAS	Per- and polyfluoroalkyl substances
PHA	Preliminary Hazard Assessment
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
PSC	Port Stephens Council
RAAF	Royal Australian Air Force

RAP	Registered Aboriginal Parties
REZ	Renewable Energy Zones
RNP AR	Required Navigation Performance Approach Required
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SIL	Screening impact level
SO <sub>2</sub>	Sulfur dioxide
SWHSS	Surface Water and Hydrology Specialist Study
TAC	Tomago Aluminium Company
TN	Total nitrogen
TP	Total phosphorous
TSS	Total suspended soils
VCE	Vapour cloud explosion
VOC	Volatile organic compound
WAL	Water Access Licence
WHS	Work health and safety

# 1. Introduction

## 1.1. Overview

AGL Energy Limited (AGL) is proposing to construct and operate a dual fuel fast-start peaking power plant with nominal capacity of 250 megawatt (MW), the Newcastle Power Station (NPS). The NPS would be located at 1940 Pacific Highway, Tomago, New South Wales (NSW) and would include gas pipelines, electricity transmission lines, site access and associated ancillary infrastructure (the Proposal). The location of the Proposal is shown in Figure 1.1, while the conceptual site layout is shown in Figure 1.2.

The Proposal is part of AGL's strategy to introduce new electricity generating development to improve energy security and reliability. The Proposal has a capital investment value of approximately \$400 million and is anticipated to be operational by 2022, following construction commencing in 2021.

The NPS would supply electricity to the grid at short notice during periods of high electricity demand, and low supply, particularly during periods where intermittent renewable energy supply is low or during supply outages.

This Submissions Report has been prepared to address submissions made on the Environmental Impact Statement (EIS) prepared for the NPS.

## 1.2. Assessment process

### 1.2.1. State

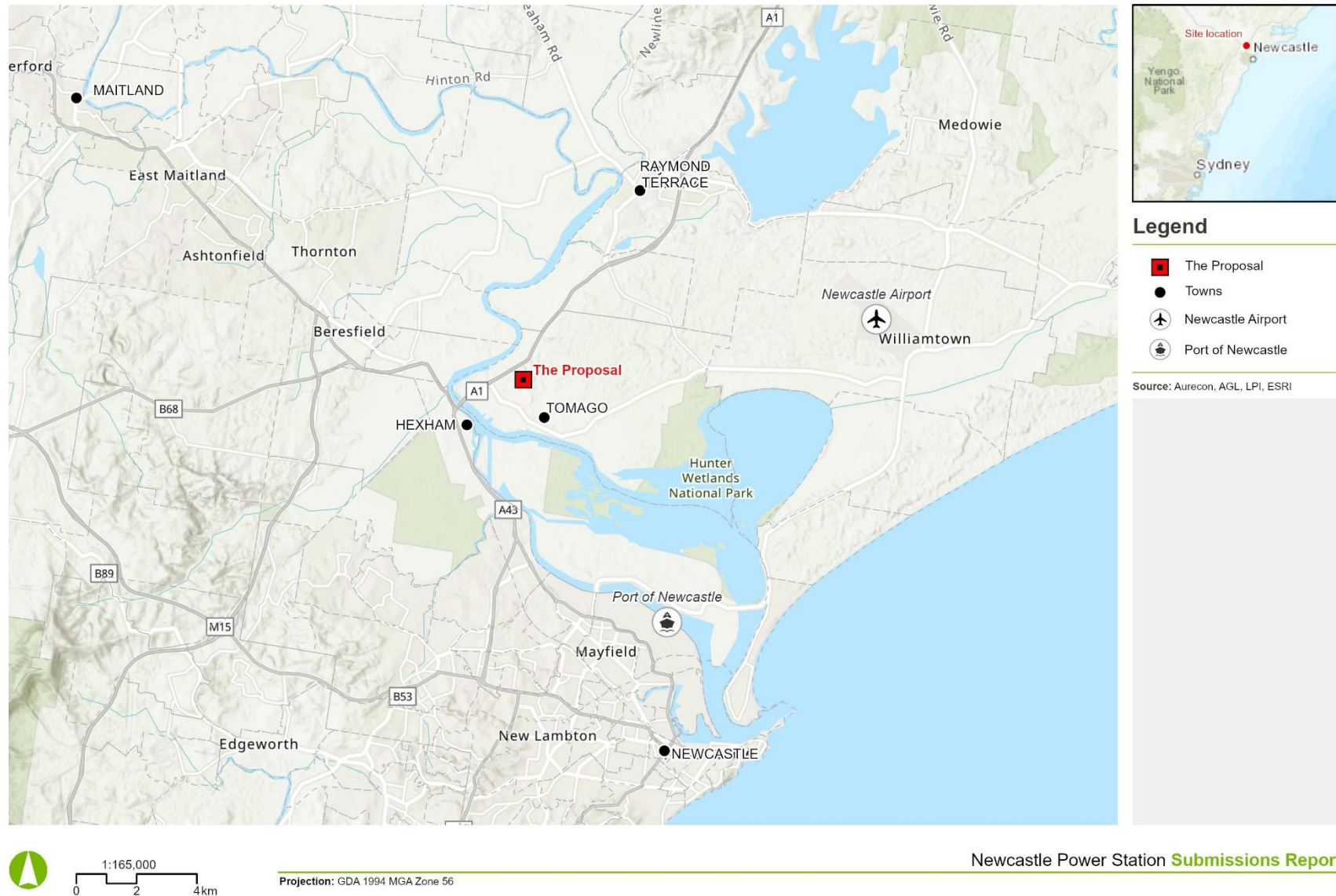
The Proposal was declared Critical State significant infrastructure (CSSI) by the NSW Minister for Planning in December 2018 under Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011* (NSW) (SEPP). As CSSI, the Proposal requires approval from the Minister under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). An Environmental Impact Statement (EIS) was prepared to assess the construction and operation impacts of the Proposal, and this was placed on public exhibition from 20 November to 18 December 2019.

During the exhibition period, 27 submissions were provided to the NSW Department of Planning, Industry and Environment (DPIE) from the community, organisations and government agencies. An additional three submissions were received after the exhibition period. Copies of these submissions were provided to AGL to respond to the issues raised, which are addressed in Chapter 4 of this Submissions Report. Additional environmental assessments that were required to address issues raised in the submissions are described in Chapter 5 of this report.

### 1.2.2. Commonwealth

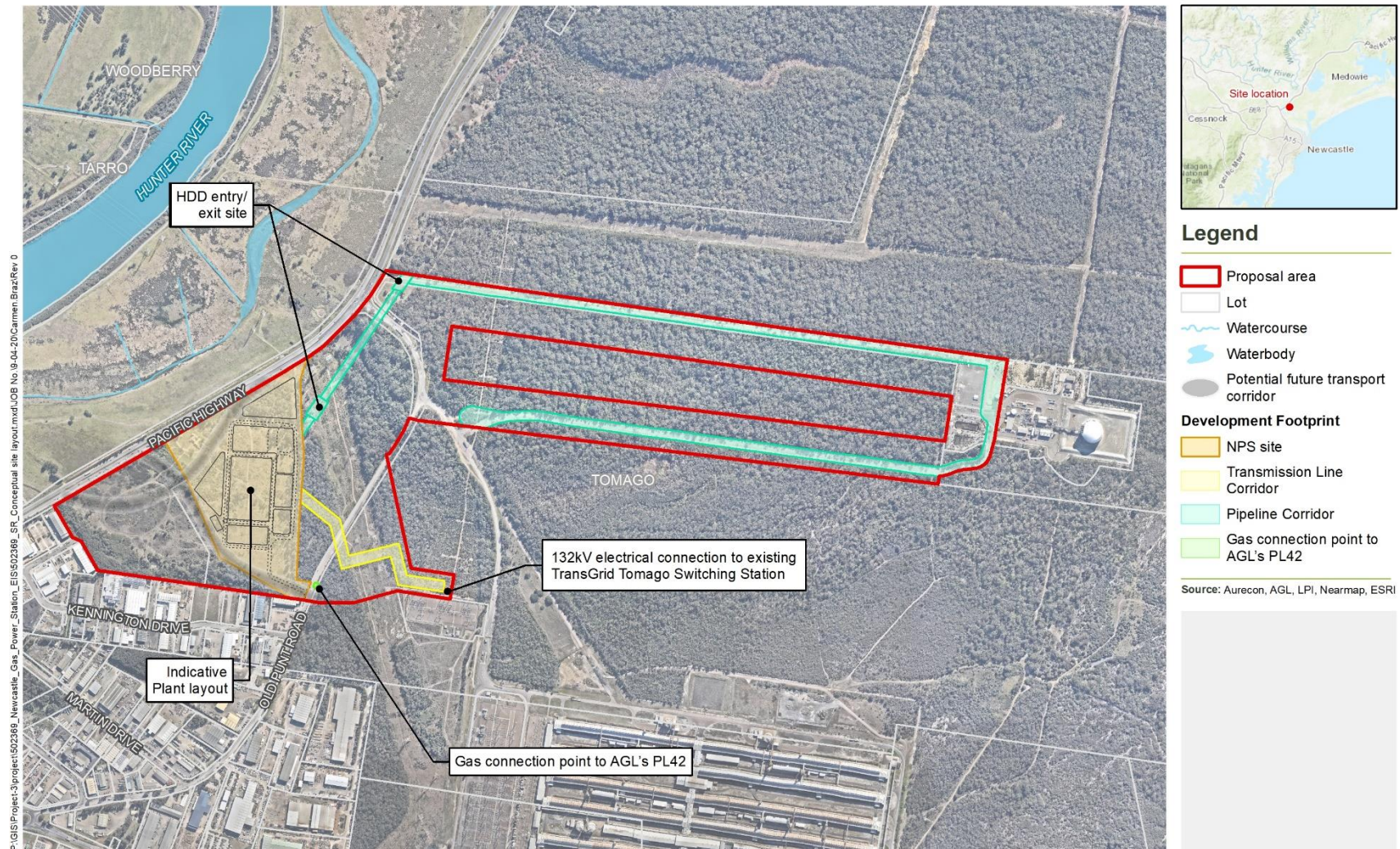
The Proposal was declared a controlled action on 15 August 2019 under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). This was due to potential construction or operational impacts of the Proposal on a Ramsar wetland, due to its proximity to the Kooragang component of the Hunter Estuary Wetland approximately 2.7 km south southeast of the NPS site.

As such, the Proposal requires assessment and approval under the EPBC Act and will be assessed through a bilateral agreement between the Commonwealth and NSW governments, within the NSW planning approval process.



**Figure 1.1 Proposal location**





1:14,000  
0 250 500m  
Projection: GDA 1994 MGA Zone 56

Figure 1.2 Conceptual site layout

## 1.3. The Proposal

The key features of the Proposal, as described in the EIS and shown in Figure 1.3 include:

- Power station: a dual fuel power station capable of operating on natural gas and/or liquid fuel (diesel)
- Gas pipelines: to store gas and to connect the NPS to existing gas supply sources (including the Jemena Gas Network (JGN) and AGL's Newcastle Gas Storage Facility (NGSF)) via AGL's existing pipeline PL42
- Electricity transmission lines: to transfer the electricity produced by the NPS to the National Electricity Market (NEM)

The NPS is intended to be operated as a peaking plant (base case scenario); however, it will be designed for continuous operation to maximise operational flexibility (worst case scenario).

## 1.4. Environmental Impact Statement public exhibition

The EIS, prepared by AGL to assess the construction and operational impacts of the Proposal, was publicly displayed for the statutory period from Wednesday 20 November 2019 to Wednesday 18 December 2019 inclusive.

The EIS was available through the DPIE Major Projects online portal, AGL's website and at the five display locations listed in Table 1.4-1. A soft copy was also provided to Nature Conservation Council, 14/338 Pitt Street, Sydney.

**Table 1.4-1 EIS public exhibition locations**

Location	Address
Port Stephens Council	116 Adelaide Street, Raymond Terrace
Maitland City Council	285-287 High Street, Maitland
Newcastle City Council	12 Stewart Street, Newcastle
DPIE	320 Pitt Street, Sydney
Exhibition station at the Hunter Region Botanic Gardens	2100 Pacific Highway, Heatherbrae

Advertisements of the Proposal were placed in the Maitland Mercury, Newcastle Herald and The Australian on 14 October 2019 and in the Port Stephens Examiner on 17 October 2019. Letters were also sent to landholders/occupiers within a 3 km radius surrounding the Proposal on 14 October 2019. In addition, the offices of the NSW Member of Parliament for Port Stephens and the Federal Member of Parliament for Paterson received one copy each to increase the availability of the document to their constituents.

Two community information sessions were held during the display period. These sessions provided the community an opportunity to speak with the project team and ask any questions relating to the Proposal. The community information sessions were held at Tomago Bowling Club (657 Tomago Road, Tomago) on Saturday 30 November 2019 and Thursday 5 December 2019. This location was selected due to its close proximity to the Proposal location and for being a popular local business frequented by the community.

Copies of all submissions received were provided to AGL by the DPIE.

This Submissions Report has considered all submissions received during public display of the EIS and additional submissions that were received following the statutory period display, as described in further detail in Chapter 4.



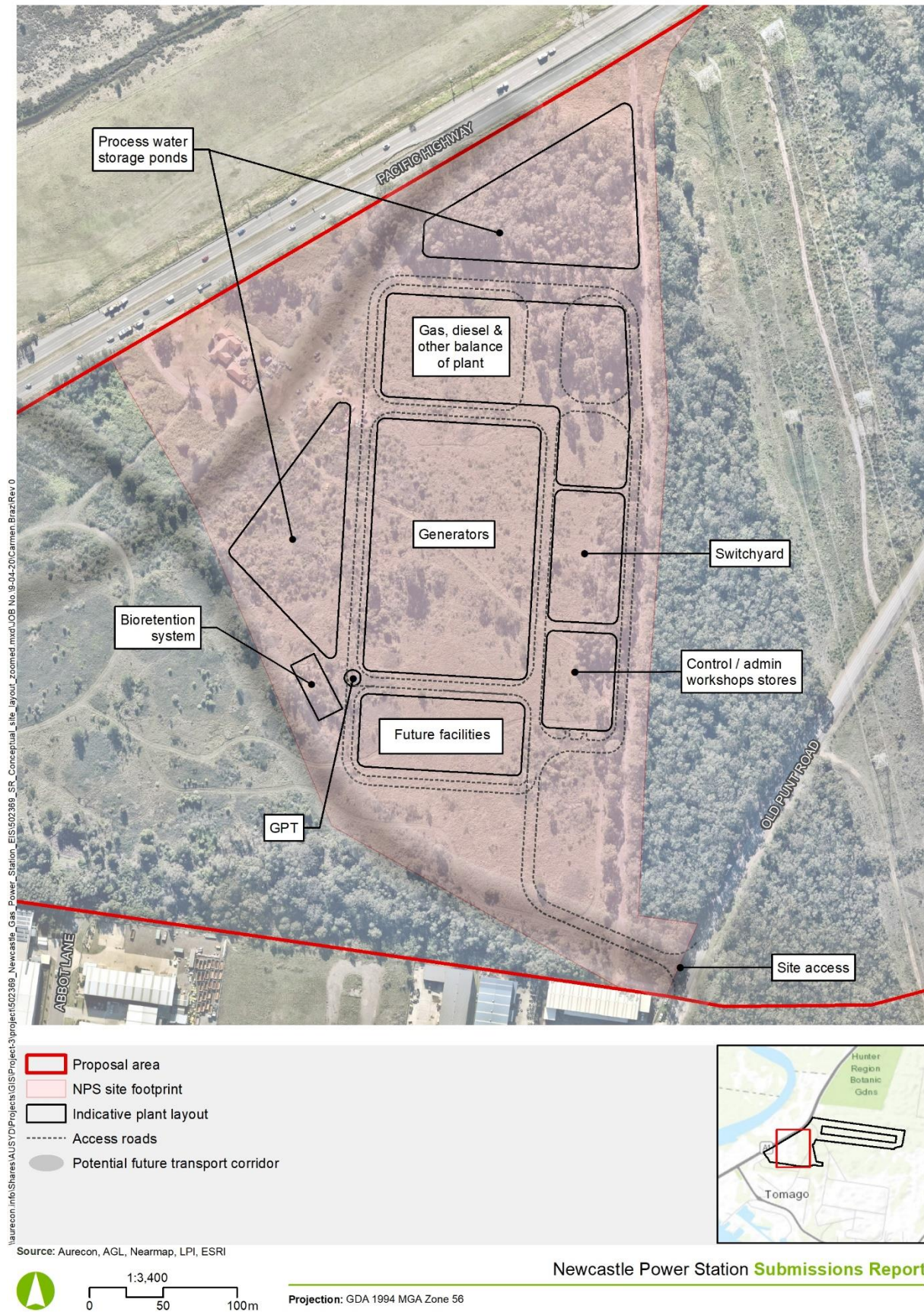


Figure 1.3 Conceptual power station overview

## 1.5. Purpose of this report

In accordance with Section 5.17(6)(a) of the EP&A Act, this Submissions Report has been prepared to identify and address issues raised within the submissions received on the Proposal during the display period for the EIS.

This report is structured as described in Table 1.5-1.

**Table 1.5-1 Structure of this Submissions Report**

Chapter number	Description
1	Provides an introduction and purpose of this report
2	Clarifies environmental issues and power station design from the EIS
3	Provides an update to the community and stakeholder engagement undertaken since the EIS display
4	Summarises all submissions received and provides responses
5	Details additional environmental assessments required since the completion of the EIS
6	Provides a summary of all environmental management measures including any changes required following the completion of the EIS, and licensing and approvals required



## 2. Environmental Impact Statement clarifications

### 2.1. Proposal consistency with legislation

#### 2.1.1. Environmental Planning and Assessment Act 1979

An assessment of the Proposal's consistency with the objectives of the EP&A Act was provided in Table 10.2.1 of the EIS (Section 10.2). Table 2.1-1 below provides an updated assessment of the consistency of the Proposal against the objectives of the EP&A Act, using the version last modified on 25 March 2020.

This revision shows that the Proposal is fully justified and aligned with the objectives of the EP&A Act.

**Table 2.1-1 Consistency of objectives with the EP&A Act**

Objective	Consistency
<p>Section 1.3 (a)</p> <p>To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.</p>	<p>The Proposal was recognised as being an essential investment in the NSW energy sector when it was declared as Critical State Significant Infrastructure in December 2018 (as detailed in Section 1.2.1). It is expected to deliver greater energy security as well as creating flow on economic and social benefits for the State, providing employment opportunities for the region, and investment into regional NSW.</p> <p>The Proposal would efficiently use resources and produce electricity at lower greenhouse gas (GHG) emissions and with reduced environmental impacts than traditional coal fired power. The Proposal would also contribute to lower emissions by delivering firming capacity in support of intermittent renewables.</p> <p>The Proposal has been designed and located to minimise impacts on the environment, including on biodiversity, water quality and visual amenity, and would bring positive social experiences to the local community and the region.</p> <p>As part of the Proposal, AGL would offset:</p> <ul style="list-style-type: none"><li>▪ Spotted Gum - Broad-leaved Mahogany- Red Ironbark shrubby open forest requiring 216 ecosystem credits</li><li>▪ Smooth-barked Apple - Blackbutt - Old Man Banksia woodland on coastal sands of the Central and Lower North Coast requiring 8 ecosystem credits</li><li>▪ <i>Eucalyptus parramattensis subsp. Decadens</i>, requiring 6 species credits</li><li>▪ Squirrel Glider habitat, requiring 144 species credits</li><li>▪ Koala habitat, requiring 5 species credits</li></ul> <p>Full details of the proposed management regime for these offsets would be included in a requisite management plan prepared in consultation with DPIE's Biodiversity and Conservation Division (BCD), previously known as NSW's Office of Environment and Heritage (OEH).</p>
<p>Section 1.3 (b)</p> <p>To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.</p>	<p>The Proposal would encourage ecologically sustainable development. This is discussed in detail in Section 10.1 of the EIS.</p>

Objective	Consistency
<p>Section 1.3 (c)</p> <p>To promote the orderly and economic use and development of land.</p>	<p>The development footprint is wholly within land zoned IN1 Industrial under the Port Stephens Local Environment Plan (LEP). Surrounding areas are proposed for industrial development under the Hunter Regional Plan 2036.</p> <p>The objectives of zone IN1 as stated in the Port Stephens LEP are:</p> <ul style="list-style-type: none"> <li>▪ To provide a wide range of industrial and warehouse land uses</li> <li>▪ To encourage employment opportunities</li> <li>▪ To minimise any adverse effect of industry on other land uses</li> <li>▪ To support and protect industrial land for industrial uses</li> </ul> <p>The Proposal is consistent with the objectives of zone IN1.</p>
<p>Section 1.3 (d)</p> <p>To promote the delivery and maintenance of affordable housing.</p>	<p>The provision and maintenance of affordable housing is not relevant to the Proposal.</p>
<p>Section 1.3 (e)</p> <p>To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.</p>	<p>The Proposal has been designed and located to protect and minimise impacts on the environment, including on biodiversity and water quality.</p> <p>Although mitigation is proposed, there would be some residual vegetation clearing impacts that cannot be avoided. Offsets have been identified for the Proposal in accordance with the Biodiversity Assessment Method (BAM), due to impacts on native vegetation and threatened species including the Squirrel Glider, Koala and <i>Eucalyptus parramettensis</i> subsp. <i>decadens</i>. Full details of the proposed management regime for these offsets would be included in a requisite management plan prepared in consultation with DPIE's BCD.</p> <p>AGL is committed to achieving excellence in environmental management and performance, and AGL's Environmental Policy includes adhering to high standards to protect the environment where AGL does business.</p>
<p>Section 1.3 (f)</p> <p>To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).</p>	<p>The Proposal has been designed and located to minimise impacts to Aboriginal and non-Aboriginal heritage.</p> <p>Of the four Aboriginal heritage sites identified in the Proposal area, none were found to have scientific significance and had overall low Aboriginal cultural heritage significance. No non-Aboriginal heritage features or items were identified in the Proposal area, including structures of subsurface impressions. The detailed assessments and strategies to promote the sustainable management of built and cultural heritage are discussed further in Sections 6.7 and 6.12 of the EIS.</p>
<p>Section 1.3 (g)</p> <p>To promote good design and amenity of the built environment.</p>	<p>The Proposal is in line with the designated land use in accordance with the Port Stephens Planning Strategy and Port Stephens LEP. The industrial function of the design adds to the diversity and compatibility of land uses in the local government area.</p> <p>An assessment of the potential amenity impacts of the Proposal's design has been discussed in Chapter 6.11 of the EIS. The Proposal promotes good design and amenity of the environment.</p>
<p>Section 1.3 (h)</p> <p>To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.</p>	<p>To ensure adequate environmental management during construction and operation, works would be undertaken in compliance with an approved Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP).</p> <p>As plans would be prepared in accordance with the NSW Guideline for the Preparation of Environmental Plans published by the Department of Infrastructure, Planning and Natural Resources in 2004 and the relevant Minister's Conditions of Approval, the Proposal is designed to meet modern building standards by not</p>

Objective	Consistency
	negatively impacting the environment. These standards would also ensure the protection of the health and safety of employees and nearby residents.
Section 1.3 (i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	<p>The Proposal was declared CSSI in December 2018. The declaration came into effect following gazettal and inclusion in Schedule 5 of the SEPP. As CSSI, the Proposal requires the Minister's approval under Division 5.2 of the EP&amp;A Act. The Proposal was also declared a controlled action under section 75 of the EPBC on 15 August 2019 and will be assessed under a bilateral agreement.</p> <p>Relevant clauses within the Port Stephens LEP have been considered during design development and within the environmental impact assessment process. This is discussed further in Section 4.3 of the EIS.</p>
Section 1.3 (j) To provide increased opportunity for community participation in environmental planning and assessment.	<p>Consultation with the community, key stakeholders, and relevant government agencies was undertaken during the planning and development of the Proposal and throughout the EIS public exhibition period.</p> <p>AGL has committed to ongoing consultation activities.</p> <p>Details of consultation undertaken and proposed are provided in Chapter 5 of the EIS and Section 3.2 of this Submissions Report.</p>

### 2.1.2. Workplace Health and Safety Regulation 2017

The Proposal design includes a gas storage pipeline which will be designed, constructed, maintained and operated in a safe and reliable way in accordance with AS 2885: Pipelines – Gas and Liquid Petroleum, as required by clause 10 of the *Pipelines Regulation 2013* (NSW). Pipeline licensing typically falls outside the *Work Health and Safety (WHS) Regulation 2017* (NSW), (WHS Regulation) and therefore is not normally considered to be a Major Hazard Facility (MHF) subject to the licencing requirements under the WHS regulations.

As the gas storage pipeline may contain over 200 tonnes of natural gas, AGL considered it appropriate to seek confirmation from SafeWork NSW that the appropriate legislative framework was applied for the pipeline. AGL sought this confirmation via email to SafeWork NSW on 20 March 2020.

SafeWork NSW responded via reply email on 27 March 2020 confirming that it is also SafeWork's opinion that the proposed gas storage pipeline be considered under the *Pipelines Act 1967* (NSW) and the *Pipelines Regulation 2013* (NSW), and not under WHS legislation. SafeWork confirmed in writing that no approval is required from SafeWork NSW; however, information contained within clauses 389-391 of the WHS Regulation, which are duties on the pipeline owner, pipeline builder, and pipeline operator, must be provided to SafeWork NSW as relevant. AGL will provide this information to SafeWork NSW as required.

## 2.2. Power station capacity

The EIS describes the proposed power station to be a dual fuel fast-start peaking power plant with a nominal capacity of 250 MW. Although the power station's capacity was not raised as an issue in the received submissions, clarification of the meaning of nominal capacity, as assessed in the EIS, is provided below.

### 2.2.1. Technology option

Sections 2.3.3 and 2.4.1 of the EIS describe that the selection of the generation technology (ie reciprocating engine or gas turbine), and the arrangement of the specific generation units within the power station site, are subject to ongoing design development. At the time of writing this Submissions Report, the decision of generating technology and the arrangement of units is still to be determined.

As design development continues, a range of manufacturers are being considered for both the reciprocating engine and the gas turbine technologies. Due to varying sizes of generators (approximately between 18MW and 65 MW), the sum of the different arrangements of generators for each option does not precisely add up to 250 MW.

The nominal capacity of 250 MW is intended as an approximation of all options, with each option considered to be at least  $\pm 10\%$  of the described 250 MW. As this variation between options exists, the description used within the EIS for the power station was 'a dual fuel fast-start peaking power plant with a 'nominal' capacity of 250 MW'.

Although the final technology option chosen may have a nameplate capacity  $\pm 10\%$  of 250 MW (depending on the final combination of generators), each option being proposed was considered and assessed in the EIS.

All consultants that provided specialist input to inform the EIS (including the air quality, Greenhouse Gas emissions (GHG,) noise and vibration, electric and magnetic fields, visual and plume rise assessments) were provided the design specifications for each plant option. The Proposal was then assessed using a maximum parameters approach in accordance with the NSW *Draft Environmental Impact Assessment Guidance Series Preparing and Environmental Impact Statement* (DPIE, 2017) in order to bring greater certainty to the assessment of the Proposal.

### 2.2.2. Proposal operation

The electricity generated from power stations is measured by its 'net capacity factor' which is a ratio or percentage of the actual electrical energy output over a given period of time, compared to the maximum possible energy output of the power station. A power station's maximum energy output is the intended full-load sustained output of a power station within its thermal limits (ie operating at optimal conditions that it was designed for).

The capacity factor of a power station can be influenced significantly by physical limitations (temperature of the ambient air, cooling water or humidity), maintenance requirements, electricity demand and cost of fuels. Due to these variables, actual operating conditions and the capacity factor will vary.

With its proposed design function as a peaking power station, it is most likely that the capacity factor of the Proposal would be around 14%. As discussed above, the assessment of the worst-case scenario for the Proposal (operating at 100% of a nominal 250 MW power station) is robust as it assesses all potential environmental impacts, regardless of actual operating scenario.

## 2.3. Emissions profile start-up

Clarifications on the start-up emissions of each proposed technology type have been detailed in Sections 2.3.1 and 2.3.2 in response to a submission from NSW EPA. This takes emission variations and pollution control efficiency into consideration, as plant start-up has the potential to increase peak impacts from plant operation.

### 2.3.1. Gas turbine option

During the start-up of gas turbines, the pollutant air exhaust concentrations can be higher than those achieved during operation, as air emission controls for these are not as effective during start-up conditions. For gas turbines of the scale being considered by AGL, this start-up period lasts for a short duration prior to full operating capacity.

Emission estimates for gas turbine start-ups with water-injected turbines of the scale of those considered for the Proposal were reviewed. Average pollutant emission rates over start-up events were noted to be similar to those present during operation. Although these estimates could not be sourced for liquid fuel start-up (i.e. a process proposed for the NPS gas turbine), due to the general consistency of combustion parameters for gas and liquid fuel start-ups, it is anticipated that these would also be similar in scale to operational emissions. As the start-up duration would be short, and have reduced exhaust mass flow rates, the potential for these emissions to have an adverse impact on air quality is low.

### 2.3.2. Reciprocating engine option

Like gas turbines, emissions vary between start-up and operation in reciprocating engines. A comparison between these phases found that start-up emission rates are similar in scale to those under continuous operation, except for oxides of nitrogen (NO<sub>x</sub>) emissions under diesel operation for which emission rates were higher during start-up. Although NO<sub>x</sub> emissions are expected to continue longer than the time it takes for engines to reach full operating capacity, the short duration of start-up events would result in a low potential for adverse air quality impacts.

## 2.4. Predicted operational water use

A submission received from the Hunter Water Corporation (described in detail in Section 4.3.4 of this report), identified that a typographical error was evident in Table 6.3.2 of the EIS. This section describes the error, the proposed changes and how it would affect the assessment provided in the EIS.

Section 6.3.3 of the EIS indicated that the annualised water consumption during operation of the Proposal was approximately 120,000 m<sup>3</sup> under peaking load (base case scenario) and 800,000 m<sup>3</sup> under continuous operation (worst case scenario).

Worst case operational water demands of 800,000 m<sup>3</sup> were subsequently reported as 0.08 GL/a in Table 6.3.2; however the value should have been 0.8 GL/a.

The correct statements, based on worst case operation of 0.8 GL/a, are:

- The Proposal would require 0.3% of water supply available in the region
- Annual water use in the area would increase by 1.2%

Operational water use of the Proposal remains a small fraction of the water supply available in the region.

## 2.5. Editorial updates to mitigation measures

In reviewing the mitigation measures as part of this Submissions Report, a number of minor editorial changes have been made, which do not change the intent of the measures. These changes are due to:

- Department or agency name changes
- Bringing forward the timeframe of commitments
- Grammatical improvement

Changes to mitigation measures are detailed further in Section 6.1.

## 3. Community and stakeholder involvement

### 3.1. Environmental Impact Statement consultation overview

The EIS was exhibited for 30 days from 20 November 2019 to 18 December 2019, inclusive. During this time, consultation activities were carried out to encourage participation and provide advice on how a submission could be made. Consultation activities included:

- Advertisement of the Proposal in the Maitland Mercury, Newcastle Herald and The Australian on 14 October 2019 and in the Port Stephens Examiner on 17 October 2019. Letters were also sent to landholders/occupiers within a three kilometre radius surrounding the Proposal on 14 October 2019.
- Hard copies of the EIS were made available to the public at the councils of Port Stephens, Maitland and Newcastle. In addition, copies were distributed to the local offices of the Members of Parliament for Paterson and Port Stephens.
- An exhibition station with a hard copy of the EIS was facilitated at the Hunter Region Botanic Gardens, which is adjacent to the proposed location of the Proposal
- Community information sessions at the Tomago Bowling Club on 30 November 2019 and 5 December 2019. This location was selected due to its close proximity to the Proposal's location and for being a popular local business frequented by the community.
- Frequently asked questions and responses were provided on the [AGL Newcastle Power Station Project website](#). This included general information about the purpose of the Proposal, technology of the power station, operating costs, and social and economic impacts .
- The EIS was summarised with a series of fact sheets which were provided on the website. These highlighted some of the key findings from the EIS including information on air quality and GHG, biodiversity, noise and vibration, Aboriginal heritage, socio-economic, visual, traffic, soil and water assessments, as well as what could be expected during construction and operation of the Proposal.
- Opportunities were given to the public to submit questions or further enquiries through contact details provided at the community information sessions and on AGL's website, including:
  - AGL Community Complaints and Enquiries Hotline: 1800 039 600
  - Email: [AGLCommunity@agl.com.au](mailto:AGLCommunity@agl.com.au)
  - Mail: AGL Community Complaints & Enquiries, Locked Bag 3013, Australia Square NSW 1215

### 3.2. Ongoing consultation and engagement

AGL has carried out further consultation with various stakeholders to discuss the findings of the EIS and gain a greater understanding into the submissions made. This has included ongoing liaison with State agencies and adjacent energy and infrastructure operators to ensure their submissions have been understood and adequately addressed in this Submissions Report or through updated assessments. The outbreak of the COVID-19 coronavirus pandemic meant that consultation has adapted from face-to-face meetings to teleconferences and Skype meetings, and in some instances consultation is still ongoing. A summary of these meetings and where the specific matters raised are addressed in this Submissions Report is provided in Table 3.2-1.



**Table 3.2-1 Direct stakeholder consultation after the EIS exhibition**

Stakeholder	Date	Discussion points/issues raised by the stakeholder	Where addressed
TransGrid	16 January 2020	Face to face meeting to discuss easement locations, TransGrid's commercial proposal and the proposed Connection Process Agreement	Section 4.3.2
	30 January 2020	Follow up email from AGL to TransGrid requesting clarification on TransGrid's queries relating to the above	
	6 March 2020	Email from TransGrid to AGL providing easement guidelines and standard clearance heights	
	1 April 2020	Additional meeting discussing the above Email from AGL to TransGrid summarising meeting outcomes and actions	
Transport for NSW	19 February 2020	Face to face meeting to discuss letter to DPIE dated 17 December 2019 and proposed updated M1 Location and interaction with NPS	Sections 4.3.2, 4.3.4, 4.3.7, 4.3.8
	11 March 2020	Email regarding updated M12RT Concept Design and submissions responses	
	31 March 2020	Meeting between Transport, SECA Solution and AGL to discuss updated M12RT concept design, interaction between projects and submission responses	
EPA	16 January 2020	Face to face meeting to discuss letter to DPIE dated 13 December 2019. This included project overview and discussion on proposed technical approach.	Sections 4.3.4, 4.3.5, 4.3.9
	17 March 2020	Phone conversation to discuss EPA's submission	
	18 March 2020	Email from AGL to EPA to understand whether residual issues have been closed out to EPA's satisfaction	
	20 March 2020	Phone call from EPA to confirm they had reviewed the email and agreed AGL had adequately addressed the issues raised in their submission	
DPIE	4 February 2020	Face to face meeting with AGL to discuss matters related to an extension in time for the Submissions Report, potential design changes and use of a Preferred Infrastructure Report	N/A
	6 February 2020	Email received confirming a Submissions Report and separate Amendment Report will be required	
	21 February 2020	Email received confirming an extension for Response to Submissions Report to 30 April	
	24 March 2020	Email to DPIE to confirm whether the proposed future community consultation was adequate	
	24 March 2020	Email from DPIE advising future community consultation would be addressed as conditions of consent	

Stakeholder	Date	Discussion points/issues raised by the stakeholder	Where addressed
Department of Defence	12 February 2020	Face to face meeting to discuss matters relating to the submission made to DPIE dated 16 December 2019. A project update and technology options were discussed.	Section 4.3.11
	6 March 2020	Letter to Department of Defence addressing the submission and providing context of modelling and technical approaches. A meeting to discuss was scheduled for 19 March 2020 but was deferred.	
	11 March 2020	Email from Department of Defence acknowledging the letter and advised it was being assessed by relevant technical staff	
	16 March 2020	Phone conversation with Department of Defence, who advised that they had passed the letter onto Civil Aviation Safety Authority (CASA) for review	
Hunter Water	18 February 2020	Face to face meeting to discuss letter to DPIE dated 18 December 2019 (After conversation 6 February 2020)	Section 4.3.4
	10 March 2020	Email correspondence regarding Biodiversity Offset requirements	
BCD	18 February 2020	Face to face meeting to discuss letter to DPIE submission dated 9 December 2019 (After conversation 6 February 2020)	Sections 4.3.3, 4.3.4, 4.3.7
NSW Health	6 February 2020	Conversation offering a meeting to discuss NSW Health letter dated 11 December 2019 and a follow up email	Sections 4.3.5, 4.3.9
	18 February 2020	Planned meeting cancelled. NSW Health phoned AGL to request the comments from the 11 December letter were addressed and to confirm that no further follow up was required	
Port Stephens Council	6 February 2020	Voice message offering a meeting to discuss their letter dated 18 December 2019	Section 4.3.3, 4.3.4, 4.3.8
	7 February 2020	Meeting arranged for 19 February 2020 to discuss Port Stephens Council (PSC) letter to DPIE	
	19 February 2020	Face to face meeting to discuss the letter to DPIE dated 18 December 2019	
DPIE Hazard and Risk Division	20 February 2020	Face to face meeting to discuss letter to DPIE dated 18 December 2019	Section 4.3.12
	17 March 2020	Email from AGL to DPIE Hazard team requesting a meeting to discuss proposed response to submission	
	18 March 2020	Email from DPIE requesting a draft response to submissions which incorporates discussion from 20 February	
	23 March 2020	Email from AGL to DPIE advising that AGL has been able to update information to encompass	



Stakeholder	Date	Discussion points/issues raised by the stakeholder	Where addressed
		what was discussed at the 20 February meeting and can address comments raised by DPIE Hazard team in this Submissions Report, and therefore no longer require a further meeting	
DPIE Water Division	6 February 2020	Conversation offering a meeting to discuss their letter dated 4 December 2019 and follow up email 7 February 2020 offering meeting 18 February 2020	Section 4.3.4
	18 February 2020	Face to face meeting with DPIE Water Division and NRAR to discuss submission dated 4 December 2019	
	9 March 2020	Email from DPIE – Water to DPIE to advise of the meeting held with AGL on 18 February	
	9 March 2020	Email from DPIE to DPIE Water acknowledging their email and advising that the Submissions Report would be provided for final comments	
	24 April 2020	Phone meeting with DPIE Water, NRAR and AGL to discuss Licensing and Brokering requirements	
Community Dialogue Meeting	5 March 2020	Quarterly meeting to provide an update on the project	N/A
Meryl Swanson and Susan Ley's Office	26 February 2020	Discussion on progress of the Proposal	N/A
SafeWork Australia	20 March 2020	Letter regarding appropriate legislative framework for the gas pipeline	Section 2.1.2
	27 March 2020	Response from SafeWork NSW clarifying that the gas pipeline does not fall under MHF requirements	
Registered Aboriginal Parties (RAPs)	25 March 2020	Letter provided to RAPs with project update and advising updates to ACHA to respond to issues raised in submissions	Section 4.3.7
	23 April 2020	No comments on the updated ACHA were received from any RAPs	

## 4. Submissions received

### 4.1. Respondents

The DPIE received 27 submissions in response to the EIS during the 30-day public exhibition period (20 November 2019 to 18 December 2019). An additional three submissions that were received outside of the exhibition period have also been considered in this report (one from a member of the public, one from the City of Newcastle and DPIE's response to submissions). No additional submissions were received that were not addressed in this report. In total, 30 submissions have been considered in this Submissions Report.

All submissions were received electronically through the DPIE Major Project's website, where they are available for viewing:

- <https://www.planningportal.nsw.gov.au/major-projects/project/9951>

Table 4.1-1 lists the number of submissions received by respondent type and indicates where in this report the submission is addressed.

**Table 4.1-1 Submissions received**

Respondent	Submission number	Where addressed
<b>Public authority</b>		
WaterNSW	1	Section 4.3.1
Department of Primary Industries	2	Section 4.3.1
Crown Lands	3	Section 4.3.1
Heritage Council of NSW	4	Section 4.3.1
Biodiversity and Conservation Division of DPIE (previously Office of Environment and Heritage)	5	Sections 4.3.3, 4.3.4, 4.3.7
Department of Defence	6	Section 4.3.11
Environment Protection Authority	7	Sections 4.3.4, 4.3.5, 4.3.9
DPIE – Water and Natural Resources Access Regulator (NRAR)	8	Section 4.3.4
Transport for NSW (previously Roads and Maritime Service)	9	Sections 4.3.2, 4.3.4, 4.3.7, 4.3.8
Civil Aviation Safety Authority	10	Section 4.3.11
Hunter New England Population Health	11	Sections 4.3.5, 4.3.9
Port Stephens Council	12	Section 4.3.3, 4.3.4, 4.3.8
Fire and Rescue NSW	13	Section 4.3.12
DPIE Hazards Team	29	Section 4.3.12
City of Newcastle	30	Section 4.3.1
<b>Public</b>		
Individual	14	Section 4.3.4

Respondent	Submission number	Where addressed
Individual	15	Sections 4.3.6, 4.3.12
Individual	16	Sections 4.3.3, 4.3.10
Individual	17	Sections 4.3.5, 4.3.6
Individual	18	Section 4.3.6
Individual	28	Section 4.3.5
<b>Organisation</b>		
Newcastle Airport Pty Limited	19	Section 4.3.11
Jetstar Airways	20	Section 4.3.11
Nature Conservation Council of NSW	21	Section 4.3.6
Ampcontrol	22	Sections 4.3.1, 4.3.10
Port Stephens Greens	23	Sections 4.3.5, 4.3.6
TransGrid	24	Section 4.3.2
Hunter Environment Lobby Inc	25	Sections 4.3.5, 4.3.6
Jemena Limited	26	Section 4.3.1
Hunter Water Corporation	27	Sections 2.4, 4.3.4

## 4.2. Overview of issues raised

All submissions received were reviewed, assessed and categorised by the main and sub-issues raised with responses provided in Section 4.3. Where submissions raised similar issues, responses have been grouped together by issue.

### 4.2.1. Public authority submissions

A total of 15 Public Authority submissions were received, all of which were comments on the EIS or the Proposal. A summary of each authority's issues is provided below, with responses detailed in Section 4.3.

#### WaterNSW

WaterNSW confirmed that the Proposal is not located near any WaterNSW land, assets or infrastructure and provided no additional comment on the EIS or Proposal. WaterNSW requested that should the development impact any WaterNSW land, assets or infrastructure that consultation occur.

#### Department of Primary Industries

The Department of Primary Industries confirmed that they reviewed the Proposal and provided no additional comment.

#### Crown Lands

Crown Lands confirmed that the Proposal does not impact any Crown land and provided no additional comment.

## **Heritage Council of NSW**

The Heritage Council of NSW confirmed that the Proposal site is not listed on the State Heritage Register (SHR), nor are any SHR items located nearby. They further confirmed that given the heritage assessment for the EIS did not identify any significant archaeological relics requiring management, no further consultation with them was required. They did not provide any additional comments.

## **Biodiversity and Conservation Division**

The Biodiversity and Conservation Division (BCD) of the DPIE identified four key issues requiring responses including:

- Biodiversity assessment and mitigation measures
- Aboriginal cultural heritage impacts and mitigation measures
- Site drainage and water treatment system, including a volumetric water balance
- Impact to Ramsar wetlands as a result of an updated volumetric water balance assessment

## **Department of Defence**

The Department of Defence raised issues relating to:

- Aviation operations
- Intrusion into the Obstacle Limitation Surface (OLS)
- Plume rise
- Safety

## **Environment Protection Authority**

The Environmental Protection Authority (EPA) raised the following issues:

- Further air quality impact assessment is required for ground-level ozone and acrolein; analysis of emissions against background SO<sub>2</sub> data from Tomago Aluminium Smelter; consideration of variable emissions including start-up, shut down and variable operating load
- Additional noise impact assessment is required to confirm mitigation measures
- Water quality impacts including Total Suspended Solids, Total Nitrogen and Total Phosphorus

## **Department of Planning, Industry and Environment Water and the Natural Resources Access Regulator**

DPIE – Water and NRAR raised the following issues:

- Consideration of groundwater dependent ecosystems (GDEs), water users and licensable take of water
- Requirement for a Water Access Licence (WAL) should any ground or surface water take be required

## **Transport for NSW**

Transport for NSW (Transport) raised issues relating to:

- Continued consultation with Transport regarding the M1 to Raymond Terrace (M12RT) project and mitigation measures to minimise impact on delivery
- Utilities impact
- Further traffic investigations required

- Responsibilities of AGL such as the upgrade to Old Punt Road and salvage of Aboriginal heritage items
- Surface water discharge

### **Civil Aviation Safety Authority Aviation Group**

CASA noted Department of Defence are the Aerodrome operator and as such stated that they did not disagree with the Department's comments.

### **Hunter New England Population Health**

Hunter New England Population Health (HNE Health) discussed health related issues and impacts including:

- Air quality and acrolein exposure
- Noise impacts on surrounding receivers
- Legionella
- Community engagement

### **Port Stephens Council**

Port Stephens Council (PSC) raised the following issues:

- Stormwater easements, drainage system and flow impacts
- Flooding impacts
- Traffic impacts
- Biodiversity, species survey assessments and water quality

### **Fire and Rescue NSW**

Fire and Rescue NSW reaffirmed that continued consultation with AGL is required and recommended that the Preliminary Hazard Assessment (PHA) and the Fire Safety Study (FSS) be progressed to final following the completion of design.

### **Department of Planning, Industry and Environment Hazards Team**

Following the conclusion of the EIS exhibition on 18 December 2019, the DPIE released all submissions for public view on the NSW Major Projects website. The DPIE requested AGL prepare and submit a Submissions Report to detail a response to the submissions. In addition, the DPIE Hazards Team provided specific guidance to AGL as to how to update the existing PHA.

### **City of Newcastle**

The City of Newcastle had no comments on the Proposal.

### **4.2.2. Public submissions**

A total of six public submissions were received regarding the EIS. Of the submissions, three were objecting and three were commenting. Submissions from the public raised the following main issues:

- Use of fossil fuels and CO<sub>2</sub> emissions
- Impacts to flora and fauna
- Safety of the operation of the Proposal

- Air quality impacts
- Water consumption/use
- Social impacts

Responses to the public submissions received are provided in Section 4.3.

### **4.2.3. Organisation submissions**

A total of nine organisations and utility agencies made submissions on the EIS. Of the submissions, three were objecting, five were commenting and one was supporting. Some recommendations of additional mitigation measures or conditions of approval were made. A summary of the issues raised by each organisation is provided below, with responses provided in Section 4.3.

#### **Newcastle Airport Pty Limited**

Newcastle Airport Pty Limited (NAPL) were broadly supportive of the Proposal and raised the following issues:

- Reciprocating engine technology would have less impact to the Obstacle Limitation Surface (OLS) and is therefore NAPL's preferred option over the gas turbine technology
- Ongoing consultation between AGL and other aviation industry participants is required
- Requested a new mitigation measure, the installation of Required Navigation Performance Approach Required system (RNP AR), with financial support from AGL
- Public safety risk of intrusion into the OLS
- Aviation operation disruptions

#### **Jetstar Airways**

Jetstar Airways raised the following issues:

- Construction timing and consultation to inform the Williamstown Traffic Management Plan
- Requested an impact analysis report showing surface infringements to inform flight path management
- Suggested the use of RNP AR to mitigate safety risks
- Aviation operation disruptions

#### **Nature Conservation Council of NSW**

The Nature Conservation Council of NSW objected to the Proposal and raised the following issues:

- Fossil fuels and climate change
- Assessment of peaking station as opposed to base load
- NSW commitment to climate change and the Paris Agreement
- Clean energy projects

#### **Ampcontrol**

Ampcontrol\* was supportive of the Proposal and raised the following issues:

- Local employment growth
- Need for additional Australian energy generation

- Appropriate management of environmental impacts during construction and operation

*\*AGL notes that Ampcontrol was formerly part-owned by Aurecon, who are AGL's primary consultants on the EIS and Proposal. Aurecon have confirmed that it does not, including through its officers and directors, currently have any direct or indirect financial interest in Ampcontrol.*

## **Port Stephens Greens**

The Port Stephens Greens objected to the Proposal raising the issues of:

- Fossil fuels and climate change
- Air quality
- Project need

## **TransGrid**

TransGrid raised the following issues:

- The design of the transmission line easements in relation to TransGrid infrastructure and property
- Identified that a formal Connection Processes Agreement is required

## **Hunter Environment Lobby Inc**

The Hunter Environment Lobby Inc objected to the Proposal and raised the following issues:

- Fossil fuels and climate change
- Increased GHG emissions
- Clean energy projects

## **Jemena Limited**

Jemena Limited recognised continual consultation with AGL to identify gas supply options is still required and provided no additional comment on the EIS.

## **Hunter Water Corporation**

The Hunter Water Corporation (HWC) raised the following issues:

- Drinking water catchments and water supply
- Water quality management
- Wastewater and stormwater
- Biodiversity impacts

## **4.3. Responses to submissions**

### **4.3.1. Project need**

#### **Submission**

23

#### **Issue**

Queried the need for a diesel option, and whether conditions could be placed on the approval to limit the circumstances in which diesel is used.

## **Response**

The EIS described the Proposal as a dual fuel power station capable of operating on natural gas and/or liquid fuel, such as diesel. Section 2.1 of the EIS notes that diesel operation would be used in the event of a gas supply disruption or when the power station is required to operate for extended hours. Flexibility in the use of liquid fuel is necessary to respond to conditions in the NEM, however, it is anticipated that the NPS would be preferentially fuelled by natural gas.

## **Submissions**

23, 25

## **Issue**

The EIS did not clarify how the Proposal relates to the existing AGL Newcastle Gas Storage Facility (NGSF), the proposed gas import terminal at Kooragang Island and the proposed Queensland to Hunter Gas pipeline.

## **Response**

A summary of the abovementioned projects and how the Proposal relates to existing and proposed gas infrastructure is provided below.

### *AGL Newcastle Gas Storage Facility*

AGL's NGSF is a gas storage facility which converts pipeline natural gas into liquified natural gas (LNG) and stores the gas to meet peak domestic requirements and provide security of gas supply during disruptions. The NGSF is connected to the receiving station at Hexham via a 5.5 km pipeline (known as PL42), where it is then linked to the NSW gas network.

The Proposal would connect to the existing PL42 on the eastern side of Old Punt Road and through this PL42, connection would be indirectly linked to the NGSF.

The Proposal also includes a gas storage pipeline capable of storing natural gas in compressed gaseous form, on land between the NPS and NGSF. Gas would be drawn from the PL42 connection and stored in the gas storage pipeline for use by the NPS during periods of high-power demand. Whilst the gas storage pipeline is designed to pass through the NGSF land, it is not expected to connect directly to any existing equipment at the NGSF.

### *The proposed gas import terminal at Kooragang Island*

On 14 August 2019, the DPIE released a Ministerial Media Release describing that a proposed Liquified Natural Gas (LNG) import terminal at Newcastle was declared CSSI. The media release noted the terminal would connect to the existing NSW gas supply network via a pipeline that is proposed to supply up to 80% of NSW's gas needs through gas imports. It stated that the terminal could be operational by 2022-2023 following public exhibition of the EIS by proponent Newcastle GasDock Company and assessment by the DPIE. It suggested the import terminal would help manage energy security during this period of changing gas market demand (DPIE, 2019a).

The EIS indicates that natural gas supply for the Proposal would be supplied locally from the Jemena Gas Network (JGN). The EIS does not consider the potential future gas supply which the proposed gas import terminal at Kooragang Island would provide. The Proposal is not contingent on the proposed gas import terminal, however, if approved, the terminal would provide additional security of fuel supply for gas-fired generators in the NEM.

### *The proposed Queensland to Hunter Gas pipeline*

Hunter Gas Pipeline Pty Ltd (Hunter Gas) propose to develop a new 825 km high-pressure gas pipeline from Queensland to the Hunter Valley region. The project was declared CSSI on 11 February 2009 and a modification to extend the lapse date of the conditions of approval was approved on 17 October 2019. Hunter Gas confirmed in their submission that the pipeline would increase energy security and reliability in NSW by providing local gas supply (DPIE, 2019b).



As with the terminal, the EIS for the NPS does not consider the potential future gas supply which the proposed Queensland to Hunter Gas pipeline would provide. The Proposal is not contingent on the gas pipeline, however, if approved, the pipeline would provide additional security of fuel supply option for gas-fired generators in the NEM.

#### *Relationship between the Proposal and other gas infrastructure*

The NPS is part of AGL's vision to secure the energy market and would preferentially be fuelled by natural gas supplied locally from the JGN, as described in the EIS.

The NPS is anticipated to be operational in 2022, prior to the operation of the LNG import terminal and the Queensland to Hunter Gas pipeline project. The Proposal does not rely on either of these projects for gas supply. As these are independent projects, Newcastle Gasdock Company and Hunter Gas, not AGL, would be responsible for all environmental impact assessment (including cumulative impacts with the NPS, if relevant), and construction and operation of the assets.

### **Submissions**

14, 22

#### **Issue**

Support for the Proposal.

#### **Response**

The support for the Proposal has been acknowledged by AGL.

### **Submissions**

1, 2, 3, 4, 26, 30

#### **Issue**

No comment on the Proposal.

#### **Response**

These submissions have been acknowledged by AGL.

## **4.3.2. Proposal design**

### **Submissions**

6, 10, 19

#### **Issue**

The EIS assessed reciprocating engine and gas turbine generating technology for the Proposal. Although both options penetrate the Obstacle Limitation Surface (OLS), the reciprocating engine is the preferred option of the Department of Defence and NAPL.

#### **Response**

As identified in Section 2.2.1 of this report, the selection of the technology option (reciprocating engine or gas turbine) for the Proposal is still to be determined due to continuing design development.

AGL has consulted with the Department of Defence in relation to progressing the Proposal with both technology types, including a face-to-face meeting on 12 February 2020, a technical response letter on 6 March 2020, and additional phone and email correspondence (refer to Section 3.2). Correspondence from Department of Defence confirms that they have been liaising with CASA on this matter.

Additional information has been provided to Department of Defence, including context for the plume rise modelling completed for the EIS and proposed technical approaches to assess both reciprocating and gas turbine technologies. This includes consideration of the 99.9% critical plume extent rather than the 100%,

and adoption of CASA's recommendations regarding critical plume velocity for instrument flight (6.1 m/s) and visual flight (10.6 m/s). A revised assessment was provided to Department of Defence which is also included in AGL's response to Department of Defence in Section 4.3.11. AGL is seeking endorsement of this assessment from Department of Defence in order to progress both technology options, and at the time of writing this Submissions Report, is in continued consultation with the Department of Defence to resolve the matter.

AGL is committed to continued consultation with the Department of Defence, CASA and NAPL regarding the Proposal technology and design, and to the development of mitigation measures for both technologies as the Proposal design development continues, so as to not preclude either option.

## **Submission**

24

## **Issue**

TransGrid raised the following issues regarding the Proposal:

- 1) TransGrid requests to view the transmission line plans when they are available that specify the horizontal and vertical clearances to existing transmission lines and structures that traverse TransGrid's easement.
- 2) TransGrid requests to review proposed terms of easement to ensure they do not conflict with pre-existing easement terms. AGL should ensure that the registration of its easements does not interfere with TransGrid's existing land interest or extinguish any registered interest on the title.
- 3) The location of the proposed transmission line easement at the point of connection to the existing Tomago Switching Station appears to be overlapping an existing TransGrid easement. The proposed AGL easement would need to be moved further north to avoid the overlap.
- 4) The final design including the positioning and encasement of the proposed AGL gas pipeline that crosses any of TransGrid's access tracks will need to be capable of withstanding the weight of large and laden 40 tonne mobile plant and equipment.
- 5) A formal Connection Processes Agreement is required to enable detailed review of the gas power station connection.

## **Response**

- 1) AGL notes there are some inconsistencies between the submission received from TransGrid and the ongoing consultation between AGL and TransGrid to date regarding the NPS (refer to Section 3.2). AGL previously provided plans to TransGrid specifying horizontal and vertical clearances to TransGrid's existing infrastructure, and in 2018 and 2019 provided plans of the transmission structures. Furthermore, there has been ongoing consultation between AGL and TransGrid to discuss potential transmission line route options, including impact to TransGrid's existing 132kV lines. AGL can also confirm that the design complies with the TransGrid standard clearances as per TL-613883 and the easement guidelines.
- 2) The terms of the easement will comply with relevant legislation, regulations and standards. AGL will not be able to consult with TransGrid regarding all proposed terms of easement, as these are subject to commercial negotiations. AGL will however ensure that TransGrid's memorandum for transmission will be attached to the easement, and that the registration of easements would not interfere with existing land interest or extinguish any registered interest on the title.
- 3) The potential overlap of easements has been the subject of ongoing consultation between TransGrid and AGL as noted in Section 3.2. At the time of writing this report, final options for easement alignments are being considered, including realignment of the transmission line easement so as to be adjacent to the existing TransGrid easement, whilst remaining within the Proposal area which was assessed in the EIS. AGL is committed to working with TransGrid to optimise the final design and ensure utilities standards for clearances and maintenance access are met.

- 4) AGL will protect its proposed pipeline(s) where they cross TransGrid's existing access tracks on TransGrid easements in such a manner that road legal axle loads will be withstood in accordance with AS 2885. All pipeline installation works would be completed to Australian Standards. AGL will continue consultation with TransGrid during detailed design development to ensure access along TransGrid easements is maintained and to ensure any heavy equipment crossing/s required are coordinated and that appropriate padding material and signposting is installed at crossing locations.
- 5) A formal Connection Process Agreement has been the subject of ongoing consultation between AGL and TransGrid as outlined in Section 3.2.

## **Submission**

9

## **Issue**

Transport requested that the layout of internal roads and service areas be included as part of the EIS, and that AGL provide analysis that demonstrates adequacy of accommodating Oversize/Overmass (OSOM) vehicles to access the site.

## **Response**

Detailed design of the internal roads and service area for the Proposal has not yet commenced, as the Proposal is still within the design stage. A selection of the energy generation equipment is yet to be determined and this will inform the layout of the Proposal site and the final design of internal roads is not yet available. Figure 2.4.1 in the EIS (and Figure 1.3 of this Submissions Report) provides the most accurate indication of internal roads (access roads) available at this stage.

Road works for the Proposal would include a new access road located off Old Punt Road. Permanent site roads including access roads would be included to provide adequate access to the NPS and buildings for operations and maintenance activities. Minimum width of the internal roads between the kerbs would be 8m for perimeter roads, which is adequate to accommodate OSOM vehicles, and 4 m for internal service roads. Environmental safeguard BF-2, states that the NPS road system would consist of a perimeter road and a network of services roads to allow for multiple access routes to the site; and that the perimeter road would be sealed and a minimum of 8 m wide.

During construction, environmental safeguard T-3 provides for the Construction Traffic Management Plan to be prepared to address OSOM vehicles.

AGL will continue to consult with Transport throughout development of the design and construction of the Proposal. AGL will provide the detailed design layout of internal roads and services areas to Transport when it becomes available and this commitment has been captured as T-6.

## **4.3.3. Biodiversity**

### **Submissions**

5, 12

### **Issues**

DPIE's BCD and PSC requested an update to Appendix D of the EIS, the Biodiversity Development Assessment Report (BDAR), with additional assessment including:

- 1) Reclarification of the Endangered Ecological Community (EEC) classification of mapped vegetation in Zones 1 and 3 and subsequent update to the BAM calculator inputs.
- 2) Inclusion of Regent Honeyeater and Swift Parrot as ecosystem credit species and inclusion of Pale-headed Snake as a candidate species.
- 3) Amend BAM calculator inputs to include ecosystem credit species in Vegetation Zones 3 and 5.
- 4) Update to Table 9 with all confirmed candidate species and provide further evidence of targeted surveys.

- 5) Inclusion of description of weather conditions and justification of target surveys.
- 6) Include details of how the project has avoided and minimised biodiversity impacts as required by the BAM.
- 7) Details of fauna survey methods and threatened orchid targeted survey methodology.
- 8) Append BAM final credit summary report.
- 9) Koala feed tree offsetting and exclusion fencing.
- 10) Consider indirect and cumulative impacts to the Ramsar listed Hunter Estuary wetland and migratory species.

## Response

In order to address the submissions received, the BDAR was updated with additional assessment and information, as summarised in Section 5.1.

- 1) Due to the lack of key diagnostic species (particularly *Eucalyptus fibrosa*) not occurring within Zone 1 it was not mapped as the EEC in the initial BDAR prepared to inform the EIS. Zone 3 was not mapped as EEC due to the lack of key diagnostic species and due to the degraded nature of the zone (lacks forest structure), the Final Determination does not include grasslands/shrublands as part of the EEC. Further justification has been included within the revised BDAR (Section 5.1). Included in this updated BDAR is the revision of the BAM calculator (BAM-C) inputs.
- 2) The Regent Honeyeater and Swift Parrot were included as ecosystem credit species within BAM-C in the updated BDAR. The BDAR has been updated in Section 4.1.2 of the revised BDAR to reflect data in the BAM-C. The Pale-headed Snake was assessed as a candidate for a species credit species. Targeted surveys were conducted through spotlighting, as detailed in Section 4.2.3 of the revised BDAR.
- 3) All species where no habitat constraints are listed in the Threatened Biodiversity Data Collection have been updated to be included as ecosystem credit species within BAM-C. The BDAR has been updated in Section 4.1.2 to reflect data in the BAM-C.
- 4) Table 9 in the BDAR has been updated to reflect the BAM-C (which correctly identifies that these species have been surveyed). Survey methodology for candidate species has been updated in Section 4.2.3.1 of the revised BDAR.
- 5) Weather data has been added to Section 4.3.2.1, Table 11, of the BDAR. Justification for amphibian surveys, which require rainfall prior to surveys, have been included in Section 4.3.2.1.
- 6) Avoid and minimise principles were considered in the design of the Proposal, and the description of measures has been expanded upon within Section 5 of the revised BDAR. It should also be noted that the final design will avoid areas of EEC where possible, but is likely to impact on a small strip within the power station site and along some easements. The layout and final design of the Proposal would endeavour to prioritise the reduction of impacts to biodiversity. Avoidance measures which would be taken to minimise EEC impacts include the placement of the northern process water storage pond and areas of infrastructure which are required for the operation of the power station to be in lower quality areas of vegetation, where possible. The environmental impact of the location of easements and power transmission to the TransGrid switching station have been considered in the design with cleared land for creation of easements being used where possible and underground horizontal direction drilling in ecologically sensitive areas proposed during construction. The approach in reducing the biodiversity impacts in the final design would be focused on avoidance, where possible, or use of previously disturbed and lower quality vegetation with low potential of providing habitat for native fauna species.
- 7) The potential for Zone 3 (PCT 1590 Low Condition) as a habitat for threatened orchids (particularly *Diuris praecox* and *Pterostylis chaetophora*) was highlighted in the submission. Areas of Vegetation Zone 3 which were dominated by native grasses were targeted for survey of threatened orchid species. Habitat for threatened orchids was ruled out within the majority of the zone, due to historic disturbance and subsequent dominance of exotic grasses and/or Couch (non-endemic to the community). Although these two species can occur within disturbed areas, including powerline

easements, this typically occurs in open areas and areas dominated by native species. The majority of Vegetation Zone 3 within the development site contains a density vegetation ground layer with a high cover of exotic species. Section 4.1.1.1 of the BDAR has been updated to reflect this.

Where available, reference populations for all orchid species were utilised. This information was updated in Section 4.2.2.2 of the BDAR. A reference population was used for *Diuris praecox*, *Cryptostylis hunteriana*, and *Pterostylis chaetophora*. Kleinfelder were not aware of a reference population for *Corybas dowlingii*, however, surveys were conducted within BAM-C survey period (prior to update). Furthermore, Kleinfelder have been informed during communication with the Hunter Region Botanic Gardens (2018) that the species is currently not recognised by Hunter Region Botanic Gardens (grouped with *Cyperus alterniflorus* – based on unpublished work). With regard to *Rhizanthella slateri* this species was triggered by vegetation occurring outside the Development Site (within the larger Study Area). As such, the requirement to survey for this species is no longer triggered by the BAM-C and has been removed from the BDAR.

- 8) The like-for-like biodiversity credit report has been included in Appendix 5 of the revised BDAR (previously Appendix 4, further detailed in Section 5.1).
- 9) The BDAR contained an assessment of the impacts of the Proposal in accordance with the *Port Stephens Comprehensive Koala Plan of Management* (Port Stephens Council, 2002). AGL acknowledges that PSC would support the consideration of offsetting the loss of Koala feed trees within the local area to help ensure any impacts on the loss of Koala habitat within the locality are appropriately mitigated. Koala feed trees will be avoided where possible within the final design of the Proposal. Where feed trees cannot be avoided, tree planting as an additional offset / mitigation for Koala habitat would endeavour to be accommodated within the local area. AGL are currently identifying appropriate locations and will seek Council approval prior to finalising any compensatory planting plan. Additionally, the size class of all feed trees to be impacted will be identified in order to determine the offsetting ratio required in accordance with the tree specification. Section 7.2.2 has been added to the BDAR to address this offsetting requirement.

To manage the risk of Koalas entering the site and being hurt, injured or killed, fauna exclusion fencing will be installed around operational areas where reasonable and feasible. The fencing would ensure that fauna species, particularly the Koala, would be prevented from entering the site and becoming trapped in the operational areas. This mitigation measure has been added to Table 12 of Section 5.3 of the BDAR and included as an EIS commitment B-11.

- 10) Assessments of the cumulative impacts on the Ramsar wetland have been added to Appendix 6 of the BDAR (previously Appendix 5) and conducted in accordance with Significant Impact Guidelines. While there is a general requirement for cumulative impacts to be assessed (SEARs), the Commonwealth requirements did not specifically seek an assessment of cumulative impacts on the Ramsar wetland.

## Submission

16

## Issue

Removal of vegetation for the Proposal would impact the existing nature corridor linking native vegetation areas in the region, impacting flora and fauna.

## Response

As discussed in Section 6.2 of the EIS, AGL has undertaken a thorough biodiversity assessment of the potential impacts of the Proposal on flora and fauna through the BDAR and found that with the implementation of management measures, there would not be any significant impacts on vegetation community, fauna habitat, migratory birds, or regional fauna connectivity.

The Proposal would require 15.5 ha of native vegetation to be cleared however about two thirds of the vegetation removal (11.1 ha) would occur in low quality or managed vegetation. As stated in the EIS, these areas were assessed as being weed infested and mostly cleared of canopy trees, of which the presence of the latter is a core component of an effective nature corridor.

Although mitigation is proposed, there would be some residual vegetation clearing impacts. Offsets have been proposed in accordance with the NSW Biodiversity Offsets Scheme.

The Proposal has been designed to minimise clearing of vegetation and habitat by utilising previously cleared areas and easements in large connective habitats, where possible. The EIS indicated that due to the relatively narrow proposed easements and the majority of clearing for the Proposal would be in previously disturbed areas or low-quality vegetation, the Proposal is unlikely to cause fragmentation or impact the connectivity of the local fauna populations.

## **Submission**

16

### **Issue**

The submission disagrees with the proposed location of the power station due to its ecological value and proposes relocating the Proposal to land contaminated with per- and polyfluoroalkyl substances (PFAS) to the east in Williamstown which has already been cleared for farming.

### **Response**

The selection of the Proposal site was the result of a comprehensive site comparison undertaken by Macquarie Generation on behalf of AGL in 2000. A revision in 2018 re-assessed whether the Tomago site still met the key selection criteria and provided the best economic outcome for AGL. Alternative site locations were reviewed for factors including proximity to vital energy sources and potential major clients, and suitable land for the development of proposed pipeline corridors and associated infrastructure. The site chosen was considered to be the most suitable as it met all key selection criteria. It provides existing infrastructure for energy generation, it has compatible land zoning for industrial development, and the land is sufficiently cleared therefore presenting minimal environmental constraints. If the site was relocated further to the east, the distance between the power station and the existing electricity infrastructure, including the TransGrid 132 kV switching station, would create a reduction in efficiencies and necessitate a larger disturbance footprint for infrastructure connections.

Most significantly, the Proposal would require soil disturbance including preparation of the power station pad and trenching to install pipelines. Trenching activities pose the risk of mobilising PFAS, which can then leach through soils or disperse into groundwater and surface waterways. Undertaking these activities in PFAS contaminated land would raise serious health and safety concerns for humans and the environment. The cost of health and safety measures of remediating the contaminated land for construction would make the project non-viable. Negotiations with State Government regarding land swapping and PFAS remediation is outside the scope of the Proposal.

## **4.3.4. Water**

### **Submission**

9

### **Issue**

Transport identified concerns with modelling and monitoring to demonstrate how construction and operational surface water discharges would impact the area affected by the M12RT project.

### **Response**

At the time of writing the EIS, the design and alignment of the M12RT project was still being developed, so the potential for construction and operational surface water discharges to impact on the Proposal could not be fully understood or assessed. Despite this, an indicative alignment of the potential future M12RT transport corridor was included in Figure 2.4.1 of the EIS (the conceptual power station overview), and the layout of the Proposal including its component infrastructure was refined to avoid this potential transport corridor.

The design of the Proposal is currently within design stages and can be adapted to recognise the M12RT design as it progresses. AGL has consulted with Transport as described in Section 3.2 and will continue to



consult with Transport as the ongoing design of the M12RT progresses. An additional environmental safeguard has been provided to ensure continued consultation and design information sharing between Transport and AGL and to ensure that the Proposal does not prevent the construction or operation of the M12RT. This is provided in T-6 in the revised environmental mitigation measures in Section 6 of this report. During construction, runoff and surface water discharges would be managed using a Surface Water Management Plan which would include a Stormwater Management Strategy and a Dewatering Procedure (environmental safeguards SW-1 to SW-5). Construction sediment basins would be established for temporary storage of site runoff before controlled discharge offsite using existing drainage paths, as indicated on Figure 6.3.2 in the EIS. Whilst it is not expected, in the event the M12RT project is in construction or operation during construction of the Proposal, due consideration would be given to potential impacts of any offsite surface water discharges on the M12RT project. AGL would continue its ongoing collaborative consultation with Transport.

A Surface Water Quality Assessment was completed for the EIS which considered operational surface water management. As described in the EIS, a series of operational water storage or treatment systems would be established within the NPS facility to manage operational water discharge:

- Contaminated water would be sent to a designated drainage system for transport to an appropriate liquid waste disposal facility
- A process wastewater system would collect wastewater in ponds or tanks for temporary storage, with wastewater and solids/sludge being periodically removed for disposal at a licenced wastewater facility
- Stormwater would be sent through a bioretention system and gross pollutant trap (GPT) and ultimately discharged to the existing grassed areas adjacent to Lot 3 where it would then infiltrate into the water table below or runoff to existing drainage paths as indicated in Figure 6.3.9 of the EIS. This infiltration or runoff would occur beyond the potential transport corridor and is therefore not expected to have any impact on the M12RT corridor, based on current understanding of its layout.

The EIS commits to pre-construction surface water quality monitoring (SW-27), and a surface water quality monitoring program during construction and operation (SW-28).

The EIS (Section 3.1) noted that both Transport and AGL would be required to accommodate each other's projects through design, construction, and operation. AGL is committed to ongoing consultation with Transport and would ensure that construction and operational discharges and monitoring associated with the Proposal would give due consideration to the M12RT project, as relevant.

## Submissions

5, 7

## Issue

DPIE's BCD and the EPA raised that the Surface Water and Hydrology Specialist Study (SWHSS) requires the following updates:

- 1) Further details of discharge volumes and frequencies.
- 2) Details on management of wastewater and evaporation.

## Response

- 1) Updates were made to the SWHSS in response to submissions received, and further detail is provided in Section 5.2. **Error! Reference source not found.** The MUSIC model used as part of the SWHSS was run to estimate future stormwater discharge rates, volumes and qualities. The volume of water discharge to receiving environments was estimated at a daily volume of 0.37 m<sup>3</sup> at median frequency and 4,666 m<sup>3</sup> at maximum frequency. The daily flow rate was estimated at 0.054 m<sup>3</sup>/s at a maximum frequency.
- 2) Most liquid waste from the operation of the Proposal would be managed as wastewater, collected in process water storage ponds or tanks for temporary storage and evaporation prior to collection and disposal as detailed in Section 2.6.7 of the EIS. The process wastewater and solids / sludge would

be periodically removed from the Proposal area by tankers for disposal at a licenced wastewater facility, to maintain capacity of the ponds. AGL has been in consultation with HWC regarding wastewater disposal, and HWC has indicated that they are able to accept and treat the wastewater created by operational activities from the Proposal.

Regular inspections and maintenance of the process water storage ponds would be carried out as part of the operational water management measures (SW-30) to manage the function and capacity of the ponds. AGL acknowledges the issue raised regarding potential discharge of contaminated water due to overflow events or leachate to groundwater from the ponds and, as part of the Operation Environmental Management Plan (OEMP) will implement measures to prevent these risks and eliminate any potential impacts to downstream wetland areas.

The capacity of and structure of the process water storage ponds is dependent on the final design of the power station technology. The operational arrangement is subject to ongoing design development and engineering advice, and the ultimate layout would be determined by the chosen contractor. Further detail on the arrangement, composition, and management of the process water storage ponds will be provided as the design progresses.

## **Submission**

9

### **Issue**

Aquatic species protection thresholds do not appear to align with ANZECC and/or NSW SWQ objectives.

### **Response**

The water quality and river flow objectives in the SWHSS used the objectives from the Hunter River Water Quality Objectives (OEH, 2006). These objectives included the maintenance or improvement of the ecological condition of aquatic ecosystems, with the numerical criteria of water quality indicators. The objectives in the Hunter River Water Quality Objectives Guidelines are community-based values with associated national criteria drawn from the ANZECC 2000 Guidelines. Although the ANZECC 2000 Guidelines provide default water quality conditions as a benchmark, there is emphasis to tailor these values to local conditions. The refinement of the trigger values to account for local aquatic conditions are consistent with the approach advocated by the ANZECC 2000 Guidelines. For these reasons, the SWHSS used the trigger values provided in the Hunter Water Objectives as these thresholds directly correspond to the guidelines provided by ANZECC.

## **Submissions**

7, 12

### **Issue**

The NSW EPA and PSC raised the following issues relating to the potential impact of the Proposal on water quality:

- 1) The NSW EPA raised that the assessments only detail reduction or retention targets based on Port Stephens Development Control Plan (DCP) criteria. Specific discharge quality concentration limits need to be provided for each parameter including Total Suspended Solids, Total Nitrogen and Total Phosphorus.
- 2) PSC raised that the proposed bio-retention basin and wet-sump oil and grease separator (GPT) would only treat nitrogen, phosphorous, sediment and gross pollutants and hydrocarbon. However, there may be other pollutants generated from the development which have should be identified and assessed accordingly.
- 3) PSC also raised that the MUSIC model and associated MUSIC-Link report were not included in the files for review. PSC offered to review the modelling if required by DPIE.

### **Response**



- 1) The Australian and New Zealand Environment Conservation Council (ANZECC) NSW lowland rivers trigger values are, 0.5 mg/L for total nitrogen (TN), 0.05 mg/L for total phosphorous (TP), and no adopted threshold for turbidity. Although the ANZECC 2000 Guidelines provide default water quality conditions as a benchmark, there is emphasis to tailor these values to local conditions.

Surface water quality data collected near the Proposal is described in the EIS in Section 6.3.1, including monitoring data from the construction of the adjacent NGSF. Locally adopted surface water thresholds for NGSF (Coffey, 2013) which were used to compare with monitoring data included Total Suspended Solids (TSS) concentration of 1000 mg/L, TN of 9 mg/L, and TP of 0.5 mg/L. Generally, pre-construction readings of TSS were below 40 NTU, and nitrogen and phosphorous levels were within the locally adopted thresholds.

Existing (baseline) water quality data would be used to derive Proposal-specific trigger values as part of construction and operational environmental management plans. The EIS has committed that pre-construction baseline monitoring of water quality parameters would be undertaken to form a dataset which would be correlated with monitoring data from NGSF and together could be used for comparison during construction and operational monitoring programs (SW-27).

- 2) AGL acknowledges that the proposed bio-retention system (not just a basin but an infiltration area incorporating selectively vegetated areas with enhanced filter media) and wet-sump oil and grease separator would primarily treat nitrogen, phosphorous, sediment and gross pollutants and hydrocarbon, however, the GPT should also help to remove attached metals in suspended solids and the filter media would assist to break down and remove common stormwater contaminants. Moreover, this system is intended to treat stormwater which is not contaminated by chemicals, oils, or other contaminants from the process. Oily or contaminated runoff would be sent in a designated drainage system for treatment or transport to an appropriate liquid waste disposal facility, as described in the EIS (Section 3.3). These pollutants would be captured in this wastewater and not allowed to discharge from the site. For other pollutants that may impact stormwater run-off quality through unplanned events such as spills or leaks, a spill response procedure would be implemented, as indicated in Section 6.3.3 of the EIS. The spill would be immediately contained, and the impacted material would be removed from the Proposal area to avoid contaminants potentially spreading via either surface water or groundwater pathways.
- 3) AGL acknowledges that PSC and/or DPIE may request to view the MUSIC model and associated MUSIC-Link report. Continued consultation between AGL, PSC and DPIE will be undertaken and the models and report can be provided if requested.

## Submissions

12, 27

### Issue

HWC and PSC raised that the Proposal's construction and operation impacts on flooding and flood risk require the following additional assessments:

- 1) PSC raised that the development site is above flood prone area and that the Proposal would not affect flood levels. Consideration should be given to evacuation routes in flooding conditions should flooding impact the site access road.
- 2) HWC raised that Section 6.3 of the EIS used climate projections from the NSW Climate Impact Profile (DECCW, 2010), indicating increased rain in all seasons excluding for winter. However, more recent advice from the OEH suggests that rainfall in spring and summer will decrease compared to historical levels by 5-10%.

### Response

- 1) AGL acknowledges PSC comments that the majority of the Proposal site is above flood prone area, and that the Proposal would not have any effect on the pattern of flood flows or on flood levels.

The concern of PSC regarding evacuation routes in flooding conditions was addressed in the Flood Assessment Report which formed Appendix E of the EIS and was summarised in Section 6.3 of the EIS. In the design events modelled (other than the 10% Annual Exceedance Probability (AEP)

event), it revealed all potential evacuation routes from the Proposal site would be inundated during flooding. As committed to in the EIS (SW-26), a Flood Preparedness Plan would be prepared based on the probable maximum flood design event. The plan would include monitoring of weather forecasts and flood warnings to enable flood preparedness procedures to be implemented ahead of potential flooding events, and site shutdown to be undertaken when required, including an evacuation route plan to minimise harm to persons, plant and the environment. The EIS notes the safest and most direct evacuation route for flood events below the 10% AEP, would be to exit the Proposal area by turning left onto Old Punt Road and then right onto the Pacific Highway.

- 2) Climate change was a consideration in the flooding models as detailed in Section 6.3.2 of the EIS. As per recent projections, climate change predictions in the area indicate wide potential changes of changes over the seasons. AGL used climate data in the flooding assessment which showed overall hotter conditions by 2050. The latest published documents available on the DPIE NSW website indicate that the seasonal rainfall projections for the near and far future, span both drying and wetting scenarios (OEH, 2014). AGL acknowledges the drier projected climate change conditions as per the advice from OEH. It should be noted that the Proposal would still be prepared for low rainfall conditions as it has been designed to accommodate water capacity in stormwater events at 1% AEP flooding scenarios.

## **Submission**

14

## **Issues**

A member of the public suggested the use of saline water from the north channel could be utilised in the NPS for steam generation, rather than water from the municipal water supply system.

## **Response**

The use of potable water for the Proposal is required for a range of services and systems at the NPS, including:

- Input to demineralised water treatment plant for power augmentation (wet compression) and NO<sub>x</sub> control if required
- Inlet air cooling (evaporative cooling or chilling (if required))
- Amenities including toilets, showers and hand basins
- Drinking water / kitchens (at workshop and administration buildings)
- Emergency showers and eyewash facilities (if required depending if chemicals are used on site)
- Firefighting
- Workshops
- Plant wash water
- Site landscaping irrigation

For certain power station processes, water is required to be of high purity to avoid damaging or corroding the machinery.

Depending on the technology, there are differences in the process of cooling various types of power generation units which allows for different types of water to be used. Saline water is used to cool the secondary source of energy generation and therefore can be used in closed cycle gas turbine power stations. This form of technology has not however been considered for the Proposal as it has slow start up times which are not appropriate for a peaking power station.

The NPS would be designed to be either an open cycle gas turbine power station or a reciprocating engine. Saline water cannot be used in open cycle technology as it would cause erosion of the machinery ie natural gas fuel goes through a combustion process to produce hot exhaust gases which in turn drive an electrical

generator to produce electricity. These exhaust gases are no longer used again by the plant but are released through the exhaust stack into the surrounding air in a one-way process. AGL has intentionally opted to use fresh water as opposed to saline water due to the requirements of the Proposal's turbine technology.

## Submission

8

## Issue

The DPIE Water and NRAR raised that:

- Impacts to GDEs, water users and any licensable take of water will need to be considered in detail
- A Water Access Licence must be obtained prior to the commencement of works for groundwater and/or surface water take

## Response

The Groundwater Specialist Study which informed the EIS predicted there would be no measurable groundwater impacts from the construction or operation of the Proposal on GDEs. The power station pad would not intercept or alter groundwater levels, however the gas pipelines and electricity transmission lines would, given they will be developed across land identified as high, moderate and low potential terrestrial GDEs.

The EIS also determined that even when assessing the peak water requirements for the Proposal, no other water users in the region would be affected during construction and/or operation.

As noted in Section 3.2, AGL have had continued consultation with DPIE – Water and NRAR, including a face-to-face meeting on 18 February 2020, follow up email correspondence in March, and another meeting in April. Through this correspondence, DPIE – Water and NRAR have confirmed their recommendation that the impact of the Proposal on the GDEs and water users is considered low risk. No further detail is necessary to address these issues.

In the meetings and email correspondence, DPIE – Water and NRAR provided the following guidance in terms of water take and licencing requirements (if necessary):

- The proponent should complete an analytical solution for estimated take of water
- If the estimated water take exceeds 3 ML/year, the proponent is to demonstrate a commitment to acquire all necessary units via the water trading market
- If the projected take is less than 3 ML/year, no further action is required

In relation to water take and licencing requirements, AGL engaged Aurecon to undertake a groundwater volume estimation, which is summarised in Section 5.3 of this report. Based on preliminary estimates, the volume of groundwater which may require management during construction of the gas storage pipeline component of the Proposal would exceed the 3 ML/year threshold and would, therefore, require a Water Access License (WAL) under the *Water Management Act 2000* (NSW).

At the time of writing this Submissions Report, AGL have determined that they will commence an application for a WAL with a zero-share component in anticipation of this groundwater impact and will engage in ongoing consultation with DPIE – Water and NRAR to further this application. AGL will also investigate the availability of temporary transfer of water allocations and options for water trading through the NSW Water Register.

In line with DPIE – Water and NRAR recommendations, AGL will commit to continued consultation regarding any water trading requirements. This commitment has been captured as an additional environmental safeguard in the revised environmental mitigation measures in Section 6 of this report, GW-12: 'If more than 3 ML/year groundwater is expected to be intercepted during construction, AGL would pursue a Water Access Licence and continue consultation regarding any water trading requirements.'

## Submission

### Issue

The potential impact of the Proposal on stormwater management was raised. PSC noted the following:

- 1) Post-development flows must be controlled to the pre-development flows (up to and including 1% AEP storm events using detention basins).

All discharges from the development must be directed to a legal and physical point of discharge which is currently located within Lot 54 DP 270494 (24 Kennington Drive, Tomago). As this property is located upstream of Lot 2 DP 1043561, a legal easement is likely to be required through the downstream property (Lot 2 DP 1043561) to discharge the developed, concentrated flows.

- 2) The drainage system and associated easements must be appropriately sized to cater for up to and including a 1% AEP storm event.
- 3) Discharge of developed, concentrated stormwater via the existing open drain within the Lot 54 DP 270494 may require permission from the downstream owner as this large drain is considered as an inter-allotment drain which PSC does not have any responsibility over.

Hydrological/hydraulic calculations should use current practice Australian Rainfall and Runoff (ARR) methods, noting that the rational method adopted is no longer endorsed.

### Response

AGL acknowledges the comments from PSC, and provides the following response:

- 1) Lot 2 DP 1043561 forms part of the 'Proposal area' defined in the EIS and is currently owned by AGL and therefore an easement is not required.

All operational wastewater would either be sent offsite to a licensed wastewater facility or treated and infiltrated as clean stormwater through the bioretention system and GPT as described in Section 6.3.3 of the EIS.

- 2) Noted.

- 3) It is not intended to discharge developed, concentrated stormwater via the open drain in Lot 54 DP 270494, however, PSC comments have been noted. Should detailed design indicate that the use of the inter-allotment drain is required, communication and negotiation with the property owner/manager would be instigated.

The methodology adopted for the hydrological/hydraulic calculations used the latest techniques recommended in the Australian Rainfall and Runoff Guideline 2019 ARR methods. The flood impact assessment was conducted using a two-dimensional hydraulic model, however the drainage calculations used the Rational Method as the ARR methods suggest that this is most applicable due to the small catchment area and industrial (not rural) land use type of the Proposal.

### Submission

27

### Issue

HWC raised that the Proposal would be located adjacent to and within the Tomago Sandbeds Catchment Area which is a drinking water catchment as described in Part 2 of the *Hunter Water Regulation 2015*, and further, the eastern portion of the proposed gas pipeline corridors are located within the water supply draw zone for groundwater extraction wells at Station 20. HWC suggested that this risk should have been better articulated in the EIS.

### Response

Section 4.2.3 of the EIS acknowledges that the gas pipelines and transmission lines are located in the Tomago Sandbeds Catchment Area, which is a catchment managed under the *Hunter Water Regulation 2015*.

Section 6.3.1 of the EIS further states that whilst the power station would be located outside of the Tomago Sandbeds Catchment Area, the proposed storage pipeline and electricity transmission line corridors would overlie the south-western fringe of the catchment area. This section of the EIS also acknowledges that the aquifer supplements potable water supply for the Newcastle region and forms an important component of drought response in the lower Hunter region. The EIS identifies the Tomago Sandbeds as a natural aquifer being composed of highly permeable fine-grained sands, a shallow water table and source of environmental water for GDE. AGL acknowledges that this aquifer is a vital source of water for the Lower Hunter region and identified its vulnerability to contamination as a key risk of the Proposal. The potential groundwater impacts of the Proposal were assessed in Section 6.4 of the EIS. Proposal activities impacting GDEs would only be a possible consideration during construction when gas pipeline installation extends below the water table. As discussed in the EIS, the lining of pipeline trenches with permeable sand or gravel would avoid impeding the flow of shallow groundwater along the proposed pipeline alignment and mitigate potential adverse impacts on GDEs during operation. A Groundwater Management Plan including a groundwater monitoring program was proposed to manage the risk of groundwater contamination or alteration of flows due to drawdown (EIS environmental safeguard GW-1).

The prevention of surface water contamination, which may cause subsequent groundwater contamination, was addressed in avoidance, mitigation and management measures listed in Section 6.3.4 of the EIS. These included a Dewatering Procedure to ensure all water discharged from the Proposal meets certain criteria before being released into the environment. Water that cannot be treated would be captured and disposed of offsite. This would remove cumulative impacts to surface water, including any run-off to groundwater.

The proposed operational wastewater and stormwater management systems, including the GPT and bioretention system, were assessed and found to achieve Neutral or Beneficial Effect (NorBE). The implementation of a bioretention system for stormwater was found to reduce the concentration of pollutants in the Proposal's operational stormwater discharge to a superior quality than existing background conditions.

Given the robust environmental safeguards as outlined in the EIS, the quality of the Tomago Sandbeds aquifer will not be impacted by the Proposal. HWC state if the works are undertaken as proposed, they do not consider the Proposal works warrant ongoing environmental monitoring of the aquifer.

HWC generally supports AGL's findings in relation to water quality and impact. In their submission, they advise support for the location of the proposed power station development outside of the Catchment Area as a means of achieving NorBE. HWC also note provided construction and operation occurs as described in the EIS, they are satisfied that the proposed construction and operation of ancillary works to be located within the Catchment Area present a low risk to the aquifer and a neutral impact on source water quality.

## **Submission**

27

## **Issue**

HWC raised an error in the SWHSS and EIS Table 6.3.2 which said 0.8 GL instead of 0.08 GL.

## **Response**

AGL acknowledges the typographical error in the SWHSS and Table 6.3.2 of the EIS, where the operational water requirements of the Proposal were incorrectly presented in the tables. As described in Section 2.4 of this report, at the operational water demand of 0.8 GL/a as calculated in the initial SWHSS, the Proposal would use only 0.3% of the water supply in the region and increase annual water usage fractionally by 1.2%. It should be noted that these calculations are based on a worst-case scenario, therefore AGL acknowledges that the anticipated operational water usage of the Proposal is substantially less than this. Operational water use of the Proposal remains a small fraction of the water supply available in the region.

## **4.3.5. Air quality**

### **Submissions**

7, 11

## Issue description

The EPA and HNE Health requested an update to the Air Quality Impact Assessment (AQIA), including:

- 1) Detailed information on the application of specific emissions controls of final power station design.
- 2) An ozone and inter-regional transport assessment, in accordance with *Tiered Procedure for Estimating Ground Level Ozone Impacts from Stationary Sources*.
- 3) Revised assessment considering emission variability, including assessment of emissions and impacts from plant start-up, shutdowns and variable load (noting that Clean Air Regulation emission limits do not apply during start-up and shutdown (Clause 52)).
- 4) Revised AQIA needs to be resubmitted based on final plant design for emissions inventory which is required for EPA monitoring and auditing.
- 5) Further consideration of impact and cumulative impacts of SO<sub>2</sub> is required, including impact to receptors.
- 6) Further assessment of exceedances of principal toxic air pollutants including acrolein is required. Following assessment, HNE Health will comment on potential health impacts.
- 7) Table 3.3 in the air quality impact assessment is erroneous and needs correcting.

## Response

- 1) AGL remains in a commercial tendering process for the delivery of the NPS with multiple technology providers. As such, a preferred power station option and associated emissions control technology have not yet been finalised.

The updated Air Quality Impact Assessment (AQIA) now includes a new Section 4 that describes the power station's emission performance with respect to Best Available Technology for the technologies currently proposed. Additionally, benchmarking of the Proposal's NO<sub>x</sub> emissions on a mass per unit output basis is provided, relative to other power stations in NSW. The updated AQIA is described in Section 5.4 of this report.

- 2) The updated AQIA includes a new Section 9 which provides a screening level assessment of potential ozone impacts, with consideration of the potential for interregional transport of air emissions from the Proposal. This screening level is appropriate and in accordance with the *NSW Tiered Procedure for Estimating Ground Level Ozone Impacts from Stationary Sources*, as detailed in Section 9.1 of the revised AQIA.
- 3) A discussion of start-up and shutdown emissions is provided in Appendix C of the updated AQIA. In addition, it is noted that whilst POEO limits may not be met during low load operation, (ie where an individual generator is run at low loads typically less than 40-50% of maximum output), AGL do not propose to operate generators at low loads.
- 4) As noted above, AGL remains in a commercial tendering process for the delivery of the NPS with multiple technology providers. As such, a final plant design cannot yet be provided. However, the updated AQIA seeks to provide sufficient information to allow the EPA to audit and evaluate the emission rates used in the modelling, for all technology options, and AGL will continue to engage with stakeholders as the design progresses.
- 5) Hourly SO<sub>2</sub> observations have now been sourced from the monitoring stations maintained by Tomago Aluminium Company (TAC) and have been referenced within Section 10 (Local Cumulative Assessment) of the updated AQIA.

To assess the potential for the Proposal to produce exceedances of SO<sub>2</sub> criteria in the local vicinity of the smelter, an assessment of potential cumulative impacts has been undertaken within Section 10 (Local Cumulative Assessment) of the updated AQIA. This has involved the addition of peak Proposal model predictions (reciprocating engine option, natural gas operation, continuous operation all hours of the year) to peak measured concentrations within the TAC monitoring network for the assessment year (2018). This exercise demonstrates that the Proposal is not predicted to produce additional exceedances of the SO<sub>2</sub> criteria for all averaging periods.



- 6) To further investigate the potential for acrolein emissions to produce adverse air quality impacts, the following analysis was undertaken:
- Appendix A of the amended AQIA provides a review of the NSW EPA and international screening criteria for acrolein. Based on assessment against these additional criteria, all predictions were estimated to be within respective screening criteria, as formulated to be protective of adverse public health outcomes.
  - Appendix D of the amended AQIA provides a review of meteorological conditions conducive to acrolein exceedances and identified that predicted exceedances were associated with high wind, moderate temperature daytime conditions and did not align with times at which the plant is most likely to operate. In this capacity, the assumption of continuous operation, as adopted within this assessment, is considered to provide a conservative assessment of peak acrolein predictions.
- 7) The error in Table 3.3 in the AQIA has been updated (related to particulate matter less than 2.5µm (PM<sub>2.5</sub>))

## Submissions

17, 23, 25, 28

## Issue

Degradation in air quality as a result of increased CO<sub>2</sub> and particulate emissions negatively impacting human health for surrounding receivers, residents and the Hunter Valley.

## Response

The potential impacts to air quality during construction and operation of the Proposal is described in Section 6.5.3 of the EIS. Air quality impacts during construction would be from the disturbance of dust during excavation, ground disturbance and demolition, odours from materials used and vehicle / plant exhaust emissions, with a number of environmental safeguards proposed to reduce the impacts. The residual impacts would be minor, localised to the worksite and short term, and are unlikely to affect receivers.

The air quality assessment found that there would be minor impacts due to air emissions from construction activities (dust, odours and exhaust). During operation, there would be minor exceedances of PM<sub>2.5</sub> when compared to the NSW EPA air quality impact assessment criteria, however, this needs to be considered in the context of existing elevated background levels. The EIS identifies that background levels in the Hunter region are currently assessed as above the NSW EPA impact assessment criteria due to the existing regional environment, which includes hazard reduction burns and onshore winds.

Air quality impacts during construction would be from the disturbance of dust during excavation, ground disturbance and demolition, odours from materials used and vehicle / plant exhaust emissions, with a number of environmental safeguards proposed to reduce the impacts. The residual impacts would be minor, localised to the worksite and short term, and are unlikely to affect receivers.

The EIS highlights the potential respiratory and cardiovascular health impacts and environmental impacts that particulate matter may cause. The EIS also identifies that background levels in the Hunter Region are currently assessed as above the NSW EPA impact assessment criteria due to the existing regional environment, which includes hazard reduction burns and onshore winds. The air quality assessment identified that for the worst-case scenario (ie continuous operations), a maximum of 0.2 µg/m<sup>3</sup> PM<sub>2.5</sub> above background conditions would be added to the existing environment, which represents less than a 1% increase and is not considered material in terms of cumulative impacts.

As part of the environmental safeguards to be implemented during the operation of the power station, pollution control equipment would be maintained to ensure emissions remain at acceptable levels. Under the EPA framework for regulating power stations in NSW, power stations are required to operate and maintain equipment under strict licenses to minimise air pollutants emitted to the surroundings. The mitigation measure AQ-1 commits to installing a Continuous Emission Monitoring Systems (CEMS) to demonstrate ongoing regulatory compliance, ensure proper and efficient operation of pollution control equipment, and evaluate operating and emission variability. This monitoring requirement would assist in tracking and

minimising emissions from the Proposal, and would help to ensure these emissions do not negatively impact the health of surrounding residents.

#### **Submission**

11

#### **Issue**

HNE Health raised that any cooling towers as part of the Proposal must comply with the requirements of the *Public Health Act 2010* and *Public Health Regulation 2012* in order to maintain and prevent the growth of *Legionella*.

#### **Response**

*Legionella* is a type of pneumonia caused by bacteria which is spread by breathing in mist from water that contains the bacteria. Although the generating technology option is still to be determined (reciprocating engines or gas turbines), no cooling towers are proposed as part of the Proposal. The Proposal would not have any infrastructure items which would promote the growth of *Legionella*.

#### **Submission**

11

#### **Issue**

HNE Health noted the new NEPC targets for PM<sub>2.5</sub> from the 2025 NEPM goals.

#### **Response**

The NEPM 2016 goals are currently adopted by the NSW EPA for measuring air quality (EPA, 2020). It is acknowledged that there will be a new PM<sub>2.5</sub> goal for 2025.

### **4.3.6. Fossil fuels and emissions**

#### **Submissions**

17, 18, 21, 23, 25

#### **Issue description**

Opposition to the construction and operation of a power station that utilises fossil fuels (gas or diesel), due to the emission of GHG including CO<sub>2</sub> and pollution concerns. The submissions propose that alternative energy (non-thermal) power sources could be used to meet electricity demands, and Submission 21 suggests that AGL should invest in more clean energy projects.

#### **Response**

The Proposal is required as part of AGL's plan to replace generation to the electricity grid when the Liddell Coal Fired Power Station is retired, delivering firming and dispatchable capacity to complement investment in renewables. AGL's focus is on developing flexible supply from new technology sources, to support the transition to a low emissions energy future. AGL are the largest private investor in renewable energy, and are already well on their way to this low emissions energy future, having committed to a \$1.9 billion development pipeline which includes, wind, solar, hydro, gas, battery storage, and improvements to the efficiency of their existing thermal generation. AGL have a further \$2 billion worth of projects in the pipeline across the NEM.

As part of this multi-faceted plan, the Proposal would service the electricity market during peak use times, which requires the NPS to be able to supply electricity to the grid at short notice during periods of high electricity demand and/or low supply.

Section 2.3.2 of the EIS describes a thermal peaking power station is best suited for this type of electricity demand, as well as being the most economical solution. Other commercial power generation alternatives, including non-thermal sources (solar, wind, hydro) were considered for the Proposal but were not suitable for the following reasons:



- 1) Solar and wind: Both are intermittent energy generators and require dispatchable electricity generation (a source of electricity that can be used on demand) in order to 'firm' the supply. The capacity factor of solar and wind power stations is also impacted by weather variables, making them less reliable in providing electricity supply to the grid at short notice. Solar and wind are viable power generation technologies which are being explored by AGL for other projects, but are not suitable for a fast-start peaking plant like the Proposal.
- 2) Hydro-electric: Hydro-electric power stations represent significant infrastructure developments with associated high capital expenditure. The NPS is required to be operational by the retirement of the Liddell Coal Fired Power Station, to ensure security of the electricity market. Hydro-electric power stations would not be operational within this time period. AGL is considering non-thermal power sources, and the feasibility of a pumped hydro project in the Hunter region is being explored by AGL with the NSW Government.
- 3) Pumped or battery storage: Energy storage power plants for electrical energy is still a developing field in Australia as battery storage facilities are not yet able to provide long duration services. Pumped storage facilities are not considered feasible as they are geographically constrained and have long development and construction periods.

As these alternative options were determined not to be viable for the Proposal, the dual fuel power station option was taken forward.

As noted in Section 6.5.2 of the EIS, Australia's target under the Paris Agreement is to reduce emissions by 26-28% below 2005 levels by the year 2030, progressing the levels of reduction required to meet the Kyoto Protocol targets. This will be achieved through a credible policy suite that is already reducing emissions, encouraging technological innovation and expanding Australia's clean energy sector. The Proposal would be consistent with the objectives of the Paris Agreement because it would support the transition to renewables by providing 'firming' capacity for grid security when renewables are not generating energy, while releasing lower emissions than coal fired generation.

With regard to GHG emissions of the Proposal, the GHG impact assessment in Section 6.5.3 of the EIS found that when operated at the base case (approximately 14% capacity factor), the Proposal would result in approximately 0.18% and 0.04% of the 2017 NSW and national inventory totals (respectively), and that the potential GHG emissions impacts of the construction and operation of the Proposal were anticipated to be below the current grid average emission intensity.

## **Submissions**

17, 18, 21, 23, 25, 28

### **Issue description**

Increased GHG emissions negatively accelerating climate change and global warming.

### **Response**

The Proposal has been planned and designed to meet a number of key objectives across the areas of operations and functionality, economics and environmental benefits. The key environmental objectives of the Proposal are to provide electricity with low GHG emissions and acceptable environmental impacts.

AGL recognises that Australia's energy sector is transitioning from a system dependent on ageing thermal generation assets to one characterised by renewable energy, lower emission technologies, firming technologies and storage. The transition towards these newer technologies requires dispatchable power generation in order to firm electricity supply to the NEM to ensure homes and businesses always have access to electricity.

The Proposal supports federal and state government renewable energy and climate policies by providing reliable, dispatchable capacity at times of high demand and/or low supply.

The Proposal would come online as Liddell Coal Fired Power Station retires and, would provide electricity with lower atmospheric emissions of greenhouse gases, oxides of nitrogen and sulphur dioxide than the existing coal-fired power station. The Proposal would also provide a necessary firming capacity in the NEM to support the development and use of other renewable energy projects.

The Proposal would be compliant with the requirements for Electricity generation in Schedule 3 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* (NSW) and would be fitted with Continuous Emission Monitoring Systems (CEMS) to demonstrate ongoing regulatory compliance. CEMS are installed to control emissions of NO<sub>x</sub>, an indirect contributor to greenhouse gases, which react in the atmosphere to form ozone. The monitoring of this air emission would further reduce the greenhouse gas impact of the power station.

As previously noted, the Proposal would be consistent with the objectives of the Paris Agreement as it supports the transition to renewables by providing 'firming' capacity for grid security when renewables are not generating energy, while releasing lower emissions than coal fired generation.

The Proposal would also fall under the National Greenhouse and Energy Reporting (NGER) Scheme, the framework for reporting annual GHG emissions, energy consumption and production in Australia, which is an important step in establishing a domestic emissions trading scheme. This means that the Proposal is required to report on its GHG emissions and energy consumption and production each year. AGL propose to conform with the safeguard mechanism under the NGER Act (2007), to keep their emissions at or below emissions baselines set by the Clean Energy Regulator. This provides a guarantee that should the Proposal be likely to exceed its baseline in any given year, the responsible emitter would have to reduce the facility's net emissions by purchasing or surrendering carbon credits. This is further detailed in the Greenhouse Gas Assessment which was undertaken to inform the EIS (Appendix H of the EIS).

## **Submission**

15

## **Issue**

A question was raised on whether the GHG assessment in the EIS include assets and processes associated with the Proposal including power consumed in refrigerating, transfer, pipeline and storage processes.

## **Response**

The GHG assessment was completed based on an assessment of emissions for various scopes. These assessments calculated the GHG emissions based on energy used during operation and associated emissions factors. For GHG assessments, there are three types of scope that can be assessed to identify emissions rates and scenarios. These include:

- Scope 1: Direct GHG emissions from sources that are owned or controlled by the Proposal. These emissions are the result of activities such as the combustion of fuels and generation of electricity.
- Scope 2: Indirect GHG emissions from purchased energy products. During operation, the Proposal would import electricity to power ancillary equipment at the site.
- Scope 3: Other indirect GHG emissions that are consequences of the activities of, but not controlled, by the Proposal. These include extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services.

The emissions associated with the refrigeration, transport and storage of the gas used to fuel the power station are considered under Scope 3. The GHG Assessment to inform the EIS presented operational emissions estimates for Scope 3, for each fuel type and plant option considered for the Proposal (Table 5.6, Appendix H of the EIS).

The GHG Assessment has compiled the emission factors for Scope 1 and Scope 3 emissions in order to allow a 'full fuel cycle' assessment of the greenhouse performance of the Proposal. This addressed both the greenhouse gas assessment of the Proposal as well as the fuel source, as appropriate to the assessment of the Proposal in the context of alternatives, and identified emissions that are implicit in the operation of the Proposal.

The assessment in Section 6.5 of the EIS estimated emissions based on the operating conditions proposed for when the Proposal would operate at either peaking load (base case) or continuous operation (worst case). The worst-case estimated combined emission intensity from these scopes (ie operating at worst case heat rates, on diesel fuel, and with the technology option and arrangements leading to the maximum

estimated emissions, and including an allowance for auxiliary loads and plant start-ups) would equate to a maximum of less than 90% of the NSW grid average emission intensity (DoEE, 2017), therefore having a GHG emission intensity lower than the state's average of 910 kg CO<sub>2</sub>-e/MWh. This is further detailed in the Greenhouse Gas Assessment which was undertaken to inform the EIS (Appendix H of the EIS).

## **Submission**

18

## **Issue**

Submission considered that the Proposal contradicts the NSW government's plans for the development of renewable energy zones.

## **Response**

Energy NSW describes renewable energy zones (REZ) as areas of high energy resource potential, where transmission infrastructure upgrades are proposed to connect multiple private sector energy projects at lower cost, helping to diversify the State's energy mix. There are three REZ proposed in the Central-West (near Dubbo), New England (near Armidale) and South-West (near Hay) regions, none of which are near the Proposal. The REZ are a part of the NSW Transmission Infrastructure Strategy, which also recognises the importance of gas as a dispatchable technology that will support renewable energy generation (DPIE, 2018). The Proposal does not contradict plans for the development of REZ.

## **Submission**

21, 25, 28

## **Issue**

Concern that the drilling and extraction of natural gas from wells and the transportation in pipelines leads to methane leakage, with methane being a potent GHG.

## **Response**

The Proposal does not include construction of any new wells for extraction of natural gas. The EIS indicates that natural gas supply for the Proposal would be supplied locally from the JGN.

Fugitive methane emissions are typically considered in relation to natural gas production rather than natural gas usage, such as coal seam gas (CSG) projects. The submissions refer to a US report which considers gas production by fracking. Emissions from CSG projects in Australia are likely to be lower than the US report. This is supported by various CSIRO studies (CSIRO, 2014; GISERA CSIRO, 2019). The 2014 CSIRO report notes that US emissions factors are unlikely to be indicative of emissions from Australian CSG production facilities, and that there is high uncertainty associated with estimates for methane emissions such as from pipelines.

Reliable measurements on Australian facilities are yet to be made (CSIRO, 2014), however, various studies have investigated fugitive methane emissions from CSG in Australia. One study indicated that the median emissions from CSG wells in NSW are less than 1kg/day and measurements from CSG compression plant of 780 kg/day, compared to 45 kg/day from an urban sewerage treatment plant and 2,600 kg/day from a cattle feedlot (GISERA CSIRO, 2019). Whilst there are studies which consider the production, storage and processing of natural gas, there is little research on end-users of the natural gas, including gas-fired power stations.

The proposed gas storage pipeline may contain volumes of natural gas as described in Section 2.1.2 of the EIS. This pipeline would be designed, constructed, maintained and operated in a safe and reliable way in accordance with AS 2885: Pipelines – Gas and Liquid Petroleum, Operation and Maintenance and as required by clause 10 of the *Pipelines Regulation 2013* (NSW).

The NPS and the storage pipeline would have safety features to prevent a major failure leading to significant methane emissions. The pipeline, and the NPS, would also be subject to periodic maintenance, monitoring, and inspection which would be detailed in the OEMP.

### 4.3.7. Aboriginal heritage

#### Submission

5

#### Issue

DPIE's BCD requested that Appendix J of the EIS, the Aboriginal Cultural Heritage Assessment Report (ACHAR) be updated, including:

- 1) Further assessment of the Aboriginal heritage item described in the EIS as 'NSP01' as it may be impacted by the Proposal.
- 2) The ACHAR must address avoiding impact or identifying conservation outcomes of Aboriginal cultural values. The ACHAR should be revised to demonstrate that harm avoidance or conservation outcomes have been considered for the Proposal in accordance with Section 2.6 of the Guide to Investigating, Assessing and Reporting on Aboriginal cultural heritage in NSW (OEH 2011).
- 3) To fulfil Aboriginal community consultation requirements, a copy of the draft ACHAR must be made available to each of the Registered Aboriginal Parties (RAPs) for review and comment prior to finalisation of the ACHAR.

#### Response

- 1) The Aboriginal heritage item 'NPS01' is located on Lot 2 DP 1043561, which is not part of the Proposal footprint. At the EIS stage it was determined that Lot 2, including NPS01, would not be impacted by the proposed works as it is located outside of the proposed development area. As no further heritage impact is anticipated, further assessment of the Aboriginal heritage item 'NPS01' is not warranted.
- 2) The assessment of Aboriginal cultural values was added to Section 8.1.1 of the revised ACHAR. The Aboriginal community submitted no comments regarding the cultural significance relating to the Proposal site or works. The impact to cultural heritage values was considered in field survey and test excavation programs. All three sites found within the Proposal area were deemed to have low significance and would be directly or indirectly impacted by the Proposal works.

Further detail on the revised assessment can be found in Section 5.5.

- 3) AGL acknowledges that a copy of the draft ACHAR must be provided to each RAP for review and comment. The draft ACHAR was provided to the RAPs on 7 August 2019 and a 28-day period provided for comment before the ACHAR was finalised. An amendment in Section 10.2.6 of the revised ACHAR has clarified this requirement. Further, on 25 March 2020, ERM on behalf of AGL issued the updated ACHAR with an accompanying project update letter to the RAPs, providing contact details should there be any comments on the updated report. AGL have met the requirements of the consultation guidelines.

#### Submission

5

#### Issue

The AHIMS site cards should be updated for Aboriginal sites that were subject to test excavation.

#### Response

At the completion of test excavations, AHIMS Site Impact Recording forms were completed and submitted to the AHIMS Registrar to reflect the status of sites that were subject to impacts from test excavation.

#### Submission

5

#### Issue

An Aboriginal Cultural Heritage Management Plan (ACHMP) was recommended for the Proposal and should include the following conditions:

- The ACHMP should include a strategy for mitigating Aboriginal cultural heritage
- The ACHMP should be prepared in consultation with the RAPS and BCD prior to ground disturbing works being undertaken for the Proposal
- A care agreement be prepared and integrated into the ACHMP
- A long-term management procedure for Aboriginal objects be prepared for the project and integrated into the ACHMP

### **Response**

The Proposal has an environmental safeguard (AH-2) which includes the requirement for a Cultural Heritage Management Plan. The environmental safeguard has been updated to include the recommendations provided by the DPIE's BCD, which now includes:

- An Aboriginal Cultural Heritage Management Plan (ACHMP) would be prepared in consultation with RAPs and BCD and implemented for the Proposal construction. The ACHMP would include, but not be limited to:
  - Monitoring and salvage works procedures
  - An Aboriginal artefacts care agreement
  - Long term management procedures for Aboriginal objects
  - Aboriginal cultural heritage mapping
  - Community consultation with RAPs and BCD prior to construction

### **Submission**

9

### **Issue**

The ACHAR for the EIS highlights that Transport will complete salvage on part of the AGL site, however, as AGL will impact the heritage sites prior to Transport works, the cultural heritage salvage must be comprehensively addressed by AGL.

### **Response**

AGL confirms that it is responsible for avoiding, mitigating and managing all impacts to Aboriginal heritage items as a result of the construction and operation of the Proposal. The submission is referring to the Aboriginal heritage site identified on Lot 2 DP 1043561, described as 'NPS01' in the EIS. At the EIS stage, the Proposal was determined to not impact this lot, and as such, no further heritage impact on Lot 2 DP 1043561 is anticipated as a result of the Proposal.

## **4.3.8. Traffic**

### **Submission**

9, 12

### **Issue**

Transport is in the environmental assessment stage for the M12RT project which has been declared CSSI. Regarding the construction and operation of the M12RT project and the Proposal, the following issues were raised:

- 1) Require continued commitment from AGL to undertake consultation with Transport throughout design and construction to enable the future delivery of the M12RT project and the Proposal.

- 2) The EIS does not include any commitment to ensure that the M12RT project can be constructed and that there are no future constraints to the operation of the road network, including Old Punt Road.
- 3) The proposed emergency access point in the north east corner of the NPS site will likely interfere with the proposed M12RT and is not suitable to put vehicles on to the Pacific Highway or proposed motorway. Further details and consultation are required to determine an appropriate emergency access.
- 4) The proposed access from Old Punt Road would need to be adapted to the proposed Transport upgrade to Old Punt Road.

## Response

- 1) As described in Section 5.3.1 of the EIS, AGL has had several face-to-face meetings with Transport (recorded as Roads and Maritime in the EIS) between July 2018 and the finalisation of the EIS. AGL's recent consultation with Transport is provided in Section 3.2.  
  
AGL are grateful that Transport acknowledges the ongoing negotiations and design reviews between AGL and Transport to ensure both projects can be delivered at the site. AGL further acknowledges that Transport requests ongoing consultation throughout the design process to ensure that both the Proposal and the M12RT project can be developed simultaneously. AGL commits to continuing this consultation with a new environmental safeguard T-6 throughout the design, construction and operation stages of the Proposal in order to support the future delivery of both projects.
- 2) An additional environmental safeguard has been provided in the revised environmental mitigation measures in Section 6 of this report, T-6, where prior to construction of the Proposal, AGL undertakes to share designs and collaborate with Transport to ensure that there is no restriction to the development of the M12RT project, and associated local or state roads.
- 3) The Proposal is currently within design stages and can be adapted to recognise the M12RT design. AGL has consulted with Transport as described in Section 3.2 and acknowledges that the current design of M1RT is in conflict with a proposed emergency access / egress to the north-east of the Proposal area. AGL will continue to consult with Transport as the ongoing design of the M12RT progresses so as to determine an appropriate emergency access / egress that is safe and does not interfere with the construction or operation of the proposed M12RT project. An existing environmental safeguard BF-2 and new environmental safeguard T-6 provide for this commitment.
- 4) AGL is not aware of any current development proposal for the upgrade of Old Punt Road. To manage design integration in the event that an upgrade of Old Punt Road is proposed, AGL makes the following new environmental safeguard T-8: AGL would design the access from Old Punt Road to integrate appropriately with any development proposal designs for the upgrade of Old Punt Road that are exhibited prior to commencement of the construction of the Proposal.

## Submission

9

## Issue

Both the M12RT and the Proposal would impact existing infrastructure in the area including Old Punt Road and major utilities connections across/within the Old Punt Road Corridor. Regarding the construction and operation of the M12RT project and the Proposal, the following issues were raised by Transport:

- 1) Request that AGL provide plans of utilities works in the Old Punt Road corridor, including how these works will be constructed or protected, ensuring that the Proposal does not impact the ability for Old Punt Road to be upgraded or maintained in the future.
- 2) Proposed utilities connections in the Old Punt Road corridor must not impact the constructability and maintenance of the M12RT project. It would be optimal if these works could be completed as an early stage in the AGL Proposal.



- 3) Concerns over proposed depth of directional drilling at only 900-1200 mm, as may impact on M12RT constructability and maintenance.
- 4) Electricity transmission lines would need to have adequate clearance heights above Old Punt Road, consistent with those above Tomago Road, which allows for OSOM vehicles.
- 5) Vertical clearance heights along the M12RT have been required to be at 12 m. Clearance over Old Punt Road should be subject to Transport and TransGrid agreement.
- 6) The new TransGrid towers should be located a suitable clearance from the Old Punt Road reserve to ensure Council / Transport have no horizontal clearance issue to manage in the future.
- 7) It is AGL's responsibility to upgrade Old Punt Road to accommodate the largest service vehicles accessing the AGL site as part of the Proposal. In order to allow for right turns into the site access to occur in a safe manner, a channelised right turn treatment (CHR(S)) on Old Punt Road southbound has been proposed.
- 8) The access road needs to be designed to ensure no queuing onto Old Punt Road at the site access.
- 9) AGL shall install the assets in a manner that creates no limitations on the construction and/or operation of the road reserve.

## Response

- 1) Section 5.3 of the EIS summarised direct agency consultation and noted that AGL and Roads and Maritime (now Transport) had discussed the possible location of utilities so as neither project is compromised. Detailed design of the utilities and utility protections for the Proposal has not yet commenced, as the Proposal is still within design stage. AGL commits to continuing collaborative consultation and sharing of designs with Transport, in a new environmental safeguard T-6. Another new safeguard, T-8, has been included to specifically address Transport's concern: 'AGL would design the access from Old Punt Road to integrate appropriately with any development proposal designs for the upgrade of Old Punt Road that are exhibited prior to commencement of the construction of the Proposal.'
- 2) A new environmental safeguard T-6 has been included to specifically address Transport's concern: 'AGL undertakes to share designs and collaborate with Transport for NSW to ensure that there is no restriction to the development of the M12RT project and associated state or local roads'. AGL would consider completing utilities connections as an early works stage of the Proposal construction.
- 3) AGL would like to clarify that the gas storage pipeline would primarily be constructed by trenching and be generally buried at a minimum depth of 900-1,200 mm. However, in the area of proposed horizontal directional drilling (HDD) under Old Punt Road near its intersection with the Pacific Highway (refer to Figure 1.2), the gas storage pipeline would be deeper than 1,200 mm. Through HDD, the gas storage pipeline will be installed in a shallow arc under the road to ensure minimal surface disturbance in this area and enable a greater depth from the road surface to the pipeline, which would avoid impacts and provide appropriate clearances to other existing utilities. HDD installation has been specifically proposed as the preferred pipeline installation technique for this area to avoid impact to Old Punt Road and buried utilities, as well as the environmentally sensitive Freshwater Wetland Complex vegetation areas adjoining the Pacific Highway near Old Punt Road.  
  
The gas pipeline connection proposed from the NPS to the PL42 pipeline will be trenched across Old Punt Road north of Kennington Drive (refer to Figure 1.2), as there would not be enough space to undertake HDD. In this area, the depth of trench cover will be 1,500 mm to match the existing depth of PL42 and comply with AS 2885. As stated in the EIS (Section 2.5.1), the pipeline route would be registered with Dial Before You Dig to identify buried utilities prior to commencing construction. AGL would consult with Transport throughout the duration of the detailed design and construction of the PL42 connection across Old Punt Road.
- 4) The Proposal is still in design stages. The final design of the electricity transmission lines would consider impacts of clearance heights on traffic, such as the accessibility of OSOM vehicles on Old Punt Road. AGL would ensure that OSOM vehicles would have adequate clearance beneath the transmission lines, as OSOM vehicles would need to access the Proposal during operations, maintenance and decommissioning phases. A new environmental safeguard T-7 has been included

to specifically address Transport's concern: 'AGL will design proposed utilities to be adequately protected and/or have suitable vertical clearance so as not to limit the current operation of the road reserve'.

- 5) AGL acknowledge this information and commit to continued consultation with Transport, TransGrid and Ausgrid to resolve vertical clearance heights of electricity transmission lines. A new environmental safeguard T-7 has been included, as discussed above.
- 6) AGL has been in continued consultation with TransGrid regarding clearances and tower locations (refer to Section 4.3.2), including in the Old Punt Road reserve. AGL will ensure the design does not create horizontal clearance issues which require ongoing management by PSC or Transport. New environmental safeguard T-7 has been included, as discussed above.
- 7) AGL is committed to ensuring that the existing local road network will continue to operate both efficiently and safely during construction and operation. As part of this commitment, AGL will upgrade Old Punt Road, where required for the Proposal, including the construction of a channelised right turn (CHR) treatment on Old Punt Road. The upgrade work would comply with relevant standards appropriate for major heavy vehicle access. This was detailed in the EIS and was also captured as an environmental safeguard T-5.

Environmental safeguard T-5 did not include a specific commitment to ensure that the design would be developed to the satisfaction of Council and Transport. As such environmental safeguard T-5 has been modified to require the design to be developed to the satisfaction of PSC and Transport.

- 8) Section 6.8.3 of the EIS includes an assessment of the construction and operational access to the NPS. The Proposal access site would be off Old Punt Road, which would be the primary access route for heavy vehicles and site vehicles during construction and operation.

The assessment included the provision for a CHR on Old Punt Road for safety reasons and to cater for higher traffic flows during construction. The assessment determined that the CHR treatment at the site access would enable the forecast additional construction traffic to turn into the site with negligible impact on through traffic flows along Old Punt Road, which would eliminate any risk of queuing. The assessment concluded that there were no safety or capacity issues identified for the nominated access location off Old Punt Road.

The Proposal access road and internal roads have been designed to avoid queuing on Old Punt Road. Both the site access and the internal access roads have been designed to provide for two-way movement of vehicles and allow for circulation of vehicles within the site. This ensures one lane of travel in each direction is always maintained with no requirement for vehicles to hold or give way to a vehicle travelling in the opposite direction. This will ensure there is no queuing caused by the Proposal that may extend back onto the external road network upon entering the site.

Environmental safeguard T-5 has been modified to ensure that the design of the CHR on Old Punt Road would ensure no queuing of vehicles along Old Punt Road.

- 9) The Traffic Impact Assessment undertaken to inform the EIS demonstrated that the local road network is sufficient to continue to operate both efficiently and safely during construction and operation of the Proposal.

## **Submission**

9

## **Issue**

Transport raised that Appendix K of the EIS, the Traffic Impact Assessment (TIA), requires the following updates/inclusions:

- 1) An assessment of traffic impact at the intersection of the Pacific Highway and Old Punt Road. Analysis should be provided to demonstrate the longest B-Doubles servicing the Proposal can safely complete a left hand turn to Pacific Highway.

- 2) An assessment of OSOM vehicles required to access the site during construction and any road improvements required as a result, which would be the responsibility of AGL. The management of OSOM vehicles should be included in the Construction Traffic Management Plan (CTMP).

## Response

- 1) AGL's traffic consultant, Seca Solution, were engaged to conduct an additional traffic impact assessment at the intersection of the Pacific Highway and Old Punt Road. The assessment is further detailed in Section 5.6 and demonstrates the longest B-Doubles servicing the Proposal can safely complete a left hand turn to Pacific Highway.
- 2) OSOM vehicles will need to access the site during construction. Construction access to the site would be off Old Punt Road, which would be accessed from Pacific Highway. Based on recent traffic observations at the intersection of Old Punt Road and Pacific Highway (refer to Section 5.6.4), OSOM vehicles are able to turn within the existing road geometry which has been designed to accommodate this movement, and no additional road improvements are required.

The EIS has committed to the provision of a CHR/s turn treatment at the site access point off Old Punt Road, which would allow any vehicles turning right into the site to do so with negligible impact upon through traffic flows along Old Punt Road.

AGL understands that OSOM vehicles would be controlled under a separate approval from the road authority and would be subject to route restrictions, maximum dimension and mass limits, and various operating conditions.

In the EIS, AGL committed to addressing OSOM vehicle requirements in Traffic Control Plans within the CTMP (mitigation measure T-3). The CTMP would be prepared prior to construction, when the timing of OSOM deliveries is understood. The Traffic Control Plans would include detailed plans, procedures and operational activities required to enable the safe transport of OSOM vehicles to the project site. The Traffic Control Plans would include requirements for pilot and escort vehicles as required under relevant Guidelines, with the requirements varying depending on the size and length of the vehicle.

In preparing the Traffic Control Plans, AGL would refer to the guidance and requirements outlined in the Transport webpages 'Oversize and/or overmass vehicles and loads' and Transport's publication on 'Additional Access Conditions for oversize and overmass heavy vehicles and loads' dated November 2017 and other advice provided by Transport in any future consultation.

## 4.3.9. Noise and Vibration

### Submission

7

### Issue

The EPA raised issues regarding the Noise and Vibration Assessment (NVA), including:

- 1) Detailed information to demonstrate that the attenuated sound power levels in Table 9-2 are feasible and reasonable to achieve.
- 2) A comprehensive assessment of the applicability of any annoying noise characteristics including low-frequency and/or tonal modifying factors to the operation of the proposed project.
- 3) Additional data to confirm that the background noise monitoring results are still representative of the cooler autumn/winter months when insect noise is less likely.
- 4) A review of how the amenity levels have been derived, particularly with respect to the conversion between LAeq(period) and LAeq(15minute) data.
- 5) Explanation of why the amenity levels in Table 5-3 have been increased by 5 dB at receiver R4 (Caravan Park).
- 6) Revision of evening intrusiveness levels so that they are not set higher than the daytime intrusiveness level. This is required by Section 2.3 of the Noise Policy for Industry (NPI).

- 7) An analysis of meteorological conditions to support the adoption of any relevant prevailing winds in the noise modelling.

## Response

In order to address the submissions received, the NVA was updated, as summarised in Section 5.7.

- 1) At this stage of the Proposal, AGL are in a commercial tender process with multiple vendors for delivery of the NPS. The attenuated sound power levels for individual components from tenderers have not yet been provided as this data is commercial-in-confidence. However, the tender process includes requirements for vendors to achieve the noise management levels identified in the noise impact assessment, as set out in Table 51 of the updated NVA.
- 2) At this stage of the Proposal, AGL are in a commercial tender process with multiple vendors for delivery of the NPS. Detailed spectral data for the tenderers design options have not yet been provided as this data is commercial-in-confidence. Noise emissions from the operation of the power station would be required to be free of annoying characteristics to avoid tonal or lower frequency penalties.
- 3) Observations during site visits indicated background levels at locations L1 and L3 were primarily influenced by traffic noise from the M1 Pacific Motorway, which at the time of assessment carried approximately 50,000 vehicles per day. Additional monitoring data during autumn / winter months is not expected to result in the Rating Background Level (RBL) changing significantly. In order for the RBL to have a material impact on the Proposal's noise triggers, RBLs would need to be less than 35 dB at these locations, which is not expected given the proximity to the highway.

Observations on site at location L2 identified a large influence from farm animals and birds. Distant traffic was observed in the background at this location. Review of the noise logging data indicates that this location is potentially influenced by farming or animal / fauna noise during all periods over the logging period with inconsistent trends occurring in the logging data. Notwithstanding these results, adopting the rural amenity criteria of 40 dB evening and 35 dB night time limits the criteria to the minimum threshold during the most sensitive night time period. Where additional data indicated a lower RBL, the controlling amenity noise limit of 35 dBA for the night time period would still control noise limits at this location. As the Proposal would be required to meet the most sensitive night time criteria, this becomes the controlling limit for all operational periods.

Additional noise logging data while useful in further understanding the existing acoustic environment is not expected to result in a change in the controlling noise criteria (Proposal trigger levels) for operation of the NPS.

Observation data has been provided in Table 3.6 of the updated NVA to provide context on the noise sources influencing the ambient noise environment.

- 4) The Proposal trigger levels presented in the noise impact assessment are based on the lower of either the intrusive ( $LA_{eq}$  15 minute) or the amenity limit ( $LA_{eq}$  period). Intrusive limit  $LA_{eq}$  15-minute criteria would be 3 dB greater than the amenity period criteria. During NPS operations, continuous running of the power station over the entire day time, evening or night time period would require compliance with the period amenity criteria. Hence the lower period limit has been adopted. Section 5.2.3 of NVA has been updated to clarify this point.
- 5) The amenity criteria for receiver R4 was adjusted as per the guidance provided in Table 2.2 of the Noise Policy for Industry (EPA 2017), which states that for Caravan Parks amenity levels are "5 dB(A) above the recommended amenity level for a residence". Footnotes have been updated on Table 5-3 of the NVA to clarify this.
- 6) Noise logging data at Location L2 indicated background noise levels were 1 dB higher during the evening than the day time noise levels at this location. Background levels of 37 dBA day time, 38 dBA evening and 37 dBA night time were measured. After comparison with the amenity criteria, noise Proposal Noise Trigger Levels of 42 dBA day, 40 dBA evening and 35 dBA night time were adopted at locations L2. The adjustment of evening intrusive criteria is immaterial to the adopted Proposal Noise Trigger level during the evening period at this location.

Table 5.2 of NVA has been updated to include the correction where background levels are higher in the evening than day time at L2.

- 7) Wind conditions assessed were based on an analysis of OEH Beresfield meteorological data for the period 2013 to 2017 with the NSW EPA noise enhancement wind analysis program. The analysis indicated that noise enhancing SE winds were a feature of the area (greater than 30%) of the time during the winter night time period.

Section 9.2 of the NVA has been updated with reference to the meteorological analysis undertaken.

## **Submission**

11

## **Issue**

HNE Health raised that environmental noise can adversely impact human health and well-being. All noise as a result of construction and operation of the Proposal should ensure compliance with all NSW EPA noise criteria as well as mitigation described in the EIS.

## **Response**

AGL acknowledges the importance of managing the impacts of noise on surrounding receivers as a result of construction and operation of the Proposal. Noise and vibration assessments were undertaken in accordance with the NSW EPA's guideline, Noise Policy for Industry (NPI) (EPA, 2017), as detailed in Section 6.9 of the EIS. A Construction Noise and Vibration Management Plan would be developed prior to commencement of works (environmental safeguard NV-1). This plan would identify mitigation measures to minimise noise and vibration impacts on surrounding receivers. Mitigation measures could include silencers, lined ducts, acoustic enclosures, noise screens/barriers, selection of quieter plant/equipment, or a combination of the above.

Predicted construction noise levels would comply with noise management levels for standard hours, out-of-hours and highly noise affected receivers. Sleep disturbance was also evaluated through the NPI screening method, and the predicted Proposal night noise levels during construction would comply with the criteria. Noise levels during operation were modelled based on worst case daytime, evening and night time scenarios. With the implementation of noise management measures and sound attenuation, the Proposal would comply with the project noise trigger levels as set out by the NPI at all surrounding residential and non-residential receivers during operation. In addition, assessments for potential cumulative noise indicate no acoustically significant impacts on the local area are anticipated from the Proposal. This is due to existing ambient noise levels which are influenced by nearby industrial developments. The noise and vibration assessments carried out in the EIS demonstrated compliance with EPA guidelines.

## **4.3.10. Social and economic**

### **Submission**

22

### **Issue**

Supportive of the Proposal increasing social and economic growth.

### **Response**

The support for the Proposal is acknowledged by AGL.

## **4.3.11. Aviation impacts**

### **Submissions**

6, 19, 20

### **Issue**



Department of Defence, NAPL and Jetstar Airways raised concerns regarding operation of the NPS near the Newcastle Airport/RAAF Base Williamstown, including:

- 1) Exhaust plume rise from operation of the NPS is predicted to penetrate the OLS and the Procedure for Air Navigation Services – Aircraft Operations surfaces, and may affect aviation flight paths. Concerns were raised about aviation airspace safety and disruption to aviation / regular public transport operations due to the operation of the NPS during airport hours of operation.
- 2) Query regarding the short amount of notice able to be provided before the plant is operational. Recommend the installation of Required Navigation Performance Approach Required system (RNP AR), with NAPL suggesting financial support from AGL.
- 3) Need for ongoing consultation between AGL and other aviation industry participants.

## Response

- 1) Plume rise modelling has been conducted based on worst case scenarios, as detailed in Section 7.1 of the EIS. As a range of generation plant options are still being considered, the plume rise assessment considered general 'worst case' emission parameters including exhaust flow, exhaust temperature, stack separation, and stack height. The assessment was based on continuous operation of the plant at full operating load. Table 2.6.1 in the EIS compares the operating runtime of the base case and the worst case, with an average of 3.25 hours/day compared to 24 hours/day. Given the NPS is more likely to operate on an intermittent/peaking basis, with a capacity factor of around 14%, and given the conservative assumptions and parameters used in the modelling, the maximum plume rise extent is considered a highly conservative prediction.

As noted in Section 3.2 above, AGL responded to Department of Defence's request for a letter providing additional context of plume rise modelling completed for the EIS and presented technical approaches to assess both technologies being considered by AGL. The letter sought endorsement from the Department of Defence on the proposed approaches, which include consideration of the 99.9<sup>th</sup> percentile critical plume extent rather than the 100<sup>th</sup> percentile, and adoption of CASA's recommendations regarding critical plume velocities for instrument flight and visual flight.

The peak (100<sup>th</sup> percentile) plume rise represents the highest hour in over 43,000 hours of meteorology covered in the 5-year modelling period. Context was provided around the highly conservative nature of the assumptions and modelling.

AGL completed an assessment of plume conditions using The Air Pollution Model which uses the 99.9<sup>th</sup> percentile statistic, which demonstrated that the critical plume for instrument flight rule (IFR) operations is not predicted to impact any PANS-OPS surfaces and would not present a hazard to aircraft when flying using instrument procedures. The assessment of impact to flight under visual flight rules is also being considered as part of ongoing consultation. AGL also clarified that aircraft operating under IFR would be automatically protected from plume due to procedure design requirements. This updated assessment indicates that risks to aviation safety and disruption to aviation operations has reduced significantly below those raised in the submission.

As indicated above, AGL has sought endorsement of this process from Department of Defence and at the time of writing this Submissions Report, is in continued consultation with the Department of Defence to progress this matter. As part this ongoing consultation, a flight charter amendment is no longer considered appropriate, and mitigation measure PR-2 has been updated to 'AGL would continue to consult with Department of Defence during design, construction and operation on appropriate measures to manage aviation safety risks associated with the Proposal.'

- 2) AGL appreciates the query that due to the Proposal being a peaking plant, there may not be predictable operating timeframes of the power station and little notice of the power station starting up. AGL has considered the request for financial assistance in the matter of installing a RNP AR, however, this type of support is outside the scope of the Proposal. AGL does however commit to continued consultation with the relevant Aviation Authorities.
- 3) AGL is committed to ongoing consultation with various aviation industry participants, including Airservices Australia, Department of Defence, and CASA. This is captured in the EIS mitigation measure PR-2.



## Submission

20

## Issue

Jetstar Airways requested additional detail to understand potential impacts to the obstacle and PANS-OPS surfaces, such as an impact analysis showing surface infringements, and relative location to flight paths and procedures. The submission also noted that the Proposal development timeframe will need to be considered in the Williamstown Traffic Management Plan review, which will be completed in 2021 by AirServices Australia.

## Response

As the Proposal is still in design, and the decision of generating technology and the arrangement of generation units is still to be determined, AGL cannot yet provide the detail requested by Jetstar Airways in its submission.

AGL is committed to continuing consultation with Airservices Australia, Department of Defence, and CASA throughout project planning. EIS mitigation measure PR-2 commits that 'AGL would continue to consult with Department of Defence during design, construction and operation on appropriate measures to manage aviation safety risks associated with the Proposal.' Department of Defence would feed relevant information from this consultation through to aviation industry participants and airline operators including AirServices Australia and Jetstar Airways. This information may assist the Williamstown Traffic Management Plan review.

Once detailed design is complete, AGL has committed to provide the plume rise assessment report to Airservices Australia, Department of Defence, and CASA for review prior to the commencement of construction (captured as EIS mitigation measure PR-1).

## 4.3.12. Hazards

### Submission

15

### Issue

The Proposal would be located in bushfire prone land. Questions were raised including:

- Will the Proposal emit heat through exhausts that could cause bushfires?
- Is the Proposal bushfire safe, especially on high risk days?

### Response

A Bushfire Threat Assessment was completed to inform the EIS (Appendix R), and ignition sources during the construction and operation of the Proposal that have the potential to cause bushfires were identified in Section 7.2 of the EIS. This assessment considered bush fire prone vegetation, topography, weather and potential ignition sources as the key hazards which contribute to the risk of bushfire threat. Bush fire danger is associated with weather conditions, with high risk days characterised by hot, dry conditions (lack of recent rainfall and low humidity) and high wind speeds, as well as fuel loads. Table 7.2.2 in the EIS included potential ignition sources and scenarios during operation of the Proposal. This table indicated there is a chance of emitting hot exhaust carbon particles through the generator exhaust, which, unmitigated, can cause ignition of surrounding vegetation and cause bushfires. An asset protection zone (APZ) would be implemented around the NPS to increase the space between infrastructure and bushfire hazards (ie vegetation containing 'bushfire fuel') to the furthest possible extent. This would act to provide a level of bushfire safety for the Proposal, especially on high risk days where weather conditions can accelerate bushfire risk. To avoid ignition of combustible sources through exhaust emissions and vegetation clearing, maintenance activities would be undertaken within the APZ, and infrastructure would be located in suitable locations within the compound away from combustible materials.

The EIS noted that levels of radiant heat exposure during bushfires have the potential to reduce infrastructure integrity. Mitigation measures have been put in place to ensure the design of the Proposal has

appropriate bushfire resistance and would maintain a radiant heat impact of 23 kW/m<sup>2</sup> or less. This limit is to prevent the thermal failure of infrastructure, resulting in it becoming a source of ignition during a bushfire.

Further safeguards to mitigate bushfire impacts include a ring main water supply and hydrants throughout the site to provide firefighting resources and providing multiple access routes to the site for emergency services. An Emergency Management and Evacuation Plan (environmental safeguard BF-1) would be developed in accordance with NSW RFS and Australian Standard guidelines, including the NSW Rural Fire Service guide to developing a Bushfire Emergency Management and Evacuation Plan. As part of this plan, Fire Danger Ratings would be assessed on a regular basis using the RFS website. The Proposal would have bushfire safety integrated into the design, and emergency management implemented during operation. The Bushfire Threat Assessment confirms this, and that the proposed development can also achieve required bushfire mitigation actions, minimum defendable space, and access and water provisions.

## **Submission**

15

### **Issue**

Questions were raised regarding the use of hazardous materials including:

- Has Newcastle Port handled large gas vessels?
- Can Newcastle Port do so safely?
- Are permits in place to do so?
- Isn't most gas transferred from offshore based unloaders, not port based because of dangers in this phase?

### **Response**

It is not proposed to supply the NPS with gas from gas vessels via the Port of Newcastle. The Proposal would be fuelled by natural gas supplied from JGN, which would be transported to the site via existing in-ground gas pipelines. The proposed new gas pipeline corridors would contain underground high-pressure pipelines and would be designed, constructed and operated to meet the requirements in AS 2885: Pipelines – Gas and Liquid Petroleum. This would ensure the pipeline infrastructure is built and maintained to meet modern standards for safety. Details of the gas pipeline dimensions and gas storage facility are described in Section 2.4.2 of the EIS.

The Proposal would not have direct contact with the Port of Newcastle for the transport of gas during construction and operation, and as such would not be required to obtain permits from the Port. Safety concerns regarding gas vessels and transfers are outside the scope of the Proposal and should be raised directly with the Port of Newcastle.

## **Submissions**

13, 29

### **Issue**

DPIE raised that the Preliminary Hazard Assessment (PHA) requires updating, whilst the RFS NSW raised that following detailed design, the PHA should be finalised, and in turn the Fire Safety Study (FSS) should also be finalised.

The updates required to the PHA include:

- 1) Clarification on ignition probabilities in Table 26 of the PHA.
- 2) Review of other available literature sources for large pipeline failure frequencies, such as UK Health and Safety Executive (HSE), 2015, Update of Pipeline Failure Rates for Land Use Planning Assessments, Research Report (RR) 1035 (HSE RR 1035).

- 3) Clarification on whether a Vessel Phast Model has been adopted and whether a linear source risk model should be adopted.
- 4) Site layout diagrams to include more detail.
- 5) Further details on comparing the proposed power station against the Dalton Power Station to justify the result from Dalton Power Station should be referenced.
- 6) Clarification on whether the PHA included Flash Fire and vapour cloud explosion (VCE).
- 7) Clarification on whether the PHA included determination of the propagation risk, including but not limited to the 'storage pipeline', pigging facility, power station (such as control room, switching room, generators) and other neighbouring industrial development. If propagation between the two pipelines is possible, it is required to be include in the analysis.
- 8) Further detail of the individual fatality risk (also known as individual risk (IR)) and the illustrated IR contour mentioned in Section 10.3 of the PHA. It should clearly illustrate the potential interaction between the IR contour to the neighbouring facility (circular vs contour along the pipelines).
- 9) An update to Table 29 of the PHA and provision of the IR value for various land uses.

## Response

AGL notes that an updated FSS is required and acknowledges that this will be finalised upon completion of the detailed design. The Proposal's PHA will also be progressed to a Final Hazard Analysis at the completed design stage. In order to address the submissions received, the PHA was updated, as summarised in Section 5.8.

- 1) Table 26 is now Table 23 in the updated PHA. The ignition probability of 40% was used for the above ground areas where there are between "Very Few" to "Few" ignition sources available. The ignition probability of 81% was applied for the pipeline sections, based on the proposed values given in the Research Report RR1034, Table 14 which presents the ignition probability for high pressure gas transmission pipeline as is uniformly applied 0.81 and is published by UK Health and Safety Executive (HSE), in 2015.

The frequency data has been updated based on the UK HSE, 2015, Update of Pipeline Failure Rates for Land Use Planning Assessments, Research Report (RR) 1035 (HSE RR 1035).

- 2) Frequency data has been updated in the PHA based on the UK Health and Safety Executive (HSE), 2015, Update of Pipeline Failure Rates for Land Use Planning Assessments, Research Report (RR) 1035 (HSE RR 1035).
- 3) A Vessel Phast Model has been used for pig-launchers and above ground piping. A long pipe model was used for the pipelines. A user defined source was used for VCE due to confined housings.
- 4) New maps showing a concept layout of major equipment, and a process flow diagram illustrating the interconnection of the major pieces of equipment and pipelines, have been added to the updated PHA.
- 5) As the designs of the Proposal's gas turbines are currently at the design stage, the details of safety requirements and failure rates are not yet available. The safety mitigations as per the AGL Dalton power station design failure rates have been removed and no longer referenced in the PHA.
- 6) Flash Fire and VCE were included in Section 8 of the PHA as potential results from the release of flammable gas from high-pressure pipework. Different worst-case flash fire scenarios were modelled to determine the burn zone or the boundary of flammable limit of the cloud.
- 7) The determination of the propagation risk was discussed qualitatively in Section 10.3 of the PHA as the Proposal layout is currently in design stage.
- 8) The risk of the pipeline (contour along the pipeline) and the risk associated with an assumed point event (eg circular excavation) is shown in Section 10 of the updated PHA.
- 9) The table detailing the assessment for the individual fatality risk criteria of safe locations has been moved to the Risk Analysis chapter (Section 10.1) as Table 25 of the updated PHA. This revised table only provides an outline of the criteria and no longer details the provisions of the IR value to

each land use. The IR has been illustrated instead in Figures 8 and 9 of the updated PHA as individual fatality risk contours for the site and pipelines, with each contour corresponding to one of the criteria from the table.

## 5. Additional assessment

### 5.1. Biodiversity Development Assessment Report

#### 5.1.1. Background

AGL engaged Kleinfelder to prepare a Biodiversity Development Assessment Report (BDAR) to review the potential impacts on biodiversity from the construction of the Proposal. In response to the submissions, an updated BDAR was required (Appendix A) as the original assessment did not sufficiently cover vegetation classification, ecosystem credit species, mitigation measures, offsetting and Ramsar impacts.

#### 5.1.2. Scope

The scope of the updated BDAR was to:

- Reclarify EEC classifications in mapped vegetation zones and update the BAM calculator inputs accordingly
- Consider the inclusion and exclusion of certain candidate ecosystem credit species
- Include a description of weather conditions and justification of target surveys
- Detail the avoidance and mitigation of impacts required by the BAM
- Provide a justification of surveys for threatened plants
- Append the BAM credit summary report
- Provide updated Koala feed tree offsetting and fauna exclusion fencing measures
- Consider long-term impacts to the Ramsar wetlands

#### 5.1.3. Methodology

The methodology for the revised BDAR was informed by the submissions received, as specified in the subheadings below. The BDAR referred to the area for the proposed works as the Development Site.

##### *EEC classifications in mapped vegetation zones*

The method of vegetation community classification for each vegetation zone was unchanged from the initial BDAR. Each zone was assessed for a status under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) using the NSW Scientific Committee's Determination (2019). The zones in the original BDAR were referred to by number (ie Zone 1, Zone 2 etc).

To manage the likely impacts the Proposal would have on the existing biodiversity, ecosystem and species credits were determined for the Development Site. These would be used as a measurement for the offset requirement for threatened ecological communities and threatened individual species affected by the development.

Flora surveys for threatened orchid species in Zone 3 were noted to have been conducted in the original BDAR. In response to a submission, further clarity regarding the methodology and survey results were included in the revised assessment.

##### *Candidate ecosystem credit species*

A list of predicted ecosystem credit species for the Development Site was reviewed in the Biodiversity Assessment Method (BAM) calculator, identified in the initial BDAR according to plant community types on the land. The potential for these threatened species to occur were assessed according to the type of condition of vegetation present. The prediction of the species occurrence for fauna and associated

justification were recorded in Table 6 of the updated BDAR. The potential for species credit species was also updated in response to the submissions to identify the potential for identified threatened species based on specific habitat requirements as opposed to vegetation present. To determine the presence or absence of the species identified as species credit species, further flora and fauna species surveys were conducted.

#### *Weather conditions and target surveys*

Weather data was obtained to provide justification regarding the date and conditions the amphibian surveys were conducted under. The temperature and rainfall data were sourced from the Williamstown RAAF weather station.

#### *Koala feed tree offset*

Mitigation measures for fauna exclusion and offset of feed trees for impacted Koala populations in the Port Stephens area was explored in Section 7.2 of the updated BDAR. The strategies proposed were in accordance with the *Port Stephens Comprehensive Koala Plan of Management (2002)* and *Port Stephens Council Tree Specification (2014)*.

#### *Long term impacts on Ramsar wetlands*

The assessment of indirect and cumulative impacts to the Ramsar-listed Hunter Estuary wetland was added in Appendix 6 of the updated BDAR with respect to the significant impact criteria contained within the Significant Impact Guidelines (DoEE, 2013). This chapter was originally in Appendix 5 of the BDAR and moved to Appendix 6 in the revised version.

### **5.1.4. Results**

#### *EEC classifications in mapped vegetation zones*

To reclarify the vegetation zones mapped for the Development Site, Section 3.2.1.2 was updated in the BDAR. Additions were made to Table 4, including the justification to exclude Zone 1 from being classified as an EEC. Although this Zone met the locality, geological and structural characteristics of the *Lower Hunter Spotted Gum – Ironbark Forest* EEC, key diagnostic floristic species were not present. This Zone was observed to contain species typical of the EEC such as *T. triandra*, *E. stricta*, *D. ulicifolia*, *L. multiflora* and *C. maculate*, however was missing the dominating key species, *E. fibrosa*. Zone 3 was also not determined to be an EEC with a revision of the vegetation status in Table 4. Similar to Zone 1, the third Zone satisfied the characteristics of the Lower Hunter Spotted Gum – Ironbark Forest EEC except for that it lacks the open forest structure and key diagnostic floristic composition. The grasslands with patches of shrubs which compose of the majority of vegetation present in Zone 3 does not match the final determination for the EEC. The assessment acknowledges the presence of some species from Zone 2 in 3 as the latter may have been a derivation derived from Zone 2 vegetation.

#### *Candidate ecosystem credit species*

Results of the BAM calculator (BAM-C) were revised to update the potential of certain animal species to occur in the Development Site (Table 6 of the BDAR) as ecosystem credit species. The potential presence of the Regent Honeyeater (*Anthochaera phrygia*) and Swift Parrot (*Lathamus dicolor*) were amended to an affirmative prediction. The justifications for all species were also removed except for the Painted Honeyeater (*Haliaeetus leucogaster*) and Yellow-bellied Glider (*Petaurus australis*) to reflect revisions made in the new assessment. The justifications for these two species were retained to reflect their exclusion from Zones 3 and 5 based on woodland habitat features not being present, in response to a submission. The species credit species list in Table 7 was revised to confirm the Pale-headed Snake (*Hoplocephalus bitorquatus*) as a candidate species, justified through target surveys conducted through spotlighting, and update the list to be consistent with the BAM-C.

The candidate threatened fauna species in Table 9 were also updated to reflect the revisions made to the BAM-C and determined through threatened species surveys. The methodology for these surveys had detail added for the Squirrel Glider and Brush-tailed Phascogale identification process. The former species was assumed present in the Study Area through nest box monitoring works, and for the Brush-tailed Phascogale remote cameras were used as opposed to the traditional arboreal trapping method.



Survey methods for Microchiropteran bats were further elaborated. Harp trapping was not conducted for the Southern Myotis due to unsuitable foraging habitat for the species in the vicinity of the impact area deeming this survey unnecessary.

Bird surveys were detailed further for the Bush Stone-curlew, where spotlighting was noted to be conducted in-conjunction with mammal surveys in February 2019. Nest surveys were also elaborated to provide detail for the date, habitat type and justification of the chosen method.

#### *Weather conditions and target survey*

Weather data was supplied in the revised BDAR to provide justification for the adequacy of conditions the surveys were conducted under (Table 11). Weather conditions were highlighted as especially vital for amphibian surveys. The weather data collated information on the dates, minimum and maximum temperature (°C), and rainfall (mm) during the survey period.

Section 4.1.1.1 was updated to provide further information on the habitat assessment for threatened flora species. The flora survey results eliminated potential for most of Zone 3 to be a suitable habitat for threatened orchid species due to historic disturbance and subsequent dominance of exotic grasses in the area. The methodology was updated in Section 4.2.2.2 to specify that reference populations were used for the five species surveyed.

As the original BDAR was prepared prior to the preparation of the *BAM Operational Manual – Stage 2* guidelines, the exploration of avoid and minimise measures were added to Section 5 of the revised assessment. These measures were considered during the site selection and design of the Proposal through the identification of biodiversity values across multiple sites within the Tomago area, and consultation took place between the design and ecology teams to finalise a design footprint with the least biodiversity impact. The final power station site (Lot 3 DP 1043561) was determined through comparison with other potential sites, the latter of which would have had greater impacts on multiple threatened species and/or ecological communities. The preferred site underwent further considerations due to restrictions from other nearby projects, presence of Aboriginal Sites, and the identified Vegetation Zones. Where possible, the disturbance area is intended to be limited to Zone 3 (avoiding the higher quality vegetation within Zones 1 and 2). The layout of the power station and associated infrastructure was designed to minimise impact, notably in relation to the northern process water storage pond. The construction of this pond would be subject to the final power station technology requirements. Areas of infrastructure which are needed for the operation of NPS would be placed in areas of low-quality vegetation where possible.

An options assessment informed the selection of a preferred gas supply easement design – along with existing clearing easements, the northern easement was selected and would incorporate a section of underground directional drilling to avoid impacts on a portion of remnant native vegetation.

The option with the least native vegetation clearing, and therefore disturbance to threatened species habitat, was also selected for the final transmission route from the power station to the switching station.

#### *Long term impacts on Ramsar wetlands*

Revisions to the Ramsar-listed Hunter Estuary wetland impact assessment were made in Appendix 6 of the updated BDAR (previously Appendix 5 of the original BDAR). Air pollution impact was added to the assessment as a possible action that would result in substantial and measurable change in the water quality of the wetland. It was found that the potential for air quality exceedances as a result of the Proposal was low and manageable through proposed mitigation measures. Cumulative impacts of the Proposal were also considered in contribution with Tomago Aluminium Smelter and other polluters near the wetland and it was deemed to have a low potential to exceed air quality standards.

The possibility of plume rise disrupting the lifecycle of migratory bird populations was also noted in the table. In the gas turbine and continuous (worst-case) operation scenario, the plume height would be substantial at 882 m and radial distance of around 150 m. This, however, would be a small proportion of the wetland's total 12 km width, and so has been concluded to have low impact potential for migratory species.

The like-for-like biodiversity credit reports were updated in Appendix 5 (previously Appendix 4) with details on the assessments undertaken in 2020. The species used in the calculations and credit outputs did not have any changes from the initial report.

#### *Koala feed tree offset*

Mitigation measures to manage impacts to Koala populations in the Proposal area were newly added in Section 7.2.2. To acknowledge the threat Koalas within the Port Stephen Local Government Area face and in accordance with the performance criteria of the *Port Stephens Comprehensive Koala Plan of Management (2002)*, Koala feed trees would be avoided within the final Proposal design. Where this is not possible, tree planting for Koala habitat was proposed as an offset strategy to be agreed with Council approval required for the final location. The location and type of planting would be in accordance with the *Port Stephens Council Tree Specification (2014)*. The BDAR identified three Koala feed tree species within the Development Site. The final planting requirements of these trees would be determined in respect to the final number and size class of trees to be removed in the final Proposal design.

Fauna injury due to site entry was added to the impact summary in Table 12, Section 5.3, as an indirect impact. The proposed mitigation strategy for this impact was the installation of fauna friendly fencing where possible around operational areas to prevent fauna species, such as Koalas, from entering and being injured as a result of Proposal activities.

## 5.2. Surface Water and Hydrology Specialist Study

### 5.2.1. Background

In response to submissions, AGL engaged Aurecon to revise the Surface Water and Hydrology Specialist Study (SWHSS) for the Proposal (Appendix B). The study has been updated to provide further clarification on the Neutral or Beneficial Effect (NorBE) assessment for water releases and alignment with the appropriate regional guideline trigger values. The water quality assessment has been updated with results from eWater's Model for urban stormwater improvement conceptualisation (MUSIC) software, triggered by EIS submissions requesting estimates of future stormwater discharge rates, volumes and quantities.

### 5.2.2. Scope

The scope for the revised SWHSS was to:

- Provide the discharge concentrations from the bioretention pond based on the MUSIC model
- Justify the use of locally adopted thresholds for surface water concentration limits, as opposed to ANZECC lowland river trigger values

### 5.2.3. Methodology

Further detail was added in the SWHSS to justify the use of locally adopted thresholds for surface water concentration limits, and Table 8-3 was added as a comparison criteria for total suspended solids, nitrogen and phosphorous criteria. The locally adopted thresholds were based on natural background concentrations from local baseline monitoring and are less conservative than the ANZECC NSW lowland rivers trigger values. The ANZECC guidelines acknowledge that water quality characteristics differ between regions and emphasise that guidelines can be determined individually, according to local environmental conditions.

Specific stormwater discharge concentrations calculated using the MUSIC model are provided in Section 6.2 of the updated water quality assessment (Appendix C of the updated SWHSS), comparing the performance of a 500 m<sup>2</sup> and a 735 m<sup>2</sup> bioretention pond design. The simulated bioretention pond discharge flow rates for daily and 6-minute timesteps and with their predicted daily volumes are shown for the median, 98<sup>th</sup> percentile and maximum frequency scenarios. The results below show predicted 50<sup>th</sup> and 98<sup>th</sup> percentile total nitrogen and total phosphorus concentrations.

As the Proposal is partially within the Tomago Sandbeds Drinking Water Catchment Area, a Neutral or Beneficial Effect assessment has been carried out for the Proposal. Discharges from the site will meet NorBE requirements if the post-development concentrations of these pollutants are less than or equal to the pre-development concentrations.

The MUSIC model was also used to estimate stormwater discharge rates, volumes and qualities for the Proposal to investigate the potential for erosion.

## 5.2.4. Results

The modelling predicted that the 98<sup>th</sup> percentile concentration results for phosphorous and nitrogen with a 735 m<sup>2</sup> bio-retention pond, shown below in Table 5.2-1, would be well below the locally adopted thresholds shown in Table 5.2-2, below (or Table 66 of the updated Water Quality Assessment).

**Table 5.2-1** Total phosphorous and nitrogen concentration for 735 m<sup>2</sup> bio-retention pond

Total Phosphorous Concentration (mg/L)			Total Nitrogen Concentration (mg/L)		
	Pre-development residual load	Post-development residual load		Pre-development residual load	Post-development residual load
<b>98<sup>th</sup> percentile</b>	0.4	0.14	<b>98<sup>th</sup> percentile</b>	2.4	0.6

**Table 5.2-2** Surface water concentration limits, extracted from the SWHSS

	Total Suspended Solids (mg/l)	Total Nitrogen (mg/l)	Total Phosphorous (mg/l)
Locally adopted water quality thresholds	1000	9	0.5

Based on the assessment of surface water concentration limits using a MUSIC water quality assessment model, both the 500 m<sup>2</sup> and 735 m<sup>2</sup> bio-retention designs satisfied the water quality stripping targets, but only the 735 m<sup>2</sup> bio-retention scenario satisfied the NorBE criteria for total nitrogen discharges from the Proposal works. Since this development falls within a water drinking catchment area, the targets for both water quality stripping and NorBE need to be satisfied.

These results also meet NorBE requirements, as the concentration of these pollutants for the post-development case are lesser than or equal to the concentration for the pre-development case. This was achieved through the increased size of the bioretention pond and considers the safety of the Tomago Sandbeds aquifer, of which the Proposal is located within.

Future stormwater discharge rates, volumes and qualities were calculated using the MUSIC model, with daily flow rate and volume detailed in Appendix C of the SWHSS. The values are also shown below in Table 5.2-3. While the modelling showed that soil erosion and scour could occur after wind and rain events, the impact can be minimised by implementing an Erosion and Sediment Control Plan that includes measures to reduce water flow velocities at discharge points and ensure discharge rates are moderated to eliminate downstream erosion.

**Table 5.2-3** Stormwater discharge flow rates\*

Time Step	Frequency	Median	90 <sup>th</sup> Percentile	Maximum
6-minute Flow Rate (m <sup>3</sup> /s)		2.40x10 <sup>-6</sup>	418x10 <sup>-6</sup>	0.794
Daily Flow Rate (m <sup>3</sup> /s)		4.28x10 <sup>-6</sup>	0.003	0.054
Daily volume (m <sup>3</sup> )		0.37	259	4666

\* as simulated by the MUSIC model, extracted from the Water Quality Assessment

## 5.3. Groundwater

### 5.3.1. Background

In response to submissions, AGL engaged Aurecon to provide advice on the volumes of groundwater that may require management during installation of the gas pipeline, and whether this would require a WAL. This

includes the proposed gas storage pipeline in the central northern area of the project, and the proposed connection to the existing PL42 pipeline near Old Punt Road.

### 5.3.2. Scope

The scope for the advice on the groundwater volume estimations was to:

- Review available information relating to subsurface and groundwater conditions at the site and immediate vicinity
- Establish a hydrogeological conceptual site model
- Provide preliminary estimates of the gross cumulative volumes of groundwater that may require management

### 5.3.3. Methodology

To understand the subsurface conditions in the proposed trenching area, Aurecon considered data that was previously collected for a Groundwater Specialist Study which informed the EIS, as well as geotechnical reports prepared for the Proposal and surrounding area.

To determine preliminary estimates of the gross volumes of groundwater that may require management during construction, Aurecon used a standard steady state analytical solution developed by Powrie and Preene (1992). This is shown in the following equation, where the parameters are listed in Table 5.3-1, and was considered the best fit for the site specific hydrogeological conceptual site model and construction method.

$$Q = KD (H - h_{ex}) \frac{2(a+b)}{L_0}$$

Table 5.3-1 Parameter definition for groundwater volume analytical solutions

Parameter	Description	Units
<b>K</b>	Hydraulic conductivity	m/s
<b>D</b>	Thickness of unconfined aquifer	m
<b>Lo</b>	Distance to constant head boundary (Hunter River)	m
<b>a</b>	Excavation Length	m
<b>b</b>	Excavation width	m
<b>H</b>	Head at the constant boundary	mAHD
<b>Hex</b>	Head in the excavation	mAHD
<b>Q</b>	Flowrate into trench	m/s

Assumptions which applied to the preliminary groundwater volume include:

- Volume calculations are based on an assumed steady state condition as the rate of groundwater production would vary during construction activities

- The entire length of the trenches is open at one time. While staged trenching and construction practices could reduce the volumes produced, the cumulative volume estimates would still be in the same order of magnitude.
- The entire length of the trench would intersect the water table in either area and half of the trench depth would be below the water table
- The hydraulic conductivity (and lithology) is constant along the entire length of the trenches
- The thickness of the unconfined aquifer is consistent along the length of the trenches
- The average distance between the constant head and the trenches has been used to account for distance differences along the length of the trenches
- The dimensions of the trenches are consistent along their length

### 5.3.4. Results

A preliminary sensitivity analysis was undertaken to determine a reasonable range of groundwater volumes that may be produced during construction. It was determined that the volume estimates are most sensitive to changes in the hydraulic conductivity, rather than the excavation length or width or distance to the Hunter River. The construction methodology and duration of trenching activities would also impact on the volume of groundwater produced.

The analysis indicated that very low volumes of groundwater would require management during construction of the connection to PL42, which is very likely to be below the 3 ML/year threshold. This is due to lower permeable clays and shallow bedrock in this area, and the short pipeline length.

Based on the analysis, the 3 ML/year threshold for a Water Access Licence was considered likely to be exceeded during construction of the gas storage pipeline, due primarily to highly permeable sands in this area, the length of pipeline and the likely trench construction duration. While it may be possible to limit the volumes of water that enter excavations, eg through staged trenching, sheet pile walls and excavation floors, these measures would only have a limited effect on reducing groundwater ingress given the highly permeable sand in this area.

Based on the findings, AGL intends to commence an application for a WAL to enable the gas storage pipeline construction. Further detailed studies into potential groundwater intersection would support this application, and would be informed by the construction approach, when known.

## 5.4. Air Quality Impact Assessment

### 5.4.1. Background

Revisions to the Air Quality Impact Assessment (AQIA) were made in response to EIS submissions and to record further assessments conducted after the EIS exhibition (Appendix C).

Concerns relating to the air quality impact from power station emissions were raised in the submissions, requiring additional assessments to be conducted for ground-level ozone, sulfur dioxide (SO<sub>2</sub>) and acrolein.

Previously conducted studies of ozone and interregional transport in the region for similar gas turbine projects have provided sufficient support for the Proposal to not require a Level 2 Refined Assessment, which has been confirmed by the EPA to be acceptable.

Additional information was requested on controls to minimise emissions of air pollutants, in particular acrolein, including benchmarking data and the emission rate methodology.

### 5.4.2. Scope

The scope for the revised AQIA was to:

- Provide updated estimates for air emissions
- Detail ozone impacts as a result of these emissions and whether these meet threshold limits
- Describe cumulative impacts of SO<sub>2</sub> impacts with consideration of the Tomago Aluminium Smelter

### 5.4.3. Methodology

Amendments to the AQIA include the addition of a new section to the updated AQIA report, Air Emission Control Review (Section 4), to review the emission controls proposed for the four technology options considered for the NPS. These options were compared against standards set by the European Commission's Best Available Techniques (BAT) Reference Document for Large Combustion Plants (IPPC, 2017) for the Best Available Technology.

Emission estimation methods remained unchanged from the initial AQIA for the EIS. In response to the submissions, a discussion was added in Appendix C of the updated AQIA to clarify start-up and shutdown emissions of the power plant.

In consideration of the potential photochemical smog and ozone created by the interaction of emissions from NPS with the atmosphere, an ozone screening assessment was prepared in accordance with the *NSW Tiered Procedure for Estimating Ground-Level Ozone Impacts from Stationary Sources* (Environ, 2011), adopted by the NSW EPA in 2015 (Section 9). This EPA report provides a framework which illustrates the assessment procedure for a development's ozone impacts and was utilised in the Proposal's updated AQIA. As part of the first step, ambient 1-hour and 4-hour regional ozone concentrations in the Newcastle region were completed for the most recent 5-year period, 2014-2018, to determine the classification of the Proposal as either an ozone attainment or non-attainment area. It is noted that 2019 was excluded as it is not yet fully validated.

Estimated emissions of NO<sub>x</sub> were then compared to emissions thresholds. Scheduled activities with emissions which exceed the thresholds are required to assess the significance of the incremental ozone contributions. NO<sub>x</sub> emissions were estimated at both 14% and 100% operating duty, to reflect base and worst-case operations, respectively.

Where thresholds or criteria are exceeded for emissions, the development proceeds to the subsequent 'Screening Level' in accordance with the NSW EPA Ground-level ozone impact assessment framework. The EPA's Level 1 screening tool is a component of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2016) and used as part of the EPA's framework. Usually intended for continuous emission sources, this tool has been adapted for the intermittent as well as continuous operating scenarios of the Proposal. The NSW EPA's ozone impact assessment framework defines criteria for assessment of increments to ground level ozone concentrations in the Greater Metropolitan Region.

The framework defines a screening impact level (SIL) and maximum allowable increment as follows:

- SIL of 0.5 ppb
- Maximum allowable increment of 1 ppb

By considering an operating scenario of 6 hours per day, the screening tool would reflect the Proposal's intended intermittent operation. However, as it is designed to also run continuously in some circumstances, a 24 hour per day operation was also included in the screening assessment. The screening tool found that the incremental ozone concentration was above the SIL and maximum allowable increment for most of the scenarios for the Proposal.

The Level 2 screening tool was not applied for the Proposal, as findings from previously conducted studies were taken into consideration to estimate the impact of the Proposal. This is further detailed in the Results, below.

An EIS submission for the consideration of the cumulative impacts of SO<sub>2</sub> emissions from the Proposal as well as the Tomago Aluminium Smelter has led to the revision of Section 10 (Local Cumulative Assessment) of the updated AQIA. In further consideration of cumulative impacts from the Proposal, hourly SO<sub>2</sub> emission observations were sourced from the monitoring stations maintained by Tomago Aluminium Corporation



(TAC) and used as background concentrations. These were added to the highest Proposal model predictions to give the cumulative impact and compared with the NSW EPA SO<sub>2</sub> criteria.

#### 5.4.4. Results

The addition of the Air Emission Control Review (Section 4 of the Assessment) provides detail on proposed emission controls for each power station technology. The most suitable technique to reduce emissions of the NO<sub>x</sub> from the gas turbines option was assessed to be water injection technology in Section 4.1 of the updated AQIA. The elimination of the other reduction techniques was due to the proposed dual fuel nature of the NPS. The performance of this emission control technique is comparable to the range presented in the Best Available Technology Achievable Emission Limits (BAT-AEL) for new open cycle gas turbines, and therefore a preferred option for NO<sub>x</sub> prevention or reduction.

Emission controls for the alternative power station technology, reciprocating engines, were assessed in Section 4.2 of the updated AQIA. The reciprocating engine technology providers for NPS have opted to include Selective Catalytic Reduction technology to control emissions. The NO<sub>x</sub> emissions assessed using this proposed technology will be comparable with the IPPC (2017) Best Available Techniques Achievable Emission Limits. The reciprocating engine technology providers have proposed using catalytic oxidation technology for VOC control – the design of this technology would be finalised with detailed design.

A benchmark of the Proposal's NO<sub>x</sub> emissions in comparison to other power stations in NSW has been included in Section 4.2 as Figure 4.1 and Table 4.1 of the AQIA, both demonstrating the lower output of the NPS when using either plant options or fuel types.

The manufacturer data used for emission estimation in both plant options was stated to reflect control of emissions in or within POEO limits in the initial AQIA. This has now been revised in Section 7.2 of the amended assessment to highlight that the POEO limits do not apply during the start-up or shutdown of the plant, when higher emissions are more likely to occur. A discussion of start-up and shutdown emissions was added to Appendix C of the updated AQIA. The limits may also not be met during low load operation, however AGL do not propose to operate generators at low loads.

Section 9 was newly added in the amended AQIA to investigate the Proposal's potential impacts on ozone and interregional transport of air emissions from the Proposal. The review of regional ozone concentrations determined that for the most current period of data from 2014 to 2018 the Newcastle region was an ozone non-attainment area, or an area which does not meet the National Ambient Air Quality Standards. When comparing the 14% and 100% operating duty of the Proposal with the NO<sub>x</sub> emissions threshold, both instances exceeded the threshold (Table 9.3 and 9.4 of the amended assessment) thus triggering the ozone screening assessment.

Level 1 of this screening assessment, as summarised in Table 9.6 of the initial AQIA, predicted the Proposal's incremental ozone and SIL exceeding the NSW Ozone Procedure's maximum levels for both plant options and both fuel types. The gas turbine option using natural gas resulted in an incremental ozone of 0.5 parts per billion (ppb) on peak 1-hour and 0.3 ppb for peak 4-hour concentrations (in a base-case, 6 hours per day of operation scenario). This meets the SIL and maximum allowable increment of 0.5 ppb and 1 ppb, respectively, however exceeds these values at a 24 hour per day of operation scenario. The same case occurs for the gas turbine option using distillate fuel. The reciprocating engine option sees the SIL and maximum allowable increment being surpassed for natural gas and distillate fuels in both operation scenarios.

Ordinarily, it would then be required by the NSW EPA's ozone assessment framework for the Proposal to proceed to a Level 2 screening assessment. Previously conducted studies of ozone and interregional transport in the region for similar gas turbine projects have presented sufficient support for the Proposal to not require further assessment. CSIRO modelled previous proposals on or near the Proposal site in their reports, *DIPNR Report on the Assessment of Development Application No.165 05 2002 -Pursuant to Section 80 of the Environmental Planning and Assessment Act, 1979 Proposal by Macquarie Generation to Construct and Operate a Combined Cycle Gas Fired Power Station and Associated Infrastructure at Tomago, in the Port Stephens and Newcastle Local Government Areas* (2003) and *Photochemical Pollution Assessment of a Proposed Gas-Fired Power Station at Munmorah* (2005). These reports featured specific event periods with high ozone concentrations and meteorological conditions suitable for the interregional transport between the power stations and the Sydney region. Although the ambient air quality standards of

ozone are exceeded on occasion in the study region, the development was found to not exacerbate these levels, and emissions of NO<sub>2</sub> and O<sub>3</sub> would not exceed standards in the Sydney Basin region. These previous studies were comparable to the Proposal due to similarities in emission intensity, power production and ozone screening results. There has also been a general reduction in industry and vehicle emissions between the Metropolitan Air Quality Study regional emission inventory and present day, so the comparison would provide a conservative assessment. This previous modelling of the impacts of power station emissions on air quality standards and ozone in the region provided validation for the NPS as a lower output proposal. The EPA has advised AGL that the use of these previous assessments is acceptable to adequately address the ozone assessment requirement for the Proposal.

An additional assessment has been included in the amended Air Quality Impact Assessment for cumulative SO<sub>2</sub> impacts. The likelihood of potential exceedances in SO<sub>2</sub> concentration when combined with ambient measurements near the existing Tomago Aluminium Smelter was presented in Section 10 of the initial and updated AQIA. The highest predicted 10-minute, 1-hour and annual average concentrations from the Proposal, when added to the highest background measurements from the TAC stations and the Proposal, did not exceed the relevant NSW EPA criteria (as detailed in Table 10.5 of the amended assessment). As the highest 24-hour average background concentrations from the TAC stations exceed the criteria, the approach recommended in the Approved Methods was used to assess whether additional exceedances of the impact assessment criteria would occur as a result of the proposed activity. The highest non-exceeding concentration level was added to the predicted 24-hour average concentrations, and the total was found to be within the criteria. This demonstrated that the Proposal is not expected to produce additional exceedances of the 24-hour average criterion.

With the revised evaluation in the AQIA, it was concluded that the proposed emission performance and control technologies of the NPS were consistent with the Best Available Technology standards.

An amendment to Appendix A of the revised AQIA addressed an EIS submission concerning the potential for acrolein emissions from the NPS to have adverse air quality impacts. While predicted concentrations of acrolein from the Proposal exceed the NSW EPA criteria, they fall within international criteria for acrolein.

Appendix D of the revised AQIA was also updated to include meteorological conditions that would be conducive to acrolein exceedances, including high wind and moderate temperature daytime conditions. These conditions would not align with the times at which the NPS would most likely operate. The assumption of continuous operation adopted within this assessment is considered to provide a conservative assessment of peak acrolein predictions as the NPS would be intended as a peaking plant.

## 5.5. Aboriginal Cultural Heritage Assessment Report

### 5.5.1. Background

In response to submissions, the Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Proposal has been updated (Appendix D). The NPS, associated pipeline easements and transmission line easements are described as the 'development footprint' in the ACHAR. The development footprint has been identified in the EIS as Lot 3 DP1043561, Lot 4 DP1043561, Lot 202 DP1173564, Lot 1201 DP 1229590, Lot 1202 DP1229590 and Lot 1203 DP1229590.

Lot 2 DP 1043561 is not part of the development footprint for the Proposal.

In response to a submission received, clarifications were made in the impact assessment regarding Aboriginal cultural heritage values and the discussion of appropriate management measures for these, including the involvement of Registered Aboriginal Parties (RAPs).

### 5.5.2. Scope

The ACHAR assessed the potential impacts of the Proposal on Aboriginal cultural heritage values, and prepared strategies to manage any risks the Proposal may have on any identified heritage values. The scope of the updated ACHAR was to:

- Update the AHIMS database status of Aboriginal sites that were subject to test excavation

- Describe in further depth the potential impact of the Proposal on the Aboriginal cultural and historical heritage of these sites and to demonstrate that harm avoidance or conservation outcomes have been considered
- Discuss management and mitigation measures based on the results of the investigation
- Provide the long-term management of salvaged objects recovered from the testing program

### 5.5.3. Methodology

Previously recorded Aboriginal sites were identified through an AHIMS database search. Following test excavations on the Proposal site an Aboriginal Site Impact Recording form was completed and submitted to the AHIMS registrar to update the AHIMS status of each site.

Archaeological field surveys and test programs were carried out for the initial Aboriginal cultural heritage assessment to identify potential Aboriginal sites and objects in the Proposal area. The findings from the original surveys were amended to provide further clarification of the impact at each site. No new surveys were conducted following the EIS submission.

The overall assessments of the Aboriginal cultural heritage significance and the impact on these values by the Proposal were discussed, as well as any additional management measures to minimise these potential impacts to sites.

### 5.5.4. Results

Amendments to the ACHAR include the additional consideration of the cultural significance of the Proposal area in Section 8.1.1, as well as the social significance. The impact of Aboriginal cultural heritage values was expanded upon in Section 9.2. The four archaeological sites in the report are now identified in the report with their AHIMS site identification codes (NPS01/AHIMS #38-4-2020, NPS02/AHIMS #38-4-2021, NPS03/AHIMS #38-4-2022, NPS04/AHIMS # pending, awaiting an AHIMS registration number). The PAD, NPS04, was reclassified as a low-density subsurface scatter. Only the low-density artefact scatter (NPS01) was not found within the study area – this is located inside Lot 2 DP 1043561, which is outside of the development footprint, and would not be impacted by the proposed works.

The three sites found within the Proposal area would be directly or indirectly impacted by the works but were all assessed as having low overall significance. It was suggested that NPS03 could be avoided through careful design of the pipeline easement, but this would only be able to be confirmed with the final, detailed design. Table 9.1 has been updated to incorporate a summary of these assessments and findings.

Section 10.1 of the updated ACHAR clarifies the interaction between the Proposal and M12RT project areas reiterating that NPS01 is located outside the Proposal area and was expected to be impacted by the current design of the M12RT project but not by the Proposal. Therefore, this archaeological site was not further investigated in the ACHAR.

A discussion was added as Section 10.1.1 of the updated ACHAR to present the findings of the assessment and potential mitigation measures appropriate to the Proposal. Proposed alternatives which have historically been considered for the Proposal were described in Section 2.3 of the EIS, and included site selection, and layout configurations, with the Proposal area being determined as the best option, having reduced environmental constraints when compared to other sites considered. Due to the nature of the PADs, being large deposits across the whole site, avoidance through design is not possible, and direct impacts are anticipated for NPS02 and NPS04. Due to this, a salvage of objects was proposed for NPS02, but not necessary for NPS04 as objects identified during the test excavation were already recovered. A salvage of surface objects would be recommended at NPS03 if the final design of the proposed pipelines is not able to avoid the site. These conservation measures have been recommended as harm avoidance is not possible.

Preparation of an Aboriginal Cultural Heritage Management Plan (ACHMP) was added as a recommended management measure and would be prepared prior to commencement of groundworks. This plan would cover procedures involving management of Aboriginal objects and cultural values, cultural awareness inductions, chance find procedures, mitigating impact to Aboriginal sites and ongoing consultation with relevant parties.

The Repatriation of Archaeological Material section of the ACHAR was replaced with information on the long-term management of objects (Section 10.2.5). Artefacts and charcoal were recovered during the testing program and are currently being held by ERM. These objects would be returned to the RAPs, who would also be consulted to determine the appropriate method and location of reburial.

The draft ACHAR was provided to the RAPs on 7 August 2019, with 28 days provided for comment before the ACHAR was finalised. To fulfil the Aboriginal community endorsement and recommendation requirements, an update to Section 10.26 specifies that a copy of the ACHAR would be provided to each of the RAPs for comment. On 25 March 2020, ERM on behalf of AGL issued the updated ACHAR with an accompanying project update letter to the RAPs. The 28-day period ended on 22 April 2020, with no comments received from any of the RAPs.

## 5.6. Traffic Assessment

### 5.6.1. Background

Seca Solution were engaged by AGL to conduct additional traffic assessment in response to the EIS submissions received. The Proposal site is bordered by the Pacific Highway to the north-west and Old Punt Road to the south-east. Access to the site requires passage through three major intersections at Pacific Highway / Tomago Road, Pacific Highway / Old Punt Road, and Tomago Road / Old Punt Road.

A traffic assessment was undertaken to assess the movement of external vehicles accessing the Proposal site, to address concerns raised regarding the safe and timely movement of traffic at key intersections in the locality of the site.

### 5.6.2. Scope

The scope of the additional traffic assessment was to:

- Provide an assessment of traffic impact at the intersection of Pacific Highway and Old Punt Road (intersection modelling)
- Demonstrate that the longest B-doubles servicing the site can safely complete a left-hand turn to Pacific Highway (OSOM)

### 5.6.3. Methodology

#### Intersection modelling

Seca Solution completed traffic surveys at the intersection of the Pacific Highway / Old Punt Road on 20 February 2020, during the morning (6-9 am) and afternoon (3-5 pm). The AM peak hour was determined as 7:30-8:30 am, whilst the PM peak was determined as 3:15-4:15 pm.

The Pacific Highway / Old Punt Road intersection was modelled allowing for construction (development) traffic associated with the NPS as this phase was determined to have the greatest impact on the external road network. The intersection was modelled using Sidra 8 to assess construction traffic under two scenarios:

- Existing operation: surveyed traffic flows (2020)
- Existing plus development: surveyed traffic flows plus construction traffic flows

The distribution of construction traffic was applied in a manner consistent with that allowed for in the Traffic Impact Assessment prepared for the EIS.

#### Accessibility

Seca Solution considered the accessibility of the Proposal site for over-size over-mass (OSOM) vehicles during the traffic surveys.

## 5.6.4. Results

### Intersection modelling

The Sidra modelling originally carried out in the EIS for Pacific Highway / Old Punt Road found that the intersection operated well with acceptable levels of delays and congestion. Additional Sidra modelling undertaken in response to the submissions found that the signalised intersection of Pacific Highway and Old Punt Road is currently operating at Level of Service (LoS) A in the AM peak and LoS B in the PM peak.

The Sidra modelling of the intersection determined that the intersection can continue to operate at an acceptable level of service while allowing for construction traffic associated with the Proposal. The modelling shows that the intersection has spare capacity to accommodate the peak flows associated with the Proposal construction period, which would be higher than the operational traffic flows.

### Accessibility

During the various traffic surveys and assessments undertaken for the Proposal, Seca Solution noted that the left turn out of Old Punt Road onto the Pacific Highway is currently used by traffic associated with the Tomago Industrial precinct, including B-doubles. During the 2020 traffic surveys, these OSOM trucks were observed to complete this turn within the existing road geometry which has been designed to accommodate this movement and then utilise the merge lane provided to enter the Pacific Highway in a safe and efficient manner. No road improvements are required as a result of the Proposal.

## 5.7. Noise and Vibration Assessment

### 5.7.1. Background

Revisions to the Noise and Vibration Assessment (NVA) were made in response to EIS submissions received (Appendix E). Updates were actioned to provide clarification on data presented from the assessment.

### 5.7.2. Scope

The objectives of the revised NVA were to provide clarity on data presented in the initial assessment of the noise impacts from the Proposal's operation. These include:

- Influences of noise sources on background noise monitoring results
- Basis of amenity levels converted from period level to a 15-minute level, and for the caravan park
- Adjustment of the evening intrusiveness noise criteria in accordance with the Noise Policy for Industry
- Confirm that the noise attenuation levels are reasonable and feasible
- Assess the potential for low-frequency and/or tonal noise impacts
- Include an analysis to support the adoption of prevailing winds in the noise modelling

### 5.7.3. Method

The data provided in the initial NVA by ERM was not altered, however adjustments and/or clarifications have been added in the revised assessment in response to the EIS submissions. No new modelling or noise monitoring was conducted for these results. References to the Noise Policy for Industry (EPA, 2017) were included to justify the values used for project intrusive or amenity noise limits.

## 5.7.4. Results

In response to a submission regarding the background noise monitoring results and concerns of cooler autumn/winter months not being represented accurately, Table 3-6 of the NVA has been updated to include observational data recorded during attended noise monitoring. Observations at Locations L01 and L03 were mainly influenced by vehicular traffic from the Pacific Motorway and set a higher background noise level when compared to the ambient animal sources at Location L02.

To clarify how amenity levels for Project Noise Trigger Levels were derived, the footnotes of Section 5.2.3 of the Assessment have been revised. A footnote has been added to highlight that the lower values of the project intrusive or amenity limit have been applied, as the power station would be run continuously over daytime, evening and night time periods.

The Project Intrusiveness Noise Criteria data in Table 5-2 of the Assessment has been revised at Residential Location R2 and R8 so that the evening background levels do not exceed daytime levels. This revision is based on the Noise Policy for Industry recommendation to adjust evening criteria so that they are not higher than the daytime values for each receiver. Another clarification in the data provided was in the Project Amenity Noise Criteria summary (Table 5-3 of the assessment), where footnotes were included to explain that the amenity criteria at Receiver Location R4 (Caravan Park) was increased in accordance to the EPA's Noise Policy for Industry (2017).

Noise modelling took in consideration of the meteorological conditions of the existing environment. Meteorological data was analysed to confirm that wind is a factor in the noise assessment, as source-to-receiver wind speeds of 3 m/s or below occur for 30% or more of the time. This reference was included as a revision in Section 9.2 of the Assessment.

## 5.8. Preliminary Hazard Assessment

### 5.8.1. Background

The Hazard and Risk Analysis in the EIS provided assessments on the potential impacts of the Proposal in relation to hazards and risks. Included in this was the Preliminary Hazard Assessment (PHA), which was required to demonstrate that the risks from the Proposal comply with the criteria set out in the DPIE's *Hazardous Industry Planning Advisory Paper No.4 – Risk Criteria for Land Use Safety Planning*. This section addresses the additional preliminary hazard assessments conducted after the exhibition of the EIS and in response to Government agency feedback.

In their response to submissions, the DPIE requested further detail on:

- Ignition probabilities
- Large pipeline failure frequencies
- The adoption of a Vessel Phast Model or a linear source risk model
- Major equipment shown in the site layout diagrams
- The comparison between the Proposal and the Dalton Power Station
- Whether Flash Fire and VCE were assessed in the PHA
- Whether propagation risk was determined in the PHA
- The individual fatality risk
- The provision of the Individual Risk (IR) for various land uses

The further assessment was undertaken to address this feedback, with full details provided in the revised PHA (Appendix F).



### 5.8.2. Scope

The scope of the revised assessment includes:

- Include a comparative review of ignition probabilities for each scenario with other literatures sources
- Confirm the models used in the assessment
- Include a new map to show the concept layout of major equipment and a process flow diagram showing the interconnection of the major pieces of equipment and pipelines
- Remove the reference to Dalton Power Station
- Update to show that the PHA included flash fire and VCE
- Update the assessment to address propagation risk
- Include a risk contour map showing land uses

### 5.8.3. Methodology

The preliminary hazard analysis was based on the Proposal concept design to determine if the handling, storing or processing of any substances have the potential to be a risk to people, property or the environment.

Risks are assessed in the following steps:

- Preliminary risk screening
- Assessment approach: determination of the appropriate level of analysis and assessment depending on the potentially hazardous industry the Proposal is categorised in accordance with the Department of Planning's Multi-Level Risk Assessment Guidelines
- Risk criteria: determination of the level at which the Proposal is potentially hazardous and potentially offensive. Potentially hazardous risks are assessed in accordance with HIPAP Paper No 4 – Risk Criteria for Land Use Safety Planning and considers qualitative and quantitative aspects of the development. The assessment of the potentially offensive industry includes setting appropriate safeguards to control the level of emissions from the Proposal to a level at which they are not significant.

A concept design indicative site layout has been included in the report in Section 4.2, and a Process Flow Diagram added in Appendix 3 to show the interconnection of the major pieces of equipment and pipelines.

The natural gas pipeline section failure frequency rates in Section 9.1 for the above ground sections including, piping, valves, equipment, pig launchers/receivers etc. were updated based on the Research Report RR1035, Table 72 published by the UK Health and Safety Executive in 2015. A parts count and line length calculations were estimated for the process and based on the Piping and Instrumentation Diagrams and inventory calculations and applied to the leak frequencies as relevant for each scenario.

To conduct a Level 3 quantitative risk assessment for pig-launchers and above ground piping, the DNV GL PHAST version 8.22 modelling tool was used to model the plume dispersion and determine the specific heat radiation and over-pressure consequences relating to each of the major hazardous event scenarios. Long pipe model has been used for the pipelines, and a user defined source was used for VCE due to confined housings. This item has been added to the list of deviations from the PHAST default parameters specified in Table 18.

### 5.8.4. Results

The Proposal description was updated in Section 3.4 to specify the proposed population of the power station facility as 23 people (Table 6). This was also included in a revised calculation of the population density for the Tomago region (Table 8) – in the power station facility, the density was highest indoors at night.

Meteorological and topographic conditions for the Newcastle region were used to model dispersion of gas clouds and impacts of thermal radiation for the range of scenarios that were assessed. Weather parameters

were grouped in the revised PHA into two stability categories: moderately stable conditions with low wind (1.5/F), and neutral conditions with little sun and high wind (5/D). Table 11 was amended to show the percentage of time that 5/D and 1.5/F stability classes tend to occur at night (using 9 am data) and during the day (using 3 pm data), calculated from meteorological data measured at the University of Newcastle weather station between 1998 and 2018. The data indicated that 5/D stability conditions would occur more frequently in the daytime period and a higher proportion of 1.5/F stability conditions would occur at night.

The major hazardous events which were identified to have potential offsite impacts were categorised in Section 7 of the PHA and have been given unique identification tags. In the calculation of failure frequencies, a scenario was included to represent a pipe leak or rupture due to the compressor house filling with natural gas to the upper explosive limit. Revisions made to the failure frequencies have now led to the inclusion of the MHE10 release scenario that represents a VCE that releases a volume of gas equivalent to the maximum capacity of one gas turbine from a gas leak in an enclosure.

The results from the Consequences Effects assessment (Section 8.4) were updated based on updated model inputs and scenarios to present the worst-case jet fire radiation, flash fire and overpressure distances resulting from VCE. The worst-case scenarios and the quantitative measurement of the resulting impact have been presented in Tables 20, 21 and 22.

The natural gas pipeline section failure frequency rates in Section 9.1 for the above ground sections including, piping, valves, equipment, pig launchers/receivers etc. were updated based on the on the Research Report RR1035, Table 72 published by the UK Health and Safety Executive in 2015. A parts count and line length calculations were estimated for the process and based on the Piping and Instrumentation Diagrams and inventory calculations and applied to the leak frequencies as relevant for each scenario.

Section 9.2 from the original PHA detailed the frequency of explosion in gas generator housing and referenced frequency estimates from the Dalton Power Station PHA. This was removed in the revised PHA to simplify the assessment, as raised by a submission from the EIS.

The risk of property damage and accident propagation at the power station, pipeline corridor and NGSF were assessed against the HIPAP Paper No 4 criteria in Section 10.3 of the updated PHA. The assessment has been discussed qualitatively in Section 10.3 because the layout of the facility is still at design stage. All equipment and structures are considered to be subject to failure due to direct jet fire impingement, high intensity jet fire thermal radiation and overpressure if they exceed the maximum tolerable risk of 50 in a million per year.

Avoidance and mitigation measures that will need to be considered in the detailed design of the power station include the placement of buildings outside the consequence impact zones, away from prevailing wind direction or through fire safety design as identified in the Fire Safety Study in line with HIPAP Paper No 2.

The pipeline corridor was considered as a single pipeline running in a loop, and so the assessment did not consider propagation risk to itself. The designs of the existing pipelines Tomago-Hexham Pipeline and the Gas Storage pipeline have a no-rupture design. Although there is potential for the Jemena low pressure pipeline to rupture, its distance away from the Gas Storage pipeline puts the proposed storage pipeline outside of the potential impact zone.

The NPS is currently at concept level, and at this stage includes above ground equipment which could pose a risk to other surrounding equipment and structures through failure due to direct jet fire impingement, high intensity jet fire thermal radiation and overpressure. The PHA recommends that above ground gas pipeline equipment be located to give sufficient separation distance from protected places, infrastructure and emergency assembly areas. Any fire safety design and mitigations as identified in the Fire Safety Study in line with HIPAP Paper No 2 would be incorporated in the NPS detailed design.

In response to a submission, Table 25 (Section 10.1 of the revised PHA, previously Table 29) was updated to show individual fatality risk criteria for different land use categories. The results are now shown as overlays on the individual risk contour maps (Figures 8 and 9), illustrating risk levels that have been modelled for the plant and pipelines. The figures show that a lower fatality risk directly corresponds with a larger proximity away from the NPS.

## 6. Environmental management

### 6.1. Summary of safeguards and management measures

Management measures were proposed in the EIS to avoid or mitigate the environmental impacts of the Proposal during construction and operation. In response to the submissions raised, as well as editorial updates described in Section 2.5, the following revised or additional mitigation measures and strategies are proposed, shown in **bold** in Table 6.1-1. The full set of revised mitigation measures which AGL will be committing to are provided in Appendix G.

**Table 6.1-1 New or modified mitigation measures**

ID	Measures and programs	Timing
<b>Cumulative impacts</b>		
CU-1	AGL would continue to engage with <b>Transport for NSW</b> as to the collaborative design and construction processes to reduce the cumulative visual impact of the projects (the Proposal and M12RT project).	Pre-construction Construction
<b>Biodiversity</b>		
B-6	A Biodiversity Offset Strategy would be prepared for the <b>Proposal</b> .	<b>Pre-Construction</b>
B-11	<b>To manage the risk of koalas entering the site and being hurt, injured or killed, fauna exclusion fencing will be installed around operational areas where reasonable and feasible.</b>	<b>Construction</b>
<b>Surface water and hydrology</b>		
SW-26	<p>A Flood Preparedness Plan would be developed based on the PMF event, and would include:</p> <ul style="list-style-type: none"> <li>▪ Roles, responsibilities and communication procedures including emergency contacts</li> <li>▪ Monitoring procedures for rainfall and flood warnings (including BoM and local flood warning services)</li> <li>▪ Requirement for an environmental risk assessment prior to commencing excavation or trenching work in the event of a flood warning</li> <li>▪ Site shut-down and flood preparedness procedures to minimise harm to persons, plant and the environment</li> <li>▪ Actions in the lead up to the flood (such as monitoring water levels, filling excavations, completing erosion and sediment controls, removing hazardous materials and waste from the Proposal area, barricading, sealing tanks and containers to prevent overflows, tying down loose items)</li> <li>▪ Actions at the time of the flood (may include further evacuation, rescue, pollution prevention, spill response, and contingency measures)</li> <li>▪ Actions post-flood (including clean up and rectification)</li> <li>▪ Evacuation routes and procedures <b>identified, particularly for the access road into the site</b></li> <li>▪ Rescue procedures</li> <li>▪ Procedure for resuming operations</li> </ul>	Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Reporting requirements and corrective actions</li> </ul> <p>During its development, the Flood Preparedness Plan would be discussed with the SES and Council to ensure alignment with community evacuation arrangements.</p>	
<b>Groundwater</b>		
GW-5	When working along the pipeline route, additional precautions should be made when using or transporting fuels and chemicals, and any spills should be immediately contained and cleaned up. Any contaminated material to be removed from the site <b>would be sent</b> to a licensed facility.	Construction
GW-12	<b>If more than 3 ML/year groundwater is expected to be intercepted during construction, AGL would pursue a Water Access Licence and continue consultation regarding any water trading requirements.</b>	<b>Pre-construction</b> <b>Construction</b>
<b>Soils and contamination</b>		
SC-3	A pre-demolition hazardous materials survey is required for the demolition of the residential dwelling on Lot 3. Based on the findings, required controls would be implemented for removing the identified materials.	<b>Pre-construction</b>
<b>Aboriginal heritage</b>		
AH-2	<p>An <b>Aboriginal</b> Cultural Heritage Management Plan (<b>ACHMP</b>) <del>including potential monitoring and salvage works procedures</del> would be prepared and implemented for the Proposal construction. <b>The ACHMP would include, but not be limited to:</b></p> <ul style="list-style-type: none"> <li><b>Monitoring and salvage works procedures</b></li> <li><b>An Aboriginal artefacts care agreement</b></li> <li><b>Long term management procedures for Aboriginal objects</b></li> <li><b>Aboriginal cultural heritage mapping</b></li> <li><b>Community consultation with RAPs and BCD prior to construction</b></li> </ul>	Construction
AH-6	A copy of the final ACHAR including comments and recommendations by RAPs should be provided to the relevant <b>DPIE BCD</b> regional branch.	Pre-construction
<b>Traffic and transport</b>		
T-5	A CHR turn treatment on Old Punt Road is required to allow for the safe movement of construction traffic turning right into the site <b>and to prevent queuing of vehicles along Old Punt Road</b> . This must be designed in accordance with the Austroads Guidelines <b>and to the satisfaction of PSC and Transport for NSW</b> .	Pre-construction
T-6	<b>Prior to construction of the Proposal, AGL undertakes to share designs and collaborate with Transport for NSW to ensure that there is no restriction to the development of the M12RT project and associated local or state roads.</b>	<b>Pre-construction</b>
T-7	<b>AGL will design proposed utilities to be adequately protected and/or have suitable vertical clearance so as not to limit the current operation of the road reserve.</b>	<b>Pre-construction</b> <b>Construction</b>
T-8	<b>AGL would design the access from Old Punt Road to integrate appropriately with any development proposal designs for the upgrade of Old Punt Road that are exhibited prior to commencement of the construction of the Proposal.</b>	<b>Pre-construction</b>
<b>Social and economic</b>		
SE-4	<p>Throughout the Proposal planning, construction and operation, AGL would continue consultation with the following key stakeholders:</p> <ul style="list-style-type: none"> <li>DPIE</li> </ul>	Pre-construction Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Paterson electoral division</li> <li>Newcastle electoral division</li> <li>Port Stephens Council</li> <li><b>Transport for NSW</b></li> <li>Hunter Water Corporation</li> <li>Department of Defence</li> <li>Civil Aviation Authority</li> <li>Newcastle Airport</li> <li>Department of <del>Energy</del> <b>Agriculture, Water and the Environment (previously Department of Energy and Environment)</b></li> </ul>	
<b><i>Plume rise and aviation hazard</i></b>		
PR-2	<p><del>AGL would consult with Airservices Australia, Department of Defence, and CASA and provide information necessary to allow for a flight chart amendment.</del></p> <p><b>AGL would continue to consult with Department of Defence during design, construction and operation on appropriate measures to manage aviation safety risks associated with the Proposal.</b></p>	<p>Pre-construction</p> <p>Construction</p> <p>Operation</p>

## 7. Conclusion

This Submissions Report addresses the submissions received by DPIE on the NPS EIS. The content of this Submissions Report includes:

- Clarifications from the EIS
- Community and stakeholder involvement and consultation completed since the EIS
- Summary of submissions received
- AGL's response to these submissions
- Associated additional assessments completed
- Revised and additional mitigation measures

A total of 30 submissions were addressed in this report, half of which were received from public authorities, and half from organisations, agencies, and members of the community. AGL is engaged in ongoing consultation with many of these authorities and agencies, and adjacent infrastructure operators, to ensure the concerns raised in their submissions have been properly understood and adequately addressed in this Submissions Report. Some of the issues raised continue to be the subject of cooperative consultation between AGL and other parties at the time of writing this report.

Additional studies were commissioned by AGL to support the responses to submissions, including:

- Updated Biodiversity Development Assessment Report
- Updated Surface Water and Hydrology Specialist Study
- Groundwater intersection volume estimations during pipeline construction
- Updated Air Quality Impact Assessment
- Minor amendments to the Aboriginal Cultural Heritage Assessment Report
- Additional traffic assessments
- Updated Noise and Vibration Impact Assessment
- Updated Preliminary Hazard Assessment

Several environmental management measures from the EIS have been revised, and new measures included, following consideration of issues raised in the submissions and design refinements after the EIS.

Following provision of this Submissions Report to DPIE, the Proposal, as defined in the EIS, will be submitted for determination by the NSW Minister of Planning and Public Spaces.



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# Appendix A

## Biodiversity Development Assessment Report



# Appendix B

## Surface Water and Hydrology Specialist Study



# Appendix C

## Air Quality Impact Assessment



# Appendix E

## Noise and Vibration Assessment





# Appendix E

## Noise and Vibration Assessment



# Appendix F

## Preliminary Hazard Assessment



# Appendix G

## Consolidated mitigation measures



**Table A-1 Consolidated, revised mitigation measures**

ID	Measures and programs	Timing
<b>General</b>		
G-1	AGL would carry out the Proposal in accordance with the Project Application documents and the Minister's Conditions of Approval.	Pre-construction Construction Operation
G-2	Monitoring would be carried out in accordance with the requirements of an Environmental Protection Licence.	Operation
<b>Cumulative impacts</b>		
CU-1	AGL would continue to engage with <b>Transport for NSW</b> as to the collaborative design and construction processes to reduce the cumulative visual impact of the projects (the Proposal and M12RT project).	Pre-construction Construction
<b>Management planning</b>		
M-1	The construction and operation would be carried out under the provisions of an Environmental Management System prepared in accordance with ISO 14001 or equivalent.	Construction Operation
M-2	The construction would be carried out under the provisions of a Construction Environmental Management Plan.	Construction
M-3	The operation would be carried out under the provisions of an Operational Environmental Management Plan.	Operation
<b>Consultation</b>		
CO-1	Consultation would continue with stakeholders during all stages of the Proposal.	Pre-construction Construction Operation
CO-2	Stakeholders, including adjoining landholders and the local community would be notified when construction and operation are planned to commence.	Construction Operation
<b>Biodiversity</b>		
B-1	<p>A Biodiversity Management Plan would be prepared as part of the CEMP and implemented throughout construction. The Plan would include, but not be limited to:</p> <ul style="list-style-type: none"> <li>Plans showing areas to be cleared and areas to be protected, including exclusion zones, appropriate signage, protected habitat features and revegetation areas, vehicle and equipment parking areas, and stockpile areas</li> <li>Site inductions</li> <li>Location of threatened biodiversity</li> <li>Pre-clearing survey requirements</li> <li>Vegetation clearing procedures</li> <li>Procedures for unexpected threatened species finds and fauna handling</li> <li>Protocols to manage weeds and pathogens including a Plan of Management for the control of weeds, according to requirements under the NSW <i>Biosecurity Act 2015</i></li> <li>Protocols for soil and seed material to minimise transfer between sites</li> </ul>	Pre-construction Construction

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>■ Restriction of public access and associated impacts from domestic pets, waste dumping and damage to adjoining vegetation should be enforced pre, during and post construction</li> <li>■ Reduction in lighting levels at access road to avoid any adverse effects upon the essential behavioural patterns of light-sensitive fauna, in accordance with AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting</li> <li>■ Noise management practices</li> <li>■ Dust control measures</li> </ul>	
B-2	Detailed design would consider areas identified in the Biodiversity Development Assessment Report (BDAR) that host threatened species and communities and limits the intrusion of the Proposal into those areas.	Pre-construction Construction
B-3	<p>Limit removal of trees to that required within the development footprint and reinstate logs and rocks, which are removed for pipeline construction, along the right of ways or relocate them to appropriate nearby habitats.</p> <ul style="list-style-type: none"> <li>■ A pre-clearing protocol would be implemented during clearing works, as follows: <ul style="list-style-type: none"> <li>– Pre-clearance surveys would be undertaken to determine if any inhabiting fauna are present</li> <li>– A suitably qualified and trained fauna handler would be present during hollow-bearing tree clearing to rescue and relocate displaced fauna</li> </ul> </li> <li>■ Appropriate exclusion fencing around trees and woodland that are to be retained within the development footprint would be erected, considering allowance for Tree Protection zones in accordance with the Australian Standards</li> </ul>	Pre-construction Construction
B-4	Koala traffic signs would be installed along the access route from Old Punt Road.	Construction Operation
B-5	Any fencing required around proposed easements (not including fencing erected for safety of operation purposes) would have a Koala-friendly design, with a 20cm gap at the bottom to allow the movement of Koalas and other terrestrial fauna.	Construction Operation
B-6	A Biodiversity Offset Strategy would be prepared for the <b>Proposal</b> .	<b>Pre-Construction</b>
B-7	Weed infestations within the construction footprint would be identified and mapped prior to construction.	Pre-construction
B-8	Appropriate wheel wash and hygiene procedures would be implemented to limit construction plant and vehicles spreading weed seeds, vegetation debris and loose soil to and from the Proposal area.	Construction
B-9	Weed controls would be monitored regularly to promote the rehabilitation of revegetated areas within the Proposal area. Supplementary active revegetation would be undertaken as required.	Operation
B-10	Open sections of trenches would be monitored as required for trapped animals such as small ground dwelling mammals.	Construction
<b>B-11</b>	<b>To manage the risk of koalas entering the site and being hurt, injured or killed, fauna exclusion fencing will be installed around operational areas where reasonable and feasible.</b>	<b>Construction</b>
<b>Surface water and hydrology</b>		
SW-1	A Surface Water Management Plan (SWMP) will be prepared as part of the CEMP and implemented throughout construction. It would include, but not be limited to:	Pre-construction

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>▪ Erosion and Sediment Control Plan</li> <li>▪ Stormwater Management Strategy</li> <li>▪ Dewatering Procedure</li> <li>▪ Acid Sulphate Soil Management Plan (ASSMP)</li> </ul>	Construction
SW-2	<p>A site-specific Erosion and Sediment Control Plan (ESCP) would be developed in accordance with the Blue Book. At minimum this would include:</p> <ul style="list-style-type: none"> <li>▪ Scheduling construction works to avoid periods of heavy rainfall, where possible</li> <li>▪ Incorporating a designated stable vehicle access road and construction phase car park</li> <li>▪ Minimisation of the area of exposed and unstable ground surfaces during construction</li> <li>▪ Using sediment control systems including geofabric on stockpiles, silt fences, sediment traps, contour berms, energy dissipators</li> <li>▪ Resealing or revegetating exposed surfaces as soon as practical</li> <li>▪ Dust suppression methodologies including the use of a mist/spray and limiting certain tasks once a wind threshold is reached</li> <li>▪ Clean/dirty water separation and management via a Stormwater Management Strategy</li> <li>▪ Contact with soil, sediment, groundwater and surface water where possible</li> <li>▪ A description of monitoring required (dust as well as certain contaminants)</li> <li>▪ A description of the inspection and maintenance of erosion and sediment controls required</li> </ul>	Pre-construction Construction
SW-3	<p>A Stormwater Management Strategy would be developed including:</p> <ul style="list-style-type: none"> <li>▪ Clean water diversion drains or berms to divert clean water runoff from the surrounding catchment around the construction site and into existing drainage lines to prevent the formation of new surface flow paths</li> <li>▪ Separation of clean and dirty/contaminated stormwater within the construction site</li> <li>▪ All surface runoff from disturbed areas will be directed via dirty water drains to sediment control structures which will ultimately run into the sediment basin/s</li> <li>▪ Sediment basin sizing, location and maintenance regime in accordance with Blue Book and IECA guidelines</li> <li>▪ Turbidity testing and treatment (via a Dewatering Procedure)</li> <li>▪ A description of disposal/reuse options (eg reuse for dust suppression or irrigation or disposal to stormwater or sewer)</li> <li>▪ Water quality monitoring</li> <li>▪ Siting of waste and chemical storage areas</li> <li>▪ Disposal of contaminated water at a licensed facility</li> </ul>	Construction
SW-4	<p>A Dewatering Procedure would be developed to instruct:</p> <ul style="list-style-type: none"> <li>▪ Process for testing whether water meets discharge criteria</li> <li>▪ Water treatment methods including flocculation and pH adjustment</li> </ul>	Construction



ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Discharge process and location/s including avoiding erosion or scour</li> <li>Water quality monitoring requirements</li> <li>Permits and records required</li> <li>Any water which cannot be treated to meet discharge criteria would be removed by sucker truck and transported for offsite disposal at a licenced facility</li> </ul>	
SW-5	<p>An ASSMP would be developed and implemented and would include:</p> <ul style="list-style-type: none"> <li>Further site investigations to determine the areas of ASS that may generate sulphuric acidity from sulphide oxidation</li> <li>Preparation in accordance with the Port Stephens LEP 2013, the Port Stephens Council ASS Policy 2004, and the Acid Sulphate Soils Manual (ASSMAC 1998)</li> <li>Protocol to minimise the disturbance and exposure of ASS</li> <li>A description of the management/stockpiling requirements for each of the scenarios that may generate ASS (ie excavation or HDD)</li> <li>Methods for storing excavated ASS in conditions which simulate its natural state; or treatment and storage away from water bodies and drainage lines</li> <li>Bunding of exposed ASS storage and treatment areas to minimise and prevent spread of leachate</li> <li>Appropriate signage, barricading and sediment controls</li> <li>Recommended liming rates for generated ASS</li> <li>Method for lime treatment with machinery sufficient to perform adequate mixing</li> <li>A description of the maximum onsite residency time for untreated ASS</li> <li>A description of an emergency response protocol (ie where acidic runoff is generated)</li> <li>Steps to minimise groundwater dewatering (potentially oxidising unoxidised ASS)</li> <li>A field screening test using hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) would be performed on excavated soils in areas where ASS or PASS is anticipated, or on suspect soils. Soils which record a pH of below 4 following oxidation should be managed as ASS.</li> <li>Record keeping requirements including: <ul style="list-style-type: none"> <li>ASS monitoring and laboratory testing results</li> <li>Excavation records</li> <li>Stockpile tracking</li> <li>Register of lime used for ASS treatment</li> <li>Register of any offsite disposal of treated ASS</li> </ul> </li> </ul>	<p>Pre-construction</p> <p>Construction</p>
SW-6	<p>The permanent piped connection to the Hunter Water Corporation (HWC) network would be installed as early works to provide water for construction purposes and minimise water deliveries to the Proposal area.</p>	Pre-construction
SW-7	<p>A procedure would be developed and implemented to minimise the risk of drilling waste (in the form of drilling fluids and hydraulic stimulation fluids) contaminating watercourses during drilling, completion, hydraulic stimulation and workover activities.</p> <p>Drilling fluid spills would be immediately contained, cleaned up and reported.</p>	Construction

ID	Measures and programs	Timing
SW-8	The HDD entry and exit sites would be securely bunded to prevent the release of leachate from excavated material, drilling fluids, or spills entering the surrounding environment.	Construction
SW-9	A designated concrete washout area for concrete mixers and pump trucks, concrete chutes, tools and equipment would be established away from drainage lines and water bodies, which would be lined with impervious material. The washout capacity would be regularly checked before being used. The wash water would be left to evaporate, with dried concrete removed for recycling as required. Inspection of the capacity of the washout area and integrity of the liner would be undertaken prior to each use, and prior to rainfall events or site shut down, with improvements made as required. Wash water would be pumped out as required to maintain capacity or prior to rain events and disposed of as contaminated water.	Construction
SW-10	The use of pesticides in the project footprint would be limited where possible to avoid contamination of nearby watercourses/wetland areas.	Construction Operation
SW-11	Use of chemical treatment of hydrostatic test water would be avoided where possible. If necessary, chemical concentration to be calculated such that they are consumed in the hydrotesting process and only trace volumes would be present in any discharge.	Construction
SW-12	Water used in pressure testing would be collected following testing and disposed of off-site at a licensed facility.	Construction
SW-13	Any mulch stockpiles from cleared vegetation must be located at high points away from watercourses, with upgradient water diverted to avoid entering the stockpile.	Construction
SW-14	Mulch should not be used as part of erosion controls in the floodplain or along concentrated flow paths.	Construction
SW-15	Bunding and hazardous materials storage requirements include: <ul style="list-style-type: none"> <li>▪ Appropriately bunded in accordance with relevant Australian Standards</li> <li>▪ Bund-wall expansion joints and fire suppression to be incorporated into design.</li> <li>▪ Sufficient capacity</li> <li>▪ Isolation valves for all bunds</li> <li>▪ A high-level alarm would be fitted to the sewage tank</li> <li>▪ Low- and high-level alarms would be fitted to the diesel tanks</li> <li>▪ Inspection and maintenance after rainfall</li> <li>▪ Bund areas and tanker loading/unloading areas having sufficient capacity</li> </ul>	Construction Operation
SW-16	A register of all hazardous chemicals kept in the Proposal area is to be maintained and updated regularly.	Construction Operation
SW-17	Dedicated re-fuelling areas and spill controls, and appropriate chemical, fuel and liquid storage and handling would be undertaken during construction, in accordance with Australian standards.	Construction Operation
SW-18	Spill kits to be maintained in appropriate locations in accordance with Australian Standards, including where required inside machinery and vehicles.	Construction Operation
SW-19	A Spill Response and Containment Procedure would be developed including: <ul style="list-style-type: none"> <li>▪ Training and PPE</li> <li>▪ Precautionary measures for handling and storage of chemicals and fuels</li> </ul>	Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>▪ Spill response protocols (control, contain, clean up)</li> <li>▪ Contaminated soils to be disposed of appropriately</li> <li>▪ All spills to be reported and recorded in the Spills Register</li> <li>▪ Spill kits to be restocked following use</li> </ul>	
SW-20	All vehicles, plant and equipment to be checked regularly for fuel tank and line leaks or failures.	Construction Operation
SW-21	Bunds and sumps should be regularly inspected, and capacity maintained by regular draining and disposal.	Construction Operation
SW-22	Licensed contractors would be engaged to collect, transport and dispose of liquid hazardous materials, waste solvents, paints and hydrocarbon products to an appropriate off-site facility in accordance with relevant NSW Environment Protection Authority (EPA) guidelines.	Construction Operation
SW-23	Management and maintenance of the sewage system must be carried out by suitably trained personnel.	Construction Operation
SW-24	The civil design of the power station will incorporate the principles in the Port Stephens Council DCP 2007 to ensure that the post-development flow rate and volume is equal to pre-development for all storm events.	Pre-construction
SW-25	The power station would be developed above the PMF level.	Pre-construction
SW-26	<p>A Flood Preparedness Plan would be developed based on the PMF event, and would include:</p> <ul style="list-style-type: none"> <li>▪ Roles, responsibilities and communication procedures including emergency contacts</li> <li>▪ Monitoring procedures for rainfall and flood warnings (including BoM and local flood warning services)</li> <li>▪ Requirement for an environmental risk assessment prior to commencing excavation or trenching work in the event of a flood warning</li> <li>▪ Site shut-down and flood preparedness procedures to minimise harm to persons, plant and the environment</li> <li>▪ Actions in the lead up to the flood (such as monitoring water levels, filling excavations, completing erosion and sediment controls, removing hazardous materials and waste from the Proposal area, barricading, sealing tanks and containers to prevent overflows, tying down loose items)</li> <li>▪ Actions at the time of the flood (may include further evacuation, rescue, pollution prevention, spill response, and contingency measures)</li> <li>▪ Actions post-flood (including clean up and rectification)</li> <li>▪ Evacuation routes and procedures <b>identified, particularly for the access road into the site</b></li> <li>▪ Rescue procedures</li> <li>▪ Procedure for resuming operations</li> <li>▪ Reporting requirements and corrective actions</li> </ul> <p>During its development, the Flood Preparedness Plan would be discussed with the SES and Council to ensure alignment with community evacuation arrangements.</p>	Construction Operation

ID	Measures and programs	Timing
SW-27	<p>Pre-construction surface water quality monitoring would be undertaken at the following monitoring locations:</p> <ul style="list-style-type: none"> <li>▪ Drainage Path 1 (at culvert crossing Pacific Highway)</li> <li>▪ Drainage Path 2 (at culvert crossing Pacific Highway)</li> </ul> <p>Water quality testing would be undertaken monthly (if water is present) and following elevated periods of rainfall for a period of at least 3 months prior to construction.</p> <p>Test results from pre-construction monitoring would be correlated with available monitoring data from the adjacent NGSF site to create a baseline dataset which could be used for comparison during construction and operation of the Proposal.</p>	Pre-construction
SW-28	<p>A surface water quality monitoring program would be implemented at the following monitoring locations:</p> <ul style="list-style-type: none"> <li>▪ Construction phase sediment basin/s (construction only)</li> <li>▪ Wet sump oil and grease separator (GPT)</li> <li>▪ Bio-retention system outflow</li> <li>▪ Drainage Path 1</li> <li>▪ Drainage Path 2</li> <li>▪ LEP Wetlands discharge location (downstream of the secondary drainage that meets Drainage Path 1)</li> </ul> <p>Water quality testing would be undertaken monthly and following elevated periods of rainfall.</p>	Construction Operation
SW-29	<p>Regular inspection, monitoring and maintenance of erosion and sediment control structures would be undertaken in accordance with the ESCP and Blue Book.</p> <p>In addition, inspections would be undertaken immediately prior to and following heavy rainfall and rectifications made as required.</p>	Construction
SW-30	<p>Regular inspection and maintenance would be undertaken of:</p> <ul style="list-style-type: none"> <li>▪ Hazardous material containment facilities</li> <li>▪ Bunds and sumps</li> <li>▪ Vehicles, plant and equipment including tanks and line failures</li> <li>▪ Sewage tanks</li> <li>▪ Water storage tanks or ponds</li> <li>▪ GPT</li> <li>▪ Spill kits</li> </ul> <p>In addition, inspections would be undertaken immediately prior to and following heavy rainfall and rectifications made as required.</p>	Construction Operation
SW-31	<p>An Operation Environmental Management Plan (OEMP) will include a Stormwater Management Strategy including:</p> <ul style="list-style-type: none"> <li>▪ Drainage and temporary water storage systems, including separation of clean and dirty/contaminated water</li> <li>▪ Use of GPT (sediment and oil/water separator) and bioretention area</li> <li>▪ Reuse options (eg irrigation)</li> <li>▪ Water quality monitoring</li> <li>▪ Clean water discharge location and method</li> </ul>	Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Disposal of contaminated water and sewage at a licensed facility</li> </ul>	
SW-32	<p>A chemical drains system would be provided for collection and treatment of chemical spills and stormwater falling into bunded chemical storage areas (if outdoors).</p> <p>Chemical drains would be collected in a drains sump for testing and treatment before being piped to the process wastewater system.</p>	Operation
<b>Groundwater</b>		
GW-1	<p>A Groundwater Management Plan would be prepared, implemented and updated as required as part of the CEMP and OEMP. The plan would describe best practice control measures to reduce the risk of contamination of groundwater, or the substantial alteration of groundwater flows due to drawdown effects. The plan would detail:</p> <ul style="list-style-type: none"> <li>Background groundwater quality and levels</li> <li>Management of groundwater interference and dewatering</li> <li>Groundwater testing and assessment</li> <li>Groundwater discharge or reinjection criteria</li> <li>Best practice controls</li> <li>Spill response and containment plan</li> <li>Contamination response plan</li> <li>Drawdown contingency plan</li> <li>Groundwater monitoring program</li> </ul> <p>The Groundwater Management Plan would include a groundwater monitoring program which would detail:</p> <ul style="list-style-type: none"> <li>Groundwater monitoring required <ul style="list-style-type: none"> <li>Analytes/parameters (water quality)</li> <li>Background concentrations</li> <li>Criteria/thresholds</li> </ul> </li> <li>Groundwater levels</li> <li>Frequency</li> <li>Bore locations <ul style="list-style-type: none"> <li>The 10 existing monitoring bores on the power station site</li> <li>Available boreholes at the NGSF site near the proposed pipeline corridor</li> <li>Additional locations along the pipeline corridor</li> <li>At the directional drilling entry and exit pits (during construction)</li> <li>Upstream and downstream of the operational stormwater discharge point/s</li> </ul> </li> <li>Potential impacts <ul style="list-style-type: none"> <li>Change in groundwater quality or levels</li> <li>Drawdown impacts</li> <li>Effects on GDE</li> <li>Effects on beneficial aquifers (including groundwater users)</li> </ul> </li> </ul>	Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>▪ Reporting requirements</li> <li>▪ Protocol for the investigation, notification and mitigation of any identified exceedances of the groundwater quality criteria</li> </ul> <p>Monitoring requirements would be reviewed once the details of the construction are finalised and during construction.</p>	
GW-2	Limit the extent of impervious surfaces to allow aquifer recharge.	Pre-construction
GW-3	Minimise long-term disturbance of groundwater flows through design, such as incorporating permeable zones that allow groundwater to bypass the buried gas pipeline.	Pre-construction Construction
GW-4	<p>When constructing the gas pipeline in areas of shallow groundwater, the following techniques should be considered to minimise groundwater impact:</p> <ul style="list-style-type: none"> <li>▪ Trenches below the water table would be excavated over short lengths to reduce the volume of groundwater impacted during construction</li> <li>▪ As required, use appropriate materials, such as trench shields or sheet piles, to maintain the stability of excavation walls</li> <li>▪ If practical, dewater to locally lower the water table beneath the floor of the excavation to provide a safe and dry working surface</li> <li>▪ Abstracted groundwater would be stored pending water quality testing, for either re-injection or infiltration (if water quality criteria are met) or disposal offsite at a licensed disposal facility</li> <li>▪ Replace material excavated from trenches to minimise changes to groundwater flows</li> <li>▪ Where possible, pipelines will be bedded on sand in the base of the trench</li> </ul>	Construction
GW-5	When working along the pipeline route, additional precautions should be made when using or transporting fuels and chemicals, and any spills should be immediately contained and cleaned up. Any contaminated material to be removed from the site <b>would be sent</b> to a licensed facility.	Construction
GW-6	<p>Any water encountered and abstracted from the Tomago Sandbeds aquifer should be locally reinjected back into the aquifer on the hydraulically down gradient side, approximately 50m from the edge of the construction works.</p> <p>Prior to re-injection the abstracted groundwater must be inspected for any signs of contamination (high turbidity, oily sheen or odour of hydrocarbons) and tested for water quality parameters (temperature, dissolved oxygen, redox, EC, and pH), which would be compared to measurements from nearby monitoring wells.</p> <p>If greater than 10% difference with the groundwater measurements treatment would be required prior to re-injection.</p> <p>If collected groundwater does not meet criteria for re-injection, then the collected groundwater must be disposed to a facility licenced to accept and treat contaminated water.</p>	Construction
GW-7	Undertake infiltration rate tests at locations of proposed groundwater discharge areas or infiltration basins to determine local infiltration rates and the presence of indurated sand layers capable of inhibiting groundwater recharge.	Construction Operation
GW-8	Process water would be managed to prevent discharge to surface water systems or groundwater.	Operation
GW-9	Sealed pavement areas should be used for refuelling and chemical storage areas to minimise the risk of spills infiltrating to groundwater.	Construction Operation



ID	Measures and programs	Timing
GW-10	Prepare a remediation action plan for major spills or other incidents which may cause impact to groundwater quality. This may include hydraulic containment using downgradient berms and pumps.	Construction Operation
GW-11	Rehabilitate compacted areas which are not needed for operational activities by loosening the soil, adding organic matter and revegetating the area.	Post-construction
<b>GW-12</b>	<b>If more than 3 ML/year groundwater is expected to be intercepted during construction, AGL would pursue a Water Access Licence and continue consultation regarding any water trading requirements.</b>	<b>Pre-construction Construction</b>
<b>Air quality</b>		
AQ-1	The power station would be fitted with a Continuous Emission Monitoring Systems (CEMS) to demonstrate ongoing regulatory compliance, ensure proper and efficient operation of pollution control equipment, and evaluate operating and emission variability.	Pre-construction Operation
AQ-2	<p>The CEMP will include requirements to monitor and manage potential air quality impacts associated with the construction of the Proposal. The CEMP will identify project construction activities with the potential to have air quality impacts and the controls required to avoid, minimise and mitigate these impacts. The plan will include measures to:</p> <ul style="list-style-type: none"> <li>Minimise dust generation from stockpiles, haulage routes, work activities and exposed ground surfaces</li> <li>Minimise generator and vehicle emissions</li> <li>Cover or minimise truck loads</li> <li>Reduce speeds on unsealed roads</li> <li>Modify or cease dust generating works during unfavourable weather conditions</li> <li>Inspect and address corrective actions</li> </ul>	Construction
AQ-3	Any long-term stockpiles would be stabilised and are to be managed to suppress dust emissions.	Construction
AQ-4	Demolition activities, including removal of hazardous building materials, will be planned and carried out in a manner that minimises the potential for dust generation. Removal of hazardous building materials will be completed prior to the commencement of general demolition works.	Construction
AQ-5	Vegetation or other materials are not to be burnt on site.	Construction Operation
AQ-6	All air quality requirements and monitoring would be adhered to in accordance with an EPA license.	Operation
<b>Soils and contamination</b>		
SC-1	Heavy vehicles and machinery would use allocated tracks where possible to minimise soil erosion.	Construction
SC-2	Where highly contaminated soil and/or groundwater is impacted, a site-specific remediation action plan would be required to manage the material. This would include management requirements that are above those outlined within the CEMP. It may be specific to the selected remediation technique and detail the requirements of a specialist remediation contractor.	Pre-construction Construction
SC-3	A pre-demolition hazardous materials survey is required for the demolition of the residential dwelling on Lot 3. Based on the findings, required controls would be implemented for removing the identified materials.	<b>Pre-construction</b>

ID	Measures and programs	Timing
SC-4	<p>A spills protocol would be developed as part of the OEMP, including:</p> <ul style="list-style-type: none"> <li>Fuel/chemical spill protocols – spill kits to be available and relevant workers to be trained on response protocols</li> <li>A formal reporting procedure - any spills to be reported on the Spill Register</li> <li>A register of all hazardous chemicals kept on site is to be maintained and updated regularly</li> <li>Appropriate recorded spill capture points (i.e. bunding, collection sump, etc)</li> <li>Maintenance requirements of effluent-related infrastructure or disposal to stormwater or sewer)</li> </ul>	Operation
SC-5	<p>Monitoring of contamination would be included in the CEMP which would include:</p> <ul style="list-style-type: none"> <li>Further assessment of identified contamination AECs prior to construction to determine remedial actions</li> <li>Hazardous materials (HAZMAT) asbestos and lead paint surveys of any buildings or structures within the Proposal area prior to demolition</li> <li>Monitoring to be detailed in Proposal construction environmental management plans</li> </ul>	Construction
SC-6	Construction of sediment basin/s would be in accordance with the specifications outlined in Appendix I.	Construction Operation
<b>Aboriginal heritage</b>		
AH-1	Cultural awareness induction for any personnel involved in ground breaking activities. This could include a Cultural Awareness Training Program.	Construction
AH-2	<p>An <b>Aboriginal</b> Cultural Heritage Management Plan (<b>ACHMP</b>) including potential monitoring and salvage works procedures would be prepared and implemented for the Proposal construction. <b>The ACHMP would include, but not be limited to:</b></p> <ul style="list-style-type: none"> <li><b>Monitoring and salvage works procedures</b></li> <li><b>An Aboriginal artefacts care agreement</b></li> <li><b>Long term management procedures for Aboriginal objects</b></li> <li><b>Aboriginal cultural heritage mapping</b></li> <li><b>Community consultation with RAPs and BCD prior to construction</b></li> </ul>	Construction
AH-3	Chance Finds Procedure to be followed for any Aboriginal heritage objects found during the works. In the event an Aboriginal heritage object is found all activity in the immediate area must cease and an appropriately qualified heritage professional should be consulted. OEH and local Aboriginal stakeholder groups must be immediately contacted and informed of the Aboriginal heritage object found. The qualified heritage professional should record the location and the attributes of the site and determine its Aboriginal cultural significance. If Aboriginal remains (human skeletal material or suspected human skeletal material) are discovered during construction all activities in the immediate area must cease. The State Police and OEH must be contacted and any sand or soil removed from the near vicinity identified and set aside for investigation purposes.	Construction
AH-4	Repatriation of archaeological material is to be conducted for artefacts and charcoal recovered during test excavations. The location of the reburial must be determined by the RAPs and should be as close as possible to the location at which the sites were recovered.	Construction

ID	Measures and programs	Timing
AH-5	A copy of the final ACHAR should be distributed to all Aboriginal organisations who expressed interest in the proposed works.	Pre-construction
AH-6	A copy of the final ACHAR including comments and recommendations by RAPs should be provided to the relevant <b>DPIE BCD</b> regional branch.	Pre-construction
<b>Traffic and transport</b>		
T-1	Parking for construction staff is to be provided within the NPS site.	Construction
T-2	A Construction Traffic Management Plan (CTMP) would be prepared by the contractor to safely manage traffic movements to and from the Proposal.	Pre-construction
T-3	Over Size Over Mass vehicle requirements would be addressed in Traffic Control Plans within the CTMP.	Pre-construction
T-4	A Drivers Code of Conduct would be prepared that directs all heavy vehicles to access the site via the Pacific Highway and Old Punt Road intersection.	Pre-construction
T-5	A CHR turn treatment on Old Punt Road is required to allow for the safe movement of construction traffic turning right into the site <b>and to prevent queuing of vehicles along Old Punt Road</b> . This must be designed in accordance with the Austroads Guidelines <b>and to the satisfaction of PSC and Transport for NSW</b> .	Pre-construction
<b>T-6</b>	<b>Prior to construction of the Proposal, AGL undertakes to share designs and collaborate with Transport for NSW to ensure that there is no restriction to the development of the M12RT project and associated local or state roads.</b>	<b>Pre-construction</b>
<b>T-7</b>	<b>AGL will design proposed utilities to be adequately protected and/or have suitable vertical clearance so as not to limit the current operation of the road reserve. AGL undertakes to collaborate with Transport for NSW upon finalisation of the M12RT design/exhibition to ensure that there is no restriction to the development of local and state roads relevant to M12RT.</b>	<b>Pre-construction Construction</b>
<b>T-8</b>	<b>AGL would design the access from Old Punt Road to integrate appropriately with any development proposal designs for the upgrade of Old Punt Road that are exhibited prior to commencement of the construction of the Proposal.</b>	<b>Pre-construction</b>
<b>Noise and vibration</b>		
NV-1	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared prior to the commencement of works to manage high noise works, affected receivers, complaints handling and consultation protocols, and out of hours work.	Construction
NV-2	Respite periods of one hour would be employed for every three hours of work where works are anticipated to generate noise levels > 75dBA at a receiver.	Construction
NV-3	Appropriate plant and equipment would be selected for the task at hand and efficient work practices would be adopted to minimise the construction period and the number of noise sources on site.	Construction
NV-4	Power down plant and equipment when not in use and avoid high engine speeds when lower speeds are sufficient.	Construction
NV-5	All construction plant and equipment would be maintained in suitable condition prior to mobilisation to the site and during construction.	Construction
NV-6	Particular emphasis would be placed on construction maintenance of exhaust silencers, covers on engines and transmissions, and poorly maintained components.	Construction
NV-7	Excessively noisy machines would be taken out of service for repair or removed from the site.	Construction

ID	Measures and programs	Timing
NV-8	Tonal motion alarms (beepers) would be avoided in favour of broadband motion alarms (quackers).	Construction
NV-9	Where night works are required, works with the potential to generate impulsive noise would be avoided.	Construction
NV-10	Noise complaints would be managed by the construction contractor in accordance with the CEMP.	Construction
NV-11	Appropriate plant and equipment would be selected for the task at hand so that lower vibration/lower impact plant would be chosen over that with a higher impact.	Construction
NV-12	Plant and equipment selected for the Proposal would have sound power levels not exceeding those presented in Section 6.9 of the EIS – Attenuated Sound Power Levels at Source.	Operation
NV-13	Where the attenuated noise levels from the Proposal exceed the predicted noise levels, further attenuation and/or analysis would be carried out to assess and recommend additional measures.	Operation
NV-14	Where noise complaints are validated, operator attended noise measurements would be undertaken to measure and compare the site noise level contributions with the NMLs presented in the EIS.	Construction
NV-15	Where noise monitoring is carried out, all site noise levels would be measured.	Construction
NV-16	Where noise monitoring identifies an exceedance, management measures would be designed and implemented to ensure ongoing compliance.	Construction
NV-17	Where vibration complaints are validated, vibration monitoring would be undertaken to identify the nature and extent of any exceedances.	Construction
NV-18	Where vibration monitoring identifies an exceedance, management measures would be designed and implemented to ensure ongoing compliance.	Construction
<b>Social and economic</b>		
SE-1	AGL would use social procurement policies to employ local labour, local and regional businesses, contractors and supply companies for provision of labour, goods and services.	Construction Operation
SE-2	Detailed advanced notice of goods and services required by the Proposal would be issued to assist local businesses and services meet the needs of the Proposal. AGL would require all tenderers on the Proposal to prepare a Local Industry Participation Plan and an Indigenous Engagement Plan as a mandatory component of each tender.	Construction Operation
SE-3	Community consultation would be ongoing throughout the Proposal life. Public notifications, letterbox drops, and emails would be used to update the local community on the Proposal's progress and scheduling of works, particularly works which would have an impact on public amenity such as noisy night works.	Construction Operation
SE-4	Throughout the Proposal planning, construction and operation, AGL would continue consultation with the following key stakeholders: <ul style="list-style-type: none"> <li>▪ DPIE</li> <li>▪ Paterson electoral division</li> <li>▪ Newcastle electoral division</li> <li>▪ Port Stephens Council</li> <li>▪ <b>Transport for NSW</b></li> </ul>	Pre-construction Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Hunter Water Corporation</li> <li>Department of Defence</li> <li>Civil Aviation Authority</li> <li>Newcastle Airport</li> <li>Department of Energy, Agriculture, Water and the Environment (previously Department of Energy and Environment)</li> </ul>	
SE-5	AGL would continue dialogue groups with representatives from Port Stephens Koalas, Hunter Wildlife Rescue, Wahroonga Aboriginal Corporation, HWC and Hunter Region Botanic Gardens.	Construction Operation
SE-6	A Local Community Investment Program would be established for the Proposal once construction commences and would continue into operation. The Proposal would further facilitate, or support initiatives aimed at community development, capacity building and strengthening community institutions.	Construction Operation
SE-7	AGL would continue to develop their working relationships with local area emergency service providers including Raymond Terrace police, ambulance and fire services, and regional hospitals, to prepare for emergencies and advise on risks to or from the Proposal. Proposal design will provide sufficient access for emergency vehicles and equipment including firefighting and rescue.	Construction Operation
SE-8	AGL's existing 'Fitness for Work Policy' will be enforced, and all staff, contractors and visitors will undergo site inductions to be familiar with the construction safety management plan and emergency management plan, as well as occupational health and safety requirements.	Construction Operation
SE-9	First aid facilities will be provided on site.	Construction Operation
SE-10	Community liaison would be undertaken throughout the construction and operation phases. A 24-hour information line would be established for any concerned residents to enquire about the Proposal, and a complaints register would be maintained for the life of the Proposal.	Construction Operation
SE-11	<p>AGL would monitor socio-economic parameters so that the effects of the Proposal on the socio-economic conditions of the local area can be quantified during the Proposal and additional management measures can be applied where required. These parameters may include:</p> <ul style="list-style-type: none"> <li>Number of direct jobs created for local and regional residents</li> <li>Number of contracts with local businesses and their monetary value</li> <li>Funding provided to community organisations and groups</li> <li>Housing and accommodation requirements of the workforce</li> <li>Number of staff who remain in the community after construction</li> <li>Stakeholder and community feedback</li> </ul>	Construction Operation
<b>Visual amenity</b>		
VA-1	The power station design including all plant facilities such as diesel storage and operational and amenity buildings would be located insofar as is practical to reduce the requirement to clear vegetation and to reduce the angle from passing viewpoints.	Pre-construction
VA-2	A landscape design workshop would be considered to establish the means to minimise the visual impact and visibility of the Proposal. The workshop would	Pre-construction

ID	Measures and programs	Timing
	assess the retention of trees, the planting of new and endemic vegetation, and viewpoint specific plantings to eliminate visual impacts from specific locations.	
VA-3	<p>A site landscape plan would be prepared that emphasises integration of new plantings with existing vegetation and that includes opportunities to provide screen plantings. The landscape plan would include (but not limited to):</p> <ul style="list-style-type: none"> <li>Visual and ecological planting patterns of locally endemic species to emulate existing mixes of tree and grass cover in the surrounding landscape</li> <li>Installation of temporary screens to minimise exposure of construction areas from local viewpoints</li> <li>Specific plantings would be considered for screening the nearest residential receivers</li> </ul>	Pre-construction Construction
VA-4	The power station design would seek to include the selection of visually sympathetic cladding and security fencing materials to reduce contrast and improve integration of the balance of plant and of the site as a whole.	Pre-construction
VA-5	The lighting design would be in accordance with AS4282-1997 Control of the obtrusive effects of outdoor lighting.	Pre-construction
VA-6	<p>The site-specific CEMP would include the following:</p> <ul style="list-style-type: none"> <li>Where possible, lights would be used at the lowest effective level and would be directed downwards to the work area and away from incoming viewpoints</li> <li>Construction lighting would be kept to a minimum necessary for safety and security needs and would not be directed in a manner so as to shine toward oncoming traffic on the Pacific Highway</li> <li>Night works would be limited where possible to avoid areas that are exposed to direct views along Pacific Highway and workers will be trained in the management of night time lighting</li> <li>Inspection and maintenance schedules of the following construction elements and mitigations for visual impacts: <ul style="list-style-type: none"> <li>Construction lighting direction</li> <li>Temporary construction fencing and screening</li> <li>Delineated no-go areas</li> <li>Vegetation plantings and rehabilitation</li> </ul> </li> </ul>	Construction
VA-7	<p>A site-specific OEMP will be prepared for the Proposal. The OEMP would include the following inspection requirements:</p> <ul style="list-style-type: none"> <li>Inspection and maintenance of security lighting direction to ensure it is directed to the worksite and away from neighbouring land uses</li> <li>Inspection and maintenance of security fencing to remove litter and graffiti</li> <li>Inspection and maintenance of vegetation plantings and rehabilitation</li> </ul>	Operation
<b>Non-Aboriginal heritage</b>		
NAH-1	<p>If any heritage objects and/or relics are uncovered during the construction of the Proposal the following steps would be followed:</p> <ul style="list-style-type: none"> <li>All activity in the immediate area would cease immediately</li> <li>The project manager would be notified</li> <li>Flagging or fencing would be erected to demarcate and protect the area</li> </ul>	Construction



ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Site personnel and visitors would be advised to avoid the area until further notice</li> <li>An appropriately qualified heritage professional would be consulted to confirm if the object/s is a heritage item or relic</li> <li>The Office of Environment and Heritage (OEH) would be contacted</li> <li>An appropriately qualified heritage professional would record the location and attributes of the site and determine the significance of the find</li> </ul> <p>Heritage objects and/or relics may include glass, ceramic, metal, building footings, and building materials etc., as protected under NSW legislation.</p>	
NAH-2	<p>In the event of the discovery of human skeletal material (or suspected human skeletal material) during project activities in the Proposal area the following steps would most likely be followed:</p> <ul style="list-style-type: none"> <li>All activities and/or works in the immediate area would cease</li> <li>The NSW Police would be immediately contacted along with the project manager and OEH</li> <li>Flagging or fencing would be erected to demarcate and protect the area</li> <li>Site personnel and visitors would be advised to avoid the area until further notice</li> <li>Any sand or soils removed from the near vicinity of the find would be identified and set aside for assessment by the investigating authorities</li> </ul>	Construction
<b>Waste and recycling</b>		
WR-1	<p>Appropriate construction and demolition waste storage and disposal methods would be completed in accordance with the CEMP and <i>Protection of the Environment Operations Act 1997</i> during possible demolition of the onsite property. This aims to reduce any transportation of harmful contaminant via surface water run-off into the surrounding waterway systems.</p>	Construction
WR-2	<p>A Construction Waste Management Plan (CWMP) and Operational Waste Management Plan (OWMP) would be developed and implemented prior to each stage. The plans would be developed with the following criteria:</p> <ul style="list-style-type: none"> <li>A hierarchical waste management approach would be used, from the most preferable (reduce, reuse or recycle wastes) to the least preferable (disposal) to prioritise waste management strategies to avoid waste generation</li> <li>The CWMP and OWMP would be developed in accordance with the mitigation strategies described in the WSM which provides avoidance, mitigation, reuse, recycle or disposal methods for each waste stream identified in the NPS</li> <li>The plans would promote the use of materials with minimal packaging requirements, removal of packaging offsite by suppliers and fabrication of parts offsite</li> <li>Where waste cannot be avoided, waste materials would be segregated by type for collection and removal (for processing or disposal) by licensed contractors</li> <li>All waste types would be separated at source for recycling and apply a system of colour-coded waste storage containers to ensure the segregation of waste is affected as far as possible</li> <li>A licensed service provider would be appointed to collect general solid waste and hazardous waste during construction and operation</li> <li>Each waste type would be classified for transport to ensure correct handling</li> </ul>	Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>Any waste that cannot be recovered or recycled would need to go to a licensed treatment or disposal facility where it would be treated and disposed of according to its classification</li> </ul>	
WR-3	An audit regime would be implemented, in accordance with the AGL Health and Safety Environmental Management System (HSEMS) during construction and operation which includes (but not limited to) quantities of waste, storage areas and contractor services.	Construction Operation
WR-4	Spoil that can be beneficially reused would be done so in accordance with the project spoil re-use hierarchy.	Construction
WR-5	Ongoing consultation would be required between AGL and HWC regarding the arrangement for the disposal of wastewater.	Construction Operation
<b>Plume rise and aviation hazard</b>		
PR-1	AGL would provide the plume rise assessment report to Airservices Australia, Department of Defence, and CASA for review prior to the commencement of construction.	Pre-construction
PR-2	AGL would continue to consult with Department of Defence during design, construction and operation on appropriate measures to manage aviation safety risks associated with the Proposal.	Pre-construction Construction Operation
PR-3	AGL would apply for approval from the Directorate of External Land Planning (DELP) for the erection of permanent and temporary structures in accordance with AC 139-08(0) – CASA Advisory Circular – Reporting of Tall Structures.	Pre-construction
<b>Bushfire</b>		
BF-1	<p>An Emergency Management and Evacuation Plan (EMEP) would be developed and implemented prior to construction and operation. The EMEP would be developed in accordance with:</p> <ul style="list-style-type: none"> <li>NSW RFS – A guide to developing a Bush Fire Emergency Management and Evacuation Plan</li> <li>Australian Standard AS 3745:2010 – Planning for emergencies in facilities</li> </ul> <p>The EMEP would include:</p> <ul style="list-style-type: none"> <li>Identify designated buildings or safe places that can provide refuge from bushfires (in accordance with AS3959:2018)</li> <li>Consultation with the local NSW RFS, NSW Fire and Rescue and Port Stephens Bush Fire Management Committee</li> <li>Assessment of response times and access for fire services</li> <li>Ensuring persons are not exposed to bushfire impacts</li> </ul>	Construction Operation
BF-2	<p>Road access to the proposed NPS site would be available to the Fire Emergency Services through the incorporation of the following measures in design:</p> <ul style="list-style-type: none"> <li>The NPS road system would consist of a perimeter road and a network of services roads to allow for multiple access routes</li> <li>The perimeter road would be sealed and a minimum 8m wide forming part of the Asset Protection Zone (APZ)</li> <li>Service roads would be sealed and a minimum of 4m wide, sign posted, and with direct access toward the main entry</li> </ul>	Construction Operation

ID	Measures and programs	Timing
	<ul style="list-style-type: none"> <li>An alternate access/egress will be considered during design in the event access to Old Punt Road or Old Punt Road itself is cut off or closed</li> </ul>	
BF-3	<p>A radiant heat impact of 23kW/m<sup>2</sup> or less would be achieved within design for the generator plant, equipment and fuel storage. This would be achieved through either:</p> <ul style="list-style-type: none"> <li>Implementation of an APZ between the asset and the site boundary (as large as reasonably possible)</li> <li>Installation of radiant heat barriers such as metal clad fencing or construction within a shed (in order to be able to decrease the APZ distance less than 32m)</li> <li>Suitable siting of infrastructure within the construction compound</li> </ul>	Pre-construction Construction
BF-4	The bulk fuel (diesel) storage would be designed to be compliant with the Australian Standards AS1692:2006 and AS 1940:2017. The location of these storage areas would be located as far as possible from the primary bushfire hazard area. If compliance with AS1692:2006 and AS 1940:2017 is not possible, fire protection on the primary bushfire hazard side (east) of the plant and equipment area would, as a minimum, be compliant with AS 2419.1:2005 for the installation of fire hydrants.	Pre-construction
BF-5	Design of the proposed pipelines would take advantage of the existing bushfire protection measures. Where the final design layout demonstrates that any existing measures are insufficient, compliance with the requirements of the applicable pipeline standard; European LNG Code, EN 1473:2007 would be necessary.	Pre-construction
BF-6	Electrical transmission lines would have vegetation easements in accordance with the bushfire protection requirements of the Guide for the Management of Vegetation in the Vicinity of Electricity Assets (ISSC 3 – 2016).	Pre-construction Construction
BF-7	As described in ISSC 3, 2016, a 10m APZ would be established surrounding the boundary fence, where only maintained lawn or grasses are permitted.	Construction
BF-8	Administration, workshops and stores buildings located on the eastern side of the site (within 23m of the primary bushfire hazard) would be designed to a construction standard minimum of BAL 40.	Pre-construction Construction
BF-9	An emergency egress onto the Pacific Highway, using the existing Lot 2 residential access, will be further considered and included in the EMEP and operational management plans.	Construction Operation
BF-10	Water for firefighting would be provided through the installation of a ring main water supply and hydrants throughout the site. The water supply for the site would be capable of complying with the Australian Standard AS2419.1:2017.	Construction
BF-11	AZP's would be monitored through vegetation clearing maintenance activities.	Operation
<b>Hazard and risk</b>		
HR-1	The detailed design of the generator building/housing and associated equipment would clearly outline the basis of safety used to ensure that the explosive situations do not arise.	Pre-construction
HR-2	Rotating machines would be designed such that the risk associated with failure leading to uncontained projectiles is minimised.	Pre-construction
HR-3	The safety assessment process would continue to identify controls that prevent or limit the effects of major hazardous incidents on site, such as fire and explosion that could result in significant off-site effects.	Pre-construction
<b>Fire safety</b>		

ID	Measures and programs	Timing
FS-1	The storage and associated piping systems for gases in the gaseous or liquefied states would comply with NFPA 54, NFPA 55, NFPA 56, NFPA 58, and ASME B31.1/B31.3/B31.8 as applicable.	Pre-construction
FS-2	The detailed design would provide for the subdivision of separate fire areas for the purpose of limiting the spread of fire, protecting personnel, and limiting the resultant consequential damage to the plant. Fire areas would be separated from each other by fire barriers, spatial separation, or other approved means.	Pre-construction
FS-3	Hydrocarbon detection systems would be provided in areas of the facility where congestion and hydrocarbon loss may occur.	Pre-construction
FS-4	Hot works would be controlled by appropriate Control of Work permitting processes, if required.	Construction Operation
FS-5	Diesel tanks would be designed, installed, and operated in accordance with relevant Australian Standards.	Construction Operation
FS-6	A hydrant system comprising at least one hydrant riser per tank would be installed along with a mobile monitor.	Construction
FS-7	Foam concentrate and powder-type extinguishers would be provided along with a minimum of three powder-type extinguishers for the storage area.	Pre-construction
FS-8	A smoke detection system would be installed throughout rooms containing electrical equipment, including walk-in-type consoles, above suspended ceilings where combustibles are installed, and below raised floors. Where the only combustibles above the false ceiling are cables in conduit and the space is not used as a return air plenum, smoke detectors are permitted to be omitted from this area.	Pre-construction
FS-9	An aspirating smoke detection system would be considered for fire detection with Argonite gaseous suppression systems in cabinets and FM200 gaseous suppression in the switch rooms.	Pre-construction
FS-10	A fire detection system would be provided for each generator housing.	Pre-construction
FS-11	Fireproofing of supports and structures potentially exposed to a jet fire would be considered during design based on the requirements of API 2118.	Pre-construction
FS-12	Bund capacity in the diesel storage area would be sufficient for spill containment and firefighting purposes.	Pre-construction
FS-13	Fire water storage capacity would be provided to comply with NFPA 850 requirements.	Pre-construction

